Douglas Partners
Geotechnics / Environment / Groundwater

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Report on
Detailed Asbestos Delineation Investigation

Hurlstone Agricultural High School (Hawkesbury)
Londonderry Road, Richmond

Prepared for
NSW Department of Education

Project 85644.06
August 2018

Douglas Partners
Geotechnics / Environment / Groundwater

Document History

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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			16 August 2018
Reviewer		p.p. JR	16 August 2018

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Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
18 Waler Crescent
Smeaton Grange NSW 2567
Phone (02) 4647 0075
Fax (02) 4646 1886

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Report on Detailed Asbestos Delineation Investigation
Hurlstone Agricultural High School (Hawkesbury)
Londonderry Road, Richmond, NSW

1. Introduction

Douglas Partners Pty Ltd (DP) was commissioned by Conrad Gargett Pty Ltd on behalf of the NSW Department of Education to carry out a detailed asbestos delineation investigation ('delineation assessment') within the proposed school development located on Londonderry Road, Richmond, NSW ('the site'). The site locality is presented on Drawing 1, Appendix A.

DP previously completed a Detailed Site Investigation (DSI; project reference 85644.04) for contamination assessment purposes which identified filling in an approximate 1.5 ha area in the central southern portion of the site with elevated concentration of heavy metals, benzo(a)pyrene and asbestos detected in some soil samples collected from some of the test pits. This delineation assessment aims to further inform the remediation design i.e. further define the extent of material requiring remediation. The delineation assessment was carried out with reference to NSW Environment Protection Authority (EPA) guidelines endorsed under the Contaminated Land Management (CLM) Act 1997 and in particular the following notable guidelines:

- National Environment Protection Council (NEPC) *National Environment Protection (Assessment of Site Contamination) Measure*, 1999 as amended 2013 (NEPC, 2013);
- NSW EPA (1995) *Sampling Design Guidelines;* and
- Western Australian Department of Health (2009) *Guidelines for the Assessment, Remediation and Management of Asbestos – Contaminated Sites in Western Australia* (WA DoH 2009).

The WA DoH (2009) guideline, whilst not technically endorsed by NSW EPA, forms the basis of NEPC (2013) in relation to asbestos and provides a more comprehensive guideline, in particular, for asbestos remediation than is available in any other NSW EPA guideline and is widely adopted in NSW.

It is understood by DP that the client's preferred remediation approach for asbestos impacted soils at the site is to place impacted soils within a containment cell at the site. Depending on the findings of this investigation, the client may potentially choose to carry out their current second preferred (contingency) option (i.e. disposal to landfill). This has been appropriately considered by DP throughout this investigation.

2. Scope of Work

The scope of work carried out for the delineation assessment was as follows:

- Excavation of 50 test pits (TP1 – TP50) across identified filling containing asbestos using an excavator[1] in a general grid pattern. The adopted sampling density satisfies the requirements of WA DoH (2009) guidelines for areas of a site where asbestos has previously been identified, i.e. twice the density required by Table A in NSW EPA (1993) *Sampling Design Guidelines* (EPA, 1993);
- Each test pit excavation was completed through fill soils to a depth of approximately 0.3 m into underlying native soils;
- At each test pit location 10L bulk soil samples were collected from each metre (depth) of fill and subject to field sampling and laboratory analysis with reference to NEPC (2013) and DoH (2009) guidelines;
- Excavation of a further four delineation test pits (TP51 – TP54) targeting previous metal and PAH exceedances detected at DSI locations C27 (TP51), BH6 (TP52), C60 (TP53) and C47 (TP54). Each test pit location was subsampled at four locations immediately next to the original test pit (A-D);
- Collection and analysis of soil samples from four test pits targeting previously observed heavy metal and PAH exceedances for leachate analysis; and
- Preparation of this report.

3. Site Description

3.1 Site Identification

The site is located to the south-west of the main Western Sydney University buildings on part of Lot 2 DP 1051798. The site is approximately 12.2 ha in area. It is bound by Western Sydney University and an aged-care facility to the north, land used largely for agricultural purposes to the east and south, and Londonderry Road to the west. The ground surface on the site slopes very gently downwards to south-east; surface levels vary between about RL 23.5 m and RL 22.5 m AHD. The current investigation comprises approximately 1.5 ha of the central southern portion of the site (refer to Drawing 1, Appendix A).

At the time of the DSI the site was divided into paddocks with very few improvements. A number of drainage swales were located between the paddocks. The surface was generally well-grassed and some trees were present along the southern boundary as well as scattered sparingly elsewhere on the site. The location of the site is shown on Drawing 1 in Appendix A.

[1] It is noted that some test pit locations were repositioned (i.e. off-set from the general grid) in the field to identify the approximate lateral limit of the filling material and sample the filling accordingly. Test pits that were repositioned are labelled with 'A', 'B', 'C' and so on.

3.2 Regional and Site Geology and Hydrogeology

As presented in the DSI, reference to the Penrith 1:100,000 Soils Landscape Sheet (Soil Conservation Service of NSW, 1990) indicates that the site is underlain by the Tertiary-aged Londonderry Clay which comprises clay with patches of cemented, consolidated sand. The area to the north is shown as being underlain by the Quaternary-aged Clarendon Formation which comprises clay, clayey sand and silt.

3.3 Proposed Development

DP understands it is proposed to build an agricultural high school at the site providing secondary school level of education and incorporating outdoor areas (pastoral and arable) as part of the day to day activities at the school.

4. Previous Investigations

Prior to carrying out the DSI, DP completed a Preliminary Site Investigation (PSI) for the site in November 2016 (project reference 85644.00). The scope and key findings of the DSI (DP, 2018) are summarised below:

- A total of 130 test pits (C1 to C130) were excavated across the site at accessible locations to augment four boreholes (BH3, BH5, BH6 and BH9) carried out at the site as part of the PSI;
- Six groundwater monitoring bores were drilled and installed at the site;
- Select soil samples collected from the test pits were analysed for a range of potential contaminants including total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene and total xylenes (BTEX, polycyclic aromatic hydrocarbons (PAH), organochlorine and organophosphorus pesticides (OC/OP), polychlorinated biphenyls (PCBs), total phenols, heavy metals, asbestos and volatile organic compounds (VOCs). It is noted that select samples from the four boreholes completed at the site as part of the PSI was also carried out to inform the PSI. Groundwater samples were analysed for a similar suite of compounds as well as per- and poly-fluoroalkyl substances (PFAS);
- The site was originally dedicated for use as an agricultural high school in 1892 and has been consistently used for such purposes since. A review of aerial photographs identified a small dam in the central-southern area of the site in 1947. Buildings associated with the college were visible to the north of the site in aerial photographs from 1947 to current;
- A review of licensed groundwater bores indicated that numerous licensed groundwater bores are located on adjacent sites and were recorded as being used for domestic, irrigation, industrial and monitoring purposes with recorded standing water levels between 10 and 15 m below ground level (bgl). There were no licensed bores identified on the site;
- Two small stockpiles were observed in the central-northern portion of the site and these were sampled as part of the DSI. Contaminant concentrations were below the adopted site assessment criteria (SAC) in the samples tested;

- As the proposed development (an agricultural high school) is likely to require a greater frequency of access to soils (compared to a typical high school), the adopted SAC comprised health investigations levels/health screening levels (HIL/HSL) for category 'A' land use including primary schools and in turn more sensitive direct contact/ingestion/inhalation soil contact exposure scenarios which is considered by DP to be suitably representative for the site (as opposed to typical high schools which would be HIL/HSL 'C' land use). Ecological investigation levels/ecological screening levels (EIL/ESL) were selected for a residential scenario for coarse-grained sites due to the sandy nature of the upper soil profile;
- Filling with anthropogenic material including porcelain, bricks, glass, terracotta, sheet metal, concrete, plastic, scrap metal and bonded asbestos containing materials (ACM) in places was observed in the central-southern portion of the site (refer Drawing 1, Appendix A); and
- Within this area ACM has been identified in filling in five test pits (C27, C34, C41, C47 and C60 [notated incorrectly in the DSI as D80]). The location of identified filling is presented on Drawing 1, Appendix A. Exceedances above human health and ecological criteria were also identified in the filling material at the following locations:
  - C27:
    - 0.9 – 1.0 m bgl:
      - Lead (1,700 mg/kg) exceeds both human health and ecological criteria;
      - Zinc (2,400 mg/kg) exceeds both human health and ecological criteria;
    - 1.4 – 1.5 m bgl:
      - Lead (1,000 mg/kg) exceeds human health criteria;
      - Zinc (3,700 mg/kg) exceeds both human health and ecological criteria;
  - C47:
    - Zinc in filling from 0.4 – 0.5 m bgl (730 mg/kg) exceeds both human health and ecological criteria;
  - C60:
    - Zinc in filling from 0 – 0.1 m bgl (880 mg/kg) exceeds both human health and ecological criteria;
  - BH6:
    - Benzo(a)pyrene toxic equivalence quotient (TEQ) in filling from 0.5 m bgl (8.2 mg/kg) and 1.0 m (7.3 mg/kg) exceeds human health criteria.

Given the findings of DP (2018) and noting the localised areas of contamination within the site, a Remediation Action Plan (RAP; project reference 85644.05) was subsequently prepared. The RAP documents how the site will be remediated and validated. The RAP included the need to carry out a detailed asbestos delineation investigation (i.e. this report) to better define the extent of remediation required.

5. Preliminary Conceptual Site Model

The conceptual site model (CSM) for the site has been extensively discussed in previous reports by DP. The component of the CSM of relevance to the filling area is summarised in Table 1 below.

Table 1: Summary CSM

Source	Pathways	Receptor
Metal, asbestos and PAH impact in filling	**Human health:** Direct contact with soil, Incidental ingestion / inhalation of dust / fibres Leaching and downward migration of metals and PAH **Ecological:** Lateral migration of metals and PAH with groundwater Plant uptake	**Human health:** Construction personnel School – students, teachers, support staff and visitors Off-site receptors including school staff, students and visitors and the general public **Ecological:** On-site flora and fauna (top 2 m i.e. root zone) Off-site farmed animals

6. Fieldwork Methodology

The delineation assessment was undertaken with reference to the Data Quality Objectives (DQO) and Data Quality Indicators (DQI) as presented in Appendix B. The field work was undertaken by a DP environmental scientist between 26 and 28 June 2018.

6.1 Field Work Rationale

The adopted soil sampling density meets the minimum recommended number of test locations for approximately 1.4 hectare site with a 'known' likelihood of asbestos impact, i.e. twice the minimum recommended density listed in applicable guidelines[2] as stated in DoH (2009).

6.2 Sample Collection and Handling

Sample collection and handling were undertaken in accordance with DP's standard operating procedures (SOPs) and including:

- Use of disposable sampling equipment including disposal nitrile gloves;
- A backhoe was used to collect samples from each location representative of each 1 m depth of filling. The test pit was terminated approximately 0.3 m into the underlying natural strata;
- Samples collected for fibrous asbestos and asbestos fines (FA and AF) were placed (double-bagged) within zip-lock plastic re-sealable bags;

[2] In this case NSW EPA (1995) *Sampling Design Guidelines*.

- Samples collected for ACM testing were placed on a blue tarpaulin for field assessment and subsequently placed (double-bagged) within large minimum 10 L bulk bags for the purpose of obtaining sample weight (in kg);
- Sample bags were labelled with individual and unique identification including project/sample location and depth;
- Samples collected for metals and PAH analysis were transferred into laboratory-prepared glass jars and capping immediately, minimising head space within the jar;
- All sampling data was recorded on test pit logs (Appendix C) and samples selected for laboratory analysis were recorded on DP chain-of-custody (COC) sheets (Appendix D);
- Where feasible the sample locations were recorded using a hand held GPS, and the GIS data used to populate the sampling points on the drawings included in this report; and
- COC documentation was used so that sample tracking and custody can be cross-checked at any point in the transfer of samples from the field to hand-over to the laboratory; and
- Placement of sample containers and bags into a cooled, insulated and sealed container for transport to the laboratory (for preservation of samples to be analysed for metals and PAH).

Envirolab Services Pty Ltd (Envirolab), accredited by NATA, was employed to conduct sample analysis. The laboratory is required to carry out in-house QC procedures.

6.3 Analytical Rationale

The primary contaminant of concern is asbestos, therefore the primary analyte was asbestos (i.e. ACM and FA and AF). Select samples targeting previously observed metals and PAH exceedances were also be analysed for these compounds detected above the adopted SAC during the DSI.

6.4 Testing Procedures for Asbestos

The samples collected for ACM field testing and FA and AF laboratory testing during the assessment were managed as per the procedures below:

- Collection of samples (comprising one bulk 10 L sample and one 500 mL sample) from the area at the sampling frequency specified in the RAP;
- Manual on-site screening by passing each ~10 L bulk sample through a <7 mm aperture sieve(or spreading out each sample on contrasting coloured sheeting if soils were too cohesive) for visual identification of ACM. The concentration of asbestos as ACM in soil was estimated using the following equation:

% w/w asbestos in soil =
% asbestos content x weight of ACM (kg) / weight of soil sample

For ~10 L bulk samples, asbestos content within ACM was assumed to be 15 % as per DoH (2009).

- Laboratory analysis for asbestos of the 500 mL samples was completed at a NATA accredited Envirolab Services Pty Ltd utilising Polarized Light Microscope Dispersion Staining techniques in accordance with Standards Australia (2004), Australian Standards (AS) 4964 Method for the Qualitative Identification of Asbestos in Bulk Samples (SA, 2004) to determine presence and weight of FA and AF. The quantities of asbestos as FA and AF soil was estimated using the following equation:

  % w/w asbestos in soil =
  weight of asbestos as FA and AF (estimated by Envirolab) / weight of soil sample

- The analytical results were compared against the relevant SAC (Section 7).

6.5 Testing Procedures for Metals and PAH

Soils previously observed as containing elevated metals and PAH were resampled next to the corresponding DSI test pit and analysed for metals and PAH TCLP. The purpose of the TCLP testing is to ascertain the leaching potential of the contaminant and ascertain if the contaminant could impact the underlying groundwater if retained on site as part of the development or now.

The toxicity characteristic leaching procedure (TCLP) test method involves the leaching of the soil in an acid solution at a 1:20 mix of sample to solvent. The product leach from the sample is analysed for metals and PAH.

7. Site Assessment Criteria

The SAC are as per the DSI (DP, 2018) are based on the HIL, HSL, EIL and ESL provided in DP (2018) for a residential site with plant uptake, which includes primary schools on the basis that soil contact is likely to be more prevalent at an agricultural school when compared to less conservative criteria as presented in Schedule B1, NEPC (2013). The SAC are provided within the summary tables (Appendix E).

In the absence of soil leachate criteria in Australia, soil leachate results were generally assessed based on whether they were above the laboratory limit of reporting (LOR) or not. If results were below the LOR they were interpreted to be relatively immobile. For results above the LOR, the leachable component can be estimated in the context of the leachable and total concentration of the contaminant in the sample.

8. Results

8.1 Field Work Results

The test pit logs are included in Appendix C, together with notes defining classification methods and descriptive terms. The interpolated approximate depth of filling is shown on Drawing 2, Appendix A.

The depth and type of filling observed in the test pits varied from test pit to test pit. The maximum depth of filling was observed in TP38 (2.2 m) however generally filling was predominantly observed at depths of up to 1 m. Filling generally comprised clayey / silty sand with anthropogenic material including concrete fragments, metal, brick, ACM, glass and porcelain was observed in most test pits.

No free groundwater was observed in any of the test pits during excavation for the short time they were open. It should be noted that groundwater levels are affected by climatic conditions and soil permeability and will therefore vary with time.

8.2 Analytical Results

Field screening and laboratory analytical results are summarised in Appendix E and laboratory analytical reports are provided in Appendix D. A summary of the findings of field screening and laboratory analysis is provided below.

8.2.1 Asbestos

With respect to asbestos in filling, of the 69 fill samples analysed:

- Twenty-one samples recorded ACM in the field screening test above the SAC; and
- Four samples were recorded FA and AF above the SAC. Of these four samples, three corresponded to test locations where ACM was also observed in the fill and one corresponded to a test location where no ACM was observed in the fill. .

Based on the findings of the asbestos investigation, a total of 23 test pits (approximately 33% of test pits that encountered fill) recorded asbestos in the field screening and/or the laboratory analytical results. The interpolated extent of the filling in which samples were collected and the concentration of ACM and/or FA and AF is presented in Drawing 3, Appendix A.

It is noted that the field identification of fragments of ACM was carried out by a DP experienced asbestos investigator, per NSW EPA endorsed guidelines. Where further laboratory confirmation was required, fragments were analysed by the laboratory and confirmed to contain asbestos.

8.2.2 PAH and Metals

With respect to PAH and metal leachate analytical results:

- TP51: concentrations of lead and zinc in the leachate from a sample collected from a depth of 0.9 – 1 m bgl were 1.6 mg/L and 21 mg/L respectively. Concentrations of lead and zinc in the leachate from a sample collected from a depth of 1.4 – 1.5 m bgl were 0.65 and 17 mg/L respectively. The LOR for lead and zinc is 0.03 mg/L and 0.02 mg/L respectively;
- TP52: concentrations of PAHs including benzo(a)pyrene in the leachate from a sample collected from a depth of 0.4 – 0.5 m bgl were below the laboratory LOR. The LOR for PAHs including benzo(a)pyrene were 0.001 mg/L;
- TP53: the concentration of zinc in the leachate from a sample collected from a depth of 0 – 0.1 m bgl was 1.8 mg/L;
- TP54: the concentration of zinc in the leachate from a sample collected from a depth of 0.4 – 0.5 m bgl was 3.7 mg/L.

8.3 Quality Assurance and Quality Control

A review of the adopted QA/QC procedures and results (Appendix F) indicates that the DQIs have generally been met. On this basis, the sampling and laboratory methods used during the investigation were found to meet DQOs for this project.

9. Discussion

A total of 54 test pits were excavated at the site; 50 test pits were carried out for field screening and laboratory analysis for asbestos and a further four targeted previously observed metal and PAH filling exceedances to assess potential mobility of contaminants.

Of the 50 test pits carried out for asbestos assessment purposes, 23 recorded asbestos primarily as ACM and occasionally as FA and AF. In summary, asbestos in the form of ACM or FA and AF was detected at concentrations exceeding the SAC in approximately 33 % of the test pits.

Metal soil leachate analytical results in TP51 (DSI location C27; DP, 2018), TP53 (DSI location C60) and TP54 (DSI location C47) confirmed that a component of the target metals (i.e. lead and zinc) is leachable. PAH soil leachate analytical results for TP52 (DSI location BH6) confirmed that PAH in soil at this location is relatively immobile.

10. Conclusions and Recommendations

Overall, the results for asbestos testing on samples of fill suggest that the presence of asbestos in the fill may be quite widespread and essentially confirms the need for remediation. The results of asbestos in the form of ACM and/or FA and AF at concentrations exceeding the SAC has been interpolated and mapped on Drawing 3, Appendix A and as summarised below to assist with remediation planning:

- Filling at DSI locations C27, C60 and C47 is required to be remediated (disposed of to landfill) with reference to Section 8.3 of the RAP (DP, 2018a);
- Filling within the yellow shaded areas excluding fill in the vicinity of BH6 is generally suitable for reuse at the site from a contamination perspective and should be managed in accordance with Section 8.4 of the RAP. This is subject to the limitations associated with the heterogeneous distribution of asbestos in filling discussed below;
- Filling at location BH6 should be placed in the containment cell in accordance with Section 8.5 of the RAP. The dimensions of filling to be removed are 5m x 5m to base of filling; and
- Filling within the purple areas contain asbestos above guideline values including ACM and/or FA and AF. As such, filling in the purple areas will require remediation (i.e. placement in a containment cell) in accordance with Section 8.5 of the RAP.

