ENVIRONMENTAL INVESTIGATION SERVICES

REPORT

TO

THE UNIVERSITY OF SYDNEY

ON

STAGE 1 AND PRELIMINARY STAGE 2 ENVIRONMENTAL SITE ASSESSMENT

FOR

PROPOSED AIN BUILDING

AT

UNIVERSITY OF SYDNEY, CAMPERDOWN, NSW

MAY 2011 **REF: E24782Krpt**

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EXECUTIVE SUMMARY

Sydney University commissioned EIS, a division of J&K, to undertake a Stage 1 and preliminary Stage 2 environmental assessment to assess the potential risk for significant soil contamination for the proposed AIN building close to St Paul's College, Sydney University, NSW. This report describes the investigation procedures and presents the results of the assessment, together with comments, discussion and recommendations.

The site is located in the northern portion of the St Paul's College property within the Sydney University campus at Camperdown, New South Wales. The site area, where the proposed building footprint is located, is mostly grass-covered, also containing sports courts, car-parking areas and several medium to large trees.

A search for historical information relating to the site indicated that the site appears to have been used as agricultural land until around 1855, at which time the land was acquired by the University and construction of St Paul's College began the year after. The sports courts were constructed during the 1950s.

Potential contamination at the site would be anticipated to be associated with potentially contaminated, imported fill material and historical activities such as the use of pesticides for gardening or agriculture. The compounds identified as soil contaminants of concern at the site include heavy metals, total petroleum hydrocarbons (TPH); benzene, toluene, ethyl benzene and xylenes (BTEX); polycyclic aromatic hydrocarbons (PAHs); organochlorine pesticides (OCPs); organophosphorus pesticides (OPPs); polychlorinated biphenyls (PCBs) and asbestos. The main potential contamination receptors are considered to include site visitors, workers and adjacent property owners, who may come into contact with contaminated soil and/or be exposed to contaminated dust arising from construction activity; and site occupants.

Soil samples were obtained from eight boreholes drilled on-site during a geotechnical investigation in March 2011. Fill material was encountered in all boreholes to depths ranging from 0.05m to 1.9m, below which lay natural silty clay soils followed by shale bedrock. One fill and one natural soil sample from each borehole were analysed for contaminants of concern, and the analytical results were compared to relevant site assessment criteria (SAC), which were derived with reference to appropriate guidelines and regulations. The analytical results for all analytes were below SAC.

As elevated concentrations of contaminants were not encountered in the soil samples analysed for this investigation, EIS are of the opinion that the potential for significant widespread soil contamination at the site is relatively low. Based on the scope of work undertaken for this assessment EIS consider that the site can be made suitable for the proposed development provided that the site is inspected by experienced environmental personnel during demolition and excavation works to assess any unexpected conditions or subsurface facilities that may be discovered between investigation locations.

The conclusions presented in this report have been made within the limitations of the scope of works undertaken for the investigation. The conclusions and recommendations should be read in conjunction with the limitations presented in the body of the report.

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1 INTRODUCTION

University of Sydney commissioned Environmental Investigation Services (EIS), a division of Jeffery & Katauskas Pty Ltd (J&K), to undertake a Stage 1 and preliminary Stage 2 environmental site assessment to assess the potential risk for significant soil contamination for the proposed Australian Institute of Nanoscience (AIN) building (the site). The investigation was undertaken generally in accordance with an EIS proposal (Ref: EP5456K) of 2 March 2011.

The site location is shown on Figure 1 and the investigation was confined to the site boundaries as shown on Figure 2.

This report describes the investigation procedures and presents the results of the assessment, together with comments, discussion and recommendations.

1.1 Proposed Development Details

EIS understand that the proposed development involves construction of a four-storey building over a basement level. Construction will involve excavation to a depth of up to 12m. The building footprint will be approximately 4000m^2.

2 REGULATORY BACKGROUND

In 1997 the NSW Government introduced the CLM Act. This Act has recently been amended by the *Contaminated Land Management Amendment Act* (2008[1]).

The CLM Act 1997, associated regulations, *State Environmental Planning Policy No.55* (1998[2]) and NSW Office of Environment and Heritage (OEH) guidelines were designed to provide uniform state-wide control of the management, investigation and remediation of contaminated land.
Prior to granting consent for any proposed rezoning or development, SEPP55 requires the consent authority to:

- Consider whether the land is contaminated;
- Consider whether the site is suitable, or if contaminated, can be made suitable by remediation, for the proposed land use; and
- Be satisfied that remediation works will be undertaken prior to use of the site for the proposed use.

Should the assessment indicate that the site poses a risk to human health or the environment, remediation of the site may be required prior to occupation of the proposed development. SEPP55 requires that the relevant local council be notified of all remediation works, whether or not development consent is required. Where development consent is not required, 30 days written notice of the proposed works must be provided to council. Details of validation of remediation work must also be submitted to Council within one month of completion of remediation works.

The consent authority may request that a site audit be undertaken during, or following the completion of the site assessment process. Under the terms of the CLM Act 1997 the NSW DECCW (EPA) Site Auditor Scheme was developed to provide a system of independent review for assessment reports. An accredited Contaminated Site Auditor is engaged to review reports prepared by suitably qualified consultants to ensure that the investigation has been undertaken in accordance with the guidelines and confirm that the sites are suitable for their intended use.

Section 59(2) of the CLM Act 1997 states that specific notation relating to contaminated land issues must be included on Section149 (s149) planning certificates prepared by Council where the land to which the certificate relates is:

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[1] *Contaminated Land Management Amendment Act,* NSW Government Legislation, 2008 (CLM Amendment Act 2008)

[2] *State Environmental Planning Policy No. 55 – Remediation of Land,* NSW Government, 1998 (SEPP55)

- Within an investigation or remediation area;
- Subject to an investigation or remediation order by the DECCW (EPA);
- The subject of a voluntary investigation or remediation proposal; and/or
- The subject of a site audit statement.

Submission of contaminated site investigation and validation reports to council as part of rezoning or development application submissions may also result in notation of actual or potential site contamination on future s149 certificates prepared for the site.

Section 60 of the CLM Amendment Act 2008 sets out a positive duty on a land owner, or person whose activities have caused contamination, to notify the DECCW if they are or become aware that contamination exists on a site that generally poses "*an unacceptable risk to human health or the environment, given the site's current or approved use*". This duty to report is based on trigger values, above which notification is required.

3 OBJECTIVES AND SCOPE OF WORK

3.1 Objectives

The primary objectives of the investigation were to:

- Assess the potential risk of significant soil contamination at the site in relation to the proposed development of the site for commercial land use;
- Prepare a report presenting the results of the assessment generally in accordance with the *NSW EPA (now DECCW) Guidelines for Consultants Reporting on Contaminated Sites (1997[3])* and *State Environmental Planning Policy No.55 – Remediation of Land (1998[4])*.

3.2 Scope of Work

The scope of work undertaken to achieve the objectives included:

- Review of available geological/hydro-geological groundwater data;
- Review of historical aerial photographs and land title records;
- Purchase and review of Section 149 (2) and (5) certificates for the site;
- Search of the NSW DECCW (EPA) notices for the site under Section 58 of the Contaminated Land Management Act (1997);
- Search of the NSW DECCW (EPA) public register (POEO) for licences, applications or notices for the site;
- Search of WorkCover databases for underground storage tank (USTs) licenses and licenses to store dangerous goods;
- Review of council historical development application (DA) and building approval (BA) records for the site;
- Walkover inspection of the site to identify potential on-site and off-site contamination sources;
- Soil sampling from boreholes drilled for the J&K geotechnical investigation;
- Analysis of soil samples for the following contaminants: heavy metals, polycyclic aromatic hydrocarbons (PAHs), petroleum hydrocarbons (TPH), monocyclic aromatic hydrocarbons (BTEX), asbestos, organochlorine (OC) and organophosphate (OP) pesticides and polychlorinated biphenyls (PCBs);
- Implementation of field QA/QC procedure during the soil sampling; and
- Preparation of a report presenting the results of the assessment.

[3] *Guidelines for Consultants Reporting on Contaminated Sites,* NSW EPA (now DECCW), 1997 (Reporting Guidelines 1997)

[4] *State Environmental Planning Policy No. 55 – Remediation of Land,* NSW Government, 1998 (SEPP55)

4 SITE INFORMATION

4.1 Site Identification

The site identification details are summarised in the following table:

Site Owner:	Trustees of St Paul's College (Kim Santow, Henrie Nicholas, Gavin Brown, Robert Otto Albert, Ivan Francis Head)
Site Address:	9 City Road, Camperdown, New South Wales
Lot & Deposited Plan:	Lot 1966 DP 1117595
Current Land Use:	Educational
Proposed Land Use:	Educational
Local Government Authority:	City of Sydney
Current Zoning:	Zone No.5 – the Special Uses Zone
Site Area/Area of Proposed Development:	Approximately 4000m^2
AHD:	Varies from approximately 30m – 35m
Geographical Location (MGA):	S: 33°53'19" E: 151°11'14"
Site Locality Plan:	Refer to Figure 1
Borehole Location Plan:	Refer to Figure 2

4.2 Site Description

The site is located in the northern portion of the St Paul's College property within the University of Sydney campus at Camperdown, New South Wales. The site area, where the proposed building footprint is located, was mostly grass-covered. The western and southern portions of the site contained an asphalt-paved car park and synthetic rubber covered sports courts. The north-eastern portion of the site contained a building used as the Physics Annexe and a small car parking area. Several medium to large trees were located on the site.

The site is located between Physics Road to the north, Western Avenue to the west, Carillon Avenue to the south and City Road to the east. The sandstone buildings of St Paul's College were situated to the south-west and St Paul's Oval was situated to the south-east. Several other university buildings were located to the north of the site, including the Physics building. The four-storey brick buildings of Wesley College lay to the west of the site, while other university buildings including the Edward Ford building were situated to the east of the site.

4.3 Regional Geology

The geological map of Sydney (1983[5]) indicates that the site is underlain by Ashfield Shale of the Wianamatta Group consisting of black to dark-grey shale and laminite.

4.4 Hydrogeology

NSW Office of Water (formerly Department of Water and Energy[6]) records were researched for the investigation and indicated that four (4) registered groundwater bores lie within 500m of the site. The groundwater works summaries and a map indicating the location of the bores in relation to the site are attached in Appendix C. The details are summarised in the following table:

Ref No	Approximate Distance from site (m)	Approximate Direction from site	Gradient from site	Depth (m)	Standing Water Level (m)	Registered Purpose
GW109230	480	NW	Down	1.8	Unknown	Monitoring bore
GW109231	500	NW	Down	3.2	Unknown	Monitoring bore
GW110247	350	S	Up	210	31	Domestic
GW111048	350	NW	Down	4.4	2.07	Monitoring bore

Based on the results of the groundwater bore search groundwater is not considered to be a significant resource in the immediate area of the site.

[5] Dept. of Mineral Resources (1983) *Sydney 1:100,000 Geological Sheet 9130,* NSW Geological Survey, Sydney.

[6] http://www.waterinfo.nsw.gov.au/gw/ visited on 3 May 2011

5 SITE HISTORY ASSESSMENT

5.1 Aerial Photographs

Aerial photographs of the site taken in 1930, 1951, 1961, 1968, 1970, 1978, 1986, 1994, 1999 and 2004 were obtained from the Department of Lands and were reviewed as part of the assessment of the site history. The information obtained from the photographs is summarised in the following table.

Year	Details
1930	The site appeared similar to its current appearance. St Paul's Oval and the buildings of St Paul's College were visible in the photograph. The two sports courts that are currently on-site had not been constructed in 1930. Many of the Sydney University buildings including the Physics building to the north of the site were visible in this photograph.
1951	The site appeared similar to the 1930 photograph.
1961	The two sports courts currently located in the north of the site were apparent in the 1961 aerial photograph.
1968	The site appeared similar to the 1961 photograph.
1970	The site appeared similar to the 1968 photograph.
1978	The site appeared similar to the 1970 photograph.
1986	The site appeared similar to the 1978 photograph.
1994	The site appeared similar to the 1986 photograph.
1999	The site appeared similar to the 1994 photograph.
2004	The site appeared similar to the 1999 photograph.

5.2 Land Title Search

A limited historical land title search was performed on our behalf by Advanced Legal Searchers Pty Ltd. The records obtained indicate that the site forms part of DP1117595 which was registered in 2007. Prior to 2007 the land was registered under various other identifiers, including Lot 576 DP752049 from 1999 to 2007. Copies of the title records are presented in Appendix C and a summary of the relevant information is provided in the following table:

Registration Date	Proprietor
2007 – to date	Kim Santow, Henrie Nicholas, Gavin Brown, Robert Otto Albert, Ivan Francis Head (Trustees of St Paul's College)
2007 – 2007	Kim Santow, Henrie Nicholas, Gavin Brown, Robert Otto Albert, Ivan Francis Head (Trustees of St Paul's College)
1999-2007	Leonie Judith Kramer, Gavin Brown, John Robert Lehane, Robert Otto Albert, Ivan Francis Head

Land title records prior to 2007 indicate that the site or portions of the site have been owned by the University of Sydney since 1855.

The land search has not indicated any particular land use that may be considered to have resulted in significant contamination of the soil and groundwater at the site.

5.3 Council Records

A search of Development Application (DA) and Building Approval (BA) records held by City of Sydney Council was undertaken by EIS. The records showed numerous development applications were received by Council relating to a variety of additions to St Paul's College and the use of the College for special events. A copy of these records is included in Appendix C.

5.4 WorkCover Database Records

A records search for licenses to store dangerous goods was undertaken on our behalf by WorkCover. The records did not indicate the existence of any licences, including underground storage tanks, at this site.

5.5 NSW DECCW Records

A search of the NSW DECCW (EPA) on-line database did not indicate the existence of any EPA notices for the site under section 58 of the CLM Act 1997. A search of the NSW DECCW public register (POEO) did not indicate the existence of any EPA notices, applications and licenses for the site.

5.6 Other Historical Records

Historical records indicate that the Sydney University site formed part of Grose Farm until 1855 when 128 acres of the farm were granted by the colonial government for the purposes of the construction of Sydney University[7]. The building of the College commenced in 1856[8].

5.7 Assessment of Historical Information Integrity

The site history assessment has generally been obtained from: government records including the NSW land titles office and historical aerial photographs. The veracity of

[7] http://sydney.edu.au/arms/archives/johnsmithphotos.shtml, accessed 3 May 2011
[8] http://www.stpauls.edu.au/node/159, accessed 3 May 2011

the information from these sources is considered to be high, however given the age of the development, a certain degree of information loss is to be expected.

5.8 Summary of Historical Site Use

The search of historical information has indicated the following:

- The site appears to have been used as agricultural land until approximately 1855;
- The site began to be developed as St Paul's College in 1856;
- Two sports courts were built on the site during the 1950s; and
- There are no recorded notices listed on the NSW DECCW CLM or POEO register.

6 POTENTIAL CONTAMINATION SOURCES

6.1 Potential Site Specific Contamination

Potential contamination at the site would be anticipated to be associated with:

- Potentially contaminated, imported fill material;
- Historical activities such as the use of pesticides for gardening or agriculture.

6.1.1 Site Specific Soil Contaminants of Concern

The compounds identified as soil contaminants of concern at the site include:

- Heavy metals: arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc;
- Total petroleum hydrocarbons (TPH);
- Monocyclic aromatic hydrocarbon compounds: benzene, toluene, ethyl benzene and xylenes (BTEX);
- Polycyclic aromatic hydrocarbons (PAHs) including benzo(a)pyrene;
- Organochlorine pesticides (OCPs) including Aldrin, dieldrin, chlordane, DDT, DDD, DDE and heptachlor;
- Organophosphorus pesticides (OPPs);
- Polychlorinated Biphenyls (PCBs); and
- Asbestos.

6.2 Potential Receptors

The main potential contamination receptors are considered to include:

- Site visitors, workers and adjacent property owners, who may come into contact with contaminated soil and/or be exposed to contaminated dust arising from construction activity; and
- Site occupants.

6.3 Contaminant Laydown and Transport Mechanisms

At this site, mobile contaminants would be expected to move down through the fill material to the rock surface and migrate laterally down-slope from the source. The movement of contaminants would be expected to be associated with groundwater flow and seepage at the top of the bedrock.

7 ASSESSMENT CRITERIA DEVELOPMENT

7.1 Regulatory Background

Over the years the environmental department of the NSW government has undergone a number of name changes. Previous names for this department include:

- Environment Protection Authority (EPA);
- Department of Environment and Conservation (DEC);
- Department of Environment and Climate Change (DECC); and
- Department of Environment and Climate Change and Water (DECCW).

Currently this department is known as the Office of Environment and Heritage (OEH).

In 1997 the NSW Government introduced the CLM Act. This Act has been amended by the *Contaminated Land Management Amendment Act* (2008[9]).

The CLM Act 1997, associated regulations, SEPP55 and NSW DECCW (EPA) guidelines, were designed to provide uniform state-wide control of the management, investigation and remediation of contaminated land.

Prior to granting consent for any proposed rezoning or development, SEPP55 requires the consent authority to:

- Consider whether the land is contaminated;
- Consider whether the site is suitable, or if contaminated, can be made suitable by remediation, for the proposed land use; and
- Be satisfied that remediation works will be undertaken prior to use of the site for the proposed use.

Should the assessment indicate that the site poses a risk to human health or the environment, remediation of the site may be required prior to occupation of the proposed development. SEPP55 requires that the relevant local council be notified of all remediation works, whether or not development consent is required. Where development consent is not required, 30 days written notice of the proposed works must be provided to council. Details of validation of remediation work must also be submitted to Council within one month of completion of remediation works.

The consent authority may request that a site audit be undertaken during, or following the completion of the site assessment process. Under the terms of the CLM Act 1997 the NSW DECCW (EPA) Site Auditor Scheme was developed to provide a system of

[9] *Contaminated Land Management Amendment Act,* NSW Government Legislation, 2008 (CLM Amendment Act 2008)

independent review for assessment reports. An accredited Contaminated Site Auditor is engaged to review reports prepared by suitably qualified consultants to ensure that the investigation has been undertaken in accordance with the guidelines and confirm that the sites are suitable for their intended use.

Section 59(2) of the CLM Act 1997 states that specific notation relating to contaminated land issues must be included on Section149 (s149) planning certificates prepared by Council where the land to which the certificate relates is:

- Within an investigation or remediation area;
- Subject to an investigation or remediation order by the DECCW (EPA);
- The subject of a voluntary investigation or remediation proposal; and/or
- The subject of a site audit statement.

Submission of contaminated site investigation and validation reports to council as part of rezoning or development application submissions may also result in notation of actual or potential site contamination on future s149 certificates prepared for the site.

Section 60 of the CLM Amendment Act 2008 sets out a positive duty on a land owner, or person whose activities have caused contamination, to notify the DECCW if they are or become aware that contamination exists on a site that generally poses "*an unacceptable risk to human health or the environment, given the site's current or approved use*". This duty to report is based on trigger values, above which notification is required.

