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Report on
Preliminary Waste Classification

Proposed Residential Development
Ivanhoe Estate, Macquarie Park

Prepared for
Fraser Property Ivanhoe Pty Ltd

Project 86043.01.R.004
December 2017

Douglas Partners
Geotechnics / Environment / Groundwater

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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	D. Walker	20 December 2017
Reviewer	pp: J. Beamer	20 December 2017

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
96 Hermitage Road
West Ryde NSW 2114
PO Box 472
West Ryde NSW 1685
Phone (02) 9809 0666
Fax (02) 9809 4095

bsi. ISO 9001 Quality Management

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Report on Preliminary Waste Classification
Proposed Residential Development
Ivanhoe Estate, Macquarie Park

1. Introduction

This report presents the results of a preliminary waste classification undertaken for the proposed residential development known as Ivanhoe Estate at Macquarie Park. The investigation was commissioned by Fraser Property Ivanhoe Pty Ltd under the Consultancy Services Deed for Ivanhoe Estate dated 15 November 2017.

It is understood that the development of the site will include the demolition of existing structures followed by the construction of new high rise buildings, largely for residential purposes. Basements of four to six levels are proposed to provide parking, together with the construction of a new bridge across Shrimptons Creek and connecting road to Lyonpark Road. Significant excavation is anticipated across the greater site area in order to obtain the proposed site levels and for the basement excavations.

Sampling for the preliminary waste classification was conducted from boreholes positioned for geotechnical investigations which are reported separately by DP (reference numbers 86043.01.R001, 86043.01.R002 and 86043.01.R003). The purpose of the preliminary waste classification, therefore, was to collect waste classification data on the basis that further testing/assessment will need to be undertaken in untested areas of the site during construction.

2. Scope of Works

The scope of works for the preliminary waste classification included:

- A review of relevant reports;
- Collection of soil samples from geotechnical test bores (where possible);
- Analysis of selected samples at a NATA (National Association of Testing Authority) accredited laboratory for the following:
  - metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc);
  - polycyclic aromatic hydrocarbons (PAH);
  - total recoverable hydrocarbons (TRH);
  - benzene, toluene, ethylbenzene and xylene (BTEX);
  - organochlorine pesticides (OCP);
  - organophosphorus pesticides (OPP);
  - polychlorinated biphenyls (PCB);
  - total phenols;
  - asbestos;

- TRH with silica gel clean-up; and
- Toxicity characteristic leaching procedure (TCLP) (for lead and nickel); and

) Preparation of this preliminary waste classification report.

3. Site Description

The Ivanhoe Estate site is located in Macquarie Park near the corner of Epping Road and Herring Road within the Ryde Local Government Area (LGA). The site is approximately 8.2 hectares and currently accommodates 259 social housing dwellings, comprising a mix of townhouse and four storey apartment buildings set around a cul-de-sac street layout. An aerial photo of the site is provided in Figure 1 below.

Figure 1: Ivanhoe Estate site

Immediately to the north of the site are a series of four storey residential apartment buildings. On the north-western boundary, the site fronts Herring Road and a lot which is currently occupied by four former student accommodation buildings and is likely to be subject to redevelopment. Epping Road runs along the south-western boundary of the site and Shrimptons Creek, an area of public open space runs along the south-eastern boundary. Vehicle access to the site is via Herring Road.

The site is comprised of 17 individual lots and part of an 18th lot and are owned and managed by Land and Housing Corporation. The site also incorporates an extension of this land, being a portion of Shrimptons Creek and part of the commercial site at 2-4 Lyonpark Road. The extended land is included to facilitate a bridge crossing and road connection to Lyonpark Road.

Ground levels in the Ivanhoe Estate site slope down from approximately RL 71 towards the Herring Road/Epping Road intersection towards the east and south-east, to RL 42 at Shrimptons Creek, at the south-eastern site boundary.

4. Previous Investigations

Previous field investigations where soil contamination testing was undertaken for the Ivanhoe Estate project were reported in the following which were provided to DP:

- JBS&G Australia Pty Ltd, *Detailed Site Investigation, Ivanhoe Estate, Herring Road, Macquarie Park, NSW,* October 2016 (52047/104956 Rev0) [JBS&G, 2016]; and
- DLA Environmental Services Pty Ltd, *Supplementary Site Investigation, Ivanhoe Estate, Corner Herring Road and Epping Road, Macquarie Road NSW 2113,* June 2017 (DL3953_S006887) [DLA, 2017a]; and
- DLA, *Supplementary Site Investigation, New Property Acquisition – Ivanhoe Estate, 2 Lyon Road, Macquarie Park NSW 2113*, July 2017 (DL3953_S007076) [DP, 2017b].

It is noted that JBS&G (2016) did not include an assessment of results for waste classification.

According to JBS&G (2016), the site has previously been used for market gardens, with a small number of historical structures, up until development of the site for its current land use as government housing. Potential areas of environmental concern (AEC) or potentially contaminating activities were identified as:

- Fill materials of unknown origin observed to be present as a result of the site development activities;
- Hazardous building materials associated with existing / former site structures; and
- Former agricultural / market garden activities.

Potential contaminants (associated with one or more of the above-listed AEC) were listed to include metals, PAH, TRH, BTEX, OCP, OPP, PCB and asbestos.

JBS&G (2016) included sampling using a hand auger at 32 locations (HA01 to HA32) across the Ivanhoe Estate site. Test locations are shown on Figure 4 from JBS&G (2016), Appendix A. Borehole

logs are provided in Appendix C. A summary of analytical results is shown in Table A from JBS&G (2016), Appendix B. Further comments regarding the results are made in Section 11.

DLA (2017a) included sampling from nine locations (BH1 to BH4, BH5/1, BH5/2, BH6 to BH9) at the northern and central parts of the Ivanhoe Estate site. Test locations are shown on Figure 2 from DLA (2017a), Appendix A. Borehole logs (dated 24 May 2017) are provided in Appendix C. A summary of analytical results is shown in Table 1 and Table 2 from DLA (2017a), Appendix B. DLA assessed the results and stated that both the topsoil and underlying reworked natural material are classified as General Solid Waste (non-putrescible), although a more detailed assessment of fill material would be required to more thoroughly classify the material to facilitate appropriate off-site disposal.

DLA (2017b) included sampling from six locations (BH1 to BH6) at the proposed road reserve at Lyon Park Road. Test locations are shown on Figure 2 from DLA (2017b), Appendix A. Borehole logs (dated 27 June 2017) are provided in Appendix C. A summary of analytical results is shown in Table 1 and Table 2 (titled *New Property Acquisition*), from DLA (2017b), Appendix B. DLA assessed the results and stated that the data indicates that fill material is classified as General Solid Waste (non-putrescible), although a more detailed assessment of fill material would be required to more thoroughly classify the material to facilitate appropriate off-site disposal.

5. Geology and Acid Sulfate Soils

Reference to the Sydney Geology Series Sheet suggests that the site is underlain by Ashfield Shale (typically comprising shale and laminite) at more elevated parts of the site and by Hawkesbury Sandstone in the lower parts of the site (typically comprising medium to coarse grained sandstone with very minor shale and laminite lenses).

According to Acid Sulfate Soil Risk Mapping Data supplied by the NSW Department of Environment and Climate Change (1994-1998), the site is in an area of no known risk of Acid Sulfate Soils.

6. Field Work Methodology

Samples were collected from test bores that were drilled for geotechnical purposes (except at Borehole 36 where shallow refusal was encountered). Drawing 1, Appendix A, shows the location of boreholes (1 to 13, 31 to 47 and LP1). Various machinery and equipment was used to drill the boreholes including:

- A truck-mounted drilling rig at Boreholes 1 to 5, 7 to 13, 34, 38, 41 and LP1;
- A bobcat-mounted drilling rig at Boreholes 6 and 44;
- An excavator with auger attachment at Boreholes 31 to 33, 35, 37, 39, 40, 42, 43 ,45 to 47; and
- A hand auger at Borehole 36 (where there was considered to be an elevated risk of buried services).

Boreholes 1 to 13 and LP1 were drilled using a combination of the solid flight auger attachment and NMLC-coring (of rock). Boreholes 34, 38, 41, 44 were drilled using a solid flight auger attachment (only).

Samples for contamination testing were collected by a geotechnical engineer with reference to standard operating procedures outlined in the DP *Field Procedures Manual*. The general sampling procedure comprised:

- Collection of representative soil samples directly from the auger at regular depth intervals;
- The use of disposable gloves for each sampling event;
- Transfer of samples into laboratory-prepared glass jars, capping immediately, minimising the headspace within the sample jar;
- Labelling of sample containers with individual and unique identification, including project number, sample location and sample depth; and
- Placing the glass jars into a cooled, insulated and sealed container for transport to the laboratory; and
- Use of chain of custody documentation ensuring that sample tracking and custody could be cross-checked at any point in the transfer of samples from the field to the laboratory.

7. Field Work Observations

The borehole logs are provided in Appendix A and should be referenced for detailed soil descriptions at each sample location.

Filling (including topsoil) was encountered to various depths of up to 2.1 m bgl and comprised various filling materials included silty sand, sand, silty clay, clay, sandy clay, clayey sand, gravel, sandy gravelly clay and gravelly sand. Filling was typically brown in colour but also orange-brown, grey and red-brown. No obvious signs of contamination (e.g. odours or possible asbestos containing materials) were noted in the samples; however, anthropogenic materials were noted in the filling at some locations including:

- A trace of slag at Borehole 3, depth 0-0.3 m;
- A trace of brick fragments at Borehole 3, depth 1.35 to 2.1 m;
- A trace of brick at Borehole 4, depth 0 – 0.2 m;
- Concrete fragments at Borehole 8, depth 0 - 0.7 m;
- A trace of slag at Borehole 9, depth 0.05 - 0.16 m;
- A trace of concrete fragments at Borehole 10, depth 0 - 0.2 m;
- Metal and plastic wire at Borehole 12, depth 0.4-0.5 m;
- A trace of brick fragments at Borehole 31, depth 0 – 0.1 m;
- A possible concrete boulder (or service) at Borehole 33, depth 1.2 m where the bore was discontinued;
- A concrete boulder at Borehole 37, depth 0.8 m where the bore was discontinued;

- A plastic sheet and a concrete boulder at Borehole 45 at depths of 0.2 m; and
- A pen and brick at Borehole 46, at depths of 0.1 m and 0.2 m, respectively.

Although asbestos containing materials were not observed in the filling, asbestos may be associated with building rubble in filling, such as brick and concrete listed above.

Natural soil was not commonly observed beneath filling (as bedrock directly beneath filling was often encountered). Observed natural soils included:

- Orange-brown clay at Borehole 7, depth 1.3-1.5 m;
- Light orange-brown clay at Borehole 8, depth 0.7 – 1.6 m;
- Dark brown silty sand at Borehole 10, depth 0.6 - 1.0 m, then light brown sandy clay at depth 1 – 2.1 m;
- Grey, orange-brown and red-brown clayey silt and silty clay at Borehole 11, depth 0.7 - 2.8m;
- Brown sandy clay at Borehole 12, depth 1.2 – 2.1 m;
- Yellow brown silty clay at Borehole 13, depth 1.35 – 2.0 m;
- Red-brown mottled brown clay at Borehole LP1, depth 1.3 - 2.2 m; and
- Yellow-brown sandy clay at Borehole 39, depth 0.1 - 0.5 m;
- Brown clay at Borehole 40, depth 1.2-1.5 m;
- Yellow-brown clay at Borehole 41, depth 0.2-0.7 m;
- Light brown clay at Borehole 42, depth 1.3 to 1.7m; and
- Light brown and red-brown clay at Borehole 47, depth 0.8 to 3.1 m (although the soil was logged as possible filling to a depth of 1.3 m).

Observed bedrock (beneath filling or beneath natural soil) included orange-brown, orange and grey, brown shale; orange, yellow, brown, red-brown, grey-brown, grey, yellow-brown, purple-brown, orange-brown, purple-grey sandstone; and laminite.

8. Waste Classification Criteria

EPA (2014) contains a six step procedure for determining the type of waste and the waste classification. Part of the procedure, for materials not classified as special waste or pre-classified waste, is a comparison of analytical data initially against contaminant threshold (CT) values specific to a waste category. Alternatively, the data can be assessed against specific contaminant concentration (SCC) thresholds when used in conjunction with toxicity characteristic leaching procedure (TCLP) thresholds.

The CT, SCC, and TCLP values relevant to this preliminary waste classification are shown on Table B1, Appendix B.

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The POEO Act defines virgin excavated natural material (VENM) as:

'natural material (such as clay, gravel, sand, soil or rock fines):

(a) that has been excavated or quarried from areas that are not contaminated with manufactured chemicals, or with process residues, as a result of industrial, commercial, mining or agricultural activities and

(b) that does not contain any sulfidic ores or soils or any other waste

and includes excavated natural material that meets such criteria for virgin excavated natural material as may be approved for the time being pursuant to an EPA Gazettal notice.'

Additional advice is provided on the EPA web site [http://www.epa.nsw.gov.au/waste/virgin-material.htm] entitled 'Virgin Excavated Natural Material'. This advice states:

- Generators of VENM must assess the past and present activities on the site. The possibility that a previous land use has caused contamination of a site must be considered when assessing whether an excavated material is VENM. Land uses that could result in contaminants being present in an excavated material are listed on the web site. The list is not exhaustive and an excavated material may still be contaminated even where none of these activities have previously occurred on a site. Activities not directly related to a site may also lead to contamination, including diffuse sources of pollution such as contaminated groundwater that migrates under a site, or dust settling out from industrial emissions. Generators of VENM must consider these factors.
- Generators of excavated material should review the applicable Acid Sulfate Soil Risk Maps to determine the probability of acid sulfate soils being present at the site at which VENM excavation is proposed. The waste cannot be classified as VENM if the Acid Sulfate Soil Risk Maps identify a high probability of occurrence of acid sulfate soils or potential acid sulfate soils, unless it has undergone chemical assessment in accordance with the *Acid Sulfate Soils Assessment Guidelines* and the updated *Acid Sulfate Soils Laboratory Method Guidelines Version 2.1* - June 2004.
- By definition, VENM cannot contain any other waste, or be 'made' from processed soils. Excavated material that has been processed in any way cannot be classified as VENM.
- Classification of excavated material as VENM requires certainty that all aspects of the definition are met. Chemical testing may be required to ascertain whether an excavated material is contaminated with manufactured chemicals or process residues, or whether it contains sulfidic ores or soils.

9. Laboratory Analysis

All sample analysis was conducted by Envirolab Services Pty Ltd (a NATA accredited laboratory). Selected samples (primarily filling samples) were subject to laboratory analysis for metals, PAH, TRH, BTEX, PCB, total phenols, OPP, OCP and asbestos. The filling sample from Borehole 32, depth 0.1 m, was analysed for TRH with silica gel clean up (total petroleum hydrocarbons) given that TRH was detected above the laboratory's limit of reporting.

Samples from Borehole 9, depth 0.1 m, and Borehole 41, depth 0-0.1m, were subject to TCLP analysis for nickel given that concentrations of nickel were above the CT1 values. The sample from Borehole 38, depth 0.1 m, was subject TCLP analysis for lead given the concentration of lead was above the CT1 value.

Laboratory certificates with chain of custody are provided in Appendix D. Results are summarised in Table B1, Appendix B.

Based on a review of laboratory QA/QC results, it is considered that the laboratory results are useable for this assessment.

10. Waste Classification

10.1 Filling

The following Table 1 presents the results of the six step procedure outlined in EPA (2014) for determining the type of waste and the waste classification. This process applies to fill (including topsoil) at the site, which do not meet the definition of VENM.

Table 1: Six Step Classification Procedure for Filling

Step	Comments	Rationale
1. Is the waste special waste?	No	No asbestos-containing materials (ACM), clinical or related waste, or waste tyres were observed in the test pits; Asbestos was not detected by the analytical laboratory.
2. Is the waste liquid waste?	No	The fill comprised a soil matrix.
3. Is the waste “pre-classified”?	No	The fill is not pre-classified with reference to EPA (2014).
4. Does the waste possess hazardous waste characteristics?	No	The waste was not observed to contain or considered at risk to contain explosives, gases, flammable solids, oxidising agents, organic peroxides, toxic substances, corrosive substances, coal tar, batteries, lead paint or dangerous goods containers.
5. Determining a wastes classification using chemical assessment	Conducted	Refer to Table B1, Appendix B.
6. Is the waste putrescible?	No	The fill does not contain materials considered to be putrescible [a].

Note: a wastes that are generally not classified as putrescible include soils, timber, garden trimmings, agricultural,forest and crop materials, and natural fibrous organic and vegetative materials (EPA, 2014).

As shown on Table B1, Appendix B, contaminants concentrations for analysed filling samples were within the contaminant thresholds (CT1s) for General Solid Waste (GSW) with the exception of:

- Nickel concentrations in the samples from Borehole 9, depth 0.1 m, and Borehole 41, depth 0 - 0.1 m; and
- The lead concentration in the sample from Borehole 38, depth 0.1 m.

Concentrations for the above samples were within the SCC1 and TCLP1 contaminant thresholds for GSW.

Based on the observations at the time of sampling and the reported analytical results, the filling (including topsoil) as described in the borehole logs, Appendix C, has a preliminary classification of **General Solid Waste (non-putrescible)**, as defined in EPA (2014). It is noted that building rubble (such as brick and concrete) was observed in filling and asbestos contamination can sometimes be associated with building rubble in filling. Asbestos is pre-classified as Special Waste and, therefore, the above preliminary waste classification of General Solid Waste (non-putrescible) does not apply if asbestos is encountered in the filling during excavation.

10.2 Natural Soil

The following Table 2 presents the results of the assessment of natural soils and bedrock at the site with reference to the VENM definition and EPA advice outlined in Section 8.

Table 2: VENM Classification Procedure

Item	Comments	Rationale
1. Is the material natural?	Yes	Natural clay, silty sand, silty clay, sandy clay, clay, shale, sandstone and laminite logged as natural soil in the borehole logs, Appendix C.
2. Is the material impacted by manufactured chemicals or process residues?	Yes	There were no visual indicators of chemical contamination in sampled materials; however, residual OCP was detected in three natural soil samples.
3. Are the materials acid sulphate soils?	No	A review of the Acid Sulfate Soil Risk Map shows the site in an area of no ASS occurrence.
4. Are there current or previous land uses that have (or may have) contaminated the materials?	Yes	The site has previously been used as market gardens where pesticides may have impacted natural soils.

As shown in Table B1, Appendix B concentrations of cadmium, mercury, PAH, TRH and BTEX for analysed natural soil samples were below the laboratory's limit of reporting. Concentrations of arsenic, chromium, copper, lead, nickel and zinc are considered to be at background concentrations (ANZECC, *Australia and New Zealand Guidelines for the Assessment and Management of Contaminated Sites*, 1992). Out of the 16 natural samples analysed, three samples had concentrations of OCP at or above the laboratory's limit of reporting, including from:

- Borehole 10, depth 0.9-1.0 m (DDE 0.4 mg/kg);
- Borehole 47, depth 1 m (Chlordane 0.2 mg/kg, DDE 0.1 mg/kg); and
- Borehole 47, depth 1.5 m (DDE 0.1 mg/kg).

It is noted that the site was previously used as market gardens, and it is considered that the low (residual) concentrations of OCP in natural soil listed above are likely to be a result of the application of pesticides for the previous market gardens. Given the presence of OCP, the natural soil represented by the above listed sample is not VENM; however, results are within the CT1 criteria and, therefore, the natural soil represented by the above listed samples has a preliminary classification of **General Solid Waste (non-putrescible)** as defined in EPA (2014).

Results for natural samples from Boreholes 1, 7, 8, 11, 12, 13, 38, 39, 40, 41, 42 and 44 indicate that the natural soil at these locations may be classified as **VENM**. It is noted, however, that further testing will need to be undertaken during construction to provide a final VENM classification, in particular, to show that OCP impacted soils have been segregated from underlying soil/rock that has not been impacted from contaminants.

If during excavation the natural *in situ* soil is found to contain possible signs of contamination or is cross-contaminated with any non-VENM materials the excavated natural soil cannot be classified as VENM. In this regard, it is also recommended that care should be taken during the bulk excavation of the VENM to prevent cross contamination between the VENM and non-VENM materials.

11. Additional Comments

Only filling samples were analysed for the JBS&G investigation JBS&G (2016) which did not include a waste classification assessment. Based on a review of results from DLA (2016), results were within the CT1 criteria for General Solid Waste, except for:

- The nickel concentration of 58 mg/kg in the sample from HA14, depth 0-0.1 m;
- The benzo(a)pyrene concentration of 2.5 mg/kg in the sample from HA20, depth 0-0.1; and
- The nickel concentration of 48 mg/kg in the sample from HA22, depth 0-0.1 m.

TCLP analysis was not undertaken on these samples, so it cannot be determined if results meet the TCLP1 (and SCC1) criteria for General Solid Waste.

Given the generally low level of contaminants in filling, there may be opportunity to assess filling soils as Excavated Natural Material (ENM), in accordance with *The Excavated Natural Material Order 2014*. The sampling for an ENM assessment may need to be done *ex situ* (from stockpiles) to adequately assess the proportion of foreign materials.

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12. Conclusion

Results of this investigation and previous investigations indicate that filling at the site may be classified as General Solid Waste (non-putrescible), although further assessment and testing will be required to provide final waste classification.

Results indicate that not all natural soil can be classified as VENM given that the presence of OCP was identified in some natural soil samples. Further testing will need to be undertaken during construction to provide a final VENM classification of soil/rock, in particular, to show that OCP impacted natural soils have been segregated from underlying soil/rock that has not been impacted from contaminants.

13. Limitations

Douglas Partners (DP) has prepared this report (or services) for the Ivanhoe Estate project at Macquarie Park in general accordance with DP's proposal dated 18 September 2017. The work was carried out under the Consultancy Services Deed for Ivanhoe Estate dated 15 November 2017. This report is provided for the exclusive use of Fraser Property Ivanhoe Pty Ltd 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.

Asbestos has not been detected by observation or by laboratory analysis, either on the surface of the site, or in filling materials at the test locations sampled and analysed. Building demolition materials,

such as concrete and brick, were, however, located in below-ground filling and these are considered as indicative of the possible presence of hazardous building materials (HBM), including asbestos.

Although the sampling plan adopted for this investigation is considered appropriate to achieve the stated project objectives, there are necessarily parts of the site that have not been sampled and analysed. This is either due to undetected variations in ground conditions or to budget constraints (as discussed above), or to parts of the site being inaccessible and not available for inspection/sampling, or to vegetation preventing visual inspection and reasonable access. It is therefore considered possible that HBM, including asbestos, may be present in unobserved or untested parts of the site, between and beyond sampling locations, and hence no warranty can be given that asbestos is not present.

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 (geotechnical / environmental / groundwater) components set out in this report and to their application by the project designers to project design, construction, maintenance and demolition.

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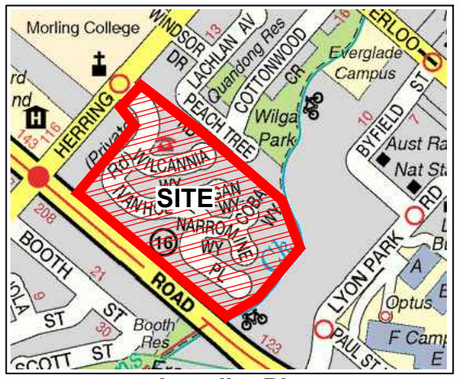
Appendix A

Drawings



Locality Plan

NOTE:
1: Base image from Nearmap.com (Dated 19.10.2017)
2: Test locations are approximate only and are shown with reference to existing features.

LEGEND

- Cored bore location
- Shallow bore location
- Site boundary
- Area to facilitate road extension to Lyonpark Road

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CLIENT: Frasers Property Ivanhoe		TITLE: **Test Location Plan**	PROJECT No: 86043.01
OFFICE: Sydney	DRAWN BY: PSCH	**Proposed Residential Development**	DRAWING No: 1
SCALE: 1:2000 @ A3	DATE: 29.11.2017	**Ivanhoe Estate, MACQUARIE PARK**	REVISION: A

DLA Environmental Services
A Pacific Environment company

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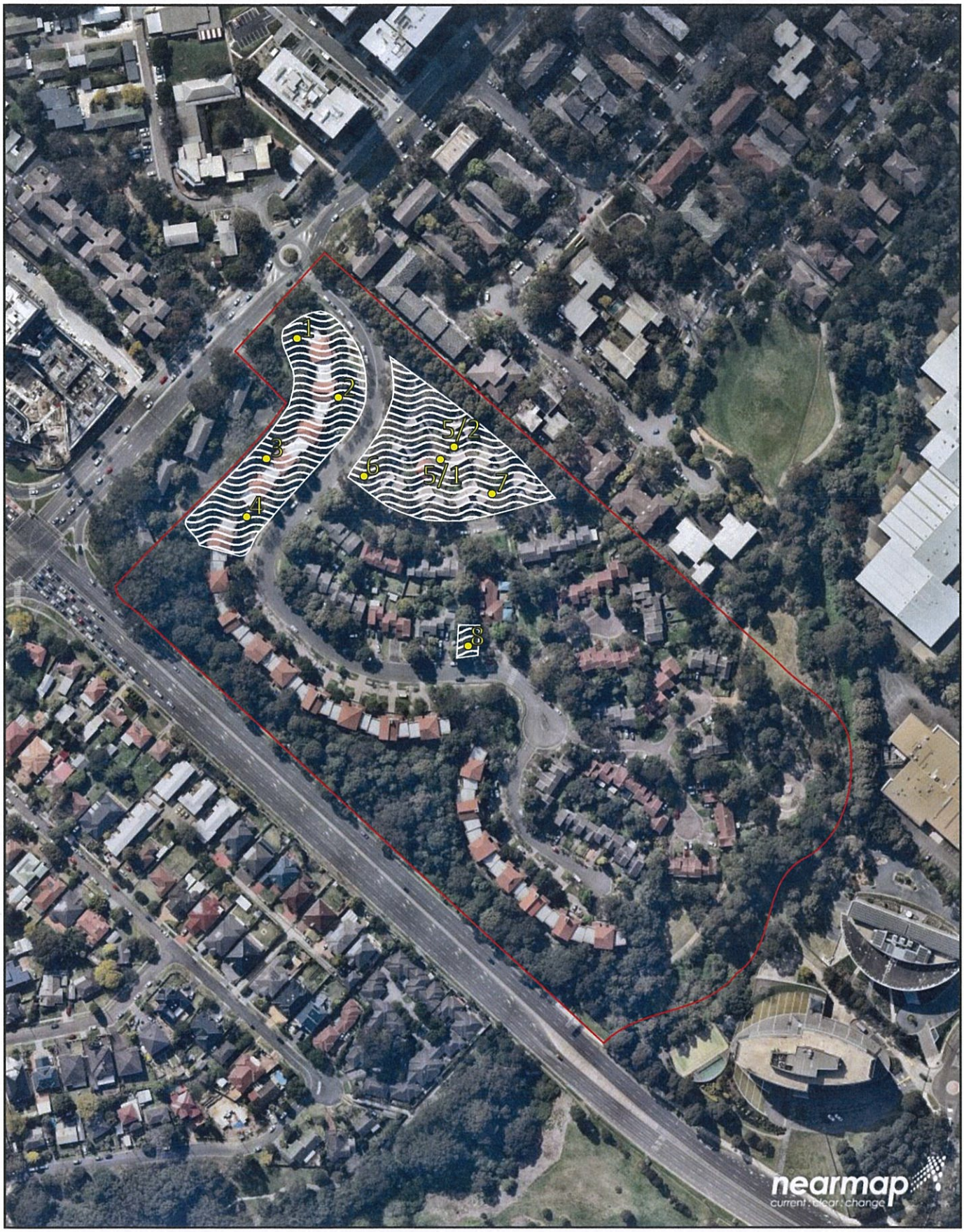

Legend

- Site Boundary
- Sample Locations (approximate)
- Altered Topography Areas

N

Approximate Scale

0m 75m 130m

Figure Title				
Additional Investigation Locations				
Project Title		Client		
Ivanhoe Estate, Macquarie Park		Frasers Property Australia		
Project No.	Date	Scale	Figure No.	Revision
DL 3953	6/6/2017	As Shown	2	Version 1.0

Legend:

- Approximate Site Boundary
- Areas of Environmental Concern
- Sample Location

JBS&G

Job No: 52047	
Client: NSW Land & Housing Corporation	
Version: R01 Rev A	Date: 13-Oct-2016
Drawn By: SE	Checked By: LB

Scale 1:2,500

0 25 50
metres

Coor. Sys. GDA 1994 MGA Zone 56

Ivanhoe Estate,
Located Off Herring Road,
Macquarie Park, NSW

AREAS OF ENVIRONMENTAL CONCERN AND SAMPLE LOCATIONS

FIGURE 4:

File Name: 52047_04
Reference: http://maps.au.nearmap.com/, imagery 19/01/2016, accessed 06/04/2016

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Compiled
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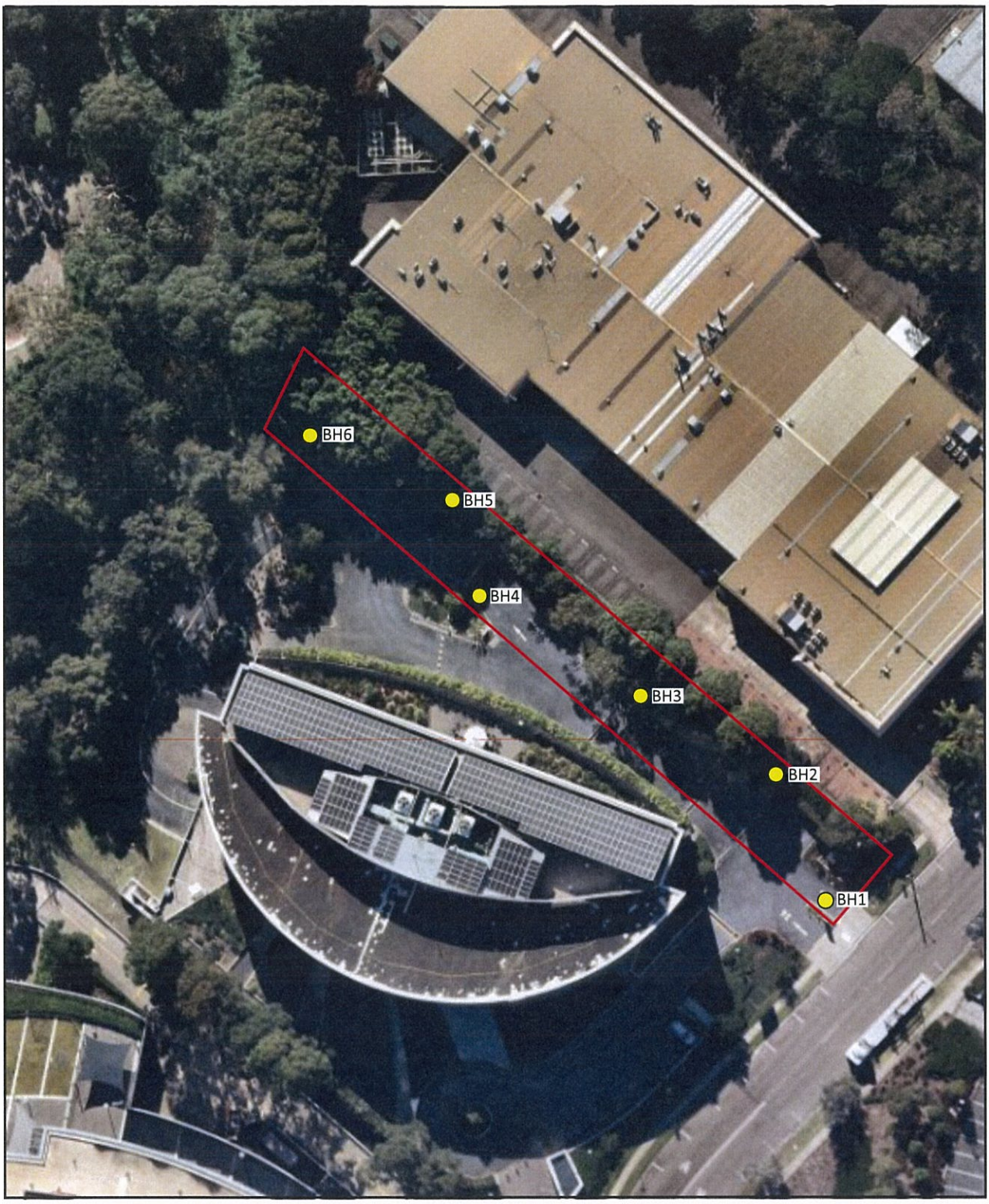

Legend

- Approximate Site Boundary
- Sample Locations (approximate)

N

Approximate Scale

0m 7.5m 15m

Figure Title: Site Layout and Sample Locations				
Project Title: New Property Acquisition Ivanhoe Estate, Macquarie Park		Client: Frasers Property Australia		
Project No. DL3953	Date 10/7/2017	Scale As Shown	Figure No. 2	Revision Version 1.0