The above remediation works will require validation by an Environmental Consultant in accordance with Section 10 of the RAP. It is pointed out that Drawing 3 is indicative only and is not intended to be used for the purpose of providing a definitive calculation of volumetric calculation of asbestos-impacted filling or (in turn) remediation costs. The actual volume of filling requiring remediation may

vary for a number of reasons including, for example, bulking of the soil post-excavation and 'pockets' of contamination that may be encountered during remediation works between test pit locations due to the inherent heterogeneous distribution of asbestos in filling. Supervision of excavation works must be undertaken by an appropriately qualified environmental consultant during remediation in order to identify any such 'pockets' which are to be directed to the containment cell (or disposed of). The remediation of asbestos impacted soils should be carried out with reference to the RAP (DP, 2018a).

The unexpected finds protocol as presented in the RAP should be followed throughout remediation works and bulk earthworks at the site.

11. Limitations

Douglas Partners Pty Ltd (DP) has prepared this report (or services) for this project at Londonderry Road, Richmond in accordance with DP's proposal MAC180176 dated 12 June 2018 and acceptance received from Phil Baigent of Conrad Gargett Pty Ltd dated 20 June 2018. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

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

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

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

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

The 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.

Douglas Partners Pty Ltd

Appendix A

Drawings 1 to 3
About This Report

Douglas Partners
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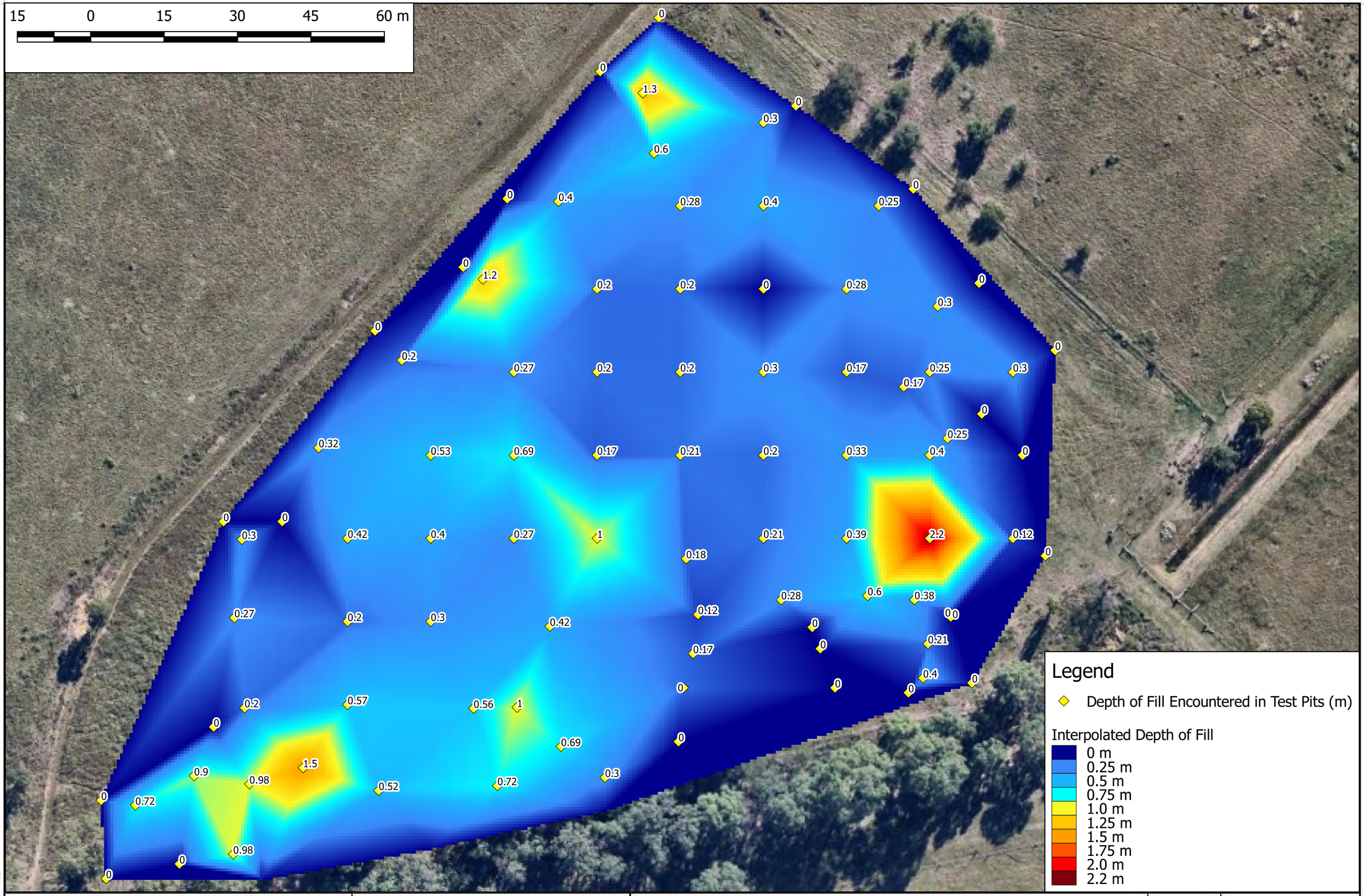
CLIENT: Conrad Gargett Pty Ltd	
OFFICE: Macarthur	DRAWN BY: LOC
SCALE: As Shown	DATE: 06.07.2018

TITLE: **Site Locality, Approximate Test Pit Locations and Fill Extent**
Hurlstone Agricultural High School (Hawkesbury)
Londonderry Road, Richmond

N
MGA

PROJECT No:	85644.06
DRAWING No:	1
REVISION:	A



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CLIENT: Conrad Gargett Pty Ltd		
OFFICE: Macarthur	DRAWN BY: LOC	
SCALE: As Shown	DATE: 06.07.2018	

TITLE: **Interpolated Depth of Fill**
Hurlstone Agricultural High School (Hawkesbury)
Londonderry Road, Richmond

N
MGA

PROJECT No:	85644.06
DRAWING No:	2
REVISION:	A

15 0 15 30 45 60 m

C47 0.6

C60 0.17

BH6 0.6

C27 1.5

Legend

- Approx. depth of Fill (m)
- Area requiring placement in containment cell and / or disposal (refer to Section 8.5 of the RAP)
- Area suitable for retention on site (refer to Section 8.4 of the RAP)
- Area requiring placement in containment cell and / or disposal (refer to Section 8.5 of the RAP; DP, 2018a)
- Area requiring disposal (refer to Section 8.3 of the RAP)

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CLIENT: Conrad Gargett Pty Ltd	
OFFICE: Macarthur	DRAWN BY: EMG
SCALE: As Shown	DATE: 06.07.2018

TITLE: **Approximate Extent of Filling**
Hurlstone Agricultural High School (Hawkesbury)
Londonderry Road, Richmond

N
MGA

PROJECT No:	85644.06
DRAWING No:	3
REVISION:	B

About this Report

Douglas Partners

Introduction

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

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

Copyright

Borehole and Test Pit Logs

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

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

Groundwater

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

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

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

Reports

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

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

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

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

About this Report

Site Anomalies

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

Information for Contractual Purposes

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

Site Inspection

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

Sampling Methods

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Sampling

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

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

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

Test Pits

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

Large Diameter Augers

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

Continuous Spiral Flight Augers

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

Non-core Rotary Drilling

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

Continuous Core Drilling

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

Standard Penetration Tests

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

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

The test results are reported in the following form.

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

  4,6,7
  N=13

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

  15, 30/40 mm

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

Dynamic Cone Penetrometer Tests / Perth Sand Penetrometer Tests

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

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

Soil Descriptions

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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, 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 - 1993. The terms used to describe rock strength are as follows:

Term	Abbreviation	Point Load Index $Is_{(50)}$ MPa	Approx 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 $Is_{(50)}$

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 loner 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

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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

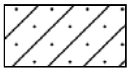
Soils


Topsoil

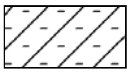

Peat


Clay

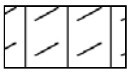

Silty clay

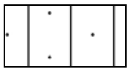

Sandy clay

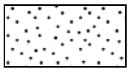

Gravelly clay

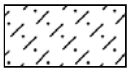

Shaly clay

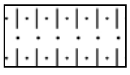

Silt


Clayey silt


Sandy silt

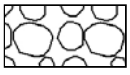

Sand

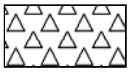

Clayey sand


Silty sand


Gravel


Sandy gravel


Cobbles, boulders

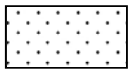

Talus

Sedimentary Rocks

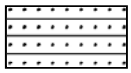

Boulder conglomerate

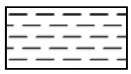

Conglomerate


Conglomeratic sandstone

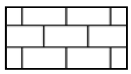

Sandstone


Siltstone


Laminite

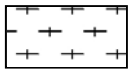

Mudstone, claystone, shale

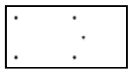

Coal


Limestone

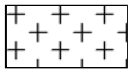
Metamorphic Rocks

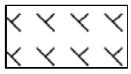

Slate, phyllite, schist

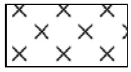

Gneiss

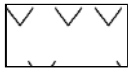

Quartzite

Igneous Rocks


Granite


Dolerite, basalt, andesite


Dacite, epidote


Tuff, breccia


Porphyry

Cone Penetration Tests

Douglas Partners

Introduction

The Cone Penetration Test (CPT) is a sophisticated soil profiling test carried out in-situ. A special cone shaped probe is used which is connected to a digital data acquisition system. The cone and adjoining sleeve section contain a series of strain gauges and other transducers which continuously monitor and record various soil parameters as the cone penetrates the soils.

The soil parameters measured depend on the type of cone being used, however they always include the following basic measurements

- Cone tip resistance q_c
- Sleeve friction f_s
- Inclination (from vertical) i
- Depth below ground z

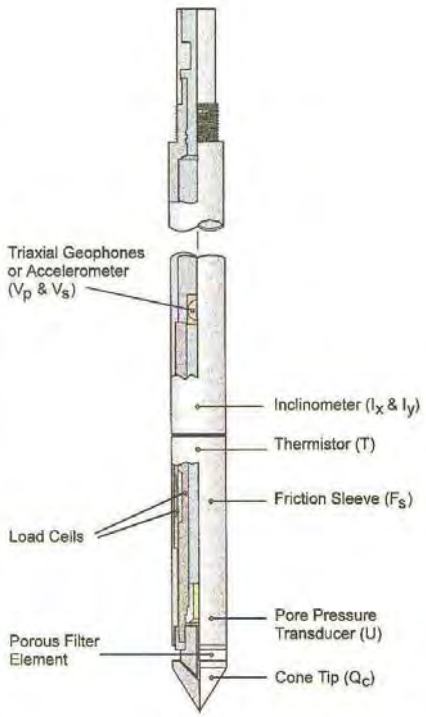


Figure 1: Cone Diagram

The inclinometer in the cone enables the verticality of the test to be confirmed and, if required, the vertical depth can be corrected.

The cone is thrust into the ground at a steady rate of about 20 mm/sec, usually using the hydraulic rams of a purpose built CPT rig, or a drilling rig. The testing is carried out in accordance with the Australian Standard AS1289 Test 6.5.1.

Figure 2: Purpose built CPT rig

The CPT can penetrate most soil types and is particularly suited to alluvial soils, being able to detect fine layering and strength variations. With sufficient thrust the cone can often penetrate a short distance into weathered rock. The cone will usually reach refusal in coarse filling, medium to coarse gravel and on very low strength or better rock. Tests have been successfully completed to more than 60 m.

Types of CPTs

Douglas Partners (and its subsidiary GroundTest) owns and operates the following types of CPT cones:

Type	Measures
Standard	Basic parameters (q_c, f_s, i & z)
Piezocone	Dynamic pore pressure (u) plus basic parameters. Dissipation tests estimate consolidation parameters
Conductivity	Bulk soil electrical conductivity (σ) plus basic parameters
Seismic	Shear wave velocity (V_s), compression wave velocity (V_p), plus basic parameters

Strata Interpretation

The CPT parameters can be used to infer the Soil Behaviour Type (SBT), based on normalised values of cone resistance (Qt) and friction ratio (Fr). These are used in conjunction with soil classification charts, such as the one below (after Robertson 1990)

Cone Penetration Tests

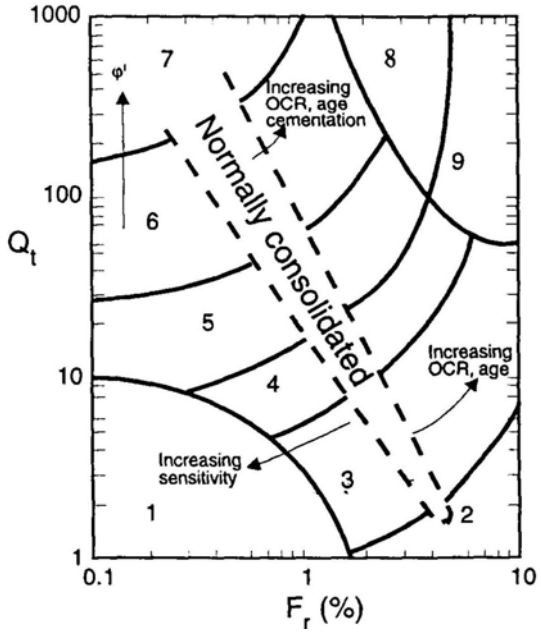


Figure 3: Soil Classification Chart

DP's in-house CPT software provides computer aided interpretation of soil strata, generating soil descriptions and strengths for each layer. The software can also produce plots of estimated soil parameters, including modulus, friction angle, relative density, shear strength and over consolidation ratio.

DP's CPT software helps our engineers quickly evaluate the critical soil layers and then focus on developing practical solutions for the client's project.

Engineering Applications

There are many uses for CPT data. The main applications are briefly introduced below:

Settlement

CPT provides a continuous profile of soil type and strength, providing an excellent basis for settlement analysis. Soil compressibility can be estimated from cone derived moduli, or known consolidation parameters for the critical layers (eg. from laboratory testing). Further, if pore pressure dissipation tests are undertaken using a piezocone, in-situ consolidation coefficients can be estimated to aid analysis.

Pile Capacity

The cone is, in effect, a small scale pile and, therefore, ideal for direct estimation of pile capacity. DP's in-house program ConePile can analyse most pile types and produces pile capacity versus depth plots. The analysis methods are based on proven static theory and empirical studies, taking account of scale effects, pile materials and method of installation. The results are expressed in limit state format, consistent with the Piling Code AS2159.

Dynamic or Earthquake Analysis

CPT and, in particular, Seismic CPT are suitable for dynamic foundation studies and earthquake response analyses, by profiling the low strain shear modulus G_0. Techniques have also been developed relating CPT results to the risk of soil liquefaction.

Other Applications

Other applications of CPT include ground improvement monitoring (testing before and after works), salinity and contaminant plume mapping (conductivity cone), preloading studies and verification of strength gain.

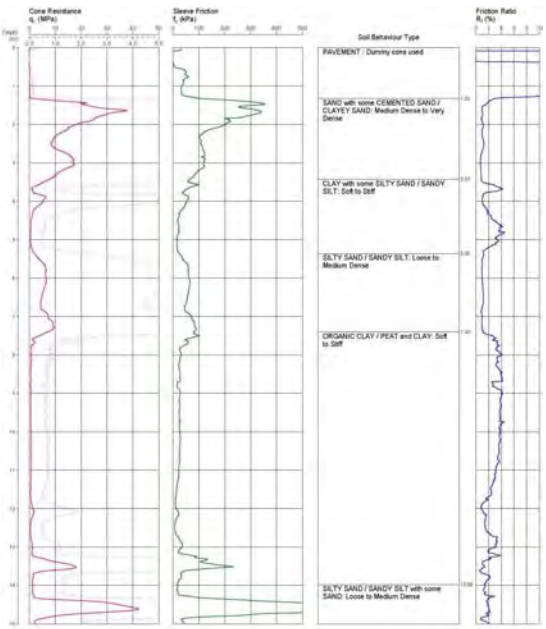


Figure 4: Sample Cone Plot

Appendix B

Data Quality Objectives

Appendix D - 1 Data Quality Objectives

The delineation assessment has been devised broadly in accordance with the seven step data quality objective (DQO) process which is provided in Appendix B, Schedule B2 of the *National Environment Protection (Assessment of Site Contamination) Measure* 1999 as amended 2013 (NEPC, 2013). The DQO process is outlined as follows:

D1.1 State the Problem

The NSW Department of Education proposes to develop an agricultural high school at the site; previous investigations (see main report) have identified asbestos impact and localised metal and PAH impact in filling in the central southern portion of the site. The "problem" to be addressed is to further define the extent of asbestos, metal and PAH impact in filling at the site to inform remediation works.

The objective of the investigation is to undertake a delineation assessment of the site to further define the extent of contamination.

D1.2 Identify the Decision/Goal of the Study

The suitability of the site for the proposed development was assessed based on a comparison of the analytical results for all COPC against the adopted site assessment criteria (SAC) as detailed in the report.

The filling area is approximately 1.5 ha. NSW EPA (1995) guidelines require a minimum of 25 sampling points for an area of 1.5 ha and WA DoH (2009) guidelines require double this density testing for a site with 'known' asbestos impact. As such, a total of 50 test pits were carried out for asbestos assessment purposes. A further four were carried out targeting metal and PAH exceedances.

The main COPC is asbestos; targeted sampling for metals and PAH is required for previously observed exceedances (see main report).

The following specific decisions were considered as part of the current investigation:

- Were COPC present in soil at concentrations that pose a potential risk to identified receptors?
- Does concentration of metals and PAH in soil present a risk to groundwater beneath the site if they are retained at the site (buried or containment cell)?
- Is the data sufficient to make a decision regarding the abovementioned risks, the suitability of the site for the proposed development, or are additional investigations required?
- Is the data sufficient to enable remediation of the site to occur with reference to the RAP?

D1.3 Identify Information Inputs

Inputs into the decisions are as follows:

- A total of 50 test pits were carried out for asbestos assessment purposes. A further four were carried out targeting metal and PAH exceedances;
- The lithology of the site as described in the test pit logs (Appendix G);
- Field and laboratory QA / QC data to assess the suitability of the environmental data for the PSI (Appendix E);
- All analysis was undertaken at a NATA accredited laboratory; and
- Laboratory reported concentrations of contaminants of concern were compared with the NEPC (2013) criteria as discussed in the main report.

D1.4 Define the Study Boundaries

The site is located to the south-west of the main Western Sydney University buildings on part of Lot 2 DP 1051798. The site is approximately 12.2 ha in area. It is bound by Western Sydney University and an aged-care facility to the north, land used largely for agricultural purposes to the east and south, and Londonderry Road to the west. The ground surface on the site slopes very gently downwards to south-east; surface levels vary between about RL 23.5 m and RL 22.5 m AHD. The current investigation comprises approximately 1.5 ha of the central southern portion of the site (refer to Drawing 1, Appendix A).