Off-site disposal of fill, contaminated material and excess soil/rock excavated as part of the proposed development works is regulated by the provisions of the *Protection of the Environment Operations Act* (1997[10]) and associated regulations and guidelines including the *NSW DECC (now DECCW) Waste Classification Guidelines - Part 1: Classifying Waste* (2009[11]). All materials should be classified in accordance with these guidelines prior to disposal.

Section 143 of the POEO Act 1997 states that if waste is transported to a place that cannot lawfully be used as a waste facility for that waste, then the transporter and owner of the waste are each guilty of an offence. The transporter and owner of the waste have a duty to ensure that the waste is disposed of in an appropriate manner.

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

[11] *Waste Classification Guidelines, Part 1: Classifying Waste,* NSW DECC, 2009 (Waste Classification Guidelines 2009)

7.2 Soil Contaminant Threshold Concentrations

The soil investigation levels adopted for this investigation are derived from the NSW DEC (now DECCW) document *Guidelines for the NSW Site Auditor Scheme, 2nd Edition* (2006[12]) and the National Environmental Protection Council document *National Environmental Protection (Assessment of Site Contamination) Measure* (1999[13]). The contaminant thresholds listed below are levels at which further investigation and evaluation is required to assess whether the site is considered suitable for the proposed urban land use.

To accommodate the range of human and ecological exposure settings, a number of generic settings are used on which the Health based Investigation Levels (HILs) can be based. Four categories of HILs are adopted for urban site assessments. Contaminant levels for a standard residential site with gardens and accessible soil (Column A) are based on protection of a young child resident at the site. The remaining categories (Columns D to F) present alternative exposure settings where there is reduced access to soil or reduced exposure time. These categories include residential land use with limited soil access, recreational and public open space and commercial/industrial use. Where the proposed land use will include more than one land use category (e.g. mixed residential/commercial development) the exposure setting of the most "sensitive" land use is adopted for the site.

Threshold concentrations for petroleum hydrocarbon contaminants including total TPH and BTEX compounds have previously been established in the *NSW EPA* (now OEH) *Contaminated Sites: Guidelines for Assessing Service Station Sites* (1994[14]) publication and this document is referenced in the Site Auditor Guidelines 2006. Heavy fraction petroleum hydrocarbon aliphatic/aromatic component threshold concentrations have also been introduced in NEPM 1999.

Soil samples for this investigation have been analysed for total recoverable hydrocarbons (TRH) rather than TPH. TRH analysis is undertaken without a preliminary silica gel clean-up of the sample. Consequently the TRH result may include other compounds such as phthalates, humic acids, fatty acids and sterols (if present).

[12] *Guidelines for the NSW Site Auditor Scheme, 2nd ed.,* NSW DEC, 2006 (Site Auditor Guidelines 2006)

[13] *National Environmental Protection (Assessment of Site Contamination) Measure,* National Environment Protection Council (NEPC), 1999 (NEPM 1999)

[14] *Guidelines for Assessing Service Station Sites,* NSW EPA, 1994 (Service Station Guidelines 1994)

7.2.1 Provisional Phyto-toxicity Investigation Levels (PPILs)

The Provisional Phyto-toxicity Investigation Levels (PPILs) are generic values based on phytotoxicity data for plant response to specific contaminants in a sandy loam matrix and are included in the contaminated site assessment where the proposed land use includes gardens or accessible soils. The PPILs are listed in the Site Auditor Guidelines 2006. The PPILs are identical to the Ecological Investigation Levels (EILs) originally specified in NEPM 1999.

7.2.2 Asbestos in Soil

NEPM 1999 does not provide numeric guidelines for the assessment of asbestos in soil. NSW DECCW (EPA) advice (2006) has indicated that consultants should use their 'professional judgement' regarding determination of appropriate investigation and remediation levels for asbestos in soils; however the NSW DECCW (EPA) have not published numerical guidelines for the assessment of asbestos in subsurface soils.

The WorkCover publication *Working with Asbestos Guide* (2008[15]) states that, where buried asbestos is encountered, "A competent occupational hygienist should assess the site to determine:

- If asbestos material is bonded or friable
- The extent of asbestos contamination
- Safe work procedures for the remediation of the site"

"*Any asbestos cement products that have been subjected to weathering, or damaged by hail, fire or water blasting are considered to be friable asbestos and an asbestos removal contractor with a WorkCover license for friable asbestos removal is required for its removal*". Under the *NSW Occupational Health and Safety (OHS) Regulations 2001*[16] and WorkCover requirements all necessary disturbance works associated with friable asbestos containing materials must be conducted by a licensed AS-1 Asbestos Removal Contractor.

7.2.3 Site Assessment Criteria (SAC) for Soil Contaminants

The 'commercial/industrial' (Column F) exposure setting has been adopted for this assessment and the appropriate soil criteria are listed in the following table:

[15] *Working with Asbestos Guide,* NSW WorkCover, 2008 (WorkCover Working with Asbestos Guide 2008)
[16] *Occupational Health and Safety Regulation,* NSW Government, 2001 (NSW OH&S Regulation 2001)

Contaminant	SAC - HILs Column F (mg/kg)	PPILs (mg/kg)
Heavy Metals		
Arsenic (total)	500	20
Cadmium	100	3
Chromium (III)	60%	400
Copper	5000	100
Lead	1500	600
Mercury (inorganic)	75	1
Nickel	3000	60
Zinc	35000	200
Petroleum Hydrocarbons		
TPH (C_6-C_9)	65 [a]	-
TPH (C_{10}-C_{36})	1000 [a]	-
Benzene	1 [a]	-
Toluene	1.4 [a]	-
Ethylbenzene	3.1 [a]	-
Total Xylenes	14 [a]	-
PAHs		
Total PAHs	100	-
Benzo(a)pyrene	5	-
Pesticides (OCPs & OPPs)		
Aldrin + Dieldrin	50	-
Chlordane	250	-
DDT+ DDD + DDE	1000	-
Heptachlor	50	-
Total OPPs	0.1[b]	-
Others		
PCBs (Total)	50	-
Asbestos	NDLR [c]	-

Note:

[a] Service Station Guidelines 1994

[b] Due to the absence of locally endorsed guideline criteria, the laboratory practical quantitation limit (PQL) has been adopted.

[c] Not Detected at Limit of Reporting (NDLR)

7.2.4 Waste Classification Assessment Criteria

For the purpose of off-site disposal, the classification of soil into 'General Solid Waste (non-putrescible)', 'Restricted Solid Waste (non-putrescible)' and 'Hazardous Waste (non-putrescible)' categories is defined by chemical contaminant criteria outlined in the

Waste Classification Guidelines 2009. The contaminant criteria are summarised in Table A-2.

7.3 Evaluation of Soil Analysis Data and Contaminant Threshold Concentrations

Assessment of the soil analytical data using the soil contaminant threshold concentrations has been undertaken in accordance with the methodology outlined in the NEPM 1999 Schedule 7(a).

The following criteria have been adopted for assessment of the analytical data:

- For a site to be considered suitable for the proposed land use each individual contaminant concentration should be less than the SAC; and
- Where the concentration of each contaminant is less than the SAC in all samples, the suitability of the site for the proposed use may be assessed based solely on individual analytical results.

Where contamination results exceed the SAC, a method of remediating the site is to physically and selectively remove the contamination hotspots from the site. This process should be continued until statistical analysis of the data meets the SAC. Validation of the remediated site is generally required to demonstrate that the site is suitable for the proposed land use.

8 ASSESSMENT PLAN

8.1 Soil Sampling Density

The *Contaminated Sites Sampling Design Guidelines* for contaminated site investigations state that samples should be obtained from a minimum of 11 evenly spaced sampling points for a site of this size (approximately 0.4ha).

Samples were obtained from 8 sampling locations for this investigation. This density is approximately 73% of the minimum sampling density.

The boreholes were drilled on a systematic grid sampling plan with a spacing of up to 40m between sampling points. A systematic sampling plan was considered most appropriate for this investigation as:

- no specific potential contaminant sources were identified by the available site history; and
- the distribution of contamination is expected to be associated with imported potentially contaminated fill material and is therefore likely to be random.

Soil sampling was undertaken during the geotechnical investigation which was conducted in March 2011.

8.2 Data Quality Objectives (DQOs)

The DQOs for the assessment were developed with reference to the US EPA document *Data Quality Objectives Process for Hazardous Waste Site Investigations* (2000[17]). The document includes seven steps as follows:

1. State the problem
2. Identify the decision
3. Identify inputs into the decision
4. Study Boundaries
5. Develop a Decision Rule
6. Specify Limits on Decision Errors
7. Optimise the Design for Obtaining data

Field investigations are undertaken generally in accordance with EIS sampling protocols outlined in Appendix D.

[17] *Data Quality Objectives Process for Hazardous Waste Site Investigations,* US EPA, *2000* (US EPA 2000)

8.3 Data Quality Indicators (DQIs) and Quality Assurance

The validation, as part of the DQOs, involves the technical review of the data using defined QA Assessment Criteria. The success of the DQIs is based on assessment of the data set as a whole and not on individual acceptance or exceedance within the data set.

Review of QA criteria was based on laboratory data including surrogate recovery, repeat analysis, laboratory control sample (LCS), matrix spikes and method blanks.

Field QA/QC included collection and analysis for the contaminants of concern of approximately 12.5% of field soil samples as intra-laboratory duplicates:

Success of field DQIs is based on the following criteria:

- Relative percentage differences (RPDs) were calculated for the intra-laboratory duplicates. The RPD was calculated as the absolute value of the difference between the initial and repeat result divided by the average value, expressed as a percentage. The following acceptance criteria were used to assess the RPD results:
  - For results that were greater than 10 times the Practical Quantitation Limit (PQL) RPDs less than 50% were considered acceptable.
  - For results that were between 5 and 10 times PQL RPDs less than 75% were considered acceptable.
  - For results that were less than 5 times the PQL RPDs less than 100% were considered acceptable.

9 INVESTIGATION PROCEDURE

9.1 Soil Sampling Methods

Subsurface investigation was undertaken using a track mounted hydraulically operated drill rig equipped with spiral flight augers and rotary diamond coring equipment. Soil samples were obtained from a Standard Penetration Test (SPT) sampler or directly from the auger when conditions did not allow use of the SPT sampler.

The SPT sampler was washed with phosphate free detergent and rinsed following each sampling event. The spiral flight augers were decontaminated using a scrubbing brush and potable water and Decon 90 solution (phosphate free detergent) followed by rinsing with potable water. Details of the decontamination procedure adopted during sampling are presented in Appendix D.

Soil and rock samples were obtained at various depths, based on observations made during the field investigation. During sampling, soil at selected depths was split into initial and duplicate samples for QA/QC assessment.

All samples were placed in glass jars with plastic caps and Teflon seals with minimal headspace. Samples for asbestos analysis were placed in zip-lock plastic bags. Sampling personnel used disposable nitrile gloves during sampling activities.

During the investigation, soil samples were preserved by immediate storage in an insulated sample container with ice in accordance with AS 4482.1-2005[18] and AS 4482.2-1999[19] as summarised in the following table:

Analyte	Preservation	Storage
Heavy metals	Unpreserved glass jar with Teflon lined lid	Store at <4°, analysis within 28 days (mercury and Cr[VI]) and 180 days (other metals).
VOCs (TPH/BTEX)		Store at <4°, nil headspace, extract within 14 days, analysis within forty days
PAHs, OCP, OPP & PCBs		
Asbestos	Sealed plastic bag	None

[18] *Guide to the Investigation and Sampling of sites with Potentially Contaminated Soil,* Standards Australia, 2005 (AS 2005)

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

The samples were labelled with the job number, sampling location, sampling depth and date. All samples were recorded on the borehole logs presented in Appendix A and on the laboratory chain of custody (COC) record presented in Appendix B.

On completion of the fieldwork, the samples were delivered in the insulated sample container to a NATA registered laboratory for analysis under standard COC procedures. Detailed EIS field sampling protocols are included in Appendix D.

9.2 Photoionisation Detector (PID) Screening

A portable PID was used in this investigation to assist with selection of samples for laboratory hydrocarbon (TPH/BTEX) analysis.

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

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

PID screening of detectable volatile organic compounds (VOCs) was undertaken on soil samples using the soil sample headspace method. VOC data was obtained from partly filled zip-lock plastic bags following equilibration of the headspace gases. The PID headspace data is presented on the COC documents.

9.3 Laboratory Analysis

Laboratory analysis was undertaken by Envirolab Services Pty Ltd (NATA Accreditation No. 2901).

9.3.1 Soil Samples

Soil samples were analysed using the following analytical methods detailed in Schedule B(3) of NEPM (1999[20]):

- Heavy metals – Nitric acid digestion. Analysis by ICP/AES.
- Low level mercury – cold vapour AAS.

[20] *Guideline on Laboratory Analysis of Potentially Contaminated Soils*, Schedule B(3), NEPM, 1999 (Schedule B(3))

- OC and OP pesticides and PCBs – Extracted with dichloromethane/acetone. Analysis by GC/ECD.
- PAHs – Soil extracted with dichloromethane/acetone. Analysis by GC/MS.
- TPH (volatile) – Soil extracted with methanol. Analysis by P&T GC/MS.
- TPH – Soil extracted with dichloromethane/acetone. Analysis by GC/FID.
- BTEX – Soil extracted with methanol. Analysis by P&T GC/MS.
- Asbestos – Polarizing light microscopy.

10 RESULTS OF INVESTIGATION

10.1 Subsurface Conditions

Borehole locations are shown on Figure 2. For details of the subsurface soil profile reference should be made to the borehole logs in Appendix A. A summary of the subsurface conditions encountered in the boreholes is presented below:

Fill

Silty clay fill material was encountered in all eight boreholes drilled for the investigation, ranging from a depth of 0.05m in BH1 to 1.9m in BH3.

Natural Soils

Natural silty clay soils underlay the fill material in all eight boreholes.

Bedrock

Shale bedrock was encountered in all eight boreholes directly below the natural silty clay layer. The depth of shale bedrock ranged from 2.5m below the surface at BH2 to 4.9m at BH7. The shale at first contact was extremely weathered and of extremely low to very low strength, increasing in strength with depth.

Groundwater

Groundwater was generally not encountered while auger drilling, with the exception of BH5 in which groundwater seepage was encountered at a depth of 7m. A standpipe was installed in BH3 and the groundwater depth stabilised at 5.3m.

No long-term groundwater monitoring or analysis was undertaken.

10.2 Laboratory Results

The laboratory reports are presented in Appendix B. The results have been assessed against the SAC adopted for this investigation.

10.2.1 Soil Samples

The soil laboratory results are presented in Table B. The analytical reports are presented in Appendix B. The results of the analyses are summarised below. The analytical reports also include results for three other boreholes – BH9, BH10 and BH11. These results relate to a separate part of the university that is addressed in a separate report.

Heavy Metals

Eight fill and eight natural soil samples were analysed for heavy metals. The results of the analyses were below the SAC.

Waste Classification:

The results of all analyses except one (BH1 (0.0-0.3m)) were less than the CT1 (General Solid Waste) criteria outlined in the Waste Classification Guidelines 2009. BH1 (0.0-0.3m) contained a concentration of lead (110mg/kg) marginally exceeding the CT1 criteria of 100mg/kg.

Petroleum Hydrocarbons (TPH) and Monocyclic Aromatic Hydrocarbons (BTEX)

PID soil sample headspace readings were all less than one ppm equivalent isobutylene. These results indicate a lack of PID detectable volatile organic contaminants.

Eight fill and eight natural soil samples were analysed for TPH and BTEX compounds. The results of the analyses were below the laboratory practical quantitation limit (LPQL) and the SAC.

Waste Classification:

The results of all analyses were less than the relevant CT1 and SCC1 (General Solid Waste) criteria outlined in the Waste Classification Guidelines 2009.

Polycyclic Aromatic Hydrocarbons (PAHs)

Eight fill and eight natural soil samples were analysed for a range of PAHs including benzo(a)pyrene. The results of the analyses were below the SAC.

Waste Classification:

The results of all analyses except one (BH6 (0.3-0.5m)) were less than the CT1 (General Solid Waste) criteria outlined in the Waste Classification Guidelines 2009. BH6 (0.3-0.5m) contained a concentration of benzo(a)pyrene (B(a)P) (0.9mg/kg) marginally exceeding the CT1 criteria of 0.8mg/kg. The 95% Upper Confidence Limit (UCL) on the mean was calculated for all of the B(a)P in fill soil results using ProUCL v4.1. A print out of the worksheet is attached in Appendix F. The 95% UCL on the mean B(a)P concentration in the fill soil samples was 0.598 mg/kg. This result is less than the CT1 criterion if 0.8mg/kg.

Organochlorine (OCPs) and Organophosphorous (OPPs) Pesticides

Eight fill and eight natural soil samples were analysed for a range of OCPs and OPPs. The results of the analyses were below the laboratory PQL and less than the SAC.

Waste Classification:

The results of all analyses were less than the SCC1 criteria outlined in the Waste Classification Guidelines 2009.

Polychlorinated Biphenyls (PCBs)

Eight fill and eight natural soil samples were analysed for a range of PCBs. The results of the analyses were below the laboratory PQL and less than the SAC.

Waste Classification:

The results of all analyses were less than the SCC1 criteria outlined in the Waste Classification Guidelines 2009.

Asbestos

Eight fill soil samples and eight natural soil samples were screened for the presence of asbestos fibres. The results of the analyses indicated that asbestos fibres were not encountered within the samples and no respirable fibres were detected.

11 ASSESSMENT OF ANALYTICAL QA/QC

The DQOs and DQIs established for the investigation have been assessed in this section of the report. The assessment includes a review of the laboratory QA/QC procedure to assess whether the sample data is reliable.

The laboratory reports for this investigation have been checked and issued as final by:

- Envirolab Services Pty Ltd
  NATA Accreditation No. 2901
  Report numbers: 53345, 54054

The RPD results for the field QA/QC duplicate samples are summarised in Table C. An assessment of the DQIs adopted for this investigation is summarised in the following table. A brief explanation of the individual DQI is presented in Appendix D.

DQO	Number of Samples	DQI
Precision:		
Intra-laboratory duplicates Sample Reference: QC1 is a duplicate of soil sample BH2 (0.3-0.5) QC2 is a duplicate of soil sample BH4 (0.5-0.95)	Soil: 2	The intra-laboratory RPD values indicated that field precision was acceptable. Values outside the acceptable limits can be attributed to results that are close to PQL. As both the initial results and the duplicate results were less than the SAC these results are not considered to have had an adverse impact on the data set at a whole.
Laboratory duplicate RPD values	Soil: 4	Laboratory duplicate RPD results for the soil analysis were within the acceptance criteria adopted by the laboratory/laboratories.
Accuracy:		
Surrogate Spikes	All organic analytes	Laboratory accuracy was good and that no outliers were reported.
Laboratory Control Sample (LCS)	Soil: 4	Laboratory accuracy was good and that no outliers were reported.
Representativeness:		
Samples extracted and analysed within holding time	All Samples	All samples were extracted and analysed within the appropriate holding times outlined in the investigation procedure.
Analysis of Laboratory Blanks	Soil	All laboratory blanks were found to be free of analyte concentrations above the PQLs.
Comparability:		
EIS sampling protocols	All Samples	Sampling was undertaken in accordance with the EIS sampling protocols outlined in Appendix D.
Standard laboratory analytical methods used	All Samples	All Samples

DQO	Number of Samples	DQI
Samples obtained by qualified staff	All Samples	All Samples
Completeness:		
Documentation (including site notes, borehole logs and COC etc) was correctly maintained	All Samples	All Samples
Samples obtained were analysed for the contaminants of concern	All Samples	All Samples
Appropriate analytical methods used by the laboratory.	All Samples	All Samples

12 DISCUSSION

The Stage 1 and preliminary Stage 2 environmental site assessment undertaken for the proposed development was designed to assess the potential risk of significant soil contamination at the site in relation to the proposed development of the site for commercial land use.