Appendix B

Analytical Results Summary Tables

Table B1: Summary of Results of Analytical Results

Sample Location	Sample Depth (m)	Soil Type	Metals										Polycyclic Aromatic Hydrocarbons (PAH)		Total Recoverable Hydrocarbons (TRH)		TRH with Silica Gel Clean-up	Monocyclic Aromatic Hydrocarbons (BTEX)				Asbestos	Total Polychlorinated Biphenyls (PCB)	Total Phenolics	Organophosphorus Pesticides (OPP)	Organochlorine Pesticides (OCP)	
			Arsenic	Cadmium	Chromium (III + VI)	Copper	Lead	Lead in TCLP	Mercury	Nickel	Nickel in TCLP	Zinc	Benzo(a)pyrene	Total PAH	C6-C9	C10-C36	C10-C36	Benzene	Toluene	Ethylbenzene	Total Xylene					Endosulfan	Total
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)		(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
BH01	0.35	Filling	8	<0.4	24	18	24	-	<0.1	13	-	25	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	NAD	<0.1	<5	<PQL	<PQL	<PQL
BH01	1	Natural	12	<0.4	22	15	23	-	<0.1	2	-	8	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	-	-	-	-	<PQL	<PQL
BH02	0.5	Filling	7	<0.4	13	15	23	-	<0.1	3	-	17	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	NAD	<0.1	<5	<PQL	<PQL	<PQL
BH03	0.1	Filling	5	<0.4	54	16	11	-	<0.1	37	-	25	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	NAD	<0.1	<5	<PQL	<PQL	<PQL
BH03	1	Filling	7	<0.4	22	14	17	-	<0.1	9	-	18	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	-	-	-	-	<PQL	<PQL
BH03	1.5	Filling	5	<0.4	19	8	10	-	<0.1	12	-	11	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	-	-	-	-	<PQL	<PQL
BH04	0-0.1	Filling	<4	<0.4	10	7	14	-	<0.1	14	-	24	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	NAD	<0.1	<5	<PQL	<PQL	<PQL
BH05	0.1	Filling	<4	<0.4	12	10	8	-	<0.1	3	-	14	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	-	-	-	-	<PQL	<PQL
BH05	1	Filling	<4	<0.4	17	3	8	-	<0.1	2	-	6	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	NAD	<0.1	<5	<PQL	<PQL	<PQL
BH06	0.4-0.5	Filling	6	<0.4	26	10	19	-	<0.1	5	-	16	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	NAD	<0.1	<5	<PQL	<PQL	<PQL
BH06	1.4-1.5	Filling	6	<0.4	23	6	13	-	<0.1	2	-	8	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	-	-	-	-	<PQL	<PQL
BH07	0.4-0.5	Filling	<4	<0.4	12	6	29	-	<0.1	5	-	22	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	NAD	<0.1	<5	<PQL	<PQL	<PQL
BH07	0.9-1.0	Natural	8	<0.4	30	6	14	-	<0.1	12	-	6	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	-	-	-	-	<PQL	<PQL
BH08	0.1	Filling	<4	<0.4	13	15	14	-	<0.1	15	-	65	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	NAD	<0.1	<5	<PQL	<PQL	<PQL
BH08	0.4-0.5	Filling	4	<0.4	14	6	16	-	<0.1	2	-	13	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	NAD	-	-	-	<PQL	<PQL
BH08	0.9-1.0	Natural	4	<0.4	17	2	9	-	<0.1	2	-	3	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	-	-	-	-	<PQL	<PQL
BH09	0.1	Filling	<4	<0.4	9	70	2	-	<0.1	**120**	0.2	42	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	NAD	<0.1	<5	<PQL	<PQL	<PQL
BH09	1	Filling	<4	<0.4	29	1	8	-	<0.1	3	-	3	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	-	-	-	-	<PQL	<PQL
BH10	0.5	Filling	5	<0.4	17	14	18	-	<0.1	11	-	16	<0.05	0.3	<25	<PQL	-	<0.2	<0.5	<1	<1	NAD	<0.1	<5	<PQL	<PQL	<PQL
BH10	0.9-1.0	Natural	<4	<0.4	6	5	6	-	<0.1	1	-	8	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	-	-	-	-	<PQL	0.4
BH11	0.5	Filling	<4	<0.4	30	10	13	-	<0.1	13	-	13	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	NAD	<0.1	<5	<PQL	<PQL	<PQL
BH11	1	Natural	<4	<0.4	17	9	17	-	<0.1	3	-	10	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	-	-	-	-	<PQL	<PQL
BH12	0.5	Filling	4	<0.4	19	12	42	-	<0.1	6	-	41	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	NAD	<0.1	<5	<PQL	<PQL	0.3
BH12	1.5	Natural	<4	<0.4	18	4	10	-	<0.1	3	-	9	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	-	-	-	-	<PQL	<PQL
BH13	0.15	Filling	7	<0.4	13	11	15	-	<0.1	6	-	25	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	NAD	<0.1	<5	<PQL	<PQL	<PQL
BH13	1.6	Natural	<4	<0.4	25	1	8	-	<0.1	1	-	6	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	-	-	-	-	<PQL	<PQL
BH31	0.1	Filling	<4	<0.4	13	10	20	-	<0.1	6	-	29	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	NAD	<0.1	<5	<PQL	<PQL	<PQL
BH31	0.5	Filling	<4	<0.4	10	4	13	-	<0.1	2	-	8	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	-	-	-	-	<PQL	<PQL
BH32	0.1	Filling	<4	<0.4	7	16	17	-	<0.1	15	-	65	<0.05	<0.05	<25	380	<250	<0.2	<0.5	<1	<1	NAD	<0.1	9	<PQL	<PQL	<PQL
BH33	0.1	Filling	<4	<0.4	13	7	10	-	<0.1	10	-	31	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	NAD	<0.1	<5	<PQL	<PQL	<PQL
BH34	0.1-0.2	Filling	6	<0.4	23	10	5	-	<0.1	27	-	26	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	NAD	<0.1	<5	<PQL	<PQL	<PQL
BH35	0.1	Filling	<4	<0.4	8	6	7	-	<0.1	8	-	26	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	-	-	-	-	<PQL	<PQL
BH35	0.5	Filling	5	<0.4	26	5	7	-	<0.1	11	-	7	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	NAD	<0.1	<5	<PQL	<PQL	<PQL
BH37	0.1	Filling	<4	<0.4	11	8	19	-	<0.1	4	-	26	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	NAD	<0.1	<5	<PQL	<PQL	<PQL
BH38	0.1	Filling	5	<0.4	14	46	**200**	<0.03	<0.1	22	-	89	0.2	1.6	<25	<PQL	-	<0.2	<0.5	<1	<1	NAD	<0.1	<5	<PQL	<PQL	<PQL
BH38	0.5	Natural	5	<0.4	21	4	12	-	<0.1	2	-	3	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	-	-	-	-	<PQL	<PQL
BH39	0.1	Filling	<4	<0.4	14	10	15	-	<0.1	14	-	44	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	NAD	<0.1	<5	<PQL	<PQL	<PQL
BH39	0.4	Natural	<4	<0.4	10	1	5	-	<0.1	3	-	4	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	-	-	-	-	<PQL	<PQL
BH40	0.1	Filling	<4	<0.4	12	8	14	-	<0.1	3	-	19	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	NAD	<0.1	<5	<PQL	<PQL	<PQL
BH40	1.2	Natural	8	<0.4	48	<1	13	-	<0.1	2	-	2	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	-	-	-	-	<PQL	<PQL
BH41	0-0.1	Filling	<4	<0.4	66	16	9	-	<0.1	**44**	<0.02	32	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	NAD	<0.1	<5	<PQL	<PQL	<PQL
BH41	0.4-0.5	Natural	6	<0.4	27	<1	7	-	<0.1	1	-	3	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	-	-	-	-	<PQL	<PQL
BH42	0.4-0.5	Filling	<4	<0.4	7	3	6	-	<0.1	4	-	5	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	NAD	<0.1	<5	<PQL	<PQL	<PQL
BH42	1.4-1.5	Natural	4	<0.4	29	3	7	-	<0.1	2	-	9	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	-	-	-	-	<PQL	<PQL
BH43	0.1	Filling	<4	<0.4	29	17	21	-	<0.1	22	-	66	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	NAD	<0.1	<5	<PQL	<PQL	<PQL
BH44	0.4-0.5	Filling	<4	<0.4	18	2	7	-	<0.1	1	-	4	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	NAD	<0.1	<5	<PQL	<PQL	<PQL
BH44	0.9-1.0	Natural	4	<0.4	23	5	10	-	<0.1	2	-	8	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	-	-	-	-	<PQL	<PQL
BH45	0.1	Filling	<4	<0.4	9	31	19	-	<0.1	9	-	52	<0.05	<0.05	<25	<PQL		<0.2	<0.5	<1	<1	NAD	<0.1	<5	<PQL	<PQL	<PQL
BH46	0.3	Filling	<4	<0.4	12	4	11	-	<0.1	5	-	13	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	NAD	<0.1	<5	<PQL	<PQL	<PQL
BH47	0.5	Filling	<4	<0.4	12	8	14	-	<0.1	6	-	17	<0.05	0.2	<25	<PQL	-	<0.2	<0.5	<1	<1	NAD	<0.1	<5	<PQL	<PQL	<PQL
BH47	1	Natural (possible filling)	<4	<0.4	12	8	13	-	<0.1	5	-	18	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	-	-	-	-	<PQL	0.3
BH47	1.5	Natural	<4	<0.4	12	8	14	-	<0.1	5	-	16	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	-	-	-	-	<PQL	0.1
LP1	0.1	Filling	14	<0.4	20	10	20	-	<0.1	4	-	23	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	NAD	<0.1	<5	<PQL	<PQL	<PQL
LP1	0.5	Filling	6	<0.4	19	8	21	-	<0.1	4	-	25	<0.05	<0.05	<25	<PQL	-	<0.2	<0.5	<1	<1	-	-	-	-	<PQL	<PQL
General Solid Waste Criteria (without TCLP)																											
CT1			100	20	100 for Cr(IV)	-	100	-	4	40	-	-	0.8	200	10000	40000	40000	10	288	600	1000	-	<50	40 for 2,4,6-Trichlorophenol	250**	60	<50*
General Solid Waste Criteria (with TCLP)																											
SCC1			-	-	-	-	-	5	-	-	2	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-
TCLP1			-	-	-	-	1500	-	-	1050	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-

Notes

CT	Contaminant Threshold
SCC	Specific Contaminant Concentration
TCLP	Toxicity Characteristics Leaching Procedure
NAD	No asbestos detected at reporting limit of 0.1g/kg
PQL	Practical Quantification Limit
*	Value for moderately harmful pesticides
**	Value for scheduled chemicals
-	Not Applicable / Not Defined / Not analysed

Table A: Soil Analytical Data
Project Number: 52047
Project Name: Ivanhoe DSI

JBS&G

				Metals & Metalloids									TPHs (NEPC 1999)					TRHs (NEPC 2013)						TRHs (Silica-Gel)			BTEX						Polycyclic Aromatic Hydrocarbons																							
				Arsenic (Total)	Cadmium	Chromium (Total)	Copper	Iron	Lead	Mercury (Inorganic)	Nickel	Zinc	G6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Total)	>C10-C16 Fraction	>C16-C34 Fraction	>C34-C40 Fraction	G6-C10 Fraction	G6 - C10 less BTEX (F1)	>C10 - C16 less Naphthalene (F2)	>C10-C16 Fraction (SG)	>C16-C34 Fraction (SG)	>C34-C40 Fraction (SG)	Benzene	Ethylbenzene	Toluene	Xylene (m & p)	Xylene (o)	Xylene (Total)	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(a)pyrene TEQ (lower bound)*	Benzo(a)pyrene TEQ (medium bound)*	Benzo(a)pyrene TEQ (upper bound)*	Benzo(b,j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzo(b,j+k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Carcinogenic PAHs as B(a)P TEQ	Phenanthrene	Pyrene	PAHs (Total)	Total Positive PAHs
				mg/kg	mg/kg	mg/kg

Table A: Soil Analytical Data
Project Number: 52047
Project Name: Ivanhoe DSI

JBS&G

				Polychlorinated Biphenyls								Organochlorine Pesticides																										Herbicides & Fungicides												Ecological Parameters				
				Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	PCBs (Total)	4,4-DDE	Aldrin	Aldrin + Dieldrin (Sum of Total)	Dieldrin	DDD	alpha-BHC	DDT	DDT+DDE+DDD (Sum of Total)	beta-BHC	alpha-Chlordane	Chlordane	delta-BHC	gamma-Chlordane	Endosulfan alpha	Endosulfan beta	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Lindane	Methoxychlor	Toxaphene	2,4,5-T	2,4-D	2,4-DB	Actril (Ioxynil)	Dicamba	Dichloroprop	Dinitro-o-cresol	Dinoseb	Fenoprop	MCPA	MCPB	Mecoprop	% Moisture 103oC	Cation Exchange Capacity	pH 1:5 soil:water	Total Organic Carbon	Conductivity (1:5 aqueous extract at 25°C)
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	meq/100g	pH Units	%	uS/cm
EQL				0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.50	0.05	0.05		0.05	0.05	0.05	0.05		0.05		0.10	0.05		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.10	1.00	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	1.00	0.05	0.10	0.10	10.00
NEPM 2013 EIL - Urban Residential (site specific)																		180																																					
NEPM 2013 EIL - Commercial and Industrial (site specific)																		640																																					
NEPM 2013 ESL Urban Residential and Public Open Space, Coarse Soil																																																							
NEPM 2013 ESL Commercial and Insustrial, Coarse Soil																																																							
NEPM 2013 Soil HIL A											1[#1]			6					240			50						10			6		10		300	20	600	900								600	600	600					
NEPM 2013 Soil HIL B											1[#1]			10					600			90						20			10		15		500	10	900	1600								900	900	900					
NEPM 2013 Soil HIL C											1[#1]			10					400			70						20			10		10		400	30	800	1300								800	800	800					
NEPM 2013 Soil HIL D											7[#1]			45					3600			530						100			50		80		2500	160	5000	9000								5000	5000	5000					
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Sand 0 to <1m																																																							
NEPM 2013 Soil HSL C for Vapour Intrusion - Sand 0 to <1m																																																							
Field ID	Depth (m)	Date	Lab Report #																																																					
HA01 0.0-0.1	0.0-0.1	6/09/2016	514702	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#1]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	13	-	-	-	-
HA01 0.3-0.4	0.3-0.4	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.2	-	-	-	-
HA02 0.0-0.05	0.0-0.05	6/09/2016	514702	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#1]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	-	-	-	-	-	-	-	-	-	39	-	-	-	-
HA02 0.2-0.3	0.2-0.3	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17	-	-	-	-
HA03 0.0-0.1	0.0-0.1	6/09/2016	514702	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#1]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	-	-	-	-	-	-	-	-	-	17 - 24	12	5.6	2.5	39
QC20160906-01	0.0-0.1	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	11	6.3	2.3	38
QC20160906-01A	0.0-0.1	6/09/2016	152979	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.2[#1]	<0.1	<0.1	<0.1	<0.1	<0.3[#1]	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	19	-	-	-	-
HA04 0.0-0.1	0.0-0.1	6/09/2016	514702	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#1]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	12	-	-	-	-
HA04 0.2-0.3	0.2-0.3	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.3	-	-	-	-
HA05 0.3-0.4	0.3-0.4	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA06 0.0-0.1	0.0-0.1	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.4	-	-	-	-
HA07 0.0-0.1	0.0-0.1	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.1	-	-	-	-
HA07 0.2-0.3	0.2-0.3	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA08 0.0-0.1	0.0-0.1	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-
HA09 0.0-0.1	0.0-0.1	6/09/2016	514702	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#1]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	-	-	-	-	-	-	-	-	-	9.7	-	-	-	-
HA10 0.0-0.1	0.0-0.1	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22	-	-	-	-
HA10 0.2-0.3	0.2-0.3	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	-	-	-	-
HA11 0.0-0.1	0.0-0.1	6/09/2016	514702	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#1]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	-	-	-	-	-	-	-	-	-	21	-	-	-	-
HA11 0.3-0.4	0.3-0.4	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-	-	-
HA12 0.0-0.1	0.0-0.1	6/09/2016	514702	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#1]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	-	-	-	-	-	-	-	-	-	16	-	-	-	-
HA13 0.0-0.1	0.0-0.1	6/09/2016	514702	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#1]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	8.5	-	-	-	-
HA14 0.0-0.1	0.0-0.1	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-	-	-
HA14 0.2-0.3	0.2-0.3	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA15 0.0-0.1	0.0-0.1	6/09/2016	514702	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#1]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	-	-	-	-	-	-	-	-	-	17	-	-	-	-
HA15 0.0-0.1	0.0-0.1	6/09/2016	516962	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA15 0.2-0.3	0.2-0.3	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA16 0.0-0.1	0.0-0.1	6/09/2016	514702	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#1]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	27	-	-	-	-
HA16 0.2-0.3	0.2-0.3	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA17 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA17 0.0-0.1	0.0-0.1	5/09/2016	514668	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#1]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	-	-	-	-	-	-	-	-	-	27	-	-	-	-
HA18 0.0-0.05	0-0.05	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA18 0.2-0.3	0.2-0.3	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	-	-	-	-
HA19 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	-	-	-	-
HA19 0.0-0.1	0.0-0.1	5/09/2016	514668	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#1]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	-	-	-	-	-	-	-	-	-	13	-	-	-	-
HA20 0.0-0.1	0.0-0.1	5/09/2016	514668	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#1]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	-	-	-	-	-	-	-	-	-	14	-	-	-	-
HA21 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA21 0.4-0.5	0.4-0.5	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	-	-	-	-
HA21 0.0-0.1	0.0-0.1	5/09/2016	514668	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#1]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	13	-	-	-	-
HA22 0.0-0.1	0.0-0.1	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	-	-	-	-
HA23 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-	-	-
HA23 0.0-0.1	0.0-0.1	5/09/2016	514668	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#1]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	-	-	-	-	-	-	-	-	-	21	-	-	-	-
HA24 0.0-0.05	0-0.05	5/09/2016	514668	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#1]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	20	-	-	-	-
HA25 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	-	-	-	-
HA25 0.0-0.10	0.0-0.1	5/09/2016	514668	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#1]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	-	-	-	-	-	-	-	-	-	15	-	-	-	-
HA26 0.0-0.1	0.0-0.1	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	-	-	-	-
QC20160905-01	0.0-0.1	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	-	-	-	-
QC20160905-01A	0.0-0.1	5/09/2016	152971	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	-	-	-	-
HA27 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA27 0.0-0.1	0.0-0.1	5/09/2016	514668	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#1]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	16	10	8.5	2.9	97
HA28 0.0-0.1	0.0-0.1	5/09/2016	514668	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#1]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	-	-	-	-	-	-	-	-	-	15	-	-	-	-
HA28 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	-	-	-	-
HA29 0.0-0.1	0.0-0.1	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	-	-	-	-
HA29 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	-	-	-	-
HA30 0.0-0.1	0.0-0.1	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	-	-	-	-
HA31 0.0-0.1	0.0-0.1	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	-	-	-	-
HA31 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	-	-	-	-
HA32 0.4-0.5	0.4-0.5	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	-	-	-	-
HA32 0.0-0.05	0.0-0.5	5/09/2016	514668	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#1]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	46	-	-	-	-
HA32 0.0-0.05	0.0-0.5	5/09/2016	517819	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A: Soil Analytical Data
Project Number: 52047
Project Name: Ivanhoe DSI

JBS&G

				Asbestos - Trace Analysis																
				Approx. Sample Mass	Asbestos from ACM in Soil	Mass ACM	Mass Asbestos in ACM	Asbestos from FA & AF in Soil	Mass FA	Mass Asbestos in FA	Mass AF	Mass Asbestos in AF	Mass Asbestos in FA & AF	Synthetic Fibres - Comment	ACM - Comment	AF - Comment	FA - Comment	Organic Fibres - Comment	Respirable Fibres - Comment
				g	%w/w	g	g	%w/w	g	g	g	g	g	Comment	Comment	Comment	Comment	Comment	Comment
EQL																			
NEPM 2013 EIL - Urban Residential (site specific)																			
NEPM 2013 EIL - Commercial and Industrial (site specific)																			
NEPM 2013 ESL Urban Residential and Public Open Space, Coarse Soil																			
NEPM 2013 ESL Commercial and Insustrial, Coarse Soil																			
NEPM 2013 Soil HIL A																			
NEPM 2013 Soil HIL B																			
NEPM 2013 Soil HIL C																			
NEPM 2013 Soil HIL D																			
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Sand 0 to <1m																			
NEPM 2013 Soil HSL C for Vapour Intrusion - Sand 0 to <1m																			
Field ID	**Depth (m)**	**Date**	**Lab Report #**																
HA01 0.0-0.1	0.0-0.1	6/09/2016	514702	637	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#7]	1[#4]	1[#1]
HA01 0.3-0.4	0.3-0.4	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA02 0.0-0.05	0.0-0.05	6/09/2016	514702	348	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#7]	1[#4]	1[#1]
HA02 0.2-0.3	0.2-0.3	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA03 0.0-0.1	0.0-0.1	6/09/2016	514702	414 - 558	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#7]	1[#4]	1[#1]
QC20160906-01	0.0-0.1	6/09/2016	514702	587	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#7]	1[#4]	1[#1]
QC20160906-01A	0.0-0.1	6/09/2016	152979	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA04 0.0-0.1	0.0-0.1	6/09/2016	514702	553	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#7]	1[#4]	1[#1]
HA04 0.2-0.3	0.2-0.3	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA05 0.3-0.4	0.3-0.4	6/09/2016	514702	744	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#7]	1[#4]	1[#1]
HA06 0.0-0.1	0.0-0.1	6/09/2016	514702	662	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#7]	1[#4]	1[#1]
HA07 0.0-0.1	0.0-0.1	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA07 0.2-0.3	0.2-0.3	6/09/2016	514702	624	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#7]	1[#4]	1[#1]
HA08 0.0-0.1	0.0-0.1	6/09/2016	514702	623	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#7]	1[#4]	1[#1]
HA09 0.0-0.1	0.0-0.1	6/09/2016	514702	570	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#7]	1[#4]	1[#1]
HA10 0.0-0.1	0.0-0.1	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA10 0.2-0.3	0.2-0.3	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA11 0.0-0.1	0.0-0.1	6/09/2016	514702	508	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#7]	1[#4]	1[#1]
HA11 0.3-0.4	0.3-0.4	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA12 0.0-0.1	0.0-0.1	6/09/2016	514702	613	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#7]	1[#4]	1[#1]
HA13 0.0-0.1	0.0-0.1	6/09/2016	514702	617	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#7]	1[#4]	1[#1]
HA14 0.0-0.1	0.0-0.1	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA14 0.2-0.3	0.2-0.3	6/09/2016	514702	493	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#7]	1[#4]	1[#1]
HA15 0.0-0.1	0.0-0.1	6/09/2016	514702	477	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#7]	1[#4]	1[#1]
HA15 0.0-0.1	0.0-0.1	6/09/2016	516962	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA15 0.2-0.3	0.2-0.3	6/09/2016	514702	492	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#7]	1[#4]	1[#1]
HA16 0.0-0.1	0.0-0.1	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA16 0.2-0.3	0.2-0.3	6/09/2016	514702	615	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#7]	1[#4]	1[#1]
HA17 0.2-0.3	0.2-0.3	5/09/2016	514668	372	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#7]	1[#4]	1[#1]
HA17 0.0-0.1	0.0-0.1	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA18 0.0-0.05	0-0.05	6/09/2016	514702	341	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#7]	1[#4]	1[#1]
HA18 0.2-0.3	0.2-0.3	6/09/2016	514702	442	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#7]	1[#4]	1[#1]
HA19 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA19 0.0-0.1	0.0-0.1	5/09/2016	514668	535	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#7]	1[#4]	1[#1]
HA20 0.0-0.1	0.0-0.1	5/09/2016	514668	407	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#7]	1[#4]	1[#1]
HA21 0.2-0.3	0.2-0.3	5/09/2016	514668	619	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#7]	1[#4]	1[#1]
HA21 0.4-0.5	0.4-0.5	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA21 0.0-0.1	0.0-0.1	5/09/2016	514668	528	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#7]	1[#4]	1[#1]
HA22 0.0-0.1	0.0-0.1	5/09/2016	514668	528	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#7]	1[#4]	1[#1]
HA23 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA23 0.0-0.1	0.0-0.1	5/09/2016	514668	409	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#7]	1[#4]	1[#1]
HA24 0.0-0.05	0-0.05	5/09/2016	514668	400	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#7]	1[#4]	1[#1]
HA25 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA25 0.0-0.10	0.0-0.1	5/09/2016	514668	519	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#7]	1[#4]	1[#1]
HA26 0.0-0.1	0.0-0.1	5/09/2016	514668	446	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#7]	1[#4]	1[#1]
QC20160905-01	0.0-0.1	5/09/2016	514668	355	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#7]	1[#4]	1[#1]
QC20160905-01A	0.0-0.1	5/09/2016	152971	409	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-
HA27 0.2-0.3	0.2-0.3	5/09/2016	514668	688	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#7]	1[#4]	1[#1]
HA27 0.0-0.1	0.0-0.1	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA28 0.0-0.1	0.0-0.1	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA28 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA29 0.0-0.1	0.0-0.1	5/09/2016	514668	647	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#7]	1[#4]	1[#1]
HA29 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA30 0.0-0.1	0.0-0.1	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA31 0.0-0.1	0.0-0.1	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA31 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA32 0.4-0.5	0.4-0.5	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA32 0.0-0.05	0.0-0.5	5/09/2016	514668	283	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#7]	1[#4]	1[#1]
HA32 0.0-0.05	0.0-0.5	5/09/2016	517819	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A: Soil Analytical Data
Project Number: 52047
Project Name: Ivanhoe DSI

Env Stds Comments

#1:TV taken for Chromium (III), Clay Contem of 1%
#2:TV taken for pH 4.5
#3:TV taken for CEC 5
#4:TV taken for pH 4 and CEC 5
#5:ESLs are of moderate reliability
#6:ESLs are of low reliability.
#7:ESLs are of moderate reliability. To obtain F1 subtract the sum of BTEX from C6-C10.
#8:Key limitations of HSL should be referred to prior to application in Friebel and Nadebaum (2011b and 2011d).
#9:TV adopted from Chromium (VI)
#10:Assumptions of HSL are presented in Friebel and Nadebaum (2011a and 2011b).
#11:Refer to HSL and soil saturation concentration limit.
#12:Sensitive setting HSL A & HSL B Sand 0m to <1m criteria adopted. Exceedence quantifies further interpretation.
#13:Refer to Section 8.2 and Appendix J in Friebel and Nadebaum (2011a).
#14:TV maybe be multiplied by a factor to account for biodegradation of vapour
#15:HIL relates to non-dioxin-like PCBs only. If PCB source is suspected a site-specific assessment should be untertaken
#16:Sensitive setting HSL A & HSL B Sand 0m to <1m criteria adopted. Exceedence quantifies further interpretation. To obtain F1 subtract the sum of BTEX from C6-C10.
#17:Sensitive setting HSL A & HSL B Sand 0m to <1m criteria adopted. Exceedence quantifies further interpretation. To obtain F2 subtract naphthalene from >C10-C16.
#18:To obtain F1 subtract the sum of BTEX from C6-C10.
#19:To obtain F2 subtract naphthalene from >C10-C16.
#20:Sensitive setting HSL C Sand 0m to <1m criteria adopted. Exceedence quantifies further interpretation. To obtain F1 subtract the sum of BTEX from C6-C10. NL - Not Limiting.
#21:Sensitive setting HSL C Sand 0m to <1m criteria adopted. Exceedence quantifies further interpretation. To obtain F2 subtract naphthalene from >C10-C16 NL - Not Limiting.
#22:Sensitive setting HSL C Sand 0m to <1m criteria adopted. NL - Not Limiting. Exceedence quantifies further interpretation.

Data Comments

#1 ESDAT Combined. Some Analytes are missing from this Combined Compound.
#2 ESDAT Combined with Non-Detect Multiplier of 0.5.
#3 No respirable fibres detected
#4 Organic fibres detected.
#5 ESDAT Combined.
#6 NIL (+)VE
#7 NIL

Table 1 - Soil Analytical Results
Supplementary Investigation
'Ivanhoe Estate'
Macquarie Park NSW

Sample ID	Depth (m)	Date	Chemical Report	Asbestos	BTEX				Naphthalene	TRH				PAH		Pesticides		PCB	Heavy Metals							
					Benzene	Toluene	Ethylbenzene	Xylene		F1	F2	F3	F4	BaP TEQ	Total PAH	OCP	OPP		As	Cd	Cr VI	Cu	Pb	Hg	Ni	Zn
SITE ASSESSMENT CRITERIA																										
HIL A Residential (NEPC, 2013)				ND	-	-	-	-	-	-	-	-	-	3	300	-	-	-	100	20	100	6000	300	40	400	7400
HSL A Residential, 0-<1m, sand (NEPM, 2013)				-	0.5	160	55	40	3	45	110	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HSL A Direct Contact (Friebel, et al, 2011)				-	400	14000	4500	12000	1400	4400	3300	4500	6300	-	-	-	-	-	-	-	-	-	-	-	-	-
Management Limits, Urban Residential, fine (NEPC, 2013)				-	-	-	-	-	-	700	1000	2500	10000	-	-	-	-	-	-	-	-	-	-	-	-	-
EIL Urban Residential / Public Open Space (NEPC, 2013)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	-	410	217	1109	-	312	407
ESL Urban Residential / Public Open Space, coarse (NEPM, 2013)				-	50	85	70	45	-	180	120	300	2800	0.7	-	-	-	-	-	-	-	-	-	-	-	-
PRIMARY SAMPLES																										
BH1	0.1-0.2	24-May-17	167858	ND	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	<0.1	<0.1	<0.1	7	<0.4	20	21	25	<0.1	8	31
BH1	0.2-0.5	24-May-17	167858	-	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	-	-	-	7	<0.4	17	18	32	<0.1	7	29
BH2	0.1-0.4	24-May-17	167858	ND	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	<0.1	<0.1	<0.1	5	<0.4	45	17	11	<0.1	36	25
BH2	0.5-0.6	24-May-17	167858	-	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	-	-	-	7	<0.4	14	12	16	<0.1	3	7
BH3	0.0-0.1	24-May-17	167858	ND	<0.2	<0.5	<1	<1	<1	<25	<50	140	<100	<0.5	<0.05	<0.1	<0.1	<0.1	8	<0.4	23	8	22	<0.1	4	16
BH3	0.1-0.8	24-May-17	167858	-	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	-	-	-	7	<0.4	14	17	22	<0.1	2	16
BH4	0.1-0.2	24-May-17	167858	ND	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	<0.1	<0.1	<0.1	8	<0.4	9	5	6	<0.1	7	17
BH4	0.2-0.4	24-May-17	167858	-	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	-	-	-	5	<0.4	18	18	14	<0.1	14	33
BH5/1	0.1-0.5	24-May-17	167858	ND	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	<0.1	<0.1	<0.1	<4	<0.4	6	8	8	<0.1	5	32
BH5/2	0.5-0.8	24-May-17	167858	-	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	-	-	-	<4	<0.4	10	2	9	<0.1	2	7
BH6	0.1-0.5	24-May-17	167858	ND	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	<0.1	<0.1	<0.1	<4	<0.4	8	2	8	<0.1	1	4
BH7	0.2-0.7	24-May-17	167858	ND	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	<0.1	<0.1	<0.1	<4	<0.4	10	3	8	<0.1	1	7
BH8	0.0-0.1	24-May-17	167858	ND	<0.2	<0.5	<1	<1	<1	<25	250	650	170	<0.5	<0.05	<0.1	<0.1	<0.1	<4	<0.4	14	8	14	<0.1	3	22
BH8	0.1-0.4	24-May-17	167858	-	<0.2	<0.5	<1	<1	<1	<25	120	180	<100	<0.5	<0.05	-	-	-	<4	<0.4	12	5	12	<0.1	2	13
INTRA-LABORATORY DUPLICATE																										
BH2	0.1-0.4A	24-May-17	167858	ND	<0.2	<0.5	<1	<1	<1	<25	<50	140	<100	<0.5	<0.05	<0.1	<0.1	<0.1	4	<0.4	44	20	11	<0.1	42	29
BH7	0.2-0.7A	24-May-17	167858	ND	<0.2	<0.5	<1	<1	<1	<25	<50	140	<100	<0.5	<0.05	<0.1	<0.1	<0.1	<4	<0.4	10	4	8	<0.1	3	11
STATISTICAL ANALYSIS																										
Min	MiMin				0	0	0	0	0	0	120	140	170	0	0	0	0	0	5	0	6	2	6	0	1	4
Max	MaMax				0	0	0	0	0	0	250	650	170	0	0	0	0	0	8	0	45	21	32	0	36	33
Avg	AvAvg				-	-	-	-	-	-	185	323	170	-	-	-	-	-	7	-	16	10	15	-	7	19
Stdev					-	-	-	-	-	-	92	284	-	-	-	-	-	-	1	-	10	7	8	-	9	10

Reported in mg/kg unless stated otherwise

* Depth relates to Depth Below Surface Level

nd = not detected above laboratory LOR

NL = Not Limiting

RED = Exceeds HIL Criteria

YELLOW = Exceeds EIL Criteria

Table 2 - RPD Results
Supplementary Investigation
'Ivanhoe Estate'
Macquarie Park NSW

Sample ID	Date	Report	BTEX					TRH				PAH	
			Benzene	Toluene	EthylBenzene	Xylene	Naphthalene	F1	F2	F3	F4	B(a)P TEQ	Total
INTRA-LABORATORY													
BH2_0.1-0.4	24-May-17	167858	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05
BH2_0.1-0.4A	24-May-17	167858	<0.2	<0.5	<1	<1	<1	<25	<50	140	<100	<0.5	<0.05
RPD			**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
BH7_0.2-0.7	24-May-17	167858	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05
BH7_0.2-0.7A	24-May-17	167858.0	<0.2	<0.5	<1	<1	<1	<25	<50	140	<100	<0.5	<0.05
RPD			**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

Sample ID	Date	Report	Heavy Metals							
			As	Cd	Cr	Cu	Pb	Hg	Ni	Zn
INTRA-LABORATORY										
BH2_0.1-0.4	24-May-17	167858	5	<0.4	45	17	11	<0.1	36	25
BH2_0.1-0.4A	24-May-17	167858	4	<0.4	44	20	11	<0.1	42	29
RPD			**22%**	**NA**	**2%**	**16%**	**0%**	**NA**	**15%**	**15%**
BH7_0.2-0.7	24-May-17	167858	<4	<0.4	10	3	8	<0.1	1	7
BH7_0.2-0.7A	24-May-17	167858	<4	<0.4	10	4	8	<0.1	3	11
RPD			**NA**	**NA**	**0%**	**29%**	**0%**	**NA**	***100%***	***44%***

Table 1 - Soil Analytical Results
Supplementary Investigation
New Property Aquisition
'Ivanhoe Estate'
Macquarie Park NSW

Sample ID	Depth (m)	Date	Chemical Report	BTEX				Naphthalene	TRH				PAH		Pesticides		PCB	Heavy Metals							
				Benzene	Toluene	Ethylbenzene	Xylene		F1	F2	F3	F4	BaP TEQ	Total PAH	OCP	OPP		As	Cd	Cr VI	Cu	Pb	Hg	Ni	Zn
SITE ASSESSMENT CRITERIA																									
HIL D Commercial / Industrial (NEPC, 2013)				-	-	-	-	-	-	-	-	-			-	-	-	3000	900	3600	240000	1500	730	6000	400000
HSL D Commercial / Industrial, 0-<1m, sand (NEPM, 2013)				3.0	NL	NL	230	NL	260	NL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HSL D Commercial / Industrial, 1-<2m, sand (NEPM, 2013)				3.0	NL	NL	NL	NL	370	NL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HSL D Direct Contact (Friebel, et al, 2011)				430	99000	27000	81000	11000	26000	20000	27000	38000	-	-	-	-	-	-	-	-	-	-	-	-	-
Management Limits, Commercial / Industrial, coarse (NEPC, 2013)				-	-	-	-	-	700	1000	3500	10000	-	-	-	-	-	-	-	-	-	-	-	-	-
PRIMARY SAMPLES																									
BH1	0.2	27-Jun-17	170151	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	0.4	<0.1	<0.1	<0.1	<4	<0.4	12	24	47	<0.1	7	100
BH1	0.7	27-Jun-17	170151	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	0.9	-	-	-	<4	<0.4	11	13	70	<0.1	6	62
BH1	1.4	27-Jun-17	170151	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	<0.1	<0.1	<0.1	9	<0.4	24	5	24	<0.1	2	13
BH1	0.4	27-Jun-17	170151	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	-	-	-	4	<0.4	21	1	10	<0.1	2	3
BH2	0.5	27-Jun-17	170151	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	-	-	-	<4	<0.4	3	210	6	<0.1	5	42
BH3	0.2	27-Jun-17	170151	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	<0.1	<0.1	<0.1	<4	<0.4	5	9	6	<0.1	1	7
BH4	0.4	27-Jun-17	170151	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	-	-	-	<4	<0.4	1	2	4	<0.1	<1	5
BH5	0.2	27-Jun-17	170151	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	2.2	<0.1	<0.1	<0.1	<4	<0.4	3	5	9	<0.1	1	22
BH5	0.5	27-Jun-17	170151	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	-	-	-	4	0.5	12	10	17	<0.1	4	23
BH6	0.1	27-Jun-17	170151	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	0.51	<0.1	<0.1	<0.1	<4	<0.4	6	12	18	<0.1	2	35
BH6	0.4	27-Jun-17	170151	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	-	-	-	4	<0.4	12	5	15	<0.1	2	13
INTRA-LABORATORY DUPLICATE																									
BH1	1.4A	27-Jun-17	170151	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	<0.1	<0.1	<0.1	8	<0.4	19	4	30	<0.1	2	15
STATISTICAL ANALYSIS																									
Min	MiMin			0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	1	1	4	0	1	3
Max	MaMax			0	0	0	0	0	0	0	0	0	0	2	0	0	0	9	1	24	210	70	0	7	100
Avg	AvAvg			-	-	-	-	-	-	-	-	-	-	1	-	-	-	5	1	10	27	21	-	3	30
Stdev				-	-	-	-	-	-	-	-	-	-	0.8	-	-	-	3	-	7	61	20	-	2	29

Reported in mg/kg unless stated otherwise

* Depth relates to Depth Below Surface Level

nd = not detected above laboratory LOR

NL = Not Limiting

RED = Exceeds HIL Criteria

YELLOW = Exceeds EIL Criteria

Table 2 - RPD Results
Supplementary Investigation
New Property Aquisition
'Ivanhoe Estate'
Macquarie Park NSW

Sample ID	Date	Report	BTEX					TRH				PAH	
			Benzene	Toluene	EthylBenzene	Xylene	Naphthalene	F1	F2	F3	F4	B(a)P TEQ	Total
INTRA-LABORATORY													
BH1_1.4	27-Jun-17	170151	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05
BH1_1.4A	27-Jun-17	170151	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05
RPD			**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

Sample ID	Date	Report	Heavy Metals							
			As	Cd	Cr	Cu	Pb	Hg	Ni	Zn
INTRA-LABORATORY										
BH1_1.4	27-Jun-17	170151	9	<0.4	24	5	24	<0.1	2	13
BH1_1.4A	27-Jun-17	170151	8	<0.4	19	4	30	<0.1	2	15
RPD			**12%**	**NA**	**23%**	**22%**	**22%**	**NA**	**0%**	**14%**

Appendix C

Borehole Logs

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.