The field work was undertaken by a DP environmental scientist between 26 and 28 June 2018.

D1.5 Develop the Analytical Approach (or decision rule)

The information obtained during the assessment was used to characterise the site in terms of contamination issues and risk to human health and the environment. The decision rules used in characterising the site were as follows:

- The adopted SAC comprised NSW EPA endorsed criteria; and
- The contaminant concentrations in soil were compared to the adopted SAC to determine the extent of filling requiring remedial action.

Field and laboratory test results were considered useable for the assessment after evaluation against the following data quality indicators (DQIs):

- Precision – a measure of variability or reproducibility of data;
- Accuracy – a measure of closeness of the data to the ‘true’ value;
- Representativeness – the confidence (qualitative) of data representativeness of media present on site;
- Completeness – a measure of the amount of usable data from a data collection activity; and
- Comparability – the confidence (qualitative) that data may be considered to be equivalent for each sampling and analytical event.

The specific limits are outlined in the data QA/QC procedures and results (Appendix F).

D1.6 Specify the Performance or Acceptable Criteria

Decision errors for the respective COPC for fill and natural soils are:

1. Deciding that fill and natural soil at the site exceeds the adopted SAC when they truly do not; and
2. Deciding that fill and natural soil at the site is within the adopted SAC when they truly are not.

Decision errors for the investigation were minimised and measured by the following:

- Sample collection and handling techniques were in accordance with DP's *Field Procedures Manual*;
- Samples were prepared and analysed by a NATA-accredited laboratory with the acceptance limits for laboratory QA/QC parameters based on the laboratory reported acceptance limits and those stated in NEPC (2013);
- The analyte selection is based on the findings of the previous contamination investigations. The potential for contaminants other than those proposed to be analysed is considered to be low;
- The SAC were adopted from established and NSW EPA endorsed guidelines. The SAC have risk probabilities already incorporated; and
- A NATA accredited laboratory using NATA endorsed methods are used to perform laboratory analysis. Where NATA endorsed methods are not used, the reasons are stated. The effect of using non – NATA methods on the decision making process are explained.

D1.7 Optimise the design for obtaining data

Sampling design and procedures that were implemented to optimise data collection for achieving the DQOs included the following;

- A NATA accredited laboratory using NATA endorsed methods were used to perform laboratory analysis;
- Additional soil samples were collected but kept 'on hold' pending details of initial analysis so that they could be analysed if further delineation was required; and
- Adequately experienced environmental scientists were chosen to conduct field work and sample analysis interpretation.

Appendix C

Test Pit Logs

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 21 mAHD
EASTING: 290741
NORTHING: 6278162

PIT No: 1
PROJECT No: 85644.06
DATE: 26/6/2018
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 mm) 5 10 15 20
21	0.03	TOPSOIL - brown fine to medium grained silty sand with some rootlets, moist		D	0.0				
		FILLING - dark brown fine to medium grained silty sand with a trace of porcelain, glass and ACM							
	0.3	SILTY SAND - light brown and yellow fine to medium grained silty sand, humid			0.3				
	0.6	Pit discontinued at 0.6m - limit of investigation							
20	1								1
19	2								2
18	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 22 mAHD
EASTING: 290722
NORTHING: 6278167

PIT No: 2
PROJECT No: 85644.06
DATE: 26/6/2018
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 mm) 5 10 15 20
22	0.02	TOPSOIL - brown fine to medium grained silty sand, moist			0.0				
		FILLING - dark brown fine to medium grained silty sand with a trace of some anthropogenics comprising wire, glass, ACM, bricks and sheet metal, humid		D					
21	1			D	1.0				1
	1.3	SILTY SAND - light brown and yellow fine to medium grained silty sand, humid			1.3				
	1.5	Pit discontinued at 1.5m - limit of investigation							
20	2								2
19	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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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TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 18 mAHD
EASTING: 290699
NORTHING: 6278147

PIT No: 3
PROJECT No: 85644.06
DATE: 26/6/2018
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 mm) 5 10 15 20
18	0.03	TOPSOIL - brown fine to medium grained silty sand with some rootlets, moist			0.0				
		FILLING - dark brown fine to medium grained silty sand with a trace of rusted metal, humid		D					
	0.4	SILTY SAND - light brown and yellow fine to medium grained silty sand, humid			0.4				
	0.7	Pit discontinued at 0.7m - limit of investigation							
17	1								1
16	2								2
15	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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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TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 26 mAHD
EASTING: 290730
NORTHING: 6278145

PIT No: 4
PROJECT No: 85644.06
DATE: 26/6/2018
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 mm) 5 10 15 20
26	0.02	TOPSOIL - brown fine to medium grained silty sand with some rootlets, moist		D	0.0				
		FILLING - dark brown fine to medium grained silty sand with a trace of gravel, glass and metal, humid							
	0.28	SILTY SAND - light brown and yellow fine to medium grained silty sand, humid			0.3				
	0.8	Pit discontinued at 0.8m - limit of investigation							
25	1								1
24	2								2
23	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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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TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 29 mAHD
EASTING: 290745
NORTHING: 6278141

PIT No: 5
PROJECT No: 85644.06
DATE: 26/6/2018
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 mm) 5 10 15 20
29	0.02	TOPSOIL - dark brown fine to medium grained silty sand with some rootlets, moist			0.0				
		FILLING - dark brown fine to medium grained silty sand with a trace of concrete cobbles, gravel, porcelain, metal and ACM, humid		D					
	0.4	SILTY SAND - light brown, grey and yellow fine to medium grained silty sand, humid			0.4				
	0.7	Pit discontinued at 0.7m - limit of investigation							
28	1								1
27	2								2
26	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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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TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 11 mAHD
EASTING: 290768
NORTHING: 6278142

PIT No: 6
PROJECT No: 85644.06
DATE: 26/6/2018
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 mm) 5 10 15 20
11	0.02	TOPSOIL - brown fine to medium grained silty sand with some rootlets, moist		D	0.0				
	0.25	FILLING - dark brown fine to medium grained silty sand with a trace of rootlets, porcelain and brick, humid			0.25				
		SILTY SAND - light brown, grey and yellow fine to medium grained silty sand, humid							
	0.6	Pit discontinued at 0.6m - limit of investigation							
10	1								1
9	2								2
8	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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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TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 18 mAHD
EASTING: 290778
NORTHING: 6278122

PIT No: 7
PROJECT No: 85644.06
DATE: 26/6/2018
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 mm) 5 10 15 20
18	0.02	TOPSOIL - dark brown fine to medium grained silty sand with some rootlets, moist		D	0.0				
		FILLING - brown and dark brown fine to medium grained silty sand with a trace of gravel, porcelain, terracotta, brick and glass, humid							
	0.3	SILTY SAND - light brown, grey and yellow fine to medium grained silty sand, humid			0.3				
	0.7	Pit discontinued at 0.7m - limit of investigation							
17	1								1
16	2								2
15	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit moved due to no fill (initially)

☐ 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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TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 15 mAHD
EASTING: 290761
NORTHING: 6278121

PIT No: 8
PROJECT No: 85644.06
DATE: 26/6/2018
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 mm)
15	0.02	TOPSOIL - dark brown fine to medium grained silty sand with some rootlets, moist		D	0.0				5 10 15 20
		FILLING - brown fine to medium grained silty sand with a trace of gravel and glass, humid							
	0.28	SILTY SAND - light brown and yellow fine to medium grained silty sand, humid			0.28				
	0.7	Pit discontinued at 0.7m - limit of investigation							
14	1								1
13	2								2
12	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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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TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 21 mAHD
EASTING: 290743
NORTHING: 6278127

PIT No: 9
PROJECT No: 85644.06
DATE: 26/6/2018
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 mm) 5 10 15 20
21	0.08	TOPSOIL - dark brown fine to medium grained silty sand with some rootlets, humid to moist		D	0.0				
	0.2	SILTY SAND - brown fine to medium grained silty sand, humid to moist			0.2				
		SILTY SAND - light brown and grey fine to medium grained silty sand, humid							
	0.6	Pit discontinued at 0.6m - limit of investigation							
20	1								1
19	2								2
18	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: No fill observed

☐ 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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TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 26 mAHD
EASTING: 290723
NORTHING: 6278128

PIT No: 10
PROJECT No: 85644.06
DATE: 26/6/2018
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 mm)
26	0.01	TOPSOIL - dark brown fine to medium grained silty sand with some rootlets, moist		D	0.0				
	0.2	FILLING - dark brown fine to medium grained silty sand with a trace of brick, glass, metal, rubber and terracotta, humid to moist			0.2				
		SILTY SAND - light brown and grey fine to medium grained silty sand, humid							
	0.5	Pit discontinued at 0.5m - limit of investigation							
25	1								1
24	2								2
23	3								3

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

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 27 mAHD
EASTING: 290707
NORTHING: 6278124

PIT No: 11
PROJECT No: 85644.06
DATE: 26/6/2018
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 mm) 5 10 15 20
27	0.01	TOPSOIL - dark brown fine to medium grained silty sand with some rootlets, moist		D	0.0				
	0.2	FILLING - brown fine to medium grained sandy silt with a trace of rootlets, porcelain, brick and glass, humid to moist			0.2				
		SILTY SAND - light brown and grey fine to medium grained silty sand, humid							
	0.5	Pit discontinued at 0.5m - limit of investigation							
26	1								1
25	2								2
24	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: ACM in sieve sample from filling

☐ 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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TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 22 mAHD
EASTING: 290688
NORTHING: 6278124

PIT No: 12
PROJECT No: 85644.06
DATE: 26/6/2018
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 mm) 5 10 15 20
22	0.01	TOPSOIL - dark brown fine to medium grained silty sand with some rootlets, moist			0.0				
		FILLING - brown and light brown fine to medium grained silty sand with some brick, metal rods, porcelain, metal sheet, plastic lid, tile and ACM, humid							
		SILTY SAND - light brown and yellow fine to medium grained silty sand, humid		D					
	0.6	- large piece of reinforced with metal concrete at 0.6m							
21	1			D	1.0				1
	1.2	SILTY SAND - light brown and grey fine to medium grained silty sand, humid			1.2				
	1.4	CLAYEY SAND - golden brown and grey fine to medium grained clayey sand							
	1.6	Pit discontinued at 1.6m - limit of investigation							
20	2								2
19	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 26 mAHD
EASTING: 290670
NORTHING: 6278113

PIT No: 13
PROJECT No: 85644.06
DATE: 26/6/2018
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 mm) 5 10 15 20
26	0.02	TOPSOIL - dark brown fine to medium grained silty sand with some rootlets, moist		D	0.0				
	0.2	FILLING - brown fine to medium grained silty sand with a trace of white gravel, porcelain, glass and bricks, humid			0.2				
		SILTY SAND - light brown and grey fine to medium grained silty sand, humid							
	0.5	Pit discontinued at 0.5m - limit of investigation							
25	1								1
24	2								2
23	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 21 mAHD
EASTING: 290691
NORTHING: 6278108

PIT No: 14
PROJECT No: 85644.06
DATE: 26/6/2018
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 mm) 5 10 15 20
21	0.01	TOPSOIL - dark brown fine to medium grained silty sand with some rootlets, humid to moist		D	0.0				
	0.27	FILLING - dark brown fine to medium grained silty sand with a trace of gravel, porcelain, glass, brick and ACM, humid to moist			0.27				
		SILTY SAND - light brown and grey fine to medium grained silty sand, humid							
	0.6	Pit discontinued at 0.6m - limit of investigation							
20	1								1
19	2								2
18	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 27 mAHD
EASTING: 290709
NORTHING: 6278109

PIT No: 15
PROJECT No: 85644.06
DATE: 26/6/2018
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 mm) 5 10 15 20
27	0.02	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp		D	0.0				
	0.2	FILLING - brown fine to medium grained silty sand with a trace of rootlets, bricks and porcelain, humid to damp			0.2				
		SILTY SAND - light brown and grey fine to medium grained silty sand, humid							
	0.7	Pit discontinued at 0.7m - limit of investigation							
26	1								1
25	2								2
24	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 28 mAHD
EASTING: 290727
NORTHING: 6278104

PIT No: 16
PROJECT No: 85644.06
DATE: 26/6/2018
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 mm) 5 10 15 20
28	0.03	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp		D	0.0				
	0.2	FILLING - brown and dark brown fine to medium grained silty sand with a trace of porcelain and glass, humid to damp			0.2				
		SILTY SAND - light brown and grey fine to medium grained silty sand, humid							
	0.6	Pit discontinued at 0.6m - limit of investigation							
27	1								1
26	2								2
25	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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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TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 30 mAHD
EASTING: 290740
NORTHING: 6278102

PIT No: 17
PROJECT No: 85644.06
DATE: 26/6/2018
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 mm)
30	0.01	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp		D	0.0				
	0.3	FILLING - dark brown and brown fine to medium grained silty sand with a trace of gravel, porcelain and terracotta, humid to damp			0.3				
		SILTY SAND - light grey and brown fine to medium grained silty sand, humid							
	0.6	Pit discontinued at 0.6m - limit of investigation							
29	1								1
28	2								2
27	3								3

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

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 29 mAHD
EASTING: 290759
NORTHING: 6278109

PIT No: 18
PROJECT No: 85644.06
DATE: 26/6/2018
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 mm) 5 10 15 20
29	0.01	TOPSOIL - brown fine grained silty sand with some rootlets, damp		D	0.0				
	0.17	FILLING - brown fine to medium grained silty sand with a trace of porcelain and glass, humid to damp			0.17				
		SILTY SAND - light brown and yellow fine to medium grained silty sand, humid							
	0.55	Pit discontinued at 0.55m - limit of investigation							
28	1								1
27	2								2
26	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 25 mAHD
EASTING: 290772
NORTHING: 6278110

PIT No: 19
PROJECT No: 85644.06
DATE: 26/6/2018
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 mm) 5 10 15 20
25	0.01	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp		D	0.0				
	0.25	FILLING - dark brown fine to medium grained silty sand with a trace of porcelain, glass, metal pipe, rusted metal sheet, brick and concrete, humid to damp			0.25				
		SILTY SAND - light yellow brown fine to medium grained silty sand, humid							
	0.6	Pit discontinued at 0.6m - limit of investigation							
24	1								1
23	2								2
22	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: ACM in sieve sample from filling

☐ 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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 12 mAHD
EASTING: 290796
NORTHING: 6278107

PIT No: 20
PROJECT No: 85644.06
DATE: 26/6/2018
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 mm) 5 10 15 20
12	0.05	TOPSOIL - brown fine grained silty sand with some rootlets, moist		D	0.0				
		FILLING - brown fine to medium grained silty sand with a trace of porcelain, humid							
	0.3	SILTY SAND - light brown and grey fine to medium grained silty sand, humid			0.3				
	0.6	Pit discontinued at 0.6m - limit of investigation							
11	1								1
10	2								2
9	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 24 mAHD
EASTING: 290795
NORTHING: 6278096

PIT No: 21
PROJECT No: 85644.06
DATE: 26/6/2018
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 mm) 5 10 15 20
24	0.02	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp			0.0				
		SILTY SAND - brown fine to medium grained silty sand, humid to damp		D					
		- becoming light brown and yellow below 0.3m							
	0.6	Pit discontinued at 0.6m - limit of investigation			0.6				
23	1								1
22	2								2
21	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit 21A with fill (0.25m deep)

☐ 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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 27 mAHD
EASTING: 290780
NORTHING: 6278095

PIT No: 21A
PROJECT No: 85644.06
DATE: 27/6/2018
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 mm)
27	0.01	TOPSOIL - brown fine grained silty sand with some rootlets, damp		D	0.0				
	0.25	FILLING - brown fine to medium grained silty sand with a trace of thin piece of dark grey shale and single piece of metal stick, humid to damp			0.25				
		SILTY SAND - light brown and yellow fine to medium grained silty sand, humid							
	0.53	Pit discontinued at 0.53m - limit of investigation							
26	1								1
25	2								2
24	3								3

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

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 30 mAHD
EASTING: 290778
NORTHING: 6278088

PIT No: 22
PROJECT No: 85644.06
DATE: 26/6/2018
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 mm)
30	0.03	TOPSOIL - dark brown fine to medium grained silty sand with some rootlets, damp			0.0				5 10 15 20
		FILLING - very light grey and golden yellow fine to medium grained cemented clayey sand with a trace of gravel and glass, humid		D					
	0.4	SILTY SAND - light brown and yellow fine to medium grained silty sand, humid			0.4				
	0.7	Pit discontinued at 0.7m - limit of investigation							
29	1								1
28	2								2
27	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 24 mAHD
EASTING: 290760
NORTHING: 6278089

PIT No: 23
PROJECT No: 85644.06
DATE: 26/6/2018
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 mm)
24	0.01	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp		D	0.0				5 10 15 20
		FILLING - dark brown fine to medium grained silty sand with a trace of gravel, and single piece of asphaltic cement, humid to damp							
	0.33	SILTY SAND - light brown and yellow fine to medium grained silty sand, humid			0.33				
	0.65	Pit discontinued at 0.65m - limit of investigation							
23	1								1
22	2								2
21	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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
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TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 27 mAHD
EASTING: 290742
NORTHING: 6278089

PIT No: 24
PROJECT No: 85644.06
DATE: 26/6/2018
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 mm) 5 10 15 20
27	0.03	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp			0.0				
	0.2	SILTY SAND - light brown to brown fine to medium grained silty sand with a trace of rootlets, damp		D					
		SILTY SAND - light brown and yellow fine to medium grained silty sand, humid							
	0.55	Pit discontinued at 0.55m - limit of investigation			0.55				
26	1								1
25	2								2
24	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 29 mAHD
EASTING: 290722
NORTHING: 6278094

PIT No: 25
PROJECT No: 85644.06
DATE: 26/6/2018
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 mm) 5 10 15 20
29	0.02	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp		D	0.0				
	0.21	FILLING - dark brown fine to medium grained silty sand with a trace of gravel, rootlets, porcelain, terracotta and glass, humid to damp			0.21				
		SILTY SAND - light grey and brown fine to medium grained silty sand, humid							
	0.6	Pit discontinued at 0.6m - limit of investigation							
28	1								1
27	2								2
26	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 24 mAHD
EASTING: 290707
NORTHING: 6278094

PIT No: 26
PROJECT No: 85644.06
DATE: 27/6/2018
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 mm) 5 10 15 20
24	0.01	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp		D	0.0				
	0.17	FILLING - dark brown fine to medium grained silty sand with a trace of rootlets and glass, damp			0.17				
		SILTY SAND - light grey and brown fine to medium grained silty sand, humid							
	0.51	Pit discontinued at 0.51m - limit of investigation							
23	1								1
22	2								2
21	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 38 mAHD
EASTING: 290689
NORTHING: 6278091