12.1 Summary of Soil Conditions

Soil samples obtained for the investigation were analysed for the potential contaminants of concern identified at the site.

Elevated concentrations of contaminants were not encountered in the soil samples analysed for the investigation. All results were below the site assessment criteria (SAC) and were below the PPILs.

Based on the results, EIS are of the opinion that the potential for significant widespread soil contamination at the site is relatively low.

12.1.1 Asbestos in Soil

Asbestos was not detected above the reporting limit in the soil samples analysed for the investigation.

12.2 Waste Classification

12.2.1 Classification of Fill Soils

Based on the results of the assessment, the fill material is likely to be classified as 'General Solid Waste (non-putrescible)' according to the criteria outlined in Waste Classification Guidelines 2009.

12.2.2 Classification of Natural Soil and Bedrock

The natural silty clay and underlying shale bedrock at the site is considered to be virgin excavated natural material (VENM). The material is considered suitable for re-use on-site, or alternatively, the information included in this report may be used to assess whether the material is suitable for beneficial reuse at another site as fill material. Where doubt exists about the difference between fill and VENM material an environmental/geotechnical engineer should be contacted.

VENM must not be mixed with any fill material (including building rubble) as this will invalidate the VENM classification.

In the event the natural soils require disposal to a NSW DECCW (EPA) licensed landfill, the material can be disposed as 'General Solid Waste (non-putrescible)'.

12.3 Conclusion

Based on the scope of work undertaken for this assessment EIS consider that the site can be made suitable for the proposed development provided that the site is inspected by experienced environmental personnel during demolition and excavation works to assess any unexpected conditions or subsurface facilities that may be discovered between investigation locations. This should facilitate appropriate adjustment of the works programme and schedule in relation to the changed site conditions.

13 LIMITATIONS

The conclusions developed in this report are based on site conditions which existed at the time of the site assessment and the scope of work outlined previously in this report. They are based on investigation of conditions at specific locations, chosen to be as representative as possible under the given circumstances, and visual observations of the site and vicinity, together with the interpretation of available historical information and documents reviewed as described in this report.

The investigation for this assessment and preparation of this report have been undertaken in accordance with accepted practice for environmental consultants, with reference to applicable environmental regulatory authority and industry standards, guidelines and assessment criteria.

Where information has been provided by third parties, EIS has not undertaken any verification process, except where specifically stated.

EIS has not undertaken any assessment of off-site areas that may be potential contamination sources or may have been impacted by site contamination.

No subsurface investigation, sampling or analysis has been undertaken for this assessment. EIS cannot comment on actual contamination conditions at this site.

In addition, unrecorded excavation and burial of material may have occurred on the site. Backfilling of excavations could have been undertaken with potentially contaminated material that may be discovered in discrete, isolated locations across the site during construction work.

EIS accept no responsibility for potentially asbestos containing materials that may exist at the site. These materials may be associated with fill material at the site.

EIS have not and will not make any determination regarding finances associated with the site.

Changes in the proposed or current site use may result in remediation or further investigation being required at the site.

During construction at the site, soil, fill and any unsuspected materials that are encountered should be monitored by qualified environmental and geotechnical engineers to confirm assumptions made on the basis of the limited investigation data,

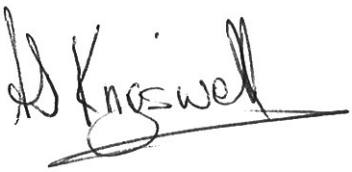
and possible changes in site level and other conditions since the investigation. Soil materials considered to be suitable from a geotechnical point of view may be unsatisfactory from a soil contamination viewpoint, and vice versa.

This report has been prepared for the particular project described and no responsibility is accepted for the use of any part of this report in any other context or for any other purpose. Copyright in this report is the property of EIS. EIS has used a degree of care, skill and diligence normally exercised by consulting engineers in similar circumstances and locality. No other warranty expressed or implied is made or intended. Subject to payment of all fees due for the investigation, the client alone shall have a licence to use this report.

Should you require any further information regarding the above, please do not hesitate to contact us.

Yours faithfully
For and on behalf of
ENVIRONMENTAL INVESTIGATION SERVICES

Rob Muller
Environmental Scientist



Adrian Kingswell
Senior Associate

ABBREVIATIONS

AHD	Australian Height Datum
ASS	Acid Sulfate Soil
BTEX	Benzene, Toluene, Ethyl benzene, Xylene
CLM	Contaminated Land Management
DECCW	Department of Environment, Climate Change and Water (formerly DECC, DEC and EPA)
DP	Deposited Plan
EPA NSW	Environment Protection Authority, New South Wales (now part of DECCW)
OCPs	Organochlorine Pesticides
PAH	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
SEPP	State Environmental Planning Policy
TPH	Total Petroleum Hydrocarbons
UST	Underground Storage Tank

IMPORTANT INFORMATION ABOUT THE SITE ASSESSMENT REPORT

These notes have been prepared by EIS to assist with the assessment and interpretation of this report.

An Environmental Assessment Report is Based on a Unique Set of Project Specific Factors:

This report has been prepared in response to specific project requirements as stated in the EIS proposal document which may have been limited by instructions from the client. This report should be reviewed, and if necessary, revised if any of the following occur:

- the proposed land use is altered;
- the defined subject site is increased or sub-divided;
- the proposed development details including size, configuration, location, orientation of the structures are modified;
- the proposed development levels are altered, e.g. addition of basement levels; or
- ownership of the site changes.

EIS/J&K will not accept any responsibility whatsoever for situations where one or more of the above factors have changed since completion of the assessment. If the subject site is sold, ownership of the assessment report should be transferred by EIS to the new site owners who will be informed of the conditions and limitations under which the assessment was undertaken. No person should apply an assessment for any purpose other than that originally intended without first conferring with the consultant.

Changes in Subsurface Conditions

Subsurface conditions are influenced by natural geological and hydrogeological process and human activities. Groundwater conditions are likely to vary over time with changes in climatic conditions and human activities within the catchment (e.g. Water extraction for irrigation or industrial uses, subsurface waste water disposal, construction related dewatering). Soil and groundwater contaminant concentrations may also vary over time through contaminant migration, natural attenuation of organic contaminants, ongoing contaminating activities and placement or removal of fill material. The conclusions of an assessment report may have been affected by the above factors if a significant period of time has elapsed prior to commencement of the proposed development.

This Assessment is Based on Professional Interpretations of Factual Data

Site assessments identify actual subsurface conditions at the actual sampling locations at the time of the investigation. Data obtained from the sampling and subsequent laboratory analyses, available site history information and published regional information is interpreted by geologists, engineers or environmental scientists and opinions are drawn about the overall subsurface conditions, the nature and extent of contamination, the likely impact on the proposed development and appropriate remediation measures.

Actual conditions may differ from those inferred, because no professional, no matter how qualified, and no subsurface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than an assessment indicates. Actual conditions in areas not sampled may differ from predictions. Nothing can be done to prevent the unanticipated, but steps can be taken to help minimise the impact. For this reason, site owners should retain the services of their consultants throughout the development stage of the project, to identify variances, conduct additional tests which may be needed, and to recommend solutions to problems encountered on site.

Environmental Site Assessment Limitations

Although information provided by an environmental site assessment can reduce exposure to the risk of the presence of contamination, no environmental site assessment can eliminate the risk. Even a rigorous professional assessment may not detect all contamination on a site. Contaminants may be present in areas that were not surveyed or sampled, or may migrate to areas which showed no signs of contamination when sampled. Contaminant analysis cannot possibly cover every type of contaminant which may occur; only the most likely contaminants are screened.

Misinterpretation of Environmental Site Assessments by Design Professionals

Costly problems can occur when other design professionals develop plans based on misinterpretation of an environmental assessment report. To minimise problems associated with misinterpretations, the environmental consultant should be retained to work with appropriate professionals to explain relevant findings and to review the adequacy of plans and specifications relevant to contamination issues.

Logs Should not be Separated from the Environmental Assessment Report

Borehole and test pit logs are prepared by environmental scientists, engineers or geologists based upon interpretation of field conditions and laboratory evaluation of field samples. Logs are normally provided in our reports and these should not be re-drawn for inclusion in site remediation or other design drawings, as subtle but significant drafting errors or omissions may occur in the transfer process. Photographic

reproduction can eliminate this problem, however contractors can still misinterpret the logs during bid preparation if separated from the text of the assessment. If this occurs, delays, disputes and unanticipated costs may result. In all cases it is necessary to refer to the test of the report to obtain a proper understanding of the assessment. Please note that logs with the 'Environmental Log' header are not suitable for geotechnical purposes as they have not been peer reviewed by a Senior Geotechnical Engineer.

To reduce the likelihood of borehole and test pit log misinterpretation, the complete assessment should be available to persons or organisations involved in the project, such as contractors, for their use. Denial of such access and disclaiming responsibility for the accuracy of subsurface information does not insulate an owner from the attendant liability. It is critical that the site owner provides all available site information to persons and organisations such as contractors.

Read Responsibility Clauses Closely

Because an environmental site assessment is based extensively on judgement and opinion, it is necessarily less exact than other disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, model clauses have been developed for use in written transmittals. These are definitive clauses designed to indicate consultant responsibility. Their use helps all parties involved recognise individual responsibilities and formulate appropriate action. Some of these definitive clauses are likely to appear in the environmental site assessment, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to any questions.

TABLE A - 2
CHEMICAL CONTAMINANT CRITERIA FOR WASTE CLASSIFICATION
Waste Classification Guidelines. Part 1: Classifying Waste DECC (now DECCW) NSW July 2009

GENERAL SOLID WASTE	RESTRICTED SOLID WASTE	HAZARDOUS WASTE
IF SCC ≤ CT1, TCLP NOT NEEDED TO CLASSIFY AS GENERAL SOLID WASTE	IF SCC ≤ CT2, TCLP NOT NEEDED TO CLASSIFY AS RESTRICTED SOLID WASTE	IF SCC > CT2, TCLP NOT NEEDED TO CLASSIFY AS HAZARDOUS WASTE
IF TCLP ≤ TCLP1 AND SCC ≤ SCC1 TREAT AS GENERAL SOLID WASTE	IF TCLP ≤ TCLP2 AND SCC ≤ SCC2 TREAT AS RESTRICTED SOLID WASTE	IF TCLP > TCLP2 AND/OR SCC > SCC2 TREAT AS HAZARDOUS WASTE

	GENERAL SOLID WASTE			RESTRICTED SOLID WASTE		
CONTAMINANT	CT1 (mg/kg)	TCLP1 (mg/L)	SCC1 (mg/kg)	CT2 (mg/kg)	TCLP2 (mg/L)	SCC2 (mg/kg)
Arsenic	100	5	500	400	20	2,000
Beryllium	20	1.0	100	80	4	400
Cadmium	20	1.0	100	80	4	400
Chromium VI	100	5	1,900	400	20	7,600
Cyanide (total)	320	16	5,900	1280	64	23,600
Cyanide (Amenable)	70	3.5	300	280	14	1,200
Fluoride	3,000	150	10,000	12,000	600	40,000
Lead	100	5	1,500	400	20	6,000
Mercury	4	0.2	50	16	0.8	200
Molybdenum	100	5	1,000	400	20	4,000
Nickel	40	2	1,050	160	8	4,200
Selenium	20	1	50	80	4	200
Silver	100	5.0	180	400	20	720
Benzene	10	0.5	18	40	2	72
Toluene	288	14.4	518	1,152	57.6	2,073
Ethylbenzene	600	30	1,080	2,400	120	4,320
Total xylenes	1,000	50	1,800	4,000	200	7,200
Total petroleum hydrocarbons (C6-C9)	-	-	650	-	-	2,600
Total petroleum hydrocarbons (C10-C36) (C10-C14, C15-C28, C29-C36)	-	-	10,000	-	-	40,000
Benzo(a)pyrene	0.8	0.04	10	3.2	0.16	23
Polycyclic aromatic hydrocarbons (Total)	-	-	200	-	-	800
Polychlorinated biphenyls	-	-	<50	-	-	<50
Phenol (nonhalogenated)	288	14.4	518	1,152	57.6	2,073
Scheduled chemicals	-	-	<50	-	-	<50

NOTE:
SCC – Specific Contaminant Concentration
CT – Contaminant Threshold
TCLP – Toxicity Characteristics Leaching Procedure

TABLE B
SUMMARY OF LABORATORY TEST DATA
SOIL ASSESSMENT
All data in mg/kg unless stated otherwise

ANALYTE			HEAVY METALS								PAHs		ORGANOCHLORINE PESTICIDES				OP PESTICIDES	PCBs	PETROLEUM HYDROCARBONS								ASBESTOS FIBRES
																			Petroleum Hydrocarbons					Benzene	Toluene	Ethyl benzene	Total Xylenes	
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	B(a)P	Aldrin & Dieldrin	Chlordane	DDT, DDD & DDE	Heptachlor			C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	C_{10} - C_{36}					
PQL - Envirolab Services			4	0.5	1	1	1	0.1	1	1	-	0.05	0.1	0.1	0.1	0.1	0.1	0.1	25	50	100	100	250	0.5	0.5	1	3	100
Site Assessment Criteria ^			500 *	100 *	60% *	5000 *	1500 *	75 *	3000 *	35000 *	100 *	5 *	50 *	250 *	1000 *	50 *	0.1 ^^	50 *	65 #	nsl	nsl	nsl	1000 #	1 #	1.4 #	3.1 #	14 #	100^^
PPILs			20 **	3 **	400 **	100 **	600 **	1 **	60 **	200 **	nsl	nsl	nsl	nsl	nsl	nsl	nsl	nsl	nsl	nsl	nsl	nsl	nsl	nsl	nsl	nsl	nsl	-
General Solid Waste CT1[+]			100	20	100	nsl	100	4	40	nsl	nsl	0.8	nsl					nsl	nsl	nsl			nsl	10	288	600	1000	-
General Solid Waste SCC1[+]			500	100	1900	nsl	1500	50	1050	nsl	200	10	50					50	650	nsl			10000	18	518	1080	1800	-
Sample Reference	**Sample Depth**	**Sample Description**																										
BH1	0.0-0.3	Fill	9	LPQL	23	44	110	0.2	9	91	6.73	0.73	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH1	0.5-1.0	Natural soil	7	LPQL	13	1	11	LPQL	LPQL	2	0	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH2	0.3-0.5	Fill	7	LPQL	32	4	22	LPQL	3	8	0.26	0.06	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH2	2.0-2.3	Natural soil	5	LPQL	7	3	16	LPQL	LPQL	1	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH3	1.0-1.5	Fill	LPQL	LPQL	14	6	20	0.1	1	26	1.4	0.2	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH3	2.0-2.5	Natural soil	LPQL	LPQL	11	7	25	LPQL	LPQL	12	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH4	0.5-0.95	Fill	6	LPQL	26	5	32	LPQL	2	13	0.61	0.11	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH4	1.5-1.95	Natural soil	9	LPQL	46	2	23	LPQL	5	6	0	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH5	0.3-0.5	Fill	7	LPQL	25	27	77	0.1	7	42	2.99	0.29	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH5	2.8-3.0	Natural soil	6	LPQL	10	10	26	LPQL	1	5	0	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH6	0.3-0.5	Fill	9	LPQL	21	42	62	0.5	5	64	10	0.9	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH6	3.5-4.0	Natural soil	LPQL	LPQL	5	6	18	LPQL	LPQL	2	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH7	0.0-0.5	Fill	17	LPQL	17	40	74	0.4	10	130	3.7	0.4	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH7	2.5-2.8	Natural soil	7	LPQL	22	1	14	0.1	1	6	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH8	0.0-0.5	Fill	8	LPQL	23	27	64	0.2	6	170	4.7	0.5	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH8	0.5-1.0	Natural soil	5	LPQL	31	2	20	LPQL	2	12	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL

EXPLANATION:

^ Site Assessment Criteria: Guideline concentrations adopted for the investigation as outlined below:
* National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPC Guidelines)
Health Investigation Levels (HIL) - Column F, Commercial/Industrial
** Provisional Phyto-toxicity Investigation Levels (PPILs)
# NSW DECC (EPA) Guidelines for Assessing Service Station Sites (1994)
^^ In the absence of Australian guidelines, the laboratory PQL has been adopted as the site assessment criteria
+ NSW DECCW (EPA) Waste Classification Guidelines (2009)

Concentration above the Site Assessment Criteria **VALUE**
Concentration above PPILs ***VALUE***

ABBREVIATIONS:

PAHs: Polycyclic Aromatic Hydrocarbons
B(a)P: Benzo(a)Pyrene
PQL: Practical Quantitation Limit
LPQL: Less than PQL
OP: Organophosphorus Pesticides
PID: Photoionisation Detector
PCBs: Polychlorinated Biphenyls
UCL: Upper Level Confidence Limit on Mean Value
na: Not Analysed
nc: Not Calculated
nsl: No Set Limit

NOTE: Statistical calculation has been undertaken using ProUCL version 3.0 (USEPA). Statistical calculation has only been undertaken on fill samples.

