Douglas Partners
Geotechnics / Environment / Groundwater

Integrated Practical Solutions

Report on
Salinity Investigation and Management Plan

Pendle Hill High School Development
Cornock Avenue, Toongabbie

Prepared for
TSA Management Pty Ltd

Project 86977.01
March 2021

Document History

Document details

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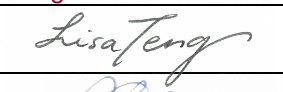
Distribution of copies

Status	Electronic	Paper	Issued to
Revision 0	1	-	SINSW c/o TSA Management Pty Ltd
Revision 1	1	-	SINSW c/o TSA Management Pty Ltd

The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

	Signature	Date
Author		31 March 2021
Reviewer		31 March 2021

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Douglas Partners
Geotechnics / Environment / Groundwater

Table of Contents

Report on Salinity Investigation and Management Plan
Pendle Hill High School Development
Cornock Avenue, Toongabbie

1. Introduction

This report presents the results of a salinity investigation and management plan undertaken for the State Significant Development (the 'site') at Pendle Hill High School (PHHS) located at Cornock Avenue, Toongabbie (see Drawing 1, Appendix A). The investigation was commissioned by School Infrastructure NSW (SINSW) C/O TSA Management Pty Ltd and was undertaken in accordance with Douglas Partners' proposal SYD201350 dated 7 December 2020.

Saline soils affect much of the Western Sydney region. Buildings and infrastructure located on shales of the Wianamatta Group are particularly at risk. Salinity can affect urban structures in a number of ways, including corrosion of concrete, breakdown of bricks and mortar, corrosion of steel (including reinforcement), break up of roads, attack on buried infrastructure, reduced ability to grow vegetation and increased erosion potential.

We understand that the proposed development includes the construction of a new three-storey courtyard building on Binalong Road comprising:

- Two new 3 storey wings under a connected roof which will accommodate a library, staff unit, lecture theatre, multimedia and senior learning, administration unit and student amenities;
- External transport infrastructure upgrade works;
- New covered walkways and upgraded landscape; and
- New hardstand areas for bicycle parking.

An assessment of soil salinity is required to assist in planning of the proposed development as required under general requirement 17 of the Planning Secretary's Environmental Requirements (SEARS). An extracted architectural drawing showing the proposed development is included in Appendix B.

DP notes that this investigation was undertaken in conjunction with a supplementary contamination assessment and is reported under a separate cover[1].

2. Scope of Work

The scope of works for the current report included a salinity assessment based upon:

- Collection of samples at regular depth intervals from thirteen boreholes to 3.0 m depth or prior practical refusal;

[1] DP *Report on Supplementary Contamination Assessment, Pendle Hill High School Development, Cornock Avenue, Toongabbie* dated 17 March 2021 (DP reference: 86977.01.R.001.Rev0)

- Inspection of the Site for signs of salinity;
- Analysis of electrical conductivity ($EC_{1:5}$), pH and soil texture test results for soil and weathered rock samples determined at a NATA accredited analytical laboratory, for classification of salinity and aggressivity;
- Laboratory analysis of additional salinity, aggressivity and erodibility indicators, including chloride and sulphate ion concentrations and dispersibility testing at a NATA accredited analytical laboratory; and
- Assessment of the results with respect to potential for salinity impacts on the development.

3. Site Description

The summary of Site information is presented in Table 1 below and a drawing of the site and the approximate boundary of the Site is included as Drawing 1 in Appendix B.

Table 1: Site Identification Details

Address	Cornock Avenue, Toongabbie
Lot Identification	Lot 101, Deposited Plan 1141329
Approximate Site Area	6.6 ha
Local Government Area	City of Parramatta Council
Approximate Stage 2 Site Area	4600 m^2

The Site is located in the eastern portion of PHHS. It is significantly lower in surface level compared to the school and the grassed area to the south. A footpath follows the site's northern edge, and the ground level falls moderately steeply to the north to meet the ground level of the adjacent residential buildings. This is indicative of cut and fill activities having taken place during the construction of the school.

4. Regional Geology, Soil Landscapes and Hydrogeology

4.1 Site Soil Landscape and Geology

The Penrith 1:100,000 Soils Landscape Series Sheet indicates that the site is situated on the Blacktown Soils Group, which is characterised by shallow to moderately deep (<100 cm) Red and Brown Podzolic Soils on crests, upper slopes and well drained areas; and deep (150-300 cm) Yellow Podzolic Soils and Soloths on lower slopes and in areas of poor drainage.

The Penrith 1:100,000 Geology Series Sheet indicates that the site is underlain by Ashfield Shale. Ashfield Shale comprises dark-grey to black claystone-siltstone and fine sandstone-siltstone laminite.

4.2 Acid Sulfate Soils

A review of the acid sulfate Soils risk mapping indicates that the site is located in an area with an extremely low probability for the occurrence of ASS.

4.3 Groundwater and Surface Water

The nearest surface water receptor is Pendle Creek, which is approximately 600 m west of the site. Based on local topography observed in the regional map information, groundwater is anticipated to flow west towards the creek.

A search of the WaterNSW database of registered groundwater bores on 5 November 2019 indicated no registered groundwater bores / wells within 500 m of the site.

4.4 Salinity Potential

Reference to the *Map of Salinity Potential in Western Sydney* (2002), indicates that the site is located within an area of 'moderate salinity potential', where *"saline areas may occur, which have not yet been identified or may occur if risk factors change adversely."*

5. Field Work Methods

Field investigations were undertaken on 21 and 22 January 2021 by a DP environmental scientist. The field work included the drilling of 13 boreholes (BH109N, BH109E, BH109S, BH109W and BH201 to BH209) using a 3.5 tone excavator fitted with either a 300 mm or 100 mm diameter auger. Boreholes were drilled to a depth of 3 m below ground level (bgl) or prior refusal.

Borehole locations were nominated by DP and were co-ordinated in the field using a DGPS unit. Borehole locations are shown on Drawing 2, in Appendix B.

The subsurface conditions encountered in the boreholes were logged on site by a DP environmental scientist (refer to Borehole logs in Appendix D). Representative samples were collected at 0.5 m depth intervals for laboratory testing and to assist in strata identification.

All field measurements and mapping for this project have been carried out using the Geodetic Datum of Australia 1994 (GDA94) and the Map Grid of Australia (MGA94), Zone 56. All reduced levels are given in relation to the Australian Height Datum (AHD).

6. Field Work and Laboratory Test Results

6.1 Sub-surface Conditions

The borehole logs for this assessment are included in Appendix D and recorded the following general sub-surface profile as shown in Table 2 below.

Table 2: Summary of Ground Profile

Depth Range	Description
From 0 m bgl to depths of between 0.2 m bgl and 2.3 m bgl	TOPSOIL / FILL: • Topsoil generally comprised dark brown clayey silt with trace rootlets; • Fill encountered beneath the topsoil generally comprised red-brown to brown silty clay with ironstone and shale gravels; • Tile, brick and concrete fragments were identified within BH109N, BH109E, BH109S, BH109W and BH209; • Ash and clinker were observed in BH109N, BH109E, BH109S and BH109W at depths of between 1.2 and 1.5 m bgl; and • A concrete slab underlies the fill in BH109N, BH109E, BH109S, and BH109W at a depth of 1.5 m bgl.
Underlying the above to depths of between 0.2 m bgl and 3.0 m bgl	RESIDUAL SILTY CLAY: Red-brown, red and grey residual silty clay weathered from Ashfield Shale.
1.3 m bgl to 3.0+ m bgl	SHALE: Pale grey and yellow-brown shale, highly to moderately weathered

No free groundwater was observed whilst drilling. Backfilling of the boreholes at the completion of drilling precluded long-term monitoring of groundwater.

6.2 Laboratory Results

The laboratory test results and assessments of aggressivity, salinity, sodicity and dispersibility are summarised in Table C1 in Appendix C. Aggressivity to concrete was determined using pH values and sulphate concentrations and aggressivity to steel was determined using pH values, chloride concentrations and resistivities. The salinity class was inferred from EC_e values using the method of Richards (1954) and sodicity was determined using the cation exchange capacity (CEC) and exchangeable sodium concentration. Dispersion potentials were derived from the Soils for Landscaping Category Tests. The detailed laboratory test reports and chain of custody documents are provided in Appendix E.

The results of the laboratory tests were compared to various salinity and aggressivity classifications. The range of values obtained are presented as maximum and minimum values in Table 3 together with the number of samples tested for each parameter.

Table 3: Summary of Test Results

Parameter		Units	Samples	Minimum	Maximum
pH		pH units	62	4.5	6.5
Chlorides		(mg/kg)	19	<10	100
Sulphates		(mg/kg)	19	<10	110
Aggressivity	to Concrete	[AS2159]	-	non-aggressive	Moderate
	to Steel	[AS2159]	-	non-aggressive	Moderate
Exchangeable Sodium (Na)		(meq/100g)	8	<0.1	0.7
CEC (cation exchange capacity)		(meq/100g)	8	6.1	15
Sodicity [Na/CEC]		(ESP%)	8	2	14
Sodicity Class		[after DLWC]	-	Non-sodic	Highly sodic
$EC_{1:5}$ [Lab.]		(µS/cm)	62	27	150
EC_e [M x $EC_{1:5}$] [1]		(dS/m)	62	<2	<2
Resistivity		(Ω.cm)	62	6667	37037
Salinity Class		[after Richards 1954]	-	non-saline	non-saline
Dispersibility (H2O)		Category	7	4	4
Dispersibility (CaCl2)		Category	7	2	2

1 M is soil textural factor

6.3 Aggressivity

Figure 1 presents variations of aggressivity with depth, based on pH profiles at the borehole locations, together with the aggressivity class ranges indicated in Australian Standard AS2159 (2009). The absence of free groundwater in the boreholes and the low permeability of the sampled clay-rich soils indicate that soils in all boreholes are in Condition B, as defined by AS2159.

The pH profiles of Figure 1 indicate that the materials throughout the Site, at all investigated depths, are non-aggressive to steel. The chloride and resistivity concentration guidelines of AS2159 support this non-aggressive classification.

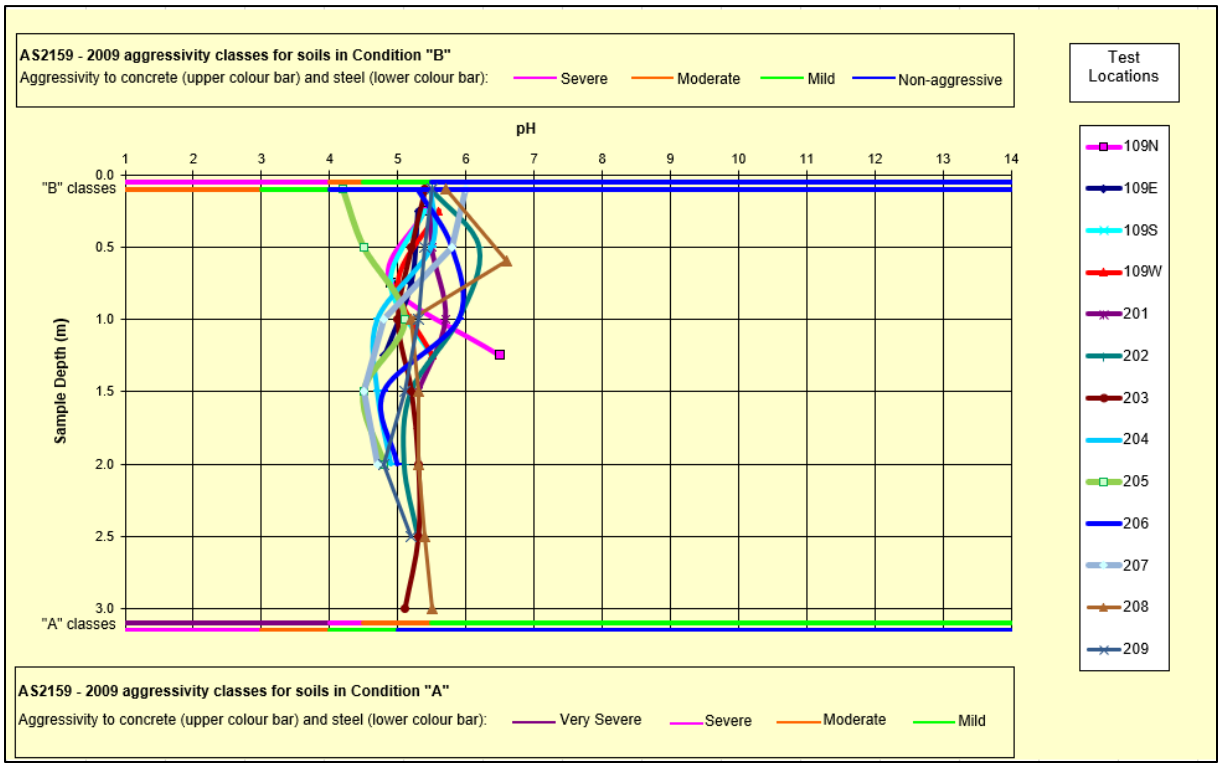

Figure 1: Vertical Soil pH Profiles and Aggressivity Classes

The results indicate that the samples collected from the site are predominantly mildly aggressive to concrete and non-aggressive to steel elements.

6.4 Salinity

Figure 2 presents the variations of salinity with depth, based on salinity (EC_e) profiles at test pit locations, together with the salinity classifications of Richards (1954).

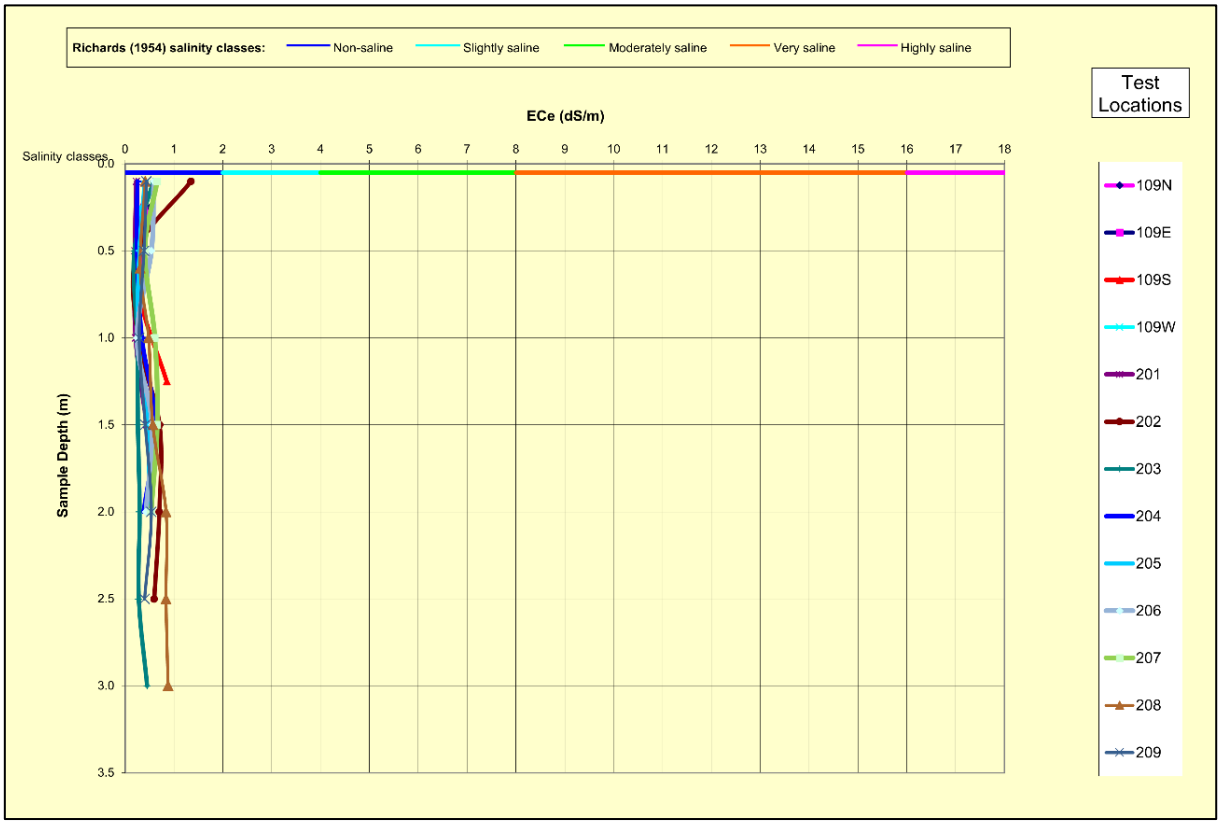

Figure 2: Vertical Soil Salinity Profiles and Salinity Classes

The results indicate the following:

- 100% of all soil samples were non-saline.

The laboratory test results indicate that the samples collected from the site are generally non-saline. As such, the entire site has been classified as non-saline.

6.5 Sodicity and Dispersibility

The sodicity tests reported in the Summary Table shows that shallow soils were general non-sodic overlying some deeper non-sodic to sodic soils, indicating some potential for erodibility of soils left exposed.

The dispersion potential of the soils tested at depths of between 0.1 m bgl to 3 m bgl tested by the Dispersibility test (refer Summary Table, Appendix D) was identified as Category 4 in water (minimal flocculation) and Category 2 in calcium chloride (moderate flocculation). Where soils treated in the calcium chloride is 2 or more categories lower than that tested in water, the soil is deemed dispersive and unacceptable without some treatment e.g. gypsum. Therefore, soils at the site have the potential to exhibit poor drainage and there is a tendency for water logging to occur.

7. Impact and Management of Site Materials on the Proposed Development

The mild aggressivity to concrete and the highly sodic soils are naturally occurring features of the local landscape and are not considered significant impediments to the proposed development, provided appropriate management techniques are employed.

Aggressivity affects the durability of concrete and steel by causing premature breakdown of concrete and corrosion of steel. This has impacts on the longevity of structures in contact with these materials. As a result, management of aggressivity with respect to concrete should be managed in accordance with the requirements of AS2159 and AS3600.