PIT No: 27
PROJECT No: 85644.06
DATE: 27/6/2018
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 mm)
38	0.01	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp			0.0				
	0.25	FILLING - brown fine to medium grained silty sand with a trace of gravel and porcelain, damp							
	0.31	FILLING - light grey and brown fine to medium grained silty sand, humid		D					
		FILLING - dark brown fine to medium grained silty sand with some rusted metal, terracotta, glass, concrete, porcelain, metal wire and ACM fragments, humid							
	0.69	SILTY SAND - light grey and brown fine to medium grained silty sand, humid			0.69				
37	1 1.0	Pit discontinued at 1.0m - limit of investigation							1
36	2								2
35	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 21 mAHD
EASTING: 290670
NORTHING: 6278086

PIT No: 28
PROJECT No: 85644.06
DATE: 27/6/2018
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 mm)
21	0.01	TOPSOIL - dark brown fine to medium grained silty sand with some rootlets, damp		D	0.0				
	0.31	FILLING - dark brown fine to medium grained silty sand with a trace of rootlets, rusted metal sheets and sticks, porcelain, glass and bricks, humid to damp		D	0.31				
	0.53	FILLING - light grey fine to medium grained silty sand with a trace of porcelain, humid			0.53				
	0.9	SILTY SAND - light grey and brown fine to medium grained silty sand, humid							
20	1	Pit discontinued at 0.9m - limit of investigation							
19	2								
18	3								

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

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: ACM in sieve sample from filling

☐ 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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 23 mAHD
EASTING: 290650
NORTHING: 6278093

PIT No: 29
PROJECT No: 85644.06
DATE: 27/6/2018
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 mm) 5 10 15 20
23	0.01	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp			0.0				
		FILLING - brown to dark brown fine to medium grained silty sand with a trace of porcelain and glass, humid to damp		D					
	0.32	SILTY SAND - light grey and brown fine to medium grained silty sand, humid			0.32				
	0.7	Pit discontinued at 0.7m - limit of investigation							
22	1								1
21	2								2
20	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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
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TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 18 mAHD
EASTING: 290634
NORTHING: 6278078

PIT No: 30
PROJECT No: 85644.06
DATE: 27/6/2018
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 mm)
18	0.01	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp		D	0.0				5 10 15 20
	0.3	FILLING - dark brown fine to medium grained silty sand with a trace of porcelain, glass, terracotta and rusted metal, humid to damp			0.3				
		SILTY SAND - light grey and brown fine to medium grained silty sand, humid							
	0.6	CLAYEY SAND - golden brown and light grey fine to medium grained clayey sand, humid							
	0.8	Pit discontinued at 0.8m - limit of investigation							
17	1								1
16	2								2
15	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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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TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 20 mAHD
EASTING: 290656
NORTHING: 6278074

PIT No: 31
PROJECT No: 85644.06
DATE: 27/6/2018
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 mm)
20	0.02	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp			0.0				
	0.17	FILLING - golden brown mottled grey fine to medium grained clayey sand, damp		D					
	0.41	FILLING - brown fine to medium grained silty sand with a trace of porcelain, metal, glass and terracotta, humid			0.42				
	0.42	FILLING - golden brown mottled grey fine to medium grained clayey sand, humid							
		SILTY SAND - light grey and brown fine to medium grained silty sand, humid							
	0.82	Pit discontinued at 0.82m - limit of investigation							
19	1								1
18	2								2
17	3								3

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

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 17 mAHD
EASTING: 290679
NORTHING: 6278076

PIT No: 32
PROJECT No: 85644.06
DATE: 27/6/2018
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 mm)
17	0.01	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp			0.0				5 10 15 20
		FILLING - dark brown fine to medium grained silty sand with some terracotta, glass, concrete, plastic, metal and bricks, humid to damp		D					
	0.4	SILTY SAND - light grey and brown fine to medium grained silty sand, humid			0.4				
	0.75	Pit discontinued at 0.75m - limit of investigation							
16	1								1
15	2								2
14	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 15 mAHD
EASTING: 290693
NORTHING: 6278074

PIT No: 33
PROJECT No: 85644.06
DATE: 27/6/2018
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 mm) 5 10 15 20
15	0.03	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp		D	0.0				
		FILLING - dark brown to brown fine to medium grained silty sand with a trace of rootlets, metal wire, glass and porcelain, humid							
	0.27	SILTY SAND - light grey and brown fine to medium grained silty sand, humid			0.27				
	0.7	Pit discontinued at 0.7m - limit of investigation							
14	1								1
13	2								2
12	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 18 mAHD
EASTING: 290708
NORTHING: 6278072

PIT No: 34
PROJECT No: 85644.06
DATE: 27/6/2018
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 mm) 5 10 15 20
18	0.01	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp		D	0.1				
		FILLING - brown fine to medium grained silty sand with some ACM fragments, porcelain, terracotta, amber glass, concrete pipe, metal wire, metal sheeting and brick, humid							
17	1 1.0	CLAYEY SAND - golden brown and grey fine to medium grained clayey sand, humid							1
	1.4	Pit discontinued at 1.4m - limit of investigation							
16	2								2
15	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 19 mAHD
EASTING: 290730
NORTHING: 6278068

PIT No: 35
PROJECT No: 85644.06
DATE: 27/6/2018
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 mm) 5 10 15 20
19	0.01	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp		D	0.0				
	0.18	FILLING - brown fine to medium grained silty sand with a trace of terracotta, damp			0.18				
		SILTY SAND - light grey and brown fine to medium grained silty sand, humid							
	0.5	Pit discontinued at 0.5m - limit of investigation							
18	1								1
17	2								2
16	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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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TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 19 mAHD
EASTING: 290729
NORTHING: 6278059

PIT No: 35A
PROJECT No: 85644.06
DATE: 27/6/2018
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 mm) 5 10 15 20
19	0.01	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp		D	0.0				
	0.12	FILLING - brown fine to medium grained silty sand with a trace of terracotta, humid			0.1				
		SILTY SAND - light grey and brown fine to medium grained silty sand, humid							
	0.8	Pit discontinued at 0.8m - limit of investigation							
18	1								1
17	2								2
16	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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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TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 19 mAHD
EASTING: 290728
NORTHING: 6278051

PIT No: 35B
PROJECT No: 85644.06
DATE: 27/6/2018
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 mm) 5 10 15 20
19	0.01	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp		D	0.0				
	0.17	FILLING - dark brown fine to medium grained silty sand with a trace of glass, metal wire and rubber, humid			0.17				
		SILTY SAND - light grey and brown fine to medium grained silty sand, humid							
	0.78	Pit discontinued at 0.78m - limit of investigation							
18	1								1
17	2								2
16	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 26 mAHD
EASTING: 290726
NORTHING: 6278044

PIT No: 35C
PROJECT No: 85644.06
DATE: 27/6/2018
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 mm) 5 10 15 20
26	0.0	SILTY SAND - light brown fine to medium grained silty sand, humid			0.0				
	0.2	SILTY SAND - light grey and brown fine to medium grained silty sand, humid		D					
	0.7	Pit discontinued at 0.7m - limit of investigation			0.7				
25	1								1
24	2								2
23	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: No fill

☐ 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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 23 mAHD
EASTING: 290745
NORTHING: 6278074

PIT No: 36
PROJECT No: 85644.06
DATE: 27/6/2018
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 mm) 5 10 15 20
23	0.01	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp		D	0.0				
	0.21	FILLING - brown to dark brown fine to medium grained silty sand with a trace of glass, humid			0.21				
		SILTY SAND - light grey and brown fine to medium grained silty sand, humid							
	0.66	Pit discontinued at 0.66m - limit of investigation							
22	1								1
21	2								2
20	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 23 mAHD
EASTING: 290759
NORTHING: 6278071

PIT No: 37
PROJECT No: 85644.06
DATE: 27/6/2018
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 mm)
23	0.01	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp			0.0				5 10 15 20
		FILLING - dark brown fine to medium grained silty sand with a trace of rootlets, bricks, concrete and porcelain, humid		D					
	0.39	SILTY SAND - light grey and brown fine to medium grained silty sand, humid			0.39				
	0.82	Pit discontinued at 0.82m - limit of investigation							
22	1								1
21	2								2
20	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 24 mAHD
EASTING: 290775
NORTHING: 6278073

PIT No: 38
PROJECT No: 85644.06
DATE: 27/6/2018
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 mm) 5 10 15 20
24	0.01	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp			0.0				
		FILLING - dark brown fine to medium grained silty sand with anthropogenics comprising fibro, plastic sheets, plastic bags, markets, fibreglass, plastic lids, processed wood, metal sheeting, potential ACM, asphaltic cement, metal pipe, steel structure and a trace of gravel, humid to damp		D					
23	1				1.0				1
				D					
22	2				2.0				2
				D					
	2.2	CLAYEY SAND - golden brown mottled grey fine to medium grained clayey sand, humid to damp			2.2				
	2.5	Pit discontinued at 2.5m - limit of investigation							
21	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Anthropogenic materials seem more modern than the rest of the site

☐ 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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 23 mAHD
EASTING: 290792
NORTHING: 6278076

PIT No: 39
PROJECT No: 85644.06
DATE: 27/6/2018
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 mm) 5 10 15 20
23	0.02	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp		D	0.0				
	0.12	FILLING - brown fine to medium grained silty sand with a trace of glass, humid			0.12				
		SILTY SAND - light grey and brown fine to medium grained silty sand, humid							
	0.6	Pit discontinued at 0.6m - limit of investigation							
22	1								1
21	2								2
20	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 24 mAHD
EASTING: 290774
NORTHING: 6278065

PIT No: 40
PROJECT No: 85644.06
DATE: 27/6/2018
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 mm)
24	0.01	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp			0.0				5 10 15 20
		FILLING - brown fine to medium grained silty sand with a trace of clay, styrofoam cup, metal, wire, rubber tube and asphaltic cement, damp		D					
	0.38	- with pocket of dark grey asphaltic cement in part of the pit at 0.32m			0.38				
23	1	SILTY SAND - light grey and brown fine to medium grained silty sand, humid							1
	1.1	Pit discontinued at 1.1m - limit of investigation							
22	2								2
21	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit moved till fill was found

☐ 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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 24 mAHD
EASTING: 290776
NORTHING: 6278053

PIT No: 40A
PROJECT No: 85644.06
DATE: 27/6/2018
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 mm)
24	0.01	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp		D	0.0				
	0.21	FILLING - brown fine to medium grained silty sand with a trace of asphaltic cement, damp			0.21				
	0.3	SILTY SAND - light brown and grey fine to medium grained silty sand, humid							
		Pit discontinued at 0.3m - limit of investigation							
23	1								1
22	2								2
21	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 25 mAHD
EASTING: 290775
NORTHING: 6278046

PIT No: 40B
PROJECT No: 85644.06
DATE: 27/6/2018
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 mm)
25	0.01	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp		D	0.0 0.04				
	0.26	FILLING - brown fine to medium grained silty sand with a trace of processed wood, bricks and glass, humid							
	0.4	FILLING - golden brown mottled grey fine to medium grained clayey sand, humid							
		SILTY SAND - light grey and brown fine to medium grained silty sand, humid							
	0.85	Pit discontinued at 0.85m - limit of investigation							
24	1								1
23	2								2
22	3								3

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

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 30 mAHD
EASTING: 290746
NORTHING: 6278062

PIT No: 41
PROJECT No: 85644.06
DATE: 27/6/2018
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 mm) 5 10 15 20
30	0.03	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp		D	0.0				
		FILLING - brown to dark brown fine to medium grained silty sand with a trace of porcelain, glass, bricks and metal wire, humid to damp							
	0.28	SILTY SAND - light grey and brown fine to medium grained silty sand, humid			0.28				
29	1								1
	1.2	Pit discontinued at 1.2m - limit of investigation							
28	2								2
27	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: ACM in sieve sample from filling

☐ 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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 26 mAHD
EASTING: 290701
NORTHING: 6278055

PIT No: 42
PROJECT No: 85644.06
DATE: 27/6/2018
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 mm) 5 10 15 20
26	0.03	TOPSOIL - dark brown fine grained silty sand with some rootlets, humid			0.0				
		FILLING - dark brown to brown fine to medium grained silty sand with some bricks, wire metal, porcelain and glass, humid		D					
	0.42	SILTY SAND - light grey and brown fine to medium grained silty sand, humid			0.42				
	0.83	Pit discontinued at 0.83m - limit of investigation							
25	1								1
24	2								2
23	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 29 mAHD
EASTING: 290692
NORTHING: 6278040

PIT No: 42A
PROJECT No: 85644.06
DATE: 27/6/2018
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 mm) 5 10 15 20
29	0.01	TOPSOIL - dark brown fine grained silty sand with some rootlets, humid			0.0				
		FILLING - brown to dark brown fine to medium grained silty sand with some rusted metal, bricks, porcelain, glass and terracotta, humid		D					
28	1.0	SILTY SAND - light grey and brown with a trace of golden brown fine to medium grained silty sand, humid			1.0				1
	1.4	Pit discontinued at 1.4m - limit of investigation							
27	2								2
26	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 26 mAHD
EASTING: 290701
NORTHING: 6278032

PIT No: 42B
PROJECT No: 85644.06
DATE: 27/6/2018
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 mm) 5 10 15 20
26	0.01	TOPSOIL - dark brown fine grained silty sand with some rootlets, humid			0.0				
		FILLING - brown to brown fine to medium grained silty sand with a trace of metal wire, bricks, glass and ceramics, humid		D					
	0.69	SILTY SAND - light brown and grey with a trace of golden yellow brown fine to medium grained silty sand, humid			0.69				
25	1								1
	1.1	Pit discontinued at 1.1m - limit of investigation							
24	2								2
23	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 29 mAHD
EASTING: 290710
NORTHING: 6278031

PIT No: 42C
PROJECT No: 85644.06
DATE: 27/6/2018
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 mm) 5 10 15 20
29	0.01	TOPSOIL - dark brown fine grained silty sand with some rootlets, humid		D	0.0				
	0.2	FILLING - brown fine to medium grained silty sand with a trace of porcelain and glass, humid							
	0.3	FILLING - golden brown and grey fine to medium grained clayey sand, humid			0.3				
		SILTY SAND - light grey and brown fine to medium grained silty sand, humid							
	0.7	Pit discontinued at 0.7m - limit of investigation							
28	1								1
27	2								2
26	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 23 mAHD
EASTING: 290673
NORTHING: 6278055

PIT No: 43
PROJECT No: 85644.06
DATE: 27/6/2018
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 mm)
23	0.02	TOPSOIL - dark brown fine grained silty sand with some rootlets, humid		D	0.0				5 10 15 20
		FILLING - brown fine to medium grained silty sand with a trace of porcelain, terracotta and glass, humid							
	0.3	SILTY SAND - light grey and brown fine to medium grained silty sand, humid			0.3				
	0.7	Pit discontinued at 0.7m - limit of investigation							
22	1								1
21	2								2
20	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 24 mAHD
EASTING: 290659
NORTHING: 6278062

PIT No: 44
PROJECT No: 85644.06
DATE: 28/6/2018
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 mm) 5 10 15 20
24	0.02	TOPSOIL - dark brown fine to medium grained silty sand with some rootlets, damp		D	0.0				
	0.2	FILLING - dark brown fine to medium grained silty sand with some glass, tile and porcelain, damp			0.2				
		SILTY SAND - light grey and brown fine to medium grained silty sand, humid							
	0.52	Pit discontinued at 0.52m - limit of investigation							
23	1								1
22	2								2
21	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 21 mAHD
EASTING: 290630
NORTHING: 6278058

PIT No: 45
PROJECT No: 85644.06
DATE: 28/6/2018
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 mm) 5 10 15 20
21	0.02	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp		D	0.0				
		FILLING - dark brown fine to medium grained silty sand with some bricks, metal pipe, glass and porcelain, damp							
	0.27	SILTY SAND - light grey and brown fine to medium grained silty sand, humid			0.27				
	0.54	Pit discontinued at 0.54m - limit of investigation							
20	1								1
19	2								2
18	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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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TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 24 mAHD
EASTING: 290637
NORTHING: 6278037

PIT No: 46
PROJECT No: 85644.06
DATE: 28/6/2018
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 mm)
24	0.01	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp		D	0.0				
	0.2	FILLING - brown fine to medium grained silty sand with a trace of glass, bricks and timber, damp			0.2				
		SILTY SAND - light brown and yellow fine to medium grained silty sand, humid							
	0.56	Pit discontinued at 0.56m - limit of investigation							
23	1								1
22	2								2
21	3								3

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

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 30 mAHD
EASTING: 290639
NORTHING: 6278040

PIT No: 47
PROJECT No: 85644.06
DATE: 28/6/2018
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 mm)
30	0.01	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp			0.0				
	0.15	FILLING - dark brown fine to medium grained silty sand with some bricks, glass, porcelain, concrete and wood, damp		D					
	0.3	FILLING - brown fine to medium grained silty sand with a trace of bricks, glass, porcelain, concrete and wod							
	0.46	FILLING - reddish brown fine to medium grained silty sand and rusty metal fragments, bricks, glass, porcelain, concrete and wood, humid			0.57				
	0.57	FILLING - brown fine to medium grained silty sand with a trace of bricks, glass, porcelain, concrete and wood							
	0.8	SILTY SAND - light grey and brown fine to medium grained silty sand, humid							
29	1 1.0	CLAYEY SAND - golden brown mottled light grey fine to medium grained clayey sand, humid							1
		Pit discontinued at 1.0m - limit of investigation							
28	2								2
27	3								3

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

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: ACM in sieve sample from filling

☐ 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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TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 25 mAHD
EASTING: 290684
NORTHING: 6278036

PIT No: 48
PROJECT No: 85644.06
DATE: 28/6/2018
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 mm)
25	0.03	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp			0.0				5 10 15 20
	0.2	FILLING - yellow brown fine to medium grained clayey sand, damp		D					
		FILLING - brown fine to medium grained silty sand with some rusted metal sheets, pieces of porcelain, bricks, glass, terracotta and ACM fragments, humid							
	0.56	SILTY SAND - very light grey and brown fine to medium grained silty sand, humid			0.56				
24	0.92 1	Pit discontinued at 0.92m - limit of investigation							1
23	2								2
22	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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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TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 16 mAHD
EASTING: 290688
NORTHING: 6278024

PIT No: 48A
PROJECT No: 85644.06
DATE: 28/6/2018
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 mm) 5 10 15 20
16	0.03	TOPSOIL - dark brown fine to medium grained sandy silt with some rootlets, damp			0.0				
		FILLING - light brown fine to medium grained silty sand with a trace of porcelain, humid							
	0.31	FILLING - dark brown fine to medium grained silty sand with some glass, porcelain, metal and bricks, humid		D					
	0.72	SILTY SAND - light yellow brown fine to medium grained silty sand, very slightly cemented, humid			0.72				
15	1								1
	1.1	Pit discontinued at 1.1m - limit of investigation							
14	2								2
13	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 19 mAHD
EASTING: 290658
NORTHING: 6278021

PIT No: 49
PROJECT No: 85644.06
DATE: 28/6/2018
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 mm) 5 10 15 20
19		FILLING - light brown fine to medium grained silty sand with a trace of porcelain, humid		D	0.0				
	0.52	SILTY SAND - light brown and grey fine to medium grained silty sand, humid			0.52				
	0.85	Pit discontinued at 0.85m - limit of investigation							
18	1								1
17	2								2
16	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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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TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 21 mAHD
EASTING: 290634
NORTHING: 6278026