TABLE C
SUMMARY OF LABORATORY TEST DATA
QA/QC DUPLICATE RPD RESULTS
All results in mg/kg unless stated otherwise

ANALYSIS	Envirolab PQL	INITIAL BH2 (0.3-0.5)	REPEAT QC1	MEAN	RPD %	INITIAL BH4 (0.5-0.95)	REPEAT QC2	MEAN	RPD %
Arsenic	4	7	7	7	0	6	LPQL	NC	NC
Cadmium	0.5	LPQL	LPQL	NC	NC	LPQL	LPQL	NC	NC
Chromium	1	32	31	31.5	3	26	17	21.5	5
Copper	1	4	4	4	0	5	2	3.5	0
Lead	1	22	22	22	0	32	22	27	0
Mercury	0.1	LPQL	LPQL	NC	NC	LPQL	LPQL	NC	NC
Nickel	1	3	3	3	0	2	2	2	0
Zinc	1	8	8	8	0	13	6	9.5	0
Naphthalene	0.1	LPQL	LPQL	NC	NC	LPQL	LPQL	NC	NC
Acenaphthylene	0.1	LPQL	LPQL	NC	NC	LPQL	LPQL	NC	NC
Acenaphthene	0.1	LPQL	LPQL	NC	NC	LPQL	LPQL	NC	NC
Fluorene	0.1	LPQL	LPQL	NC	NC	LPQL	LPQL	NC	NC
Phenanthrene	0.1	LPQL	0.2	0.2	NC	LPQL	LPQL	NC	NC
Anthracene	0.1	LPQL	LPQL	NC	NC	LPQL	LPQL	NC	NC
Fluoranthene	0.1	0.1	0.3	0.2	**100**	0.2	LPQL	NC	NC
Pyrene	0.1	0.1	0.3	0.2	**100**	0.2	LPQL	NC	NC
Benzo(a)anthracene	0.1	LPQL	0.1	0.1	NC	LPQL	LPQL	NC	NC
Chrysene	0.1	LPQL	0.2	0.2	NC	0.1	LPQL	NC	NC
Benzo(b)&(k)fluorant	0.2	LPQL	0.2	0.2	NC	LPQL	LPQL	NC	NC
Benzo(a)pyrene	0.05	0.06	0.1	0.08	50	0.11	LPQL	NC	NC
Indeno(123-cd)pyrene	0.1	LPQL	LPQL	NC	NC	LPQL	LPQL	NC	NC
Dibenzo(ah)anthracene	0.1	LPQL	LPQL	NC	NC	LPQL	LPQL	NC	NC
Benzo(ghi)perylene	0.1	LPQL	LPQL	NC	NC	LPQL	LPQL	NC	NC
Total OCPs	0.1	LPQL	LPQL	NC	NC	LPQL	LPQL	NC	NC
Total OPPs	0.1	LPQL	LPQL	NC	NC	LPQL	LPQL	NC	NC
Total PCBs	0.1	LPQL	LPQL	NC	NC	LPQL	LPQL	NC	NC
C_6-C_9 TPH	25	LPQL	LPQL	NC	NC	LPQL	LPQL	NC	NC
C_{10}-C_{14} TPH	50	LPQL	LPQL	NC	NC	LPQL	LPQL	NC	NC
C_{15}-C_{28} TPH	100	LPQL	LPQL	NC	NC	LPQL	LPQL	NC	NC
C_{29}-C_{36} TPH	100	LPQL	LPQL	NC	NC	LPQL	LPQL	NC	NC
Benzene	0.5	LPQL	LPQL	NC	NC	LPQL	LPQL	NC	NC
Toluene	0.5	LPQL	LPQL	NC	NC	LPQL	LPQL	NC	NC
Ethylbenzene	1	LPQL	LPQL	NC	NC	LPQL	LPQL	NC	NC
Total Xylenes	1	LPQL	LPQL	NC	NC	LPQL	LPQL	NC	NC

EXPLANATION:

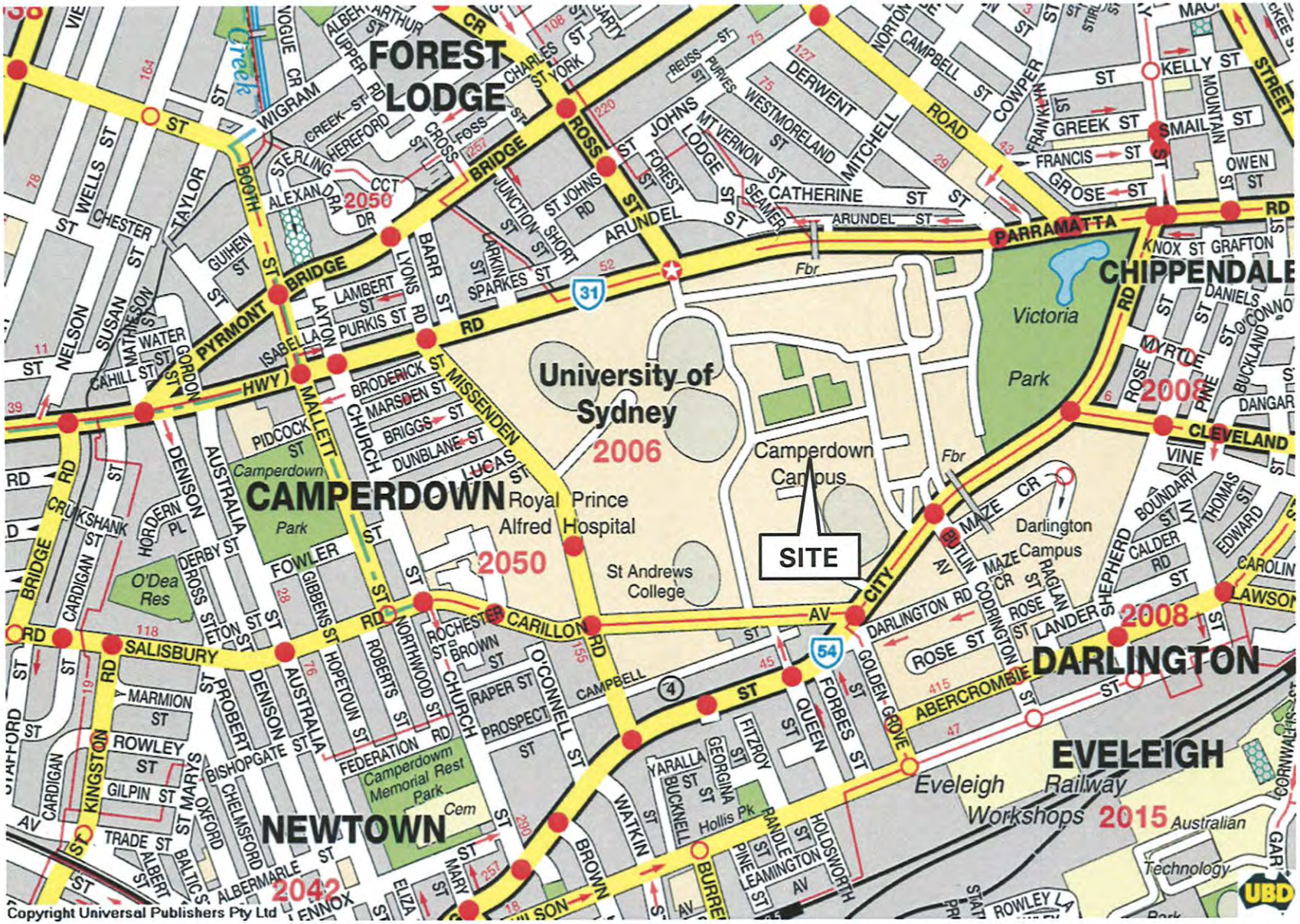
The RPD value is calculated as the absolute value of the difference between the initial and repeat results divided by the average value expressed as a percentage. The following acceptance criteria will be used to assess the RPD results:

- Results > 10 times PQL = RPD value < 50% are acceptable
- Results between 5 & 10 time PQL = RPD value < 75% are acceptable
- Results < 5 times PQL = RPD value < 100% are acceptable

RPD Results Above the Acceptance Criteria **VALUE**

ABBREVIATIONS:

PQL: Practical Quantitation Limit
LPQL: Less than PQL
NA: Not Analysed
NC: Not Calculated



NOTES:
Figure 1 has been recreated from UBD on disc (version 5.0). Figure is not to scale.

UBD Map ref: 255 M2

Reference should be made to the report text for a full understanding of this plan.

EIS ENVIRONMENTAL INVESTIGATION SERVICES	Project Number: E24782K	Title: SITE LOCATION PLAN
	Figure: 1	Address: Proposed AIN Building, University of Sydney Camperdown, NSW

N

LEGEND:

- Approximate site boundary
- BH1 (0.2) Borehole location, number and depth of fill (m)

NOTES:
Figure 2 has been recreated from Google Earth

The borehole locations presented on this plan have been established from site measurements only and should not be construed as survey points.

Reference should be made to the report text for a full understanding of this plan.

Approximate Scale (m): 0 5 10 15 20 25

ENVIRONMENTAL INVESTIGATION SERVICES

Project Number: **E24782K**	Title: **BOREHOLE LOCATION PLAN**
Figure: **2**	Address: **Proposed AIN Building, University of Sydney Camperdown, NSW**

APPENDIX A

(Borehole Logs and Geotechnical Explanatory Notes)

Jeffery and Katauskas Pty Ltd
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Borehole No. 1 1/4

BOREHOLE LOG

Client: THE UNIVERSITY OF SYDNEY CAMPUS INSTRASTRUCTURE & SERVICES

Project: PROPOSED AIN BUILDING

Location: WESTERN AVENUE, UNIVERSITY OF SYDNEY, CAMPERDOWN, NSW

Job No. 24782S **Method:** SPIRAL AUGER JK305 **R.L. Surface:** ≈ 28.9m

Date: 23-3-11 **Datum:** AHD

Logged/Checked by: P.C./

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION OF AUGERING					N > 20 6,10, 10/50mm	0		CH	FILL: Silty clay, high plasticity, dark brown and grey.	MC > PL	VSt H-	-	GRASS COVER ROOT FIBRES TO 0.05m
									SILTY CLAY: high plasticity, light grey mottled red brown, with fine to medium grained sub angular to angular ironstone gravel.			380 380 480	
					N = 27 9,12,15	1					H		RESIDUAL
						2						>600 >600 >600	
									as above, without ironstone gravel.	MC < PL			
					N > 29 14,15/ 150mm	3		-	SHALE: light grey.	XW	EL-VL	>600 >600 >600 -	
						4			SHALE: dark grey and grey.				
						5				DW	VL-L		
						6							
						7							LOW 'TC' BIT RESISTANCE WITH MODERATE BANDS

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Borehole No. 1 2/4

BOREHOLE LOG

Client: THE UNIVERSITY OF SYDNEY CAMPUS INSTRASTRUCTURE & SERVICES

Project: PROPOSED AIN BUILDING

Location: WESTERN AVENUE, UNIVERSITY OF SYDNEY, CAMPERDOWN, NSW

Job No. 24782S **Method:** SPIRAL AUGER JK305 **R.L. Surface:** ≈ 28.9m

Date: 23-3-11 **Datum:** AHD

Logged/Checked by: P.C./

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES D8	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
									SHALE: dark grey and grey.	DW	L-M		
						8			SHALE: dark grey and light grey.		M-H		
						9							
									REFER TO CORED BOREHOLE LOG				
						10							
						11							
						12							
						13							
						14							

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Borehole No. 1 3/4

CORED BOREHOLE LOG

Client: THE UNIVERSITY OF SYDNEY CAMPUS INSTRASTRUCTURE & SERVICES
Project: PROPOSED AIN BUILDING
Location: WESTERN AVENUE, UNIVERSITY OF SYDNEY, CAMPERDOWN, NSW

Job No. 24782S **Core Size:** NMLC **R.L. Surface:** ≈ 28.9m
Date: 23-3-11 **Inclination:** VERTICAL **Datum:** AHD
Drill Type: JK305 **Bearing:** - **Logged/Checked by:** P.C./

Water Loss/Level	Barrel Lift	Depth (m)	Graphic Log	CORE DESCRIPTION (Rock Type, grain characteristics, colour, structure, minor components.)	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_S(50)$	DEFECT DETAILS: DEFECT SPACING (mm)	DEFECT DETAILS: DESCRIPTION (Type, inclination, thickness, planarity, roughness, coating.) Specific / General
		9		START CORING AT 9.44m					
FULL RET-URN		10		SHALE: dark grey, with frequent light grey laminae, bedded at 0-5°.	SW	H			- 9.72-9.84m J, 70°, P, R - XWS, 15mm.t - XWS, 90mm.t
					DW	L			- XWS, 20mm.t - XWS, 10mm.t - Cr, 60mm.t
		11		as above, but laminae at 5-40°	SW	H			- XWS, 20mm.t - XWS, 100mm.t - XWS, 10°, 8mm.t - XWS, 30°, 15mm.t - Cr, 25°, 135mm.t - J, 90°, P, S
		12							- CS, 15mm.t - XWS, 15mm.t - XWS, 10mm.t - XWS, 8mm.t
		13		as above, but laminae at 0-5°.		M			- Cr, 46mm.t
		14		as above, but laminae at 5-35°		H			- XWS, 11mm.t - J, 20°, Un, S, CLAY INFILL - J, 20°, P, S -XWS, 80mm.t - XWS, 10mm.t
		15		as above, but occasional laminae at 0-5°		L-M			- XWS, 80mm.t
						H			- XWS, 0°, 40mm.t - XWS, 15mm.t - CS, 15mm.t - XWS, 13mm.t - CS, 0°, 20mm.t

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Borehole No. 1 4/4

CORED BOREHOLE LOG

Client: THE UNIVERSITY OF SYDNEY CAMPUS INSTRASTRUCTURE & SERVICES
Project: PROPOSED AIN BUILDING
Location: WESTERN AVENUE, UNIVERSITY OF SYDNEY, CAMPERDOWN, NSW

Job No. 24782S **Core Size:** NMLC **R.L. Surface:** ≈ 28.9m
Date: 23-3-11 **Inclination:** VERTICAL **Datum:** AHD
Drill Type: JK305 **Bearing:** - **Logged/Checked by:** P.C./

Water Loss/Level	Barrel Lift	Depth (m)	Graphic Log	CORE DESCRIPTION (Rock Type, grain characteristics, colour, structure, minor components.)	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_S(50)$ (EL VL L M H VH EH)	DEFECT DETAILS: DEFECT SPACING (mm) (500 300 100 50 30 10)	DEFECT DETAILS: DESCRIPTION (Type, inclination, thickness, planarity, roughness, coating.) Specific	General
		17		SHALE: dark grey, with laminae at 0-5°.	SW	H M-H	×		- XWS, 15mm.t -CS, 20mm.t - XWS, 12mm.t - XWS, 10mm.t - CS, 10mm.t - XWS, 10mm.t	
		18		END OF BOREHOLE AT 17.87m						
		19								
		20								
		21								
		22								

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Borehole No. 2 1/2

BOREHOLE LOG

Client: THE UNIVERSITY OF SYDNEY CAMPUS INSTRASTRUCTURE & SERVICES

Project: PROPOSED AIN BUILDING

Location: WESTERN AVENUE, UNIVERSITY OF SYDNEY, CAMPERDOWN, NSW

Job No. 24782S **Method:** SPIRAL AUGER JK305 **R.L. Surface:** ≈ 27.9m

Date: 16-3-11 **Datum:** AHD

Logged/Checked by: P.C./

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION OF AUGERING						0			FILL: Silty clay, medium plasticity, brown, with roots and root fibres.				
					N = 14 7,7,7			CH	SILTY CLAY: high plasticity, light grey, with a trace of fine to medium grained angular ironstone gravel.	MC≈PL	H	>600 >600 >600	RESIDUAL
					N = 19 7,8,11	1				MC>PL		450 550 >600	
					N = 38 10,17,21	2		-	SHALE: light grey.	XW	EL	-	VERY LOW 'TC' BIT RESISTANCE
					N > 11 10,11/ 50mm	3							
						4							
						5				DW	VL-L		LOW RESISTANCE
						6			SHALE: dark grey.		M		
						7			REFER TO CORED BOREHOLE LOG				

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Borehole No. 2 2/2

CORED BOREHOLE LOG

Client: THE UNIVERSITY OF SYDNEY CAMPUS INSTRASTRUCTURE & SERVICES
Project: PROPOSED AIN BUILDING
Location: WESTERN AVENUE, UNIVERSITY OF SYDNEY, CAMPERDOWN, NSW

Job No. 24782S | **Core Size:** NMLC | **R.L. Surface:** ≈ 27.9m
Date: 23-3-11 | **Inclination:** VERTICAL | **Datum:** AHD
Drill Type: JK305 | **Bearing:** - | **Logged/Checked by:** P.C./

Water Loss/Level	Barrel Lift	Depth (m)	Graphic Log	CORE DESCRIPTION (Rock Type, grain characteristics, colour, structure, minor components.)	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_S(50)$ (EL VL L M H VH EH)	DEFECT DETAILS: DEFECT SPACING (mm)	DEFECT DETAILS: DESCRIPTION (Type, inclination, thickness, planarity, roughness, coating.) Specific / General
		6		START CORING AT 6.84m					
		7		SILTY CLAY: high plasticity, brown, trace of fine grained shale gravel.	SW	M			
				CORE LOSS 0.04m					
				SHALE: dark grey, frequent light grey laminae, bedded at 0-10°.					- Be, 0°, P, S, IS - Be, 0°, P, R, IS - Be, 0°, P, S, IS - Be, 0°, P, S, IS - Be, 0°, P, S, IS - Be, 0°, P, R, IS
		8							- J, 75°, P, S - Be, 0°, P, R, IS - XWS, 170mm.t - XWS, 15mm.t
		9				M-H			
5-15% RET-URN		10				M			- CS, 2mm.t - Cr, 30mm.t - J, 45°, CLAY INFILL - J, 30°, P, S
		11							- J, 35°, CLAY INFILL - J, 20°, P - J, 45°, P, R
		12							- XWS, 10mm.t - XWS, 10mm.t - XWS, 20mm.t - CS, 15mm.t - CS, 15mm.t
				END OF BOREHOLE AT 12.81m					

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Borehole No. 3 1/2

BOREHOLE LOG

Client: THE UNIVERSITY OF SYDNEY CAMPUS INSTRASTRUCTURE & SERVICES

Project: PROPOSED AIN BUILDING

Location: WESTERN AVENUE, UNIVERSITY OF SYDNEY, CAMPERDOWN, NSW

Job No. 24782S **Method:** SPIRAL AUGER JK305 **R.L. Surface:** ≈ 27.1m

Date: 16-3-11 **Datum:** AHD

Logged/Checked by: P.C./

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION OF AUGERING					N = 15 7,8,7	0			FILL: Silty clay, medium plasticity, dark grey brown, with root fibres.				GRASS COVER ROOT FIBRES TO 0.05m
									FILL: Silty clay, high plasticity, light grey, brown and dark grey, trace of fine to medium grained ironstone gravel.	MC<PL		>600 >600	APPEARS WELL COMPACTED TOO FRIABLE FOR HP TESTING
					N = 15 6,7,8	1			FILL: Silty clay, high plasticity, dark grey mottled orange brown, fine to medium grained rounded ironstone gravel.				
▼ ON COMPLETION OF CORING						2		CH	SILTY CLAY: high plasticity, light grey, trace of fine to medium grained sub rounded ironstone gravel.	MC>PL	H		RESIDUAL
					N = 28 8,12,16	3						>600 >600 >600	
						4		-	SHALE: light grey, red brown and dark grey.	XW	EL	-	
					SPT 13/80mm REFUSAL	5					VL-L		
▼ ON 24-3-11										DW	L-M		50mm DIA. PVC STANDPIPE INSTALLED TO 9.96m. SLOTTED FROM 4m TO 9.96m. BACKFILLED WITH 2mm SAND FROM 4m TO 9.96m
						6							
						7			REFER TO CORED BOREHOLE LOG				

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Borehole No. 3 2/2

CORED BOREHOLE LOG

Client:	THE UNIVERSITY OF SYDNEY CAMPUS INSTRASTRUCTURE & SERVICES
Project:	PROPOSED AIN BUILDING
Location:	WESTERN AVENUE, UNIVERSITY OF SYDNEY, CAMPERDOWN, NSW

Job No. 24782S	**Core Size:** NMLC	**R.L. Surface:** ≈ 27.1m
Date: 23-3-11	**Inclination:** VERTICAL	**Datum:** AHD
Drill Type: JK305	**Bearing:** -	**Logged/Checked by:** P.C./