Sodic soils have low permeability due to infilling of interstices with fine clay particles during the weathering process, restricting infiltration of surface water and potentially creating perched water tables, seepage in cut faces or ponding of water in flat open areas. In addition, sodic soils tend to erode when exposed. Management of sodic soils is therefore required to prevent these adverse effects from occurring on the site. Management strategies should include covering the site with a working platform layer during construction and all exposed areas on completion with appropriate vegetation cover.

To maintain the non-saline nature of the site, all imported materials should be firstly assessed for salinity and only those proven to be non-saline should be imported to the site.

8. References:

- Chhabra, R. 1966, *Soil Salinity and Water Quality*, A. Bakema/Rotterdam/Brookfield, New York, 284 pp.
- Department of Mines 1985, *Geology of Wollongong – Port Hacking 1:100 000 Geological Series* Sheet No 9029 – 9129.
- Cement, Concrete and Aggregates, Australia 2005, *Guide to Residential Slabs and Footings in a Saline Environment, Introduction to Urban Salinity*.
- Department of Infrastructure, Planning and Natural Resources, New South Wales (DIPNR) 2003, *Salinity Potential in Western Sydney 1:100 000 Sheet* (now managed by the Department of Primary Industries – DPI).
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- DNR 2002, *Site Investigations for Urban Salinity* (now managed by DPI).
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- DNR 2004, *Urban Salinity Processes* (now managed by DPI).

- DNR 2004, *Waterwise Parks and Gardens* (now managed by DPI).
- Hazelton, P. A. and Murphy B. W. 2007, *Interpreting Soil Test Results* Department of Natural Resources.
- McNally, G. 2005, *Investigation of Urban Salinity – Case Studies from Western Sydney, Urban Salt 2005 Conference Paper*, Parramatta.
- Richards, L. A. (ed.) 1954, *Diagnosis and Improvement of Saline and Alkaline Soils* USDA Handbook No. 60, Washington D.C.
- Soil Conservation Service of New South Wales 1990, *Soil Landscapes of Wollongong and Port Hacking 1:100 000 Sheet*.
- Spies, B. and Woodgate, P. 2004, *Technical Report Salinity Mapping Methods in the Australian Context*, Natural Resource Management Ministerial Council.
- Standards Australia 1995, AS 2159 – 2009 *Piling Design and Installation*.
- Standards Australia 1996, AS 2870 – 1996 *Residential Slabs and Footings*.
- Standards Australia 1996, AS 4419 – 2018 *Soils for Landscaping and Garden Use.*

9. Limitations

Douglas Partners (DP) has prepared this report for this project at Pendle Hill High School in accordance with DP's proposal SYD201350 dated 7 December 2020 and acceptance received from SINSW c/o TSA Management Pty Ltd (TSA). The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of TSA for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and / or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and / or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after DP's field testing has been completed.

DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and / or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

The scope for work for this investigation/report did not include the assessment of surface or sub-surface materials or groundwater for contaminants, within or adjacent to the site. Should evidence of filling of unknown origin be noted in the report, and in particular the presence of building demolition materials, it should be recognised that there may be some risk that such filling may contain contaminants and hazardous building materials.

The contents of this report do not constitute formal design components such as are required, by the Health and Safety Legislation and Regulations, to be included in a Safety Report specifying the hazards likely to be encountered during construction and the controls required to mitigate risk. This design process requires risk assessment to be undertaken, with such assessment being dependent upon factors relating to likelihood of occurrence and consequences of damage to property and to life. This, in turn, requires project data and analysis presently beyond the knowledge and project role respectively of DP. DP may be able, however, to assist the client in carrying out a risk assessment of potential hazards contained in the Comments section of this report, as an extension to the current scope of works, if so requested, and provided that suitable additional information is made available to DP. Any such risk assessment would, however, be necessarily restricted to the environmental components set out in this report and to their application by the project designers to project design, construction, maintenance and demolition.

Douglas Partners Pty Ltd

Appendix A

Notes About this Report

About this Report

Douglas Partners

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

Borehole and Test Pit Logs

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

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

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

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

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

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

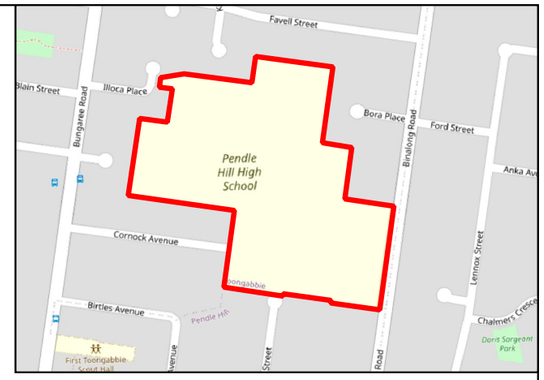
Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

Appendix B

Drawings



LOCALITY MAP

Notes:
1. Basemap from metromap.com.au (dated 07/12/2020).
2. Boundaries shown are approximate only.

Legend

- Approximate School Boundary
- Approximate Site Boundary

0 25 50 75 100 m

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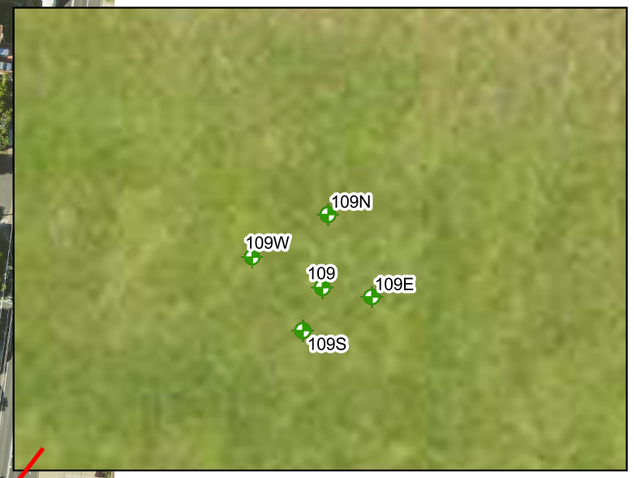
CLIENT:	TSA Management Pty Ltd		
OFFICE:	Sydney	DRAWN BY:	NW
SCALE:	1:1500 @ A3	DATE:	16.03.2021

TITLE: **Site Location Plan**
Supplementary Contamination Services
Cornock Avenue, Toongabbie

N

PROJECT No:	86997.01
DRAWING No:	1
REVISION:	0



Inset: Sample Locations around 109

Legend

- Approximate School Boundary
- Approximate Site Boundary
- Current Investigation Borehole Location
- DP (2020) Environmental Borehole Location
- DP (2020) Geotechnical and Environmental Borehole Location

0 25 50 75 m

Notes:
1. Basemap from metromap.com.au (dated 07/12/2020).
2. Boundaries and test locations shown are approximate only.

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CLIENT:	TSA Management Pty Ltd		
OFFICE:	Sydney	DRAWN BY:	NW
SCALE:	1:1200 @ A3	DATE:	17.03.2021

TITLE: **Borehole Location Plan**
Supplementary Contamination Services
Cornock Avenue, Toongabbie

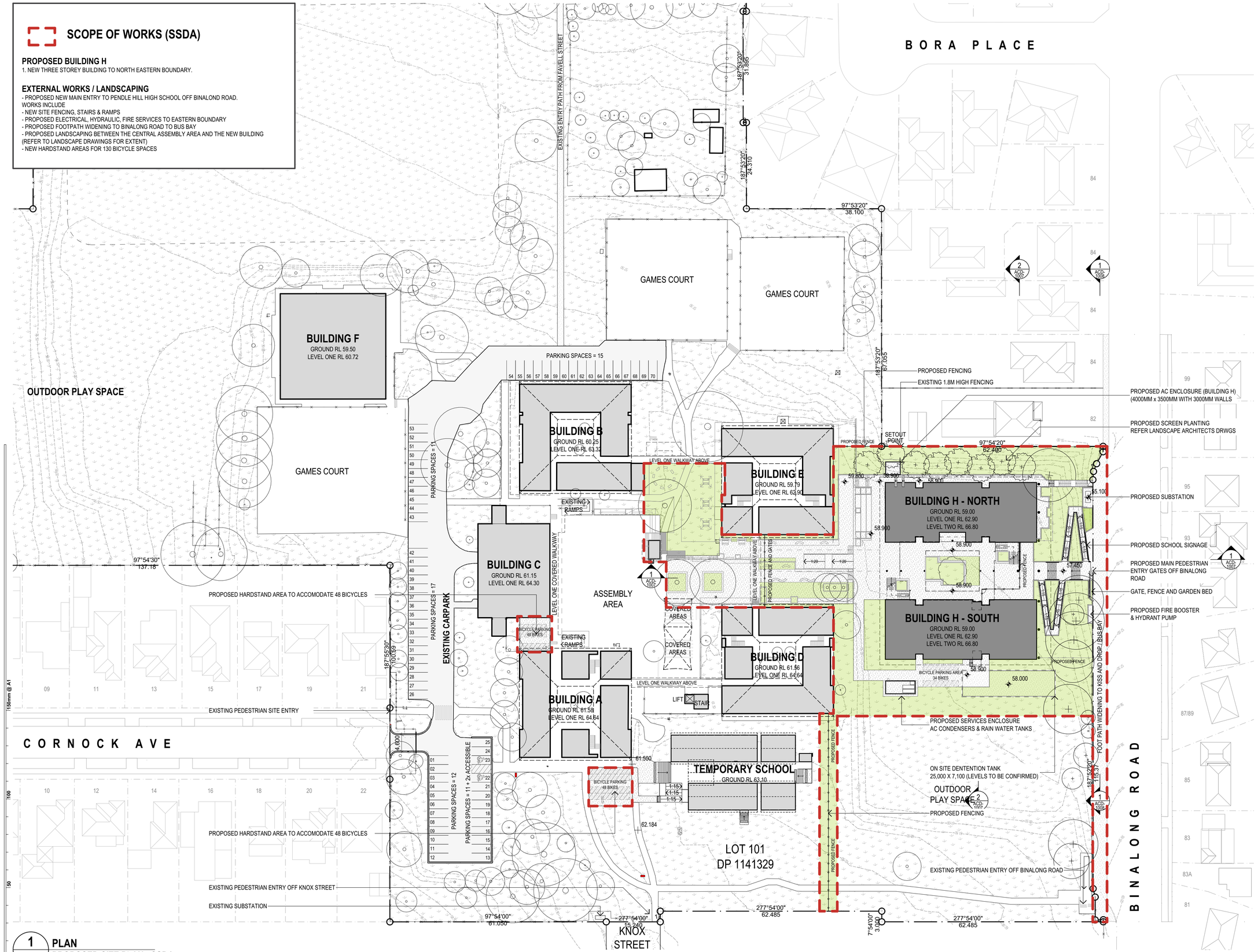
N

PROJECT No:	86997.01
DRAWING No:	2
REVISION:	0

SCOPE OF WORKS (SSDA)

PROPOSED BUILDING H
1. NEW THREE STOREY BUILDING TO NORTH EASTERN BOUNDARY.

EXTERNAL WORKS / LANDSCAPING
- PROPOSED NEW MAIN ENTRY TO PENDLE HILL HIGH SCHOOL OFF BINALOND ROAD.
WORKS INCLUDE
- NEW SITE FENCING, STAIRS & RAMPS
- PROPOSED ELECTRICAL, HYDRAULIC, FIRE SERVICES TO EASTERN BOUNDARY
- PROPOSED FOOTPATH WIDENING TO BINALONG ROAD TO BUS BAY
- PROPOSED LANDSCAPING BETWEEN THE CENTRAL ASSEMBLY AREA AND THE NEW BUILDING
(REFER TO LANDSCAPE DRAWINGS FOR EXTENT)
- NEW HARDSTAND AREAS FOR 130 BICYCLE SPACES



SITE PLAN LEGEND

- EXISTING BUILDINGS
- PROPOSED BUILDINGS (SSDA)
- PROPOSED REFURBISHED AREAS (CDC)
- EXISTING PAVING
- PROPOSED PAVING
- EXISTING ASPHALT
- PROPOSED ASPHALT
- EXISTING LANDSCAPING
- PROPOSED LANDSCAPING
- EXISTING FENCING
- PROPOSED FENCING
- EXISTING TREES
- TREES TO BE REMOVED
- PROPOSED TREES
- PROPOSED SPOT LEVEL (0.000)
- EXISTING SPOT LEVEL (0.000)

REV.	DESCRIPTION	DATE	INIT.
P1	PRELIMINARY ISSUE	14/01/2021	AP
P2	CONSULTANT ISSUE	29/01/2021	AP
P3	TSG REVIEW ISSUE	10/02/2021	AP
P4	REVISED TSG ISSUE	17/02/2021	AP
	ISSUED TO PENDLE HILL HIGH SCHOOL		AP
P5	SDRP ISSUE	23/02/2021	AP
P6	CONSULTANT ISSUE	01/03/2021	AP
P7	PRELIMINARY SSD ISSUE	10/03/2021	AP

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Paul Trotter fraia		NSW 7177	QLD 2646
Ryan Loveday raia			QLD 4500

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PHASE **SCHEMATIC DESIGN**

CLIENT SCHOOL INFRASTRUCTURE NSW

PROJECT PENDLE HILL HIGH SCHOOL

ADDRESS 19-21 CORNOCK AVENUE
PENDLE HILL, NSW, 2146

DRAWING **PROPOSED SITE PLAN**

Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

PROJECT NUMBER	DIRECTOR	CHECKED
7068TO01	JW	

DRAWING NUMBER **ACD-1002** REVISION **P7**

1 PLAN
PROPOSED SITE PLAN - SSDA
SCALE: 1:500

150mm @ A1 — 50 — 100 — 150mm @ A1

plot date: Wednesday, 10 March 2021, 4:53 PM
file location: BIMcloud: SYDBIMSYD - BIMcloud Basic for ARCHICAD 23/7068TO01 - PHHS - SITE FILE