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This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

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.

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.

Soil Descriptions

Douglas Partners

Description and Classification Methods

The methods of description and classification of soils and rocks used in this report are based on Australian Standard AS 1726-1993, Geotechnical Site Investigations Code. 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	20 - 63
Medium gravel	6 - 20
Fine gravel	2.36 - 6
Coarse sand	0.6 - 2.36
Medium sand	0.2 - 0.6
Fine sand	0.075 - 0.2

The proportions of secondary constituents of soils are described as:

Term	Proportion	Example
And	Specify	Clay (60%) and Sand (40%)
Adjective	20 - 35%	Sandy Clay
Slightly	12 - 20%	Slightly Sandy Clay
With some	5 - 12%	Clay with some sand
With a trace of	0 - 5%	Clay with a trace of sand

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

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

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	SPT N value	CPT qc value (MPa)
Very loose	vl	<4	<2
Loose	l	4 - 10	2 -5
Medium dense	md	10 - 30	5 - 15
Dense	d	30 - 50	15 - 25
Very dense	vd	>50	>25

Soil Descriptions

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;
- Transported soils - formed somewhere else and transported by nature to the site; or
- Filling - moved by man.

Transported soils may be further subdivided into:

- Alluvium - river deposits
- Lacustrine - lake deposits
- Aeolian - wind deposits
- Littoral - beach deposits
- Estuarine - tidal river deposits
- Talus - scree or coarse colluvium
- Slopewash or Colluvium - transported downslope by gravity assisted by water. Often includes angular rock fragments and boulders.

Rock Strength

Rock strength is defined by the Point Load Strength Index ($Is_{(50)}$) and 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 test procedure is described by Australian Standard 4133.4.1 - 2007. The terms used to describe rock strength are as follows:

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

* 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
Extremely weathered	EW	Rock substance has soil properties, i.e. it can be remoulded and classified as a soil but the texture of the original rock is still evident.
Highly weathered	HW	Limonite staining or bleaching affects whole of rock substance and other signs of decomposition are evident. Porosity and strength may be altered as a result of iron leaching or deposition. Colour and strength of original fresh rock is not recognisable
Moderately weathered	MW	Staining and discolouration of rock substance has taken place
Slightly weathered	SW	Rock substance is slightly discoloured but shows little or no change of strength from fresh rock
Fresh stained	Fs	Rock substance unaffected by weathering but staining visible along defects
Fresh	Fr	No signs of decomposition or staining

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 some fragments
Fractured	Core lengths of 40-200 mm with some shorter and longer sections
Slightly Fractured	Core lengths of 200-1000 mm with some shorter and longer sections
Unbroken	Core lengths mostly > 1000 mm

Rock Descriptions

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 better. 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

Douglas Partners

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

BOREHOLE LOG

CLIENT: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 67.5 AHD
EASTING: 325470
NORTHING: 6260569
DIP/AZIMUTH: 90°/--

BORE No: 01
PROJECT No: 86043.01
DATE: 31-10-2017
SHEET 1 OF 3

RL	Depth (m)	Description of Strata	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
67	0.3 0.4	FILLING - brown silty sand filling with a trace of clay and roadbase gravel, damp - root affected (topsoil) to 0.05m		A/E A/E A/E			
66	0.9 1	FILLING - light brown sand filling, slightly clayey, with some roadbase and ironstone gravel, damp FILLING - pale brown silty clay filling with some ironstone gravel and a trace of sand, humid	Note: Unless otherwise stated, rock is fractured along rough planar bedding dipping 0°- 10°, some ironstained	A/E S			15,16,6/110mm refusal
65	1.75 2	SANDSTONE - very low strength, orange and red-brown sandstone SHALE - very low strength, highly weathered, fractured, orange-brown and light grey shale, thinly laminated with some high strength iron-cemented bands	1.8m: B0°, cly, 10mm 1.94m: B0°, cly, 5mm 1.96m: B0°, cly, 10mm 2.11m: B0°, cly, 10mm 2.8m: B0°, cly, 10mm	C	100	0	PL(A) = 1.2 PL(A) = 1.1
64	3 3.56	LAMINITE - low to medium and medium strength, moderately weathered, fractured laminite, thinly laminated with some iron-cemented beds	3.1m: J60°- 85°, un, ro, cln 3.3-3.79m: B (x12), cly, 5-10mm 3.62-3.89m: Cs, 70mm	C	100	46	PL(A) = 1.2
63	4		3.95m: B0°, cly, 10mm 3.97m: J60°, pl, ro, cly, 2mm 4m: B30°, cly, 4mm 4.03m: J90°, pl, ro, cly, 2mm 4.09m: J85° & 50°, st, ro, fe 4.14-4.27m: B0°, cly, 5-8mm 4.29m: J75°- 85°, un, he, fe 4.55m: J25°, pl, he, fe 4.8-4.94m: B (x2) 0°, cly, 6mm 5.86m: B0°, cly, 2mm, fe				PL(A) = 0.87 PL(A) = 0.31
62	5						
61	5.8 6	SANDSTONE - high strength, slightly weathered and fresh, slightly fractured and unbroken, grey-brown and grey, medium grained, thinly bedded sandstone 6.4-6.94m: fine grained, thinly laminated	6.51m: B0°, cly, 11mm 6.54-6.59m: Ds, 40mm 6.86-6.92m: B (x3) 0°, fe 7.13-7.3m: B (x4) 0°, fe	C	100	88	PL(A) = 1.4 PL(A) = 1.1
60	7						
59	8		8.04m: B0°, fe				PL(A) = 1.3
58	9		9.32-9.45m: Ds, 110mm 9.56m: B0°, cly, 7mm	C	100	89	PL(A) = 1.2

Degree of Weathering: EW, HW, MW, SW, FS, FR
Graphic Log
Rock Strength: Ex Low, Very Low, Low, Medium, High, Very High, Ex High
Water
Fracture Spacing (m): 0.01, 0.05, 0.10, 0.50, 1.00

RIG: Scout 2 **DRILLER:** Ground Test **LOGGED:** LS/SI **CASING:** HQ to 1.75m

TYPE OF BORING: Solid flight auger (TC-bit) to 1.75m; NMLC-Coring to 23.5m

WATER OBSERVATIONS: No free groundwater observed whilst augering. Water level at 17.7m depth on 12/12/17

REMARKS: Well constructed to 23.5m (blank 0.0-1.0m; screen to 23.5m; backfill 0.0-0.4m; bentonite 0.4-1.4m; sand 1.4-23.5m)

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: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 67.5 AHD
EASTING: 325470
NORTHING: 6260569
DIP/AZIMUTH: 90°/--

BORE No: 01
PROJECT No: 86043.01
DATE: 31-10-2017
SHEET 2 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW, HW, MW, SW, FS, FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
		SANDSTONE - high strength, slightly weathered and fresh, slightly fractured and unbroken, grey-brown and grey, medium grained, thinly bedded sandstone *(continued)*						10.3-10.34m: Ds, 40mm				PL(A) = 1.5
57	11	11.08-11.8m: fine grained sandstone, indistinct bedding						11.0-11.07m: Ds, 70mm	C	100	89	
56								11.73m: B0°, cly, 3mm 11.75-11.78m: Ds, 20mm 11.86m: B0°, cly, 3mm				PL(A) = 1.9
55	12											PL(A) = 1.4
54	13								C	100	99	PL(A) = 1.3
53	14							14.25-14.28m: B (x2), cly, 3mm				PL(A) = 1.4
52	15							15.3-15.33m: B (x2), cly, 4mm				PL(A) = 1.67
51	16							16.65-16.75m: B (x2) 0°, cly	C	100	95	PL(A) = 1.3
50	17					12-12-17		17.17-17.87m: B (x5), cly, 2-5mm				PL(A) = 2.1
49	18							18.04-18.05m: B (x2) 0°, cly, 2mm				PL(A) = 1.2
48	19								C	100	98	
	19.7	SANDSTONE - see next page						19.68m: B0°, fe				PL(A) = 2.5

RIG: Scout 2 **DRILLER:** Ground Test **LOGGED:** LS/SI **CASING:** HQ to 1.75m

TYPE OF BORING: Solid flight auger (TC-bit) to 1.75m; NMLC-Coring to 23.5m

WATER OBSERVATIONS: No free groundwater observed whilst augering. Water level at 17.7m depth on 12/12/17

REMARKS: Well constructed to 23.5m (blank 0.0-1.0m; screen to 23.5m; backfill 0.0-0.4m; bentonite 0.4-1.4m; sand 1.4-23.5m)

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: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 67.5 AHD
EASTING: 325470
NORTHING: 6260569
DIP/AZIMUTH: 90°/--

BORE No: 01
PROJECT No: 86043.01
DATE: 31-10-2017
SHEET 3 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW, HW, MW, SW, FS, FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
47		SANDSTONE - high strength, slightly and moderately weathered, slightly fractured, grey, yellow-brown and purple-brown, medium grained sandstone *(continued)*							C	100	98	PL(A) = 2.7
	21							20.96m: B0°, cly, 2mm, fe 21.03m: J30°, pl, ro, cly, 1mm, fe				
46								21.66m: B0°, fe, cly, 1mm				PL(A) = 2.7
	22							22.14-22.44m: B (x2) 0°, fe	C	100	100	PL(A) = 3.1
45												
	23											PL(A) = 2.8
44	23.5	Bore discontinued at 23.5m										
	24											
43												
	25											
42												
	26											
41												
	27											
40												
	28											
39												
	29											
38												

RIG: Scout 2 **DRILLER:** Ground Test **LOGGED:** LS/SI **CASING:** HQ to 1.75m

TYPE OF BORING: Solid flight auger (TC-bit) to 1.75m; NMLC-Coring to 23.5m

WATER OBSERVATIONS: No free groundwater observed whilst augering. Water level at 17.7m depth on 12/12/17

REMARKS: Well constructed to 23.5m (blank 0.0-1.0m; screen to 23.5m; backfill 0.0-0.4m; bentonite 0.4-1.4m; sand 1.4-23.5m)

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
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BOREHOLE LOG

CLIENT: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 63.1 AHD
EASTING: 325516
NORTHING: 6260564
DIP/AZIMUTH: 90°/--

BORE No: 02
PROJECT No: 86043.01
DATE: 1-11-2017
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW, HW, MW, SW, FS, FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
63		FILLING - apparently well compacted, brown clay filling with some ironstone gravel							A/E			
		- root affected to 0.01m							A/E			
		- some gravel at 0.5m										
62	1	- possible natural from 1.1m							A/E			
									S			10,9,17 N = 26
	1.4	SHALE - low to very low strength, brown shale						Note: Unless otherwise stated, rock is fractured along rough planar bedding dipping 0°- 10°				
61	2											
	2.6											
	2.66	SHALE and LAMINITE - low strength with extremely low and high strength beds, highly weathered, fragmented to fractured, orange-brown with some dark grey beds, shale and laminite some iron-cemented beds						2.6m: CORE LOSS: 60mm 2.66-2.82m: fg	C	88	29	PL(A) = 0.18
60	3							3.03-3.11m: B (x5) 0°, cly, 1-3mm, fe 3.2m: B0°, cly , 10mm 3.28-3.33m: Ds, 50mm 3.48-3.77m: B (x5) 0°, cly, 2mm, fe				PL(A) = 3.3
59	4							3.94m: B0°, cly, 1mm 4.1m: B0°, fe 4.17m: B0°, cly, 10mm 4.33-4.37m: Cs, 40mm 4.41-4.48m: Ds, 70mm 4.52m: J45°, pl, ro, cly, 2mm 4.68-4.79m: fragmented	C	100	44	PL(A) = 0.5
	4.83	SANDSTONE - high strength, moderately weathered then fresh, slightly fractured and unbroken, medium grained sandstone, very thinly bedded						5.14m: B0°, fe, mica, cbs 5.38m: B0°, fe, mica 5.54m: B0°, cly, 3mm, cbs				PL(A) = 1.3
58	5											
57	6							6.06-6.07m: B (x2) 0°, fe 6.17m: B0°, fe				PL(A) = 1.2
		6.5-13.7m: indistinct bedding						6.66m: B0°, cly, 10mm				
56	7											PL(A) = 1.4
									C	100	97	
55	8							>>				PL(A) = 1.4
54	9											PL(A) = 1.5
									C	100	98	
	10.0											

RIG: Scout 2 **DRILLER:** Ground Test **LOGGED:** LS/SI **CASING:** HW to 2.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.6m; NMLC-Coring to 19.21m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

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: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 63.1 AHD
EASTING: 325516
NORTHING: 6260564
DIP/AZIMUTH: 90°/--

BORE No: 02
PROJECT No: 86043.01
DATE: 1-11-2017
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
53		SANDSTONE - high strength, fresh, slightly fractured and unbroken, medium grained sandstone, very thinly bedded	10.3m: B0°, cly, 5mm				PL(A) = 1.6
52	11			C	100	98	PL(A) = 1.7
51	12						PL(A) = 1.8
50	13		12.74-12.81m: Ds, 70mm				PL(A) = 1.2
49	14		13.67-13.7m: Cs, 30mm 14.17-14.72m: B (x4) 0°, cly, 2-4mm	C	100	97	PL(A) = 2.1
48	15	15.0-16.47m: bedding at 10°					PL(A) = 1.3
47	16		16.0-16.22m: B (x2) 0°, cly, 3mm	C	100	100	PL(A) = 2.1
46	17						PL(A) = 2.1
45	18			C	100	100	PL(A) = 3
44	19						PL(A) = 3.4
	16.47	SANDSTONE - high then very high strength, moderately weathered, unbroken, orang-brown and purple-brown, medium to coarse grained sandstone					
	19.21	Bore discontinued at 19.21m - target depth reached					

Degree of Weathering: EW, HW, MW, SW, FS, FR
Graphic Log
Rock Strength: Ex Low, Very Low, Low, Medium, High, Very High, Ex High
Water
Fracture Spacing (m): 0.01, 0.05, 0.10, 0.50, 1.00

RIG: Scout 2 **DRILLER:** Ground Test **LOGGED:** LS/SI **CASING:** HW to 2.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.6m; NMLC-Coring to 19.21m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

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: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 62.3 AHD
EASTING: 325514
NORTHING: 6260536
DIP/AZIMUTH: 90°/--

BORE No: 03
PROJECT No: 86043.01
DATE: 8-11-2017
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
62	0.3	FILLING - dark brown clay filling with some medium to fine sand, roadbase gravel and a trace of slag, MC<PL		A			
				A/E			
61	1	FILLING - light brown sandy clay filling with some ironstone and roadbase gravel and a trace of plastic film, apparently poorly compacted - trace of brick fragments below 1.35m		A/E S A/E			3,2,3 N = 5
60	2.1	SHALE - very low to low strength with some medium strength bands, light brown shale		S			PL(A) = 2.57 4,15,5/50mm refusal
59	2.85 3 3.21	SANDSTONE - medium strength, highly weathered, fractured, light grey and orange-brown, fine grained sandstone, with some very low and high strength bands	2.89-2.95m: B (x2) cly, 10mm 3.1m: CORE LOSS: 110mm 3.31m: B0°, cly, 2mm 3.37-3.59m: Cz, 20mm 3.5-3.66m: Ds, 60mm 3.57m: J85°- 90°, un, he, cly, 2mm 3.6m: J45° & 70°, st, ro, he, cly, 2-9mm 3.7m: B0°, cly, 3mm 4.31-4.41m: Cs, 100mm 4.44-4.49m: Cs, 50mm	C C	100 97	0 73	PL(A) = 0.81
58	4.5	SANDSTONE - medium then high strength, moderately weathered and fresh, slightly fractured and unbroken, thinly and thickly bedded 5.0-5.55m: very thinly bedded at 10°	5.47m: J70°, pl, ro, fe 5.59m: B0°, cly, 5mm				PL(A) = 0.62
57	5						
56	6						PL(A) = 1.9
55	7						PL(A) = 1.2
54	8	8.2-8.7m: fine grained sandstone, very thinly bedded at 5°	8.21m: B0°, cly, 8mm 8.72m: B0°, cly vn	C	100	100	PL(A) = 1.9
53	9 10.0			C	100	100	PL(A) = 1.4

RIG: Scout 2 **DRILLER:** Ground Test **LOGGED:** LS **CASING:** HW to 2.85m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.85m; NMLC-Coring to 18.08m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

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: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 62.3 AHD
EASTING: 325514
NORTHING: 6260536
DIP/AZIMUTH: 90°/--

BORE No: 03
PROJECT No: 86043.01
DATE: 8-11-2017
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering	Graphic Log	Rock Strength	Water	Fracture Spacing (m)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
52		SANDSTONE - high strength, moderately weathered and fresh, slightly fractured and unbroken, thinly and thickly bedded	EW HW MW SW FS FR		Ex Low Very Low Low Medium High Very High Ex High		0.01 0.05 0.10 0.50 1.00	10.39m: B0°, cly vn				
		10.32-10.72m: fine grained sandstone, very thinly bedded cross bedding at 5°- 10°										PL(A) = 1.9
	11								C	100	100	
51												PL(A) = 1.7
	12							11.87-12.1m: B (x3) 0°, cbs				
50								12.13m: B0°, cly vn				
								12.34-12.81m: B (x3) 0°, cly vn, cbs				PL(A) = 1.8
	13											
49												PL(A) = 1.5
									C	100	100	
	14											
48												PL(A) = 1.2
	15											
		15.05-15.78m: very thinly bedded at 5°- 10°						15.04m: B0°, fe				
47								15.14m: B0°, cly, 3mm				PL(A) = 1.5
								15.6m: B0°, fe, cly, 3mm				
								15.64m: B0°, cly, 3mm				
	16							15.7-15.76m: Ds, 60mm				
46												PL(A) = 2.4
	16.6	SANDSTONE - high strength, moderately weathered, unbroken, purple-brown and orange-brown, coarse grained sandstone, thickly bedded						16.57m: B10°, cly, 1mm	C	100	100	
	17											
45								17.42m: B0°, cly, 2mm				PL(A) = 2.3
	18											
	18.08	Bore discontinued at 18.08m										
44												
	19											
43												

RIG: Scout 2 **DRILLER:** Ground Test **LOGGED:** LS **CASING:** HW to 2.85m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.85m; NMLC-Coring to 18.08m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

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: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 64.6 AHD
EASTING: 325483
NORTHING: 6260455
DIP/AZIMUTH: 90°/--

BORE No: 04
PROJECT No: 86043.01
DATE: 30-10-2017
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
	0.2	TOPSOIL - brown, slightly clayey sand with a trace of brick, rootlets and ironstone gravel, humid	Note: Unless otherwise stated, rock is fractured along rough planar bedding dipping 0°- 10°	E			
64	0.5	SANDSTONE - low strength, yellow and red-brown sandstone		A			PL(A) = 1.4
63	1.0	SANDSTONE - high then very low strength, highly weathered, fractured, red-brown, fine to medium grained sandstone with some medium strength iron-cemented bands	0.75m: CORE LOSS: 250mm 1.0-1.08m: Ds 1.34-1.52m: B's 0°- 5°, cly, fe 1.87-2.2m: Ds	C	88	38	PL(A) = 1.2
62	2.2	SANDSTONE - high strength, moderately weathered, fractured, brown, medium grained sandstone with some extremely low and very low strength bands	2.32m: J35°, un, ro, fe 2.6-2.63m: Cs 2.74m: B0°, cly, 1mm 2.9-3.0m: Ds 3.0-3.3m: J80°, pl, ro, cly, 1mm 3.25m: B10°, cly, 10mm 3.45m: B0°, cly, 3mm 3.76m: B5°, fe 3.87, 3.9m: B5°, cly vn, fe 4.04-4.08m: Ds, 40mm	C	100	78	PL(A) = 2.2 PL(A) = 2.1
61	4.05	SANDSTONE - high strength, moderately then slightly weathered, slightly fractured, light grey and yellow-brown, medium grained sandstone with some siltstone/carbonaceous flakes	4.9m: B0°, cly, 1mm, fe & J90°, pl, ro, cly vn 5.08, 5.11m: B (x2) 0°, fe 6.04m: B, fe 6.71, 6.75m: B (x2) 0°, fe 7.31m: B0°, fe 7.49m: B0°, cly, 1mm 7.68-7.7m: Cs, 20mm 7.94m: B0°, fe 8.1m: B0°, fe 8.14m: J20°, pl, ro, fe, cly, 5mm 8.25m: J25°, pl, ro, fe, cly, 10mm	C	100	90	PL(A) = 1.8 PL(A) = 1.6 PL(A) = 1.3 PL(A) = 1.6 PL(A) = 0.7
56	8.5	SANDSTONE - high strength, fresh, slightly fractured and unbroken, medium grained, thickly bedded, light grey sandstone 9.0-9.65m: thinly bedded, fine to medium grained sandstone	9.44-9.45m: Ds, 10mm 9.75m: B0°, cly, 4mm	C	100	98	PL(A) = 2.5

- medium strength from 7.95m

RIG: Scout 2 **DRILLER:** Ground Test **LOGGED:** LS/SI **CASING:** HW to 0.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 0.5m; NMLC-Coring to 20.0m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

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: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 64.6 AHD
EASTING: 325483
NORTHING: 6260455
DIP/AZIMUTH: 90°/--

BORE No: 04
PROJECT No: 86043.01
DATE: 30-10-2017
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
54		SANDSTONE - high strength, fresh, slightly fractured and unbroken, medium grained, thickly bedded, light grey sandstone *(continued)*		C	100	98	PL(A) = 1.5
	11						PL(A) = 1.5
53		11.7-12.0m: thinly bedded sandstone	11.7m: irregular bedding with high angle 11.93m: B0°, cly, 1mm	C	100	100	PL(A) = 1.4
52	12						
51	13		12.93m: B0°, cly, 1mm				PL(A) = 1.6
50	14	- thinly cross bedded (5°- 10°) from 14.1m	14.45, 14.63m: B0°, cly, 1mm				PL(A) = 1.5
49	15	15.2-15.6m & 16.25 to 16.6m: fine sandstone	15.04-15.14m: B (x4) 0°, cbs, cly	C	100	98	PL(A) = 2.1
48	16		16.25m: B5°, cly vn				PL(A) = 1.9
47	17		17.45m: B10°, cly co, 3mm				PL(A) = 2.3
46	18 18.4	SANDSTONE - high strength, moderately weathered, unbroken, medium to coarse grained sandstone		C	100	100	PL(A) = 2.6
45	19 20.0						PL(A) = 2.9

Bore discontinued at 20.0m

RIG: Scout 2 **DRILLER:** Ground Test **LOGGED:** LS/SI **CASING:** HW to 0.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 0.5m; NMLC-Coring to 20.0m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

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: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 59.2 AHD
EASTING: 325541
NORTHING: 6260484
DIP/AZIMUTH: 90°/--

BORE No: 05
PROJECT No: 86043.01
DATE: 1-11-2017
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
59	0.3	FILLING - brown medium sand filling with some ironstone gravel and clay, humid - root affected (topsoil) to 0.05m		A/E A/E			
	0.6	FILLING - orange-brown medium sand filling with some ironstone gravel and trace of clay, damp	Note: Unless otherwise stated, rock is fractured along rough planar bedding dipping 0°- 10°	B A/E			
58	1.35	FILLING - brown, gravelly clay filling, ironstone gravel (20-30mm) with a trace of fine sand, MC<PL		S			9,10,11 N = 21
	1.7	SANDSTONE - extremely low to very low strength, orange-brown and grey sandstone	1.8m: B0°, cly, 1mm 1.95m: CORE LOSS: 270mm				PL(A) = 0.28
57	2.22	SANDSTONE - extremely low and low strength, extremely to moderately weathered, fractured, light grey and red-brown, medium grained sandstone with some high strength iron-cemented beds	2.6m: B0°, cly, 1mm 2.66-2.74m: Cs, 60mm 2.802.89m: B (x5) 0°, cly, 1-3mm, fe 2.95m: B0°, cly, 3mm	C	78	0	PL(A) = 2.2
	2.9	SANDSTONE - high strength, slightly weathered and fresh, slightly fractured and unbroken, light grey, medium grained sandstone	3.67-3.21m: B0°, fe				PL(A) = 1.1
55				C	100	85	PL(A) = 1.4
54			5.24m: B15°, fe 5.56-5.89m: B (x6) 0°, fe 5.9-5.95m: Ds, 50mm 6.09-6.11m: B (x2) 0°, fe				PL(A) = 1.2
53			6.57m: B0°, cly, 2mm 6.68m: J65°, he, fe 6.8m: B0°, cly, 2mm				PL(A) = 1
52			7.3-7.32m: B (x2) 20°, cly, 2mm	C	100	91	PL(A) = 1.4
51			8.78m: B0°, cly, 10mm				PL(A) = 2.1
50			9.1-9.15m: B (x2) 0°, cly, 1-8mm	C	100	95	PL(A) = 1.3

RIG: Scout 2 **DRILLER:** Ground Test **LOGGED:** LS/SI **CASING:** HW to 1.7m

TYPE OF BORING: Solid flight auger (TC-bit) to 1.7m; NMLC-Coring to 18.27m

WATER OBSERVATIONS: No free groundwater observed whilst augering. Water level at 12.68m depth on 12/12/17

REMARKS: Well constructed to 18.27m (blank to 0.5m; screen 0.5-18.27m; bentonite 0.1-0.8m; sand 0.8-18.27m). MC= Moisture content; PL=Plastic limit; bulk sample obtained by excavator-mounted large diameter auger on 9/11/2017

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: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 59.2 AHD
EASTING: 325541
NORTHING: 6260484
DIP/AZIMUTH: 90°/--

BORE No: 05
PROJECT No: 86043.01
DATE: 1-11-2017
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
49		SANDSTONE - high strength, slightly weathered and fresh, slightly fractured and unbroken, light grey, medium grained sandstone *(continued)*					
			10.63m: B0°,, cly, 4mm 10.67-10.7m: Ds, 30mm				PL(A) = 1.5
48	11			C	100	95	
							PL(A) = 1.3
47	12						
			12.42m: B0°, cly, 10mm, fe				PL(A) = 0.89
46	13						
			13.68m: B0°, cly, 3mm	C	100	97	PL(A) = 2.4
45	14						
			14.55m: B0°, cly, 3mm				PL(A) = 2.4
	14.8	SANDSTONE - high strength, slightly weathered, unbroken, light brown, medium and medium to coarse grained sandstone					
44	15						
							PL(A) = 2.7
43	16		16.26m: B0°, fe				
				C	100	100	PL(A) = 2.6
42	17						
							PL(A) = 2.6
41	18						
							PL(A) = 2.7
	18.27	Bore discontinued at 18.27m					
40	19						

Water: 12-12-17

RIG: Scout 2 **DRILLER:** Ground Test **LOGGED:** LS/SI **CASING:** HW to 1.7m

TYPE OF BORING: Solid flight auger (TC-bit) to 1.7m; NMLC-Coring to 18.27m

WATER OBSERVATIONS: No free groundwater observed whilst augering. Water level at 12.68m depth on 12/12/17

REMARKS: Well constructed to 18.27m (blank to 0.5m; screen 0.5-18.27m; bentonite 0.1-0.8m; sand 0.8-18.27m). MC= Moisture content; PL=Plastic limit; bulk sample obtained by excavator-mounted large diameter auger on 9/11/2017

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: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 54.1 AHD
EASTING: 325597
NORTHING: 6260464
DIP/AZIMUTH: 90°/--

BORE No: 06
PROJECT No: 86043.01
DATE: 10-11-2017
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering	Graphic Log	Rock Strength	Water	Fracture Spacing (m)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
54		FILLING - apparently compacted, dark brown clay filling, slightly sandy with some silt, MC<PL - top 0.05m affected by rootlets - top 0.2m with some ironstone gravel							A/E			
									A/E			
	0.9								A/E			
53	1	FILLING - apparently compacted, brown mottled orange-brown, clay filling with some fine sand, silt and a trace of ironstone gravel, MC<PL						Note: Unless otherwise stated, rock is fractured along rough planar bedding dipping 0°- 10°	S			4,7,4 N = 11
									A/E			
52	2											
	2.1	SANDSTONE - medium strength, moderately and slightly weathered, slightly fractured, red-brown with light grey bands, medium grained sandstone						2.4m: J35°, pl, ro, cly vn, fe 2.46m: B0°, cly, 3mm 2.64m: B0°, fe 2.7-2.78m: Ds, 80mm 3.02-3.14m: Ds, 30mm 3.06-3.14m: Cs, 80mm 3.24m: B0°, cly, 1mm 3.58m: B0°, cly, 4mm 3.9-4.0m: Ds, 100mm 4.05m: B0°, cly, 3mm	C	100	79	PL(A) = 1.3 PL(A) = 0.44
51	3											
50	4											
	4.3	SANDSTONE - medium then high strength, slightly weathered to fresh, slightly fractured, light grey with some orange-brown bands, fine and medium grained sandstone						4.3m: B5°, fe 4.34m: J5°- 50°, un, ro, fe, cly, 1mm 4.6m: B0°, cly, 3mm 4.9m: B0°, fe, cly, 3mm 5.05-5.3m: B (x2) 0°, cly, 3mm, fe 5.58-6.04m: B (x2) 0°, cly, 2-4mm 6.76-6.77m: Ds, 10mm	C	100	100	PL(A) = 0.64 PL(A) = 2 PL(A) = 1.4
49	5											
48	6											
47	7											
								7.64m: B0°, cly, 3mm				PL(A) = 1.5
46	8							8.38-8.56m: B (x2) 0°- 5°, cly, 1-4mm	C	100	98	PL(A) = 0.96
45	9											PL(A) = 1.2
								9.6-9.65m: Cs, 50mm				
	10.0											

RIG: Bobcat **DRILLER:** Ground Test **LOGGED:** LS **CASING:** HW to 2.1m

TYPE OF BORING: Solid flight auger to 2.2m; NMLC-Coring to 17.25m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

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: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 54.1 AHD
EASTING: 325597
NORTHING: 6260464
DIP/AZIMUTH: 90°/--

BORE No: 06
PROJECT No: 86043.01
DATE: 10-11-2017
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
44		SANDSTONE - high strength, slightly weathered to fresh, slightly fractured, light grey with some orange-brown bands, fine and medium grained sandstone					
			10.36-10.48m: B (x2) 0°, fe				
			10.77m: B5°, cbs				PL(A) = 1.2
43	11						
				C	100	100	PL(A) = 1.3
			11.77m: B5°, cbs				
42	12						PL(A) = 1.5
41	13						
							PL(A) = 2.3
40	14						
			14.64m: B0°, cly, 2mm	C	100	100	PL(A) = 2
39	15	- slightly weathered below 15.0m					
							PL(A) = 2.4
38	16						
			16.6m: J30°, pl, ro, cbs, fe	C	100	100	PL(A) = 2.5
37	17						
	17.25	Bore discontinued at 17.25m					
36	18						
35	19						

Degree of Weathering: EW, HW, MW, SW, FS, FR
Graphic Log
Rock Strength: Ex Low, Very Low, Low, Medium, High, Very High, Ex High
Water
Fracture Spacing (m): 0.01, 0.05, 0.10, 0.50, 1.00

RIG: Bobcat **DRILLER:** Ground Test **LOGGED:** LS **CASING:** HW to 2.1m

TYPE OF BORING: Solid flight auger to 2.2m; NMLC-Coring to 17.25m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

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: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 59.1 AHD
EASTING: 325545
NORTHING: 6260402
DIP/AZIMUTH: 90°/--

BORE No: 07
PROJECT No: 86043.01
DATE: 7-11-2017
SHEET 1 OF 3

RL	Depth (m)	Description of Strata	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
59	0.05	BRICK PAVERS		A/E			
	0.1	FILLING - light brown then dark brown, fine then coarse sand filling with some roadbase gravel, moist		A/E			
	0.6	FILLING - brown silty clay filling with some fine sand, with a trace of ironstone gravel, humid		A/E			
58	1						
	1.3	CLAY - stiff to very stiff, orange-brown, slightly silty clay with a trace of fine sand, MC<PL		S			6,8,20 N = 28
	1.5	SANDSTONE - very low strength, light grey and orange-brown sandstone	1.5-1.56m: fg 1.56-1.59m: Cs, 30mm	C	100	93	PL(A) = 0.9
57	2	SANDSTONE - medium to high strength, highly weathered, slightly fractured, light grey and orange-brown, medium grained sandstone	2.2m: B5°, cly, 8mm				PL(A) = 1
56	3		3.28-3.34m: Cs, 60mm 3.4-3.6m: Cs, 200mm				
	3.6	SANDSTONE - medium strength, slightly weathered, fractured, light grey fine grained sandstone, thinly bedded with some siltstone laminations	3.69m: B0°, cly, 3mm 3.84-3.86m: fg, 20mm 3.86m: J0° & 90°, st, ro, cln 3.91-3.94m: fg, 30mm 4.17m: B0°, he, cly, 2mm 4.2-4.24m: Cs, 40mm 4.28-4.41m: B (x3) 0°, he, cly, 3mm 4.57-4.74m: B (x4) 0°, fe 4.82-4.94m: B (x4) 0°, he, cly, 2mm 5.21-5.28m: Cs, 70mm 5.57-5.62m: Cs, 50mm 5.72-5.76m: B (x4) 0°, he, cly, 2mm 5.84-5.88m: Cs, 40mm 5.91-5.96m: Cs, 50mm 6.27m: B0°, fe, cly, 1mm	C	100	77	PL(A) = 0.32 PL(A) = 0.94 PL(A) = 1
55	4						
54	5						
53	6						
	6.0	SANDSTONE - high strength, fresh, unbroken, light grey, medium grained sandstone, thinly and thickly bedded with some siltstone laminations					PL(A) = 1.6
52	7						PL(A) = 1.4
51	8		8.22m: B0°, cly, 3mm	C	100	100	PL(A) = 1.5
50	9		9.45m: B0°, cly, 2mm 9.6m: B0°, cly, 5mm				PL(A) = 1.7

Degree of Weathering: EW HW MW SW FS FR
Graphic Log
Rock Strength: Ex Low, Very Low, Low, Medium, High, Very High, Ex High
Water
Fracture Spacing (m): 0.01, 0.05, 0.10, 0.50, 1.00

RIG: Scout 2 **DRILLER:** Ground Test **LOGGED:** LS **CASING:** HW to 1.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 1.5m; NMLC-Coring to 21.0m