Water Loss/Level	Barrel Lift	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, structure, minor components.	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_S(50)$	DEFECT DETAILS DEFECT SPACING (mm)	DESCRIPTION Type, inclination, thickness, planarity, roughness, coating. Specific / General
		6		START CORING AT 6.85m					
FULL RET-URN		7		SHALE: dark grey, with light grey laminae, bedded at 0-5°.	SW	M-H			- J, 80°, P, S - XWS, 70mm.t - XWS, 10mm.t - Be, 0°, Un, S - XWS, 22mm.t - Be, 0°, Un, S, CLAY INFILL - CS, 7mm.t - CS, 10mm.t - CS, 8mm.t - XWS, 20mm.t - XWS, 8mm.t - XWS, 30mm.t - XWS, 10mm.t - XWS, 9mm.t - XWS, 0°, 10mm.t - Be, 0°, Un, S, IS - XWS, 30mm.t - CS, 11mm.t - XWS, 8mm.t - XWS, 15mm.t - XWS, 30mm.t - XWS, 7mm.t - XWS, 10mm.t - XWS, 12mm.t - XWS, 10mm.t - XWS, 50mm.t - CS, 11mm.t - XWS, 30mm.t - XWS, 20mm.t
		8							
		9							
		10		END OF BOREHOLE AT 9.96m					
		11							
		12							

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Borehole No. 4 1/3

BOREHOLE LOG

Client: THE UNIVERSITY OF SYDNEY CAMPUS INSTRASTRUCTURE & SERVICES

Project: PROPOSED AIN BUILDING

Location: WESTERN AVENUE, UNIVERSITY OF SYDNEY, CAMPERDOWN, NSW

Job No. 24782S **Method:** SPIRAL AUGER JK305 **R.L. Surface:** ≈ 25.1m

Date: 22-3-11 **Datum:** AHD

Logged/Checked by: D.W./

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
						0		-	ASPHALTIC CONCRETE: 50mm.t	D			
					N = 9 4,5,4				FILL: Gravelly sand, fine to medium grained, dark brown, fine to coarse grained sub rounded and sub angular igneous gravel, trace of silt.	MC>PL			APPEARS MODERATELY COMPACTED
						1			FILL: Silty clay, high plasticity, light grey and brown, trace of root fibres and ironstone and igneous gravel.				
					N = 10 3,4,6			CH	SILTY CLAY: high plasticity, brown, with red brown mottling, with root fibres and a trace of fine to coarse grained ironstone gravel.	MC>PL	St-VSt	100 210 360	
▼ ON COMPLETION						2							
									as above, but medium plasticity, light grey mottled orange brown and red brown.	MC≈PL	VSt-H		
					N = 20 4,9,11	3				MC<PL		470 500 240	
						4		CL	SILTY CLAY: low plasticity, light grey.	MC<PL			RESIDUAL
					N > 18 8,12/ 90mm REFUSAL			-	SHALE: light grey.	XW	EL	-	
						5			as above, but dark grey and light grey.	DW	VL-L		VERY LOW TO LOW RESISTANCE
						6							
						7					L-M		

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Borehole No. 4 2/3

BOREHOLE LOG

Client: THE UNIVERSITY OF SYDNEY CAMPUS INSTRASTRUCTURE & SERVICES

Project: PROPOSED AIN BUILDING

Location: WESTERN AVENUE, UNIVERSITY OF SYDNEY, CAMPERDOWN, NSW

Job No. 24782S **Method:** SPIRAL AUGER JK305 **R.L. Surface:** ≈ 25.1m

Date: 22-3-11 **Datum:** AHD

Logged/Checked by: D.W./

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
									SHALE: dark grey. REFER TO CORED BOREHOLE LOG	DW	L-M		

8
9
10
11
12
13
14

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Borehole No. **4** 3/3

CORED BOREHOLE LOG

Client: THE UNIVERSITY OF SYDNEY CAMPUS INSTRASTRUCTURE & SERVICES

Project: PROPOSED AIN BUILDING

Location: WESTERN AVENUE, UNIVERSITY OF SYDNEY, CAMPERDOWN, NSW

Job No. 24782S **Core Size:** NMLC **R.L. Surface:** ≈ 25.1m

Date: 23-3-11 **Inclination:** VERTICAL **Datum:** AHD

Drill Type: JK305 **Bearing:** - **Logged/Checked by:** D.W./

Water Loss/Level	Barrel Lift	Depth (m)	Graphic Log	CORE DESCRIPTION (Rock Type, grain characteristics, colour, structure, minor components.)	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_S(50)$ (EL, VL, L, M, H, VH, EH)	DEFECT SPACING (mm) (500, 300, 100, 50, 30, 10)	DEFECT DETAILS: DESCRIPTION Type, inclination, thickness, planarity, roughness, coating. Specific / General
		7		START CORING AT 7.06m					
				CORE LOSS					
		8		SHALE: dark grey, with light grey laminae.	SW	M-H			· Be, 0°, Un, S · Cr · Be, 0°, P, S · Be, 0°, P, S, IS
		9							
		10							
				END OF BOREHOLE AT 10.13m					
		11							
		12							
		13							

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Borehole No. 5 1/3

BOREHOLE LOG

Client: THE UNIVERSITY OF SYDNEY CAMPUS INSTRASTRUCTURE & SERVICES

Project: PROPOSED AIN BUILDING

Location: WESTERN AVENUE, UNIVERSITY OF SYDNEY, CAMPERDOWN, NSW

Job No. 24782S **Method:** SPIRAL AUGER JK305 **R.L. Surface:** ≈ 26.1m

Date: 22-3-11 **Datum:** AHD

Logged/Checked by: P.C./

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
						0			FILL: Silty clay, high plasticity, dark brown, trace of fine to medium grained rounded to angular ironstone and sandstone gravel.	MC>PL		420 510 600	GRASS COVER APPEARS WELL COMPACTED
					N = 15 6,7,8	1			FILL: Silty clay, high plasticity, dark brown, trace of fine to medium grained rounded ironstone gravel.				
					N = 17 6,7,10	2		CH	SILTY CLAY: high plasticity, brown mottled light grey and orange brown, trace of fine to medium grained rounded to angular ironstone gravel.	MC>PL	H	420 500 550	
									as above, but light grey mottled red brown.				
					N > 23 14,23/ 150mm REFUSAL	3		CL	SILTY CLAY: medium plasticity, light grey, trace of fine to medium grained rounded to angular ironstone gravel.	MC≈PL		>600 >600 >600	RESIDUAL
▼ ON COMPLETION OF CORING						4			SHALE: light grey.	XW	EL-VL		LOW 'TC' BIT RESISTANCE
									SHALE: light grey and dark grey.		VL-L		
						6			SHALE: dark grey.	XW-DW	L-M		MODERATE RESISTANCE
▼ ON COMPLETION OF AUGERING						6				DW	M		
						7							

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CONSULTING GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 5 2/3

BOREHOLE LOG

Client: THE UNIVERSITY OF SYDNEY CAMPUS INSTRASTRUCTURE & SERVICES

Project: PROPOSED AIN BUILDING

Location: WESTERN AVENUE, UNIVERSITY OF SYDNEY, CAMPERDOWN, NSW

Job No. 24782S **Method:** SPIRAL AUGER JK305 **R.L. Surface:** ≈ 26.1m

Date: 22-3-11 **Datum:** AHD

Logged/Checked by: P.C./

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
									SHALE: dark grey and light grey.	DW	M-H		MODERATE RESISTANCE WITH HIGH BANDS
									REFER TO CORED BOREHOLE LOG				
						8							
						9							
						10							
						11							
						12							
						13							
						14							

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Borehole No. 5 3/3

CORED BOREHOLE LOG

Client:	THE UNIVERSITY OF SYDNEY CAMPUS INSTRASTRUCTURE & SERVICES
Project:	PROPOSED AIN BUILDING
Location:	WESTERN AVENUE, UNIVERSITY OF SYDNEY, CAMPERDOWN, NSW

Job No. 24782S	**Core Size:** NMLC	**R.L. Surface:** ≈ 26.1m
Date: 24-3-11	**Inclination:** VERTICAL	**Datum:** AHD
Drill Type: JK305	**Bearing:** -	**Logged/Checked by:** P.C./

Water Loss/Level	Barrel Lift	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, structure, minor components.	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_S(50)$	DEFECT DETAILS DEFECT SPACING (mm)	DESCRIPTION Type, inclination, thickness, planarity, roughness, coating. Specific / General
		6					EL VL L M H VH EH	600 200 60 20 6 2	
		7		START CORING AT 7.31m					
FULL RET-URN		8		SHALE: dark grey, with light grey laminae bedded at 0°.	DW	L-M			- 7.35-7.65m XWS, BETWEEN 5-10mm.t - XWS, 0°, 13mm.t
		9			SW	M-H			- J, 30°, P, R
		10				M			
				END OF BOREHOLE AT 10.38m					
		11							
		12							

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Borehole No. 6 1/3

BOREHOLE LOG

Client: THE UNIVERSITY OF SYDNEY CAMPUS INSTRASTRUCTURE & SERVICES

Project: PROPOSED AIN BUILDING

Location: WESTERN AVENUE, UNIVERSITY OF SYDNEY, CAMPERDOWN, NSW

Job No. 24782S **Method:** SPIRAL AUGER JK305 **R.L. Surface:** ≈ 29.6m

Date: 17-3-11 **Datum:** AHD

Logged/Checked by: P.C./

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION OF AUGERING					N = 14 6,7,7	0			FILL: Silty clay, high plasticity, brown mottled orange brown, trace of ash, fine grained rounded to sub angular ironstone and igneous gravel.	MC≈PL	H	>600 >600 >600	
						1				MC>PL			
					N = 20 7,10,10							>600 >600 >600	
						2		CH	SILTY CLAY: high plasticity, light grey mottled red brown and orange brown.	MC>PL	H	520 560 >600	
					N = 36 11,16,20	3							TOO FRIABLE FOR HP TESTING
						4							
					N > 13 7,13/ 150mm REFUSAL							>600 >600 >600	
						5		-	SHALE: light grey.	XW	EL		VERY LOW 'TC' BIT RESISTANCE
						6							
									SHALE: light grey and dark grey.	DW	VL		VERY LOW TO LOW RESISTANCE
						7							

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CONSULTING GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 6 2/3

BOREHOLE LOG

Client: THE UNIVERSITY OF SYDNEY CAMPUS INSTRASTRUCTURE & SERVICES

Project: PROPOSED AIN BUILDING

Location: WESTERN AVENUE, UNIVERSITY OF SYDNEY, CAMPERDOWN, NSW

Job No. 24782S **Method:** SPIRAL AUGER JK305 **R.L. Surface:** ≈ 29.6m

Date: 17-3-11 **Datum:** AHD

Logged/Checked by: P.C./

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
						8			SHALE: light grey and dark grey.	DW	VL		LOW 'TC' BIT RESISTANCE WITH MODERATE BANDS
						9			REFER TO CORED BOREHOLE LOG				
						10							
						11							
						12							
						13							
						14							

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CONSULTING GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 6 3/3

CORED BOREHOLE LOG

Client: THE UNIVERSITY OF SYDNEY CAMPUS INSTRASTRUCTURE & SERVICES

Project: PROPOSED AIN BUILDING

Location: WESTERN AVENUE, UNIVERSITY OF SYDNEY, CAMPERDOWN, NSW

Job No. 24782S | **Core Size:** NMLC | **R.L. Surface:** ≈ 29.6m

Date: 17-3-11 | **Inclination:** VERTICAL | **Datum:** AHD

Drill Type: JK305 | **Bearing:** - | **Logged/Checked by:** P.C./

Water Loss/Level	Barrel Lift	Depth (m)	Graphic Log	CORE DESCRIPTION (Rock Type, grain characteristics, colour, structure, minor components.)	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_S(50)$ (EL VL L M H VH EH)	DEFECT DETAILS: DEFECT SPACING (mm) (600 300 100 60 30 10)	DEFECT DETAILS: DESCRIPTION (Type, inclination, thickness, planarity, roughness, coating.) Specific / General
		8		START CORING AT 8.98m					
85% RET-URN		9		SHALE: dark grey, with light grey laminae bedded at 0-5°.	DW-SW	M			- XWS, 40mm.t - XWS, 11mm.t - CS, 10mm.t - BE, 5°, Un, P, R - XWS, 10mm.t
		10							- XWS, 8mm.t - CS, 13mm.t - CS, 8mm.t
		11			DW	L			
		12			DW-SW	M			- XWS, 20mm.t - CS, 8mm.t - CS, 8mm.t - CS, 9mm.t
		13							- XWS, 40mm.t - XWS, 7mm.t - XWS, 10mm.t - XWS, 6mm.t
		14							- XWS, 5mm.t
				END OF BOREHOLE AT 14.85m					

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Borehole No. 7
1/3

BOREHOLE LOG

Client: THE UNIVERSITY OF SYDNEY CAMPUS INSTRASTRUCTURE & SERVICES

Project: PROPOSED AIN BUILDING

Location: WESTERN AVENUE, UNIVERSITY OF SYDNEY, CAMPERDOWN, NSW

Job No. 24782S **Method:** SPIRAL AUGER JK305 **R.L. Surface:** ≈ 31.0m

Date: 17-3-11 **Datum:** AHD

Logged/Checked by: P.C./

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION OF AUGER-ING						0			FILL: Silty clay, medium to high plasticity, dark brown, with root fibres.	MC < PL			GRASS COVER
					N = 20 8,9,11			CH	SILTY CLAY: high plasticity, red brown and brown, with fine to medium grained rounded ironstone gravel.	MC < PL	H	-	
						1						>600	
										MC > PL		>600	
					N = 23 9,11,12				SILTY CLAY: high plasticity, red brown mottled light grey, with fine to medium grained rounded to angular ironstone gravel.			>600	
						2						>600	
												>600	
					N = 30 10,12,18	3						>600	
												>600	
												>600	
					N > 23 12,18, 5/50mm REFUSAL	4			SILTY CLAY: high plasticity, light grey.			>600	
												>600	
						5		-	SHALE: light grey.	XW	EL	>600	VERY LOW 'TC' BIT RESISTANCE
						6			SHALE: dark grey.	M	VL-L		VERY LOW TO LOW RESISTANCE
						7							

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Borehole No. 7 2/3

BOREHOLE LOG

Client: THE UNIVERSITY OF SYDNEY CAMPUS INSTRASTRUCTURE & SERVICES
Project: PROPOSED AIN BUILDING
Location: WESTERN AVENUE, UNIVERSITY OF SYDNEY, CAMPERDOWN, NSW

Job No. 24782S **Method:** SPIRAL AUGER JK305 **R.L. Surface:** ≈ 31.0m
Date: 17-3-11 **Datum:** AHD
Logged/Checked by: P.C./

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
									SHALE: dark grey.	M	L		LOW RESISTANCE
						8			SHALE: dark grey and light grey.	(SW)	L-M		LOW TO MODERATE RESISTANCE
						9							
						10			END OF BOREHOLE AT 9.9m				
						11							
						12							
						13							
						14							

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Borehole No. 7 3/3

CORED BOREHOLE LOG

Client: THE UNIVERSITY OF SYDNEY CAMPUS INSTRASTRUCTURE & SERVICES
Project: PROPOSED AIN BUILDING
Location: WESTERN AVENUE, UNIVERSITY OF SYDNEY, CAMPERDOWN, NSW

Job No. 24782S | **Core Size:** NMLC | **R.L. Surface:** ≈ 31.0m
Date: 17-3-11 | **Inclination:** VERTICAL | **Datum:** AHD
Drill Type: JK305 | **Bearing:** - | **Logged/Checked by:** P.C./

Water Loss/Level	Barrel Lift	Depth (m)	Graphic Log	CORE DESCRIPTION (Rock Type, grain characteristics, colour, structure, minor components.)	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_S(50)$ (EL VL L M H VH EH)	DEFECT DETAILS: DEFECT SPACING (mm) (500 300 200 100 60 30 10)	DEFECT DETAILS: DESCRIPTION (Type, inclination, thickness, planarity, roughness, coating.) Specific / General
		9		START CORING AT 9.90m					
FULL RET-URN		10		SHALE: dark grey, with frequent light grey laminae, bedded at 0-5°.	SW	M-H			- J, 90°, P, S - XWS, 60mm.t - Bo, 5°, IS, P, R - XWS, 0°, 40mm.t - XWS, 25mm.t - XWS, 12mm.t - J, 70°, Un, R - CS, 5mm.t - XWS, 11mm.t - XWS, 10mm.t - XWS, 40mm.t - XWS, 40mm.t - XWS, 12mm.t - XWS, 15mm.t - J, 70°, Un, S - XWS, 6mm.t - XWS, 7mm.t - CS, 10mm.t - J, 15°, Un, S - XWS, 10mm.t - J, 70°, Un, S - XWS, 8mm.t - XWS, 8mm.t - XWS, 20mm.t - XWS, 8mm.t
		11							
		12							
		13							
		14							
		15		END OF BOREHOLE AT 15.91m					

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Borehole No. 8 1/3

BOREHOLE LOG

Client: THE UNIVERSITY OF SYDNEY CAMPUS INSTRASTRUCTURE & SERVICES

Project: PROPOSED AIN BUILDING

Location: WESTERN AVENUE, UNIVERSITY OF SYDNEY, CAMPERDOWN, NSW

Job No. 24782S **Method:** SPIRAL AUGER JK305 **R.L. Surface:** ≈ 31.6m

Date: 22-3-11 **Datum:** AHD

Logged/Checked by: P.C./

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION OF AUGERING						0			FILL: Silty clay, medium to high plasticity, dark brown and grey, trace of fine to medium grained sub rounded ironstone gravel.				GRASS COVER ROOT FIBRES TO 0.01m
					N = 15 9,8,7	1		CH	SILTY CLAY: high plasticity, light grey and red brown, with fine to medium grained rounded ironstone gravel.	MC > PL	H	>600 >600 >600	
					N = 31 9,13,18	2						>600 >600 >600	RESIDUAL
					N > 22 9,22/ 150mm REFUSAL	3			SILTY CLAY: light grey.			>600 >600	
						4		-	SHALE: light grey.	XW	EL	>600	VERY LOW TO LOW 'TC' BIT RESISTANCE
									SHALE: light grey and dark grey.		VL		
						5			SHALE: dark grey.	DW	L		
						6							
						7							

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Borehole No. 8 2/3

BOREHOLE LOG

Client: THE UNIVERSITY OF SYDNEY CAMPUS INSTRASTRUCTURE & SERVICES
Project: PROPOSED AIN BUILDING
Location: WESTERN AVENUE, UNIVERSITY OF SYDNEY, CAMPERDOWN, NSW

Job No. 24782S **Method:** SPIRAL AUGER JK305 **R.L. Surface:** ≈ 31.6m
Date: 22-3-11 **Datum:** AHD
Logged/Checked by: P.C./

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
						8			SHALE: dark grey.	DW	L		
						9			REFER TO CORED BOREHOLE LOG				
						10							
						11							
						12							
						13							
						14							

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Borehole No. **8** 3/3

CORED BOREHOLE LOG

Client: THE UNIVERSITY OF SYDNEY CAMPUS INSTRASTRUCTURE & SERVICES
Project: PROPOSED AIN BUILDING
Location: WESTERN AVENUE, UNIVERSITY OF SYDNEY, CAMPERDOWN, NSW

Job No. 24782S | **Core Size:** NMLC | **R.L. Surface:** ≈ 31.6m
Date: 17-3-11 | **Inclination:** VERTICAL | **Datum:** AHD
Drill Type: JK305 | **Bearing:** - | **Logged/Checked by:** P.C./

Water Loss/Level	Barrel Lift	Depth (m)	Graphic Log	CORE DESCRIPTION (Rock Type, grain characteristics, colour, structure, minor components.)	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_S(50)$ (EL, VL, L, M, H, VH, EH)	DEFECT SPACING (mm) (500, 300, 100, 50, 30, 10)	DEFECT DETAILS: DESCRIPTION (Type, inclination, thickness, planarity, roughness, coating.) Specific / General
		8		START CORING AT 9.00m					
FULL RET-URN		9		SHALE: dark grey, with light grey laminae, bedded at 0-5°	DW	M	×		- XWS, 0°, 6mm.t
							×		- XWS, 140mm.t - HIGHLY FRACTURED ZONE, 200mm.t
		10					×		- CS, 26mm.t
							×		- XWS, 6mm.t
		11			SW		×		
							×		- Cr, 40mm.t
		12			SW-FR	H	×		- J, HEALED, 30°, Un, R - XWS, 10mm.t
							×		
		13					×		- J, 60°, P, S - J, 9°, P, S
							×		- XWS, 80mm.t
		14		END OF BOREHOLE AT 13.68m					

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ABN 17 003 550 801

REPORT EXPLANATION NOTES

INTRODUCTION

These notes have been provided to amplify the geotechnical report in regard to classification methods, field procedures and certain matters relating to the Comments and Recommendations section. Not all notes are necessarily relevant to all reports.