Appendix C

Table C1 - Summary of Laboratory Results

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Borehole	Test Location			Sample ID	Sample	pH	Chloride Concentration	Sulphate Concentration	Resistivity	Soil Condition	Sample Aggressivity Class					Exchangeable Sodium (Na) Concentration	Cation Exchange Capacity	Sodicity	Sodicity Class	Dispersibility Category (H2O)	Dispersibility Category (CaCl2)	Dispersion?	Soil Texture Group	Textural Factor (M)	$EC_{1:5}$	EC_e	Sample Salinity Class
	East	North	RL		Average Depth				By inversion of EC1:5		Aggr. to Concrete - from sample pH	Aggr. to Concrete - from Sulphate conc.	Aggr. to Steel - from sample pH	Aggr. to Steel - from Chloride conc.	Aggr. to Steel - from sample Resistivity			[Na/CEC]				(from Landscaping Soil Categories)	(for detailed soil logs see Report Appendix)		[Lab.]	[M x $EC_{1:5}$]	(Based on sample ECe)
	(m MGA56)	(m MGA56)	(m AHD)		(m bgl)	(pH units)	(mg/kg)	(mg/kg)	Ω.cm	[AS2159-2009]	[AS2159-2009]					(meq/100g)	(meq/100g)	(%)	[after DLWC]	[AS4419]	[AS4419]	[AS4419]	[after DLWC]	[after DLWC]	(microS/cm)	(deciS/m)	[Richards 1954]
109N			58.7	BH109N/0.05-0.5	0.25	5.4			17544	B	Mild		Non-Aggressive		Non-Aggressive								Clay loam	9	57	0.5	Non-Saline
			58.7	BH109N/0.5-1.0	0.75	4.9	<10	10	30303	B	Mild	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive								Medium clay	7	33	0.2	Non-Saline
			58.7	BH109N/1.0-1.5	1.25	6.5			23256	B	Non-Aggressive		Non-Aggressive		Non-Aggressive								Clay loam	9	43	0.4	Non-Saline
109E			58.7	BH109E/0.05-0.5	0.25	5.3			23256	B	Mild		Non-Aggressive		Non-Aggressive								Clay loam	9	43	0.4	Non-Saline
			58.7	BH109E/0.5-1.0	0.75	5.2	<10	10	27027	B	Mild	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive								Medium clay	7	37	0.3	Non-Saline
			58.7	BH109E/1.0-1.5	1.25	4.8			20000	B	Mild		Non-Aggressive		Non-Aggressive								Medium clay	7	50	0.4	Non-Saline
109S			58.7	BH109S/0.05-0.5	0.25	5.4			27027	B	Mild		Non-Aggressive		Non-Aggressive								Clay loam	9	37	0.3	Non-Saline
			58.7	BH109S/0.5-1.0	0.75	4.9	10	36	23256	B	Mild	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive								Medium clay	7	43	0.3	Non-Saline
			58.7	BH109S/1.0-1.5	1.25	5.5			10526	B	Mild		Non-Aggressive		Non-Aggressive								Clay loam	9	95	0.9	Non-Saline
109W			58.6	BH109W/0.05-0.5	0.25	5.6			29412	B	Non-Aggressive		Non-Aggressive		Non-Aggressive								Clay loam	9	34	0.3	Non-Saline
			58.6	BH109W/0.5-1.0	0.75	5	<10	20	29412	B	Mild	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive								Medium clay	7	34	0.2	Non-Saline
			58.6	BH109W/1.0-1.5	1.25	5.5			28571	B	Mild		Non-Aggressive		Non-Aggressive								Clay loam	9	35	0.3	Non-Saline
201			58.0	BH201/0.1	0.1	5.5			30303	B	Mild		Non-Aggressive		Non-Aggressive								Medium clay	7	33	0.2	Non-Saline
			58.0	BH201/0.5	0.5	5.5	<10	<10	34483	B	Mild	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive								Medium clay	7	29	0.2	Non-Saline
			58.0	BH201/1.0	1	5.7			37037	B	Non-Aggressive		Non-Aggressive		Non-Aggressive								Light medium clay	8	27	0.2	Non-Saline
			58.0	BH201/1.5	1.5	5.3			15873	B	Mild		Non-Aggressive		Non-Aggressive								Medium clay	7	63	0.4	Non-Saline
202			59.1	BH202/0.1	0.1	5.5			6667	B	Mild		Non-Aggressive		Non-Aggressive								Clay loam	9	150	1.4	Non-Saline
			59.1	BH202/0.5	0.5	6.2			27778	B	Non-Aggressive		Non-Aggressive		Non-Aggressive								Medium clay	7	36	0.3	Non-Saline
			59.1	BH202/1.0	1	5.9	<10	10	30303	B	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive	0.21	10	2	Non-Sodic	4	2	Dispersive	Light medium clay	8	33	0.3	Non-Saline
			59.1	BH202/1.5	1.5	5.2			11364	B	Mild		Non-Aggressive		Non-Aggressive								Light medium clay	8	88	0.7	Non-Saline
			59.1	BH202/2.0	2	5.1			10000	B	Mild		Non-Aggressive		Non-Aggressive								Medium clay	7	100	0.7	Non-Saline
			59.1	BH202/2.5	2.5	5.3	<10	110	11765	B	Mild	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive	0.7	5.1	14	Sodic	4	2	Dispersive	Medium clay	7	85	0.6	Non-Saline
203			58.3	BH203/0.1	0.1	5.4			15625	B	Mild		Non-Aggressive		Non-Aggressive								Clay loam	9	64	0.6	Non-Saline
			58.3	BH203/0.5	0.5	5.2			37037	B	Mild		Non-Aggressive		Non-Aggressive								Medium clay	7	27	0.2	Non-Saline
			58.3	BH203/1.0	1	5			28571	B	Mild		Non-Aggressive		Non-Aggressive								Medium clay	7	35	0.2	Non-Saline
			58.3	BH203/1.5	1.5	5.2	<10	10	34483	B	Mild	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive								Clay loam	9	29	0.3	Non-Saline
			58.3	BH203/2.0	2	5.3			30303	B	Mild		Non-Aggressive		Non-Aggressive								Clay loam	9	33	0.3	Non-Saline
			58.3	BH203/2.5	2.5	5.3			32258	B	Mild		Non-Aggressive		Non-Aggressive								Clay loam	9	31	0.3	Non-Saline
			58.3	BH203/3.0	3	5.1	<10	32	20000	B	Mild	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive	0.21	9.4	2	Non-Sodic	4	2	Dispersive	Clay loam	9	50	0.5	Non-Saline
204			59.2	BH204/0.1	0.1	5.5			35714	B	Mild		Non-Aggressive		Non-Aggressive								Clay loam	9	28	0.3	Non-Saline
			59.2	BH204/0.5	0.5	5.5			37037	B	Mild		Non-Aggressive		Non-Aggressive								Clay loam	9	27	0.2	Non-Saline
			59.2	BH204/1.0	1	4.7			20408	B	Mild		Non-Aggressive		Non-Aggressive								Medium clay	7	49	0.3	Non-Saline
			59.2	BH204/1.5	1.5	4.7			11364	B	Mild		Non-Aggressive		Non-Aggressive								Medium clay	7	88	0.6	Non-Saline
			59.2	BH204/2.0	2	4.9	20	43	18519	B	Mild	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive								Medium clay	7	54	0.4	Non-Saline
205			59.6	BH205/0.1	0.1	4.2			17241	B	Moderate		Non-Aggressive		Non-Aggressive								Medium clay	7	58	0.4	Non-Saline
			59.6	BH205/0.5	0.5	4.5	10	30	23810	B	Moderate	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive								Medium clay	7	42	0.3	Non-Saline
			59.6	BH205/1.0	1	5.1			26316	B	Mild		Non-Aggressive		Non-Aggressive								Medium clay	7	38	0.3	Non-Saline
			59.6	BH205/1.5	1.5	4.5			15385	B	Moderate		Non-Aggressive		Non-Aggressive								Medium clay	7	65	0.5	Non-Saline
			59.6	BH205/2.0	2	4.8			13699	B	Mild		Non-Aggressive		Non-Aggressive								Medium clay	7	73	0.5	Non-Saline
206			58.9	BH206/0.1	0.1	5.3	10	<10	15385	B	Mild	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive	<0.1	12	<1	Non-sodic	4	2	Dispersive	Clay loam	9	65	0.6	Non-Saline
			58.9	BH206/0.5	0.5	5.8			16667	B	Non-Aggressive		Non-Aggressive		Non-Aggressive								Clay loam	9	60	0.5	Non-Saline
			58.9	BH206/1.0	1	5.9	<10	<10	37037	B	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive	0.23	12	2	Non-Sodic	4	2	Dispersive	Clay loam	9	27	0.2	Non-Saline
			58.9	BH206/1.5	1.5	4.8			12658	B	Mild		Non-Aggressive		Non-Aggressive								Medium clay	7	79	0.6	Non-Saline
			58.9	BH206/2.0	2	5	10	59	16393	B	Mild	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive								Medium clay	7	61	0.4	Non-Saline
207			58.4	BH207/0.1	0.1	6			10638	B	Non-Aggressive		Non-Aggressive		Non-Aggressive								Medium clay	7	94	0.7	Non-Saline
			58.4	BH207/0.5	0.5	5.8			17241	B	Non-Aggressive		Non-Aggressive		Non-Aggressive								Medium clay	7	58	0.4	Non-Saline
			58.4	BH207/1.0	1	4.8			11494	B	Mild		Non-Aggressive		Non-Aggressive								Medium clay	7	87	0.6	Non-Saline
			58.4	BH207/1.5	1.5	4.5	32	84	10638	B	Moderate	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive								Medium clay	7	94	0.7	Non-Saline
			58.4	BH207/2.0	2	4.7			13158	B	Mild		Non-Aggressive		Non-Aggressive								Medium clay	7	76	0.5	Non-Saline
208			59.5	BH208/0.1	0.1	5.7			21739	B	Non-Aggressive		Non-Aggressive		Non-Aggressive								Clay loam	9	46	0.4	Non-Saline
			59.5	BH208/0.6	0.6	6.6	<10	20	22727	B	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive	0.26	15	2	Non-Sodic	4	2	Dispersive	Medium clay	7	44	0.3	Non-Saline
			59.5	BH208/1.0	1	5.2			14493	B	Mild		Non-Aggressive		Non-Aggressive								Medium clay	7	69	0.5	Non-Saline
			59.5	BH208/1.5	1.5	5.3			12346	B	Mild		Non-Aggressive		Non-Aggressive								Medium clay	7	81	0.6	Non-Saline
			59.5	BH208/2.0	2	5.3	100	39	8333	B	Mild	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive								Medium clay	7	120	0.8	Non-Saline
			59.5	BH208/2.5	2.5	5.4			8333	B	Mild		Non-Aggressive		Non-Aggressive								Medium clay	7	120	0.8	Non-Saline
			59.5	BH208/3.0	3	5.5			10204	B	Mild		Non-Aggressive		Non-Aggressive								Clay loam	9	98	0.9	Non-Saline
209			58.4	BH209/0.1	0.1	5.5			20408	B	Mild		Non-Aggressive		Non-Aggressive								Clay loam	9	49	0.4	Non-Saline
			58.4	BH209/0.5	0.5	5.4			23256	B	Mild		Non-Aggressive		Non-Aggressive								Clay loam	9	43	0.4	Non-Saline
			58.4	BH209/1.0	1	5.3	<10	10	31250	B	Mild	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive								Clay loam	9	32	0.3	Non-Saline
			58.4	BH209/1.5	1.5	5.1			16949	B	Mild		Non-Aggressive		Non-Aggressive								Medium clay	7	59	0.4	Non-Saline
			58.4	BH209/2.0	2	4.8			12987	B	Mild		Non-Aggressive		Non-Aggressive								Medium clay	7	77	0.5	Non-Saline
			58.4	BH209/2.5	2.5	5.2	<10	42	17544	B	Mild	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive	0.53	5.7	9	Sodic	4	2	Dispersive	Medium clay	7	57	0.4	Non-Saline

Appendix D

Borehole Logs

BOREHOLE LOG

CLIENT: SINSW c/o TSA Management
PROJECT: Pendle Hill High School, Proposed Development
LOCATION: Cornock Avenue, Toongabbie

SURFACE LEVEL: 58.7 AHD
EASTING: 6258786
NORTHING: 311479.5
DIP/AZIMUTH: 90°/--

BORE No: BH109E
PROJECT No: 86977.01
DATE: 21-1-2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
58	0.05	FILL/TOPSOIL: Clayey SILT ML, low plasticity, brown, trace rootlets, w<PL, generally in a firm condition			0.05				
		FILL/Silty CLAY: medium to high plasticity, red-brown and grey with ironstone and shale gravel, tile, brick and concrete fragments, generally in a firm to stiff condition		A			PID<3ppm Sieve sample taken at 0.05-1.0		
					0.5				
				A			PID<3ppm		
	1				1.0				1
		Between 1.2-1.5m depth: with ash and clinker fragments		A			PID<3ppm		
57	1.5	Bore discontinued at 1.5m Refusal on concrete			1.5				
	2								2
56									
	3								3
55									
	4								4
54									

RIG: IHI 3.5 tonne excavator **DRILLER:** A&A **LOGGED:** TG **CASING:** Nil
TYPE OF BORING: 300mm Solid Flight Auger
WATER OBSERVATIONS: No Free Groundwater Observed
REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: SINSW c/o TSA Management
PROJECT: Pendle Hill High School, Proposed Development
LOCATION: Cornock Avenue, Toongabbie

SURFACE LEVEL: 58.7 AHD
EASTING: 6258787
NORTHING: 311478.9
DIP/AZIMUTH: 90°/--

BORE No: BH109N
PROJECT No: 86977.01
DATE: 21-1-2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
58	0.05	FILL/TOPSOIL: Clayey SILT ML, low plasticity, brown, trace rootlets, w<PL, generally in a firm condition			0.05				
		FILL/Silty CLAY: medium to high plasticity, red-brown and grey with ironstone and shale gravel, tile and concrete fragments, generally in a firm to stiff condition		A			PID<3 ppm Sieve samples taken at 0.05-1.0 and 1.0-1.5		
					0.5				
				A*			PID<3 ppm		
	1				1.0				1
		Between 1.3-1.5m depth: with ash and clinker fragments		A			PID<3 ppm		
	1.5	Bore discontinued at 1.5m Refusal on concrete			1.5				
57	2								2
56	3								3
55	4								4
54									

RIG: IHI 3.5 tonne excavator **DRILLER:** A&A **LOGGED:** TG **CASING:** Nil

TYPE OF BORING: 300mm Solid Flight Auger

WATER OBSERVATIONS: No Free Groundwater Observed

REMARKS: Location coordinates are in MGA94 Zone 56.
* Replicate sample BD1/20210121 taken at 0.5-1.0m

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: SINSW c/o TSA Management
PROJECT: Pendle Hill High School, Proposed Development
LOCATION: Cornock Avenue, Toongabbie

SURFACE LEVEL: 58.7 AHD
EASTING: 6258785.5
NORTHING: 311478.5
DIP/AZIMUTH: 90°/--

BORE No: BH109S
PROJECT No: 86977.01
DATE: 21-1-2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.05	FILL/TOPSOIL: Clayey SILT ML, low plasticity, brown, trace rootlets, w<PL, generally in a firm condition			0.05				
		FILL/Silty CLAY: medium to high plasticity, red-brown and grey with ironstone and shale gravel, tile, brick and concrete fragments, generally in a firm to stiff condition		A			PID<3ppm Sieve samples taken at 0.05-1.0 and 1.0-1.5		
					0.5				
58				A			PID<3ppm		
	1				1.0				1
		Between 1.2-1.5m depth: with ash and clinker fragments		A			PID<3ppm		
	1.5	Bore discontinued at 1.5m Refusal on concrete			1.5				
57									
	2								2
56									
	3								3
55									
	4								4
54									

RIG: IHI 3.5 tonne excavator **DRILLER:** A&A **LOGGED:** TG **CASING:** Nil
TYPE OF BORING: 300mm Solid Flight Auger
WATER OBSERVATIONS: No Free Groundwater Observed
REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: SINSW c/o TSA Management
PROJECT: Pendle Hill High School, Proposed Development
LOCATION: Cornock Avenue, Toongabbie

SURFACE LEVEL: 58.6 AHD
EASTING: 6258786.5
NORTHING: 311477.9
DIP/AZIMUTH: 90°/--

BORE No: BH109W
PROJECT No: 86977.01
DATE: 21-1-2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
58	0.05	FILL/TOPSOIL: Clayey SILT ML, low plasticity, brown, trace rootlets, w<PL, generally in a firm condition			0.05				
		FILL/Silty CLAY: medium to high plasticity, red-brown and grey with ironstone and shale gravel, tile, brick and concrete fragments, generally in a firm to stiff condition		A			PID<3 ppm Sieve samples taken at 0.05-1.0 and 1.0-1.5		
					0.5				
				A			PID<3 ppm		
	1				1.0				1
		Between 1.3-1.5m depth: with ash and clinker fragments		A			PID<3 ppm		
57	1.5	Bore discontinued at 1.5m Refusal on concrete			1.5				
	2								2
56									
	3								3
55									
	4								4
54									

RIG: IHI 3.5 tonne excavator **DRILLER:** A&A **LOGGED:** TG **CASING:** Nil
TYPE OF BORING: 300mm Solid Flight Auger
WATER OBSERVATIONS: No Free Groundwater Observed
REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: SINSW c/o TSA Management
PROJECT: Pendle Hill High School, Proposed Development
LOCATION: Cornock Avenue, Toongabbie

SURFACE LEVEL: 58.0 AHD
EASTING: 6258802
NORTHING: 311458.1
DIP/AZIMUTH: 90°/--

BORE No: BH201
PROJECT No: 86977.01
DATE: 22-1-2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
58	0.25	FILL/Silty CLAY: low plasticity, trace rootlets, shale and ironstone gravel, w<PL, generally in a firm condition		A	0.1 0.2				
		FILL/Silty CLAY: medium plasticity, red-brown and grey, with ironstone and shale gravel, trace rootlets, w<PL, generally in a firm to stiff condition		A	0.5 0.6				
57	1			A	1.0 1.1				1
	1.3	SHALE: grey and yellow-brown, with ironstone bands and hard clay seams, inferred low strength, highly weathered, dry.		A	1.4				
	1.5	Bore discontinued at 1.5m Refusal on shale			1.5				
56	2								2
55	3								3
54	4								4

RIG: IHI 3.5 tonne excavator **DRILLER:** A&A **LOGGED:** TG **CASING:** Nil
TYPE OF BORING: 100mm Solid Flight Auger
WATER OBSERVATIONS: No Free Groundwater Observed
REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: SINSW c/o TSA Management
PROJECT: Pendle Hill High School, Proposed Development
LOCATION: Cornock Avenue, Toongabbie

SURFACE LEVEL: 59.1 AHD
EASTING: 6258788.5
NORTHING: 311447.1
DIP/AZIMUTH: 90°/--

BORE No: BH202
PROJECT No: 86977.01
DATE: 21-1-2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
59	0.15	FILL/TOPSOIL: Clayey SILT ML, low plasticity, dark red and brown, trace rootlets, w<PL		A	0.1				
		FILL/ Silty CLAY: medium to high plasticity, red-brown and grey with ironstone and shale gravels, w<PL, generally in a firm to stiff condition			0.15				
				A	0.5				
					0.6				
58	1			A	1.0				1
					1.1				
	1.3	Silty CLAY: grey and red-brown mottled, very stiff, relict rock texture, residual							
				A	1.5				
					1.6				
57	2			A	2.0				2
					2.1				
	2.2	SHALE: grey and yellow-brown, with ironstone bands and hard clay seams, inferred low strength, highly weathered, dry.							
				A	2.5				
	2.6	Bore discontinued at 2.6m Refusal on shale			2.6				
56	3								3
55	4								4

RIG: IHI 3.5 tonne excavator **DRILLER:** A&A **LOGGED:** TG **CASING:** Nil
TYPE OF BORING: 100mm Solid Flight Auger
WATER OBSERVATIONS: No Free Groundwater Observed
REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: SINSW c/o TSA Management
PROJECT: Pendle Hill High School, Proposed Development
LOCATION: Cornock Avenue, Toongabbie

SURFACE LEVEL: 58.3 AHD
EASTING: 6258781.6
NORTHING: 311498
DIP/AZIMUTH: 90°/--

BORE No: BH203
PROJECT No: 86977.01
DATE: 22-1-2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
58	0.15	FILL/TOPSOIL: Clayey SILT ML, low plasticity, brown, trace rootlets, w<PL, generally in a firm condition		A	0.1				
		FILL/Silty CLAY: medium to high plasticity, red-brown and grey with ironstone and shale gravel, tile and concrete fragments, generally in a firm to stiff condition			0.15				
				A	0.5				
					0.6				
57	1			A	1.0				1
					1.1				
				A	1.5				
					1.6				
56	2			A	2.0				2
					2.1				
	2.3	Silty CLAY: grey and red-brown mottled, very stiff, relict rock texture, residual		A	2.5				
					2.6				
				A	2.9				
55	3								3
	3.0	Bore discontinued at 3.0m Target Depth Achieved			3.0				
54	4								4

RIG: IHI 3.5 tonne excavator **DRILLER:** A&A **LOGGED:** TG **CASING:** Nil

TYPE OF BORING: 100mm Solid Flight Auger

WATER OBSERVATIONS: No Free Groundwater Observed

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: SINSW c/o TSA Management
PROJECT: Pendle Hill High School, Proposed Development
LOCATION: Cornock Avenue, Toongabbie

SURFACE LEVEL: 59.2 AHD
EASTING: 6258768.3
NORTHING: 311458.1
DIP/AZIMUTH: 90°/--

BORE No: BH204
PROJECT No: 86977.01
DATE: 21-1-2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
59	0.15	FILL/TOPSOIL: Clayey SILT ML, low plasticity, dark red and brown, trace rootlets, w<PL, generally in a firm condition		A	0.1 0.15				
		FILL/ Silty CLAY: medium to high plasticity, red-brown and grey with ironstone and shale gravels, w<PL, generally in a firm to stiff condition		A	0.5 0.6				
	0.8	Silty CLAY: grey and red-brown mottled, very stiff, relict rock texture, residual		A	1.0 1.1				
58	1			A	1.5 1.6				1
	1.7	SHALE: grey and yellow-brown, with ironstone bands and hard clay seams, inferred low strength, highly weathered, dry		A	2.0 2.1				
57	2								2
	2.2	Bore discontinued at 2.2m Refusal on shale							
56	3								3
55	4								4