PIT No: 50
PROJECT No: 85644.06
DATE: 28/6/2018
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 mm) 5 10 15 20
21	0.03	TOPSOIL - dark brown fine to medium grained silty sand with some rootlets, damp			0.0				
		FILLING - brown fine to medium grained silty sand, damp							
	0.24	FILLING - grey brown fine to medium grained silty sand with some bricks, metal, ACM, concrete, glass, terracotta and asphalt, humid		D					
20	1 0.98	CLAYEY SAND - golden brown mottled light grey clayey sand, humid			0.98				1
	1.3	Pit discontinued at 1.3m - limit of investigation							
19	2								2
18	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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
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TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 20 mAHD
EASTING: 290626
NORTHING: 6278026

PIT No: 50A
PROJECT No: 85644.06
DATE: 28/6/2018
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 mm) 5 10 15 20
20	0.01	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp			0.0				
		FILLING - brown fine to medium grained silty sand, damp							
	0.32	FILLING - grey brown fine to medium grained silty sand with some bricks, metal, glass, porcelain, ACM, concrete and terracotta, humid		D					
19	0.9	CLAYEY SAND - golden brown mottled light grey and brown fine to medium grained clayey sand, slightly cemented, humid			0.9				1
	1								
	1.2	Pit discontinued at 1.2m - limit of investigation							
18	2								2
17	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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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TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 22 mAHD
EASTING: 290614
NORTHING: 6278020

PIT No: 50B
PROJECT No: 85644.06
DATE: 28/6/2018
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 mm) 5 10 15 20
22	0.02	TOPSOIL - brown fine to medium grained silty sand with some rootlets, humid to damp			0.0				
		FILLING - brown and yellow fine to medium grained silty sand, humid		D					
	0.4	FILLING - brown fine to medium grained silty sand with a trace of glass, metal, terracotta, porcelain and ACM, humid							
	0.72	SILTY SAND - light grey and brown fine to medium grained silty sand, humid			0.72				
21	0.9 1	CLAYEY SAND - golden brown mottled light grey fine to medium grained clayey sand, humid							1
	1.2	Pit discontinued at 1.2m - limit of investigation							
20	2								2
19	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 21 mAHD
EASTING: 290624
NORTHING: 6278010

PIT No: 50C
PROJECT No: 85644.06
DATE: 28/6/2018
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 mm)
21	0.01	TOPSOIL - brown fine to medium grained silty sand with some rootlets, damp			0.0				
		FILLING - brown fine to medium grained silty sand, humid		D					
	0.54	FILLING - brown fine to medium grained silty sand with a trace of steel, reinforced concrete, porcelain, bricks and glass, humid							
20	1 0.98	CLAYEY SAND - golden brown mottled light grey fine to medium grained clayey sand, humid			0.98				1
	1.3	Pit discontinued at 1.3m - limit of investigation							
19	2								2
18	3								3

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

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 20 mAHD
EASTING: 290643
NORTHING: 6278023

PIT No: 51
PROJECT No: 85644.06
DATE: 28/6/2018
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 mm)
20	0.01	TOPSOIL - dark brown fine grained silty sand with some rootlets, humid		E	0.0				
					0.1				
		FILLING - brown fine to medium grained silty sand with some ACM, porcelain, barbed wire, glass, terracotta, brick, metal sheets, metal rods, concrete block and bricks, humid							
				E	0.4				
					0.5				
					0.9				
19	1			D	1.0				1
					1.4				
				E					
	1.5	CLAYEY SAND - golden brown mottled light grey fine to medium grained clayey sand, slightly cemented, humid			1.5				
	1.8	Pit discontinued at 1.8m - limit of investigation							
18	2								2
17	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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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TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 20 mAHD
EASTING: 290643
NORTHING: 6278023

PIT No: 51A
PROJECT No: 85644.06
DATE: 28/6/2018
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 mm)
20	0.01	TOPSOIL - dark brown fine grained silty sand with some rootlets, humid		E	0.0				
					0.1				
		FILLING - brown fine to medium grained silty sand with some ACM, porcelain, barbed wire, glass, terracotta, brick, metal sheets, metal rods, concrete block and bricks, humid							
				E	0.4				
					0.5				
					0.9				
19	1			D*	1.0				1
					1.4				
				E					
	1.5	CLAYEY SAND - golden brown mottled light grey fine to medium grained clayey sand, slightly cemented, humid			1.5				
	1.8	Pit discontinued at 1.8m - limit of investigation							
18	2								2
17	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: * Replicate sample BD1/280618 collected

☐ 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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 20 mAHD
EASTING: 290643
NORTHING: 6278023

PIT No: 51B
PROJECT No: 85644.06
DATE: 28/6/2018
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 mm)
20	0.01	TOPSOIL - dark brown fine grained silty sand with some rootlets, humid		E	0.0				
					0.1				
		FILLING - brown fine to medium grained silty sand with some ACM, porcelain, barbed wire, glass, terracotta, brick, metal sheets, metal rods, concrete block and bricks, humid							
				E	0.4				
					0.5				
					0.9				
19	1			D	1.0				1
					1.4				
				E					
	1.5	CLAYEY SAND - golden brown mottled light grey fine to medium grained clayey sand, slightly cemented, humid			1.5				
	1.8	Pit discontinued at 1.8m - limit of investigation							
18	2								2
17	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 20 mAHD
EASTING: 290643
NORTHING: 6278023

PIT No: 51C
PROJECT No: 85644.06
DATE: 28/6/2018
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 mm)
20	0.01	TOPSOIL - dark brown fine grained silty sand with some rootlets, humid		E	0.0				
					0.1				
		FILLING - brown fine to medium grained silty sand with some ACM, porcelain, barbed wire, glass, terracotta, brick, metal sheets, metal rods, concrete block and bricks, humid							
				E	0.4				
					0.5				
					0.9				
19	1			D	1.0				1
					1.4				
				E					
	1.5	CLAYEY SAND - golden brown mottled light grey fine to medium grained clayey sand, slightly cemented, humid			1.5				
	1.8	Pit discontinued at 1.8m - limit of investigation							
18	2								2
17	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 20 mAHD
EASTING: 290643
NORTHING: 6278023

PIT No: 51D
PROJECT No: 85644.06
DATE: 28/6/2018
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 mm)
20	0.01	TOPSOIL - dark brown fine grained silty sand with some rootlets, humid		E	0.0				
					0.1				
		FILLING - brown fine to medium grained silty sand with some ACM, porcelain, barbed wire, glass, terracotta, brick, metal sheets, metal rods, concrete block and bricks, humid							
					0.4				
				E	0.5				
					0.9				
19	1			D	1.0				1
	1.5	CLAYEY SAND - golden brown mottled light grey fine to medium grained clayey sand, slightly cemented, humid							
	1.8	Pit discontinued at 1.8m - limit of investigation							
18	2								2
17	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 20 mAHD
EASTING: 290762
NORTHING: 6278060

PIT No: 52
PROJECT No: 85644.06
DATE: 28/6/2018
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 mm)
20	0.01	TOPSOIL - dark brown fine to medium grained silty sand with some rootlets, damp		E	0.0				
		FILLING - brown fine to medium grained silty sand with a trace of porcelain, bricks and glass, humid			0.1				
				E	0.4				
					0.5				
	0.6	SILTY SAND - light grey and brown fine to medium grained silty sand, humid							
19	1 1.0	Pit discontinued at 1.0m - limit of investigation							1
18	2								2
17	3								3

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

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 20 mAHD
EASTING: 290762
NORTHING: 6278060

PIT No: 52A
PROJECT No: 85644.06
DATE: 28/6/2018
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 mm)
20	0.01	TOPSOIL - dark brown fine to medium grained silty sand with some rootlets, damp		E*	0.0				
		FILLING - brown fine to medium grained silty sand with a trace of porcelain, bricks and glass, humid			0.1				
				E	0.4				
					0.5				
	0.6	SILTY SAND - light grey and brown fine to medium grained silty sand, humid							
19	1 1.0	Pit discontinued at 1.0m - limit of investigation							1
18	2								2
17	3								3

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

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: * Replicate sample BD2/280618 collected

☐ 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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 20 mAHD
EASTING: 290762
NORTHING: 6278060

PIT No: 52B
PROJECT No: 85644.06
DATE: 28/6/2018
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 mm)
20	0.01	TOPSOIL - dark brown fine to medium grained silty sand with some rootlets, damp		E	0.0				
		FILLING - brown fine to medium grained silty sand with a trace of porcelain, bricks and glass, humid			0.1				
				E	0.4				
					0.5				
	0.6	SILTY SAND - light grey and brown fine to medium grained silty sand, humid							
19	1 1.0	Pit discontinued at 1.0m - limit of investigation							1
18	2								2
17	3								3

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

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 20 mAHD
EASTING: 290762
NORTHING: 6278060

PIT No: 52C
PROJECT No: 85644.06
DATE: 28/6/2018
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 mm)
20	0.01	TOPSOIL - dark brown fine to medium grained silty sand with some rootlets, damp		E	0.0				
		FILLING - brown fine to medium grained silty sand with a trace of porcelain, bricks and glass, humid			0.1				
				E	0.4				
					0.5				
	0.6	SILTY SAND - light grey and brown fine to medium grained silty sand, humid							
19	1 1.0	Pit discontinued at 1.0m - limit of investigation							1
18	2								2
17	3								3

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

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 20 mAHD
EASTING: 290762
NORTHING: 6278060

PIT No: 52D
PROJECT No: 85644.06
DATE: 28/6/2018
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 mm)
20	0.01	TOPSOIL - dark brown fine to medium grained silty sand with some rootlets, damp		E	0.0				
		FILLING - brown fine to medium grained silty sand with a trace of porcelain, bricks and glass, humid			0.1				
				E	0.4				
					0.5				
	0.6	SILTY SAND - light grey and brown fine to medium grained silty sand, humid							
19	1 1.0	Pit discontinued at 1.0m - limit of investigation							1
18	2								2
17	3								3

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

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 19 mAHD
EASTING: 290768
NORTHING: 6278109

PIT No: 53
PROJECT No: 85644.06
DATE: 28/6/2018
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 mm)
19	0.01	TOPSOIL - dark brown fine to medium grained silty sand with some rootlets, damp		D	0.0				
	0.17	FILLING - dark brown to brown fine to medium grained silty sand with some rootlets, damp			0.1				
		SILTY SAND - light grey and brown fine to medium grained silty sand, humid							
	0.75	Pit discontinued at 0.75m - limit of investigation							
18	1								1
17	2								2
16	3								3

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

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 19 mAHD
EASTING: 290768
NORTHING: 6278109

PIT No: 53A
PROJECT No: 85644.06
DATE: 28/6/2018
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 mm) 5 10 15 20
19	0.01	TOPSOIL - dark brown fine to medium grained silty sand with some rootlets, damp		D*	0.0				
	0.17	FILLING - dark brown to brown fine to medium grained silty sand with some rootlets, damp			0.1				
		SILTY SAND - light grey and brown fine to medium grained silty sand, humid							
	0.75	Pit discontinued at 0.75m - limit of investigation							
18	1								1
17	2								2
16	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: * Replicate sample BD3/280618 collected

☐ 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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 19 mAHD
EASTING: 290768
NORTHING: 6278109

PIT No: 53B
PROJECT No: 85644.06
DATE: 28/6/2018
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 mm) 5 10 15 20
19	0.01	TOPSOIL - dark brown fine to medium grained silty sand with some rootlets, damp		D	0.0				
	0.17	FILLING - dark brown to brown fine to medium grained silty sand with some rootlets, damp			0.1				
		SILTY SAND - light grey and brown fine to medium grained silty sand, humid							
	0.75	Pit discontinued at 0.75m - limit of investigation							
18	1								1
17	2								2
16	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 19 mAHD
EASTING: 290768
NORTHING: 6278109

PIT No: 53C
PROJECT No: 85644.06
DATE: 28/6/2018
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 mm) 5 10 15 20
19	0.01	TOPSOIL - dark brown fine to medium grained silty sand with some rootlets, damp		D	0.0				
	0.17	FILLING - dark brown to brown fine to medium grained silty sand with some rootlets, damp			0.1				
		SILTY SAND - light grey and brown fine to medium grained silty sand, humid							
	0.75	Pit discontinued at 0.75m - limit of investigation							
18	1								1
17	2								2
16	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 19 mAHD
EASTING: 290768
NORTHING: 6278109

PIT No: 53D
PROJECT No: 85644.06
DATE: 28/6/2018
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 mm)
19	0.01	TOPSOIL - dark brown fine to medium grained silty sand with some rootlets, damp		D	0.0				
	0.17	FILLING - dark brown to brown fine to medium grained silty sand with some rootlets, damp			0.1				
		SILTY SAND - light grey and brown fine to medium grained silty sand, humid							
	0.75	Pit discontinued at 0.75m - limit of investigation							
18	1								1
17	2								2
16	3								3

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

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 21 mAHD
EASTING: 290717
NORTHING: 6278157

PIT No: 54
PROJECT No: 85644.06
DATE: 28/6/2018
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 mm)
21	0.02	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp		E	0.0				
		FILLING - brown to dark brown fine to medium grained silty sand with a trace of metal, glass, metal horse shoes, porcelain and bricks, humid			0.1				
				E	0.4				
					0.5				
	0.6	SILTY SAND - light brown fine to medium grained silty sand, humid							
	0.9	Pit discontinued at 0.9m - limit of investigation							
20	1								1
19	2								2
18	3								3

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

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 21 mAHD
EASTING: 290717
NORTHING: 6278157

PIT No: 54A
PROJECT No: 85644.06
DATE: 28/6/2018
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 mm) 5 10 15 20
21	0.02	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp		E	0.0				
		FILLING - brown to dark brown fine to medium grained silty sand with a trace of metal, glass, horse shoes, porcelain and bricks, humid			0.1				
				E	0.4				
	0.6	SILTY SAND - light brown fine to medium grained silty sand, humid			0.5				
	0.9	Pit discontinued at 0.9m - limit of investigation							
20	1								1
19	2								2
18	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 21 mAHD
EASTING: 290717
NORTHING: 6278157

PIT No: 54B
PROJECT No: 85644.06
DATE: 28/6/2018
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 mm)
21	0.02	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp		E	0.0				
		FILLING - brown to dark brown fine to medium grained silty sand with a trace of metal, glass, horse shoes, porcelain and bricks, humid			0.1				
				E	0.4				
	0.6	SILTY SAND - light brown fine to medium grained silty sand, humid			0.5				
	0.9	Pit discontinued at 0.9m - limit of investigation							
20	1								1
19	2								2
18	3								3

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

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 21 mAHD
EASTING: 290717
NORTHING: 6278157

PIT No: 54C
PROJECT No: 85644.06
DATE: 28/6/2018
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 mm) 5 10 15 20
21	0.02	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp		E	0.0				
		FILLING - brown to dark brown fine to medium grained silty sand with a trace of metal, glass, horse shoes, porcelain and bricks, humid			0.1				
				E	0.4				
	0.6	SILTY SAND - light brown fine to medium grained silty sand, humid			0.5				
	0.9	Pit discontinued at 0.9m - limit of investigation							
20	1								1
19	2								2
18	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 21 mAHD
EASTING: 290717
NORTHING: 6278157

PIT No: 54D
PROJECT No: 85644.06
DATE: 28/6/2018
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 mm) 5 10 15 20
21	0.02	TOPSOIL - dark brown fine grained silty sand with some rootlets, damp		E	0.0				
					0.1				
		FILLING - brown to dark brown fine to medium grained silty sand with a trace of metal, glass, horse shoes, porcelain and bricks, humid							
					0.4				
				E	0.5				
	0.6	SILTY SAND - light brown fine to medium grained silty sand, humid							
	0.9	Pit discontinued at 0.9m - limit of investigation							
20	1								1
19	2								2
18	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

TEST PIT LOG

CLIENT: Conrad Gargett Pty Ltd
PROJECT: Hurlstone Agriculture High School
LOCATION: Londonderry Road, Richmond, NSW

SURFACE LEVEL: 29 mAHD
EASTING: 290863
NORTHING: 6278156

PIT No: 55
PROJECT No: 85644.06
DATE: 28/6/2018
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 mm) 5 10 15 20
29		FILLING - brown and golden brown fine to medium grained silty sand with a trace of bricks, damp to moist		D	0.0				
		- base of stockpile at 0.8m							
	0.8	SILTY SAND - brown fine to medium grained silty sand, damp to moist			0.8				
28	1								1
	1.13	Pit discontinued at 1.13m - limit of investigation							
27	2								2
26	3								3

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: LOC

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit located in stockpile

☐ 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
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Appendix D

Laboratory Analytical Reports

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 195188

Client Details

Client	Douglas Partners Pty Ltd Smeaton Grange
Attention	Lachlan Clement, Emily McGinty
Address	18 Waler Crescent, Smeaton Grange, NSW, 2567

Sample Details

Your Reference	**85644.06, Hurlstone Agriculture High School Asb.**
Number of Samples	75 Soil, 1 Material
Date samples received	29/06/2018
Date completed instructions received	29/06/2018

Analysis Details

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

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

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

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

Report Details

Date results requested by	06/07/2018
Date of Issue	06/07/2018

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Asbestos Approved By
Analysed by Asbestos Approved Identifier: Jessica Hie
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Dragana Tomas, Senior Chemist
Giovanni Agosti, Group Technical Manager
Lucy Zhu, Asbsestos Analyst
Matthew Tang, Asbsestos Analyst

Authorised By

Jacinta Hurst, Laboratory Manager

Asbestos ID - soils NEPM - ASB-001						
Our Reference		195188-1	195188-2	195188-3	195188-4	195188-5
Your Reference	UNITS	TP1	TP2	TP2	TP3	TP4
Depth		0-0.3	0-1.0	1.1.3	0-0.4	0-0.3
Date Sampled		26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	4-5/7/18	4-5/7/18	4-5/7/18	4-5/7/18	4-5/7/18
Sample mass tested	g	859.67	763.35	784.56	800.39	641.94
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	Chrysotile asbestos detected Amosite asbestos detected Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos#1	g/kg	<0.1	<0.1	0.1186	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	Chrysotile Amosite	See Above	No visible asbestos detected	Chrysotile Amosite
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	0.0679	0.0931	–	0.0218
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	0.0089	0.0119	<0.001	0.0034