The ground is a product of continuing natural and man-made processes and therefore exhibits a variety of characteristics and properties which vary from place to place and can change with time. Geotechnical engineering involves gathering and assimilating limited facts about these characteristics and properties in order to understand or predict the behaviour of the ground on a particular site under certain conditions. This report may contain such facts obtained by inspection, excavation, probing, sampling, testing or other means of investigation. If so, they are directly relevant only to the ground at the place where and time when the investigation was carried out.

DESCRIPTION AND CLASSIFICATION METHODS

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

Soil types are described according to the predominating particle size and behaviour as set out in the attached Unified Soil Classification Table qualified by the grading of other particles present (eg sandy clay) as set out below:

Soil Classification	Particle Size
Clay	less than 0.002mm
Silt	0.002 to 0.06mm
Sand	0.06 to 2mm
Gravel	2 to 60mm

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

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

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

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

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

SAMPLING

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

Disturbed samples taken during drilling provide information on plasticity, grain size, colour, moisture content, minor constituents and, depending upon the degree of disturbance, some information on strength and structure. Bulk samples are similar but of greater volume required for some test procedures.

Undisturbed samples are taken by pushing a thin-walled sample tube, usually 50mm diameter (known as a U50), into the soil and withdrawing it with a sample of the soil contained 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.

Details of the type and method of sampling used are given on the attached logs.

INVESTIGATION METHODS

The following is a brief summary of investigation methods currently adopted by the Company and some comments on their use and application. All except test pits, hand auger drilling and portable dynamic cone penetrometers require the use of a mechanical drilling rig which is commonly mounted on a truck chassis.

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

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

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

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

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

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

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

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

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

The test results are reported in the following form:

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

  N = 13
  4, 6, 7

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

  N>30
  15, 30/40mm

The results of the test can be related empirically to the engineering properties of the soil.

Occasionally, the drop hammer is used to drive 50mm diameter thin walled sample tubes (U50) in clays. In such circumstances, the test results are shown on the borehole logs in brackets.

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

Static Cone Penetrometer Testing and Interpretation: Cone penetrometer testing (sometimes referred to as a Dutch Cone) described in this report has been carried out using an Electronic Friction Cone Penetrometer (EFCP). The test is described in Australian Standard 1289, Test F5.1.

In the tests, a 35mm diameter rod with a conical tip is pushed continuously into the soil, the reaction being provided by a specially designed truck or rig which is fitted with an hydraulic ram system. Measurements are made of the end bearing resistance on the cone and the frictional resistance on a separate 134mm long sleeve, immediately behind the cone. Transducers in the tip of the assembly are electrically connected by wires passing through the centre of the push rods to an amplifier and recorder unit mounted on the control truck.

As penetration occurs (at a rate of approximately 20mm per second) the information is output as incremental digital records every 10mm. The results given in this report have been plotted from the digital data.

The information provided on the charts comprise:

- Cone resistance – the actual end bearing force divided by the cross sectional area of the cone – expressed in MPa.
- Sleeve friction – the frictional force on the sleeve divided by the surface area – expressed in kPa.
- Friction ratio – the ratio of sleeve friction to cone resistance, expressed as a percentage.

The ratios of the sleeve resistance to cone resistance will vary with the type of soil encountered, with higher relative friction in clays than in sands. Friction ratios of 1% to 2% are commonly encountered in sands and occasionally very soft clays, rising to 4% to 10% in stiff clays and peats. Soil descriptions based on cone resistance and friction ratios are only inferred and must not be considered as exact.

Correlations between EFCP and SPT values can be developed for both sands and clays but may be site specific.

Interpretation of EFCP values can be made to empirically derive modulus or compressibility values to allow calculation of foundation settlements.

Stratification can be inferred from the cone and friction traces and from experience and information from nearby boreholes etc. Where shown, this information is presented for general guidance, but must be regarded as interpretive. The test method provides a continuous profile of engineering properties but, where precise information on soil classification is required, direct drilling and sampling may be preferable.

Portable Dynamic Cone Penetrometers: Portable Dynamic Cone Penetrometer (DCP) tests are carried out by driving a rod into the ground with a sliding hammer and counting the blows for successive 100mm increments of penetration.

Two relatively similar tests are used:

- Cone penetrometer (commonly known as the Scala Penetrometer) – a 16mm rod with a 20mm diameter cone end is driven with a 9kg hammer dropping 510mm (AS1289, Test F3.2). The 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.
- Perth sand penetrometer – a 16mm diameter flat ended rod is driven with a 9kg hammer, dropping 600mm (AS1289, Test F3.3). This test was developed for testing the density of sands (originating in Perth) and is mainly used in granular soils and filling.

LOGS

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

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

Interpretation of the information shown on the logs, and its application to design and construction, should therefore take into account the spacing of boreholes or test pits, the method of drilling or excavation, the frequency of sampling and testing and the possibility of other than "straight line" variations between the boreholes or test pits. Subsurface conditions between boreholes or test pits may vary significantly from conditions encountered at the borehole or test pit locations.

GROUNDWATER

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

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

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

FILL

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

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

LABORATORY TESTING

Laboratory testing is normally carried out in accordance with Australian Standard 1289 *'Methods of Testing Soil for Engineering Purposes'*. Details of the test procedure used are given on the individual report forms.

ENGINEERING REPORTS

Engineering reports are prepared by qualified personnel and are based on the information obtained and on current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal (eg. a three storey building) the information and interpretation may not be relevant if the design proposal is changed (eg to a twenty storey building). If this happens, the company 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 aspects and recommendations or suggestions for design and construction. However, the Company cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions – the potential for this will be partially dependent on borehole spacing and sampling frequency as well as investigation technique.
- Changes in policy or interpretation of policy by statutory authorities.
- The actions of persons or contractors responding to commercial pressures.

If these occur, the company will be pleased to assist with investigation or advice to resolve any problems occurring.

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, the company requests that it immediately be notified. Most problems are much more readily resolved when conditions are exposed that at some later stage, well after the event.

REPRODUCTION OF INFORMATION FOR CONTRACTUAL PURPOSES

Attention is drawn to the document *'Guidelines for the Provision of Geotechnical Information in Tender Documents'*, published by the Institution of Engineers, Australia. Where information obtained from this investigation 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. The company would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

REVIEW OF DESIGN

Where major civil or structural developments are proposed or where only a limited investigation has been completed or where the geotechnical conditions/ constraints are quite complex, it is prudent to have a joint design review which involves a senior geotechnical engineer.

SITE INSPECTION

The company will always be pleased to provide engineering inspection services for geotechnical aspects of work to which this report is related.

Requirements could range from:

i) a site visit to confirm that conditions exposed are no worse than those interpreted, to

ii) a visit to assist the contractor or other site personnel in identifying various soil/rock types such as appropriate footing or pier founding depths, or

iii) full time engineering presence on site.

Jeffery and Katauskas Pty Ltd
CONSULTING GEOTECHNICAL & ENVIRONMENTAL ENGINEERS

GRAPHIC LOG SYMBOLS FOR SOILS AND ROCKS

SOIL


FILL


TOPSOIL


CLAY (CL, CH)


SILT (ML, MH)


SAND (SP, SW)


GRAVEL (GP, GW)


SANDY CLAY (CL, CH)


SILTY CLAY (CL, CH)


CLAYEY SAND (SC)


SILTY SAND (SM)


GRAVELLY CLAY (CL, CH)


CLAYEY GRAVEL (GC)


SANDY SILT (ML)


PEAT AND ORGANIC SOILS

ROCK


CONGLOMERATE


SANDSTONE


SHALE


SILTSTONE, MUDSTONE, CLAYSTONE


LIMESTONE


PHYLLITE, SCHIST


TUFF


GRANITE, GABBRO


DOLERITE, DIORITE


BASALT, ANDESITE


QUARTZITE

DEFECTS AND INCLUSIONS


CLAY SEAM


SHEARED OR CRUSHED SEAM


BRECCIATED OR SHATTERED SEAM/ZONE


IRONSTONE GRAVEL


ORGANIC MATERIAL

OTHER MATERIALS


CONCRETE


BITUMINOUS CONCRETE, COAL


COLLUVIUM

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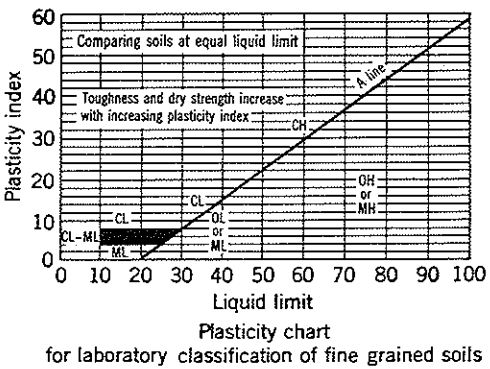
UNIFIED SOIL CLASSIFICATION TABLE

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



Plasticity chart
for laboratory classification of fine grained soils

NOTE: 1) Soils possessing characteristics of two groups are designated by combinations of group symbols (e.g. GW-GC, well graded gravel-sand mixture with clay fines).

2) Soils with liquid limits of the order of 35 to 50 may be visually classified as being of medium plasticity.

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ABN 17 003 550 801

LOG SYMBOLS

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

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ABN 17 003 550 801

LOG SYMBOLS

ROCK MATERIAL WEATHERING CLASSIFICATION

TERM	SYMBOL	DEFINITION
Residual Soil	RS	Soil developed on extremely weathered rock; the mass structure and substance fabric are no longer evident; there is a large change in volume but the soil has not been significantly transported.
Extremely weathered rock	XW	Rock is weathered to such an extent that it has "soil" properties, ie it either disintegrates or can be remoulded, in water.
Distinctly weathered rock	DW	Rock strength usually changed by weathering. The rock may be highly discoloured, usually by ironstaining. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores.
Slightly weathered rock	SW	Rock is slightly discoloured but shows little or no change of strength from fresh rock.
Fresh rock	FR	Rock shows no sign of decomposition or staining.

ROCK STRENGTH

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

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

ABBREVIATIONS USED IN DEFECT DESCRIPTION

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

APPENDIX B

(Laboratory Reports and Chain of Custody Documents)

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
Envirolab Services Pty Ltd 12 Ashley Street Chatswood NSW 2067 Phone: (02) 99106200 Fax: (02) 99106201 Attention: Aileen	EIS Job Number: E 24782K Date Results Required: Standard Sheet 1 , 2	Environmental Investigation Services Rear 115 Wicks Road Macquarie Park NSW 2113 Phone: (02) 9888 5000 Fax: (02) 9888 5004 Contact: Rob Muller

Project: Proposed Commercial Development
Location: Sydney Uni
Sampler: Peter Clousino

Sample Preservation: In esky on Ice

Tests Required

	Date Sampled	Lab Ref:	Borehole/ Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 6	Combo 6a	Combo 13	8 Metals	TPH	BTEX	PAHs	OCP/OPP/ PCBs	Asbestos	TCLP 6 Metals	TCLP PAHs	
1	16/3/11		BH7	2.5-2.9	Glass jar + Asb Bag	0.0	Soil		X										
2	↓		BH6	3.5-4.0	Glass jar + Asb Bag	0.4	↓		X										
3			BH6	0.3-0.5	Glass jar + Asb Bag	0.0			X										
4	↓		BH7	0.0-0.5	Glass jar + Asb Bag	0.2			X										
5	22/3/11		BH9	2.6-3.0	Glass jar + Asb Bag	0.3			X										
6			BH9	0.0-0.3	Glass jar + Asb Bag	0.3			X										
7			BH8	0.0-0.5	Glass jar + Asb Bag	0.1			X										
8	↓		BH8	0.5-1.0	Glass jar + Asb Bag	0.2			X										
9	16/3/11		BH3	2.0-2.5	Glass jar + Asb Bag	0.4			X										
10			BH3	1.0-1.5	Glass jar + Asb Bag	0.2			X										
11			BH2	2.0-2.3	Glass jar + Asb Bag	0.1			X										
12			BH2	0.3-0.5	Glass jar + Asb Bag	0.2			X										
13	↓		QC1	—	Glass jar + Asb Bag	–	↓		X										
					Glass jar + Asb Bag														
					Glass jar + Asb Bag														
					Glass jar + Asb Bag														
					Glass jar + Asb Bag														
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					Glass jar + Asb Bag														
					Glass jar + Asb Bag														

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: 9910 6200
Job No: 53345
Date received: 23/3
Time received: 1600
Received by:
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Remarks (comments/detection limits required):

Relinquished By:	Date:	Time:	Received By:
[signature]	23/3/11		[signature] 23/3

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

CERTIFICATE OF ANALYSIS 53345

Client:
Environmental Investigation Services
PO Box 976
North Ryde BC
NSW 1670

Attention: Rob Muller

Sample log in details:

Your Reference:	**E24782K, Sydney Uni**
No. of samples:	13 Soils
Date samples received / completed instructions received	23/03/11 / 23/03/11

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: / Issue Date:	30/03/11 / 29/03/11
Date of Preliminary Report:	Not issued

NATA accreditation number 2901. This document shall not be reproduced except in full.
This document is issued in accordance with NATA's accreditation requirements.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Jacinta Hurst
Laboratory Manager

Nancy Zhang
Chemist

Rhian Morgan
Reporting Supervisor

Matt Mansfield
Approved Signatory

Jeremy Faircloth
Chemist

Envirolab Reference: 53345
Revision No: R 00

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

vTRH & BTEX in Soil						
Our Reference:	UNITS	53345-1	53345-2	53345-3	53345-4	53345-5
Your Reference	----------	BH7	BH6	BH6	BH7	BH9
Depth	----------	2.5-2.8	3.5-4.0	0.3-0.5	0.0-0.5	2.6-3.0
Date Sampled		17/03/2011	17/03/2011	17/03/2011	17/03/2011	22/03/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	24/03/2011	24/03/2011	24/03/2011	24/03/2011	24/03/2011
Date analysed	-	26/03/2011	26/03/2011	26/03/2011	26/03/2011	26/03/2011
vTRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	89	89	90	91	90

vTRH & BTEX in Soil						
Our Reference:	UNITS	53345-6	53345-7	53345-8	53345-9	53345-10
Your Reference	----------	BH9	BH8	BH8	BH3	BH3
Depth	----------	0.0-0.3	0.0-0.5	0.5-1.0	2.0-2.5	1.0-1.5
Date Sampled		22/03/2011	22/03/2011	22/03/2011	16/03/2011	16/03/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	24/03/2011	24/03/2011	24/03/2011	24/03/2011	24/03/2011
Date analysed	-	26/03/2011	26/03/2011	26/03/2011	26/03/2011	26/03/2011
vTRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	90	86	94	86	93

vTRH & BTEX in Soil				
Our Reference:	UNITS	53345-11	53345-12	53345-13
Your Reference	----------	BH2	BH2	QC1
Depth	----------	2.0-2.3	0.3-0.5	-
Date Sampled		16/03/2011	16/03/2011	16/03/2011
Type of sample		Soil	Soil	Soil
Date extracted	-	24/03/2011	24/03/2011	24/03/2011
Date analysed	-	26/03/2011	26/03/2011	26/03/2011
vTRH C_6 - C_9	mg/kg	<25	<25	<25
Benzene	mg/kg	<0.5	<0.5	<0.5
Toluene	mg/kg	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	90	88	90

sTRH in Soil (C10-C36)						
Our Reference:	UNITS	53345-1	53345-2	53345-3	53345-4	53345-5
Your Reference	----------	BH7	BH6	BH6	BH7	BH9
Depth	----------	2.5-2.8	3.5-4.0	0.3-0.5	0.0-0.5	2.6-3.0
Date Sampled		17/03/2011	17/03/2011	17/03/2011	17/03/2011	22/03/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	24/03/2011	24/03/2011	24/03/2011	24/03/2011	24/03/2011
Date analysed	-	24/03/2011	24/03/2011	24/03/2011	24/03/2011	24/03/2011
$TRHC_{10}$ - C_{14}	mg/kg	<50	<50	<50	<50	<50
$TRHC_{15}$ - C_{28}	mg/kg	<100	<100	<100	<100	<100
$TRHC_{29}$ - C_{36}	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	109	108	111	114	102

sTRH in Soil (C10-C36)						
Our Reference:	UNITS	53345-6	53345-7	53345-8	53345-9	53345-10
Your Reference	----------	BH9	BH8	BH8	BH3	BH3
Depth	----------	0.0-0.3	0.0-0.5	0.5-1.0	2.0-2.5	1.0-1.5
Date Sampled		22/03/2011	22/03/2011	22/03/2011	16/03/2011	16/03/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	24/03/2011	24/03/2011	24/03/2011	24/03/2011	24/03/2011
Date analysed	-	24/03/2011	24/03/2011	24/03/2011	24/03/2011	24/03/2011
$TRHC_{10}$ - C_{14}	mg/kg	<50	<50	<50	<50	<50
$TRHC_{15}$ - C_{28}	mg/kg	100	<100	<100	<100	<100
$TRHC_{29}$ - C_{36}	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	112	105	107	106	106

sTRH in Soil (C10-C36)				
Our Reference:	UNITS	53345-11	53345-12	53345-13
Your Reference	----------	BH2	BH2	QC1
Depth	----------	2.0-2.3	0.3-0.5	-
Date Sampled		16/03/2011	16/03/2011	16/03/2011
Type of sample		Soil	Soil	Soil
Date extracted	-	24/03/2011	24/03/2011	24/03/2011
Date analysed	-	24/03/2011	24/03/2011	24/03/2011
$TRHC_{10}$ - C_{14}	mg/kg	<50	<50	<50
$TRHC_{15}$ - C_{28}	mg/kg	<100	<100	<100
$TRHC_{29}$ - C_{36}	mg/kg	<100	<100	<100
Surrogate o-Terphenyl	%	106	107	106