RIG: IHI 3.5 tonne excavator **DRILLER:** A&A **LOGGED:** TG **CASING:** Nil
TYPE OF BORING: 100mm Solid Flight Auger
WATER OBSERVATIONS: No Free Groundwater Observed
REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: SINSW c/o TSA Management
PROJECT: Pendle Hill High School, Proposed Development
LOCATION: Cornock Avenue, Toongabbie

SURFACE LEVEL: 59.6 AHD
EASTING: 6258756.1
NORTHING: 311442.9
DIP/AZIMUTH: 90°/--

BORE No: BH205
PROJECT No: 86977.01
DATE: 21-1-2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
59	0.2	FILL/TOPSOIL: Clayey SILT ML, low plasticity, dark red and brown, trace rootlets, w<PL, generally in a firm condition		A	0.1				
					0.2				
		Silty CLAY: grey and red-brown mottled, very stiff, relict rock texture, residual		A	0.5				
					0.6				
	1			A	1.0				1
					1.1				
				A	1.5				
58	1.6	SHALE: grey and yellow-brown, with ironstone bands and hard clay seams, inferred low strength, highly weathered, dry			1.6				
	2			A	2.0				2
	2.1	Bore discontinued at 2.1m Refusal on shale			2.1				
57									
	3								3
56									
	4								4
55									

RIG: IHI 3.5 tonne excavator **DRILLER:** A&A **LOGGED:** TG **CASING:** Nil
TYPE OF BORING: 100mm Solid Flight Auger
WATER OBSERVATIONS: No Free Groundwater Observed
REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: SINSW c/o TSA Management
PROJECT: Pendle Hill High School, Proposed Development
LOCATION: Cornock Avenue, Toongabbie

SURFACE LEVEL: 58.9 AHD
EASTING: 6258759.1
NORTHING: 311482.6
DIP/AZIMUTH: 90°/--

BORE No: BH206
PROJECT No: 86977.01
DATE: 22-1-2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
58	0.2	FILL/TOPSOIL: Clayey SILT ML, low plasticity, dark red and brown, trace rootlets, w<PL, generally in a firm condition		A	0.1 0.2				
		FILL/ Silty CLAY: medium to high plasticity, red-brown and grey with ironstone and shale gravels, w<PL, generally in a firm to stiff condition		A	0.5 0.6				
	1			A	1.0 1.1				1
	1.3	Silty CLAY: grey and red-brown mottled, very stiff, relict rock texture, residual		A	1.5 1.6				
57	1.8	SHALE: grey and yellow-brown, with ironstone bands and hard clay seams, inferred low strength, highly weathered, dry		A	2.0 2.1				
	2								2
	2.3	Bore discontinued at 2.3m Refusal on shale							
56	3								3
55	4								4
54									

RIG: IHI 3.5 tonne excavator **DRILLER:** A&A **LOGGED:** TG **CASING:** Nil
TYPE OF BORING: 100mm Solid Flight Auger
WATER OBSERVATIONS: No Free Groundwater Observed
REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: SINSW c/o TSA Management
PROJECT: Pendle Hill High School, Proposed Development
LOCATION: Cornock Avenue, Toongabbie

SURFACE LEVEL: 58.4 AHD
EASTING: 6258750.1
NORTHING: 311496.9
DIP/AZIMUTH: 90°/--

BORE No: BH207
PROJECT No: 86977.01
DATE: 22-1-2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
58	0.05	FILL/TOPSOIL: Clayey SILT ML, low plasticity, dark red and brown, trace rootlets, w<PL, generally in a firm condition		A	0.1				
					0.2				
		FILL/ Silty CLAY: medium to high plasticity, red-brown and grey with ironstone and shale gravels, w<PL, generally in a firm to stiff condition		A	0.5				
					0.6				
	1			A	1.0				1
					1.1				
57	1.2	Silty CLAY: grey and red-brown mottled, very stiff, relict rock texture, residual		A	1.5				
					1.6				
	1.7	SHALE: grey and yellow-brown, with ironstone bands and hard clay seams, inferred low strength, highly weathered, dry							
	2			A	2.0				2
					2.1				
56	2.2	Bore discontinued at 2.2m Refusal on shale							
	3								3
55									
	4								4
54									

RIG: IHI 3.5 tonne excavator **DRILLER:** A&A **LOGGED:** TG **CASING:** Nil
TYPE OF BORING: 100mm Solid Flight Auger
WATER OBSERVATIONS: No Free Groundwater Observed
REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: SINSW c/o TSA Management
PROJECT: Pendle Hill High School, Proposed Development
LOCATION: Cornock Avenue, Toongabbie

SURFACE LEVEL: 59.5 AHD
EASTING: 6258743.7
NORTHING: 311454.3
DIP/AZIMUTH: 90°/--

BORE No: BH208
PROJECT No: 86977.01
DATE: 21-1-2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
59	0.25	FILL/TOPSOIL: Clayey SILT ML, low plasticity, dark red and brown, trace rootlets, w<PL, generally in a firm condition		A	0.1 0.2				
		Silty CLAY: grey and red-brown mottled, very stiff, relict rock texture, residual		A	0.6 0.7				
	1			A	1.0 1.1				1
58	1.6			A	1.5 1.6				
		SHALE: grey and yellow-brown, with ironstone bands and hard clay seams, inferred low strength, highly weathered, dry		A	2.0 2.1				
	2								2
57				A	2.5 2.6				
	3	3.0		A	2.9 3.0				3
		Bore discontinued at 3.0m Target Depth Achieved							
56	4								4
55									

RIG: IHI 3.5 tonne excavator **DRILLER:** A&A **LOGGED:** TG **CASING:** Nil
TYPE OF BORING: 100mm Solid Flight Auger
WATER OBSERVATIONS: No Free Groundwater Observed
REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: SINSW c/o TSA Management
PROJECT: Pendle Hill High School, Proposed Development
LOCATION: Cornock Avenue, Toongabbie

SURFACE LEVEL: 58.4 AHD
EASTING: 6258767.7
NORTHING: 311496.6
DIP/AZIMUTH: 90°/--

BORE No: BH209
PROJECT No: 86977.01
DATE: 22-1-2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
		FILL/TOPSOIL: Clayey SILT ML, low plasticity, brown, trace rootlets, w<PL, generally in a firm condition		A	0.1				
	0.2	FILL/Silty CLAY: medium to high plasticity, red-brown and grey with ironstone and shale gravel, tile and concrete fragments, generally in a firm to stiff condition		A	0.2 0.5 0.6				
58	1			A	1.0 1.1				1
57				A	1.5 1.6				
	1.8	Silty CLAY: grey and red-brown mottled, very stiff, relict rock texture, residual		A	2.0 2.1				
	2								2
	2.3	SHALE: grey and yellow-brown, with ironstone bands and hard clay seams, inferred low strength, highly weathered, dry.		A	2.5				
56	2.6	Bore discontinued at 2.6m Refusal on shale			2.6				
	3								3
55									
	4								4
54									

RIG: IHI 3.5 tonne excavator **DRILLER:** A&A **LOGGED:** TG **CASING:** Nil

TYPE OF BORING: 100mm Solid Flight Auger

WATER OBSERVATIONS: No Free Groundwater Observed

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Sampling Methods

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Sampling

Sampling is carried out during drilling or test pitting to allow engineering examination (and laboratory testing where required) of the soil or rock.

Disturbed samples taken during drilling provide information on colour, type, inclusions and, depending upon the degree of disturbance, some information on strength and structure.

Undisturbed samples are taken by pushing a thin-walled sample tube into the soil and withdrawing it to obtain a sample of the soil in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shear strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Test Pits

Test pits are usually excavated with a backhoe or an excavator, allowing close examination of the in-situ soil if it is safe to enter into the pit. The depth of excavation is limited to about 3 m for a backhoe and up to 6 m for a large excavator. A potential disadvantage of this investigation method is the larger area of disturbance to the site.

Large Diameter Augers

Boreholes can be drilled using a rotating plate or short spiral auger, generally 300 mm or larger in diameter commonly mounted on a standard piling rig. The cuttings are returned to the surface at intervals (generally not more than 0.5 m) and are disturbed but usually unchanged in moisture content. Identification of soil strata is generally much more reliable than with continuous spiral flight augers, and is usually supplemented by occasional undisturbed tube samples.

Continuous Spiral Flight Augers

The borehole is advanced using 90-115 mm diameter continuous spiral flight augers which are withdrawn at intervals to allow sampling or in-situ testing. This is a relatively economical means of drilling in clays and sands above the water table. Samples are returned to the surface, or may be collected after withdrawal of the auger flights, but they are disturbed and may be mixed with soils from the sides of the hole. Information from the drilling (as distinct from specific sampling by SPTs or undisturbed samples) is of relatively low reliability, due to the remoulding, possible mixing or softening of samples by groundwater.

Non-core Rotary Drilling

The borehole is advanced using a rotary bit, with water or drilling mud being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be determined from the cuttings, together with some information from the rate of penetration. Where drilling mud is used this can mask the cuttings and reliable identification is only possible from separate sampling such as SPTs.

Continuous Core Drilling

A continuous core sample can be obtained using a diamond tipped core barrel, usually with a 50 mm internal diameter. Provided full core recovery is achieved (which is not always possible in weak rocks and granular soils), this technique provides a very reliable method of investigation.

Standard Penetration Tests

Standard penetration tests (SPT) are used as a means of estimating the density or strength of soils and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289, Methods of Testing Soils for Engineering Purposes - Test 6.3.1.

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

The test results are reported in the following form.

- In the case where full penetration is obtained with successive blow counts for each 150 mm of, say, 4, 6 and 7 as:

  4,6,7
  N=13

- In the case where the test is discontinued before the full penetration depth, say after 15 blows for the first 150 mm and 30 blows for the next 40 mm as:

  15, 30/40 mm

The results of the SPT tests can be related empirically to the engineering properties of the soils.

Dynamic Cone Penetrometer Tests / Perth Sand Penetrometer Tests

Dynamic penetrometer tests (DCP or PSP) are carried out by driving a steel rod into the ground using a standard weight of hammer falling a specified distance. As the rod penetrates the soil the number of blows required to penetrate each successive 150 mm depth are recorded. Normally there is a depth limitation of 1.2 m, but this may be extended in certain conditions by the use of extension rods. Two types of penetrometer are commonly used.

- Perth sand penetrometer - a 16 mm diameter flat ended rod is driven using a 9 kg hammer dropping 600 mm (AS 1289, Test 6.3.3). This test was developed for testing the density of sands and is mainly used in granular soils and filling.
- Cone penetrometer - a 16 mm diameter rod with a 20 mm diameter cone end is driven using a 9 kg hammer dropping 510 mm (AS 1289, Test 6.3.2). This test was developed initially for pavement subgrade investigations, and correlations of the test results with California Bearing Ratio have been published by various road authorities.

Description and Classification Methods

The methods of description and classification of soils and rocks used in this report are generally based on Australian Standard AS1726:2017, Geotechnical Site Investigations. In general, the descriptions include strength or density, colour, structure, soil or rock type and inclusions.

Soil Types

Soil types are described according to the predominant particle size, qualified by the grading of other particles present:

Type	Particle size (mm)
Boulder	>200
Cobble	63 - 200
Gravel	2.36 - 63
Sand	0.075 - 2.36
Silt	0.002 - 0.075
Clay	<0.002

The sand and gravel sizes can be further subdivided as follows:

Type	Particle size (mm)
Coarse gravel	19 - 63
Medium gravel	6.7 - 19
Fine gravel	2.36 – 6.7
Coarse sand	0.6 - 2.36
Medium sand	0.21 - 0.6
Fine sand	0.075 - 0.21

Definitions of grading terms used are:

- Well graded - a good representation of all particle sizes
- Poorly graded - an excess or deficiency of particular sizes within the specified range
- Uniformly graded - an excess of a particular particle size
- Gap graded - a deficiency of a particular particle size with the range

The proportions of secondary constituents of soils are described as follows:

In fine grained soils (>35% fines)

Term	Proportion of sand or gravel	Example
And	Specify	Clay (60%) and Sand (40%)
Adjective	>30%	Sandy Clay
With	15 – 30%	Clay with sand
Trace	0 - 15%	Clay with trace sand

In coarse grained soils (>65% coarse)
- with clays or silts

Term	Proportion of fines	Example
And	Specify	Sand (70%) and Clay (30%)
Adjective	>12%	Clayey Sand
With	5 - 12%	Sand with clay
Trace	0 - 5%	Sand with trace clay

In coarse grained soils (>65% coarse)
- with coarser fraction

Term	Proportion of coarser fraction	Example
And	Specify	Sand (60%) and Gravel (40%)
Adjective	>30%	Gravelly Sand
With	15 - 30%	Sand with gravel
Trace	0 - 15%	Sand with trace gravel

The presence of cobbles and boulders shall be specifically noted by beginning the description with ‘Mix of Soil and Cobbles/Boulders’ with the word order indicating the dominant first and the proportion of cobbles and boulders described together.

Soil Descriptions

Cohesive Soils

Cohesive soils, such as clays, are classified on the basis of undrained shear strength. The strength may be measured by laboratory testing, or estimated by field tests or engineering examination. The strength terms are defined as follows:

Description	Abbreviation	Undrained shear strength (kPa)
Very soft	VS	<12
Soft	S	12 - 25
Firm	F	25 - 50
Stiff	St	50 - 100
Very stiff	VSt	100 - 200
Hard	H	>200
Friable	Fr	-

Cohesionless Soils

Cohesionless soils, such as clean sands, are classified on the basis of relative density, generally from the results of standard penetration tests (SPT), cone penetration tests (CPT) or dynamic penetrometers (PSP). The relative density terms are given below:

Relative Density	Abbreviation	Density Index (%)
Very loose	VL	<15
Loose	L	15-35
Medium dense	MD	35-65
Dense	D	65-85
Very dense	VD	>85

Soil Origin

It is often difficult to accurately determine the origin of a soil. Soils can generally be classified as:

- Residual soil - derived from in-situ weathering of the underlying rock;
- Extremely weathered material – formed from in-situ weathering of geological formations. Has soil strength but retains the structure or fabric of the parent rock;
- Alluvial soil – deposited by streams and rivers;
- Estuarine soil – deposited in coastal estuaries;
- Marine soil – deposited in a marine environment;
- Lacustrine soil – deposited in freshwater lakes;
- Aeolian soil – carried and deposited by wind;
- Colluvial soil – soil and rock debris transported down slopes by gravity;
- Topsoil – mantle of surface soil, often with high levels of organic material.
- Fill – any material which has been moved by man.

Moisture Condition – Coarse Grained Soils

For coarse grained soils the moisture condition should be described by appearance and feel using the following terms:

- Dry (D) Non-cohesive and free-running.
- Moist (M) Soil feels cool, darkened in colour.
  Soil tends to stick together.
  Sand forms weak ball but breaks easily.
- Wet (W) Soil feels cool, darkened in colour.
  Soil tends to stick together, free water forms when handling.

Moisture Condition – Fine Grained Soils

For fine grained soils the assessment of moisture content is relative to their plastic limit or liquid limit, as follows:

- ‘Moist, dry of plastic limit’ or ‘w <PL’ (i.e. hard and friable or powdery).
- ‘Moist, near plastic limit’ or ‘w ≈ PL (i.e. soil can be moulded at moisture content approximately equal to the plastic limit).
- ‘Moist, wet of plastic limit’ or ‘w >PL’ (i.e. soils usually weakened and free water forms on the hands when handling).
- ‘Wet’ or ‘w ≈LL’ (i.e. near the liquid limit).
- ‘Wet’ or ‘w >LL’ (i.e. wet of the liquid limit).

Rock Strength

Rock strength is defined by the Unconfined Compressive Strength and it refers to the strength of the rock substance and not the strength of the overall rock mass, which may be considerably weaker due to defects.

The Point Load Strength Index $Is_{(50)}$ is commonly used to provide an estimate of the rock strength and site specific correlations should be developed to allow UCS values to be determined. The point load strength test procedure is described by Australian Standard AS4133.4.1-2007. The terms used to describe rock strength are as follows:

Strength Term	Abbreviation	Unconfined Compressive Strength MPa	Point Load Index * $Is_{(50)}$ MPa
Very low	VL	0.6 - 2	0.03 - 0.1
Low	L	2 - 6	0.1 - 0.3
Medium	M	6 - 20	0.3 - 1.0
High	H	20 - 60	1 - 3
Very high	VH	60 - 200	3 - 10
Extremely high	EH	>200	>10

* Assumes a ratio of 20:1 for UCS to $Is_{(50)}$. It should be noted that the UCS to $Is_{(50)}$ ratio varies significantly for different rock types and specific ratios should be determined for each site.

Degree of Weathering

The degree of weathering of rock is classified as follows:

Term	Abbreviation	Description
Residual Soil	RS	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible, but the soil has not been significantly transported.
Extremely weathered	XW	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible
Highly weathered	HW	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores.
Moderately weathered	MW	The whole of the rock material is discoloured , usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable, but shows little or no change of strength from fresh rock.
Slightly weathered	SW	Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.
Fresh	FR	No signs of decomposition or staining.
Note: If HW and MW cannot be differentiated use DW (see below)		
Distinctly weathered	DW	Rock strength usually changed by weathering. The rock may be highly discoloured, usually by iron staining. Porosity may be increased by leaching or may be decreased due to deposition of weathered products in pores.

Rock Descriptions

Degree of Fracturing

The following classification applies to the spacing of natural fractures in diamond drill cores. It includes bedding plane partings, joints and other defects, but excludes drilling breaks.