WATER OBSERVATIONS: No free groundwater observed whilst augering. Water level at 13.45m depth on 12/12/17

REMARKS: MC = Moisture Content; PL = Plastic Limit. Ground well (blank 0.3-1.5m; screen 1.5-21.0m; fill 0-0.6m; bentonite 0.6-1.2m; gravel 1.2-21.0m)

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)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 59.1 AHD
EASTING: 325545
NORTHING: 6260402
DIP/AZIMUTH: 90°/--

BORE No: 07
PROJECT No: 86043.01
DATE: 7-11-2017
SHEET 2 OF 3

RL	Depth (m)	Description of Strata	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
49		SANDSTONE - high strength, fresh, unbroken, light grey, medium grained sandstone, thinly and thickly bedded with some siltstone laminations *(continued)*					PL(A) = 1.4
48	11			C	100	100	
			11.56m: B0°, cly, 3mm				PL(A) = 1.6
47	12						
							PL(A) = 1.5
46	13		13.1-13.3m: B (x3) 0°, he, cly				
				C	100	100	PL(A) = 1.5
45	14						
							PL(A) = 1.6
44	15						
			15.44m: B20°, cbs, 1mm				PL(A) = 1.8
43	16						PL(A) = 2.6
				C	100	100	
42	17						
							PL(A) = 2.7
			17.64-17.74m: Cs, 10mm				
41	18	18.0m: shale clast	17.67m: B0°, cly, 4mm				PL(A) = 2.7
			18.22m: B0°, cly, 1mm, cbs				
	18.65	SANDSTONE - high strength, slightly weathered and fresh, slightly fractured, medium grained sandstone with trace siltstone clasts	18.81m: B0°, fe, cbs				
40	19			C	100	100	PL(A) = 2.6
			19.67m: B0°, cly, 2mm				
	20.0						

Degree of Weathering: EW HW MW SW FS FR
Graphic Log
Rock Strength: Ex Low, Very Low, Low, Medium, High, Very High, Ex High
Water: 12-12-17
Fracture Spacing (m): 0.01, 0.05, 0.10, 0.50, 1.00

RIG: Scout 2 **DRILLER:** Ground Test **LOGGED:** LS **CASING:** HW to 1.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 1.5m; NMLC-Coring to 21.0m

WATER OBSERVATIONS: No free groundwater observed whilst augering. Water level at 13.45m depth on 12/12/17

REMARKS: MC = Moisture Content; PL = Plastic Limit. Ground well (blank 0.3-1.5m; screen 1.5-21.0m; fill 0-0.6m; bentonite 0.6-1.2m; gravel 1.2-21.0m)

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)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 59.1 AHD
EASTING: 325545
NORTHING: 6260402
DIP/AZIMUTH: 90°/--

BORE No: 07
PROJECT No: 86043.01
DATE: 7-11-2017
SHEET 3 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW, HW, MW, SW, FS, FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
39		SANDSTONE - very high strength, slightly weathered, slightly fractured, medium grained sandstone with siltstone clasts and some very low strength bands						20.05m: B0°, fe 20.46-20.49m: B0°, cly, 10mm	C	100	100	PL(A) = 3.3
38	21 21.0	Bore discontinued at 21.0m										
37	22											
36	23											
35	24											
34	25											
33	26											
32	27											
31	28											
30	29											

RIG: Scout 2 **DRILLER:** Ground Test **LOGGED:** LS **CASING:** HW to 1.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 1.5m; NMLC-Coring to 21.0m

WATER OBSERVATIONS: No free groundwater observed whilst augering. Water level at 13.45m depth on 12/12/17

REMARKS: MC = Moisture Content; PL = Plastic Limit. Ground well (blank 0.3-1.5m; screen 1.5-21.0m; fill 0-0.6m; bentonite 0.6-1.2m; gravel 1.2-21.0m)

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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BOREHOLE LOG

CLIENT: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 50.1 AHD
EASTING: 325647
NORTHING: 6260426
DIP/AZIMUTH: 90°/--

BORE No: 08
PROJECT No: 86043.01
DATE: 7-11-2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Degree of Weathering (EW, HW, MW, SW, FS, FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
50	0.2	FILLING - dark brown clay filling, slightly sandy with some concrete fragments and trace metal wire, MC<PL, root affected to 0.05m							A/E			
	0.7	FILLING - brown clay filling with some sand and a trace of concrete fragments, MC<PL 0.5m: metal wire observed							A/E A/E			
49	1								S			7,7,7 N = 14
	1.6	CLAY - stiff, light orange-brown clay with some fine sand and silt and a trace of ironstone gravel, MC<PL										
48	2	SANDSTONE - low to medium strength, red-brown and light grey, medium grained sandstone with some very low strength bands							A			
	2.6							2.5m: CORE LOSS: 100mm				
	2.75	SANDSTONE - medium and high strength, slightly weathered and fresh, light grey with purple-brown bands, medium grained sandstone, medium bedded						2.7m: B0°, cly, 2mm 2.9-2.93m: Cs, 30mm				PL(A) = 0.2
47	3							3.3m: B0°, cly, 5mm 3.36-3.38m: Cs, 30mm 3.64m: B0°, fe, cly, 3mm	C	96	86	PL(A) = 1.6
46	4							4.2-4.22m: Ds, 20mm 4.28-4.3m: Cs, 20mm				PL(A) = 0.8
45	5											
	5.1	Bore discontinued at 5.1m										
44	6											
43	7											
42	8											
41	9											

RIG: Scout 2 **DRILLER:** Ground Test **LOGGED:** LS **CASING:** HW to 2.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.5m; NMLC-Coring to 5.1m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: MC = Moisture Content; PL = Plastic Limit

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: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 45.8 AHD
EASTING: 325720
NORTHING: 6260386
DIP/AZIMUTH: 90°/--

BORE No: 09
PROJECT No: 86043.01
DATE: 8-11-2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Degree of Weathering	Graphic Log	Rock Strength	Water	Fracture Spacing (m)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
	0.05	BRICK PAVERS							A/E			
	0.16	FILLING - dark grey medium to coarse sand filling with some roadbase and sandstone gravel and a trace of slag, moist							A/E			
45	1.0	FILLING - light brown sandy clay and clay filling with trace sandstone gravel and fine sand, MC<PL							A/E S			6,4,6/50mm refusal bouncing
	1.5	SANDSTONE - very low to low strength, red-brown sandstone										PL(A) = 0.67
44	2.0	SANDSTONE - medium strength, extremely and moderately weathered, fractured, light grey and orange-brown, medium grained sandstone						1.72m: B0°, fe 1.87m: CORE LOSS: 130mm 2.0-2.12m: Cs, 120mm 2.34m: B0°, cly, 5mm 2.44-2.45m: Ds, 10mm	C	89	73	
	2.5	SANDSTONE - medium and high strength, slightly weathered, slightly fractured, medium grained sandstone, medium bedded										PL(A) = 1.5
43	3							2.88m: B10°, fe 3.11-3.29m: B (x5) 0°-5°, cly, 3-5mm				PL(A) = 0.69
42	4							4.03m: B0°, fe 4.43-4.47m: Cs, 40mm 4.57m: B0°, fe 4.7m: B0°, fe, cly, 2mm	C	100	98	PL(A) = 0.86 PL(A) = 0.86
41	5							5.13m: B5°, cly, 3mm				PL(A) = 0.57
	5.44	Bore discontinued at 5.44m										
40	6											
39	7											
38	8											
37	9											
36												

RIG: Scout 2 **DRILLER:** Ground Test **LOGGED:** LS **CASING:** HW to 1.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 1.5m; NMLC-Coring to 5.44m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

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: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 45.2 AHD
EASTING: 325736
NORTHING: 6260351
DIP/AZIMUTH: 90°/--

BORE No: 10
PROJECT No: 86043.01
DATE: 2-11-2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Degree of Weathering	Graphic Log	Rock Strength	Water	Fracture Spacing (m)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
45	0.2	FILLING - dark brown clayey sand filling with ironstone gravel and a trace of concrete fragments, moist - root affected to 0.05m							A/E			
	0.6	FILLING - red-brown silty clay filling with some fine sandstone and roadbase gravel, moist							A/E			
44	1 1.0	SILTY SAND - medium dense, dark brown, fine to medium silty sand with some clay and a trace of ironstone gravel, moist						Note: Unless otherwise stated, rock is fractured along rough planar bedding dipping 0°- 10°	A/E S E			pp = 100 1,1,3 N = 4
43	2 2.1	SANDY CLAY - soft to firm, light brown, fine to medium sandy clay, moist										
42	2.75 3	SANDSTONE - low and medium strength, light grey and orange-brown sandstone with extremely low strength bands; SANDSTONE - medium and high strength, moderately weathered to fresh, slightly fractured and unbroken, medium grained sandstone, thinly to medium bedded						2.47m: J90°, pl, ro, cly, 2mm; 2.47m: B0°, cly, 2mm; 2.6m: B0°, cly, 2mm; 2.7-2.74m: Cs, 40mm; 3.05-3.64m: B (x2) 0°, cly, 4mm	C	100	84	PL(A) = 0.24; PL(A) = 1.2
41	4					12-12-17		4.14-4.16m: B (x2) 0°, fe				PL(A) = 1.3
40	5	5.45-6.48m: fresh						5.17-5.18m: B (x2) 0°, cly, 1mm; 5.25m: B15°, he, cly, 2mm; 5.49m: B15°, fe; 5.55-5.56m: Cs, 10mm; 5.87m: B0°, cly, 5mm	C	100	92	PL(A) = 1.1; PL(A) = 0.36
39	6							6.48m: B0°, fe				
38	7	7.07m: siltstone clast						6.8-7.22m: B (x7) 0°, fe, cbs; 7.23m: J20°, he, cbs; 7.25m: B0°, he, cbs; 7.3-7.32m: B (x2) 0°, fe, cbs	C	100	84	PL(A) = 1.9; PL(A) = 2.6
37	8							8.82m: J30°, pl, ro, cly, 1mm				PL(A) = 1.8
36	9 8.97	Bore discontinued at 8.97m - target depth reached										

RIG: Scout 2 **DRILLER:** Ground Test **LOGGED:** LS **CASING:** HW to 2.4m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.4m; NMLC-Coring to 8.97m

WATER OBSERVATIONS: No free groundwater observed whilst augering. Water level at 4.5m depth on 12/12/17

REMARKS: Well installed to 5.6m (blank 0.0-2.5m; screen 2.5-5.6m; bentonite 1.3-2.6m; gravel 2.6-5.6m)

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: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 43.2 AHD
EASTING: 325768
NORTHING: 6260337
DIP/AZIMUTH: 90°/--

BORE No: 11
PROJECT No: 86043.01
DATE: 2-11-2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Degree of Weathering (EW, HW, MW, SW, FS, FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
43	0.16	CONCRETE - 20mm reinforcement at 60mm and 80mm							A			
	0.21	SUBBASE - roadbase gravel, 25-30mm, angular to sub-angular							A/E			
	0.7	FILLING - light brown, sandy clay filling, MC>PL							A/E			
42	1	CLAYEY SILT - stiff, grey mottled orange-brown, clayey silt and fine sand, moist							A/E			pp = 340
									S			2,5,6 N = 11
	1.9	SILTY CLAY - firm, red-brown mottled grey, silty clay with a trace of fine and coarse sand, moist						Note: Unless otherwise stated, rock is fractured along rough planar bedding dipping 0°- 10°				
41	2											
		2.6m: becoming wet, gravelly MC>PL							S			6,3,7/40mm refusal bouncing
	2.8	LATERITIC SANDSTONE - high strength, highly weathered, fragmented, dark red-brown mottled dark grey and orange-brown lateritic sandstone						2.85-3.0m: fg 3.13m: B0°, cly, 10mm 3.22m: B0°, cly, 2mm 3.3m: J60°, he, fe 3.37-3.42m: Cz, 50mm 3.46m: B0°, cly, 2mm, fe 3.48m: J25°, he, cly, 2mm, fe 3.6m: CORE LOSS: 200mm				
40	3											PL(A) = 1
	3.8	SANDSTONE - high strength, slightly weathered, light red-grey, medium grained sandstone, thickly bedded							C	81	42	
39	4											PL(A) = 1.1
38	5							4.98m: J70°, pl, ro, cln 5m: CORE LOSS: 310mm 5.33-5.87m: J85°- 90°, un, ro, cln				
	5.31											PL(A) = 1.2
37	6							5.92m: B0°, cly, 1mm CORE LOSS: 80mm 6.0-6.41m: J85°- 90°, un, ro, cly, 1mm 6.23-6.63m: J70°, pl, ro, cln				PL(A) = 1.3
	6.0											
36	7	- fresh, light grey from 6.97m						6.89-8.09m: J85°- 90°, un, ro, cln	C	97	98	
35	8	- thinly bedded with 5% siltstone laminae from 8.17-8.35m						8.13-8.16m: Cs, 30mm 8.35m: B0°, cly, 3mm				PL(A) = 1.3
	8.6	Bore discontinued at 8.6m - target depth reached										PL(A) = 2.4
34	9											

RIG: Scout 2 **DRILLER:** Ground Test **LOGGED:** LS **CASING:** HW to 2.85m

TYPE OF BORING: Diacore to 0.16m; Solid flight auger (TC-bit) to 2.5m; Washbore to 2.85m; NMLC-Coring to 8.6m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: MC = Moisture Content; PL = Plastic Limit

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: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 45.2 AHD
EASTING: 325735
NORTHING: 6260295
DIP/AZIMUTH: 90°/--

BORE No: 12
PROJECT No: 86043.01
DATE: 3-11-2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Degree of Weathering (EW, HW, MW, SW, FS, FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
45	0.15	FILLING - dark grey, medium to fine sand filling (topsoil), slightly clayey with bark and rootlets and a trace of ironstone gravel, damp							A/E			
									A/E			
44	1.2	FILLING - brown, medium to fine clayey sand filling with some ironstone gravel and trace of rootlets, damp 0.4-0.5m: metal and plastic wire fragment							A S			4,5,5 N = 10
		SANDY CLAY - stiff, brown, medium grained sandy clay, moist						Note: Unless otherwise stated, rock is fractured along rough planar bedding dipping 0°- 10°	A/E			
43	2.1	SANDSTONE - extremely low to very low strength, red-brown and light grey sandstone										
	2.4	SANDSTONE - medium strength, moderately to highly weathered, fractured to slightly fractured, red-brown medium grained sandstone						2.54m: B0°, cly, 3mm 3.15m: B0°, cly, 2mm 3.21m: B0°, cly, 10mm 3.46m: B0°, cly, 1mm 3.49-3.59m: Cs, 100mm 3.61m: CORE LOSS: 80mm 3.86m: B0°, cly, 1mm, fe	C	95	80	PL(A) = 0.55 PL(A) = 0.46
42	3.69											
41	4.0	SANDSTONE - high strength, moderately weathered, slightly fractured, red-brown medium to coarse grained sandstone				12-12-17		4.2m: B0°, cly, 1mm 4.58m: B15°, cly, 1mm, fe 6.31-6.33: B (x2) 0°, fe 6.51-6.79m: B (x3) 0°, cly, 1mm	C	100	96	PL(A) = 1.7 PL(A) = 1.8 PL(A) = 1.2
38	6.93	Bore discontinued at 6.93m - target depth reached										

RIG: Scout 2 **DRILLER:** Ground Test **LOGGED:** LS **CASING:** HW to 2.4m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.4m; NMLC-Coring to 6.93m

WATER OBSERVATIONS: No free groundwater observed whilst augering. Water level at 4.1m depth on 12/12/17

REMARKS: Well installed to 6.93m (blank 0.0-2.1m; screen 2.1-6.93m; filling 0.0-1.5m; bentonite 1.5-2.3m; sand 2.3-6.93m)

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: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 46.8 AHD
EASTING: 325702
NORTHING: 6260260
DIP/AZIMUTH: 90°/--

BORE No: 13
PROJECT No: 86043.01
DATE: 3-11-2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Degree of Weathering	Graphic Log	Rock Strength	Water	Fracture Spacing (m)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
46		FILLING - light brown sandy clay filling with some roadbase gravel, damp							A/E			
	0.6	- root affected to 0.09m							A/E			
		0.3m: with some ironstone gravel										
	1	FILLING - dark brown clay filling, slightly sandy with some fine sandstone gravel, damp							A/E			
	1.35	SILTY CLAY - stiff to very stiff, yellow-brown silty clay, slightly sandy, with a trace of ironstone gravel, moist						Note: Unless otherwise stated, rock is fractured along rough planar bedding dipping 0°- 10°	S			2,4,6 N = 10 pp = 440
45									A/E			
	2											
	2.0	SANDSTONE - extremely low to very low strength, light grey and red-brown sandstone										
	2.3	SANDSTONE - low to medium then high strength, slightly weathered, slightly fractured and unbroken, light grey sandstone bands and light brown thinly and thickly bedded						2.37-2.43m: Cs, 60mm 2.47-2.93m: B (x3) 0°, cly, 3mm 2.97-2.99m: Cs, 20mm	C	100	87	PL(A) = 0.2 PL(A) = 0.61
44	3											
43	4											
42								4.58m: B5°, fe, cly, 2mm				PL(A) = 1
	5	5.24-5.3m: highly fractured, iron-cemented				12-12-17		4.95m: B10°, cly, 1mm fr				
	5.3	SANDSTONE - high strength, slightly weathred, slightly fractuerd, purple-grey, medium to coarse grained sandstone						5.25-5.31m: B (x5) 5°-10°, manganese, fe 5.54m: B0°, cly, 10mm	C	100	95	
41	6											PL(A) = 1.4 PL(A) = 2
40								6.43m: B0°, cly, 2mm, manganese				
	7											
	7.0	Bore discontinued at 7.0m - target depth reached										
39	8											
38	9											
37												

RIG: Scout 2 **DRILLER:** Ground Test **LOGGED:** LS **CASING:** HW to 2.3m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.3m; NMLC-Coring to 7.0m

WATER OBSERVATIONS: No free groundwater observed whilst augering. Water level at 4.9m depth on 12/12/17

REMARKS: Well installed to 7.0m (blank 0.0-2.1m; screen 2.1-7.0m; filling 0.0-1.3m; bentonite 1.5-1.8m; gravel 1.8-7.0m; gravel bridge in hole)

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: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 45.1 AHD
EASTING: 325807
NORTHING: 6260305
DIP/AZIMUTH: 90°/--

BORE No: LP1
PROJECT No: 86043.01
DATE: 9-11-2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Type	Core Rec. %	RQD %	Test Results & Comments
45	0.2	FILLING - brown sandy gravelly clay filling, fine to medium gravel, moist, medium plasticity, MC<PL - root affected to 0.02m	A/E			
		FILLING - brown silty sand filling, slightly clayey with some fine sandstone and ironstone gravel, humid, MC<<PL	A/E			
44	1		A			
	1.3	CLAY - stiff to very stiff, red-brown mottled brown clay with some fine sand, MC<PL, medium plasticity (residual)	S			14,10,10 N = 20
43	2					
	2.2	SANDSTONE - extremely low strength, extremely weathered, light grey sandstone (very stiff to hard sandy clay properties), - very low strength from 2.5m	S			10/50mm refusal bouncing
42	3	SANDSTONE - low and medium strength, moderately weathered, slightly fractured, red-brown, brown and light grey, medium grained sandstone	C	100	65	PL(A) = 0.14
	3.75	SANDSTONE - low and medium strength with extremely low strength bands, fresh, slightly fractured, light grey, medium grained sandstone with trace siltstone laminae <5%				
41	4					
	4.59	SANDSTONE - high strength, fresh, slightly fractured, light grey, medium grained sandstone				PL(A) = 0.59
40	5					PL(A) = 1.5
39	5.88		C	97	78	PL(A) = 1.5
38	6					
	7					
37	8					PL(A) = 1.4
	8.52	SANDSTONE - very low strength with some medium strength bands, moderately weathered, slightly fractured, light brown, medium grained sandstone	C	92	32	PL(A) = 0.07
	8.59					
36	9					
	9.0	Bore discontinued at 9.0m - target depth reached				

Degree of Weathering: EW, HW, MW, SW, FS, FR

Graphic Log

Rock Strength: Ex Low, Very Low, Low, Medium, High, Very High, Ex High

Water

Fracture Spacing (m): 0.01, 0.05, 0.10, 0.50, 1.00

Discontinuities: B - Bedding, J - Joint, S - Shear, F - Fault

Note: Unless otherwise stated, rock is fractured along rough planar bedding dipping 0°- 10°

3.61m: B30°, un, sm, cly
3.69m: B30°, pl, sm, cbs
3.77m: B30°, pl, sm, cly
4.52m: B10°, pl, ro, cly
4.58m: B5°, pl, sm, cly
5.56m: B10°, un, ro, cln
5.65m: J50°, pl, ro, cln
5.74m: J45°, pl, ro, he
5.8m: CORE LOSS: 80mm
6.32m: B15°, un, ro, cln
6.67m: B15°, pl, ro, cly
7m: J45°, pl, ro, un
7.05m: B0°, pl, ro, cly
7.35m: B5°, pl, he
7.57m: B5°, pl, he
7.58m: B30°, pl, ro, cln
7.98m: J75°, pl, ro, cln
8.4m: B30°, pl, ,ro
8.42m: J80°, pl, ro
8.55m: CORE LOSS: 40mm
8.63m: B10°, pl, sm, cln
8.74m: B10°, pl, sm, cly

RIG: Scout 2 **DRILLER:** Ground Test **LOGGED:** SCP **CASING:** HW to 2.5m

TYPE OF BORING: Solid flight auger to 2.5m; Washbore to 2.63m; NMLC-Coring to 9.0m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

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: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 66.9 AHD
EASTING: 325490
NORTHING: 6260594
DIP/AZIMUTH: 90°/--

BORE No: 31
PROJECT No: 86043.01
DATE: 9-11-2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
		FILLING - apparently compacted, dark brown, clayey sand filling, medium sand with some ironstone gravel and traces of brick fragments, damp		A/E	0.0 0.1				
	0.15	FILLING - light brown, silty clay filling, slightly sandy, medium to fine sand, MC<PL - typically in an apparently compacted condition		A/E B	0.4 0.5 0.7				
66	1								1
		1.7m: becoming light orange-brown (possibly natural)		A	1.7 1.8				
65	2								2
	2.1	SHALE - very low to low strength, light grey shale with orange bands		A	2.1 2.2				
	2.35	Bore discontinued at 2.35m - auger refusal on low strength shale							
64	3								3
63	4								4
62									

RIG: 3.5t excavator **DRILLER:** A & A Hire **LOGGED:** LS **CASING:** Uncased

TYPE OF BORING: 300mm diameter solid flight auger to 2.35m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: MC = Moisture Content; PL = Plastic Limit

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

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

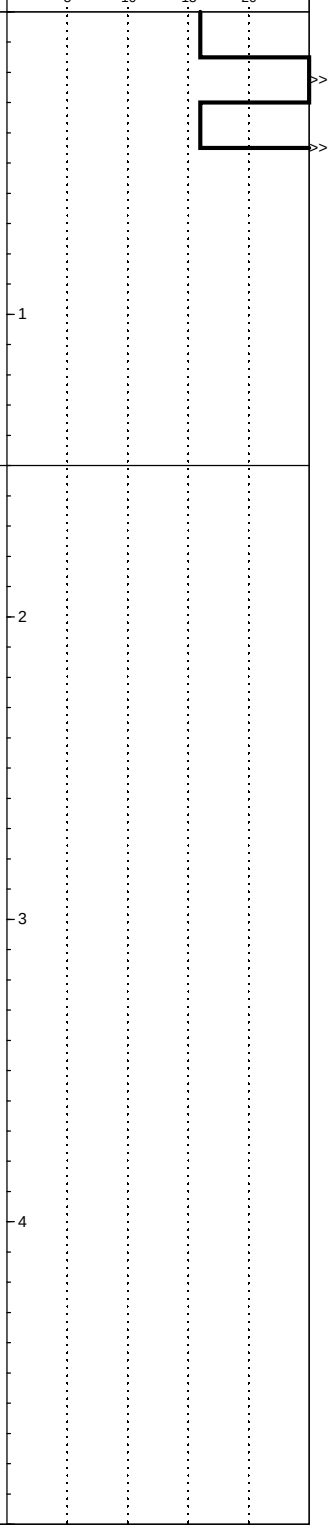
BOREHOLE LOG

CLIENT: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 63.1 AHD
EASTING: 325538
NORTHING: 6260575
DIP/AZIMUTH: 90°/--

BORE No: 32
PROJECT No: 86043.01
DATE: 9-11-2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
63		FILLING - apparently compacted, dark brown, sand filling, medium sand with some clay and sandstone gravel, moist		A/E	0.0 0.1				
	0.2	SANDSTONE - very low to low strength, light brown sandstone with extremely low strength bands (hard clay properties)							
				B	0.5 0.7				
62	1								
	1.5	Bore discontinued at 1.5m - auger refusal on low to medium strength sandstone							
61	2								
60	3								
59	4								



RIG: 3.5t excavator **DRILLER:** A & A Hire **LOGGED:** LS **CASING:** Uncased

TYPE OF BORING: 300mm diameter solid flight auger to 1.5m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

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

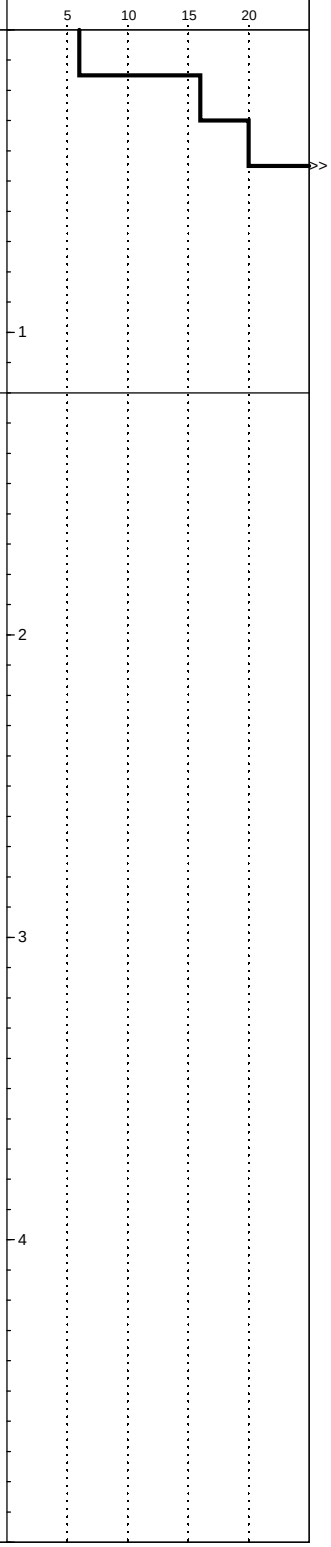
BOREHOLE LOG

CLIENT: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 62.7 AHD
EASTING: 325497
NORTHING: 6260509
DIP/AZIMUTH: 90°/--

BORE No: 33
PROJECT No: 86043.01
DATE: 9-11-2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
		FILLING - apparently compacted, brown clayey sand filling with some sandstone gravel and silt, damp		A/E	0.0 0.1				
	0.5	FILLING - apparently compacted, light brown sand filling, medium to fine sand, slightly clayey, with some ironstone and roadbase gravel, damp		A/E B	0.4 0.5 0.7				
62	1 1.0	FILLING - apparently compacted, light yellow-brown medium to fine sand filling, damp							1
	1.2	Bore discontinued at 1.2m - due to possible concrete boulder or service (concrete at side of hole)							
61	2								2
60	3								3
59	4								4
58									



RIG: 3.5t excavator **DRILLER:** A & A Hire **LOGGED:** LS **CASING:** Uncased

TYPE OF BORING: 300mm diameter solid flight auger to 1.2m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

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: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 65.3 AHD
EASTING: 325461
NORTHING: 6260475
DIP/AZIMUTH: 90°/--

BORE No: 34
PROJECT No: 86043.01
DATE: 3-10-2017
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
		FILLING - brown gravelly sand filling, medium grained ironstone and roadbase gravel with some clay, moist - root affected to 0.1m		E	0.0				
				A/E	0.1				
65					0.2				
	0.4	SANDSTONE - medium strength, orange-brown sandstone with some low strength bands							
		0.6m: becoming light grey, medium and high strength		A	0.5				
					0.6				
					0.9				
	1 1.0	Bore discontinued at 1.0m - target depth reached		A	1.0				1
64									
	2								2
63									
	3								3
62									
	4								4
61									

RIG: Scout 2 **DRILLER:** Ground Test **LOGGED:** LS **CASING:** Uncased

TYPE OF BORING: Solid flight auger (TC-bit) to 1.0m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

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

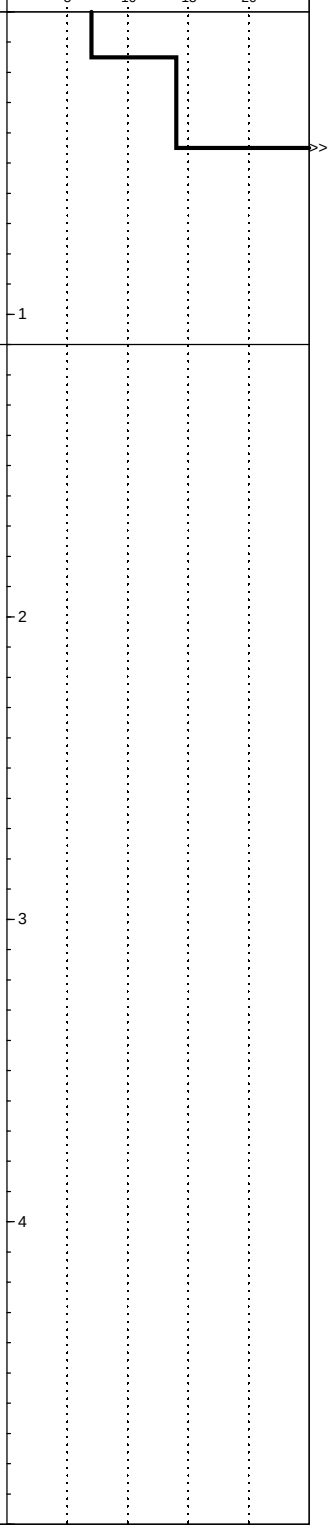
BOREHOLE LOG

CLIENT: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 65.1 AHD
EASTING: 325463
NORTHING: 6260433
DIP/AZIMUTH: 90°/--

BORE No: 35
PROJECT No: 86043.01
DATE: 11-9-2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
65	0.15	FILLING - apparently compacted, dark brown clayey sand filling, medium grained, with a trace of roadbase gravel, damp		A/E	0.0 0.1				
		FILLING - apparently compacted, light brown clay filling, slightly sandy, medium to fine sand with some sandstone gravel, MC<PL		B	0.2 0.7				
	0.8	SANDSTONE - very low to low strength, light grey sandstone		A	1.0				
64	1.1	Bore discontinued at 1.1m - auger refusal on low to medium strength rock			1.1				
63									
62									
61									



RIG: 3.5t excavator **DRILLER:** A & A Hire **LOGGED:** LS **CASING:** Uncased

TYPE OF BORING: 300mm diameter solid flight auger to 1.1m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: MC = Moisture Content; PL = Plastic Limit

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

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: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 59.4 AHD
EASTING: 325532
NORTHING: 6260471
DIP/AZIMUTH: 90°/--

BORE No: 36
PROJECT No: 86043.01
DATE: 14-11-2017
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
	0.11	FILLING - apparently hard, light brown, silty clay filling with some fine sand and sandstone gravel, MC<PL							
		Bore discontinued at 0.11m - hand auger refusal on sandstone gravel and hard clay							
59									
	1								1
58									
	2								2
57									
	3								3
56									
	4								4
55									

RIG: Hand tools **DRILLER:** LS **LOGGED:** LS **CASING:** Uncased

TYPE OF BORING: 150mm diameter hand auger to 0.11m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Bore hand augered only due to high risk of potential services after services scanning. MC = Moisture Content; PL = Plastic Limit

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

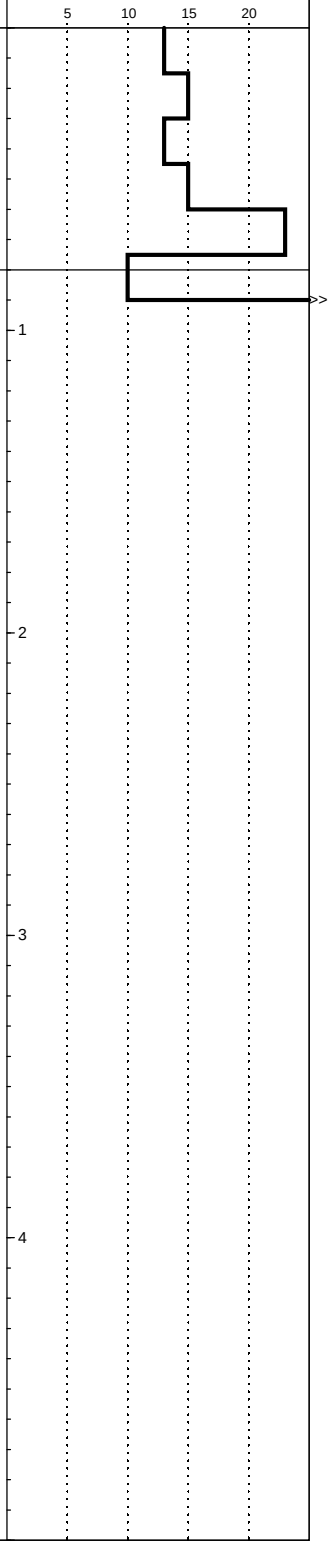
CLIENT: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 52.2 AHD
EASTING: 325645
NORTHING: 6260488
DIP/AZIMUTH: 90°/--

BORE No: 37
PROJECT No: 86043.01
DATE: 9-11-2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water
52	0.2	FILLING - apparently compacted, brown silty clay filling, slightly sandy, medium to fine grained, with a trace of ironstone gravel, MC<PL		A/E	0.0 0.1			
		FILLING - apparently compacted, light brown, clayey sandy filling, medium to fine grained with some sandstone gravel, damp		A/E B	0.4 0.5			
	0.8	Bore discontinued at 0.8m - auger refusal on concrete boulder			0.8			
51	1							
50	2							
49	3							
48	4							

Dynamic Penetrometer Test (blows per 150mm)



RIG: 3.5t excavator **DRILLER:** A & A Hire **LOGGED:** LS **CASING:** Uncased

TYPE OF BORING: 300mm diameter solid flight auger to 0.8m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: MC = Moisture Content; PL = Plastic Limit

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

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: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 63.9 AHD
EASTING: 325482
NORTHING: 6260409
DIP/AZIMUTH: 90°/--

BORE No: 38
PROJECT No: 86043.01
DATE: 8-11-2017
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
		FILLING - dark brown, sandy clay filling, slightly silty, with a trace of ironstone and riverstone gravel, MC<PL		A/E	0.0 0.1				
	0.4	SANDSTONE - medium to high strength, red-brown sandstone		A/E	0.4 0.5				
63				A/E	0.9				
	1 1.0	Bore discontinued at 1.0m - target depth reached			1.0				1
62	2								2
61	3								3
60	4								4
59									

RIG: Scout 2 **DRILLER:** Ground Test **LOGGED:** LS **CASING:** Uncased

TYPE OF BORING: Solid flight auger (TC-bit) to 1.0m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