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	53345-1 BH7 2.5-2.8 17/03/2011 Soil	53345-2 BH6 3.5-4.0 17/03/2011 Soil	53345-3 BH6 0.3-0.5 17/03/2011 Soil	53345-4 BH7 0.0-0.5 17/03/2011 Soil	53345-5 BH9 2.6-3.0 22/03/2011 Soil
Date extracted	-	24/03/2011	24/03/2011	24/03/2011	24/03/2011	24/03/2011
Date analysed	-	24/03/2011	24/03/2011	24/03/2011	24/03/2011	24/03/2011
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	1.0	0.3	0.3
Anthracene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	1.8	0.6	0.5
Pyrene	mg/kg	<0.1	<0.1	2.0	0.7	0.5
Benzo(a)anthracene	mg/kg	<0.1	<0.1	0.8	0.3	0.2
Chrysene	mg/kg	<0.1	<0.1	1.0	0.4	0.2
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2	1.3	0.6	0.3
Benzo(a)pyrene	mg/kg	<0.05	<0.05	0.9	0.4	0.2
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	0.4	0.2	0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	0.4	0.2	0.1
Surrogate p-Terphenyl-d_{14}	%	90	86	95	97	96

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	53345-6 BH9 0.0-0.3 22/03/2011 Soil	53345-7 BH8 0.0-0.5 22/03/2011 Soil	53345-8 BH8 0.5-1.0 22/03/2011 Soil	53345-9 BH3 2.0-2.5 16/03/2011 Soil	53345-10 BH3 1.0-1.5 16/03/2011 Soil
Date extracted	-	24/03/2011	24/03/2011	24/03/2011	24/03/2011	24/03/2011
Date analysed	-	24/03/2011	24/03/2011	24/03/2011	24/03/2011	24/03/2011
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.6	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	3.0	0.4	<0.1	<0.1	0.1
Anthracene	mg/kg	0.7	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	5.4	0.8	<0.1	<0.1	0.3
Pyrene	mg/kg	5.6	0.8	<0.1	<0.1	0.3
Benzo(a)anthracene	mg/kg	2.6	0.4	<0.1	<0.1	0.1
Chrysene	mg/kg	2.9	0.4	<0.1	<0.1	0.2
Benzo(b+k)fluoranthene	mg/kg	4.6	0.8	<0.2	<0.2	0.2
Benzo(a)pyrene	mg/kg	3.3	0.5	<0.05	<0.05	0.2
Indeno(1,2,3-c,d)pyrene	mg/kg	1.7	0.3	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	0.4	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	1.8	0.3	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d_{14}	%	97	97	95	96	97

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	53345-11 BH2 2.0-2.3 16/03/2011 Soil	53345-12 BH2 0.3-0.5 16/03/2011 Soil	53345-13 QC1 - 16/03/2011 Soil
Date extracted	-	24/03/2011	24/03/2011	24/03/2011
Date analysed	-	24/03/2011	24/03/2011	24/03/2011
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	0.2
Anthracene	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	0.1	0.3
Pyrene	mg/kg	<0.1	0.1	0.3
Benzo(a)anthracene	mg/kg	<0.1	<0.1	0.1
Chrysene	mg/kg	<0.1	<0.1	0.2
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2	0.2
Benzo(a)pyrene	mg/kg	<0.05	0.06	0.1
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d_{14}	%	95	94	97

Organochlorine Pesticides in soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	53345-1 BH7 2.5-2.8 17/03/2011 Soil	53345-2 BH6 3.5-4.0 17/03/2011 Soil	53345-3 BH6 0.3-0.5 17/03/2011 Soil	53345-4 BH7 0.0-0.5 17/03/2011 Soil	53345-5 BH9 2.6-3.0 22/03/2011 Soil
Date extracted	-	24/03/2011	24/03/2011	24/03/2011	24/03/2011	24/03/2011
Date analysed	-	25/03/2011	25/03/2011	25/03/2011	25/03/2011	25/03/2011
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	104	106	103	97	101

Organochlorine Pesticides in soil						
Our Reference:	UNITS	53345-6	53345-7	53345-8	53345-9	53345-10
Your Reference	----------	BH9	BH8	BH8	BH3	BH3
Depth	----------	0.0-0.3	0.0-0.5	0.5-1.0	2.0-2.5	1.0-1.5
Date Sampled		22/03/2011	22/03/2011	22/03/2011	16/03/2011	16/03/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	24/03/2011	24/03/2011	24/03/2011	24/03/2011	24/03/2011
Date analysed	-	25/03/2011	25/03/2011	25/03/2011	25/03/2011	25/03/2011
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	93	89	99	94	100

Organochlorine Pesticides in soil				
Our Reference:	UNITS	53345-11	53345-12	53345-13
Your Reference	----------	BH2	BH2	QC1
Depth	----------	2.0-2.3	0.3-0.5	-
Date Sampled		16/03/2011	16/03/2011	16/03/2011
Type of sample		Soil	Soil	Soil
Date extracted	-	24/03/2011	24/03/2011	24/03/2011
Date analysed	-	25/03/2011	25/03/2011	25/03/2011
HCB	mg/kg	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1
Surrogate TCLMX	%	105	101	100

Organophosphorus Pesticides Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	53345-1 BH7 2.5-2.8 17/03/2011 Soil	53345-2 BH6 3.5-4.0 17/03/2011 Soil	53345-3 BH6 0.3-0.5 17/03/2011 Soil	53345-4 BH7 0.0-0.5 17/03/2011 Soil	53345-5 BH9 2.6-3.0 22/03/2011 Soil
Date extracted	-	24/03/2011	24/03/2011	24/03/2011	24/03/2011	24/03/2011
Date analysed	-	25/03/2011	25/03/2011	25/03/2011	25/03/2011	25/03/2011
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	104	106	103	97	101

Organophosphorus Pesticides Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	53345-6 BH9 0.0-0.3 22/03/2011 Soil	53345-7 BH8 0.0-0.5 22/03/2011 Soil	53345-8 BH8 0.5-1.0 22/03/2011 Soil	53345-9 BH3 2.0-2.5 16/03/2011 Soil	53345-10 BH3 1.0-1.5 16/03/2011 Soil
Date extracted	-	24/03/2011	24/03/2011	24/03/2011	24/03/2011	24/03/2011
Date analysed	-	25/03/2011	25/03/2011	25/03/2011	25/03/2011	25/03/2011
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	93	89	99	94	100

Organophosphorus Pesticides Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	53345-11 BH2 2.0-2.3 16/03/2011 Soil	53345-12 BH2 0.3-0.5 16/03/2011 Soil	53345-13 QC1 - 16/03/2011 Soil
Date extracted	-	24/03/2011	24/03/2011	24/03/2011
Date analysed	-	25/03/2011	25/03/2011	25/03/2011
Diazinon	mg/kg	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1
Surrogate TCLMX	%	105	101	100

PCBs in Soil						
Our Reference:	UNITS	53345-1	53345-2	53345-3	53345-4	53345-5
Your Reference	----------	BH7	BH6	BH6	BH7	BH9
Depth	----------	2.5-2.8	3.5-4.0	0.3-0.5	0.0-0.5	2.6-3.0
Date Sampled		17/03/2011	17/03/2011	17/03/2011	17/03/2011	22/03/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	24/03/2011	24/03/2011	24/03/2011	24/03/2011	24/03/2011
Date analysed	-	25/03/2011	25/03/2011	25/03/2011	25/03/2011	25/03/2011
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1221*	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	104	106	103	97	101

PCBs in Soil						
Our Reference:	UNITS	53345-6	53345-7	53345-8	53345-9	53345-10
Your Reference	----------	BH9	BH8	BH8	BH3	BH3
Depth	----------	0.0-0.3	0.0-0.5	0.5-1.0	2.0-2.5	1.0-1.5
Date Sampled		22/03/2011	22/03/2011	22/03/2011	16/03/2011	16/03/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	24/03/2011	24/03/2011	24/03/2011	24/03/2011	24/03/2011
Date analysed	-	25/03/2011	25/03/2011	25/03/2011	25/03/2011	25/03/2011
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1221*	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	93	89	99	94	100

PCBs in Soil				
Our Reference:	UNITS	53345-11	53345-12	53345-13
Your Reference	----------	BH2	BH2	QC1
Depth	----------	2.0-2.3	0.3-0.5	-
Date Sampled		16/03/2011	16/03/2011	16/03/2011
Type of sample		Soil	Soil	Soil
Date extracted	-	24/03/2011	24/03/2011	24/03/2011
Date analysed	-	25/03/2011	25/03/2011	25/03/2011
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1
Arochlor 1221*	mg/kg	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1
Surrogate TCLMX	%	105	101	100

Acid Extractable metals in soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	53345-1 BH7 2.5-2.8 17/03/2011 Soil	53345-2 BH6 3.5-4.0 17/03/2011 Soil	53345-3 BH6 0.3-0.5 17/03/2011 Soil	53345-4 BH7 0.0-0.5 17/03/2011 Soil	53345-5 BH9 2.6-3.0 22/03/2011 Soil
Date digested	-	24/03/2011	24/03/2011	24/03/2011	24/03/2011	24/03/2011
Date analysed	-	24/03/2011	24/03/2011	24/03/2011	24/03/2011	24/03/2011
Arsenic	mg/kg	7	<4	9	17	<4
Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	mg/kg	22	5	21	17	11
Copper	mg/kg	1	6	42	40	27
Lead	mg/kg	14	18	62	74	62
Mercury	mg/kg	0.1	<0.1	0.5	0.4	0.7
Nickel	mg/kg	1	<1	5	10	1
Zinc	mg/kg	6	2	64	130	79

Acid Extractable metals in soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	53345-6 BH9 0.0-0.3 22/03/2011 Soil	53345-7 BH8 0.0-0.5 22/03/2011 Soil	53345-8 BH8 0.5-1.0 22/03/2011 Soil	53345-9 BH3 2.0-2.5 16/03/2011 Soil	53345-10 BH3 1.0-1.5 16/03/2011 Soil
Date digested	-	24/03/2011	24/03/2011	24/03/2011	24/03/2011	24/03/2011
Date analysed	-	24/03/2011	24/03/2011	24/03/2011	24/03/2011	24/03/2011
Arsenic	mg/kg	7	8	5	<4	<4
Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	mg/kg	21	23	31	11	14
Copper	mg/kg	150	27	2	7	6
Lead	mg/kg	130	64	20	25	20
Mercury	mg/kg	0.3	0.2	<0.1	<0.1	0.1
Nickel	mg/kg	9	6	2	<1	1
Zinc	mg/kg	150	170	12	12	26

Acid Extractable metals in soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	53345-11 BH2 2.0-2.3 16/03/2011 Soil	53345-12 BH2 0.3-0.5 16/03/2011 Soil	53345-13 QC1 - 16/03/2011 Soil
Date digested	-	24/03/2011	24/03/2011	24/03/2011
Date analysed	-	24/03/2011	24/03/2011	24/03/2011
Arsenic	mg/kg	5	7	7
Cadmium	mg/kg	<0.5	<0.5	<0.5
Chromium	mg/kg	7	32	31
Copper	mg/kg	3	4	4
Lead	mg/kg	16	22	22
Mercury	mg/kg	<0.1	<0.1	<0.1
Nickel	mg/kg	<1	3	3
Zinc	mg/kg	1	8	8

Moisture Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	53345-1 BH7 2.5-2.8 17/03/2011 Soil	53345-2 BH6 3.5-4.0 17/03/2011 Soil	53345-3 BH6 0.3-0.5 17/03/2011 Soil	53345-4 BH7 0.0-0.5 17/03/2011 Soil	53345-5 BH9 2.6-3.0 22/03/2011 Soil
Date prepared	-	24/03/2011	24/03/2011	24/03/2011	24/03/2011	24/03/2011
Date analysed	-	25/03/2011	25/03/2011	25/03/2011	25/03/2011	25/03/2011
Moisture	%	14	13	19	13	15

Moisture Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	53345-6 BH9 0.0-0.3 22/03/2011 Soil	53345-7 BH8 0.0-0.5 22/03/2011 Soil	53345-8 BH8 0.5-1.0 22/03/2011 Soil	53345-9 BH3 2.0-2.5 16/03/2011 Soil	53345-10 BH3 1.0-1.5 16/03/2011 Soil
Date prepared	-	24/03/2011	24/03/2011	24/03/2011	24/03/2011	24/03/2011
Date analysed	-	25/03/2011	25/03/2011	25/03/2011	25/03/2011	25/03/2011
Moisture	%	17	23	18	18	19

Moisture Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	53345-11 BH2 2.0-2.3 16/03/2011 Soil	53345-12 BH2 0.3-0.5 16/03/2011 Soil	53345-13 QC1 - 16/03/2011 Soil
Date prepared	-	24/03/2011	24/03/2011	24/03/2011
Date analysed	-	25/03/2011	25/03/2011	25/03/2011
Moisture	%	14	20	20

Asbestos ID - soils						
Our Reference:	UNITS	53345-1	53345-2	53345-3	53345-4	53345-5
Your Reference	----------	BH7	BH6	BH6	BH7	BH9
Depth	----------	2.5-2.8	3.5-4.0	0.3-0.5	0.0-0.5	2.6-3.0
Date Sampled		17/03/2011	17/03/2011	17/03/2011	17/03/2011	22/03/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	24/03/2011	24/03/2011	24/03/2011	24/03/2011	24/03/2011
Sample mass tested	g	Approx 40g	Approx 40g	Approx 40g	Approx 40g	Approx 40g
Sample Description	-	Soil	Soil	Soil	Soil	Soil
Asbestos ID in soil	-	No asbestos found at reporting limit of 0.1g/kg	No asbestos found at reporting limit of 0.1g/kg	No asbestos found at reporting limit of 0.1g/kg	No asbestos found at reporting limit of 0.1g/kg	No asbestos found at reporting limit of 0.1g/kg
Trace Analysis	-	Respirable fibres not detected	Respirable fibres not detected	Respirable fibres not detected	Respirable fibres not detected	Respirable fibres not detected

Asbestos ID - soils						
Our Reference:	UNITS	53345-6	53345-7	53345-8	53345-9	53345-10
Your Reference	----------	BH9	BH8	BH8	BH3	BH3
Depth	----------	0.0-0.3	0.0-0.5	0.5-1.0	2.0-2.5	1.0-1.5
Date Sampled		22/03/2011	22/03/2011	22/03/2011	16/03/2011	16/03/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	24/03/2011	24/03/2011	24/03/2011	24/03/2011	24/03/2011
Sample mass tested	g	Approx 40g	Approx 40g	Approx 40g	Approx 40g	Approx 40g
Sample Description	-	Soil	Soil	Soil	Soil	Soil
Asbestos ID in soil	-	No asbestos found at reporting limit of 0.1g/kg	No asbestos found at reporting limit of 0.1g/kg	No asbestos found at reporting limit of 0.1g/kg	No asbestos found at reporting limit of 0.1g/kg	No asbestos found at reporting limit of 0.1g/kg
Trace Analysis	-	Respirable fibres not detected	Respirable fibres not detected	Respirable fibres not detected	Respirable fibres not detected	Respirable fibres not detected

Asbestos ID - soils				
Our Reference:	UNITS	53345-11	53345-12	53345-13
Your Reference	----------	BH2	BH2	QC1
Depth	----------	2.0-2.3	0.3-0.5	-
Date Sampled		16/03/2011	16/03/2011	16/03/2011
Type of sample		Soil	Soil	Soil
Date analysed	-	24/03/2011	24/03/2011	24/03/2011
Sample mass tested	g	Approx 40g	Approx 40g	Approx 40g
Sample Description	-	Soil	Soil	Soil
Asbestos ID in soil	-	No asbestos found at reporting limit of 0.1g/kg	No asbestos found at reporting limit of 0.1g/kg	No asbestos found at reporting limit of 0.1g/kg
Trace Analysis	-	Respirable fibres not detected	Respirable fibres not detected	Respirable fibres not detected

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105 deg C for a minimum of 4 hours.
AS4964-2004	Asbestos ID - Qualitative identification of asbestos type fibres in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques.