Term	Description
Fragmented	Fragments of <20 mm
Highly Fractured	Core lengths of 20-40 mm with occasional fragments
Fractured	Core lengths of 30-100 mm with occasional shorter and longer sections
Slightly Fractured	Core lengths of 300 mm or longer with occasional sections of 100-300 mm
Unbroken	Core contains very few fractures

Rock Quality Designation

The quality of the cored rock can be measured using the Rock Quality Designation (RQD) index, defined as:

$$\text{RQD \%} = \frac{\text{cumulative length of 'sound' core sections} \geq \text{100 mm long}}{\text{total drilled length of section being assessed}}$$

where 'sound' rock is assessed to be rock of low strength or stronger. The RQD applies only to natural fractures. If the core is broken by drilling or handling (i.e. drilling breaks) then the broken pieces are fitted back together and are not included in the calculation of RQD.

Stratification Spacing

For sedimentary rocks the following terms may be used to describe the spacing of bedding partings:

Term	Separation of Stratification Planes
Thinly laminated	< 6 mm
Laminated	6 mm to 20 mm
Very thinly bedded	20 mm to 60 mm
Thinly bedded	60 mm to 0.2 m
Medium bedded	0.2 m to 0.6 m
Thickly bedded	0.6 m to 2 m
Very thickly bedded	> 2 m

Symbols & Abbreviations

Introduction

These notes summarise abbreviations commonly used on borehole logs and test pit reports.

Drilling or Excavation Methods

C	Core drilling
R	Rotary drilling
SFA	Spiral flight augers
NMLC	Diamond core - 52 mm dia
NQ	Diamond core - 47 mm dia
HQ	Diamond core - 63 mm dia
PQ	Diamond core - 81 mm dia

Water

▷	Water seep
▽	Water level

Sampling and Testing

A	Auger sample
B	Bulk sample
D	Disturbed sample
E	Environmental sample
U_{50}	Undisturbed tube sample (50mm)
W	Water sample
pp	Pocket penetrometer (kPa)
PID	Photo ionisation detector
PL	Point load strength Is(50) MPa
S	Standard Penetration Test
V	Shear vane (kPa)

Description of Defects in Rock

The abbreviated descriptions of the defects should be in the following order: Depth, Type, Orientation, Coating, Shape, Roughness and Other. Drilling and handling breaks are not usually included on the logs.

Defect Type

B	Bedding plane
Cs	Clay seam
Cv	Cleavage
Cz	Crushed zone
Ds	Decomposed seam
F	Fault
J	Joint
Lam	Lamination
Pt	Parting
Sz	Sheared Zone
V	Vein

Orientation

The inclination of defects is always measured from the perpendicular to the core axis.

h	horizontal
v	vertical
sh	sub-horizontal
sv	sub-vertical

Coating or Infilling Term

cln	clean
co	coating
he	healed
inf	infilled
stn	stained
ti	tight
vn	veneer

Coating Descriptor

ca	calcite
cbs	carbonaceous
cly	clay
fe	iron oxide
mn	manganese
slt	silty

Shape

cu	curved
ir	irregular
pl	planar
st	stepped
un	undulating

Roughness

po	polished
ro	rough
sl	slickensided
sm	smooth
vr	very rough

Other

fg	fragmented
bnd	band
qtz	quartz

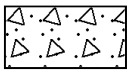
Symbols & Abbreviations

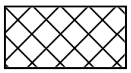
Graphic Symbols for Soil and Rock

General

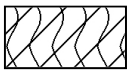

Asphalt

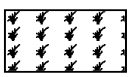

Road base

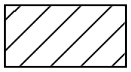

Concrete

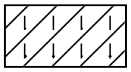

Filling

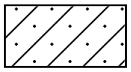
Soils


Topsoil

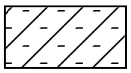

Peat

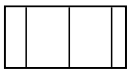

Clay

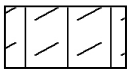

Silty clay

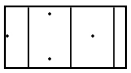

Sandy clay

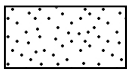

Gravelly clay

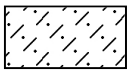

Shaly clay

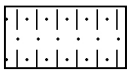

Silt


Clayey silt


Sandy silt

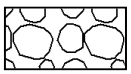

Sand

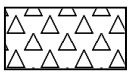

Clayey sand


Silty sand


Gravel

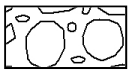

Sandy gravel


Cobbles, boulders

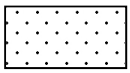

Talus

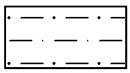
Sedimentary Rocks

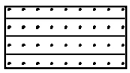

Boulder conglomerate

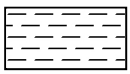

Conglomerate


Conglomeratic sandstone

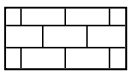

Sandstone


Siltstone

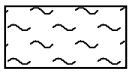

Laminite

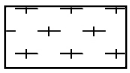

Mudstone, claystone, shale

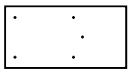

Coal


Limestone

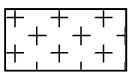
Metamorphic Rocks

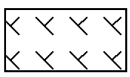

Slate, phyllite, schist

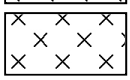

Gneiss

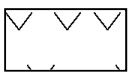

Quartzite

Igneous Rocks


Granite


Dolerite, basalt, andesite


Dacite, epidote


Tuff, breccia


Porphyry

Appendix E

Laboratory Certificates of Analysis

eastwest
geo ag enviro

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abn 82 125 442 382

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ANALYSIS REPORT SOIL

PROJECT NO: EW210283		**Date of Issue:**	**03/02/2021**
Customer:	ENVIROLAB SERVICES	Report No:	1
Address:	12 ASHLEY STREET CHATSWOOD NSW 2067	Date Received:	29/01/2021
		Matrix:	Soil
Attention:	Aileen Hie	Location:	260350
Phone:	02 9910 6200	Sampler ID:	Client
Fax:	02 9910 6201	Date of Sampling:	21/01/2021
Email:	ahie@envirolabservices.com.au	Sample Condition:	Acceptable

Results apply to the samples as submitted. All pages of this report have been checked and approved for release.

Signed: Lisa Nies

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PROFICIENT LAB
Visit www.aspac-australasia.com to view our certification details.

East West is certified by the Australian-Asian Soil & Plant Analysis Council to perform various soil and plant tissue analysis. The tests reported herein have been performed in accordance with our terms of accreditation.

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This analysis relates to the sample submitted and it is the client's responsibility to make certain the sample is representative of the matrix to be tested.

Samples will be discarded one month after the date of this report. Please advise if you wish to have your sample/s returned.

ANALYSIS REPORT

PROJECT NO: EW210283 Location: 260350

				CLIENT SAMPLE ID	260350-23	260350-26	260350-33	260350-44
				DEPTH				
Test Parameter	**Method Description**	**Method Reference**	**Units**	**LOR**	**210283-1**	**210283-2**	**210283-3**	**210283-4**
Dispersibility (H2O)	Classification	AS 4419	Category	na	4	4	4	4
Dispersibility (CaCl2)	Classification	AS 4419	Category	na	2	2	2	2

ANALYSIS REPORT

PROJECT NO: EW210283 **Location: 260350**

				CLIENT SAMPLE ID	260350-46	260350-55	260350-66	
				DEPTH				
Test Parameter	**Method Description**	**Method Reference**	**Units**	**LOR**	**210283-5**	**210283-6**	**210283-7**	
Dispersibility (H2O)	Classification	AS 4419	Category	na	4	4	4	
Dispersibility (CaCl2)	Classification	AS 4419	Category	na	2	2	2	

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Soils are air dried at 40^{0}C and ground <2mm.

NB: LOR is the Lowest Obtainable Reading.

DOCUMENT END

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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 260350

Client Details

Client	Douglas Partners Pty Ltd
Attention	Lisa Teng
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**86977.01**
Number of Samples	69 Soil
Date samples received	27/01/2021
Date completed instructions received	27/01/2021

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	03/02/2021
Date of Issue	03/02/2021

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Asbestos Approved By
Analysed by Asbestos Approved Identifier: Panika Wongchanda, Lucy Zhu
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Diego Bigolin, Team Leader, Inorganics
Dragana Tomas, Senior Chemist
Hannah Nguyen, Senior Chemist
Ken Nguyen, Reporting Supervisor
Lucy Zhu, Asbestos Supervisor
Manju Dewendrage, Chemist
Nick Sarlamis, Inorganics Supervisor

Authorised By

Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		260350-2	260350-3	260350-5	260350-6	260350-7
Your Reference	UNITS	BH109N/0.5-1.0	BH109N/1.0-1.5	BH109E/0.05-0.5	BH109E/0.5-1.0	BH109E/1.0-1.5
Date Sampled		21/01/2021	21/01/2021	21/01/2021	21/01/2021	21/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
Date analysed	-	01/02/2021	01/02/2021	01/02/2021	01/02/2021	01/02/2021
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	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	81	71	98	98	89

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		260350-9	260350-10	260350-11	260350-13	260350-14
Your Reference	UNITS	BH109S/0.05-0.5	BH109S/0.5-1.0	BH109S/1.0-1.5	BH109W/0.05-0.5	BH109W/0.5-1.0
Date Sampled		21/01/2021	21/01/2021	21/01/2021	21/01/2021	21/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
Date analysed	-	01/02/2021	01/02/2021	01/02/2021	01/02/2021	01/02/2021
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	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	101	103	91	94	105

vTRH(C6-C10)/BTEXN in Soil					
Our Reference		260350-15	260350-67	260350-68	260350-69
Your Reference	UNITS	BH109W/1.0-1.5	BD1/20210121	Trip Spike	Trip Blank
Date Sampled		21/01/2021	-	-	-
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021
Date analysed	-	01/02/2021	01/02/2021	02/02/2021	01/02/2021
TRH C_6 - C_9	mg/kg	<25	<25	[NA]	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	[NA]	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	[NA]	<25
Benzene	mg/kg	<0.2	<0.2	105%	<0.2
Toluene	mg/kg	<0.5	<0.5	84%	<0.5
Ethylbenzene	mg/kg	<1	<1	90%	<1
m+p-xylene	mg/kg	<2	<2	87%	<2
o-Xylene	mg/kg	<1	<1	89%	<1
naphthalene	mg/kg	<1	<1	[NA]	<1
Total +ve Xylenes	mg/kg	<3	<3	[NT]	<3
Surrogate aaa-Trifluorotoluene	%	93	79	94	93

svTRH (C10-C40) in Soil						
Our Reference		260350-2	260350-3	260350-5	260350-6	260350-7
Your Reference	UNITS	BH109N/0.5-1.0	BH109N/1.0-1.5	BH109E/0.05-0.5	BH109E/0.5-1.0	BH109E/1.0-1.5
Date Sampled		21/01/2021	21/01/2021	21/01/2021	21/01/2021	21/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
Date analysed	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
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	%	93	106	94	107	93

svTRH (C10-C40) in Soil						
Our Reference		260350-9	260350-10	260350-11	260350-13	260350-14
Your Reference	UNITS	BH109S/0.05-0.5	BH109S/0.5-1.0	BH109S/1.0-1.5	BH109W/0.05-0.5	BH109W/0.5-1.0
Date Sampled		21/01/2021	21/01/2021	21/01/2021	21/01/2021	21/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
Date analysed	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
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	%	94	103	93	105	107

svTRH (C10-C40) in Soil			
Our Reference		260350-15	260350-67
Your Reference	UNITS	BH109W/1.0-1.5	BD1/20210121
Date Sampled		21/01/2021	-
Type of sample		Soil	Soil
Date extracted	-	29/01/2021	29/01/2021
Date analysed	-	29/01/2021	29/01/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50
Surrogate o-Terphenyl	%	93	105

PAHs in Soil						
Our Reference		260350-2	260350-3	260350-5	260350-6	260350-7
Your Reference	UNITS	BH109N/0.5-1.0	BH109N/1.0-1.5	BH109E/0.05-0.5	BH109E/0.5-1.0	BH109E/1.0-1.5
Date Sampled		21/01/2021	21/01/2021	21/01/2021	21/01/2021	21/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
Date analysed	-	01/02/2021	02/02/2021	02/02/2021	02/02/2021	02/02/2021
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	<0.1
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	<0.05
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	%	90	97	97	95	96

PAHs in Soil						
Our Reference		260350-9	260350-10	260350-11	260350-13	260350-14
Your Reference	UNITS	BH109S/0.05-0.5	BH109S/0.5-1.0	BH109S/1.0-1.5	BH109W/0.05-0.5	BH109W/0.5-1.0
Date Sampled		21/01/2021	21/01/2021	21/01/2021	21/01/2021	21/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
Date analysed	-	02/02/2021	02/02/2021	02/02/2021	02/02/2021	02/02/2021
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	<0.1
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	<0.05
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	%	98	97	97	93	95

PAHs in Soil			
Our Reference		260350-15	260350-67
Your Reference	UNITS	BH109W/1.0-1.5	BD1/20210121
Date Sampled		21/01/2021	-
Type of sample		Soil	Soil
Date extracted	-	29/01/2021	29/01/2021
Date analysed	-	02/02/2021	02/02/2021
Naphthalene	mg/kg	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	97	97

Organochlorine Pesticides in soil					
Our Reference		260350-2	260350-6	260350-10	260350-14
Your Reference	UNITS	BH109N/0.5-1.0	BH109E/0.5-1.0	BH109S/0.5-1.0	BH109W/0.5-1.0
Date Sampled		21/01/2021	21/01/2021	21/01/2021	21/01/2021
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021
Date analysed	-	01/02/2021	02/02/2021	02/02/2021	02/02/2021
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	103	97	100	101

Organophosphorus Pesticides in Soil					
Our Reference		260350-2	260350-6	260350-10	260350-14
Your Reference	UNITS	BH109N/0.5-1.0	BH109E/0.5-1.0	BH109S/0.5-1.0	BH109W/0.5-1.0
Date Sampled		21/01/2021	21/01/2021	21/01/2021	21/01/2021
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021
Date analysed	-	01/02/2021	02/02/2021	02/02/2021	02/02/2021
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	103	97	100	101

PCBs in Soil					
Our Reference		260350-2	260350-6	260350-10	260350-14
Your Reference	UNITS	BH109N/0.5-1.0	BH109E/0.5-1.0	BH109S/0.5-1.0	BH109W/0.5-1.0
Date Sampled		21/01/2021	21/01/2021	21/01/2021	21/01/2021
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021
Date analysed	-	01/02/2021	02/02/2021	02/02/2021	02/02/2021
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	103	97	100	101

Acid Extractable metals in soil						
Our Reference		260350-2	260350-3	260350-5	260350-6	260350-7
Your Reference	UNITS	BH109N/0.5-1.0	BH109N/1.0-1.5	BH109E/0.05-0.5	BH109E/0.5-1.0	BH109E/1.0-1.5
Date Sampled		21/01/2021	21/01/2021	21/01/2021	21/01/2021	21/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	29/01/2021	29/01/2021	29/01/2021	02/02/2021	29/01/2021
Date analysed	-	31/01/2021	31/01/2021	31/01/2021	02/02/2021	31/01/2021
Arsenic	mg/kg	<4	6	6	9	4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	3	7	6	8	4
Copper	mg/kg	5	8	8	16	6
Lead	mg/kg	5	14	11	13	9
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	<1	2	3	2	<1
Zinc	mg/kg	7	39	26	23	12

Acid Extractable metals in soil						
Our Reference		260350-9	260350-10	260350-11	260350-13	260350-14
Your Reference	UNITS	BH109S/0.05-0.5	BH109S/0.5-1.0	BH109S/1.0-1.5	BH109W/0.05-0.5	BH109W/0.5-1.0
Date Sampled		21/01/2021	21/01/2021	21/01/2021	21/01/2021	21/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
Date analysed	-	31/01/2021	31/01/2021	31/01/2021	31/01/2021	31/01/2021
Arsenic	mg/kg	4	7	4	5	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	5	4	5	6	3
Copper	mg/kg	6	8	5	8	5
Lead	mg/kg	7	8	6	9	9
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	1	<1	1	2	<1
Zinc	mg/kg	13	12	19	19	9

Acid Extractable metals in soil			
Our Reference		260350-15	260350-67
Your Reference	UNITS	BH109W/1.0-1.5	BD1/20210121
Date Sampled		21/01/2021	-
Type of sample		Soil	Soil
Date prepared	-	29/01/2021	29/01/2021
Date analysed	-	31/01/2021	31/01/2021
Arsenic	mg/kg	<4	5
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	3	4
Copper	mg/kg	6	6
Lead	mg/kg	12	7
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	1	<1
Zinc	mg/kg	34	11

Misc Soil - Inorg					
Our Reference		260350-2	260350-6	260350-10	260350-14
Your Reference	UNITS	BH109N/0.5-1.0	BH109E/0.5-1.0	BH109S/0.5-1.0	BH109W/0.5-1.0
Date Sampled		21/01/2021	21/01/2021	21/01/2021	21/01/2021
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021
Date analysed	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5

Moisture						
Our Reference		260350-2	260350-3	260350-5	260350-6	260350-7
Your Reference	UNITS	BH109N/0.5-1.0	BH109N/1.0-1.5	BH109E/0.05-0.5	BH109E/0.5-1.0	BH109E/1.0-1.5
Date Sampled		21/01/2021	21/01/2021	21/01/2021	21/01/2021	21/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
Date analysed	-	01/02/2021	01/02/2021	01/02/2021	01/02/2021	01/02/2021
Moisture	%	13	16	15	15	17

Moisture						
Our Reference		260350-9	260350-10	260350-11	260350-13	260350-14
Your Reference	UNITS	BH109S/0.05-0.5	BH109S/0.5-1.0	BH109S/1.0-1.5	BH109W/0.05-0.5	BH109W/0.5-1.0
Date Sampled		21/01/2021	21/01/2021	21/01/2021	21/01/2021	21/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
Date analysed	-	01/02/2021	01/02/2021	01/02/2021	01/02/2021	01/02/2021
Moisture	%	16	15	19	21	16