Asbestos ID - soils NEPM - ASB-001						
Our Reference		195188-6	195188-7	195188-8	195188-9	195188-10
Your Reference	UNITS	TP5	TP6	TP7	TP8	TP9
Depth		0-0.4	0-0.25	0-0.3	0-0.28	0-0.2
Date Sampled		26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	4-5/7/18	4-5/7/18	4-5/7/18	4-5/7/18	4-5/7/18
Sample mass tested	g	838.58	874.63	873.77	870.97	877.21
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos#1	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	–	–	–	–
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM - ASB-001						
Our Reference		195188-11	195188-12	195188-13	195188-14	195188-15
Your Reference	UNITS	TP10	TP11	TP12	TP12	TP13
Depth		0-0.2	0-0.2	0-1.0	1-1.2	0-0.2
Date Sampled		26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	4-5/7/18	4-5/7/18	4-5/7/18	4-5/7/18	4-5/7/18
Sample mass tested	g	786.88	912.1	783.18	816.09	809.39
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	Chrysotile asbestos detected Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos#1	g/kg	<0.1	<0.1	<0.1	0.9477	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	Amosite	See Above	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	0.7734	–
FA and AF Estimation*	g	–	–	0.0028	–	–
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01	0.0948	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM - ASB-001						
Our Reference		195188-16	195188-17	195188-18	195188-19	195188-20
Your Reference	UNITS	TP14	TP15	TP16	TP17	TP18
Depth		0-0.27	0-0.2	0-0.2	0-0.3	0-0.17
Date Sampled		26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	4-5/7/18	4-5/7/18	4-5/7/18	4-5/7/18	4-5/7/18
Sample mass tested	g	888.45	713.08	694.98	744	818.38
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos#1	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	–	–	–	–
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM - ASB-001						
Our Reference		195188-21	195188-22	195188-23	195188-24	195188-25
Your Reference	UNITS	TP19	TP20	TP21	TP21(A)	TP22
Depth		0-0.25	0-0.3	0-0.6	0-0.25	0-0.4
Date Sampled		26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	4-5/7/18	4-5/7/18	4-5/7/18	4-5/7/18	4-5/7/18
Sample mass tested	g	721.92	814.17	836.17	891.62	783.49
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos#1	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	–	–	–	–
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM - ASB-001						
Our Reference		195188-26	195188-27	195188-28	195188-29	195188-30
Your Reference	UNITS	TP23	TP24	TP25	TP26	TP27
Depth		0-0.33	0-0.55	0-0.21	0-0.17	0-0.69
Date Sampled		26/06/2018	26/06/2018	27/06/2018	27/06/2018	27/06/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	4-5/7/18	4-5/7/18	4-5/7/18	4-5/7/18	4-5/7/18
Sample mass tested	g	762.83	718.31	791.57	791.1	751.14
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos#1	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	–	–	–	–
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM - ASB-001						
Our Reference		195188-31	195188-32	195188-33	195188-34	195188-35
Your Reference	UNITS	TP28	TP28	TP29	TP30	TP31
Depth		0-0.31	0.31-0.53	0-0.32	0-0.3	0-0.42
Date Sampled		27/06/2018	27/06/2018	27/06/2018	27/06/2018	27/06/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	4-5/7/18	4-5/7/18	4-5/7/18	4-5/7/18	4-5/7/18
Sample mass tested	g	640.4	939.99	752.67	788.88	841.93
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos#1	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	–	–	–	–
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM - ASB-001						
Our Reference		195188-36	195188-37	195188-38	195188-39	195188-40
Your Reference	UNITS	TP32	TP33	TP34	TP35	TP35(A)
Depth		0-0.4	0-0.27	0-1.0	0-0.18	0-0.1
Date Sampled		27/06/2018	27/06/2018	27/06/2018	27/06/2018	27/06/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	4-5/7/18	4-5/7/18	4-5/7/18	4-5/7/18	4-5/7/18
Sample mass tested	g	729.23	756.85	870.51	851.51	854.81
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos#1	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	–	–	–	–
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM - ASB-001						
Our Reference		195188-41	195188-42	195188-43	195188-44	195188-45
Your Reference	UNITS	TP35(B)	TP35(C)	TP36	TP37	TP38
Depth		0-0.17	0-0.7	0-0.21	0-0.39	0-1.0
Date Sampled		27/06/2018	27/06/2018	27/06/2018	27/06/2018	27/06/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	4-5/7/18	4-5/7/18	4-5/7/18	4-5/7/18	4-5/7/18
Sample mass tested	g	660.25	818.56	792.5	848.85	857.45
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos#1	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	–	–	–	–
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM - ASB-001						
Our Reference		195188-46	195188-47	195188-48	195188-49	195188-50
Your Reference	UNITS	TP38	TP38	TP39	TP40	TP40(A)
Depth		1.0-2.0	2-2.2	0-0.12	0-0.38	0-0.21
Date Sampled		27/06/2018	27/06/2018	27/06/2018	27/06/2018	27/06/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	4-5/7/18	4-5/7/18	4-5/7/18	4-5/7/18	4-5/7/18
Sample mass tested	g	828.77	270.37	821.91	918.95	876.45
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos#1	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	–	–	–	–
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM - ASB-001						
Our Reference		195188-51	195188-52	195188-53	195188-54	195188-55
Your Reference	UNITS	TP40(B)	TP41	TP42	TP42(A)	TP42(B)
Depth		0-0.4	0-0.28	0-0.42	0-1.0	0-0.69
Date Sampled		27/06/2018	27/06/2018	27/06/2018	27/06/2018	27/06/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	4-5/7/18	4-5/7/18	4-5/7/18	4-5/7/18	4-5/7/18
Sample mass tested	g	827.21	772.63	817.48	808.73	916.3
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	Chrysotile asbestos detected Crocidolite asbestos detected Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos[#1]	g/kg	1.0196	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	See Above	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	0.8434	–	–	–	–
FA and AF Estimation*	g	–	–	–	–	–
ACM >7mm Estimation*	%(w/w)	0.1020	<0.01	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM - ASB-001						
Our Reference		195188-56	195188-57	195188-58	195188-59	195188-60
Your Reference	UNITS	TP42(C)	TP43	TP44	TP45	TP46
Depth		0-0.3	0-0.3	0-0.2	0-0.29	0-0.2
Date Sampled		27/06/2018	27/06/2018	28/06/2018	28/06/2018	28/06/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	4-5/7/18	4-5/7/18	4-5/7/18	4-5/7/18	4-5/7/18
Sample mass tested	g	901.36	944.82	712.54	761.29	805.54
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos#1	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	–	–	–	–
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM - ASB-001						
Our Reference		195188-61	195188-62	195188-63	195188-64	195188-65
Your Reference	UNITS	TP47	TP48	TP48(A)	TP49	TP50
Depth		0-0.57	0-0.56	0-0.72	0-0.52	0-0.98
Date Sampled		28/06/2018	28/06/2018	28/06/2018	28/06/2018	28/06/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	4-5/7/18	4-5/7/18	4-5/7/18	4-5/7/18	4-5/7/18
Sample mass tested	g	702.48	800.26	803.49	921.42	948.46
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos#1	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	–	–	–	–
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM - ASB-001					
Our Reference		195188-66	195188-67	195188-68	195188-74
Your Reference	UNITS	TP50(A)	TP50(B)	TP50(C)	TP55
Depth		0-0.9	0-0.72	0-0.98	0-0.8
Date Sampled		28/06/2018	28/06/2018	28/06/2018	28/06/2018
Type of sample		Soil	Soil	Soil	Soil
Date analysed	-	4-5/7/18	4-5/7/18	4-5/7/18	4-5/7/18
Sample mass tested	g	763.91	778.65	833.17	883.47
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	Chrysotile asbestos detected Amosite asbestos detected Organic fibres detected	Chrysotile asbestos detected 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
Total Asbestos[#1]	g/kg	0.7872	5.5532	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	See Above	See Above	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	0.6013	4.3240	–	–
FA and AF Estimation*	g	–	–	–	–
ACM >7mm Estimation*	%(w/w)	0.0787	0.5553	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001

Asbestos ID - materials		
Our Reference		195188-76
Your Reference	UNITS	TP38 Material
Depth		-
Date Sampled		27/06/2018
Type of sample		Material
Date analysed	-	03/07/2018
Mass / Dimension of Sample	-	70x45x5mm
Sample Description	-	Brown vitreous fibrous material
Asbestos ID in materials	-	No asbestos detected Synthetic mineral fibres detected Organic fibres detected

Metals in TCLP USEPA1311						
Our Reference		195188-69	195188-70	195188-71	195188-72	195188-73
Your Reference	UNITS	TP51A	TP51A	TP52A	TP53A	TP54A
Depth		0.9-1.0	1.4-1.5	0.4-0.5	0-0.1	0.4-0.5
Date Sampled		28/06/2018	28/06/2018	28/06/2018	28/06/2018	28/06/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	03/07/2018	03/07/2018	03/07/2018	03/07/2018	03/07/2018
Date analysed	-	03/07/2018	03/07/2018	03/07/2018	03/07/2018	03/07/2018
pH of soil for fluid# determ.	pH units	8.1	8.6	7.0	6.6	7.0
pH of soil TCLP (after HCl)	pH units	1.7	1.7	1.6	1.6	1.6
Extraction fluid used	-	1	1	1	1	1
pH of final Leachate	pH units	5.3	5.1	4.9	4.9	5.2
Lead in TCLP	mg/L	1.6	0.65	1.2	0.08	0.40
Zinc in TCLP	mg/L	21	17	1	1.8	3.7

Metals in TCLP USEPA1311		
Our Reference		195188-75
Your Reference	UNITS	BD3 280618
Depth		-
Date Sampled		28/06/2018
Type of sample		Soil
Date extracted	-	03/07/2018
Date analysed	-	03/07/2018
pH of soil for fluid# determ.	pH units	6.6
pH of soil TCLP (after HCl)	pH units	1.6
Extraction fluid used	-	1
pH of final Leachate	pH units	4.9
Lead in TCLP	mg/L	0.09
Zinc in TCLP	mg/L	1.8

PAHs in TCLP (USEPA 1311)						
Our Reference		195188-69	195188-70	195188-71	195188-72	195188-73
Your Reference	UNITS	TP51A	TP51A	TP52A	TP53A	TP54A
Depth		0.9-1.0	1.4-1.5	0.4-0.5	0-0.1	0.4-0.5
Date Sampled		28/06/2018	28/06/2018	28/06/2018	28/06/2018	28/06/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/07/2018	04/07/2018	04/07/2018	04/07/2018	04/07/2018
Date analysed	-	05/07/2018	05/07/2018	05/07/2018	05/07/2018	05/07/2018
Naphthalene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Acenaphthylene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Acenaphthene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Fluorene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Phenanthrene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Anthracene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Fluoranthene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Pyrene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo(a)anthracene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Chrysene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Total +ve PAH's	mg/L	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	101	92	112	115	88

PAHs in TCLP (USEPA 1311)		
Our Reference		195188-75
Your Reference	UNITS	BD3 280618
Depth		-
Date Sampled		28/06/2018
Type of sample		Soil
Date extracted	-	04/07/2018
Date analysed	-	05/07/2018
Naphthalene in TCLP	mg/L	<0.001
Acenaphthylene in TCLP	mg/L	<0.001
Acenaphthene in TCLP	mg/L	<0.001
Fluorene in TCLP	mg/L	<0.001
Phenanthrene in TCLP	mg/L	<0.001
Anthracene in TCLP	mg/L	<0.001
Fluoranthene in TCLP	mg/L	<0.001
Pyrene in TCLP	mg/L	<0.001
Benzo(a)anthracene in TCLP	mg/L	<0.001
Chrysene in TCLP	mg/L	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001
Total +ve PAH's	mg/L	NIL (+)VE
Surrogate p-Terphenyl-d14	%	108

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. **NOTE** #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) **NOTE** #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
EXTRACT.7	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using in house method INORG-004.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-012	Leachates are extracted with Dichloromethane and analysed by GC-MS.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.

QUALITY CONTROL: Metals in TCLP USEPA1311						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			03/07/2018	69	03/07/2018	03/07/2018		03/07/2018	[NT]
Date analysed	-			03/07/2018	69	03/07/2018	03/07/2018		03/07/2018	[NT]
Lead in TCLP	mg/L	0.03	Metals-020 ICP-AES	<0.03	69	1.6	1.3	21	109	[NT]
Zinc in TCLP	mg/L	0.02	Metals-020 ICP-AES	<0.02	69	21	21	0	103	[NT]

QUALITY CONTROL: PAHs in TCLP (USEPA 1311)						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			04/07/2018	69	04/07/2018	04/07/2018		04/07/2018	[NT]
Date analysed	-			05/07/2018	69	05/07/2018	05/07/2018		05/07/2018	[NT]
Naphthalene in TCLP	mg/L	0.001	Org-012	<0.001	69	<0.001	<0.001	0	75	[NT]
Acenaphthylene in TCLP	mg/L	0.001	Org-012	<0.001	69	<0.001	<0.001	0	[NT]	[NT]
Acenaphthene in TCLP	mg/L	0.001	Org-012	<0.001	69	<0.001	<0.001	0	[NT]	[NT]
Fluorene in TCLP	mg/L	0.001	Org-012	<0.001	69	<0.001	<0.001	0	73	[NT]
Phenanthrene in TCLP	mg/L	0.001	Org-012	<0.001	69	<0.001	<0.001	0	72	[NT]
Anthracene in TCLP	mg/L	0.001	Org-012	<0.001	69	<0.001	<0.001	0	[NT]	[NT]
Fluoranthene in TCLP	mg/L	0.001	Org-012	<0.001	69	<0.001	<0.001	0	75	[NT]
Pyrene in TCLP	mg/L	0.001	Org-012	<0.001	69	<0.001	<0.001	0	78	[NT]
Benzo(a)anthracene in TCLP	mg/L	0.001	Org-012	<0.001	69	<0.001	<0.001	0	[NT]	[NT]
Chrysene in TCLP	mg/L	0.001	Org-012	<0.001	69	<0.001	<0.001	0	81	[NT]
Benzo(bjk)fluoranthene in TCLP	mg/L	0.002	Org-012	<0.002	69	<0.002	<0.002	0	[NT]	[NT]
Benzo(a)pyrene in TCLP	mg/L	0.001	Org-012	<0.001	69	<0.001	<0.001	0	76	[NT]
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	0.001	Org-012	<0.001	69	<0.001	<0.001	0	[NT]	[NT]
Dibenzo(a,h)anthracene in TCLP	mg/L	0.001	Org-012	<0.001	69	<0.001	<0.001	0	[NT]	[NT]
Benzo(g,h,i)perylene in TCLP	mg/L	0.001	Org-012	<0.001	69	<0.001	<0.001	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	121	69	101	109	8	78	[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-ID in soil: NEPM
This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013.
This is reported outside our scope of NATA accreditation.

Note: All samples analysed as received. However, sample 195188-47 was below the minimum 500mL sample volume as per National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013.

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY

Project Name:	Hurlstone Agriculture High School Asb. Delineation			**To:**	Envirolab Services
Project No:	85644.06	**Sampler:**	Lachlan Clement		12 Ashley Street, Chatswood NSW 2067
Project Mgr:	EMG	**Mob. Phone:**	0427 102 041	**Attn:**	Tania Notaras
Email:	lachlan.clement@douglaspartners.com.au; Emily.McGinty@douglaspartners.c			**Phone:**	(02) 9910 6200 **Fax:** (02) 9910 6201
Date Required:	Standard			**Email:**	tnotaras@envirolabservices.com.au

Sample ID	Lab ID	Date Sampled	Sample Type (S - Soil W - Water)	Container Type (G - Glass P - Plastic)	Analytes: Asbestos (500ml NEPM)	Pb and Zn Leachate	PAH Leachate	Asbestos ID						Notes/preservation
TP1/0-0.3	1	26/06/18	S	P	X									
TP2/0-1.0	2		S	P	X									
TP2/1-1.3	3		S	P	X									
TP3/0-0.4	4		S	P	X									
TP4/0-0.3	5		S	P	X									
TP5/0-0.4	6		S	P	X									
TP6/0-0.25	7		S	P	X									
TP7/0-0.3	8		S	P	X									
TP8/0-0.28	9		S	P	X									
TP9/0-0.2	10		S	P	X									
TP10/0-0.2	11		S	P	X									
TP11/0-0.2	12		S	P	X									
TP12/0-1.0	13	↓	S	P	X									

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

Job No: 195188
Date Received: 29/6
Time Received: 1620
Received By: AB
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Lab Report No:	**Note: Numerous samples contain asbestos, broken glass, metal and broken ceramics**		
Send Results to:	Douglas Partners Pty Ltd	**Address:** 18 Waler Crescent, Smeaton Grange 2567	**Phone:** (02) 4647 0075 **Fax:** (02) 4646 1886
Relinquished by:	LOC	**Transported to laboratory by:**	
Signed:	**Date & Time:**	**Received by:**	

195188

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY

Project Name:	Hurlstone Agriculture High School Asb. Delineation			**To:**	Envirolab Services
Project No:	85644.06	**Sampler:**	Lachlan Clement		12 Ashley Street, Chatswood NSW 2067
Project Mgr:	EMG	**Mob. Phone:**	0427 102 041	**Attn:**	Tania Notaras
Email:	lachlan.clement@douglaspartners.com.au; Emily.McGinty@douglaspartners.c			**Phone:**	(02) 9910 6200 **Fax:** (02) 9910 6201
Date Required:	Standard			**Email:**	tnotaras@envirolabservices.com.au

Sample ID	Lab ID	Date Sampled	Sample Type (S - Soil W - Water)	Container Type (G - Glass P - Plastic)	Analytes: Asbestos (500ml NEPM)	Pb and Zn Leachate	PAH Leachate	Asbestos ID						Notes/preservation
TP12/1-1.2	14	26/06/18	S	P	X									
TP13/0-0.2	15		S	P	X									
TP14/0-0.27	16		S	P	X									
TP15/0-0.2	17		S	P	X									
TP16/0-0.2	18		S	P	X									
TP17/0-0.3	19		S	P	X									
TP18/0-0.17	20		S	P	X									
TP19/0-0.25	21		S	P	X									
TP20/0-0.3	22		S	P	X									
TP21/0-0.6	23		S	P	X									
TP21(A)/0-0.25	24		S	P	X									
TP22/0-0.4	25		S	P	X									

Lab Report No:					
Send Results to:	Douglas Partners Pty Ltd	**Address:** 18 Waler Crescent, Smeaton Grange 2567		**Phone:** (02) 4647 0075	**Fax:** (02) 4646 1886
Relinquished by:	LOC		**Transported to laboratory by:**		
Signed:		**Date & Time:** 29/06/2018	**Received by:**		

195188

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY

Project Name:	Hurlstone Agriculture High School Asb. Delineation			**To:**	Envirolab Services
Project No:	85644.06	**Sampler:**	Lachlan Clement		12 Ashley Street, Chatswood NSW 2067
Project Mgr:	EMG	**Mob. Phone:**	0427 102 041	**Attn:**	Tania Notaras
Email:	lachlan.clement@douglaspartners.com.au; Emily.McGinty@douglaspartners.c			**Phone:**	(02) 9910 6200 **Fax:** (02) 9910 6201
Date Required:	Standard			**Email:**	tnotaras@envirolabservices.com.au

Sample ID	Lab ID	Date Sampled	Sample Type (S - Soil, W - Water)	Container Type (G - Glass, P - Plastic)	Analytes: Asbestos (500ml NEPM)	Pb and Zn Leachate	PAH Leachate	Asbestos ID						Notes/preservation
TP23/0-0.33	26	26/06/18	S	P	X									
TP24/0-0.55	27	26/06/18	S	P	X									
TP25/0-0.21	28	27/06/18	S	P	X									
TP26/0-0.17	29		S	P	X									
TP27/0-0.69	30		S	P	X									
TP28/0-0.31	31		S	P	X									
TP28/0.31-0.53	32		S	P	X									
TP29/0-0.32	33		S	P	X									
TP30/0-0.3	34		S	P	X									
TP31/0-0.42	35		S	P	X									
TP32/0-0.4	36		S	P	X									
TP33/0-0.27	37	↓	S	P	X									

Lab Report No:					
Send Results to:	Douglas Partners Pty Ltd	**Address:** 18 Waler Crescent, Smeaton Grange 2567		**Phone:** (02) 4647 0075	**Fax:** (02) 4646 1886
Relinquished by:	LOC		**Transported to laboratory by:**		
Signed:		**Date & Time:** 29/06/2018	**Received by:**		