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

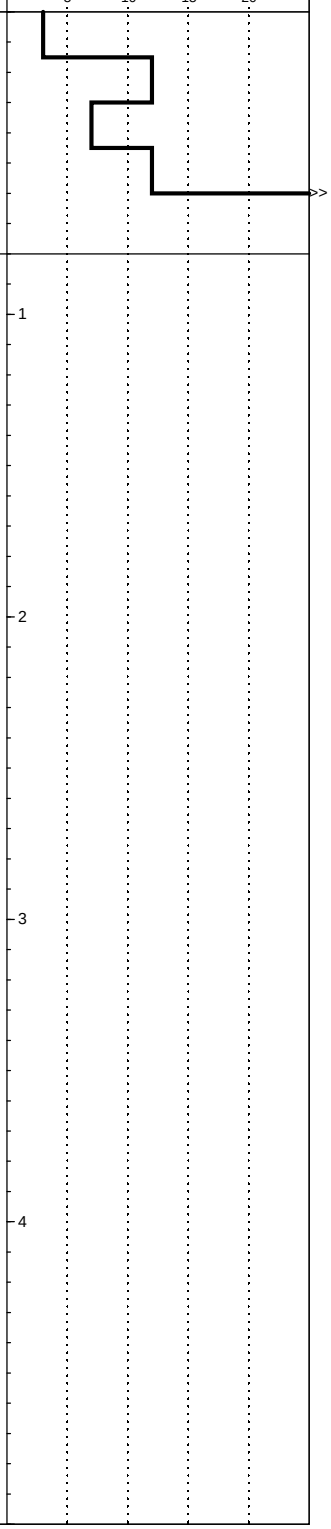
BOREHOLE LOG

CLIENT: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 57.9 AHD
EASTING: 325554
NORTHING: 6260381
DIP/AZIMUTH: 90°/--

BORE No: 39
PROJECT No: 86043.01
DATE: 9-11-2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
	0.1	FILLING - poorly compacted, dark brown, sand filling, slightly clayey with some sandstone gravel, moist		A/E	0.0				
		CLAYEY SAND - dense, yellow-brown medium to coarse sandy clay with some ironstone gravel, moist		B	0.1				
	0.5	SANDSTONE - extremely low to very low strength, orange-brown sandstone		A/E/B	0.4				
	0.8	Bore discontinued at 0.8m - auger refusal on low to medium strength sandstone			0.5				



RIG: 3.5t excavator **DRILLER:** A & A Hire **LOGGED:** LS **CASING:** Uncased

TYPE OF BORING: 300mm diameter solid flight auger to 0.8m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

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: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 53.6 AHD
EASTING: 325600
NORTHING: 6260407
DIP/AZIMUTH: 90°/--

BORE No: 40
PROJECT No: 86043.01
DATE: 9-11-2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
	0.05	BRICK PAVERS		A/E	0.05				
	0.15	FILLING - brown sand filling, moist			0.1				
		FILLING - apparently compacted, brown clay filling with some silt and ironstone gravel, MC>PL, moist							
				A/E	0.4				
					0.5				
53	1								1
	1.2	CLAY - apparently stiff, brown clay with some coarse sand and ironstone gravel, MC>PL		A/E/B	1.2				
					1.3				
				B					
	1.5	SANDSTONE - extremely low to very low strength, light grey mottled orange-brown sandstone			1.5				
52					1.6				
				A	1.7				
	2	2.0m: turning light grey mottled red							2
					2.3				
				A	2.4				
51	2.6	Bore discontinued at 2.6m - auger refusal on low to medium strength sandstone							
	3								3
50									
	4								4
49									

RIG: 3.5t excavator **DRILLER:** A & A Hire **LOGGED:** LS **CASING:** Uncased

TYPE OF BORING: 300mm diameter solid flight auger to 2.6m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: MC = Moisture Content; PL = Plastic Limit

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

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: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 53.7 AHD
EASTING: 325603
NORTHING: 6260366
DIP/AZIMUTH: 90°/--

BORE No: 41
PROJECT No: 86043.01
DATE: 30-10-2017
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
		FILLING - dark brown sand filling (topsoil), slightly clayey, medium to fine grained with some ironstone gravel and trace of rootlets, damp		A/E	0.0 0.1				
	0.2	CLAY - apparently stiff, yellow-brown clay with some sand and a trace of ironstone gravel, damp, possibly disturbed		A/E	0.4 0.5				
53	0.7	SANDSTONE - low to medium strength, light grey and red-brown sandstone with extremely low to very low and medium strength bands		A S	0.9 1.0 1.1		10/100mm refusal bouncing		
52	1								1
	2			A	2.0				2
	2.1	Bore discontinued at 2.1m - target depth reached			2.1				
51	3								3
50	4								4
49									

RIG: Scout 2 **DRILLER:** Ground Test **LOGGED:** LS **CASING:** Uncased

TYPE OF BORING: Solid flight auger (TC-bit) to 2.1m;

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

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: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 52.0 AHD
EASTING: 325633
NORTHING: 6260386
DIP/AZIMUTH: 90°/--

BORE No: 42
PROJECT No: 86043.01
DATE: 9-11-2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
52		FILLING - apparently compacted, light brown, clayey sand filling, medium to fine grained with some ironstone and roadbase gravel, damp - root affected to 0.05m		A/E	0.05 0.1				
				A/E	0.4 0.5				
				B	0.6				
				A/E	0.9 1.0				
51	1								1
	1.3	CLAY - apparently stiff, light brown clay with some silt and fine grained sand, possibly extremely weathered sandstone		E A	1.4 1.5 1.6				
	1.7	SANDSTONE - low strength, red-brown and light grey sandstone							
50	2			A	2.0 2.1				2
	2.2	Bore discontinued at 2.2m - auger refusal on low to medium strength sandstone							
49	3								3
48	4								4

Dynamic Penetrometer Test (blows per 150mm): 5, 10, 15, 20

RIG: 3.5t excavator **DRILLER:** A & A Hire **LOGGED:** LS **CASING:** Uncased

TYPE OF BORING: 300mm diameter solid flight auger to 2.1m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

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

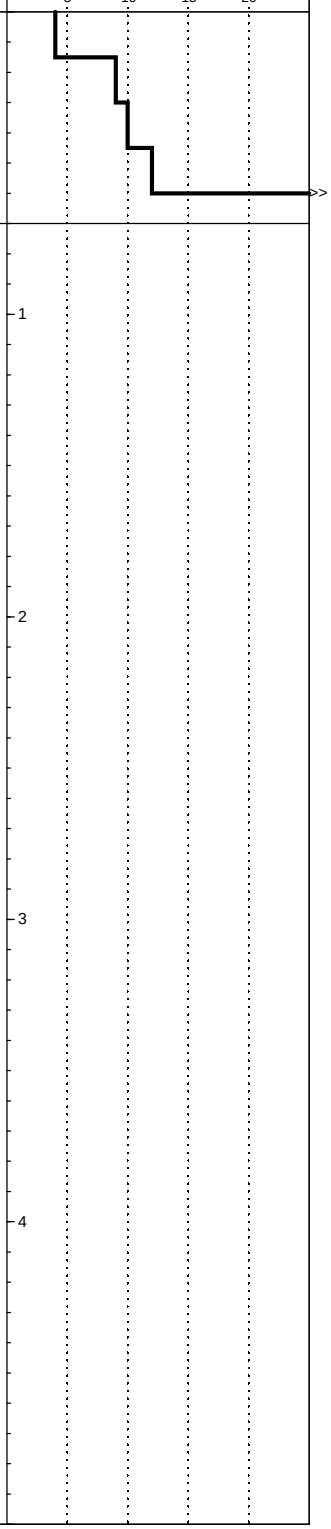
BOREHOLE LOG

CLIENT: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 52.2 AHD
EASTING: 325604
NORTHING: 6260317
DIP/AZIMUTH: 90°/--

BORE No: 43
PROJECT No: 86043.01
DATE: 14-11-2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
52		FILLING - brown gravelly medium to coarse sand filling with some roadbase gravel and brick fragments, angular to subangular with some silt, trace of rootlets, damp		A/E/B B	0.0 0.1				
	0.4	SANDSTONE - extremely low to very low strength, orange-brown sandstone		A	0.4 0.5 0.6				
	0.7	Bore discontinued at 0.7m - auger refusal on low to medium strength sandstone							
51	1								1
50	2								2
49	3								3
48	4								4



RIG: 3.5t excavator **DRILLER:** A & A Hire **LOGGED:** LS **CASING:** Uncased

TYPE OF BORING: 300mm diameter solid flight auger to 0.7m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

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: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 47.0 AHD
EASTING: 325702
NORTHING: 6260345
DIP/AZIMUTH: 90°/--

BORE No: 44
PROJECT No: 86043.01
DATE: 10-11-2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
47		FILLING - apparently compacted, brown clayey sand filling with a trace of sandstone gravel, damp		A/E	0.0 0.1				
				A/E	0.4				
	0.5	SANDSTONE - extremely low to very low strength, orange-brown mottled grey sandstone 0.8m: becoming low to medium strength			0.5				
46	1			A/E S	0.9 1.0 1.05		7/50mm refusal bouncing		1
	1.15	Bore discontinued at 1.15m - auger refusal on medium strength sandstone		A	1.1 1.15				
45	2								2
44	3								3
43	4								4

Dynamic Penetrometer Test (blows per 150mm): 5, 10, 15, 20 >>

RIG: Bobcat **DRILLER:** A & A Hire **LOGGED:** LS **CASING:** Uncased

TYPE OF BORING: 125mm diameter solid flight auger to 1.15m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

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

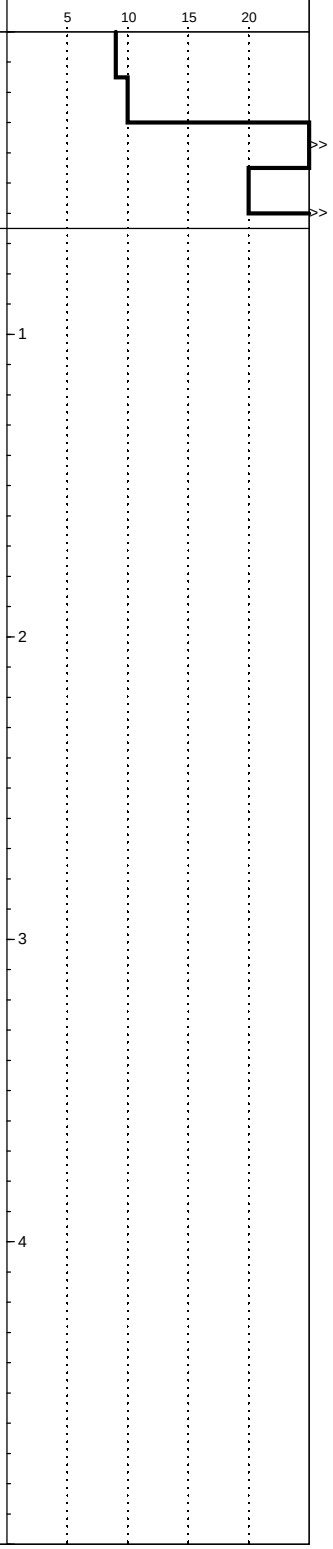
BOREHOLE LOG

CLIENT: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 49.6 AHD
EASTING: 325634
NORTHING: 6260281
DIP/AZIMUTH: 90°/--

BORE No: 45
PROJECT No: 86043.01
DATE: 14-11-2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
		FILLING - apparently compacted, brown sand filling, medium to fine grained with some clay and traces of roadbase gravel, damp		A/E	0.05 0.1				
		0.2m: plastic sheet 0.2m: concrete boulder		B					
	0.5	SANDSTONE - very low to low strength, light grey sandstone		A	0.5 0.6				
49	0.65	Bore discontinued at 0.65m - auger refusal on low to medium strength sandstone							
	1								
48									
	2								
47									
	3								
46									
	4								
45									



RIG: 3.5t excavator **DRILLER:** A & A Hire **LOGGED:** LS **CASING:** Uncased

TYPE OF BORING: 300mm diameter solid flight auger to 0.65m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

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: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 47.3 AHD
EASTING: 325695
NORTHING: 6260305
DIP/AZIMUTH: 90°/--

BORE No: 46
PROJECT No: 86043.01
DATE: 14-11-2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
47		FILLING - brown sand filling, fine grained sand with some clay and silt, with a trace of roadbase gravel 0.1m: pen 0.2m: brick 0.3m: sea shell		A/E	0.05 0.1				
	0.5	FILLING - light brown, fine to medium sandy clay filling with some silt, with a trace of roadbase gravel, MC<PL		A/E/B B	0.5 0.6				>>
	0.8	Bore discontinued at 0.8m - auger refusal on low to medium strength sandstone (possible boulder)			0.8				>> >>
46	1								1
45	2								2
44	3								3
43	4								4

Dynamic Penetrometer Test (blows per 150mm): 5, 10, 15, 20

RIG: 3.5t excavator **DRILLER:** A & A Hire **LOGGED:** LS **CASING:** Uncased

TYPE OF BORING: 300mm diameter solid flight auger to 0.8m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: DCP 46A offset 1m from Bore 46

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

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

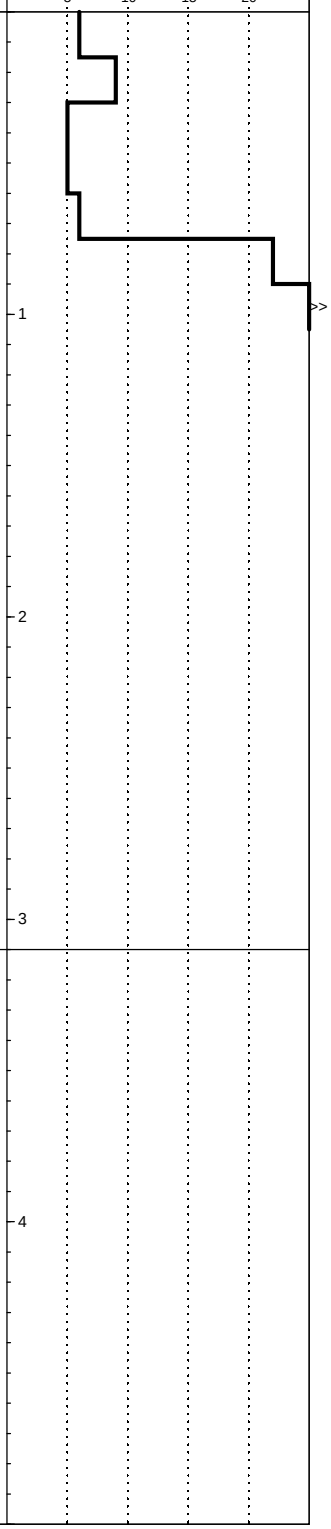
CLIENT: Fraser Property Ivanhoe Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Ivanhoe Estate, Macquarie Park

SURFACE LEVEL: 44.1 AHD
EASTING: 325755
NORTHING: 6260398
DIP/AZIMUTH: 90°/--

BORE No: 47
PROJECT No: 86043.01
DATE: 14-11-2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water
44		FILLING - dark brown clay filling with some medium to fine sand and a trace of ironstone and roadbase gravel, MC<PL		A/E	0.05			
					0.1			
				A/E	0.4			
					0.5			
	0.6	CLAY - light brown clay filling with some fine sand, silt and a trace of ironstone gravel, MC<PL (possible filling to 1.3m)		B				
43	1				1.0			
				A/E	1.4			
					1.5			
				B				
					1.8			
	1.9	CLAY - red-brown mottled light brown clay, with some coarse to fine sand and slt, MC<PL, possibly extremely weathered sandstone						
42	2			A	2.0			
					2.1			
				A	2.4			
					2.5			
	3			A	3.0			
41	3.1	Bore discontinued at 3.1m - maximum depth of auger			3.1			
40	4							

Dynamic Penetrometer Test (blows per 150mm)



RIG: 3.5t excavator **DRILLER:** A & A Hire **LOGGED:** LS **CASING:** Uncased

TYPE OF BORING: 300mm diameter solid flight auger to 3.1m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: MC = Moisture Content; PL = Plastic Limit

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

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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HA01

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.6
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Clayey Silty SAND - Dark brown, heterogeneous, damp, poorly graded, fine to medium grained, angular, sub-rounded with inclusions of sandstone gravels concrete and brick fragments	HA01 0.0-0.1	No Odours, Staining or Asbestos
		0.30		Fill	Fill - Silty SAND - Light brown, heterogeneous, damp, fine to medium grained angular, homogeneous loose	HA01 0.3-0.4	No Odours, Staining or Asbestos
	0.5						
		0.60			Borehole HA01 terminated at 0.6m		
	1.0						

HA02

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.3
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Silty SAND - dark brown, heterogeneous, damp, poorly graded, very loose	HA02 0.0-0.05	No Odours, Staining or Asbestos
		0.05		Fill	Fill - Gravelly SAND - brown/grey, homogeneous, damp, fine to medium grained, very loose sandstone gravel		
						HA02 0.2-0.3	No Odours, Staining or Asbestos
		0.30			Borehole HA02 terminated at 0.3m		
	0.5						
	1.0						

HA03

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.15
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Silty SAND - dark brown, heterogeneous, damp, poorly graded, angular, loose consistency	HA03 0.0-0.1	Refusal on sandstone No Odours, Staining or Asbestos
		0.15			Borehole HA03 terminated at 0.15m		
	0.5						
	1.0						

BOREHOLE JBSG BOREHOLE.GPJ GINT STD AUSTRALIA.GDT 30/9/16

HA04

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.3
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Silty SAND - Dark brown, heterogeneous, damp, poorly graded, fine to medium grained, angular- sub-angular	HA04 0.0-0.1	No Odours, Staining or Asbestos
		0.10		Fill	Fill - Gravelly SAND - Orangish brown, homogeneous, damp, poorly graded, fine to medium grained, angular to sub-rounded	HA04 0.2-0.3	Refusal on sandstone
		0.30			Borehole HA04 terminated at 0.3m		No Odours, Staining or Asbestos
	0.5						
	1.0						

BOREHOLE JBSG BOREHOLE.GPJ GINT STD AUSTRALIA.GDT 30/9/16

HA05

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.4
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Silty Gravelly SAND - Dark brown, heterogeneous , damp, poorly graded, fine to medium grained, angular to sub-rounded, very loose, inclusions of roots	HA05 0.0-0.1	No Odours, Staining or Asbestos
		0.10		Fill	Fill - Gravelly SAND - Orangish brown, dry, poorly graded, fine to medium grained, angular to sub-rounded, loose, non plastic, firm weathered SST sandstone	HA05 0.3-0.4	No Odours, Staining or Asbestos
		0.40			Borehole HA05 terminated at 0.4m		
	0.5						
	1.0						

HA06

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.4
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Silty SAND - Dark brown, heterogeneous, damp, poorly graded, fine to medium grained, angular to sub-rounded, high organic content and rare glass fragments.	HA06 0.0-0.1	No Odours, Staining or Asbestos
		0.10		Fill	Fill - Gravelly SAND - Greyish brown, homogeneous, damp, gravelly, fine to medium grained, angular to sub-rounded, frequent sandstone gravels	HA06 0.3-0.4	No Odours, Staining or Asbestos
		0.40			Borehole HA06 terminated at 0.4m		
	0.5						
	1.0						

BOREHOLE JBSG BOREHOLE.GPJ GINT STD AUSTRALIA.GDT 30/9/16

HA07

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.4
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Clayey Gravelly SAND - Orange brown, homogeneous, damp, poorly graded fine to medium grained, angular to sub-rounded, loose to medium dense with frequent sandstone	HA07 0.0-0.1	No Odours, Staining or Asbestos
		0.40			Borehole HA07 terminated at 0.4m		
	0.5						
	1.0						

HA08

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.2
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Clayey SAND - Orangish brown, homogeneous, dry, non plastic, firm to stiff, weathered bedrock	HA08 0.0-0.1	Refusal on sandstone bedrock No Odours, Staining or Asbestos
		0.20			Borehole HA08 terminated at 0.2m		
	0.5						
	1.0						

HA09

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.2
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Clayey SAND - Orangish brown, homogeneous, dry, fine to medium grained, angular to sub-rounded, non plastic, firm to stiff	HA09 0.0-0.1	No Odours, Staining or Asbestos
		0.20			Borehole HA09 terminated at 0.2m		
	0.5						
	1.0						

HA10

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.4
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Clayey SAND - Dark brown, poorly graded, fine to medium grained, angular to sub-rounded	HA10 0.0-0.1	No Odours, Staining or Asbestos
		0.40			Borehole HA10 terminated at 0.4m		
	0.5						
	1.0						

HA11

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.4
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Clayey SAND - Dark brown, heterogeneous, damp, poorly graded, fine to medium grained, angular to sub-rounded, high organic content	HA11 0.0-0.1	No Odours, Staining or Asbestos
		0.10		Fill	Fill - Gravelly SAND - Orangish brown, homogeneous, poorly graded, fine to medium grained, angular to sub-rounded	HA11 0.3-0.4	No Odours, Staining or Asbestos
		0.40			Borehole HA11 terminated at 0.4m		
	0.5						
	1.0						

HA12

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.4
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Silty SAND - Dark brown,heterogeneous, damp, poorly graded, fine to medium grained, angular to sub-rounded, high in organic and root content	HA12 0.0-0.1	No Odours, Staining or Asbestos
		0.10		Fill	Fill - Gravelly Clayey SAND - Orangish brown, homogeneous, poorly graded, fine to medium grain, angular to sub-rounded, low plasticity	HA12 0.3-0.4	No Odours, Staining or Asbestos
		0.40			Borehole HA12 terminated at 0.4m		
	0.5						
	1.0						

HA13

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.2
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly SAND - Orangish brown, poorly graded, fine to medium grained, angular to sub-rounded, very loose to medium dense	HA13 0.0-0.1	No Odours, Staining or Asbestos
							Refusal on sandstone bedrock
		0.20			Borehole HA13 terminated at 0.2m		
	0.5						
	1.0						

BOREHOLE JBSG BOREHOLE.GPJ GINT STD AUSTRALIA.GDT 30/9/16

HA14

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.2
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Silty SAND - Dark brown,heterogeneous, damp, poorly graded, loose density, high organic content	HA14 0.0-0.1	No Odours, Staining or Asbestos
		0.10		Fill	Fill - Gravelly Silty SAND - Greyish brown, homogeneous, damp, poorly graded, fine to medium grained, angular to sub-rounded		
						HA14 0.2-0.3	No Odours, Staining or Asbestos
		0.30			Borehole HA14 terminated at 0.2m		
	0.5						
	1.0						

HA15

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.4
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Silty SAND - Dark brown, heterogeneous, damp, poorly graded, fine to medium grained, angular to sub-rounded	HA15 0.0-0.1	No Odours, Staining or Asbestos
		0.10		Fill	Fill - Gravelly Clayey SAND - Orangish brown, homogeneous, damp, fine to medium grained, low plasticity	HA15 0.2-0.3	No Odours, Staining or Asbestos
		0.40			Borehole HA15 terminated at 0.4m		
	0.5						
	1.0						

HA16

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.4
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Silty SAND - Dark brown,heterogeneous, damp, poorly graded, high organic content	HA16 0.0-0.1	No Odours, Staining or Asbestos
		0.10		Fill	Fill - Gravelly Silty SAND - Light brown,homogeneous, dry, poorly graded, fine to medium grained, angular to sub-rounded, roots present	HA16 0.2-0.3	No Odours, Staining or Asbestos
		0.40			Borehole HA16 terminated at 0.4m		
	0.5						
	1.0						

HA17

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 5/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.4
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Silty SAND - Brown, heterogeneous, damp, poorly graded, fine to medium grained, angular to sub-rounded	HA17 0.0-0.1	No Odours, Staining or Asbestos
		0.10		Fill	Fill - Gravelly Clayey SAND - Orangish brown, homogeneous, damp, poorly graded, very angular, loose density	HA17 0.2-0.3	No Odours, Staining or Asbestos
		0.40			Borehole HA17 terminated at 0.4m		
	0.5						
	1.0						

HA18

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.6
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Silty Gravelly SAND - Dark brown, poorly graded, very loose, high organic matter	HA18 0.0-0.05	No Odours, Staining or Asbestos
		0.10		Fill	Fill - Clayey SAND - Dark yellowish brown, homogeneous, damp, low plasticity		
						HA18 0.2-0.3	No Odours, Staining or Asbestos
	0.5						
		0.60			Borehole HA18 terminated at 0.6m		
	1.0						

HA19

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 5/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.4
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Clayey SAND - Brown, heterogeneous, damp, poorly graded, fine to medium grained, angular to sub-rounded, loose density	HA19 0.0-0.1	No Odours, Staining or Asbestos
		0.10		Fill	Fill - Gravelly Silty SAND - Orangish brown, heterogeneous, damp, poorly graded, fine to medium grained, angular to sub-rounded,	HA19 0.2-0.3	No Odours, Staining or Asbestos
		0.40			Borehole HA19 terminated at 0.4m		
	0.5						
	1.0						

HA20

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 5/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.15
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Clayey SAND - Dark brown,heterogeneous, damp, poorly graded, fine to medium grained, angular to sub-rounded, loose density	HA20 0.0-0.1	No Odours, Staining or Asbestos Refusal on sandstone
		0.15			Borehole HA20 terminated at 0.15m		
	0.5						
	1.0						

HA21

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 5/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.5
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Silty SAND - Brown, heterogeneous, damp, roots present	HA21 0.0-0.1	No Odours, Staining or Asbestos
		0.15		Fill	Fill - Clayey SAND - Brown, homogeneous, dense	HA21 0.2-0.5	No Odours, Staining or Asbestos
	0.5						
		0.50			Borehole HA21 terminated at 0.5m		
	1.0						

HA22

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 5/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.4
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Clayey SAND - Brown, heterogeneous, damp, poorly graded, very angular to sub-rounded, loose density	HA22 0.0-0.1	No Odours, Staining or Asbestos
		0.10					
							Refusal on sandstone
					Borehole HA22 terminated at 0.4m		
	0.5						
	1.0						

HA23

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 5/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.4
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Silty SAND - Dark brown, heterogeneous, very angular to rounded, very loose density,	HA23 0.0-0.1	No Odours, Staining or Asbestos
		0.10		Fill	Fill - Gravelly Clayey SAND - Orangish brown, heterogeneous, poorly graded, fine to medium grained, angular to sub-rounded, brick fragments and roots present	HA23 0.2-0.3	No Odours, Staining or Asbestos
		0.40			Borehole HA23 terminated at 0.4m		
	0.5						
	1.0						

HA24

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 5/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.2
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Silty SAND - Dark brown, heterogeneous, damp, organic matter present	HA24 0.0-0.05	No Odours, Staining or Asbestos
		0.15		Fill	Fill - Clayey SAND - Orangish brown, homogeneous, damp, vary angular to sub-rounded, loose density	HA24 0.1-0.2	No Odours, Staining or Asbestos
		0.20			Borehole HA24 terminated at 0.2m		
	0.5						
	1.0						

BOREHOLE JBSG BOREHOLE.GPJ GINT STD AUSTRALIA.GDT 30/9/16

HA25

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 5/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.3
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Silty SAND - heterogeneous, damp, medium density, roots present	HA25 0.0-0.1	No Odours, Staining or Asbestos
		0.10		Fill	Fill - Clayey SAND - Brown, homogeneous, medium to coarse grain size, angular, dense	HA25 0.2-0.3	No Odours, Staining or Asbestos
		0.30			Borehole HA25 terminated at 0.3m		
	0.5						
	1.0						

HA26

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 5/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.4
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Silty SAND - Dark brown, heterogeneous, damp, poorly graded, fine to coarse grained, angular to sub-rounded, brick fragments present	HA26 0.0-0.1	No Odours, Staining or Asbestos
		0.10		Fill	Fill - Clayey SAND - Orangish brown, homogeneous, damp, firm density, low plasticity, weathered sandstone	HA26 0.2-0.3	No Odours, Staining or Asbestos
		0.40			Borehole HA26 terminated at 0.4m		
	0.5						
	1.0						

HA27

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 5/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.5
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Silty SAND - Dark brown, heterogenous, damp, poorly graded, fine to medium grained, very loose density	HA27 0.0-0.1	No Odours, Staining or Asbestos
		0.20		Fill	Fill - Clayey SAND - Brown, homogeneous, damp, poorly graded, fine to medium grained, angular to sub-rounded	HA27 0.2-0.3	No Odours, Staining or Asbestos
	0.5	0.50			Borehole HA27 terminated at 0.5m		
	1.0						

HA28

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 5/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.5
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Silty Clayey SAND - Brown, homogeneous, damp, poorly graded, organic matter present	HA28 0.0-0.1	No Odours, Staining or Asbestos
		0.10		Fill	Fill - Clayey SAND - Brown, heterogeneous, damp, soft to firm consistency, brick and sandstone fragments present		
						HA28 0.2-0.3	No Odours, Staining or Asbestos
	0.5						
		0.50			Borehole HA28 terminated at 0.5m		
	1.0						

HA29

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 5/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.3
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Clayey SAND - Dark brown, heterogeneous, soft to firm consistency, traces of brick fragments	HA29 0.0-0.1	No Odours, Staining or Asbestos
		0.30			Borehole HA29 terminated at 0.3m		
	0.5						
	1.0						

BOREHOLE JBSG BOREHOLE.GPJ GINT STD AUSTRALIA.GDT 30/9/16

HA30

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 5/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.2
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Silty SAND - Dark brown, heterogeneous, damp, poorly graded, angular to sub-angular, loose density with inclusions of sandstone and organic matter present	HA30 0.0-0.1	No Odours, Staining or Asbestos
							Refusal on sandstone bedrock
		0.20			Borehole HA30 terminated at 0.2m		
	0.5						
	1.0						

BOREHOLE JBSG BOREHOLE.GPJ GINT STD AUSTRALIA.GDT 30/9/16

HA31

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 5/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.4
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger							No Odours, Staining or Asbestos
				Fill	Fill - Silty SAND - Dark brown, heterogenous, damp, poorly graded, fine to medium grained, very loose density	HA31 0.0-0.4	
		0.40			Borehole HA31 terminated at 0.4m		
	0.5						
	1.0						

HA32

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 5/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.6
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill Fill	Fill - Clayey SAND - Dark brown, heterogenous, damp, poorly graded, high organic content Fill - Gravelly Clayey SAND - Dark brown, heterogenous, damp, poorly graded, low plasticity, soft consistency	HA32 0.0-0.05	No Odours, Staining or Asbestos
		0.05					No Odours, Staining or Asbestos
		0.30		Fill	Fill - Gravelly Clayey SAND - Yellowish brown, homogeneous, damp, low plasticity, soft consistency	HA32 0.05-0.3	
	0.5					HA32 0.4-0.5	No Odours, Staining or Asbestos
		0.60			Borehole HA32 terminated at 0.6m		
	1.0						

DLA Environmental Services
A Pacific Environment company

Borelog

Location **BH1**

Client:	Frasers Property Australia	Job Type:	Supplementary Investigation
Project No:	DL3953	Address:	Ivanhoe Estate, Macquarie Park NSW
Date:	24/05/2017	Logged By:	MJ
Contractor:	-	Method:	Hand auger
Hole Size	100mm diameter	Co-ordinates:	Not surveyed

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Density / Stiffness	Sampling	Comments
HA	0.1 0.2			TOPSOIL: sandy loam, pale brown, sandstone fragments and siltstone / claystone fragments			BH1_0.1-0.2	
	0.3 0.4 0.5			Reworked natural: siltstone / claystone, weathered, with sandstone fragments			BH1_0.2-0.5	
	0.6 0.7 0.8 0.9 1.0			Borehole BH1 terminated at 0.5m depth on extremely compacted material				

Sheet 1 of 1

Notes:

Method:	**Consistency**	**Plasticity**	**Moisture**	**Density**
SS - Solid Flight Auger	VS - Very Soft	HP - HighlyPlastic	D - Dry	VL - Very Loose
HS - Hollow Flight Auger	S - Soft	MP - Medium Plasticity	M - Moist	L - Loose
CC - Concrete Core	F - Firm	LP - Low Plasticity	W - Wet	MD - Medium Density
PT - Push Tube	VS - Very Stiff			D - Dense
RC - Rock Coring	H - Hard			VD - Very Dense
HA - Hand Auger	Friable - Fb			

DLA Environmental Services
A Pacific Environment company

Borelog

Location **BH2**

Client:	Frasers Property Australia	Job Type:	Supplementary Investigation
Project No:	DL3953	Address:	Ivanhoe Estate, Macquarie Park NSW
Date:	24/05/2017	Logged By:	MJ
Contractor:	-	Method:	Hand auger
Hole Size	100mm diameter	Co-ordinates:	Not surveyed

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Density / Stiffness	Sampling	Comments
HA	0.1 0.2 0.3 0.4			TOPSOIL: sandy loam, brown to pale brown, with roadbase and fine to coarse gravel			BH2_0.1-0.4 (BH2_0.1-0.4A)	
	0.5 0.6			Reworked natural: sandy clay, pale brown, fine to coarse sandstone gravel and crushed sandstone			BH2_0.5-0.6	
	0.7 0.8 0.9 1.0			Borehole BH2 terminated at 0.6m depth on sandstone interface				

Sheet 1 of 1

Notes:

Method:
SS - Solid Flight Auger
HS - Hollow Flight Auger
CC - Concrete Core
PT - Push Tube
RC - Rock Coring

Consistency
VS - Very Soft
S - Soft
F - Firm
VS - Very Stiff
H - Hard
Friable - Fb

Plasticity
HP - HighlyPlastic
MP - Medium Plasticity
LP - Low Plasticity

Moisture
D - Dry
M - Moist
W - Wet

Density
VL - Very Loose
L - Loose
MD - Medium Density
D - Dense
VD - Very Dense

DLA Environmental Services
A Pacific Environment company

Borelog

Location **BH3**

Client:	Frasers Property Australia	Job Type:	Supplementary Investigation
Project No:	DL3953	Address:	Ivanhoe Estate, Macquarie Park NSW
Date:	24/05/2017	Logged By:	MJ
Contractor:	-	Method:	Hand auger
Hole Size	100mm diameter	Co-ordinates:	Not surveyed

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Density / Stiffness	Sampling	Comments
HA	0.1			TOPSOIL: sandy loam, brown to pale brown, with roadbase and fine to coarse gravel			BH3_0.0-0.1	
	0.2 0.3 0.4 0.5 0.6 0.7 0.8			Reworked natural: sandy clay, pale brown, fine to coarse sandstone gravel and crushed sandstone			BH3_0.1-0.8	
	0.9 1.0			Borehole BH3 terminated at 0.8m depth on extremely compacted material				

Sheet 1 of 1

Notes:

Method:	Consistency	Plasticity	Moisture	Density
SS - Solid Flight Auger	VS - Very Soft	HP - HighlyPlastic	D - Dry	VL - Very Loose
HS - Hollow Flight Auger	S - Soft	MP - Medium Plasticity	M - Moist	L - Loose
CC - Concrete Core	F - Firm	LP - Low Plasticity	W - Wet	MD - Medium Density
PT - Push Tube	VS - Very Stiff			D - Dense
RC - Rock Coring	H - Hard			VD - Very Dense
	Friable - Fb			

DLA Environmental Services
A Pacific Environment company

Borelog

Location **BH4**

Client:	Frasers Property Australia	Job Type:	Supplementary Investigation
Project No:	DL3953	Address:	Ivanhoe Estate, Macquarie Park NSW
Date:	24/05/2017	Logged By:	MJ
Contractor:	-	Method:	Hand auger
Hole Size	100mm diameter	Co-ordinates:	Not surveyed

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Density / Stiffness	Sampling	Comments
HA	0.1			TOPSOIL: sandy loam, brown to pale brown, with roadbase and fine to coarse gravel				
	0.2			FILL: sand, yellow			BH4_0.1-0.2	
	0.4			Reworked natural: sandy silty clay, fine to coarse grained, brown to pale brown, with grey orange siltstone / claystone fragments			BH4_0.2-0.4	
	0.6			Reworked natural: sandy clay, pale brown, fine to coarse sandstone gravel and crushed sandstone				
	1.0			Borehole BH4 terminated at 0.6m depth on extremely compacted material				