Moisture			
Our Reference		260350-15	260350-67
Your Reference	UNITS	BH109W/1.0-1.5	BD1/20210121
Date Sampled		21/01/2021	-
Type of sample		Soil	Soil
Date prepared	-	29/01/2021	29/01/2021
Date analysed	-	01/02/2021	01/02/2021
Moisture	%	15	3.8

Asbestos ID - soils					
Our Reference		260350-2	260350-6	260350-10	260350-14
Your Reference	UNITS	BH109N/0.5-1.0	BH109E/0.5-1.0	BH109S/0.5-1.0	BH109W/0.5-1.0
Date Sampled		21/01/2021	21/01/2021	21/01/2021	21/01/2021
Type of sample		Soil	Soil	Soil	Soil
Date analysed	-	02/02/2021	02/02/2021	02/02/2021	02/02/2021
Sample mass tested	g	Approx. 40g	Approx. 50g	Approx. 50g	Approx. 45g
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
Asbestos comments	-	NO	NO	NO	NO
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils NEPM						
Our Reference		260350-3	260350-4	260350-7	260350-8	260350-11
Your Reference	UNITS	BH109N/1.0-1.5	BH109N/0.05-1.0	BH109E/1.0-1.5	BH109E/0.05-1.0	BH109S/1.0-1.5
Date Sampled		21/01/2021	21/01/2021	21/01/2021	21/01/2021	21/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	02/02/2021	02/02/2021	02/02/2021	02/02/2021	02/02/2021
Sample mass tested	g	1,043.49	1,099.19	969.32	1,042.02	940.08
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	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
Total Asbestos[#1]	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	Chrysotile Crocidolite	Chrysotile
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	–	–	0.0358	0.0036
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	0.0034	<0.001

Asbestos ID - soils NEPM				
Our Reference		260350-12	260350-15	260350-16
Your Reference	UNITS	BH109S/0.05-1.0	BH109W/1.0-1.5	BH109W/0.05-1.0
Date Sampled		21/01/2021	21/01/2021	21/01/2021
Type of sample		Soil	Soil	Soil
Date analysed	-	02/02/2021	02/02/2021	02/02/2021
Sample mass tested	g	1,049.55	1,132.77	995.24
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	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
Total Asbestos[#1]	g/kg	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	Chrysotile	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–
FA and AF Estimation*	g	–	0.0001	–
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001

Misc Inorg - Soil						
Our Reference		260350-1	260350-2	260350-3	260350-5	260350-6
Your Reference	UNITS	BH109N/0.05-0.5	BH109N/0.5-1.0	BH109N/1.0-1.5	BH109E/0.05-0.5	BH109E/0.5-1.0
Date Sampled		21/01/2021	21/01/2021	21/01/2021	21/01/2021	21/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/01/2021	28/01/2021	28/01/2021	28/01/2021	28/01/2021
Date analysed	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
pH 1:5 soil:water	pH Units	5.4	4.9	6.5	5.3	5.2
Chloride, Cl 1:5 soil:water	mg/kg	[NA]	<10	[NA]	[NA]	<10
Sulphate, SO4 1:5 soil:water	mg/kg	[NA]	10	[NA]	[NA]	10

Misc Inorg - Soil						
Our Reference		260350-7	260350-9	260350-10	260350-11	260350-13
Your Reference	UNITS	BH109E/1.0-1.5	BH109S/0.05-0.5	BH109S/0.5-1.0	BH109S/1.0-1.5	BH109W/0.05-0.5
Date Sampled		21/01/2021	21/01/2021	21/01/2021	21/01/2021	21/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/01/2021	28/01/2021	28/01/2021	28/01/2021	28/01/2021
Date analysed	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
pH 1:5 soil:water	pH Units	4.8	5.4	4.9	5.5	5.6
Chloride, Cl 1:5 soil:water	mg/kg	[NA]	[NA]	10	[NA]	[NA]
Sulphate, SO4 1:5 soil:water	mg/kg	[NA]	[NA]	36	[NA]	[NA]

Misc Inorg - Soil						
Our Reference		260350-14	260350-15	260350-17	260350-18	260350-19
Your Reference	UNITS	BH109W/0.5-1.0	BH109W/1.0-1.5	BH201/0.1	BH201/0.5	BH201/1.0
Date Sampled		21/01/2021	21/01/2021	22/01/2021	22/01/2021	22/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/01/2021	28/01/2021	28/01/2021	28/01/2021	28/01/2021
Date analysed	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
pH 1:5 soil:water	pH Units	5.0	5.5	5.5	5.5	5.7
Chloride, Cl 1:5 soil:water	mg/kg	<10	[NA]	[NA]	<10	[NA]
Sulphate, SO4 1:5 soil:water	mg/kg	20	[NA]	[NA]	<10	[NA]

Misc Inorg - Soil						
Our Reference		260350-20	260350-21	260350-22	260350-23	260350-24
Your Reference	UNITS	BH201/1.5	BH202/0.1	BH202/0.5	BH202/1.0	BH202/1.5
Date Sampled		22/01/2021	21/01/2021	21/01/2021	21/01/2021	21/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/01/2021	28/01/2021	28/01/2021	28/01/2021	28/01/2021
Date analysed	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
pH 1:5 soil:water	pH Units	5.3	5.5	6.2	5.9	5.2
Chloride, Cl 1:5 soil:water	mg/kg	[NA]	[NA]	[NA]	<10	[NA]
Sulphate, SO4 1:5 soil:water	mg/kg	[NA]	[NA]	[NA]	10	[NA]
Dispersibility	-	[NA]	[NA]	[NA]	#	[NA]

Misc Inorg - Soil						
Our Reference		260350-25	260350-26	260350-27	260350-28	260350-29
Your Reference	UNITS	BH202/2.0	BH202/2.5	BH203/0.1	BH203/0.5	BH203/1.0
Date Sampled		21/01/2021	21/01/2021	22/01/2021	22/01/2021	22/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/01/2021	28/01/2021	28/01/2021	28/01/2021	28/01/2021
Date analysed	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
pH 1:5 soil:water	pH Units	5.1	5.3	5.4	5.2	5.0
Chloride, Cl 1:5 soil:water	mg/kg	[NA]	<10	[NA]	[NA]	[NA]
Sulphate, SO4 1:5 soil:water	mg/kg	[NA]	110	[NA]	[NA]	[NA]
Dispersibility	-	[NA]	#	[NA]	[NA]	[NA]

Misc Inorg - Soil						
Our Reference		260350-30	260350-31	260350-32	260350-33	260350-34
Your Reference	UNITS	BH203/1.5	BH203/2.0	BH203/2.5	BH203/3.0	BH204/0.1
Date Sampled		22/01/2021	22/01/2021	22/01/2021	22/01/2021	21/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/01/2021	28/01/2021	28/01/2021	28/01/2021	28/01/2021
Date analysed	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
pH 1:5 soil:water	pH Units	5.2	5.3	5.3	5.1	5.5
Chloride, Cl 1:5 soil:water	mg/kg	<10	[NA]	[NA]	<10	[NA]
Sulphate, SO4 1:5 soil:water	mg/kg	10	[NA]	[NA]	32	[NA]
Dispersibility	-	[NA]	[NA]	[NA]	#	[NA]

Misc Inorg - Soil						
Our Reference		260350-35	260350-36	260350-37	260350-38	260350-39
Your Reference	UNITS	BH204/0.5	BH204/1.0	BH204/1.5	BH204/2.0	BH205/0.1
Date Sampled		21/01/2021	21/01/2021	21/01/2021	21/01/2021	21/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/01/2021	28/01/2021	28/01/2021	28/01/2021	28/01/2021
Date analysed	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
pH 1:5 soil:water	pH Units	5.5	4.7	4.7	4.9	4.2
Chloride, Cl 1:5 soil:water	mg/kg	[NA]	[NA]	[NA]	20	[NA]
Sulphate, SO4 1:5 soil:water	mg/kg	[NA]	[NA]	[NA]	43	[NA]

Misc Inorg - Soil						
Our Reference		260350-40	260350-41	260350-42	260350-43	260350-44
Your Reference	UNITS	BH205/0.5	BH205/1.0	BH205/1.5	BH205/2.0	BH206/0.1
Date Sampled		21/01/2021	21/01/2021	21/01/2021	21/01/2021	22/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/01/2021	28/01/2021	28/01/2021	28/01/2021	28/01/2021
Date analysed	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
pH 1:5 soil:water	pH Units	4.5	5.1	4.5	4.8	5.3
Chloride, Cl 1:5 soil:water	mg/kg	10	[NA]	[NA]	[NA]	10
Sulphate, SO4 1:5 soil:water	mg/kg	30	[NA]	[NA]	[NA]	<10
Dispersibility	-	[NA]	[NA]	[NA]	[NA]	#

Misc Inorg - Soil						
Our Reference		260350-45	260350-46	260350-47	260350-48	260350-49
Your Reference	UNITS	BH206/0.5	BH206/1.0	BH206/1.5	BH206/2.0	BH207/0.1
Date Sampled		22/01/2021	22/01/2021	22/01/2021	22/01/2021	22/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/01/2021	28/01/2021	28/01/2021	28/01/2021	28/01/2021
Date analysed	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
pH 1:5 soil:water	pH Units	5.8	5.9	4.8	5.0	6.0
Chloride, Cl 1:5 soil:water	mg/kg	[NA]	<10	[NA]	10	[NA]
Sulphate, SO4 1:5 soil:water	mg/kg	[NA]	<10	[NA]	59	[NA]
Dispersibility	-	[NA]	#	[NA]	[NA]	[NA]

Misc Inorg - Soil						
Our Reference		260350-50	260350-51	260350-52	260350-53	260350-54
Your Reference	UNITS	BH207/0.5	BH207/1.0	BH207/1.5	BH207/2.0	BH208/0.1
Date Sampled		22/01/2021	22/01/2021	22/01/2021	22/01/2021	21/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/01/2021	28/01/2021	28/01/2021	28/01/2021	28/01/2021
Date analysed	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
pH 1:5 soil:water	pH Units	5.8	4.8	4.5	4.7	5.7
Chloride, Cl 1:5 soil:water	mg/kg	[NA]	[NA]	32	[NA]	[NA]
Sulphate, SO4 1:5 soil:water	mg/kg	[NA]	[NA]	84	[NA]	[NA]

Misc Inorg - Soil						
Our Reference		260350-55	260350-56	260350-57	260350-58	260350-59
Your Reference	UNITS	BH208/0.6	BH208/1.0	BH208/1.5	BH208/2.0	BH208/2.5
Date Sampled		21/01/2021	21/01/2021	21/01/2021	21/01/2021	21/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/01/2021	28/01/2021	28/01/2021	28/01/2021	28/01/2021
Date analysed	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
pH 1:5 soil:water	pH Units	6.6	5.2	5.3	5.3	5.4
Chloride, Cl 1:5 soil:water	mg/kg	<10	[NA]	[NA]	100	[NA]
Sulphate, SO4 1:5 soil:water	mg/kg	20	[NA]	[NA]	39	[NA]
Dispersibility	-	#	[NA]	[NA]	[NA]	[NA]

Misc Inorg - Soil						
Our Reference		260350-60	260350-61	260350-62	260350-63	260350-64
Your Reference	UNITS	BH208/3.0	BH209/0.1	BH209/0.5	BH209/1.0	BH209/1.5
Date Sampled		21/01/2021	22/01/2021	22/01/2021	22/01/2021	22/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/01/2021	28/01/2021	28/01/2021	28/01/2021	28/01/2021
Date analysed	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
pH 1:5 soil:water	pH Units	5.5	5.5	5.4	5.3	5.1
Chloride, Cl 1:5 soil:water	mg/kg	[NA]	[NA]	[NA]	<10	[NA]
Sulphate, SO4 1:5 soil:water	mg/kg	[NA]	[NA]	[NA]	10	[NA]

Misc Inorg - Soil			
Our Reference		260350-65	260350-66
Your Reference	UNITS	BH209/2.0	BH209/2.5
Date Sampled		22/01/2021	22/01/2021
Type of sample		Soil	Soil
Date prepared	-	28/01/2021	28/01/2021
Date analysed	-	29/01/2021	29/01/2021
pH 1:5 soil:water	pH Units	4.8	5.2
Chloride, Cl 1:5 soil:water	mg/kg	[NA]	<10
Sulphate, SO4 1:5 soil:water	mg/kg	[NA]	42
Dispersibility	-	[NA]	#

Texture and Salinity*						
Our Reference		260350-1	260350-2	260350-3	260350-5	260350-6
Your Reference	UNITS	BH109N/0.05-0.5	BH109N/0.5-1.0	BH109N/1.0-1.5	BH109E/0.05-0.5	BH109E/0.5-1.0
Date Sampled		21/01/2021	21/01/2021	21/01/2021	21/01/2021	21/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/01/2021	28/01/2021	28/01/2021	28/01/2021	28/01/2021
Date analysed	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
Electrical Conductivity 1:5 soil:water	µS/cm	57	33	43	43	37
Texture Value	-	9.0	7.0	9.0	9.0	7.0
Texture	-	CLAY LOAM	MEDIUM CLAY	CLAY LOAM	CLAY LOAM	MEDIUM CLAY
ECe	dS/m	<2	<2	<2	<2	<2
Class	-	NON SALINE	NON SALINE	NON SALINE	NON SALINE	NON SALINE

Texture and Salinity*						
Our Reference		260350-7	260350-9	260350-10	260350-11	260350-13
Your Reference	UNITS	BH109E/1.0-1.5	BH109S/0.05-0.5	BH109S/0.5-1.0	BH109S/1.0-1.5	BH109W/0.05-0.5
Date Sampled		21/01/2021	21/01/2021	21/01/2021	21/01/2021	21/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/01/2021	28/01/2021	28/01/2021	28/01/2021	28/01/2021
Date analysed	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
Electrical Conductivity 1:5 soil:water	µS/cm	50	37	43	95	34
Texture Value	-	7.0	9.0	7.0	9.0	9.0
Texture	-	MEDIUM CLAY	CLAY LOAM	MEDIUM CLAY	CLAY LOAM	CLAY LOAM
ECe	dS/m	<2	<2	<2	<2	<2
Class	-	NON SALINE	NON SALINE	NON SALINE	NON SALINE	NON SALINE

Texture and Salinity*						
Our Reference		260350-14	260350-15	260350-17	260350-18	260350-19
Your Reference	UNITS	BH109W/0.5-1.0	BH109W/1.0-1.5	BH201/0.1	BH201/0.5	BH201/1.0
Date Sampled		21/01/2021	21/01/2021	22/01/2021	22/01/2021	22/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/01/2021	28/01/2021	28/01/2021	28/01/2021	28/01/2021
Date analysed	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
Electrical Conductivity 1:5 soil:water	µS/cm	34	35	33	29	27
Texture Value	-	7.0	9.0	7.0	7.0	8.0
Texture	-	MEDIUM CLAY	CLAY LOAM	MEDIUM CLAY	MEDIUM CLAY	LIGHT MEDIUM CLAY
ECe	dS/m	<2	<2	<2	<2	<2
Class	-	NON SALINE	NON SALINE	NON SALINE	NON SALINE	NON SALINE

Texture and Salinity*						
Our Reference		260350-20	260350-21	260350-22	260350-23	260350-24
Your Reference	UNITS	BH201/1.5	BH202/0.1	BH202/0.5	BH202/1.0	BH202/1.5
Date Sampled		22/01/2021	21/01/2021	21/01/2021	21/01/2021	21/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/01/2021	28/01/2021	28/01/2021	28/01/2021	28/01/2021
Date analysed	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
Electrical Conductivity 1:5 soil:water	µS/cm	63	150	36	33	88
Texture Value	-	7.0	9.0	7.0	8.0	8.0
Texture	-	MEDIUM CLAY	CLAY LOAM	MEDIUM CLAY	LIGHT MEDIUM CLAY	LIGHT MEDIUM CLAY
ECe	dS/m	<2	<2	<2	<2	<2
Class	-	NON SALINE	NON SALINE	NON SALINE	NON SALINE	NON SALINE

Texture and Salinity*						
Our Reference		260350-25	260350-26	260350-27	260350-28	260350-29
Your Reference	UNITS	BH202/2.0	BH202/2.5	BH203/0.1	BH203/0.5	BH203/1.0
Date Sampled		21/01/2021	21/01/2021	22/01/2021	22/01/2021	22/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/01/2021	28/01/2021	28/01/2021	28/01/2021	28/01/2021
Date analysed	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
Electrical Conductivity 1:5 soil:water	µS/cm	100	85	64	27	35
Texture Value	-	7.0	7.0	9.0	7.0	7.0
Texture	-	MEDIUM CLAY	MEDIUM CLAY	CLAY LOAM	MEDIUM CLAY	MEDIUM CLAY
ECe	dS/m	<2	<2	<2	<2	<2
Class	-	NON SALINE	NON SALINE	NON SALINE	NON SALINE	NON SALINE

Texture and Salinity*						
Our Reference		260350-30	260350-31	260350-32	260350-33	260350-34
Your Reference	UNITS	BH203/1.5	BH203/2.0	BH203/2.5	BH203/3.0	BH204/0.1
Date Sampled		22/01/2021	22/01/2021	22/01/2021	22/01/2021	21/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/01/2021	28/01/2021	28/01/2021	28/01/2021	28/01/2021
Date analysed	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
Electrical Conductivity 1:5 soil:water	µS/cm	29	33	31	50	28
Texture Value	-	9.0	9.0	9.0	9.0	9.0
Texture	-	CLAY LOAM	CLAY LOAM	CLAY LOAM	CLAY LOAM	CLAY LOAM
ECe	dS/m	<2	<2	<2	<2	<2
Class	-	NON SALINE	NON SALINE	NON SALINE	NON SALINE	NON SALINE

Texture and Salinity*						
Our Reference		260350-35	260350-36	260350-37	260350-38	260350-39
Your Reference	UNITS	BH204/0.5	BH204/1.0	BH204/1.5	BH204/2.0	BH205/0.1
Date Sampled		21/01/2021	21/01/2021	21/01/2021	21/01/2021	21/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/01/2021	28/01/2021	28/01/2021	28/01/2021	28/01/2021
Date analysed	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
Electrical Conductivity 1:5 soil:water	µS/cm	27	49	88	54	58
Texture Value	-	9.0	7.0	7.0	7.0	7.0
Texture	-	CLAY LOAM	MEDIUM CLAY	MEDIUM CLAY	MEDIUM CLAY	MEDIUM CLAY
ECe	dS/m	<2	<2	<2	<2	<2
Class	-	NON SALINE	NON SALINE	NON SALINE	NON SALINE	NON SALINE