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CHAIN OF CUSTODY

Project Name:	Hurlstone Agriculture High School Asb. Delineation			**To:**	Envirolab Services
Project No:	85644.06	**Sampler:**	Lachlan Clement		12 Ashley Street, Chatswood NSW 2067
Project Mgr:	EMG	**Mob. Phone:**	0427 102 041	**Attn:**	Tania Notaras
Email:	lachlan.clement@douglaspartners.com.au; Emily.McGinty@douglaspartners.c			**Phone:**	(02) 9910 6200 **Fax:** (02) 9910 6201
Date Required:	Standard			**Email:**	tnotaras@envirolabservices.com.au

Sample ID	Lab ID	Date Sampled	Sample Type (S - Soil W - Water)	Container Type (G - Glass P - Plastic)	Analytes: Asbestos (500ml NEPM)	Pb and Zn Leachate	PAH Leachate	Asbestos ID						Notes/preservation
TP34/0-1.0	38	27/06/18	S	P	X									
TP35/0-0.18	39		S	P	X									
TP35(A)/0-0.1	40		S	P	X									
TP35(B)/0-0.17	41		S	P	X									
TP35(c)/0-0.7	42		S	P	X									
TP36/0-0.21	43		S	P	X									
TP37/0-0.39	44		S	P	X									
TP38/0-1.0	45		S	P	X									
TP38/1.0-2.0	46		S	P	X									
TP38/2-2.2	847		S	P	X									
TP39/0-0.12	48		S	P	X									
TP40/0-0.38	49	↓	S	P	X									

Lab Report No:					
Send Results to:	Douglas Partners Pty Ltd	**Address** 18 Waler Crescent, Smeaton Grange 2567		**Phone:** (02) 4647 0075	**Fax:** (02) 4646 1886
Relinquished by:	LOC		**Transported to laboratory by:**		
Signed:		**Date & Time:** 29/06/2018	**Received by:** AZ		

195188

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Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY

Project Name:	Hurlstone Agriculture High School Asb. Delineation			**To:**	Envirolab Services
Project No:	85644.06	**Sampler:**	Lachlan Clement		12 Ashley Street, Chatswood NSW 2067
Project Mgr:	EMG	**Mob. Phone:**	0427 102 041	**Attn:**	Tania Notaras
Email:	lachlan.clement@douglaspartners.com.au; Emily.McGinty@douglaspartners.c			**Phone:**	(02) 9910 6200 **Fax:** (02) 9910 6201
Date Required:	Standard			**Email:**	tnotaras@envirolabservices.com.au

Sample ID	Lab ID	Date Sampled	Sample Type: S - Soil W - Water	Container Type: G - Glass P - Plastic	Analytes: Asbestos (500ml NEPM)	Pb and Zn Leachate	PAH Leachate	Asbestos ID						Notes/preservation
TP40(A)/0-0.21	50	27/06/18	S	P	X									
TP40(B)/0-0.4	51		S	P	X									
TP41/0-0.28	52		S	P	X									
TP42/0-0.42	53		S	P	X									
TP42(A)/0-1.0	54		S	P	X									
TP42(B)/0-0.69	55		S	P	X									
TP42(C)/0-0.3	56		S	P	X									
TP43/0-0.3	57		S	P	X									
TP44/0-0.2	58	28/06/18	S	P	X									
TP45/0-0.27	59		S	P	X									
TP46/0-0.2	60		S	P	X									
TP47/0-0.57	61		S	P	X									

Lab Report No:			
Send Results to:	Douglas Partners Pty Ltd	**Address:** 18 Waler Crescent, Smeaton Grange 2567	**Phone:** (02) 4647 0075 **Fax:** (02) 4646 1886
Relinquished by:	LOC	**Transported to laboratory by:**	
Signed:	**Date & Time:** 29/06/2018	**Received by:** AZ	

195188

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY

Project Name:	Hurlstone Agriculture High School Asb. Delineation			**To:**	Envirolab Services
Project No:	85644.06	**Sampler:**	Lachlan Clement		12 Ashley Street, Chatswood NSW 2067
Project Mgr:	EMG	**Mob. Phone:**	0427 102 041	**Attn:**	Tania Notaras
Email:	lachlan.clement@douglaspartners.com.au; Emily.McGinty@douglaspartners.c			**Phone:**	(02) 9910 6200 **Fax:** (02) 9910 6201
Date Required:	Standard			**Email:**	tnotaras@envirolabservices.com.au

Sample ID	Lab ID	Date Sampled	Sample Type (S - Soil W - Water)	Container Type (G - Glass P - Plastic)	Analytes: Asbestos (500ml NEPM)	Pb and Zn Leachate	PAH Leachate	Asbestos ID						Notes/preservation
TP48/0-0.56	62	28/06/18	S	P	X									
TP48(A)/0-0.72	63		S	P	X									
TP49/0-0.52	64		S	P	X									
TP50/0-0.98	65		S	P	X									
TP50(A)/0-0.9	66		S	P	X									
TP50(B)/0-0.72	67		S	P	X									
TP50(C)/0-0.98	68		S	P	X									
TP51A/0.9-1.0	69		S	G		x	x							
TP51A/1.4-1.5	70		S	G		x	x							
TP52A/0.4-0.5	71		S	G		x	x							
TP53A/0-0.1	72		S	G		x	x							
TP54A/0.4-0.5	73	↓	S	G		x	x							

Lab Report No:					
Send Results to:	Douglas Partners Pty Ltd	**Address:** 18 Waler Crescent, Smeaton Grange 2567		**Phone:** (02) 4647 0075	**Fax:** (02) 4646 1886
Relinquished by:	LOC		**Transported to laboratory by:**		
Signed:		**Date & Time:** 29/06/2018	**Received by:**	DR	

195168

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY

Project Name:	Hurlstone Agriculture High School Asb. Delineation			**To:**	Envirolab Services
Project No:	85644.06	**Sampler:**	Lachlan Clement		12 Ashley Street, Chatswood NSW 2067
Project Mgr:	EMG	**Mob. Phone:**	0427 102 041	**Attn:**	Tania Notaras
Email:	lachlan.clement@douglaspartners.com.au; Emily.McGinty@douglaspartners.c			**Phone:**	(02) 9910 6200 **Fax:** (02) 9910 6201
Date Required:	Standard			**Email:**	tnotaras@envirolabservices.com.au

Sample ID	Lab ID	Date Sampled	Sample Type (S - Soil W - Water)	Container Type (G - Glass P - Plastic)	Analytes: Asbestos (500ml NEPM)	Pb and Zn Leachate	PAH Leachate	Asbestos ID						Notes/preservation
TP55/0-0.8	~~74~~	28/06/18	S	P	X									
BD3 280618	~~75~~	28/06/18	S	G		X	X							
TP38 Material	~~76~~	27/06/18	S	P				X						

Lab Report No:					
Send Results to:	Douglas Partners Pty Ltd	**Address** 18 Waler Crescent, Smeaton Grange 2567		**Phone:** (02) 4647 0075	**Fax:** (02) 4646 1886
Relinquished by:	LOC		**Transported to laboratory by:**		
Signed:		**Date & Time:** 29/06/2018	**Received by:** AZ		

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 Smeaton Grange
Attention	Lachlan Clement, Emily McGinty

Sample Login Details

Your reference	85644.06, Hurlstone Agriculture High School Asb.
Envirolab Reference	195188
Date Sample Received	29/06/2018
Date Instructions Received	29/06/2018
Date Results Expected to be Reported	06/07/2018

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	75 Soil, 1 Material
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	16.8
Cooling Method	None
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	Asbestos ID - soils NEPM - ASB-001	Asbestos ID - materials	Metals in TCLP USEPA1311	PAHs in TCLP(USEPA 1311)
TP1-0-0.3	✓			
TP2-0-1.0	✓			
TP2-1.1.3	✓			
TP3-0-0.4	✓			
TP4-0-0.3	✓			
TP5-0-0.4	✓			
TP6-0-0.25	✓			
TP7-0-0.3	✓			
TP8-0-0.28	✓			
TP9-0-0.2	✓			
TP10-0-0.2	✓			
TP11-0-0.2	✓			
TP12-0-1.0	✓			
TP12-1-1.2	✓			
TP13-0-0.2	✓			
TP14-0-0.27	✓			
TP15-0-0.2	✓			
TP16-0-0.2	✓			
TP17-0-0.3	✓			
TP18-0-0.17	✓			
TP19-0-0.25	✓			
TP20-0-0.3	✓			
TP21-0-0.6	✓			
TP21(A)-0-0.25	✓			
TP22-0-0.4	✓			
TP23-0-0.33	✓			
TP24-0-0.55	✓			
TP25-0-0.21	✓			
TP26-0-0.17	✓			
TP27-0-0.69	✓			
TP28-0-0.31	✓			
TP28-0.31-0.53	✓			

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

Sample ID	Asbestos ID - soils NEPM - ASB-001	Asbestos ID - materials	Metals in TCLP USEPA1311	PAHs in TCLP(USEPA 1311)
TP29-0-0.32	✓			
TP30-0-0.3	✓			
TP31-0-0.42	✓			
TP32-0-0.4	✓			
TP33-0-0.27	✓			
TP34-0-1.0	✓			
TP35-0-0.18	✓			
TP35(A)-0-0.1	✓			
TP35(B)-0-0.17	✓			
TP35(C)-0-0.7	✓			
TP36-0-0.21	✓			
TP37-0-0.39	✓			
TP38-0-1.0	✓			
TP38-1.0-2.0	✓			
TP38-2-2.2	✓			
TP39-0-0.12	✓			
TP40-0-0.38	✓			
TP40(A)-0-0.21	✓			
TP40(B)-0-0.4	✓			
TP41-0-0.28	✓			
TP42-0-0.42	✓			
TP42(A)-0-1.0	✓			
TP42(B)-0-0.69	✓			
TP42(C)-0-0.3	✓			
TP43-0-0.3	✓			
TP44-0-0.2	✓			
TP45-0-0.29	✓			
TP46-0-0.2	✓			
TP47-0-0.57	✓			
TP48-0-0.56	✓			
TP48(A)-0-0.72	✓			
TP49-0-0.52	✓			

Envirolab Services Pty Ltd
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ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	Asbestos ID - soils NEPM - ASB-001	Asbestos ID - materials	Metals in TCLP USEPA1311	PAHs in TCLP(USEPA 1311)
TP50-0-0.98	✓			
TP50(A)-0-0.9	✓			
TP50(B)-0-0.72	✓			
TP50(C)-0-0.98	✓			
TP51A-0.9-1.0			✓	✓
TP51A-1.4-1.5			✓	✓
TP52A-0.4-0.5			✓	✓
TP53A-0-0.1			✓	✓
TP54A-0.4-0.5			✓	✓
TP55-0-0.8	✓			
BD3 280618			✓	✓
TP38 Material		✓		

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 195281

Client Details

Client	Douglas Partners Pty Ltd Smeaton Grange
Attention	Lachlan Clement, Emily McGinty
Address	18 Waler Crescent, Smeaton Grange, NSW, 2567

Sample Details

Your Reference	**85644.06, Hurlstone Agriculture High School Asb**
Number of Samples	4 Material
Date samples received	02/07/2018
Date completed instructions received	02/07/2018

Analysis Details

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

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

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

Report Details

Date results requested by	09/07/2018
Date of Issue	06/07/2018

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Asbestos Approved By
Analysed by Asbestos Approved Identifier: Matt Tang
Authorised by Asbestos Approved Signatory: Matt Tang
Results Approved By
Matthew Tang, Asbsestos Analyst

Authorised By

Jacinta Hurst, Laboratory Manager

Asbestos ID - materials					
Our Reference		195281-1	195281-2	195281-3	195281-4
Your Reference	UNITS	TP14/0-0.27 Mat	TP27/0-0.69 Mat	TP28/0-0.31 Mat	TP38/1-2.0m Mat
Date Sampled		26/06/2018	27/06/2018	27/06/2018	27/06/2018
Type of sample		Material	Material	Material	Material
Date analysed	-	06/07/2018	06/07/2018	06/07/2018	06/07/2018
Mass / Dimension of Sample	-	100x85x5mm	110x100x5mm	56x42x5mm	147x82x6mm
Sample Description	-	Grey compressed fibre cement material	Grey compressed fibre cement material	Beige compressed fibre cement material	Beige compressed fibre cement material
Asbestos ID in materials	-	Chrysotile asbestos detected Amosite asbestos detected Crocidolite asbestos detected	Chrysotile asbestos detected Amosite asbestos detected	Chrysotile asbestos detected	Chrysotile asbestos detected Amosite asbestos detected Crocidolite 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.

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

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY

Project Name:	Hurlstone Agriculture High School Asb. Delineation			**To:**	Envirolab Services
Project No:	85644.06	**Sampler:**	Lachlan Clement		12 Ashley Street, Chatswood NSW 2067
Project Mgr:	EMG	**Mob. Phone:**	0427 102 041	**Attn:**	Tania Notaras
Email:	lachlan.clement@douglaspartners.com.au; Emily.McGinty@douglaspartners.c			**Phone:**	(02) 9910 6200 **Fax:** (02) 9910 6201
Date Required:	Standard			**Email:**	tnotaras@envirolabservices.com.au

Sample ID	Lab ID	Date Sampled	Sample Type (S - Soil, W - Water)	Container Type (G - Glass, P - Plastic)	Analytes: Asbestos ID									Notes/preservation
TP14/0-0.27 Mat	1	26/06/18	Material	P	X									
TP27/0-0.69 Mat	2	27/06/18	Material	P	X									
TP28/0-0.31 Mat	3	27/06/18	Material	P	X									
TP38/1-2.0m Mat	4	27/06/18	Material	P	X									

ENVIROLAB
Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
Job No: 195281
Date Received: 2/7
Time Received: 15:20
Received By: AZ
Temp: Cool/Ambient
Cooling: Ice/icepack
Security: Intact/Broken/None

Lab Report No:					
Send Results to:	Douglas Partners Pty Ltd	**Address:** 18 Waler Crescent, Smeaton Grange 2567		**Phone:** (02) 4647 0075	**Fax:** (02) 4646 1886
Relinquished by:	LOC		**Transported to laboratory by:**		
Signed:		**Date & Time:** 2/07/2018	**Received by:** AZ		

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 Smeaton Grange
Attention	Lachlan Clement, Emily McGinty

Sample Login Details

Your reference	85644.06, Hurlstone Agriculture High School Asb
Envirolab Reference	195281
Date Sample Received	02/07/2018
Date Instructions Received	02/07/2018
Date Results Expected to be Reported	09/07/2018

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	4 Material
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	-
Cooling Method	Not applicable
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	Asbestos ID - materials
TP14/0-0.27 Mat	✓
TP27/0-0.69 Mat	✓
TP28/0-0.31 Mat	✓
TP38/1-2.0m Mat	✓

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.

Appendix E

Summary Tables

Table 1- Summary of Bulk Soil Sampling and Analytical Results

Sample Number	Weight of 10 Litre Bulk Sample (kg)	Number of fragments > 7mm	Condition of Fragments (good/poor)	Size range of Fragment (mm)	Weight of Screened ACM (g)	Concentration of asbestos in ACM in soil (% w/w)*	ACM >7mm (g) Estimation in Laboratory	ACM >7mm (% w/w) Estimation in Laboratory	Weight of 500mL Sample (g)	Weight of AF or FA (g)**	Concentration of FA and AF in soil (% w/w)
HSL A for Asbestos in soil	-	-	-	-	-	0.010			-	-	0.001
HSL C for Asbestos in soil	-	-	-	-	-	0.020			-	-	0.001
TP1/0-0.3	15.0	3	Good	34-104	78.8	0.079	-	<0.01	859.67	–	<0.001
TP2/0-1.0	18.6	3	Good	56-120	74.4	0.060	-	<0.01	763.35	0.0679	0.0089
TP2/1-1.3	16.7	6	Good	39-106	156.5	0.141	-	<0.01	784.56	0.0931	0.0119
TP3/0-0.4	20.5	0	-	-	-	-	-	<0.01	800.39	–	<0.001
TP4/0-0.3	14.1	0	-	-	-	-	-	<0.01	641.94	0.0218	0.0034
TP5/0-0.4	16.3	3	Good	41-139	164.7	0.152	-	<0.01	838.58	–	<0.001
TP6/0-0.25	12.8	0	-	-	-	-	-	<0.01	874.63	–	<0.001
TP7/0-0.3	16.4	0	-	-	-	-	-	<0.01	873.77	–	<0.001
TP8/0-0.28	11.9	0	-	-	-	-	-	<0.01	870.97	–	<0.001
TP9/0-0.2	13.9	0	-	-	-	-	-	<0.01	877.21	–	<0.001
TP10/0-0.2	10.7	0	-	-	-	-	-	<0.01	786.88	–	<0.001
TP11/0-0.2	14.8	1	Good	83	29.4	0.030	-	<0.01	912.1	–	<0.001
TP12/0-1.0	15.0	4	Good	47-76	60.1	0.060	-	<0.01	783.18	0.0028	<0.001
TP12/1-1.2	12.2	11	Good	30-112	184.6	0.227	0.7734	0.0948	816.09	-	<0.001
TP13/0-0.2	18.1	0	-	-	-	-	-	<0.01	809.39	-	<0.001
TP14/0-0.27	15.5	1	Good	107	56.8	0.055	-	<0.01	888.45	-	<0.001
TP15/0-0.2	14.0	0	-	-	-	-	-	<0.01	713.08	-	<0.001
TP16/0-0.2	12.2	0	-	-	-	-	-	<0.01	694.98	-	<0.001
TP17/0-0.3	13.7	0	-	-	-	-	-	<0.01	744	-	<0.001
TP18/0-0.17	11.9	0	-	-	-	-	-	<0.01	818.38	-	<0.001
TP19/0-0.25	13.9	2	Good	66-70	26.9	0.029	-	<0.01	721.92	-	<0.001
TP20/0-0.3	12.1	0	-	-	-	-	-	<0.01	814.17	-	<0.001
TP21/0-0.6	10.8	0	-	-	-	-	-	<0.01	836.17	-	<0.001
TP21(A)/0-0.25	12.6	0	-	-	-	-	-	<0.01	891.62	-	<0.001
TP22/0-0.4	11.6	0	-	-	-	-	-	<0.01	783.49	-	<0.001
TP23/0-0.33	11.9	0	-	-	-	-	-	<0.01	762.83	-	<0.001
TP24/0-0.55	13.9	0	-	-	-	-	-	<0.01	718.31	-	<0.001

HSL A for Asbestos in soil	Table 7 of Schedule B(1), NEPC (2013) for residential use
HSL C for Asbestos in soil	Table 7 of Schedule B(1), NEPC (2013) for Recreational use
*	Based on % w/w asbestos in soil assuming 15% asbestos in ACM
**	Based on the weight of asbestos in FA and AF as calculated by Envirolab. Values exclude calculated weight of bonded ACM greater than > 7mm in samples
-	Not applicable as no asbestos was detected
Bold	Concentration exceeds SAC