Sheet 1 of 1

Notes:

Method:
SS - Solid Flight Auger
HS - Hollow Flight Auger
CC - Concrete Core
PT - Push Tube
RC - Rock Coring

Consistency
VS - Very Soft
S - Soft
F - Firm
VS - Very Stiff
H - Hard
Friable - Fb

Plasticity
HP - HighlyPlastic
MP - Medium Plasticity
LP - Low Plasticity

Moisture
D - Dry
M - Moist
W - Wet

Density
VL - Very Loose
L - Loose
MD - Medium Density
D - Dense
VD - Very Dense

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A Pacific Environment company

Borelog

Location **BH5 / 1**

Client:	Frasers Property Australia	Job Type:	Supplementary Investigation
Project No:	DL3953	Address:	Ivanhoe Estate, Macquarie Park NSW
Date:	24/05/2017	Logged By:	MJ
Contractor:	-	Method:	Hand auger
Hole Size	100mm diameter	Co-ordinates:	Not surveyed

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Density / Stiffness	Sampling	Comments
HA	0.1, 0.2, 0.3, 0.4, 0.5			TOPSOIL: sandy loam, brown to pale brown, with roadbase and fine to coarse gravel			BH5/1_0.1-0.5	
	0.6, 0.7, 0.8			Reworked natural: sandy clay, pale brown, fine to coarse sandstone gravel and crushed sandstone				
	0.9, 1.0			Borehole BH5/1 terminated at 0.8m depth on extremely compacted material				

Sheet 1 of 1

Notes:

Method:
SS - Solid Flight Auger
HS - Hollow Flight Auger
CC - Concrete Core
PT - Push Tube
RC - Rock Coring

Consistency
VS - Very Soft
S - Soft
F - Firm
VS - Very Stiff
H - Hard
Friable - Fb

Plasticity
HP - HighlyPlastic
MP - Medium Plasticity
LP - Low Plasticity

Moisture
D - Dry
M - Moist
W - Wet

Density
VL - Very Loose
L - Loose
MD - Medium Density
D - Dense
VD - Very Dense

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Borelog

Location **BH5 / 2**

Client:	Frasers Property Australia	Job Type:	Supplementary Investigation
Project No:	DL3953	Address:	Ivanhoe Estate, Macquarie Park NSW
Date:	24/05/2017	Logged By:	MJ
Contractor:	-	Method:	Hand auger
Hole Size	100mm diameter	Co-ordinates:	Not surveyed

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Density / Stiffness	Sampling	Comments
HA	0.1, 0.2, 0.3, 0.4, 0.5			TOPSOIL: sandy loam, brown to pale brown, with roadbase and fine to coarse gravel				
	0.6, 0.7, 0.8			Reworked natural: sandy clay, pale brown, fine to coarse sandstone gravel and crushed sandstone			BH5/2_0.5-0.8	
	0.9, 1.0			Borehole BH5/2 terminated at 0.8m depth on extremely compacted material				

Notes:

Method:
SS - Solid Flight Auger
HS - Hollow Flight Auger
CC - Concrete Core
PT - Push Tube
RC - Rock Coring

Consistency
VS - Very Soft
S - Soft
F - Firm
VS - Very Stiff
H - Hard
Friable - Fb

Plasticity
HP - HighlyPlastic
MP - Medium Plasticity
LP - Low Plasticity

Moisture
D - Dry
M - Moist
W - Wet

Density
VL - Very Loose
L - Loose
MD - Medium Density
D - Dense
VD - Very Dense

DLA Environmental Services
A Pacific Environment company

Borelog

Location **BH6**

Client:	Frasers Property Australia	Job Type:	Supplementary Investigation
Project No:	DL3953	Address:	Ivanhoe Estate, Macquarie Park NSW
Date:	24/05/2017	Logged By:	MJ
Contractor:	-	Method:	Hand auger
Hole Size	100mm diameter	Co-ordinates:	Not surveyed

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Density / Stiffness	Sampling	Comments
HA	0.1, 0.2, 0.3, 0.4, 0.5			TOPSOIL: sandy loam, brown to pale brown, with roadbase and fine to coarse gravel			BH6_0.1-0.5	
	0.6, 0.7, 0.8, 0.9, 1.0			Borehole BH6 terminated at 0.5m depth on underground services				

Notes:

Method:
SS - Solid Flight Auger
HS - Hollow Flight Auger
CC - Concrete Core
PT - Push Tube
RC - Rock Coring

Consistency
VS - Very Soft
S - Soft
F - Firm
VS - Very Stiff
H - Hard
Friable - Fb

Plasticity
HP - HighlyPlastic
MP - Medium Plasticity
LP - Low Plasticity

Moisture
D - Dry
M - Moist
W - Wet

Density
VL - Very Loose
L - Loose
MD - Medium Density
D - Dense
VD - Very Dense

DLA Environmental Services
A Pacific Environment company

Borelog

Location **BH7**

Client:	Frasers Property Australia	Job Type:	Supplementary Investigation
Project No:	DL3953	Address:	Ivanhoe Estate, Macquarie Park NSW
Date:	24/05/2017	Logged By:	MJ
Contractor:	-	Method:	Hand auger
Hole Size	100mm diameter	Co-ordinates:	Not surveyed

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Density / Stiffness	Sampling	Comments
HA	0.1 0.2			TOPSOIL: sandy loam, brown to pale brown, with roadbase and fine to coarse gravel				
	0.3 0.4 0.5 0.6 0.7			Reworked natural: sandy clay, pale brown, fine to coarse sandstone gravel and crushed sandstone			BH7_0.2-0.7 (BH7_0.2-0.7A)	
	0.8 0.9 1.0			Borehole BH7 terminated at 0.7m depth on extremely compacted material				

Sheet 1 of 1

Notes:

Method:
SS - Solid Flight Auger
HS - Hollow Flight Auger
CC - Concrete Core
PT - Push Tube
RC - Rock Coring

Consistency
VS - Very Soft
S - Soft
F - Firm
VS - Very Stiff
H - Hard
Friable - Fb

Plasticity
HP - HighlyPlastic
MP - Medium Plasticity
LP - Low Plasticity

Moisture
D - Dry
M - Moist
W - Wet

Density
VL - Very Loose
L - Loose
MD - Medium Density
D - Dense
VD - Very Dense

DLA Environmental Services
A Pacific Environment company

Borelog

Location **BH8**

Client:	Frasers Property Australia	Job Type:	Supplementary Investigation
Project No:	DL3953	Address:	Ivanhoe Estate, Macquarie Park NSW
Date:	24/05/2017	Logged By:	MJ
Contractor:	-	Method:	Hand auger
Hole Size	100mm diameter	Co-ordinates:	Not surveyed

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Density / Stiffness	Sampling	Comments
HA	0.1			TOPSOIL: sandy loam, brown to pale brown, with roadbase and fine to coarse gravel			BH8_0.0-0.1	
	0.2 0.3 0.4			Reworked natural: siltstone / claystone, weathered, with sandstone fragments			BH8_0.1-0.4	
	0.5 0.6 0.7 0.8 0.9 1.0			Borehole BH8 terminated at 0.4m depth on extremely compacted material				

Notes:

Sheet 1 of 1

Method:	Consistency	Plasticity	Moisture	Density
SS - Solid Flight Auger	VS - Very Soft	HP - HighlyPlastic	D - Dry	VL - Very Loose
HS - Hollow Flight Auger	S - Soft	MP - Medium Plasticity	M - Moist	L - Loose
CC - Concrete Core	F - Firm	LP - Low Plasticity	W - Wet	MD - Medium Density
PT - Push Tube	VS - Very Stiff			D - Dense
RC - Rock Coring	H - Hard			VD - Very Dense
	Friable - Fb			

DLA Environmental Services

Borelog

Location **BH1**

Client:	Frasers Property Australia	Job Type:	Supplementary Site Investigation
Project No:	DL3953	Address:	Ivanhoe Estate, Macquarie Park NSW
Date:	27/06/2017	Logged By:	MJ
Contractor:	-	Method:	Hand auger
Hole Size	100mm diameter	Co-ordinates:	Not surveyed

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Density / Stiffness	Sampling	Comments
HA				Woodchip mulch				
				FILL: loamy sand, black				
	0.2			FILL: sand, coarse grained, brown, minor clay				
	0.4							
	0.6							
				FILL: clay, grey, with sand, brown black, trace sandstone fragments				
	0.8							
	1.0							
	1.2							
	1.4							
			SC	Sandy CLAY: orange brown				
				End of borehole at 1.5m depth				
	1.6							
	1.8							
	2.0							

Notes:

Method:	**Consistency**	**Plasticity**	**Moisture**	**Density**
SS - Solid Flight Auger	VS - Very Soft	HP - HighlyPlastic	D - Dry	VL - Very Loose
HS - Hollow Flight Auger	S - Soft	MP - Medium Plasticity	M - Moist	L - Loose
CC - Concrete Core	F - Firm	LP - Low Plasticity	W - Wet	MD - Medium Density
PT - Push Tube	VS - Very Stiff			D - Dense
RC - Rock Coring	H - Hard			VD - Very Dense

HA - Hand Auger Friable - Fb

DLA Environmental Services

Borelog

Location **BH2**

Client:	Frasers Property Australia	Job Type:	Supplementary Site Investigation
Project No:	DL3953	Address:	Ivanhoe Estate, Macquarie Park NSW
Date:	27/06/2017	Logged By:	MJ
Contractor:	-	Method:	Hand auger
Hole Size	100mm diameter	Co-ordinates:	Not surveyed

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Density / Stiffness	Sampling	Comments
HA	0.1			Woodchip mulch				
	0.2			FILL: loamy sand, black				
	0.3			FILL: sand, coarse grained, brown, minor clay				
	0.4							
	0.5			FILL: clay, grey, with sand, brown black, sandstone cobbles				
	0.6			Borehole refusal at 0.5m depth				
	0.7							
	0.8							
	0.9							
	1.0							

Sheet 1 of 1

Notes:

Method:	**Consistency**	**Plasticity**	**Moisture**	**Density**
SS - Solid Flight Auger	VS - Very Soft	HP - HighlyPlastic	D - Dry	VL - Very Loose
HS - Hollow Flight Auger	S - Soft	MP - Medium Plasticity	M - Moist	L - Loose
CC - Concrete Core	F - Firm	LP - Low Plasticity	W - Wet	MD - Medium Density
PT - Push Tube	VS - Very Stiff			D - Dense

RC - Rock Coring	H - Hard	VD - Very Dense
HA - Hand Auger	Friable - Fb	

DLA Environmental Services

Borelog

Location **BH3**

Client:	Frasers Property Australia	Job Type:	Supplementary Site Investigation
Project No:	DL3953	Address:	Ivanhoe Estate, Macquarie Park NSW
Date:	27/06/2017	Logged By:	MJ
Contractor:	-	Method:	Hand auger
Hole Size	100mm diameter	Co-ordinates:	Not surveyed

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Density / Stiffness	Sampling	Comments
HA				Woodchip mulch				
	0.1							
				FILL: sand, fine grained, yellow				
	0.2							
				FILL: loamy sand, black				
	0.3							
	0.4							
				FILL: sandstone gravel and cobbles, fine to coarse, orange				
	0.5							
				Borehole refusal at 0.5m depth				
	0.6							
	0.7							
	0.8							
	0.9							
	1.0							

Notes:

Method:	**Consistency**	**Plasticity**	**Moisture**	**Density**
SS - Solid Flight Auger	VS - Very Soft	HP - HighlyPlastic	D - Dry	VL - Very Loose
HS - Hollow Flight Auger	S - Soft	MP - Medium Plasticity	M - Moist	L - Loose
CC - Concrete Core	F - Firm	LP - Low Plasticity	W - Wet	MD - Medium Density

PT - Push Tube	VS - Very Stiff	D - Dense
RC - Rock Coring	H - Hard	VD - Very Dense
HA - Hand Auger	Friable - Fb	

DLA Environmental Services

Borelog

Location **BH4**

Client:	Frasers Property Australia	Job Type:	Supplementary Site Investigation
Project No:	DL3953	Address:	Ivanhoe Estate, Macquarie Park NSW
Date:	27/06/2017	Logged By:	MJ
Contractor:	-	Method:	Hand auger
Hole Size	100mm diameter	Co-ordinates:	Not surveyed

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Density / Stiffness	Sampling	Comments
HA				Woodchip mulch				
	0.1							
				FILL: loamy sand, black				
	0.2							
				FILL: sand, fine grained, yellow				
	0.3							
	0.4							
				FILL: sandstone gravel and cobbles, fine to coarse, orange				
	0.5							
	0.6							
				Borehole refusal at 0.6m depth				
	0.7							
	0.8							
	0.9							
	1.0							

Notes:

Method:	**Consistency**	**Plasticity**	**Moisture**	**Density**
SS - Solid Flight Auger	VS - Very Soft	HP - HighlyPlastic	D - Dry	VL - Very Loose
HS - Hollow Flight Auger	S - Soft	MP - Medium Plasticity	M - Moist	L - Loose

CC - Concrete Core	F - Firm	LP - Low Plasticity	W - Wet	MD - Medium Density
PT - Push Tube	VS - Very Stiff			D - Dense
RC - Rock Coring	H - Hard			VD - Very Dense
HA - Hand Auger	Friable - Fb			

DLA Environmental Services

Borelog

Location **BH5**

Client:	Frasers Property Australia	Job Type:	Supplementary Site Investigation
Project No:	DL3953	Address:	Ivanhoe Estate, Macquarie Park NSW
Date:	27/06/2017	Logged By:	MJ
Contractor:	-	Method:	Hand auger
Hole Size	100mm diameter	Co-ordinates:	Not surveyed

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Density / Stiffness	Sampling	Comments
HA				Woodchip mulch				
	0.1			FILL: loamy sand, black				
	0.2			FILL: sand, fine grained, yellow				
	0.3							
	0.4			FILL: sandstone gravel and cobbles, fine to coarse, orange				
	0.5							
				Borehole refusal at 0.5m depth				
	0.6							
	0.7							
	0.8							
	0.9							
	1.0							

Notes:

Method:	Consistency	Plasticity	Moisture	Density
SS - Solid Flight Auger	VS - Very Soft	HP - HighlyPlastic	D - Dry	VL - Very Loose

HS - Hollow Flight Auger	S - Soft	MP - Medium Plasticity	M - Moist	L - Loose
CC - Concrete Core	F - Firm	LP - Low Plasticity	W - Wet	MD - Medium Density
PT - Push Tube	VS - Very Stiff			D - Dense
RC - Rock Coring	H - Hard			VD - Very Dense
HA - Hand Auger	Friable - Fb			

DLA Environmental Services

Borelog

Location **BH6**

Client:	Frasers Property Australia	Job Type:	Supplementary Site Investigation
Project No:	DL3953	Address:	Ivanhoe Estate, Macquarie Park NSW
Date:	27/06/2017	Logged By:	MJ
Contractor:	-	Method:	Hand auger
Hole Size	100mm diameter	Co-ordinates:	Not surveyed

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Density / Stiffness	Sampling	Comments
HA				FILL: loamy sand, black				
	0.1			FILL: sandstone gravel and cobbles, fine to coarse, orange				
	0.2							
	0.3							
	0.4							
				Borehole refusal at 0.4m depth				
	0.5							
	0.6							
	0.7							
	0.8							
	0.9							
	1.0							

Notes:

Sheet 1 of 1

Method:	Consistency	Plasticity	Moisture	Density

SS - Solid Flight Auger	VS - Very Soft	HP - HighlyPlastic	D - Dry	VL - Very Loose
HS - Hollow Flight Auger	S - Soft	MP - Medium Plasticity	M - Moist	L - Loose
CC - Concrete Core	F - Firm	LP - Low Plasticity	W - Wet	MD - Medium Density
PT - Push Tube	VS - Very Stiff			D - Dense
RC - Rock Coring	H - Hard			VD - Very Dense
HA - Hand Auger	Friable - Fb			

Appendix D

Laboratory Results

and Chain of Custody Documentation

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

CERTIFICATE OF ANALYSIS 179341

Client Details

Client	Douglas Partners Pty Ltd
Attention	Sally Peacock, David Walker
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**86043.01, Ivanhoe**
Number of Samples	17 SOIL
Date samples received	07/11/2017
Date completed instructions received	07/11/2017

Analysis Details

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

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

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

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

Report Details

Date results requested by	14/11/2017
Date of Issue	14/11/2017
Reissue Details	This report replaces R00 created on 14/11/2017 due to: sample ID error

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

Results Approved By
Dragana Tomas, Senior Chemist
Long Pham, Team Leader, Metals
Paul Ching, Senior Analyst
Priya Samarawickrama, Senior Chemist
Steven Luong, Senior Chemist

Authorised By

David Springer, General Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		179341-1	179341-2	179341-3	179341-4	179341-5
Your Reference	UNITS	BH01	BH01	BH02	BH04	BH05
Depth		0.35	1.0	0.5	0-0.1	0.1
Date Sampled		31/10/2017	31/10/2017	01/11/2017	30/10/2017	01/11/2017
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Date analysed	-	09/11/2017	09/11/2017	09/11/2017	09/11/2017	09/11/2017
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	112	113	115	111	117

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		179341-6	179341-7	179341-8	179341-9	179341-10
Your Reference	UNITS	BH05	BH10	BH10	BH11	BH11
Depth		1.0	0.5	0.9-1.0	0.5	1.0
Date Sampled		01/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Date analysed	-	09/11/2017	09/11/2017	09/11/2017	09/11/2017	09/11/2017
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	103	112	110	109	108

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		179341-11	179341-12	179341-13	179341-14	179341-15
Your Reference	UNITS	BH12	BH12	BH13	BH13	BH34
Depth		0.5	1.5	0.15	1.6	0.1-0.2
Date Sampled		03/11/2017	03/11/2017	03/11/2017	03/11/2017	03/11/2017
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Date analysed	-	09/11/2017	09/11/2017	09/11/2017	09/11/2017	09/11/2017
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	120	112	112	116	113

vTRH(C6-C10)/BTEXN in Soil			
Our Reference		179341-16	179341-17
Your Reference	UNITS	BH41	BH41
Depth		0-0.1	0.4-0.5
Date Sampled		30/10/2017	30/10/2017
Type of sample		SOIL	SOIL
Date extracted	-	08/11/2017	08/11/2017
Date analysed	-	09/11/2017	09/11/2017
TRH C_6 - C_9	mg/kg	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25
Benzene	mg/kg	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1
m+p-xylene	mg/kg	<2	<2
o-Xylene	mg/kg	<1	<1
Total +ve Xylenes	mg/kg	<1	<1
naphthalene	mg/kg	<1	<1
Surrogate aaa-Trifluorotoluene	%	112	108

svTRH (C10-C40) in Soil						
Our Reference		179341-1	179341-2	179341-3	179341-4	179341-5
Your Reference	UNITS	BH01	BH01	BH02	BH04	BH05
Depth		0.35	1.0	0.5	0-0.1	0.1
Date Sampled		31/10/2017	31/10/2017	01/11/2017	30/10/2017	01/11/2017
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Date analysed	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	75	71	73	83	83

svTRH (C10-C40) in Soil						
Our Reference		179341-6	179341-7	179341-8	179341-9	179341-10
Your Reference	UNITS	BH05	BH10	BH10	BH11	BH11
Depth		1.0	0.5	0.9-1.0	0.5	1.0
Date Sampled		01/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Date analysed	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	79	79	79	78	77

svTRH (C10-C40) in Soil						
Our Reference		179341-11	179341-12	179341-13	179341-14	179341-15
Your Reference	UNITS	BH12	BH12	BH13	BH13	BH34
Depth		0.5	1.5	0.15	1.6	0.1-0.2
Date Sampled		03/11/2017	03/11/2017	03/11/2017	03/11/2017	03/11/2017
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Date analysed	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	80	78	78	83	78

svTRH (C10-C40) in Soil			
Our Reference		179341-16	179341-17
Your Reference	UNITS	BH41	BH41
Depth		0-0.1	0.4-0.5
Date Sampled		30/10/2017	30/10/2017
Type of sample		SOIL	SOIL
Date extracted	-	08/11/2017	08/11/2017
Date analysed	-	08/11/2017	08/11/2017
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	%	79	78

PAHs in Soil						
Our Reference		179341-1	179341-2	179341-3	179341-4	179341-5
Your Reference	UNITS	BH01	BH01	BH02	BH04	BH05
Depth		0.35	1.0	0.5	0-0.1	0.1
Date Sampled		31/10/2017	31/10/2017	01/11/2017	30/10/2017	01/11/2017
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Date analysed	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<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
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Surrogate p-Terphenyl-d14	%	82	83	80	84	86

PAHs in Soil						
Our Reference		179341-6	179341-7	179341-8	179341-9	179341-10
Your Reference	UNITS	BH05	BH10	BH10	BH11	BH11
Depth		1.0	0.5	0.9-1.0	0.5	1.0
Date Sampled		01/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Date analysed	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	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
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	<0.05	0.3	<0.05	<0.05	<0.05
Surrogate p-Terphenyl-d14	%	82	84	81	82	82

PAHs in Soil						
Our Reference		179341-11	179341-12	179341-13	179341-14	179341-15
Your Reference	UNITS	BH12	BH12	BH13	BH13	BH34
Depth		0.5	1.5	0.15	1.6	0.1-0.2
Date Sampled		03/11/2017	03/11/2017	03/11/2017	03/11/2017	03/11/2017
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Date analysed	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<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
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Surrogate p-Terphenyl-d14	%	81	84	83	82	80

PAHs in Soil			
Our Reference		179341-16	179341-17
Your Reference	UNITS	BH41	BH41
Depth		0-0.1	0.4-0.5
Date Sampled		30/10/2017	30/10/2017
Type of sample		SOIL	SOIL
Date extracted	-	08/11/2017	08/11/2017
Date analysed	-	08/11/2017	08/11/2017
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
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
Total +ve PAH's	mg/kg	<0.05	<0.05
Surrogate p-Terphenyl-d14	%	84	82

Organochlorine Pesticides in soil						
Our Reference		179341-1	179341-2	179341-3	179341-4	179341-5
Your Reference	UNITS	BH01	BH01	BH02	BH04	BH05
Depth		0.35	1.0	0.5	0-0.1	0.1
Date Sampled		31/10/2017	31/10/2017	01/11/2017	30/10/2017	01/11/2017
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Date analysed	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	96	92	90	99	86

Organochlorine Pesticides in soil						
Our Reference		179341-6	179341-7	179341-8	179341-9	179341-10
Your Reference	UNITS	BH05	BH10	BH10	BH11	BH11
Depth		1.0	0.5	0.9-1.0	0.5	1.0
Date Sampled		01/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Date analysed	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	0.4	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	0.4	<0.1	<0.1
Surrogate TCMX	%	90	112	85	93	97

Organochlorine Pesticides in soil						
Our Reference		179341-11	179341-12	179341-13	179341-14	179341-15
Your Reference	UNITS	BH12	BH12	BH13	BH13	BH34
Depth		0.5	1.5	0.15	1.6	0.1-0.2
Date Sampled		03/11/2017	03/11/2017	03/11/2017	03/11/2017	03/11/2017
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Date analysed	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	0.3	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	0.3	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	94	94	96	91	89

Organochlorine Pesticides in soil			
Our Reference		179341-16	179341-17
Your Reference	UNITS	BH41	BH41
Depth		0-0.1	0.4-0.5
Date Sampled		30/10/2017	30/10/2017
Type of sample		SOIL	SOIL
Date extracted	-	08/11/2017	08/11/2017
Date analysed	-	08/11/2017	08/11/2017
HCB	mg/kg	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1
Surrogate TCMX	%	84	86

Organophosphorus Pesticides						
Our Reference		179341-1	179341-3	179341-4	179341-6	179341-7
Your Reference	UNITS	BH01	BH02	BH04	BH05	BH10
Depth		0.35	0.5	0-0.1	1.0	0.5
Date Sampled		31/10/2017	01/11/2017	30/10/2017	01/11/2017	02/11/2017
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Date analysed	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	96	90	99	90	112

Organophosphorus Pesticides						
Our Reference		179341-9	179341-11	179341-13	179341-15	179341-16
Your Reference	UNITS	BH11	BH12	BH13	BH34	BH41
Depth		0.5	0.5	0.15	0.1-0.2	0-0.1
Date Sampled		02/11/2017	03/11/2017	03/11/2017	03/11/2017	30/10/2017
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Date analysed	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	93	94	96	89	84

PCBs in Soil						
Our Reference		179341-1	179341-3	179341-4	179341-6	179341-7
Your Reference	UNITS	BH01	BH02	BH04	BH05	BH10
Depth		0.35	0.5	0-0.1	1.0	0.5
Date Sampled		31/10/2017	01/11/2017	30/10/2017	01/11/2017	02/11/2017
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Date analysed	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	96	90	99	90	112

PCBs in Soil						
Our Reference		179341-9	179341-11	179341-13	179341-15	179341-16
Your Reference	UNITS	BH11	BH12	BH13	BH34	BH41
Depth		0.5	0.5	0.15	0.1-0.2	0-0.1
Date Sampled		02/11/2017	03/11/2017	03/11/2017	03/11/2017	30/10/2017
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Date analysed	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	93	94	96	89	84

Acid Extractable metals in soil						
Our Reference		179341-1	179341-2	179341-3	179341-4	179341-5
Your Reference	UNITS	BH01	BH01	BH02	BH04	BH05
Depth		0.35	1.0	0.5	0-0.1	0.1
Date Sampled		31/10/2017	31/10/2017	01/11/2017	30/10/2017	01/11/2017
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Date analysed	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Arsenic	mg/kg	8	12	7	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	24	22	13	10	12
Copper	mg/kg	18	15	15	7	10
Lead	mg/kg	24	23	23	14	8
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	13	2	3	14	3
Zinc	mg/kg	25	8	17	24	14

Acid Extractable metals in soil						
Our Reference		179341-6	179341-7	179341-8	179341-9	179341-10
Your Reference	UNITS	BH05	BH10	BH10	BH11	BH11
Depth		1.0	0.5	0.9-1.0	0.5	1.0
Date Sampled		01/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Date analysed	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Arsenic	mg/kg	<4	5	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	17	17	6	30	17
Copper	mg/kg	3	14	5	10	9
Lead	mg/kg	8	18	6	13	17
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	2	11	1	13	3
Zinc	mg/kg	6	16	8	13	10

Acid Extractable metals in soil						
Our Reference		179341-11	179341-12	179341-13	179341-14	179341-15
Your Reference	UNITS	BH12	BH12	BH13	BH13	BH34
Depth		0.5	1.5	0.15	1.6	0.1-0.2
Date Sampled		03/11/2017	03/11/2017	03/11/2017	03/11/2017	03/11/2017
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Date analysed	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Arsenic	mg/kg	4	<4	7	<4	6
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	19	18	13	25	23
Copper	mg/kg	12	4	11	1	10
Lead	mg/kg	42	10	15	8	5
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	6	3	6	1	27
Zinc	mg/kg	41	9	25	6	26

Acid Extractable metals in soil			
Our Reference		179341-16	179341-17
Your Reference	UNITS	BH41	BH41
Depth		0-0.1	0.4-0.5
Date Sampled		30/10/2017	30/10/2017
Type of sample		SOIL	SOIL
Date prepared	-	08/11/2017	08/11/2017
Date analysed	-	08/11/2017	08/11/2017
Arsenic	mg/kg	<4	6
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	66	27
Copper	mg/kg	16	<1
Lead	mg/kg	9	7
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	44	1
Zinc	mg/kg	32	3

Misc Soil - Inorg						
Our Reference		179341-1	179341-3	179341-4	179341-6	179341-7
Your Reference	UNITS	BH01	BH02	BH04	BH05	BH10
Depth		0.35	0.5	0-0.1	1.0	0.5
Date Sampled		31/10/2017	01/11/2017	30/10/2017	01/11/2017	02/11/2017
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Date analysed	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg						
Our Reference		179341-9	179341-11	179341-13	179341-15	179341-16
Your Reference	UNITS	BH11	BH12	BH13	BH34	BH41
Depth		0.5	0.5	0.15	0.1-0.2	0-0.1
Date Sampled		02/11/2017	03/11/2017	03/11/2017	03/11/2017	30/10/2017
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Date analysed	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Moisture						
Our Reference		179341-1	179341-2	179341-3	179341-4	179341-5
Your Reference	UNITS	BH01	BH01	BH02	BH04	BH05
Depth		0.35	1.0	0.5	0-0.1	0.1
Date Sampled		31/10/2017	31/10/2017	01/11/2017	30/10/2017	01/11/2017
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Date analysed	-	09/11/2017	09/11/2017	09/11/2017	09/11/2017	09/11/2017
Moisture	%	6.3	12	12	7.1	6.0

Moisture						
Our Reference		179341-6	179341-7	179341-8	179341-9	179341-10
Your Reference	UNITS	BH05	BH10	BH10	BH11	BH11
Depth		1.0	0.5	0.9-1.0	0.5	1.0
Date Sampled		01/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Date analysed	-	09/11/2017	09/11/2017	09/11/2017	09/11/2017	09/11/2017
Moisture	%	8.7	8.4	11	21	15

Moisture						
Our Reference		179341-11	179341-12	179341-13	179341-14	179341-15
Your Reference	UNITS	BH12	BH12	BH13	BH13	BH34
Depth		0.5	1.5	0.15	1.6	0.1-0.2
Date Sampled		03/11/2017	03/11/2017	03/11/2017	03/11/2017	03/11/2017
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	08/11/2017	08/11/2017	08/11/2017	08/11/2017	08/11/2017
Date analysed	-	09/11/2017	09/11/2017	09/11/2017	09/11/2017	09/11/2017
Moisture	%	13	11	8.4	11	7.1

Moisture			
Our Reference		179341-16	179341-17
Your Reference	UNITS	BH41	BH41
Depth		0-0.1	0.4-0.5
Date Sampled		30/10/2017	30/10/2017
Type of sample		SOIL	SOIL
Date prepared	-	08/11/2017	08/11/2017
Date analysed	-	09/11/2017	09/11/2017
Moisture	%	7.6	15

Asbestos ID - soils						
Our Reference		179341-1	179341-3	179341-4	179341-6	179341-7
Your Reference	UNITS	BH01	BH02	BH04	BH05	BH10
Depth		0.35	0.5	0-0.1	1.0	0.5
Date Sampled		31/10/2017	01/11/2017	30/10/2017	01/11/2017	02/11/2017
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date analysed	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Sample mass tested	g	Approx. 65g	Approx. 50g	Approx. 50g	Approx. 45g	Approx. 55g
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	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils						
Our Reference		179341-9	179341-11	179341-13	179341-15	179341-16
Your Reference	UNITS	BH11	BH12	BH13	BH34	BH41
Depth		0.5	0.5	0.15	0.1-0.2	0-0.1
Date Sampled		02/11/2017	03/11/2017	03/11/2017	03/11/2017	30/10/2017
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date analysed	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Sample mass tested	g	Approx. 50g	Approx. 25g	Approx. 40g	Approx. 60g	Approx. 50g
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	-	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

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.

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

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	179341-3
Date extracted	-			08/11/2017	1	08/11/2017	08/11/2017		08/11/2017	08/11/2017
Date analysed	-			09/11/2017	1	09/11/2017	09/11/2017		09/11/2017	09/11/2017
TRH C_6 - C_9	mg/kg	25	Org-016	<25	1	<25	<25	0	106	112
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	1	<25	<25	0	106	112
Benzene	mg/kg	0.2	Org-016	<0.2	1	<0.2	<0.2	0	99	104
Toluene	mg/kg	0.5	Org-016	<0.5	1	<0.5	<0.5	0	106	112
Ethylbenzene	mg/kg	1	Org-016	<1	1	<1	<1	0	107	113
m+p-xylene	mg/kg	2	Org-016	<2	1	<2	<2	0	109	115
o-Xylene	mg/kg	1	Org-016	<1	1	<1	<1	0	104	109
naphthalene	mg/kg	1	Org-014	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	118	1	112	110	2	111	117

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]	11	08/11/2017	08/11/2017		[NT]	[NT]
Date analysed	-			[NT]	11	09/11/2017	09/11/2017		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	[NT]	11	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	[NT]	11	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-016	[NT]	11	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-016	[NT]	11	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-016	[NT]	11	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-016	[NT]	11	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-016	[NT]	11	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-014	[NT]	11	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	11	120	112	7	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	179341-3
Date extracted	-			08/11/2017	1	08/11/2017	08/11/2017		08/11/2017	08/11/2017
Date analysed	-			08/11/2017	1	08/11/2017	08/11/2017		08/11/2017	08/11/2017
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	1	<50	<50	0	104	102
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	1	<100	<100	0	102	105
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	1	<100	<100	0	106	82
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	1	<50	<50	0	104	102
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	1	<100	<100	0	102	105
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	1	<100	<100	0	106	82
Surrogate o-Terphenyl	%		Org-003	74	1	75	75	0	84	73

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	08/11/2017	08/11/2017		[NT]	[NT]
Date analysed	-			[NT]	11	08/11/2017	08/11/2017		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	[NT]	11	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	[NT]	11	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	[NT]	11	<100	110	10	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	[NT]	11	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	[NT]	11	<100	110	10	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	[NT]	11	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-003	[NT]	11	80	81	1	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	179341-3
Date extracted	-			08/11/2017	1	08/11/2017	08/11/2017		08/11/2017	08/11/2017
Date analysed	-			08/11/2017	1	08/11/2017	08/11/2017		08/11/2017	08/11/2017
Naphthalene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	73	73
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	87	84
Phenanthrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	91	90
Anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	85	85
Pyrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	93	93
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	93	88
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	1	<0.05	<0.05	0	78	72
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	86	1	82	78	5	102	101

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	08/11/2017	08/11/2017		[NT]	[NT]
Date analysed	-			[NT]	11	08/11/2017	08/11/2017		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	[NT]	11	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	[NT]	11	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	[NT]	11	81	81	0	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	179341-3
Date extracted	-			08/11/2017	1	08/11/2017	08/11/2017		08/11/2017	08/11/2017
Date analysed	-			08/11/2017	1	08/11/2017	08/11/2017		08/11/2017	08/11/2017
HCB	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	91	92
gamma-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	89	91
Heptachlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	70	72
delta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	85	88
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	86	88
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	97	101
Dieldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	92	94
Endrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	75	76
pp-DDD	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	90	94
Endosulfan II	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	76	80
Methoxychlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	100	1	96	91	5	98	101

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	08/11/2017	08/11/2017		[NT]	[NT]
Date analysed	-			[NT]	11	08/11/2017	08/11/2017		[NT]	[NT]
HCB	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	[NT]	11	0.3	0.5	50	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	[NT]	11	94	109	15	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	179341-3
Date extracted	-			08/11/2017	1	08/11/2017	08/11/2017		08/11/2017	08/11/2017
Date analysed	-			08/11/2017	1	08/11/2017	08/11/2017		08/11/2017	08/11/2017
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	103	108
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	95	90
Dimethoate	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	124	114
Fenitrothion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	108	104
Malathion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	114	105
Parathion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	102	102
Ronnel	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	122	107
Surrogate TCMX	%		Org-008	100	1	96	91	5	95	100

QUALITY CONTROL: Organophosphorus Pesticides						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	08/11/2017	08/11/2017		[NT]	[NT]
Date analysed	-			[NT]	11	08/11/2017	08/11/2017		[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-008	[NT]	11	94	109	15	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	179341-3
Date extracted	-			08/11/2017	1	08/11/2017	08/11/2017		08/11/2017	08/11/2017
Date analysed	-			08/11/2017	1	08/11/2017	08/11/2017		08/11/2017	08/11/2017
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	101	104
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	100	1	96	91	5	95	100

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	08/11/2017	08/11/2017		[NT]	[NT]
Date analysed	-			[NT]	11	08/11/2017	08/11/2017		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	[NT]	11	94	109	15	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	179341-3
Date prepared	-			08/11/2017	1	08/11/2017	08/11/2017		08/11/2017	08/11/2017
Date analysed	-			08/11/2017	1	08/11/2017	08/11/2017		08/11/2017	08/11/2017
Arsenic	mg/kg	4	Metals-020	<4	1	8	10	22	127	108
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	116	107
Chromium	mg/kg	1	Metals-020	<1	1	24	26	8	123	111
Copper	mg/kg	1	Metals-020	<1	1	18	17	6	123	116
Lead	mg/kg	1	Metals-020	<1	1	24	26	8	118	109
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	110	101
Nickel	mg/kg	1	Metals-020	<1	1	13	15	14	119	111
Zinc	mg/kg	1	Metals-020	<1	1	25	29	15	123	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]	11	08/11/2017	08/11/2017		[NT]	[NT]
Date analysed	-			[NT]	11	08/11/2017	08/11/2017		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	11	4	<4	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	11	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	11	19	23	19	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	11	12	11	9	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	11	42	39	7	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	11	6	8	29	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	11	41	36	13	[NT]	[NT]

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	179341-3
Date prepared	-			08/11/2017	1	08/11/2017	08/11/2017		08/11/2017	08/11/2017
Date analysed	-			08/11/2017	1	08/11/2017	08/11/2017		08/11/2017	08/11/2017
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	1	<5	<5	0	104	93

Result Definitions

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

Quality Control Definitions

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

Report Comments

Asbestos: A portion of the supplied samples were sub-sampled for asbestos analysis according to Envirolab procedures.
We cannot guarantee that these sub-samples are indicative of the entire sample.
Envirolab recommends supplying 40-50g of sample in its own container.
Note: Samples requested for asbestos testing were sub-sampled from jars provided by the client.