Texture and Salinity*						
Our Reference		260350-40	260350-41	260350-42	260350-43	260350-44
Your Reference	UNITS	BH205/0.5	BH205/1.0	BH205/1.5	BH205/2.0	BH206/0.1
Date Sampled		21/01/2021	21/01/2021	21/01/2021	21/01/2021	22/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/01/2021	28/01/2021	28/01/2021	28/01/2021	28/01/2021
Date analysed	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
Electrical Conductivity 1:5 soil:water	µS/cm	42	38	65	73	65
Texture Value	-	7.0	7.0	7.0	7.0	9.0
Texture	-	MEDIUM CLAY	MEDIUM CLAY	MEDIUM CLAY	MEDIUM CLAY	CLAY LOAM
ECe	dS/m	<2	<2	<2	<2	<2
Class	-	NON SALINE	NON SALINE	NON SALINE	NON SALINE	NON SALINE

Texture and Salinity*						
Our Reference		260350-45	260350-46	260350-47	260350-48	260350-49
Your Reference	UNITS	BH206/0.5	BH206/1.0	BH206/1.5	BH206/2.0	BH207/0.1
Date Sampled		22/01/2021	22/01/2021	22/01/2021	22/01/2021	22/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/01/2021	28/01/2021	28/01/2021	28/01/2021	28/01/2021
Date analysed	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
Electrical Conductivity 1:5 soil:water	µS/cm	60	27	79	61	94
Texture Value	-	9.0	9.0	7.0	7.0	7.0
Texture	-	CLAY LOAM	CLAY LOAM	MEDIUM CLAY	MEDIUM CLAY	MEDIUM CLAY
ECe	dS/m	<2	<2	<2	<2	<2
Class	-	NON SALINE	NON SALINE	NON SALINE	NON SALINE	NON SALINE

Texture and Salinity*						
Our Reference		260350-50	260350-51	260350-52	260350-53	260350-54
Your Reference	UNITS	BH207/0.5	BH207/1.0	BH207/1.5	BH207/2.0	BH208/0.1
Date Sampled		22/01/2021	22/01/2021	22/01/2021	22/01/2021	21/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/01/2021	28/01/2021	28/01/2021	28/01/2021	28/01/2021
Date analysed	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
Electrical Conductivity 1:5 soil:water	µS/cm	58	87	94	76	46
Texture Value	-	7.0	7.0	7.0	7.0	9.0
Texture	-	MEDIUM CLAY	MEDIUM CLAY	MEDIUM CLAY	MEDIUM CLAY	CLAY LOAM
ECe	dS/m	<2	<2	<2	<2	<2
Class	-	NON SALINE	NON SALINE	NON SALINE	NON SALINE	NON SALINE

Texture and Salinity*						
Our Reference		260350-55	260350-56	260350-57	260350-58	260350-59
Your Reference	UNITS	BH208/0.6	BH208/1.0	BH208/1.5	BH208/2.0	BH208/2.5
Date Sampled		21/01/2021	21/01/2021	21/01/2021	21/01/2021	21/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/01/2021	28/01/2021	28/01/2021	28/01/2021	28/01/2021
Date analysed	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
Electrical Conductivity 1:5 soil:water	µS/cm	44	69	81	120	120
Texture Value	-	7.0	7.0	7.0	7.0	7.0
Texture	-	MEDIUM CLAY	MEDIUM CLAY	MEDIUM CLAY	MEDIUM CLAY	MEDIUM CLAY
ECe	dS/m	<2	<2	<2	<2	<2
Class	-	NON SALINE	NON SALINE	NON SALINE	NON SALINE	NON SALINE

Texture and Salinity*						
Our Reference		260350-60	260350-61	260350-62	260350-63	260350-64
Your Reference	UNITS	BH208/3.0	BH209/0.1	BH209/0.5	BH209/1.0	BH209/1.5
Date Sampled		21/01/2021	22/01/2021	22/01/2021	22/01/2021	22/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/01/2021	28/01/2021	28/01/2021	28/01/2021	28/01/2021
Date analysed	-	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
Electrical Conductivity 1:5 soil:water	µS/cm	98	49	43	32	59
Texture Value	-	9.0	9.0	9.0	9.0	7.0
Texture	-	CLAY LOAM	CLAY LOAM	CLAY LOAM	CLAY LOAM	MEDIUM CLAY
ECe	dS/m	<2	<2	<2	<2	<2
Class	-	NON SALINE	NON SALINE	NON SALINE	NON SALINE	NON SALINE

Texture and Salinity*			
Our Reference		260350-65	260350-66
Your Reference	UNITS	BH209/2.0	BH209/2.5
Date Sampled		22/01/2021	22/01/2021
Type of sample		Soil	Soil
Date prepared	-	28/01/2021	28/01/2021
Date analysed	-	29/01/2021	29/01/2021
Electrical Conductivity 1:5 soil:water	µS/cm	77	57
Texture Value	-	7.0	7.0
Texture	-	MEDIUM CLAY	MEDIUM CLAY
ECe	dS/m	<2	<2
Class	-	NON SALINE	NON SALINE

ESP/CEC						
Our Reference		260350-23	260350-26	260350-33	260350-44	260350-46
Your Reference	UNITS	BH202/1.0	BH202/2.5	BH203/3.0	BH206/0.1	BH206/1.0
Date Sampled		21/01/2021	21/01/2021	22/01/2021	22/01/2021	22/01/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	01/02/2021	01/02/2021	01/02/2021	01/02/2021	01/02/2021
Date analysed	-	01/02/2021	01/02/2021	01/02/2021	01/02/2021	01/02/2021
Exchangeable Ca	meq/100g	7.9	1.1	4.9	7.2	8.4
Exchangeable K	meq/100g	0.3	0.4	0.6	1.3	0.3
Exchangeable Mg	meq/100g	2.1	2.9	3.6	3.8	2.7
Exchangeable Na	meq/100g	0.21	0.70	0.21	<0.1	0.23
Cation Exchange Capacity	meq/100g	10	5.1	9.4	12	12
ESP	%	2	14	2	<1	2

ESP/CEC			
Our Reference		260350-55	260350-66
Your Reference	UNITS	BH208/0.6	BH209/2.5
Date Sampled		21/01/2021	22/01/2021
Type of sample		Soil	Soil
Date prepared	-	01/02/2021	01/02/2021
Date analysed	-	01/02/2021	01/02/2021
Exchangeable Ca	meq/100g	9.4	1.0
Exchangeable K	meq/100g	0.2	0.4
Exchangeable Mg	meq/100g	5.3	3.8
Exchangeable Na	meq/100g	0.26	0.53
Cation Exchange Capacity	meq/100g	15	5.7
ESP	%	2	9

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.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. **NOTE** #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) **NOTE** #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
Ext-037	Analysed by Sydney Environmental & Soil Laboratory
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-002	Conductivity and Salinity - measured using a conductivity cell at 25°C in accordance with APHA latest edition 2510 and Rayment & Lyons.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
INORG-123	Determined using a "Texture by Feel" method.
Metals-020	Determination of various metals by ICP-AES.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-AES analytical finish.
Metals-021	Determination of Mercury by Cold Vapour AAS.

Method ID	Methodology Summary
Org-020	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-020	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-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-021	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-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. 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-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/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-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.

Method ID	Methodology Summary
Org-023	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-023	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-3	260350-6
Date extracted	-			29/01/2021	2	29/01/2021	29/01/2021		29/01/2021	29/01/2021
Date analysed	-			01/02/2021	2	01/02/2021	01/02/2021		01/02/2021	01/02/2021
TRH C_6 - C_9	mg/kg	25	Org-023	<25	2	<25	<25	0	113	104
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	2	<25	<25	0	113	104
Benzene	mg/kg	0.2	Org-023	<0.2	2	<0.2	<0.2	0	103	96
Toluene	mg/kg	0.5	Org-023	<0.5	2	<0.5	<0.5	0	113	100
Ethylbenzene	mg/kg	1	Org-023	<1	2	<1	<1	0	124	115
m+p-xylene	mg/kg	2	Org-023	<2	2	<2	<2	0	113	104
o-Xylene	mg/kg	1	Org-023	<1	2	<1	<1	0	116	106
naphthalene	mg/kg	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	111	2	81	82	1	108	93

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]	14	29/01/2021	29/01/2021		[NT]	[NT]
Date analysed	-			[NT]	14	01/02/2021	01/02/2021		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	14	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	14	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	14	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	14	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	14	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	14	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	14	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-023	[NT]	14	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	14	105	89	16	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	260350-6
Date extracted	-			29/01/2021	2	29/01/2021	29/01/2021		29/01/2021	29/01/2021
Date analysed	-			29/01/2021	2	29/01/2021	29/01/2021		29/01/2021	29/01/2021
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	2	<50	<50	0	97	93
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	2	<100	<100	0	96	91
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	2	<100	<100	0	108	112
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	2	<50	<50	0	97	93
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	2	<100	<100	0	96	91
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	2	<100	<100	0	108	112
Surrogate o-Terphenyl	%		Org-020	109	2	93	107	14	113	112

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	14	29/01/2021	29/01/2021		[NT]	[NT]
Date analysed	-			[NT]	14	29/01/2021	29/01/2021		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	14	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	14	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	14	<100	<100	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	14	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	14	<100	<100	0	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	14	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	14	107	106	1	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	260350-6
Date extracted	-			29/01/2021	2	29/01/2021	29/01/2021		29/01/2021	29/01/2021
Date analysed	-			02/02/2021	2	01/02/2021	01/02/2021		02/02/2021	02/02/2021
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	103	105
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	108	109
Fluorene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	114	109
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	115	111
Anthracene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	116	111
Pyrene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	114	113
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	139	135
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	2	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	2	<0.05	<0.05	0	108	110
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	93	2	90	90	0	86	92

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	14	29/01/2021	29/01/2021		[NT]	[NT]
Date analysed	-			[NT]	14	02/02/2021	02/02/2021		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	14	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	14	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	14	95	95	0	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	260350-6
Date extracted	-			29/01/2021	2	29/01/2021	29/01/2021		29/01/2021	29/01/2021
Date analysed	-			02/02/2021	2	01/02/2021	01/02/2021		02/02/2021	02/02/2021
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	117	111
HCB	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	115	113
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	111	125
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	115	114
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	110	109
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	109	106
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	117	115
Endrin	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	114	95
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	108	106
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	114	116
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	98	2	103	101	2	93	97

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	14	29/01/2021	29/01/2021		[NT]	[NT]
Date analysed	-			[NT]	14	02/02/2021	02/02/2021		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	14	101	98	3	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	260350-6
Date extracted	-			29/01/2021	2	29/01/2021	29/01/2021		29/01/2021	29/01/2021
Date analysed	-			02/02/2021	2	01/02/2021	01/02/2021		02/02/2021	02/02/2021
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	98	92
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	111	114
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	95	97
Malathion	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	137	137
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	122	118
Parathion	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	98	76
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	125	129
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	98	2	103	101	2	93	97

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	14	29/01/2021	29/01/2021		[NT]	[NT]
Date analysed	-			[NT]	14	02/02/2021	02/02/2021		[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	14	101	98	3	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	260350-6
Date extracted	-			29/01/2021	2	29/01/2021	29/01/2021		29/01/2021	29/01/2021
Date analysed	-			02/02/2021	2	01/02/2021	01/02/2021		02/02/2021	02/02/2021
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	2	<0.1	<0.1	0	100	100
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	98	2	103	101	2	93	97

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	14	29/01/2021	29/01/2021		[NT]	[NT]
Date analysed	-			[NT]	14	02/02/2021	02/02/2021		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	[NT]	14	101	98	3	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	260350-6
Date prepared	-			29/01/2021	2	29/01/2021	29/01/2021		29/01/2021	02/02/2021
Date analysed	-			31/01/2021	2	31/01/2021	31/01/2021		31/01/2021	02/02/2021
Arsenic	mg/kg	4	Metals-020	<4	2	<4	<4	0	98	74
Cadmium	mg/kg	0.4	Metals-020	<0.4	2	<0.4	<0.4	0	93	71
Chromium	mg/kg	1	Metals-020	<1	2	3	3	0	95	72
Copper	mg/kg	1	Metals-020	<1	2	5	5	0	96	74
Lead	mg/kg	1	Metals-020	<1	2	5	6	18	95	85
Mercury	mg/kg	0.1	Metals-021	<0.1	2	<0.1	<0.1	0	110	91
Nickel	mg/kg	1	Metals-020	<1	2	<1	<1	0	98	71
Zinc	mg/kg	1	Metals-020	<1	2	7	7	0	110	#

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	14	29/01/2021	29/01/2021		[NT]	[NT]
Date analysed	-			[NT]	14	31/01/2021	31/01/2021		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	14	<4	4	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	14	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	14	3	4	29	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	14	5	6	18	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	14	9	7	25	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	14	<1	<1	0	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	14	9	10	11	[NT]	[NT]

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	260350-6
Date prepared	-			29/01/2021	2	29/01/2021	29/01/2021		29/01/2021	29/01/2021
Date analysed	-			29/01/2021	2	29/01/2021	29/01/2021		29/01/2021	29/01/2021
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	2	<5	<5	0	99	99

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	260350-2
Date prepared	-			28/01/2021	1	28/01/2021	28/01/2021		28/01/2021	28/01/2021
Date analysed	-			29/01/2021	1	29/01/2021	29/01/2021		29/01/2021	29/01/2021
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	1	5.4	5.4	0	101	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	<10	14	<10	<10	0	94	[NT]
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	<10	14	20	25	22	88	[NT]
Dispersibility	-	0	Ext-037	[NT]	66	#	[NT]		[NT]	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	260350-26
Date prepared	-			[NT]	14	28/01/2021	28/01/2021		28/01/2021	28/01/2021
Date analysed	-			[NT]	14	29/01/2021	29/01/2021		29/01/2021	29/01/2021
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	14	5.0	5.0	0	98	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	[NT]	52	32	33	3	[NT]	[NT]
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	[NT]	52	84	85	1	[NT]	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	260350-46
Date prepared	-			[NT]	25	28/01/2021	28/01/2021		28/01/2021	28/01/2021
Date analysed	-			[NT]	25	29/01/2021	29/01/2021		29/01/2021	29/01/2021
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	25	5.1	5.1	0	101	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	[NT]	66	<10	<10	0	[NT]	[NT]
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	[NT]	66	42	43	2	[NT]	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date prepared	-			[NT]	35	28/01/2021	28/01/2021		28/01/2021	[NT]
Date analysed	-			[NT]	35	29/01/2021	29/01/2021		29/01/2021	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	35	5.5	5.4	2	101	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	45	28/01/2021	28/01/2021		[NT]	[NT]
Date analysed	-			[NT]	45	29/01/2021	29/01/2021		[NT]	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	45	5.8	5.8	0	[NT]	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	52	28/01/2021	28/01/2021		[NT]	[NT]
Date analysed	-			[NT]	52	29/01/2021	29/01/2021		[NT]	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	52	4.5	4.5	0	[NT]	[NT]

QUALITY CONTROL: Misc Inorg - Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	66	28/01/2021	28/01/2021		[NT]	[NT]
Date analysed	-			[NT]	66	29/01/2021	29/01/2021		[NT]	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	66	5.2	5.2	0	[NT]	[NT]

QUALITY CONTROL: Texture and Salinity*						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			28/01/2021	1	28/01/2021	28/01/2021		28/01/2021	[NT]
Date analysed	-			29/01/2021	1	29/01/2021	29/01/2021		29/01/2021	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	1	57	59	3	104	[NT]
Texture Value	-		INORG-123	[NT]	1	9.0	9.0	0	[NT]	[NT]

QUALITY CONTROL: Texture and Salinity*						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			[NT]	14	28/01/2021	28/01/2021		28/01/2021	[NT]
Date analysed	-			[NT]	14	29/01/2021	29/01/2021		29/01/2021	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	[NT]	14	34	35	3	100	[NT]
Texture Value	-		INORG-123	[NT]	14	7.0	7.0	0	[NT]	[NT]

QUALITY CONTROL: Texture and Salinity*						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date prepared	-			[NT]	25	28/01/2021	28/01/2021		28/01/2021	[NT]
Date analysed	-			[NT]	25	29/01/2021	29/01/2021		29/01/2021	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	[NT]	25	100	100	0	101	[NT]
Texture Value	-		INORG-123	[NT]	25	7.0	7.0	0	[NT]	[NT]

QUALITY CONTROL: Texture and Salinity*						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date prepared	-			[NT]	35	28/01/2021	28/01/2021		28/01/2021	[NT]
Date analysed	-			[NT]	35	29/01/2021	29/01/2021		29/01/2021	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	[NT]	35	27	28	4	102	[NT]
Texture Value	-		INORG-123	[NT]	35	9.0	9.0	0	[NT]	[NT]

QUALITY CONTROL: Texture and Salinity*						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	45	28/01/2021	28/01/2021		[NT]	[NT]
Date analysed	-			[NT]	45	29/01/2021	29/01/2021		[NT]	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	[NT]	45	60	58	3	[NT]	[NT]
Texture Value	-		INORG-123	[NT]	45	9.0	9.0	0	[NT]	[NT]

QUALITY CONTROL: Texture and Salinity*						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	52	28/01/2021	28/01/2021		[NT]	[NT]
Date analysed	-			[NT]	52	29/01/2021	29/01/2021		[NT]	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	[NT]	52	94	99	5	[NT]	[NT]
Texture Value	-		INORG-123	[NT]	52	7.0	7.0	0	[NT]	[NT]

QUALITY CONTROL: Texture and Salinity*					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	66	28/01/2021	28/01/2021		[NT]	[NT]
Date analysed	-			[NT]	66	29/01/2021	29/01/2021		[NT]	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	[NT]	66	57	56	2	[NT]	[NT]
Texture Value	-		INORG-123	[NT]	66	7.0	7.0	0	[NT]	[NT]

QUALITY CONTROL: ESP/CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			01/02/2021	55	01/02/2021	01/02/2021		01/02/2021	[NT]
Date analysed	-			01/02/2021	55	01/02/2021	01/02/2021		01/02/2021	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	55	9.4	8.4	11	111	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	55	0.2	0.2	0	122	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	55	5.3	4.9	8	112	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	55	0.26	0.24	8	126	[NT]
ESP	%	1	Metals-020	[NT]	55	2	2	0	[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.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

Asbestos-ID in soil: NEPM
This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013. This is reported outside our scope of NATA accreditation.