Table 1- Summary of Bulk Soil Sampling and Analytical Results

Sample Number	Weight of 10 Litre Bulk Sample (kg)	Number of fragments > 7mm	Condition of Fragments (good/poor)	Size range of Fragment (mm)	Weight of Screened ACM (g)	Concentration of asbestos in ACM in soil (% w/w)*	ACM >7mm (g) Estimation in Laboratory	ACM >7mm (% w/w) Estimation in Laboratory	Weight of 500mL Sample (g)	Weight of AF or FA (g)**	Concentration of FA and AF in soil (% w/w)
HSL A for Asbestos in soil	-	-	-	-	-	0.010			-	-	0.001
HSL C for Asbestos in soil	-	-	-	-	-	0.020			-	-	0.001
TP25/0-0.21	13.4	0	-	-	-	-	-	<0.01	791.57	-	<0.001
TP26/0-0.17	11.0	0	-	-	-	-	-	<0.01	791.1	-	<0.001
TP27/0-0.69	14.3	2	Good	82-146	60	0.063	-	<0.01	751.14	-	<0.001
TP28/0-0.31	14.6	1	Good	67	19.2	0.020	-	<0.01	640.4	-	<0.001
TP28/0.31-0.53	13.8	0	-	-	-	-	-	<0.01	939.99	-	<0.001
TP29/0-0.32	13.3	0	-	-	-	-	-	<0.01	752.67	-	<0.001
TP30/0-0.3	15.4	0	-	-	-	-	-	<0.01	788.88	-	<0.001
TP31/0-0.42	13.7	0	-	-	-	-	-	<0.01	841.93	-	<0.001
TP32/0-0.4	13.6	0	-	-	-	-	-	<0.01	729.23	-	<0.001
TP33/0-0.27	11.9	0	-	-	-	-	-	<0.01	756.85	-	<0.001
TP34/0-1.0	14.1	5	Good	140-220	634.3	0.675	-	<0.01	870.51	-	<0.001
TP35/0-0.18	13.8	0	-	-	-	-	-	<0.01	851.51	-	<0.001
TP35(A)/0-0.1	10.3	0	-	-	-	-	-	<0.01	854.81	-	<0.001
TP35(B)/0-0.17	10.6	0	-	-	-	-	-	<0.01	660.25	-	<0.001
TP35(c)/0-0.7	14.3	0	-	-	-	-	-	<0.01	818.56	-	<0.001
TP36/0-0.21	10.2	0	-	-	-	-	-	<0.01	792.5	-	<0.001
TP37/0-0.39	11.1	0	-	-	-	-	-	<0.01	848.85	-	<0.001
TP38/0-1.0	17.8	0	-	-	-	-	-	<0.01	857.45	-	<0.001
TP38/1.0-2.0	11.6	10	Good	48-146	320.8	0.415	-	<0.01	828.77	-	<0.001
TP38/2-2.2	12.4	5	Good	18-239	247.6	0.300	-	<0.01	270.37	-	<0.001
TP39/0-0.12	12.0	0	-	-	-	-	-	<0.01	821.91	-	<0.001
TP40/0-0.38	11.3	0	-	-	-	-	-	<0.01	918.95	-	<0.001
TP40(A)/0-0.21	12.6	0	-	-	-	-	-	<0.01	876.45	-	<0.001
TP40(B)/0-0.4	12.8	0	-	-	-	-	0.8434	0.102	827.21	-	<0.001
TP41/0-0.28	11.5	1	Good	87	43.9	0.057	-	<0.01	772.63	-	<0.001
TP42/0-0.42	12.9	0	-	-	-	-	-	<0.01	817.48	-	<0.001
TP42(A)/0-1.0	11.2	0	-	-	-	-	-	<0.01	808.73	-	<0.001

HSL A for Asbestos in soil	Table 7 of Schedule B(1), NEPC (2013) for residential use
HSL C for Asbestos in soil	Table 7 of Schedule B(1), NEPC (2013) for Recreational use
*	Based on % w/w asbestos in soil assuming 15% asbestos in ACM
**	Based on the weight of asbestos in FA and AF as calculated by Envirolab. Values exclude calculated weight of bonded ACM greater than > 7mm in samples
-	Not applicable as no asbestos was detected
Bold	Concentration exceeds SAC

Table 1- Summary of Bulk Soil Sampling and Analytical Results

Sample Number	Weight of 10 Litre Bulk Sample (kg)	Number of fragments > 7mm	Condition of Fragments (good/poor)	Size range of Fragment (mm)	Weight of Screened ACM (g)	Concentration of asbestos in ACM in soil (% w/w)*	ACM >7mm (g) Estimation in Laboratory	ACM >7mm (% w/w) Estimation in Laboratory	Weight of 500mL Sample (g)	Weight of AF or FA (g)**	Concentration of FA and AF in soil (% w/w)
HSL A for Asbestos in soil	-	-	-	-	-	0.010			-	-	0.001
HSL C for Asbestos in soil	-	-	-	-	-	0.020			-	-	0.001
TP42(B)/0-0.69	14.2	0	-	-	-	-	-	<0.01	916.3	-	<0.001
TP42(C)/0-0.3	12.6	0	-	-	-	-	-	<0.01	901.36	-	<0.001
TP43/0-0.3	12.4	0	-	-	-	-	-	<0.01	944.82	-	<0.001
TP44/0-0.2	10.3	0	-	-	-	-	-	<0.01	712.54	-	<0.001
TP45/0-0.27	11.4	0	-	-	-	-	-	<0.01	761.29	-	<0.001
TP46/0-0.2	12.8	0	-	-	-	-	-	<0.01	805.54	-	<0.001
TP47/0-0.57	14.8	2	Good	46-92	40.1	0.041	-	<0.01	702.48	-	<0.001
TP48/0-0.56	12.1	5	Good	45-160	226.9	0.281	-	<0.01	800.26	-	<0.001
TP48(A)/0-0.72	12.1	1	Good	70	13.5	0.017	-	<0.01	803.49	-	<0.001
TP49/0-0.52	14.1	0	-	-	-	-	-	<0.01	921.42	-	<0.001
TP50/0-0.98	12.7	9	Good	44-266	496.6	0.587	-	<0.01	948.46	-	<0.001
TP50(A)/0-0.9	14.0	7	Good	27-160	131	0.140	0.6013	0.0787	763.91	-	<0.001
TP50(B)/0-0.72	12.1	15	Good	34-114	200.6	0.249	4.324	0.5553	778.65	-	<0.001
TP50(C)/0-0.98	13.1	0	-	-	-	-	-	<0.01	833.17	-	<0.001
TP55/0-0.8	11.2	0	-	-	-	-	-	<0.01	883.47	-	<0.001

HSL A for Asbestos in soil	Table 7 of Schedule B(1), NEPC (2013) for residential use
HSL C for Asbestos in soil	Table 7 of Schedule B(1), NEPC (2013) for Recreational use
*	Based on % w/w asbestos in soil assuming 15% asbestos in ACM
**	Based on the weight of asbestos in FA and AF as calculated by Envirolab. Values exclude calculated weight of bonded ACM greater than > 7mm in samples
-	Not applicable as no asbestos was detected
Bold	Concentration exceeds SAC

Appendix F

QA/QC

Appendix H
Data Quality Assurance and Quality Control Assessment

H1 Data Quality Indicators

Field and laboratory procedures were assessed against the following data quality indicators (DQIs):

Table H1: Data Quality Indicators

DQI	Performance Indicator	Acceptable Range
Precision		
Field considerations Laboratory considerations	SOPs appropriate and complied with	Field staff follow SOPs in the DP *Field Procedures Manual*
	field replicates	Precision average relative percent difference (RPD) result <5 times PQL, no limit; results >5 times PQL, 0% - 30%
	laboratory duplicates	Precision average RPD result <5 times PQL, no limit; results >5 times PQL, 0% - 50%
	laboratory-prepared volatile trip spikes	Recovery of 60-140%
Accuracy (bias)		
Field considerations Laboratory considerations	SOPs appropriate and complied with	Field staff to follow SOPs in the DP *Field Procedures Manual*
	Analysis of:	
	laboratory-prepared volatile trip spikes	Recovery of 60-140%
	Laboratory-prepared trip blanks (field blanks)	<PQL
	method blanks (laboratory blanks)	Recovery of 60-140%
	matrix spikes	Recovery of 70-130% (inorganics); 60-140% (organics)
	matrix spike duplicates	Recovery of 70-130% (inorganics); 60-140% (organics); Recovery 70 “low” to 130% “high” indicates interference
	surrogate spikes	Recovery of 70-130% (inorganics); 60-140% (organics)
	laboratory control samples	Recovery of 70-130% (inorganics); 60-140% (organics)
Completeness		
Field considerations	All critical locations sampled	All critical locations sampled in accordance with the DQO’s (Appendix B)
	SOPs appropriate and complied with	Field staff to follow SOPs in the DP *Field Procedures Manual*
	Experienced sampler	Experienced DP Environmental Scientist to conduct field work and sampling
	Documentation correct	Maintain COC documentation at all times
	Sample holding times complied with industry requirements	Sample holding times complied with industry requirements

DQI	Performance Indicator	Acceptable Range
Laboratory considerations	All critical samples analysed according to DQO's	All critical locations analysed in accordance with the DQO's
	Appropriate methods and PQLs	Appropriate methods and PQLs have been used by the contract laboratory
	Sample documentation complete	Maintain COC documentation at all times
Comparability		
Field considerations	Same SOPs used on each occasion	Field staff to follow SOPs in the DP *Field Procedures Manual*
	Experienced sampler	Experienced DP Environmental Engineer to conduct field work and sampling
	Same types of samples collected	Same types of samples collected
Laboratory considerations	Sample analytical methods used (including clean-up)	Methods to be NATA accredited
	Sample PQLs (justify/quantify if different)	Consistent PQLs to be used
	Same laboratories (justify/quantify if different)	Same analytical laboratory for primary samples to be used
Representativeness		
Field considerations	Appropriate media sampled according to DQO's (Appendix D)	Appropriate media sampled according to DQO's (Appendix B)
	All media identified in DQO's sampled	All media identified in DQO's sampled
Laboratory considerations	All samples analysed according to DQO's	All samples analysed according to DQO's

Notes to Table 1: SOP – Standard Operating Procedure
DQO – Data Quality Objectives (Appendix D)

H2 Field Quality Assurance and Quality Control

The field QC procedures for sampling as prescribed in the standard operating procedures (SOPs) in the Douglas Partners *Field Procedures Manual* were followed at all times during the assessment. All sample locations and media were in accordance with the DQO (i.e. as per scope of work in DP's proposal).

H2.1 Sampling Team

Sampling was undertaken by an appropriately experienced DP Environmental Scientist.

H2.2 Sample Collection and Weather Conditions

Sample collection procedures and dispatch are reported in body of the report. Sampling was undertaken during sunny and cool conditions.

H2.3 Logs

Logs for each soil sampling location were recorded in the field. The individual samples were recorded on the field logs along with the sample identity, location, depth, initials of sampler, duplicate locations, duplicate type and site observations. Logs are presented in Appendix C.

H2.4 Chain-of-Custody

Chain-of-Custody information was recorded on the Chain-of-Custody (COC) sheets and accompanied samples to the analytical laboratory. Signed copies of COCs are presented in Appendix D, prior to the laboratory certificates.

H2.5 Sample Splitting Techniques

Replicate samples were collected in the field as a measure of precision of the results. Field replicates samples for soil were collected from the same location and an identical depth to the primary sample. Equal portions of the primary sample were placed into the sampling jars and sealed. The sample was not homogenised in a bowl to prevent the loss of volatiles from the soil. Replicate samples were labelled with a DP identification number, recorded on DP logs, so as to conceal their relationship to their primary sample from the analysing laboratory.

H2.6 Duplicate Frequency

Field sampling comprised intra-laboratory duplicate sampling, at a rate of approximately one duplicate sample for every ten primary samples.

H2.7 Relative Percentage Difference

A measure of the consistency of results for field samples is derived by the calculation of relative percentage differences (RPDs) for duplicate samples. RPDs have only been considered where a concentration is greater than five times the practical quantitation limit (PQL).

H2.7.1 Intra-Laboratory Replicate Analysis

Replicates were tested to assess data 'precision' and the reproducibility within the primary laboratory (Envirolab Pty Ltd) as a measure of consistency of sampling techniques. One replicate sample was analysed. The Relative Percent Difference (RPD) between replicate results is used as a measure of laboratory reproducibility and is given by the following:

$$\text{RPD} = \frac{(\text{Replicate result 1} - \text{Replicate result 2})}{(\text{Replicate result 1} + \text{Replicate result 2})/2} \text{ x } 100$$

The RPD can have a value between 0% and 200%. An RPD data quality objective of up to 30% is considered to be within the acceptable range.

The comparative results of analysis between primary and duplicate samples are summarised in the table below. Where one or both results were below the PQL, an RPD was not calculated.

Table H2: RPD Results

Sample	Pb leachate	Zn leachate	Benzo(a)pyrene
TP53A /0-0.1	0.08	1.8	<0.001
BD3 280618	0.09	1.8	<0.001
Difference	0.01	0	0
RPD (%)	16	0	0

Notes: Bold RPD >30
Concentration of either paired duplicated not greater than five times PQL

All RPD values were within the acceptable range of ± 30.

Overall, the intra-laboratory and inter-laboratory comparisons indicate that the sampling technique was consistent and repeatable and therefore acceptable precision was achieved.

H2.8 Trip (Field) Blank

As the primary contaminant of concern was asbestos no trip (field) blank was required to be analysed.

H2.9 Trip Spike

As the primary contaminant of concern was asbestos and no volatile compounds were assessed, no trip spike was required to be analysed.

H3 Laboratory Quality Assurance and Quality Control

Envirolab Services was used as the primary laboratory. Appropriate methods and PQLs were used by the laboratory. Sample methods were NATA accredited (noting the exception for fibrous asbestos (FA) and asbestos fines (AF) quantification to 0.001% w/w).

H3.1 Surrogate Spike

As the primary contaminant of concern was asbestos and no volatile compounds were assessed, no surrogate spike was required to be analysed.

H3.2 Reference and Daily Check Sample Results – Laboratory Control Sample (LCS)

This sample comprises spiking either a standard reference material or a control matrix (such as a blank of sand or water) with a known concentration of specific analytes. The LCS is then analysed and results compared against each other to determine how the laboratory has performed with regard to sample preparation and analytical procedure and is used to assess data 'accuracy'. LCSs are analysed at a frequency of one in 20, with a minimum of one analysed per batch.

H3.3 Laboratory Duplicate Results

These are additional portions of a sample which are analysed in exactly the same manner as all other samples and is used to assess data 'precision'. The laboratory acceptance criteria for duplicate samples is: in cases where the level is <5Xpql – any RPD is acceptable; and in cases where the level is >5xPQL – 0-50% RPD is acceptable.

H3.4 Laboratory Blank Results

The laboratory blank, sometimes referred to as the method blank or reagent blank is the sample prepared and analysed at the beginning of every analytical run, following calibration of the analytical apparatus and is used to assess data 'accuracy'. This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, it can be determined by processing solvents and reagents in exactly the same manner as for samples. Laboratory blanks are analysed at a frequency of 1 in 20, with a minimum of one per batch.

H3.5 Matrix Spike

As the primary contaminant of concern was asbestos and no volatile compounds were assessed, no matrix spike was required to be analysed.

H3.6 Results of Laboratory QC

The laboratory QC for surrogate spikes, LCS, laboratory duplicate results, laboratory blanks and matrix spikes results are reported in the laboratory certificate of analysis.

The laboratory quality control samples were within the laboratory acceptance criteria. It is considered that an acceptable level of laboratory precision and accuracy was achieved and that surrogate spikes, LCS, laboratory duplicate results, laboratory blanks and matrix spike results were of an acceptable level overall. On the basis of this assessment, the laboratory data set is considered to have complied with the DQIs.

H3.7 Overall Assessment of QA/QC

Specific limits associated with sample handling and laboratory QA/QC were assessed against the DQIs and a summary of compliance is presented in the following table.

Table H5: Data Quality Indicators

DQI	Performance Indicator	Acceptable Range	Compliance
Precision			
Field considerations	SOPs appropriate and complied with	Field staff follow SOPs in the DP *Field Procedures Manual*	C
	field replicates	Precision average relative percent difference (RPD) result <5 times PQL, no limit; results >5 times PQL, 0% - 30%	C
Laboratory considerations	laboratory duplicates	Precision average RPD result <5 times PQL, no limit; results >5 times PQL, 0% - 50%	C
	laboratory-prepared volatile trip spikes	Recovery of 60-140%	N/A
Accuracy (bias)			
Field considerations	SOPs appropriate and complied with	Field staff to follow SOPs in the DP *Field Procedures Manual*	C
Laboratory considerations	Analysis of:		
	laboratory-prepared volatile trip spikes	Recovery of 60-140%	N/A
	laboratory-prepared trip blanks (field blanks)	<PQL	N/A
	method blanks (laboratory blanks)	Recovery of 60-140%	C
	matrix spikes	Recovery of 70-130% (inorganics); 60-140% (organics)	N/A
	matrix spike duplicates	Recovery of 70-130% (inorganics); 60-140% (organics); Recovery 70 “low” to 130% “high” indicates interference	N/A
	surrogate spikes	Recovery of 70-130% (inorganics); 60-140% (organics)	N/A
	laboratory control samples	Recovery of 70-130% (inorganics); 60-140% (organics)	C
Completeness			
Field considerations	All critical locations sampled	All critical locations sampled in accordance with the SAQP	C
	SOPs appropriate and complied with	Field staff to follow SOPs in the DP *Field Procedures Manual*	C
	Experienced sampler	Experienced DP Environmental Scientist/Engineer to conduct field work and sampling	C
	Documentation correct	Maintain COC documentation at all times	C
	Sample holding times complied with	Sample holding times complied with	C
Laboratory considerations	All critical samples analysed according to SAQP	All critical locations analysed in accordance with the SAQP	C
	Appropriate methods and PQLs	Appropriate methods and PQLs have been used by the contract laboratory	C
	Sample documentation complete	Maintain COC documentation at all times	C

DQI	Performance Indicator	Acceptable Range	Compliance
Comparability			
Field considerations	Same SOPs used on each occasion	Field staff to follow SOPs in the DP *Field Procedures Manual*	C
	Experienced sampler	Experienced DP Environmental Scientist/Engineer to conduct field work and sampling	C
	Same types of samples collected (filtered)	Field filtering for metals	NA
Laboratory considerations	Sample analytical methods used (including clean-up)	Methods to be NATA accredited	C
	Sample PQLs (justify/quantify if different)	Consistent PQLs to be used	C
	Same laboratories (justify/quantify if different)	Same analytical laboratory for primary samples to be used	C
Representativeness			
Field considerations	Appropriate media sampled according to DQOs	Appropriate media sampled according to DQOs	C
	All media identified in DQOs sampled	All media identified in DQOs sampled	C
Laboratory considerations	All samples analysed according to DQOs	All samples analysed according to DQOs	C

Notes to Table 5:
C – Compliance
PC – Partial Compliance
NC – Non-Compliance
NA – Not Applicable
SOP – Standard Operating Procedure
DQO – Data Quality Objectives

A review of the adopted QA/QC procedures and results indicates that the DQIs have generally been met with compliance and a minor partial-compliance. On this basis, the sampling and laboratory methods used during the investigation were found to meet DQOs for this project.