Organochlorine Pesticides in soil - The RPD for duplicate results is accepted due to the non homogenous nature of the sample/s.

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	86043.01	**Suburb:**	Macquarie Park	**To:**	Envirolab Services
Project Name:	Ivanhoe	**Order Number**			12 Ashley Street, Chatswood NSW 2067
Project Manager:	S Peacock (& David Walker)	**Sampler:**	LS	**Attn:**	Aileen
Emails:	david.walker@douglaspartners.com.au			**Phone:**	02 9910 6200
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☑			**Email:**	sydney@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	depth (m)	Lab ID	Date Sampled	Sample Type (S - soil, W - water)	Container Type (G - glass, P - plastic)	Analytes: Combo 8a	Combo 14								Notes/preservation
BH01	0.035	1	31.10.17	S	G	✓									
BH01	1.0	2	31.10.17	S	G		✓								
BH02	0.5	3	1.11.17	S	G	✓									
BH04	0-0.1	4	30.10.17	S	G	✓									
BH05	0.1	5	1.11.17	S	G		✓								
BH05	1.0	6	1.11.17			✓									
BH10	0.5	7	2.11.17			✓									
BH10	1.0	8	2.11.17				✓								
BH11	0.5	9	2.11.17			✓									
BH11	1.0	10	2.11.17				✓								
BH12	0.5	11	3.11.17			✓									
BH12	1.5	12	3.11.17				✓								
BH13	0.15	13	3.11.17			✓									
BH13	1.6	14	3.11.17				✓								
BH34	0-1-0.2	15	3.11.17			✓									
PQL (S) mg/kg														**ANZECC PQLs req'd for all water analytes** ☐	

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

Job No: 179341
Date Received: 7/11/2017
Time Received: 13:00
Received by: R
Temp: Cool/Ambient
Cooling: Ice/Icepack 4.7
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:

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

Send Results to: Douglas Partners Pty Ltd **Address** 96 Hermitage Road, West Ryde **Phone:** 98090666 **Fax:** 98094095

Signed: **Received by:** Play **Date & Time:** 7/11/2017 13:00

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	86043.01	**Suburb:**	Macquarie Park	**To:**	Envirolab Services
Project Name:	Ivanhoe	**Order Number**			12 Ashley Street, Chatswood NSW 2067
Project Manager:	S Peacock (& David Walker)	**Sampler:**	LS	**Attn:**	Aileen
Emails:	david.walker@douglaspartners.com.au			**Phone:**	02 9910 6200
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☐			**Email:**	sydney@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	Date Sampled	Sample Type (S - soil, W - water)	Container Type (G - glass, P - plastic)	Analytes: Combo 8a*	Analytes: Combo 14								Notes/preservation
BH41 0-0.1	16	30.10.17	S	G	✓									
BH41 0.4-0.5	17	30.10.17	S	G		✓								
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:

Metals to Analyse: 8HM unless specified here:

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

Send Results to: Douglas Partners Pty Ltd **Address:** 96 Hermitage Road, West Ryde **Phone:** 98090666 **Fax:** 98094095

Signed: **Received by:** Ray **Date & Time:** 7/11/2017 13:00

179341

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	Sally Peacock, David Walker

Sample Login Details

Your reference	86043.01, Ivanhoe
Envirolab Reference	179341
Date Sample Received	07/11/2017
Date Instructions Received	07/11/2017
Date Results Expected to be Reported	14/11/2017

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	17 SOIL
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	4.7
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

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

Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticidesin soil	Organophosphorus Pesticides	PCBsin Soil	Acid Extractable metalsin soil	Total Phenolics (as Phenol)	Asbestos ID - soils
BH01-0.35	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH01-1.0	✓	✓	✓	✓			✓		
BH02-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH04-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH05-0.1	✓	✓	✓	✓			✓		
BH05-1.0	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH10-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH10-0.9-1.0	✓	✓	✓	✓			✓		
BH11-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH11-1.0	✓	✓	✓	✓			✓		
BH12-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH12-.5	✓	✓	✓	✓			✓		
BH13-0.15	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH13-1.6	✓	✓	✓	✓			✓		
BH34-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH41-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH41-0.4-0.5	✓	✓	✓	✓			✓		

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

Additional Info

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

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

Envirolab Services Pty Ltd
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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 179341-A

Client Details

Client	Douglas Partners Pty Ltd
Attention	David Walker
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**86043.01, Ivanhoe**
Number of Samples	Additional testing 1 sample
Date samples received	07/11/2017
Date completed instructions received	07/12/2017

Analysis Details

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

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

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

Report Details

Date results requested by	08/12/2017
Date of Issue	08/12/2017

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

Results Approved By
Long Pham, Team Leader, Metals

Authorised By

David Springer, General Manager

Metals in TCLP USEPA1311		
Our Reference		179341-A-16
Your Reference	UNITS	BH41
Depth		0-0.1
Date Sampled		30/10/2017
Type of sample		SOIL
Date extracted	-	07/12/2017
Date analysed	-	07/12/2017
pH of soil for fluid# determ.	pH units	9.5
pH of soil TCLP (after HCl)	pH units	1.6
Extraction fluid used	-	1
pH of final Leachate	pH units	6.2
Nickel in TCLP	mg/L	<0.02

Method ID	Methodology Summary
EXTRACT.7	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using in house method INORG-004.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.

QUALITY CONTROL: Metals in TCLP USEPA1311						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			07/12/2017	[NT]	[NT]	[NT]	[NT]	07/12/2017	[NT]
Date analysed	-			07/12/2017	[NT]	[NT]	[NT]	[NT]	07/12/2017	[NT]
Nickel in TCLP	mg/L	0.02	Metals-020 ICP-AES	<0.02	[NT]	[NT]	[NT]	[NT]	100	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
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RPD	Relative Percent Difference
LCS	Laboratory Control Sample
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Measurement Uncertainty estimates are available for most tests upon request.

Andrew Fitzsimons

From: David Walker <David.Walker@douglaspartners.com.au>
Sent: Thursday, 7 December 2017 11:10 AM
To: Aileen Hie
Cc: Samplereceipt
Subject: TCLP request

ELS: 179341 - A
Rec: 7/12/17 11:10
TAT: 1 day
A

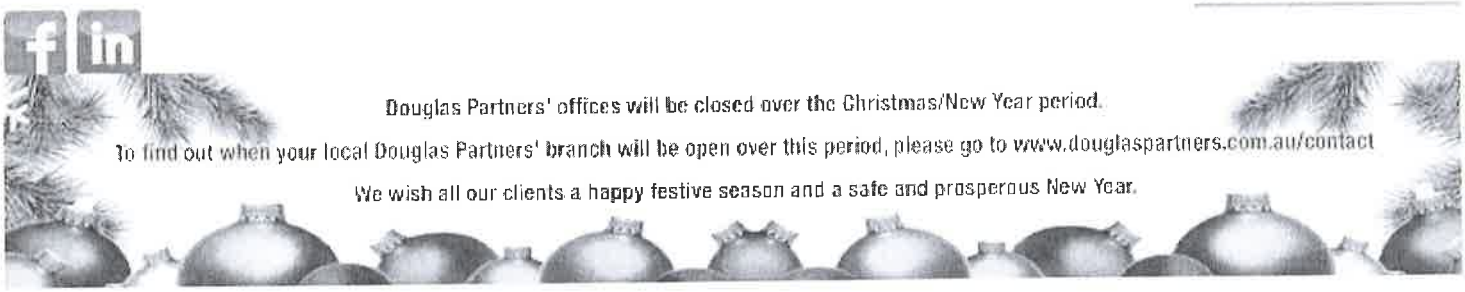
Aileen

If you still have the sample could you please do TCLP for nickel for sample 179341-16 on 24 hour turnaround.

Regards

David Walker | Associate / Environmental Engineer
Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685
P: 02 9809 0666 | F: 02 9809 4095 | M: 0407 540 537 | E: David.Walker@douglaspartners.com.au

FINANCIAL REVIEW
CLIENT CHOICE AW
WINNER



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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	David Walker

Sample Login Details

Your reference	86043.01, Ivanhoe
Envirolab Reference	179341-A
Date Sample Received	07/11/2017
Date Instructions Received	07/12/2017
Date Results Expected to be Reported	08/12/2017

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	Additional testing 1 sample
Turnaround Time Requested	1 day
Temperature on Receipt (°C)	4.7
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

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customerservice@envirolab.com.au
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Sample ID	Metals in TCLP USEPA1311	On Hold
BH01-0.35		✓
BH01-1.0		✓
BH02-0.5		✓
BH04-0-0.1		✓
BH05-0.1		✓
BH05-1.0		✓
BH10-0.5		✓
BH10-0.9-1.0		✓
BH11-0.5		✓
BH11-1.0		✓
BH12-0.5		✓
BH12-1.5		✓
BH13-0.15		✓
BH13-1.6		✓
BH34-0.1-0.2		✓
BH41-0-0.1	✓	
BH41-0.4-0.5		✓

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

Additional Info

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

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

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ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 179694

Client Details

Client	Douglas Partners Pty Ltd
Attention	David Walker
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**86043.01, Ivanhoe**
Number of Samples	27 Soil
Date samples received	13/11/2017
Date completed instructions received	13/11/2017

Analysis Details

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

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

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

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

Report Details

Date results requested by	20/11/2017
Date of Issue	17/11/2017

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

Results Approved By
Dragana Tomas, Senior Chemist
Long Pham, Team Leader, Metals
Nick Sarlamis, Inorganics Supervisor
Paul Ching, Senior Analyst
Steven Luong, Senior Chemist

Authorised By

David Springer, General Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		179694-1	179694-2	179694-3	179694-4	179694-5
Your Reference	UNITS	BH03	BH03	BH03	BH06	BH06
Depth		0.1	1.0	1.5	0.4-0.5	1.4-1.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	15/11/2017	15/11/2017	15/11/2017	15/11/2017	15/11/2017
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	86	83	88	87	89

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		179694-6	179694-7	179694-8	179694-9	179694-10
Your Reference	UNITS	BH07	BH07	BH08	BH08	BH08
Depth		0.4-0.5	0.9-1.0	0.1	0.4-0.5	0.9-1.0
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	15/11/2017	15/11/2017	15/11/2017	15/11/2017	15/11/2017
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	90	89	84	87	90

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		179694-11	179694-12	179694-13	179694-14	179694-15
Your Reference	UNITS	BH09	BH09	BH33	BH35	BH35
Depth		0.1	1.0	0.1	0.1	0.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	15/11/2017	15/11/2017	15/11/2017	15/11/2017	15/11/2017
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	93	86	87	82	91

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		179694-16	179694-17	179694-18	179694-19	179694-20
Your Reference	UNITS	BH37	BH38	BH38	BH39	BH40
Depth		0.1	0.1	0.5	0.4	0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	15/11/2017	15/11/2017	15/11/2017	15/11/2017	15/11/2017
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	89	89	86	90	84

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		179694-21	179694-22	179694-23	179694-24	179694-25
Your Reference	UNITS	BH40	BH42	BH42	BH44	BH44
Depth		1.2	0.4-0.5	1.4-1.5	0.4-0.5	0.9-1.0
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	15/11/2017	15/11/2017	15/11/2017	15/11/2017	15/11/2017
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	81	86	88	98	86

vTRH(C6-C10)/BTEXN in Soil			
Our Reference		179694-26	179694-27
Your Reference	UNITS	LP1	LP1
Depth		0.1	0.5
Type of sample		Soil	Soil
Date extracted	-	14/11/2017	14/11/2017
Date analysed	-	15/11/2017	15/11/2017
TRH C_6 - C_9	mg/kg	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25
Benzene	mg/kg	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1
m+p-xylene	mg/kg	<2	<2
o-Xylene	mg/kg	<1	<1
naphthalene	mg/kg	<1	<1
Total +ve Xylenes	mg/kg	<1	<1
Surrogate aaa-Trifluorotoluene	%	88	84

svTRH (C10-C40) in Soil						
Our Reference		179694-1	179694-2	179694-3	179694-4	179694-5
Your Reference	UNITS	BH03	BH03	BH03	BH06	BH06
Depth		0.1	1.0	1.5	0.4-0.5	1.4-1.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	85	100	79	79	78

svTRH (C10-C40) in Soil						
Our Reference		179694-6	179694-7	179694-8	179694-9	179694-10
Your Reference	UNITS	BH07	BH07	BH08	BH08	BH08
Depth		0.4-0.5	0.9-1.0	0.1	0.4-0.5	0.9-1.0
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	87	77	78	77	79

svTRH (C10-C40) in Soil						
Our Reference		179694-11	179694-12	179694-13	179694-14	179694-15
Your Reference	UNITS	BH09	BH09	BH33	BH35	BH35
Depth		0.1	1.0	0.1	0.1	0.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	78	76	78	76	78

svTRH (C10-C40) in Soil						
Our Reference		179694-16	179694-17	179694-18	179694-19	179694-20
Your Reference	UNITS	BH37	BH38	BH38	BH39	BH40
Depth		0.1	0.1	0.5	0.4	0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	14/11/2017	14/11/2017	14/11/2017	15/11/2017	15/11/2017
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	76	75	77	78	77

svTRH (C10-C40) in Soil						
Our Reference		179694-21	179694-22	179694-23	179694-24	179694-25
Your Reference	UNITS	BH40	BH42	BH42	BH44	BH44
Depth		1.2	0.4-0.5	1.4-1.5	0.4-0.5	0.9-1.0
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	15/11/2017	15/11/2017	15/11/2017	15/11/2017	15/11/2017
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	79	78	77	77	77

svTRH (C10-C40) in Soil			
Our Reference		179694-26	179694-27
Your Reference	UNITS	LP1	LP1
Depth		0.1	0.5
Type of sample		Soil	Soil
Date extracted	-	14/11/2017	14/11/2017
Date analysed	-	15/11/2017	15/11/2017
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	%	77	77

PAHs in Soil						
Our Reference		179694-1	179694-2	179694-3	179694-4	179694-5
Your Reference	UNITS	BH03	BH03	BH03	BH06	BH06
Depth		0.1	1.0	1.5	0.4-0.5	1.4-1.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	15/11/2017	15/11/2017	15/11/2017	15/11/2017	15/11/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<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	%	87	87	80	89	90

PAHs in Soil						
Our Reference		179694-6	179694-7	179694-8	179694-9	179694-10
Your Reference	UNITS	BH07	BH07	BH08	BH08	BH08
Depth		0.4-0.5	0.9-1.0	0.1	0.4-0.5	0.9-1.0
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	15/11/2017	15/11/2017	15/11/2017	15/11/2017	15/11/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<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	%	91	90	91	88	87

PAHs in Soil						
Our Reference		179694-11	179694-12	179694-13	179694-14	179694-15
Your Reference	UNITS	BH09	BH09	BH33	BH35	BH35
Depth		0.1	1.0	0.1	0.1	0.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	15/11/2017	15/11/2017	15/11/2017	15/11/2017	15/11/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<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	%	85	85	87	85	90

PAHs in Soil						
Our Reference		179694-16	179694-17	179694-18	179694-19	179694-20
Your Reference	UNITS	BH37	BH38	BH38	BH39	BH40
Depth		0.1	0.1	0.5	0.4	0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	15/11/2017	15/11/2017	14/11/2017	14/11/2017	14/11/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	0.2	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	0.2	<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	0.2	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	0.3	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	0.2	<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	1.6	<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	%	93	87	91	87	91

PAHs in Soil						
Our Reference		179694-21	179694-22	179694-23	179694-24	179694-25
Your Reference	UNITS	BH40	BH42	BH42	BH44	BH44
Depth		1.2	0.4-0.5	1.4-1.5	0.4-0.5	0.9-1.0
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<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	%	91	90	91	91	90

PAHs in Soil			
Our Reference		179694-26	179694-27
Your Reference	UNITS	LP1	LP1
Depth		0.1	0.5
Type of sample		Soil	Soil
Date extracted	-	14/11/2017	14/11/2017
Date analysed	-	14/11/2017	14/11/2017
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	%	88	89

Organochlorine Pesticides in soil						
Our Reference		179694-1	179694-2	179694-3	179694-4	179694-5
Your Reference	UNITS	BH03	BH03	BH03	BH06	BH06
Depth		0.1	1.0	1.5	0.4-0.5	1.4-1.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	98	86	88	98	93

Organochlorine Pesticides in soil						
Our Reference		179694-6	179694-7	179694-8	179694-9	179694-10
Your Reference	UNITS	BH07	BH07	BH08	BH08	BH08
Depth		0.4-0.5	0.9-1.0	0.1	0.4-0.5	0.9-1.0
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	92	92	80	92	95

Organochlorine Pesticides in soil						
Our Reference		179694-11	179694-12	179694-13	179694-14	179694-15
Your Reference	UNITS	BH09	BH09	BH33	BH35	BH35
Depth		0.1	1.0	0.1	0.1	0.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	92	79	89	93	94

Organochlorine Pesticides in soil						
Our Reference		179694-16	179694-17	179694-18	179694-19	179694-20
Your Reference	UNITS	BH37	BH38	BH38	BH39	BH40
Depth		0.1	0.1	0.5	0.4	0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	79	92	92	97	91

Organochlorine Pesticides in soil						
Our Reference		179694-21	179694-22	179694-23	179694-24	179694-25
Your Reference	UNITS	BH40	BH42	BH42	BH44	BH44
Depth		1.2	0.4-0.5	1.4-1.5	0.4-0.5	0.9-1.0
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	96	93	92	96	85

Organochlorine Pesticides in soil			
Our Reference		179694-26	179694-27
Your Reference	UNITS	LP1	LP1
Depth		0.1	0.5
Type of sample		Soil	Soil
Date extracted	-	14/11/2017	14/11/2017
Date analysed	-	14/11/2017	14/11/2017
HCB	mg/kg	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1
Surrogate TCMX	%	91	94

Organophosphorus Pesticides						
Our Reference		179694-1	179694-4	179694-6	179694-8	179694-11
Your Reference	UNITS	BH03	BH06	BH07	BH08	BH09
Depth		0.1	0.4-0.5	0.4-0.5	0.1	0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	98	98	92	80	92

Organophosphorus Pesticides						
Our Reference		179694-13	179694-15	179694-16	179694-17	179694-20
Your Reference	UNITS	BH33	BH35	BH37	BH38	BH40
Depth		0.1	0.5	0.1	0.1	0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	89	94	79	92	91

Organophosphorus Pesticides				
Our Reference		179694-22	179694-24	179694-26
Your Reference	UNITS	BH42	BH44	LP1
Depth		0.4-0.5	0.4-0.5	0.1
Type of sample		Soil	Soil	Soil
Date extracted	-	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	14/11/2017	14/11/2017	14/11/2017
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	93	96	91

PCBs in Soil						
Our Reference		179694-1	179694-4	179694-6	179694-8	179694-11
Your Reference	UNITS	BH03	BH06	BH07	BH08	BH09
Depth		0.1	0.4-0.5	0.4-0.5	0.1	0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	98	98	92	80	92

PCBs in Soil						
Our Reference		179694-13	179694-15	179694-16	179694-17	179694-20
Your Reference	UNITS	BH33	BH35	BH37	BH38	BH40
Depth		0.1	0.5	0.1	0.1	0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	89	94	79	92	91

PCBs in Soil				
Our Reference		179694-22	179694-24	179694-26
Your Reference	UNITS	BH42	BH44	LP1
Depth		0.4-0.5	0.4-0.5	0.1
Type of sample		Soil	Soil	Soil
Date extracted	-	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	14/11/2017	14/11/2017	14/11/2017
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1
Surrogate TCLMX	%	93	96	91

Acid Extractable metals in soil						
Our Reference		179694-1	179694-2	179694-3	179694-4	179694-5
Your Reference	UNITS	BH03	BH03	BH03	BH06	BH06
Depth		0.1	1.0	1.5	0.4-0.5	1.4-1.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Arsenic	mg/kg	5	7	5	6	6
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	54	22	19	26	23
Copper	mg/kg	16	14	8	10	6
Lead	mg/kg	11	17	10	19	13
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	37	9	12	5	2
Zinc	mg/kg	25	18	11	16	8

Acid Extractable metals in soil						
Our Reference		179694-6	179694-7	179694-8	179694-9	179694-10
Your Reference	UNITS	BH07	BH07	BH08	BH08	BH08
Depth		0.4-0.5	0.9-1.0	0.1	0.4-0.5	0.9-1.0
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Arsenic	mg/kg	<4	8	<4	4	4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	12	30	13	14	17
Copper	mg/kg	6	6	15	6	2
Lead	mg/kg	29	14	14	16	9
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	5	12	15	2	2
Zinc	mg/kg	22	6	65	13	3

Acid Extractable metals in soil						
Our Reference		179694-11	179694-12	179694-13	179694-14	179694-15
Your Reference	UNITS	BH09	BH09	BH33	BH35	BH35
Depth		0.1	1.0	0.1	0.1	0.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Arsenic	mg/kg	<4	<4	<4	<4	5
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	9	29	13	8	26
Copper	mg/kg	70	1	7	6	5
Lead	mg/kg	2	8	10	7	7
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	120	3	10	8	11
Zinc	mg/kg	42	3	31	26	7

Acid Extractable metals in soil						
Our Reference		179694-16	179694-17	179694-18	179694-19	179694-20
Your Reference	UNITS	BH37	BH38	BH38	BH39	BH40
Depth		0.1	0.1	0.5	0.4	0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Arsenic	mg/kg	<4	5	5	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	11	14	21	10	12
Copper	mg/kg	8	46	4	1	8
Lead	mg/kg	19	200	12	5	14
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	4	22	2	3	3
Zinc	mg/kg	26	89	3	4	19

Acid Extractable metals in soil						
Our Reference		179694-21	179694-22	179694-23	179694-24	179694-25
Your Reference	UNITS	BH40	BH42	BH42	BH44	BH44
Depth		1.2	0.4-0.5	1.4-1.5	0.4-0.5	0.9-1.0
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Arsenic	mg/kg	8	<4	4	<4	4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	48	7	29	18	23
Copper	mg/kg	<1	3	3	2	5
Lead	mg/kg	13	6	7	7	10
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	2	4	2	1	2
Zinc	mg/kg	2	5	9	4	8

Acid Extractable metals in soil			
Our Reference		179694-26	179694-27
Your Reference	UNITS	LP1	LP1
Depth		0.1	0.5
Type of sample		Soil	Soil
Date prepared	-	14/11/2017	14/11/2017
Date analysed	-	14/11/2017	14/11/2017
Arsenic	mg/kg	14	6
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	20	19
Copper	mg/kg	10	8
Lead	mg/kg	20	21
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	4	4
Zinc	mg/kg	23	25

Misc Soil - Inorg						
Our Reference		179694-1	179694-4	179694-6	179694-8	179694-11
Your Reference	UNITS	BH03	BH06	BH07	BH08	BH09
Depth		0.1	0.4-0.5	0.4-0.5	0.1	0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg						
Our Reference		179694-13	179694-15	179694-16	179694-17	179694-20
Your Reference	UNITS	BH33	BH35	BH37	BH38	BH40
Depth		0.1	0.5	0.1	0.1	0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg				
Our Reference		179694-22	179694-24	179694-26
Your Reference	UNITS	BH42	BH44	LP1
Depth		0.4-0.5	0.4-0.5	0.1
Type of sample		Soil	Soil	Soil
Date prepared	-	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	14/11/2017	14/11/2017	14/11/2017
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5

Moisture						
Our Reference		179694-1	179694-2	179694-3	179694-4	179694-5
Your Reference	UNITS	BH03	BH03	BH03	BH06	BH06
Depth		0.1	1.0	1.5	0.4-0.5	1.4-1.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	15/11/2017	15/11/2017	15/11/2017	15/11/2017	15/11/2017
Moisture	%	6.8	12	9.7	11	8.7

Moisture						
Our Reference		179694-6	179694-7	179694-8	179694-9	179694-10
Your Reference	UNITS	BH07	BH07	BH08	BH08	BH08
Depth		0.4-0.5	0.9-1.0	0.1	0.4-0.5	0.9-1.0
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	15/11/2017	15/11/2017	15/11/2017	15/11/2017	15/11/2017
Moisture	%	8.1	13	14	11	9.1

Moisture						
Our Reference		179694-11	179694-12	179694-13	179694-14	179694-15
Your Reference	UNITS	BH09	BH09	BH33	BH35	BH35
Depth		0.1	1.0	0.1	0.1	0.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	15/11/2017	15/11/2017	15/11/2017	15/11/2017	15/11/2017
Moisture	%	6.7	13	3.6	9.1	5.7

Moisture						
Our Reference		179694-16	179694-17	179694-18	179694-19	179694-20
Your Reference	UNITS	BH37	BH38	BH38	BH39	BH40
Depth		0.1	0.1	0.5	0.4	0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	15/11/2017	15/11/2017	15/11/2017	15/11/2017	15/11/2017
Moisture	%	6.6	8.2	13	9.2	11

Moisture						
Our Reference		179694-21	179694-22	179694-23	179694-24	179694-25
Your Reference	UNITS	BH40	BH42	BH42	BH44	BH44
Depth		1.2	0.4-0.5	1.4-1.5	0.4-0.5	0.9-1.0
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/11/2017	14/11/2017	14/11/2017	14/11/2017	14/11/2017
Date analysed	-	15/11/2017	15/11/2017	15/11/2017	15/11/2017	15/11/2017
Moisture	%	20	5.5	11	7.7	11

Moisture			
Our Reference		179694-26	179694-27
Your Reference	UNITS	LP1	LP1
Depth		0.1	0.5
Type of sample		Soil	Soil
Date prepared	-	14/11/2017	14/11/2017
Date analysed	-	15/11/2017	15/11/2017
Moisture	%	11	10

Asbestos ID - soils						
Our Reference		179694-1	179694-4	179694-6	179694-8	179694-9
Your Reference	UNITS	BH03	BH06	BH07	BH08	BH08
Depth		0.1	0.4-0.5	0.4-0.5	0.1	0.4-0.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	17/11/2017	17/11/2017	17/11/2017	17/11/2017	17/11/2017
Sample mass tested	g	Approx. 35g	Approx. 40g	Approx. 30g	Approx. 30g	Approx. 25g
Sample Description	-	Brown coarse-grained soil & rocks	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	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils						
Our Reference		179694-11	179694-13	179694-15	179694-16	179694-17
Your Reference	UNITS	BH09	BH33	BH35	BH37	BH38
Depth		0.1	0.1	0.5	0.1	0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	17/11/2017	17/11/2017	17/11/2017	17/11/2017	17/11/2017
Sample mass tested	g	Approx. 25g	Approx. 25g	Approx. 40g	Approx. 30g	Approx. 25g
Sample Description	-	Brown coarse-grained soil & rocks	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	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils					
Our Reference		179694-20	179694-22	179694-24	179694-26
Your Reference	UNITS	BH40	BH42	BH44	LP1
Depth		0.1	0.4-0.5	0.4-0.5	0.1
Type of sample		Soil	Soil	Soil	Soil
Date analysed	-	17/11/2017	17/11/2017	17/11/2017	17/11/2017
Sample mass tested	g	Approx. 30g	Approx. 25g	Approx. 25g	Approx. 35g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.

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

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	179694-4
Date extracted	-			14/11/2017	1	14/11/2017	14/11/2017		14/11/2017	14/11/2017
Date analysed	-			15/11/2017	1	15/11/2017	15/11/2017		15/11/2017	15/11/2017
TRH C_6 - C_9	mg/kg	25	Org-016	<25	1	<25	<25	0	90	89
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	1	<25	<25	0	90	89
Benzene	mg/kg	0.2	Org-016	<0.2	1	<0.2	<0.2	0	84	82
Toluene	mg/kg	0.5	Org-016	<0.5	1	<0.5	<0.5	0	91	88
Ethylbenzene	mg/kg	1	Org-016	<1	1	<1	<1	0	92	91
m+p-xylene	mg/kg	2	Org-016	<2	1	<2	<2	0	92	91
o-Xylene	mg/kg	1	Org-016	<1	1	<1	<1	0	90	89
naphthalene	mg/kg	1	Org-014	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	92	1	86	91	6	93	83

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	179694-24
Date extracted	-			[NT]	11	14/11/2017	14/11/2017		14/11/2017	14/11/2017
Date analysed	-			[NT]	11	15/11/2017	15/11/2017		15/11/2017	15/11/2017
TRH C_6 - C_9	mg/kg	25	Org-016	[NT]	11	<25	<25	0	88	87
TRH C_6 - C_{10}	mg/kg	25	Org-016	[NT]	11	<25	<25	0	88	87
Benzene	mg/kg	0.2	Org-016	[NT]	11	<0.2	<0.2	0	81	80
Toluene	mg/kg	0.5	Org-016	[NT]	11	<0.5	<0.5	0	88	87
Ethylbenzene	mg/kg	1	Org-016	[NT]	11	<1	<1	0	89	88
m+p-xylene	mg/kg	2	Org-016	[NT]	11	<2	<2	0	90	90
o-Xylene	mg/kg	1	Org-016	[NT]	11	<1	<1	0	88	87
naphthalene	mg/kg	1	Org-014	[NT]	11	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	11	93	87	7	91	84

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]	22	14/11/2017	14/11/2017		[NT]	[NT]
Date analysed	-			[NT]	22	15/11/2017	15/11/2017		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	[NT]	22	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	[NT]	22	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-016	[NT]	22	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-016	[NT]	22	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-016	[NT]	22	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-016	[NT]	22	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-016	[NT]	22	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-014	[NT]	22	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	22	86	86	0	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	179694-4
Date extracted	-			14/11/2017	1	14/11/2017	14/11/2017		14/11/2017	14/11/2017
Date analysed	-			15/11/2017	1	14/11/2017	14/11/2017		14/11/2017	14/11/2017
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	1	<50	<50	0	100	97
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	1	<100	<100	0	104	97
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	1	<100	<100	0	106	90
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	1	<50	<50	0	100	97
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	1	<100	<100	0	104	97
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	1	<100	<100	0	106	90
Surrogate o-Terphenyl	%		Org-003	78	1	85	86	1	92	79

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	179694-24
Date extracted	-			[NT]	11	14/11/2017	14/11/2017		14/11/2017	14/11/2017
Date analysed	-			[NT]	11	14/11/2017	14/11/2017		15/11/2017	15/11/2017
TRH C_{10} - C_{14}	mg/kg	50	Org-003	[NT]	11	<50	<50	0	95	96
TRH C_{15} - C_{28}	mg/kg	100	Org-003	[NT]	11	<100	<100	0	97	98
TRH C_{29} - C_{36}	mg/kg	100	Org-003	[NT]	11	<100	<100	0	91	88
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	[NT]	11	<50	<50	0	95	96
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	[NT]	11	<100	<100	0	97	98
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	[NT]	11	<100	<100	0	91	88
Surrogate o-Terphenyl	%		Org-003	[NT]	11	78	79	1	86	77

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	22	14/11/2017	14/11/2017		[NT]	[NT]
Date analysed	-			[NT]	22	15/11/2017	15/11/2017		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	[NT]	22	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	[NT]	22	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	[NT]	22	<100	<100	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	[NT]	22	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	[NT]	22	<100	<100	0	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	[NT]	22	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-003	[NT]	22	78	78	0	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	179694-4
Date extracted	-			14/11/2017	1	14/11/2017	14/11/2017		14/11/2017	14/11/2017
Date analysed	-			15/11/2017	1	15/11/2017	15/11/2017		15/11/2017	15/11/2017
Naphthalene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	86	81
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	89	83
Phenanthrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	86	81
Anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	89	82
Pyrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	94	87
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	95	89
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	1	<0.05	<0.05	0	76	75
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	95	1	87	91	4	119	113

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	179694-24
Date extracted	-			[NT]	11	14/11/2017	14/11/2017		14/11/2017	14/11/2017
Date analysed	-			[NT]	11	15/11/2017	15/11/2017		15/11/2017	14/11/2017
Naphthalene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	96	89
Acenaphthylene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	94	89
Phenanthrene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	96	88
Anthracene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	96	91
Pyrene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	101	96
Benzo(a)anthracene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	100	92
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	[NT]	11	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	[NT]	11	<0.05	<0.05	0	87	77
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	[NT]	11	85	85	0	117	118

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	22	14/11/2017	14/11/2017		[NT]	[NT]
Date analysed	-			[NT]	22	14/11/2017	14/11/2017		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-012	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-012	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-012	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-012	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	[NT]	22	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	[NT]	22	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	[NT]	22	90	91	1	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	17	14/11/2017	14/11/2017		[NT]	[NT]
Date analysed	-			[NT]	17	15/11/2017	15/11/2017		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-012	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-012	[NT]	17	0.1	0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-012	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	[NT]	17	0.2	0.3	40	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-012	[NT]	17	0.2	0.3	40	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	[NT]	17	0.1	0.2	67	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	[NT]	17	0.2	0.2	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	[NT]	17	0.3	0.3	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	[NT]	17	0.2	0.2	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	[NT]	17	0.1	0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	[NT]	17	0.1	0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	[NT]	17	87	91	4	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	179694-4
Date extracted	-			14/11/2017	1	14/11/2017	14/11/2017		14/11/2017	14/11/2017
Date analysed	-			14/11/2017	1	14/11/2017	14/11/2017		14/11/2017	14/11/2017
HCB	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	90	94
gamma-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	89	93
Heptachlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	79	84
delta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	77	83
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	77	83
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	80	95
Dieldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	84	92
Endrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	77	84
pp-DDD	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	85	100
Endosulfan II	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	68	76
Methoxychlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	85	1	98	81	19	100	99