Factual description of asbestos identified in the soil samples: NEPM
Sample 260350-8; Chrysotile and Crocidolite asbestos identified in 0.0421g of fibrous matted material

Sample 260350-11; Chrysotile asbestos identified in 0.0239g of fibre cement material <7mm

Sample 260350-15; Chrysotile asbestos identified in 0.0006g of fibre cement material <7mm

Samples were out of the recommended holding time for this analysis pH in soil.

Dispersibility was analysed by East West Geo Ag Enviro. Repor No. EW210283
view attached report

8 metals in soil - # Low spike recovery was obtained for this sample. The sample was re-digested and re-spiked and the low recovery was confirmed. This is due to matrix interferences. However, an acceptable recovery was obtained for the LCS.

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CHAIN OF CUSTODY DESPATCH SHEET

Project No:	86977.01	**Suburb:**	Toongabbie	**To:**	Envirolab Services
Project Name:	Pendle Hill High School Development	**Order Number**			12 Ashley Street, Chatswood
Project Manager:	Lisa Teng	**Sampler:**	Tom Graham	**Attn:**	Aileen Hie
Emails:	Lisa.Teng@douglaspartners.com.au	Tom.Graham@douglaspartners.com.au		**Phone:**	9910 6200
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☑			**Email:**	ahie@envirolab.com.au
Prior Storage:	☐ Esky ☒ Fridge ☑ Shelved	Do samples contain 'potential' HBM?	Yes ☐ No ☑ (If YES, then handle, transport and store in accordance with FPM HAZID)		

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

Sample ID	Lab ID	Date Sampled	Sample Type (S - soil, W - water)	Container Type (G - glass, P - plastic)	Analytes: Combo 8a	Combo 3	Asbestos 500mL	BTEX	Texture / Salinity	pH	Chloride	Sulphate	Sodicity / Dispersibility v	Notes/preservation
BH109N/0.05-0.5	1	21/01/21	S	G+P					X	X				
BH109N/0.5-1.0	2	21/01/21	S	G+P	X				X	X	X	X		
BH109N/1.0-1.5	3	21/01/21	S	G+P		X	X		X	X				Use Abs/ove Sample for 500mL
BH109N/0.05-1.0	4	21/01/21	S	P			X							
BH109E/0.05-0.5	5	21/01/21	S	G+P		X			X	X				
BH109E/0.5-1.0	6	21/01/21	S	G+P	X				X	X	X	X		
BH109E/1.0-1.5	7	21/01/21	S	G+P		X	X		X	X				Use Above Sample for 500mL
BH109E/0.05-1.0	8	21/01/21	S	P			X							
BH109S/0.05-0.5	9	21/01/21	S	G+P		X			X	X				
BH109S/0.5-1.0	10	21/01/21	S	G+P	X				X	X	X	X		
BH109S/1.0-1.5	11	21/01/21	S	G+P		X	X		X	X				Use Above Sample for 500mL
BH109S/0.05-1.0	12	21/01/21	S	P			X							
BH109W/0.05-0.5	13	21/01/21	S	G+P		X			X	X				
BH109W/0.5-1.0	14	21/01/21	S	G+P	X				X	X	X	X		
BH109W/1.0-1.5	15	21/01/21	S	G+P		X	X		X	X				Use Above Sample for 500mL
PQL (S) mg/kg														**ANZECC PQLs req'd for all water analytes** ☐

Job No: 260350
Date Received: 27/1/21
Time Received: 1425
Received By: JD
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Metals to Analyse: 8HM unless specified here:

Lab Report/Reference No: 260350

Total number of samples in container: **Relinquished by:** TG **Transported to laboratory by:** Bonded Courier

Send Results to: Douglas Partners Pty Ltd **Address** **Phone:** **Fax:**

Signed: **Received by:** Jason Day **Date & Time:** 27/1/21 1425

7.4°C

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CHAIN OF CUSTODY DESPATCH SHEET

Project No:	86977.01	**Suburb:**	Toongabbie	**To:**	Envirolab Services
Project Name:	Pendle Hill High School Development	**Order Number**			12 Ashley Street, Chatswood
Project Manager:	Lisa Teng	**Sampler:**	Tom Graham	**Attn:**	Aileen Hie
Emails:	Lisa.Teng@douglaspartners.com.au	Tom.Graham@douglaspartners.com.au		**Phone:**	9910 6200
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☑			**Email:**	ahie@envirolab.com.au
Prior Storage:	☐ Esky ☑ Fridge ☑ Shelved	Do samples contain 'potential' HBM? Yes ☐ No ☑ (If YES, then handle, transport and store in accordance with FPM HAZID)			

Sample ID	Lab ID	Sampling Date	Sample Type (S - soil, W - water)	Container Type (G - glass, P - plastic)	Analytes: Combo 8a	Combo 3	Asbestos 500mL	BTEX	Texture / Salinity	pH	Chloride	Sulphate	Sodicity / Dispersibility v	Notes/preservation
BH109W/0.05-1.0	16	21/01/21	S	P			X							
BH201/0.1	17	22/01/21	S	P					X	X				
BH201/0.5	18	22/01/21	S	P					X	X	X	X		
BH201/1.0	19	22/01/21	S	P					X	X				
BH201/1.5	20	22/01/21	S	P					X	X				
BH202/0.1	21	21/01/21	S	P					X	X				
BH202/0.5	22	21/01/21	S	P					X	X				
BH202/1.0	23	21/01/21	S	P					X	X	X	X	X	
BH202/1.5	24	21/01/21	S	P					X	X				
BH202/2.0	25	21/01/21	S	P					X	X				
BH202/2.5	26	21/01/21	S	P					X	X	X	X	X	
BH203/0.1	27	22/01/21	S	P					X	X				
BH203/0.5	28	22/01/21	S	P					X	X				
BH203/1.0	29	22/01/21	S	P					X	X				
BH203/1.5	30	22/01/21	S	P					X	X	X	X		
PQL (S) mg/kg														**ANZECC PQLs req'd for all water analytes** ☐

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Metals to Analyse: 8HM unless specified here:

Lab Report/Reference No: 260350

Total number of samples in container:	**Relinquished by:** TG	**Transported to laboratory by:**	Bonded Courier
Send Results to: Douglas Partners Pty Ltd	**Address**	**Phone:**	**Fax:**
Signed:	**Received by:** Jason Day GLS SYD	**Date & Time:** 27/1/21 1425	7.4°C

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CHAIN OF CUSTODY DESPATCH SHEET

Project No:	86977.01	**Suburb:**	Toongabbie	**To:**	Envirolab Services
Project Name:	Pendle Hill High School Development	**Order Number**			12 Ashley Street, Chatswood
Project Manager:	Lisa Teng	**Sampler:**	Tom Graham	**Attn:**	Aileen Hie
Emails:	Lisa.Teng@douglaspartners.com.au	Tom.Graham@douglaspartners.com.au		**Phone:**	9910 6200
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☑			**Email:**	ahie@envirolab.com.au
Prior Storage:	☐ Esky ☑ Fridge ☑ Shelved	Do samples contain 'potential' HBM?	Yes ☐ No ☒ (If YES, then handle, transport and store in accordance with FPM HAZID)		

Sample ID	Lab ID	Sampling Date	Sample Type (S - soil, W - water)	Container Type (G - glass, P - plastic)	Analytes: Combo 8a	Combo 3	Asbestos 500mL	BTEX	Texture / Salinity	pH	Chloride	Sulphate	Sodicity / Dispersibility v	Notes/preservation
BH203/2.0	31	22/01/21	S	P					X	X				
BH203/2.5	32	22/01/21	S	P					X	X				
BH203/3.0	33	22/01/21	S	P					X	X	X	X	X	
BH204/0.1	34	21/01/21	S	P					X	X				
BH204/0.5	35	21/01/21	S	P					X	X				
BH204/1.0	36	21/01/21	S	P					X	X				
BH204/1.5	37	21/01/21	S	P					X	X				
BH204/2.0	38	21/01/21	S	P					X	X	X	X		
BH205/0.1	39	21/01/21	S	P					X	X				
BH205/0.5	40	21/01/21	S	P					X	X	X	X		
BH205/1.0	41	21/01/21	S	P					X	X				
BH205/1.5	42	21/01/21	S	P					X	X				
BH205/2.0	43	21/01/21	S	P					X	X				
BH206/0.1	44	22/01/21	S	P					X	X	X	X	X	
BH206/0.5	45	22/01/21	S	P					X	X				
PQL (S) mg/kg														**ANZECC PQLs req'd for all water analytes** ☐

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Lab Report/Reference No: 260350

Metals to Analyse: 8HM unless specified here:

Total number of samples in container: **Relinquished by:** TG **Transported to laboratory by:** Bonded Courier

Send Results to: Douglas Partners Pty Ltd **Address** **Phone:** **Fax:**

Signed: **Received by:** Soon Day JBH GUS SHO **Date & Time:** 27/1/21 1425

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CHAIN OF CUSTODY DESPATCH SHEET

Project No:	86977.01	**Suburb:**	Toongabbie	**To:**	Envirolab Services
Project Name:	Pendle Hill High School Development	**Order Number**			12 Ashley Street, Chatswood
Project Manager:	Lisa Teng	**Sampler:**	Tom Graham	**Attn:**	Aileen Hie
Emails:	Lisa.Teng@douglaspartners.com.au	Tom.Graham@douglaspartners.com.au		**Phone:**	9910 6200
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☒			**Email:**	ahie@envirolab.com.au
Prior Storage:	☐ Esky ☒ Fridge ☒ Shelved	Do samples contain 'potential' HBM?	Yes ☐ No ☒ (If YES, then handle, transport and store in accordance with FPM HAZID)		

Sample ID	Lab ID	Sampling Date	Sample Type (S - soil W - water)	Container Type (G - glass P - plastic)	Analytes: Combo 8a	Combo 3	Asbestos 500mL	BTEX	Texture / Salinity	pH	Chloride	Sulphate	Sodicity / Dispersibility	Notes/preservation
BH206/1.0	46	22/01/21	S	P					X	X	X	X	X	
BH206/1.5	47	22/01/21	S	P					X	X				
BH206/2.0	48	22/01/21	S	P					X	X	X	X		
BH207/0.1	49	22/01/21	S	P					X	X				
BH207/0.5	50	22/01/21	S	P					X	X				
BH207/1.0	51	22/01/21	S	P					X	X				
BH207/1.5	52	22/01/21	S	P					X	X	X	X		
BH207/2.0	53	22/01/21	S	P					X	X				
BH208/0.1	54	21/01/21	S	P					X	X				
BH208/0.6	55	21/01/21	S	P					X	X	X	X	X	
BH208/1.0	56	21/01/21	S	P					X	X				
BH208/1.5	57	21/01/21	S	P					X	X				
BH208/2.0	58	21/01/21	S	P					X	X	X	X		
BH208/2.5	59	21/01/21	S	P					X	X				
BH208/3.0	60	21/01/21	S	P					X	X				
PQL (S) mg/kg													**ANZECC PQLs req'd for all water analytes** ☐	

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Metals to Analyse: 8HM unless specified here:

Lab Report/Reference No: 260350

Total number of samples in container:	**Relinquished by:** TG	**Transported to laboratory by:**	Bonded Courier
Send Results to: Douglas Partners Pty Ltd	**Address**	**Phone:**	**Fax:**
Signed:	**Received by:** Jessy Dy	**Date & Time:** 27/1/21	1425

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CHAIN OF CUSTODY DESPATCH SHEET

Project No:	86977.01	**Suburb:**	Toongabbie	**To:**	Envirolab Services
Project Name:	Pendle Hill High School Development	**Order Number**			12 Ashley Street, Chatswood
Project Manager:	Lisa Teng	**Sampler:**	Tom Graham	**Attn:**	Aileen Hie
Emails:	Lisa.Teng@douglaspartners.com.au	Tom.Graham@douglaspartners.com.au		**Phone:**	9910 6200
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☒			**Email:**	ahie@envirolab.com.au
Prior Storage:	☐ Esky ☒ Fridge ☒ Shelved	Do samples contain 'potential' HBM? Yes ☐ No ☒ (If YES, then handle, transport and store in accordance with FPM HAZID)			

Sample ID	Lab ID	Sampling Date	Sample Type (S - soil, W - water)	Container Type (G - glass, P - plastic)	Analytes: Combo 8a	Combo 3	Asbestos 500mL	BTEX	Texture / Salinity	pH	Chloride	Sulphate	Sodicity / Dispersibility	Notes/preservation
BH209/0.1	61	22/01/21	S	P					X	X				
BH209/0.5	62	22/01/21	S	P					X	X				
BH209/1.0	63	22/01/21	S	P					X	X	X	X		
BH209/1.5	64	22/01/21	S	P					X	X				
BH209/2.0	65	22/01/21	S	P					X	X				
BH209/2.5	66	22/01/21	S	P					X	X	X	X	X	
BD1/20210121	67		S	G		X								
Trip Spike	68		S	G				X						
Trip Blank	69		S	G				X						
PQL (S) mg/kg														**ANZECC PQLs req'd for all water analytes** ☐

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Metals to Analyse: 8HM unless specified here:

Lab Report/Reference No: 260350

Total number of samples in container: **Relinquished by:** TG **Transported to laboratory by:** Bonded Courier

Send Results to: Douglas Partners Pty Ltd **Address** **Phone:** **Fax:**

Signed: **Received by:** Jason Day SMF EOS SMO **Date & Time:** 27/1/21 1425

7.4°C

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	Douglas Partners Pty Ltd
Attention	Lisa Teng

Sample Login Details

Your reference	86977.01
Envirolab Reference	260350
Date Sample Received	27/01/2021
Date Instructions Received	27/01/2021
Date Results Expected to be Reported	03/02/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	69 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	7.4
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 Pesticides in soil	Organophosphorus Pesticides in Soil	PCBsin Soil	Acid Extractable metalsin soil	Misc Soil - Inorg	Asbestos ID - soils	Asbestos ID - soils NEPM	Misc Inorg - Soil	Texture and Salinity*	ESP/CEC
BH109N/0.05-0.5											✓	✓	
BH109N/0.5-1.0	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	
BH109N/1.0-1.5	✓	✓	✓				✓			✓	✓	✓	
BH109N/0.05-1.0										✓			
BH109E/0.05-0.5	✓	✓	✓				✓				✓	✓	
BH109E/0.5-1.0	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	
BH109E/1.0-1.5	✓	✓	✓				✓			✓	✓	✓	
BH109E/0.05-1.0										✓			
BH109S/0.05-0.5	✓	✓	✓				✓				✓	✓	
BH109S/0.5-1.0	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	
BH109S/1.0-1.5	✓	✓	✓				✓			✓	✓	✓	
BH109S/0.05-1.0										✓			
BH109W/0.05-0.5	✓	✓	✓				✓				✓	✓	
BH109W/0.5-1.0	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	
BH109W/1.0-1.5	✓	✓	✓				✓			✓	✓	✓	
BH109W/0.05-1.0										✓			
BH201/0.1											✓	✓	
BH201/0.5											✓	✓	
BH201/1.0											✓	✓	
BH201/1.5											✓	✓	
BH202/0.1											✓	✓	
BH202/0.5											✓	✓	
BH202/1.0											✓	✓	✓
BH202/1.5											✓	✓	
BH202/2.0											✓	✓	
BH202/2.5											✓	✓	✓
BH203/0.1											✓	✓	
BH203/0.5											✓	✓	
BH203/1.0											✓	✓	
BH203/1.5											✓	✓	
BH203/2.0											✓	✓	
BH203/2.5											✓	✓	

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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBsin Soil	Acid Extractable metalsin soil	Misc Soil - Inorg	Asbestos ID - soils	Asbestos ID - soils NEPM	Misc Inorg - Soil	Texture and Salinity*	ESP/CEC
BH203/3.0											✓	✓	✓
BH204/0.1											✓	✓	
BH204/0.5											✓	✓	
BH204/1.0											✓	✓	
BH204/1.5											✓	✓	
BH204/2.0											✓	✓	
BH205/0.1											✓	✓	
BH205/0.5											✓	✓	
BH205/1.0											✓	✓	
BH205/1.5											✓	✓	
BH205/2.0											✓	✓	
BH206/0.1											✓	✓	✓
BH206/0.5											✓	✓	
BH206/1.0											✓	✓	✓
BH206/1.5											✓	✓	
BH206/2.0											✓	✓	
BH207/0.1											✓	✓	
BH207/0.5											✓	✓	
BH207/1.0											✓	✓	
BH207/1.5											✓	✓	
BH207/2.0											✓	✓	
BH208/0.1											✓	✓	
BH208/0.6											✓	✓	✓
BH208/1.0											✓	✓	
BH208/1.5											✓	✓	
BH208/2.0											✓	✓	
BH208/2.5											✓	✓	
BH208/3.0											✓	✓	
BH209/0.1											✓	✓	
BH209/0.5											✓	✓	
BH209/1.0											✓	✓	
BH209/1.5											✓	✓	

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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBsin Soil	Acid Extractable metalsin soil	Misc Soil - Inorg	Asbestos ID - soils	Asbestos ID - soils NEPM	Misc Inorg - Soil	Texture and Salinity*	ESP/CEC
BH209/2.0											✓	✓	
BH209/2.5											✓	✓	✓
BD1/20210121	✓	✓	✓				✓						
Trip Spike	✓												
Trip Blank	✓												

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.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.