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	179694-24
Date extracted	-			[NT]	11	14/11/2017	14/11/2017		14/11/2017	14/11/2017
Date analysed	-			[NT]	11	14/11/2017	14/11/2017		14/11/2017	14/11/2017
HCB	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	88	99
gamma-BHC	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	85	96
Heptachlor	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	76	91
delta-BHC	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	73	88
Heptachlor Epoxide	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	74	89
gamma-Chlordane	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	76	96
Dieldrin	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	81	96
Endrin	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	73	86
pp-DDD	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	79	99
Endosulfan II	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	78	71
Methoxychlor	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	[NT]	11	92	94	2	99	108

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	22	14/11/2017	14/11/2017		[NT]	[NT]
Date analysed	-			[NT]	22	14/11/2017	14/11/2017		[NT]	[NT]
HCB	mg/kg	0.1	Org-005	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-005	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-005	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-005	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-005	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-005	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-005	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-005	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-005	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	[NT]	22	93	87	7	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	179694-4
Date extracted	-			14/11/2017	1	14/11/2017	14/11/2017		14/11/2017	14/11/2017
Date analysed	-			14/11/2017	1	14/11/2017	14/11/2017		14/11/2017	14/11/2017
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	105	89
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	106	80
Dimethoate	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	108	103
Fenitrothion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	102	102
Malathion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	103	73
Parathion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	115	114
Ronnel	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	121	101
Surrogate TCMX	%		Org-008	85	1	98	81	19	99	81

QUALITY CONTROL: Organophosphorus Pesticides						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	179694-24
Date extracted	-			[NT]	11	14/11/2017	14/11/2017		14/11/2017	14/11/2017
Date analysed	-			[NT]	11	14/11/2017	14/11/2017		14/11/2017	14/11/2017
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	92	95
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	90	95
Dimethoate	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	79	111
Fenitrothion	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	102	93
Malathion	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	82	84
Parathion	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	107	109
Ronnel	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	106	107
Surrogate TCMX	%		Org-008	[NT]	11	92	94	2	101	87

QUALITY CONTROL: Organophosphorus Pesticides						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	22	14/11/2017	14/11/2017		[NT]	[NT]
Date analysed	-			[NT]	22	14/11/2017	14/11/2017		[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-008	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-008	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-008	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-008	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-008	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-008	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-008	[NT]	22	93	87	7	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	179694-4
Date extracted	-			14/11/2017	1	14/11/2017	14/11/2017		14/11/2017	14/11/2017
Date analysed	-			14/11/2017	1	14/11/2017	14/11/2017		14/11/2017	14/11/2017
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	102	132
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	85	1	98	81	19	99	81

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	179694-24
Date extracted	-			[NT]	11	14/11/2017	14/11/2017		14/11/2017	14/11/2017
Date analysed	-			[NT]	11	14/11/2017	14/11/2017		14/11/2017	14/11/2017
Aroclor 1016	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	124	135
Aroclor 1260	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	[NT]	11	92	94	2	101	87

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	22	14/11/2017	14/11/2017		[NT]	[NT]
Date analysed	-			[NT]	22	14/11/2017	14/11/2017		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	[NT]	22	93	87	7	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	179694-4
Date prepared	-			14/11/2017	1	14/11/2017	14/11/2017		14/11/2017	14/11/2017
Date analysed	-			14/11/2017	1	14/11/2017	14/11/2017		14/11/2017	14/11/2017
Arsenic	mg/kg	4	Metals-020	<4	1	5	4	22	117	101
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	106	100
Chromium	mg/kg	1	Metals-020	<1	1	54	50	8	114	110
Copper	mg/kg	1	Metals-020	<1	1	16	18	12	112	118
Lead	mg/kg	1	Metals-020	<1	1	11	11	0	107	97
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	102	104
Nickel	mg/kg	1	Metals-020	<1	1	37	37	0	106	107
Zinc	mg/kg	1	Metals-020	<1	1	25	26	4	111	101

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	179694-24
Date prepared	-			[NT]	11	14/11/2017	14/11/2017		14/11/2017	14/11/2017
Date analysed	-			[NT]	11	14/11/2017	14/11/2017		14/11/2017	14/11/2017
Arsenic	mg/kg	4	Metals-020	[NT]	11	<4	<4	0	118	96
Cadmium	mg/kg	0.4	Metals-020	[NT]	11	<0.4	<0.4	0	108	102
Chromium	mg/kg	1	Metals-020	[NT]	11	9	9	0	117	116
Copper	mg/kg	1	Metals-020	[NT]	11	70	76	8	114	113
Lead	mg/kg	1	Metals-020	[NT]	11	2	4	67	109	101
Mercury	mg/kg	0.1	Metals-021	[NT]	11	<0.1	<0.1	0	103	104
Nickel	mg/kg	1	Metals-020	[NT]	11	120	130	8	108	104
Zinc	mg/kg	1	Metals-020	[NT]	11	42	44	5	112	102

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	22	14/11/2017	14/11/2017		[NT]	[NT]
Date analysed	-			[NT]	22	14/11/2017	14/11/2017		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	22	<4	<4	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	22	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	22	7	11	44	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	22	3	5	50	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	22	6	7	15	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	22	4	6	40	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	22	5	8	46	[NT]	[NT]

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	179694-4
Date prepared	-			14/11/2017	1	14/11/2017	14/11/2017		14/11/2017	14/11/2017
Date analysed	-			14/11/2017	1	14/11/2017	14/11/2017		14/11/2017	14/11/2017
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	1	<5	<5	0	99	100

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	22	14/11/2017	14/11/2017		[NT]	[NT]
Date analysed	-			[NT]	22	14/11/2017	14/11/2017		[NT]	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	[NT]	22	<5	<5	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.

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

Report Comments

Asbestos: A portion of the supplied sample was sub-sampled for asbestos analysis according to Envirolab procedures.
We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g of sample in its own container.
Note: Samples were sub-sampled from jars provided by the client.

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	86043.01	**Suburb:**	Macquarie Park	**To:**	Envirolab Services
Project Name:	Ivanhoe	**Order Number**			12 Ashley Street, Chatswood NSW 2067
Project Manager:	S Peacock (& David Walker)	**Sampler:**	LS	**Attn:**	Aileen
Emails:	david.walker@douglaspartners.com.au			**Phone:**	02 9910 6200
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☑			**Email:**	sydney@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	depth	Lab ID	Date Sampled	Sample Type (S - soil, W - water)	Container Type (G - glass, P - plastic)	Analytes: Combo 5a	Combo 14	Combo 14a							Notes/preservation
BH03	0.1	1	~~[illegible]~~	S	G	✓									
BH03	1.0	2		S	G		✓								
BH03	1.5	3					✓								
BH06	0.4-0.5	4				✓									
BH06	1.4-1.5	5					✓								
BH07	0.4-0.5	6				✓									
BH07	0.9-1.0	7					✓								
BH08	0.1	8				✓									
BH08	0.4-0.5	9						✓							
BH08	0.9-1.0	10					✓								
BH09	0.1	11				✓									
BH09	1.0	12					✓								
BH33	0.1	13				✓									
BH35	0.1	14					✓								
BH35	0.5	15				✓									
PQL (S) mg/kg															**ANZECC PQLs req'd for all water analytes** ☐

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
Job No: 179694
Date Received: 13/11/17
Time Received: 13:10
Received by: MT
Temp: Cool/Ambient 12.8
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:

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

Send Results to: Douglas Partners Pty Ltd **Address:** 96 Hermitage Road, West Ryde **Phone:** 98090666 **Fax:** 98094095

Signed: **Received by:** MT ECS **Date & Time:** 13/11/17 13:10

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	86043.01	**Suburb:**	Macquarie Park	**To:**	Envirolab Services
Project Name:	Ivanhoe	**Order Number**			12 Ashley Street, Chatswood NSW 2067
Project Manager:	S Peacock (& David Walker)	**Sampler:**	LS	**Attn:**	Aileen
Emails:	david.walker@douglaspartners.com.au			**Phone:**	02 9910 6200
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☐			**Email:**	sydney@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 179694	Lab ID	Date Sampled	Sample Type S - soil W - water	Container Type G - glass P - plastic	Analytes: Combo 85	Analytes: Combo 14								Notes/preservation
BH37 0.1	16	~~4.11.17~~	S	G	✓									
BH38 0.1	17				✓									
BH38 0.5	18					✓								
BH39 0.4	19					✓								
BH40 0.1	20				✓									
BH40 1.2	21					✓								
BH42 0.4-0.5	22				✓									
BH42 1.4-1.5	23					✓								
BH44 0.4-0.5	24				✓									
BH44 0.9-1.0	25					✓								
LP1 0.1	26				✓									
LP1 0.5	27					✓								
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:

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

Send Results to: Douglas Partners Pty Ltd **Address:** 96 Hermitage Road, West Ryde **Phone:** 98090666 **Fax:** 98094095

Signed: **Received by:** MT ECS **Date & Time:** 13/11/17 1320

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	David Walker

Sample Login Details

Your reference	86043.01, Ivanhoe
Envirolab Reference	179694
Date Sample Received	13/11/2017
Date Instructions Received	13/11/2017
Date Results Expected to be Reported	20/11/2017

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	27 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	12.8
Cooling Method	Ice Pack
Sampling Date Provided	Not Provided on the COC

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

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

Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticidesin soil	Organophosphorus Pesticides	PCBsin Soil	Acid Extractable metalsin soil	Total Phenolics (as Phenol)	Asbestos ID - soils
BH03-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH03-1.0	✓	✓	✓	✓			✓		
BH03-1.5	✓	✓	✓	✓			✓		
BH06-0.4-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH06-1.4-1.5	✓	✓	✓	✓			✓		
BH07-0.4-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH07-0.9-1.0	✓	✓	✓	✓			✓		
BH08-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH08-0.4-0.5	✓	✓	✓	✓			✓		✓
BH08-0.9-1.0	✓	✓	✓	✓			✓		
BH09-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH09-1.0	✓	✓	✓	✓			✓		
BH33-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH35-0.1	✓	✓	✓	✓			✓		
BH35-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH37-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH38-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH38-0.5	✓	✓	✓	✓			✓		
BH39-0.4	✓	✓	✓	✓			✓		
BH40-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH40-1.2	✓	✓	✓	✓			✓		
BH42-0.4-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH42-1.4-1.5	✓	✓	✓	✓			✓		
BH44-0.4-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH44-0.9-1.0	✓	✓	✓	✓			✓		
LP1-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓
LP1-0.5	✓	✓	✓	✓			✓		

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

Additional Info

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

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

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

CERTIFICATE OF ANALYSIS 179694-A

Client Details

Client	Douglas Partners Pty Ltd
Attention	David Walker
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**86043.01, Ivanhoe**
Number of Samples	27 Soil
Date samples received	13/11/2017
Date completed instructions received	20/11/2017

Analysis Details

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

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

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

Report Details

Date results requested by	27/11/2017
Date of Issue	24/11/2017

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Results Approved By
Long Pham, Team Leader, Metals

Authorised By

David Springer, General Manager

Metals in TCLP USEPA1311			
Our Reference		179694-A-11	179694-A-17
Your Reference	UNITS	BH09	BH38
Depth		0.1	0.1
Type of sample		Soil	Soil
Date extracted	-	22/11/2017	22/11/2017
Date analysed	-	23/11/2017	23/11/2017
pH of soil for fluid# determ.	pH units	9.3	6.6
pH of soil TCLP (after HCl)	pH units	1.6	1.6
Extraction fluid used	-	1	1
pH of final Leachate	pH units	5.2	5.1
Lead in TCLP	mg/L	[NA]	<0.03
Nickel in TCLP	mg/L	0.2	[NA]

Method ID	Methodology Summary
EXTRACT.7	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using in house method INORG-004.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.

QUALITY CONTROL: Metals in TCLP USEPA1311						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			22/11/2017	[NT]	[NT]	[NT]	[NT]	22/11/2017	[NT]
Date analysed	-			23/11/2017	[NT]	[NT]	[NT]	[NT]	23/11/2017	[NT]
Lead in TCLP	mg/L	0.03	Metals-020 ICP-AES	<0.03	[NT]	[NT]	[NT]	[NT]	108	[NT]
Nickel in TCLP	mg/L	0.02	Metals-020 ICP-AES	<0.02	[NT]	[NT]	[NT]	[NT]	110	[NT]

Result Definitions

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

Quality Control Definitions

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

Simon Song

From: David Walker <David.Walker@douglaspartners.com.au>
Sent: Monday, 20 November 2017 7:45 AM
To: Ken Nguyen
Cc: Samplereceipt
Subject: RE: Results for Registration 179694 86043.01, Ivanhoe

Hi Ken

Please go ahead with TCLP as follows:
-11 BH09, 0.1: Nickel
-17 BH38, 0.1: Lead
regards

ELS: 179694-A
Rec: 20/11/17 7:45
TAT: 5 days
AF

David Walker | Associate / Environmental Engineer
Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685
P: 02 9809 0666 | F: 02 9809 4095 | M: 0407 540 537 | E: David.Walker@douglaspartners.com.au

FINANCIAL REVIEW
CLIENT CHO
WINNER

This email is confidential. If you are not the intended recipient, please notify us immediately and be aware that any disclosure, copying, distribution or use of the contents of this information is prohibited. Please note that the company does not make any commitment through emails not confirmed by fax or letter.

From: Ken Nguyen [mailto:KNguyen@envirolab.com.au]
Sent: Friday, 17 November 2017 5:28 PM
To: David Walker
Subject: Results for Registration 179694 86043.01, Ivanhoe

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

We have a new reporting format and would welcome your feedback. Sydney@envirolab.com.au

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

Regards

Envirolab Services
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201

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	David Walker

Sample Login Details

Your reference	86043.01, Ivanhoe
Envirolab Reference	179694-A
Date Sample Received	13/11/2017
Date Instructions Received	20/11/2017
Date Results Expected to be Reported	27/11/2017

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	27 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	12.8
Cooling Method	Ice Pack
Sampling Date Provided	Not Provided on the COC

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

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

Sample ID	Metals in TCLP USEPA1311	On Hold
BH03-0.1		✓
BH03-1.0		✓
BH03-1.5		✓
BH06-0.4-0.5		✓
BH06-1.4-1.5		✓
BH07-0.4-0.5		✓
BH07-0.9-1.0		✓
BH08-0.1		✓
BH08-0.4-0.5		✓
BH08-0.9-1.0		✓
BH09-0.1	✓	
BH09-1.0		✓
BH33-0.1		✓
BH35-0.1		✓
BH35-0.5		✓
BH37-0.1		✓
BH38-0.1	✓	
BH38-0.5		✓
BH39-0.4		✓
BH40-0.1		✓
BH40-1.2		✓
BH42-0.4-0.5		✓
BH42-1.4-1.5		✓
BH44-0.4-0.5		✓
BH44-0.9-1.0		✓
LP1-0.1		✓
LP1-0.5		✓

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

Additional Info

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

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

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

CERTIFICATE OF ANALYSIS 180186

Client Details

Client	Douglas Partners Pty Ltd
Attention	David Walker
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**86043.01, Ivanhoe**
Number of Samples	10 Soil
Date samples received	20/11/2017
Date completed instructions received	20/11/2017

Analysis Details

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

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

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

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

Report Details

Date results requested by	27/11/2017
Date of Issue	24/11/2017

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

Results Approved By
Dragana Tomas, Senior Chemist
Long Pham, Team Leader, Metals
Nick Sarlamis, Inorganics Supervisor
Paul Ching, Senior Analyst
Steven Luong, Senior Chemist

Authorised By

David Springer, General Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		180186-1	180186-2	180186-3	180186-4	180186-5
Your Reference	UNITS	BH31	BH31	BH32	BH39	BH43
Depth		0.1	0.5	0.1	0.1	0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	21/11/2017	21/11/2017	21/11/2017	21/11/2017	21/11/2017
Date analysed	-	22/11/2017	22/11/2017	22/11/2017	22/11/2017	22/11/2017
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	80	87	71	73	82

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		180186-6	180186-7	180186-8	180186-9	180186-10
Your Reference	UNITS	BH45	BH46	BH47	BH47	BH47
Depth		0.1	0.3	0.5	1.0	1.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	21/11/2017	21/11/2017	21/11/2017	21/11/2017	21/11/2017
Date analysed	-	22/11/2017	22/11/2017	24/11/2017	22/11/2017	22/11/2017
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	70	78	96	77	76

svTRH (C10-C40) in Soil						
Our Reference		180186-1	180186-2	180186-3	180186-4	180186-5
Your Reference	UNITS	BH31	BH31	BH32	BH39	BH43
Depth		0.1	0.5	0.1	0.1	0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	21/11/2017	21/11/2017	21/11/2017	21/11/2017	21/11/2017
Date analysed	-	21/11/2017	21/11/2017	21/11/2017	21/11/2017	21/11/2017
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	130	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	250	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	55	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	55	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	260	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	150	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	460	<50	<50
Surrogate o-Terphenyl	%	93	92	72	91	71

svTRH (C10-C40) in Soil						
Our Reference		180186-6	180186-7	180186-8	180186-9	180186-10
Your Reference	UNITS	BH45	BH46	BH47	BH47	BH47
Depth		0.1	0.3	0.5	1.0	1.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	21/11/2017	21/11/2017	21/11/2017	21/11/2017	21/11/2017
Date analysed	-	21/11/2017	21/11/2017	21/11/2017	21/11/2017	21/11/2017
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	74	71	71	73	92

PAHs in Soil						
Our Reference		180186-1	180186-2	180186-3	180186-4	180186-5
Your Reference	UNITS	BH31	BH31	BH32	BH39	BH43
Depth		0.1	0.5	0.1	0.1	0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	21/11/2017	21/11/2017	21/11/2017	21/11/2017	21/11/2017
Date analysed	-	21/11/2017	21/11/2017	21/11/2017	21/11/2017	21/11/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<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	%	96	95	82	93	89

PAHs in Soil						
Our Reference		180186-6	180186-7	180186-8	180186-9	180186-10
Your Reference	UNITS	BH45	BH46	BH47	BH47	BH47
Depth		0.1	0.3	0.5	1.0	1.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	21/11/2017	21/11/2017	21/11/2017	21/11/2017	21/11/2017
Date analysed	-	21/11/2017	21/11/2017	21/11/2017	21/11/2017	21/11/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<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	0.2	<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	%	94	90	87	87	92

Organochlorine Pesticides in soil						
Our Reference		180186-1	180186-2	180186-3	180186-4	180186-5
Your Reference	UNITS	BH31	BH31	BH32	BH39	BH43
Depth		0.1	0.5	0.1	0.1	0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	21/11/2017	21/11/2017	21/11/2017	21/11/2017	21/11/2017
Date analysed	-	22/11/2017	22/11/2017	22/11/2017	22/11/2017	22/11/2017
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	86	80	99	80	85

Organochlorine Pesticides in soil						
Our Reference		180186-6	180186-7	180186-8	180186-9	180186-10
Your Reference	UNITS	BH45	BH46	BH47	BH47	BH47
Depth		0.1	0.3	0.5	1.0	1.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	21/11/2017	21/11/2017	21/11/2017	21/11/2017	21/11/2017
Date analysed	-	22/11/2017	22/11/2017	22/11/2017	22/11/2017	22/11/2017
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	0.1	0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	0.1	0.1
Surrogate TCMX	%	88	77	74	84	85

Organophosphorus Pesticides						
Our Reference		180186-1	180186-3	180186-4	180186-5	180186-6
Your Reference	UNITS	BH31	BH32	BH39	BH43	BH45
Depth		0.1	0.1	0.1	0.1	0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	21/11/2017	21/11/2017	21/11/2017	21/11/2017	21/11/2017
Date analysed	-	22/11/2017	22/11/2017	22/11/2017	22/11/2017	22/11/2017
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	86	99	80	85	88

Organophosphorus Pesticides			
Our Reference		180186-7	180186-8
Your Reference	UNITS	BH46	BH47
Depth		0.3	0.5
Type of sample		Soil	Soil
Date extracted	-	21/11/2017	21/11/2017
Date analysed	-	22/11/2017	22/11/2017
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1
Surrogate TCMX	%	77	74

PCBs in Soil						
Our Reference		180186-1	180186-3	180186-4	180186-5	180186-6
Your Reference	UNITS	BH31	BH32	BH39	BH43	BH45
Depth		0.1	0.1	0.1	0.1	0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	21/11/2017	21/11/2017	21/11/2017	21/11/2017	21/11/2017
Date analysed	-	22/11/2017	22/11/2017	22/11/2017	22/11/2017	22/11/2017
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	86	99	80	85	88

PCBs in Soil			
Our Reference		180186-7	180186-8
Your Reference	UNITS	BH46	BH47
Depth		0.3	0.5
Type of sample		Soil	Soil
Date extracted	-	21/11/2017	21/11/2017
Date analysed	-	22/11/2017	22/11/2017
Aroclor 1016	mg/kg	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1
Surrogate TCLMX	%	77	74

Acid Extractable metals in soil						
Our Reference		180186-1	180186-2	180186-3	180186-4	180186-5
Your Reference	UNITS	BH31	BH31	BH32	BH39	BH43
Depth		0.1	0.5	0.1	0.1	0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	21/11/2017	21/11/2017	21/11/2017	21/11/2017	21/11/2017
Date analysed	-	21/11/2017	21/11/2017	21/11/2017	21/11/2017	21/11/2017
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	13	10	7	14	29
Copper	mg/kg	10	4	16	10	17
Lead	mg/kg	20	13	17	15	21
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	6	2	15	14	22
Zinc	mg/kg	29	8	65	44	66

Acid Extractable metals in soil						
Our Reference		180186-6	180186-7	180186-8	180186-9	180186-10
Your Reference	UNITS	BH45	BH46	BH47	BH47	BH47
Depth		0.1	0.3	0.5	1.0	1.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	21/11/2017	21/11/2017	21/11/2017	21/11/2017	21/11/2017
Date analysed	-	21/11/2017	21/11/2017	21/11/2017	21/11/2017	21/11/2017
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	9	12	12	12	12
Copper	mg/kg	31	4	8	8	8
Lead	mg/kg	19	11	14	13	14
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	9	5	6	5	5
Zinc	mg/kg	52	13	17	18	16

Misc Soil - Inorg						
Our Reference		180186-1	180186-3	180186-4	180186-5	180186-6
Your Reference	UNITS	BH31	BH32	BH39	BH43	BH45
Depth		0.1	0.1	0.1	0.1	0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	23/11/2017	23/11/2017	23/11/2017	23/11/2017	23/11/2017
Date analysed	-	23/11/2017	23/11/2017	23/11/2017	23/11/2017	23/11/2017
Total Phenolics (as Phenol)	mg/kg	<5	9	<5	<5	<5

Misc Soil - Inorg			
Our Reference		180186-7	180186-8
Your Reference	UNITS	BH46	BH47
Depth		0.3	0.5
Type of sample		Soil	Soil
Date prepared	-	23/11/2017	23/11/2017
Date analysed	-	23/11/2017	23/11/2017
Total Phenolics (as Phenol)	mg/kg	<5	<5

Moisture						
Our Reference		180186-1	180186-2	180186-3	180186-4	180186-5
Your Reference	UNITS	BH31	BH31	BH32	BH39	BH43
Depth		0.1	0.5	0.1	0.1	0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	21/11/2017	21/11/2017	21/11/2017	21/11/2017	21/11/2017
Date analysed	-	22/11/2017	22/11/2017	22/11/2017	22/11/2017	22/11/2017
Moisture	%	10	6.2	13	9.1	5.4

Moisture						
Our Reference		180186-6	180186-7	180186-8	180186-9	180186-10
Your Reference	UNITS	BH45	BH46	BH47	BH47	BH47
Depth		0.1	0.3	0.5	1.0	1.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	21/11/2017	21/11/2017	21/11/2017	21/11/2017	21/11/2017
Date analysed	-	22/11/2017	22/11/2017	22/11/2017	22/11/2017	22/11/2017
Moisture	%	7.0	8.5	10	8.0	8.2

Asbestos ID - soils						
Our Reference		180186-1	180186-3	180186-4	180186-5	180186-6
Your Reference	UNITS	BH31	BH32	BH39	BH43	BH45
Depth		0.1	0.1	0.1	0.1	0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	24/11/2017	24/11/2017	24/11/2017	24/11/2017	24/11/2017
Sample mass tested	g	Approx. 40g	Approx. 40g	Approx. 40g	Approx. 40g	Approx. 40g
Sample Description	-	Brown coarse-grained soil & rocks	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	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils			
Our Reference		180186-7	180186-8
Your Reference	UNITS	BH46	BH47
Depth		0.3	0.5
Type of sample		Soil	Soil
Date analysed	-	24/11/2017	24/11/2017
Sample mass tested	g	Approx. 40g	Approx. 35g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.

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

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	180186-3
Date extracted	-			21/11/2017	1	21/11/2017	21/11/2017		21/11/2017	21/11/2017
Date analysed	-			22/11/2017	1	22/11/2017	22/11/2017		22/11/2017	22/11/2017
TRH C_6 - C_9	mg/kg	25	Org-016	<25	1	<25	<25	0	90	90
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	1	<25	<25	0	90	90
Benzene	mg/kg	0.2	Org-016	<0.2	1	<0.2	<0.2	0	76	76
Toluene	mg/kg	0.5	Org-016	<0.5	1	<0.5	<0.5	0	80	80
Ethylbenzene	mg/kg	1	Org-016	<1	1	<1	<1	0	94	92
m+p-xylene	mg/kg	2	Org-016	<2	1	<2	<2	0	101	100
o-Xylene	mg/kg	1	Org-016	<1	1	<1	<1	0	95	94
naphthalene	mg/kg	1	Org-014	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	83	1	80	75	6	83	74

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	180186-3
Date extracted	-			21/11/2017	1	21/11/2017	21/11/2017		21/11/2017	21/11/2017
Date analysed	-			21/11/2017	1	21/11/2017	21/11/2017		21/11/2017	21/11/2017
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	1	<50	<50	0	96	#
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	1	<100	<100	0	93	#
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	1	<100	<100	0	91	#
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	1	<50	<50	0	96	#
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	1	<100	<100	0	93	#
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	1	<100	<100	0	91	#
Surrogate o-Terphenyl	%		Org-003	77	1	93	92	1	78	72

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	180186-3
Date extracted	-			21/11/2017	1	21/11/2017	21/11/2017		21/11/2017	21/11/2017
Date analysed	-			21/11/2017	1	21/11/2017	21/11/2017		21/11/2017	21/11/2017
Naphthalene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	91	89
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	96	89
Phenanthrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	96	92
Anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	96	91
Pyrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	102	96
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	105	98
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	1	<0.05	<0.05	0	93	93
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	89	1	96	90	6	121	113

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	180186-3
Date extracted	-			21/11/2017	1	21/11/2017	21/11/2017		21/11/2017	21/11/2017
Date analysed	-			22/11/2017	1	22/11/2017	22/11/2017		22/11/2017	22/11/2017
HCB	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	109	97
gamma-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	110	101
Heptachlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	100	92
delta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	106	92
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	112	106
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	124	109
Dieldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	125	113
Endrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	115	111
pp-DDD	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	128	71
Endosulfan II	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	114	99
Methoxychlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	95	1	86	81	6	112	111

QUALITY CONTROL: Organophosphorus Pesticides						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	180186-3
Date extracted	-			21/11/2017	1	21/11/2017	21/11/2017		21/11/2017	21/11/2017
Date analysed	-			22/11/2017	1	22/11/2017	22/11/2017		22/11/2017	22/11/2017
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	99	93
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	106	99
Dimethoate	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	106	106
Fenitrothion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	92	84
Malathion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	96	65
Parathion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	106	85
Ronnel	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	113	99
Surrogate TCMX	%		Org-008	95	1	86	81	6	91	81

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	180186-3
Date extracted	-			21/11/2017	1	21/11/2017	21/11/2017		21/11/2017	21/11/2017
Date analysed	-			22/11/2017	1	22/11/2017	22/11/2017		22/11/2017	22/11/2017
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	114	118
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	95	1	86	81	6	91	81

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	180186-3
Date prepared	-			21/11/2017	1	21/11/2017	21/11/2017		21/11/2017	21/11/2017
Date analysed	-			21/11/2017	1	21/11/2017	21/11/2017		21/11/2017	21/11/2017
Arsenic	mg/kg	4	Metals-020	<4	1	<4	4	0	109	103
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	103	100
Chromium	mg/kg	1	Metals-020	<1	1	13	11	17	107	105
Copper	mg/kg	1	Metals-020	<1	1	10	11	10	107	109
Lead	mg/kg	1	Metals-020	<1	1	20	19	5	103	105
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	99	99
Nickel	mg/kg	1	Metals-020	<1	1	6	5	18	103	102
Zinc	mg/kg	1	Metals-020	<1	1	29	36	22	106	101

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date prepared	-			23/11/2017	1	23/11/2017	23/11/2017		23/11/2017	[NT]
Date analysed	-			23/11/2017	1	23/11/2017	23/11/2017		23/11/2017	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	1	<5	<5	0	100	[NT]

Result Definitions

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

Quality Control Definitions

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

Report Comments

svTRH (C10-C40) in Soil (Sample 3ms) - # Percent recovery is not possible to report as the high concentration of analytes in the sample/s
have caused interference.

Asbestos: A portion of the supplied samples were sub-sampled for asbestos
analysis according to Envirolab procedures.
We cannot guarantee that these sub-samples are indicative of the entire sample.
Envirolab recommends supplying 40-50g of sample in its own container.
Note: Samples requested for asbestos analysis were sub-sampled from jars
provided by the client.

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	86043.01	**Suburb:**	Macquarie Park	**To:**	Envirolab Services
Project Name:	Ivanhoe	**Order Number**			12 Ashley Street, Chatswood NSW 2067
Project Manager:	S Peacock (& David Walker)	**Sampler:**	LS	**Attn:**	
Emails:	david.walker@douglaspartners.com.au			**Phone:**	02 9910 6200
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☑			**Email:**	sydney@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	(m) depth	Lab ID	Date Sampled	Sample Type (S - soil, W - water)	Container Type (G - glass, P - plastic)	Analytes: Cons Sa	Cons 14								Notes/preservation
BH31	0.1	1		S	G	✓									
BH31	0.5	2		S	G		✓								
BH32	0.1	3				✓									
BH39	0.1	4				✓									
BH43	0.1	5				✓									
BH45	0.1	6				✓									
BH46	0.1	7				✓									
BH47	0.5	8				✓									
BH47	1.0	9					✓								
BH47	1.5	10					✓								
PQL (S) mg/kg														**ANZECC PQLs req'd for all water analytes** ☐	

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
Job No: 180186
Date Received: 20/11/17
Time Received: 12:45
Received by: 117
Temp: Cool/Ambient 10.8
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:

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

Send Results to: Douglas Partners Pty Ltd **Address** 96 Hermitage Road, West Ryde **Phone:** 98090666 **Fax:** 98094095

Signed: **Received by:** 117 **Date & Time:** 20/11/17 12:45

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	David Walker

Sample Login Details

Your reference	86043.01, Ivanhoe
Envirolab Reference	180186
Date Sample Received	20/11/2017
Date Instructions Received	20/11/2017
Date Results Expected to be Reported	27/11/2017

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	10 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	10.8
Cooling Method	Ice Pack
Sampling Date Provided	Not Provided on the COC

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
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12 Ashley St Chatswood NSW 2067
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customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticidesin soil	Organophosphorus Pesticides	PCBsin Soil	Acid Extractable metalsin soil	Total Phenolics (as Phenol)	Asbestos ID - soils
BH31-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH31-0.5	✓	✓	✓	✓			✓		
BH32-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH39-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH43-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH45-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH46-0.3	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH47-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH47-1.0	✓	✓	✓	✓			✓		
BH47-1.5	✓	✓	✓	✓			✓		

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

Additional Info

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

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

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

CERTIFICATE OF ANALYSIS 180186-A

Client Details

Client	Douglas Partners Pty Ltd
Attention	David Walker
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**86043.01, Ivanhoe**
Number of Samples	10 Soil
Date samples received	20/11/2017
Date completed instructions received	27/11/2017

Analysis Details

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

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

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

Report Details

Date results requested by	04/12/2017
Date of Issue	30/11/2017

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

Results Approved By
Dragana Tomas, Senior Chemist

Authorised By

David Springer, General Manager

sTPH in Soil (C10-C40)-Silica		
Our Reference		180186-A-3
Your Reference	UNITS	BH32
Depth		0.1
Type of sample		Soil
Date extracted	-	28/11/2017
Date analysed	-	29/11/2017
TPH C_{10} - C_{14}	mg/kg	<50
TPH C_{15} - C_{28}	mg/kg	<100
TPH C_{29} - C_{36}	mg/kg	<100
TPH >C_{10} -C_{16}	mg/kg	<50
TPH >C_{16} -C_{34}	mg/kg	<100
TPH >C_{34} -C_{40}	mg/kg	<100
Surrogate o-Terphenyl	%	100

Method ID	Methodology Summary
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.

QUALITY CONTROL: sTPH in Soil (C10-C40)-Silica						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			28/11/2017	[NT]	[NT]	[NT]	[NT]	28/11/2017	[NT]
Date analysed	-			29/11/2017	[NT]	[NT]	[NT]	[NT]	29/11/2017	[NT]
TPH C_{10} - C_{14}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	99	[NT]
TPH C_{15} - C_{28}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	108	[NT]
TPH C_{29} - C_{36}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	105	[NT]
TPH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	99	[NT]
TPH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	108	[NT]
TPH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	105	[NT]
Surrogate o-Terphenyl	%		Org-003	97	[NT]	[NT]	[NT]	[NT]	100	[NT]

Result Definitions

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

Quality Control Definitions

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

Andrew Fitzsimons

From: David Walker <David.Walker@douglaspartners.com.au>
Sent: Monday, 27 November 2017 1:24 PM
To: Nancy Zhang
Cc: Samplereceipt
Subject: RE: Results for Registration 180186 86043.01, Ivanhoe

ELS: 180186-A
Rec: 27/11/17 13:30
TAT: 5 days

Nancy,

Please go ahead with TRH with silica gel cleanup for sample -3 (BH32 0.1m).

thanks

David Walker | Associate / Environmental Engineer
Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685
P: 02 9809 0666 | F: 02 9809 4095 | M: 0407 540 537 | E: David.Walker@douglaspartners.com.au

FINANCIAL REVIEW
CLIENT CHO
WINNER

This email is confidential. If you are not the intended recipient, please notify us immediately and be aware that any disclosure, copying, distribution or use of the contents of this information is prohibited. Please note that the company does not make any commitment through emails not confirmed by fax or letter.

From: Nancy Zhang [mailto:NZhang@envirolab.com.au]
Sent: Friday, 24 November 2017 5:40 PM
To: Sally Peacock; David Walker
Subject: Results for Registration 180186 86043.01, Ivanhoe

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

We have a new reporting format and would welcome your feedback. Sydney@envirolab.com.au

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

Regards

Envirolab Services
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
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SAMPLE RECEIPT ADVICE

Client Details	
Client	Douglas Partners Pty Ltd
Attention	David Walker

Sample Login Details	
Your reference	86043.01, Ivanhoe
Envirolab Reference	180186-A
Date Sample Received	20/11/2017
Date Instructions Received	27/11/2017
Date Results Expected to be Reported	04/12/2017

Sample Condition	
Samples received in appropriate condition for analysis	YES
No. of Samples Provided	10 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	10.8
Cooling Method	Ice Pack
Sampling Date Provided	Not Provided on the COC

Comments
Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

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Sample ID	sTPH in Soil (C10-C40)-Silica	On Hold
BH31-0.1		✓
BH31-0.5		✓
BH32-0.1	✓	
BH39-0.1		✓
BH43-0.1		✓
BH45-0.1		✓
BH46-0.3		✓
BH47-0.5		✓
BH47-1.0		✓
BH47-1.5		✓

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

Additional Info

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

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