QUALITY CONTROL vTRH & BTEX in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			24/03/2011	53345-1	24/03/2011 || 24/03/2011	LCS-2	24/03/2011
Date analysed	-			26/03/2011	53345-1	26/03/2011 || 26/03/2011	LCS-2	26/03/2011
vTRH C_6 - C_9	mg/kg	25	Org-016	<25	53345-1	<25 || <25	LCS-2	90%
Benzene	mg/kg	0.5	Org-016	<0.5	53345-1	<0.5 || <0.5	LCS-2	81%
Toluene	mg/kg	0.5	Org-016	<0.5	53345-1	<0.5 || <0.5	LCS-2	88%
Ethylbenzene	mg/kg	1	Org-016	<1	53345-1	<1 || <1	LCS-2	93%
m+p-xylene	mg/kg	2	Org-016	<2	53345-1	<2 || <2	LCS-2	93%
o-Xylene	mg/kg	1	Org-016	<1	53345-1	<1 || <1	LCS-2	97%
Surrogate aaa-Trifluorotoluene	%		Org-016	98	53345-1	89 || 90 || RPD: 1	LCS-2	94%

QUALITY CONTROL sTRH in Soil (C10-C36)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			24/03/2011	53345-1	24/03/2011 || 24/03/2011	LCS-1	24/03/2011
Date analysed	-			24/03/2011	53345-1	24/03/2011 || 24/03/2011	LCS-1	24/03/2011
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	53345-1	<50 || <50	LCS-1	100%
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	53345-1	<100 || <100	LCS-1	100%
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	53345-1	<100 || <100	LCS-1	92%
Surrogate o-Terphenyl	%		Org-003	111	53345-1	109 || 105 || RPD: 4	LCS-1	106%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			24/03/2011	53345-1	24/03/2011 || 24/03/2011	LCS-1	24/03/2011
Date analysed	-			24/03/2011	53345-1	24/03/2011 || 24/03/2011	LCS-1	24/03/2011
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	53345-1	<0.1 || <0.1	LCS-1	89%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	53345-1	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	53345-1	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	53345-1	<0.1 || <0.1	LCS-1	95%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	53345-1	<0.1 || <0.1	LCS-1	104%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	53345-1	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	53345-1	<0.1 || <0.1	LCS-1	96%
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	53345-1	<0.1 || <0.1	LCS-1	100%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	53345-1	<0.1 || <0.1	[NR]	[NR]

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	53345-1	<0.1 || <0.1	LCS-1	109%
Benzo(b+k)fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	53345-1	<0.2 || <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	53345-1	<0.05 || <0.05	LCS-1	94%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	53345-1	<0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	53345-1	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	53345-1	<0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d_{14}	%		Org-012 subset	93	53345-1	90 || 112 || RPD: 22	LCS-1	94%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			24/03/2011	53345-1	24/03/2011 || 24/03/2011	LCS-1	24/03/2011
Date analysed	-			25/03/2011	53345-1	25/03/2011 || 25/03/2011	LCS-1	25/03/2011
HCB	mg/kg	0.1	Org-005	<0.1	53345-1	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	53345-1	<0.1 || <0.1	LCS-1	101%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	53345-1	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	53345-1	<0.1 || <0.1	LCS-1	98%
Heptachlor	mg/kg	0.1	Org-005	<0.1	53345-1	<0.1 || <0.1	LCS-1	99%
delta-BHC	mg/kg	0.1	Org-005	<0.1	53345-1	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	53345-1	<0.1 || <0.1	LCS-1	95%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	53345-1	<0.1 || <0.1	LCS-1	102%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	53345-1	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	53345-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	53345-1	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	53345-1	<0.1 || <0.1	LCS-1	101%
Dieldrin	mg/kg	0.1	Org-005	<0.1	53345-1	<0.1 || <0.1	LCS-1	100%
Endrin	mg/kg	0.1	Org-005	<0.1	53345-1	<0.1 || <0.1	LCS-1	97%
pp-DDD	mg/kg	0.1	Org-005	<0.1	53345-1	<0.1 || <0.1	LCS-1	99%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	53345-1	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	53345-1	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	53345-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	53345-1	<0.1 || <0.1	LCS-1	101%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	53345-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%		Org-005	100	53345-1	104 || 100 || RPD: 4	LCS-1	98%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			24/03/2011	53345-1	24/03/2011 || 24/03/2011	LCS-1	24/03/2011
Date analysed	-			25/03/2011	53345-1	25/03/2011 || 25/03/2011	LCS-1	25/03/2011
Diazinon	mg/kg	0.1	Org-008	<0.1	53345-1	<0.1 || <0.1	[NR]	[NR]
Dimethoate	mg/kg	0.1	Org-008	<0.1	53345-1	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	53345-1	<0.1 || <0.1	[NR]	[NR]
Ronnel	mg/kg	0.1	Org-008	<0.1	53345-1	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	53345-1	<0.1 || <0.1	LCS-1	92%
Fenitrothion	mg/kg	0.1	Org-008	<0.1	53345-1	<0.1 || <0.1	LCS-1	120%
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	53345-1	<0.1 || <0.1	[NR]	[NR]
Ethion	mg/kg	0.1	Org-008	<0.1	53345-1	<0.1 || <0.1	LCS-1	107%
Surrogate TCLMX	%		Org-008	100	53345-1	104 || 100 || RPD: 4	LCS-1	102%

QUALITY CONTROL PCBs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			24/03/2011	53345-1	24/03/2011 || 24/03/2011	LCS-1	24/03/2011
Date analysed	-			25/03/2011	53345-1	25/03/2011 || 25/03/2011	LCS-1	25/03/2011
Arochlor 1016	mg/kg	0.1	Org-006	<0.1	53345-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1221*	mg/kg	0.1	Org-006	<0.1	53345-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1232	mg/kg	0.1	Org-006	<0.1	53345-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1242	mg/kg	0.1	Org-006	<0.1	53345-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1248	mg/kg	0.1	Org-006	<0.1	53345-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1254	mg/kg	0.1	Org-006	<0.1	53345-1	<0.1 || <0.1	LCS-1	95%
Arochlor 1260	mg/kg	0.1	Org-006	<0.1	53345-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%		Org-006	100	53345-1	104 || 100 || RPD: 4	LCS-1	92%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date digested	-			24/03/2011	53345-1	24/03/2011 || 24/03/2011	LCS-1	24/03/2011
Date analysed	-			24/03/2011	53345-1	24/03/2011 || 24/03/2011	LCS-1	24/03/2011
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	53345-1	7 || 5 || RPD: 33	LCS-1	102%
Cadmium	mg/kg	0.5	Metals-020 ICP-AES	<0.5	53345-1	<0.5 || <0.5	LCS-1	105%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	53345-1	22 || 19 || RPD: 15	LCS-1	104%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	53345-1	1 || 1 || RPD: 0	LCS-1	105%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	53345-1	14 || 13 || RPD: 7	LCS-1	100%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	53345-1	0.1 || <0.1	LCS-1	107%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	53345-1	1 || 1 || RPD: 0	LCS-1	103%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	53345-1	6 || 5 || RPD: 18	LCS-1	103%

QUALITY CONTROL Moisture	UNITS	PQL	METHOD	Blank
Date prepared	-			24/03/2011
Date analysed	-			25/03/2011
Moisture	%	0.1	Inorg-008	<0.10

QUALITY CONTROL Asbestos ID - soils	UNITS	PQL	METHOD	Blank
Date analysed	-			[NT]

QUALITY CONTROL vTRH & BTEX in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	53345-11	24/03/2011 || 24/03/2011	53345-2	24/03/2011
Date analysed	-	53345-11	26/03/2011 || 26/03/2011	53345-2	26/03/2011
vTRH C_6 - C_9	mg/kg	53345-11	<25 || <25	53345-2	92%
Benzene	mg/kg	53345-11	<0.5 || <0.5	53345-2	83%
Toluene	mg/kg	53345-11	<0.5 || <0.5	53345-2	91%
Ethylbenzene	mg/kg	53345-11	<1 || <1	53345-2	96%
m+p-xylene	mg/kg	53345-11	<2 || <2	53345-2	96%
o-Xylene	mg/kg	53345-11	<1 || <1	53345-2	101%
Surrogate aaa-Trifluorotoluene	%	53345-11	90 || 90 || RPD: 0	53345-2	92%

QUALITY CONTROL sTRH in Soil (C10-C36)	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	53345-11	24/03/2011 || 24/03/2011	53345-2	24/03/2011
Date analysed	-	53345-11	24/03/2011 || 24/03/2011	53345-2	24/03/2011
TRH C_{10} - C_{14}	mg/kg	53345-11	<50 || <50	53345-2	103%
TRH C_{15} - C_{28}	mg/kg	53345-11	<100 || <100	53345-2	106%
TRH C_{29} - C_{36}	mg/kg	53345-11	<100 || <100	53345-2	102%
Surrogate o-Terphenyl	%	53345-11	106 || 106 || RPD: 0	53345-2	107%

QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	53345-11	24/03/2011 || 24/03/2011	53345-2	24/03/2011
Date analysed	-	53345-11	24/03/2011 || 24/03/2011	53345-2	24/03/2011
Naphthalene	mg/kg	53345-11	<0.1 || <0.1	53345-2	94%
Acenaphthylene	mg/kg	53345-11	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	53345-11	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	53345-11	<0.1 || <0.1	53345-2	93%
Phenanthrene	mg/kg	53345-11	<0.1 || <0.1	53345-2	98%
Anthracene	mg/kg	53345-11	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	53345-11	<0.1 || <0.1	53345-2	91%
Pyrene	mg/kg	53345-11	<0.1 || <0.1	53345-2	95%
Benzo(a)anthracene	mg/kg	53345-11	<0.1 || <0.1	[NR]	[NR]
Chrysene	mg/kg	53345-11	<0.1 || <0.1	53345-2	103%
Benzo(b+k)fluoranthene	mg/kg	53345-11	<0.2 || <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	53345-11	<0.05 || <0.05	53345-2	91%
Indeno(1,2,3-c,d)pyrene	mg/kg	53345-11	<0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	53345-11	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	53345-11	<0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	53345-11	95 || 95 || RPD: 0	53345-2	94%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	53345-11	24/03/2011 || 24/03/2011	53345-2	24/03/2011
Date analysed	-	53345-11	25/03/2011 || 25/03/2011	53345-2	25/03/2011
HCB	mg/kg	53345-11	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	53345-11	<0.1 || <0.1	53345-2	117%
gamma-BHC	mg/kg	53345-11	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	53345-11	<0.1 || <0.1	53345-2	113%
Heptachlor	mg/kg	53345-11	<0.1 || <0.1	53345-2	116%
delta-BHC	mg/kg	53345-11	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	53345-11	<0.1 || <0.1	53345-2	111%
Heptachlor Epoxide	mg/kg	53345-11	<0.1 || <0.1	53345-2	119%
gamma-Chlordane	mg/kg	53345-11	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	53345-11	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	53345-11	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	53345-11	<0.1 || <0.1	53345-2	116%
Dieldrin	mg/kg	53345-11	<0.1 || <0.1	53345-2	113%
Endrin	mg/kg	53345-11	<0.1 || <0.1	53345-2	109%
pp-DDD	mg/kg	53345-11	<0.1 || <0.1	53345-2	108%
Endosulfan II	mg/kg	53345-11	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	53345-11	<0.1 || <0.1	[NR]	[NR]

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Endrin Aldehyde	mg/kg	53345-11	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	53345-11	<0.1 || <0.1	53345-2	115%
Methoxychlor	mg/kg	53345-11	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%	53345-11	105 || 102 || RPD: 3	53345-2	109%
QUALITY CONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	53345-11	24/03/2011 || 24/03/2011	53345-2	24/03/2011
Date analysed	-	53345-11	25/03/2011 || 25/03/2011	53345-2	25/03/2011
Diazinon	mg/kg	53345-11	<0.1 || <0.1	[NR]	[NR]
Dimethoate	mg/kg	53345-11	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos-methyl	mg/kg	53345-11	<0.1 || <0.1	[NR]	[NR]
Ronnel	mg/kg	53345-11	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos	mg/kg	53345-11	<0.1 || <0.1	53345-2	94%
Fenitrothion	mg/kg	53345-11	<0.1 || <0.1	53345-2	86%
Bromophos-ethyl	mg/kg	53345-11	<0.1 || <0.1	[NR]	[NR]
Ethion	mg/kg	53345-11	<0.1 || <0.1	53345-2	86%
Surrogate TCLMX	%	53345-11	105 || 102 || RPD: 3	53345-2	96%
QUALITY CONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	53345-11	24/03/2011 || 24/03/2011	53345-2	24/03/2011
Date analysed	-	53345-11	25/03/2011 || 25/03/2011	53345-2	25/03/2011
Arochlor 1016	mg/kg	53345-11	<0.1 || <0.1	[NR]	[NR]
Arochlor 1221*	mg/kg	53345-11	<0.1 || <0.1	[NR]	[NR]
Arochlor 1232	mg/kg	53345-11	<0.1 || <0.1	[NR]	[NR]
Arochlor 1242	mg/kg	53345-11	<0.1 || <0.1	[NR]	[NR]
Arochlor 1248	mg/kg	53345-11	<0.1 || <0.1	[NR]	[NR]
Arochlor 1254	mg/kg	53345-11	<0.1 || <0.1	53345-2	92%
Arochlor 1260	mg/kg	53345-11	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%	53345-11	105 || 102 || RPD: 3	53345-2	102%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	53345-11	24/03/2011 || 24/03/2011	53345-2	24/03/2011
Date analysed	-	53345-11	24/03/2011 || 24/03/2011	53345-2	24/03/2011
Arsenic	mg/kg	53345-11	5 || 6 || RPD: 18	53345-2	99%
Cadmium	mg/kg	53345-11	<0.5 || <0.5	53345-2	89%
Chromium	mg/kg	53345-11	7 || 7 || RPD: 0	53345-2	102%
Copper	mg/kg	53345-11	3 || 4 || RPD: 29	53345-2	106%
Lead	mg/kg	53345-11	16 || 17 || RPD: 6	53345-2	94%
Mercury	mg/kg	53345-11	<0.1 || <0.1	53345-2	99%
Nickel	mg/kg	53345-11	<1 || <1	53345-2	98%
Zinc	mg/kg	53345-11	1 || 6 || RPD: 143	53345-2	98%

Report Comments:

Acid Extractable Metals in Soil: The duplicate result for Zinc in sample 11 is greater than the acceptable RPD and is due to sample heterogeneity.

Asbestos ID was analysed by Approved Identifier: Paul Ching
Asbestos ID was authorised by Approved Signatory: Matt Mansfield

INS: Insufficient sample for this test
NA: Test not required
<: Less than

PQL: Practical Quantitation Limit
RPD: Relative Percent Difference
>: Greater than

NT: Not tested
NA: Test not required
LCS: Laboratory Control Sample

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.

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 batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

SAMPLE AND CHAIN OF CUSTODY FORM

TO:
Envirolab Services Pty Ltd
12 Ashley Street
Chatswood NSW 2067
Phone: (02) 99106200
Fax: (02) 99106201

Attention: Aileen

EIS Job Number: E 24782K

Date Results Required: Standard

Sheet 1 / 1

FROM:
Environmental Investigation Services
Rear 115 Wicks Road
Macquarie Park NSW 2113
Phone: (02) 9888 5000
Fax: (02) 9888 5004

Contact: Rob Muller

Project: Proposed Residential Development
Location: St Paul's College
Sampler: Rob Muller

Sample Preservation:
In esky on ice

Tests Required

Date Sampled	Lab Ref:	Borehole/ Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 6	Combo 6a	Combo 13	8 Metals	TPH	BTEX	PAHs	OCP/OPP/ PCBs	Asbestos	TCLP 6 Metals	TCLP PAHs	
24/3/11	1	BH5	0.3-0.5	Glass jar + Asb Bag	0.2			X										
24/3/11	2	BH5	2.8-3.0	Glass jar + Asb Bag	0.1			X										
23/3/11	3	BH1	0.0-0.3	Glass jar + Asb Bag	0.3			X										
23/3/11	4	BH1	0.5-1.0	Glass jar + Asb Bag	0.6			X										
23/3/11	5	BH10	0.0-0.5	Glass jar + Asb Bag	0.0			X										
23/3/11	6	BH10	1.0-1.5	Glass jar + Asb Bag	0.1			X										
22/3/11	7	BH4	0.5-0.95	Glass jar + Asb Bag	0.5			X										
22/3/11	8	QC2	–	Glass jar + Asb Bag	–		X											
22/3/11	9	BH4	1.5-1.95	Glass jar + Asb Bag	0.1			X										
22/3/11	10	BH11	0.5-0.95	Glass jar + Asb Bag	0.3			X										
22/3/11	11	QC3	–	Glass jar + Asb Bag	–		X											
22/3/11	12	BH11	1.0-1.5	Glass jar + Asb Bag	0.4			X										
				Glass jar + Asb Bag														
				Glass jar + Asb Bag														
				Glass jar + Asb Bag														
				Glass jar + Asb Bag														
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				Glass jar + Asb Bag														

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: 9910 6200
Job No: 54054
Date received: 8/4/11
Time received: 2pm
Received by: MP
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Remarks (comments/detection limits required):

Relinquished By:	Date:	Time:	Received By:	
[signature]	8/4/2011		Morgan Philip	8/4/11 2pm

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

CERTIFICATE OF ANALYSIS 54054

Client:
Environmental Investigation Services
PO Box 976
North Ryde BC
NSW 1670

Attention: Rob Muller

Sample log in details:

Your Reference:	**E24782K, St Paul's College**
No. of samples:	12 soils
Date samples received / completed instructions received	08/04/11 / 08/04/11

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: / Issue Date:	15/04/11 / 14/04/11
Date of Preliminary Report:	Not issued

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This document is issued in accordance with NATA's accreditation requirements.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Jacinta Hurst
Laboratory Manager

Nancy Zhang
Chemist

Rhian Morgan
Reporting Supervisor

Lulu Guo
Approved Signatory

Jeremy Faircloth
Chemist

vTRH & BTEX in Soil						
Our Reference:	UNITS	54054-1	54054-2	54054-3	54054-4	54054-5
Your Reference	----------	BH5	BH5	BH1	BH1	BH10
Depth	----------	0.3-0.5	2.8-3.0	0.0-0.3	0.5-1.0	0.0-0.5
Date Sampled		24/03/2011	24/03/2011	23/03/2011	23/03/2011	23/03/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/04/2011	11/04/2011	11/04/2011	11/04/2011	11/04/2011
Date analysed	-	12/04/2011	12/04/2011	12/04/2011	12/04/2011	12/04/2011
vTRH C6 - C9	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	95	96	93	108	97

vTRH & BTEX in Soil						
Our Reference:	UNITS	54054-6	54054-7	54054-8	54054-9	54054-10
Your Reference	----------	BH10	BH4	QC2	BH4	BH11
Depth	----------	1.0-1.5	0.5-0.95	-	1.5-1.95	0.5-0.95
Date Sampled		23/03/2011	22/03/2011	22/03/2011	22/03/2011	22/03/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/04/2011	11/04/2011	11/04/2011	11/04/2011	11/04/2011
Date analysed	-	12/04/2011	12/04/2011	12/04/2011	12/04/2011	12/04/2011
vTRH C6 - C9	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	101	92	106	95	100

vTRH & BTEX in Soil			
Our Reference:	UNITS	54054-11	54054-12
Your Reference	----------	QC3	BH11
Depth	----------	-	1.0-1.5
Date Sampled		22/03/2011	22/03/2011
Type of sample		Soil	Soil
Date extracted	-	11/04/2011	11/04/2011
Date analysed	-	12/04/2011	12/04/2011
vTRH C6 - C9	mg/kg	<25	<25
Benzene	mg/kg	<0.5	<0.5
Toluene	mg/kg	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1
m+p-xylene	mg/kg	<2	<2
o-Xylene	mg/kg	<1	<1
Surrogate aaa-Trifluorotoluene	%	98	93

sTRH in Soil (C10-C36)						
Our Reference:	UNITS	54054-1	54054-2	54054-3	54054-4	54054-5
Your Reference	----------	BH5	BH5	BH1	BH1	BH10
Depth	----------	0.3-0.5	2.8-3.0	0.0-0.3	0.5-1.0	0.0-0.5
Date Sampled		24/03/2011	24/03/2011	23/03/2011	23/03/2011	23/03/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/04/2011	11/04/2011	11/04/2011	11/04/2011	11/04/2011
Date analysed	-	12/04/2011	12/04/2011	12/04/2011	12/04/2011	12/04/2011
TRHC10 - C14	mg/kg	<50	<50	<50	<50	<50
TRHC15 - C28	mg/kg	<100	<100	<100	<100	<100
TRHC29 - C36	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	88	92	92	92	89

sTRH in Soil (C10-C36)						
Our Reference:	UNITS	54054-6	54054-7	54054-8	54054-9	54054-10
Your Reference	----------	BH10	BH4	QC2	BH4	BH11
Depth	----------	1.0-1.5	0.5-0.95	-	1.5-1.95	0.5-0.95
Date Sampled		23/03/2011	22/03/2011	22/03/2011	22/03/2011	22/03/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/04/2011	11/04/2011	11/04/2011	11/04/2011	11/04/2011
Date analysed	-	12/04/2011	12/04/2011	12/04/2011	12/04/2011	12/04/2011
TRHC10 - C14	mg/kg	<50	<50	<50	<50	<50
TRHC15 - C28	mg/kg	<100	<100	<100	<100	<100
TRHC29 - C36	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	92	90	86	90	92

sTRH in Soil (C10-C36)			
Our Reference:	UNITS	54054-11	54054-12
Your Reference	----------	QC3	BH11
Depth	----------	-	1.0-1.5
Date Sampled		22/03/2011	22/03/2011
Type of sample		Soil	Soil
Date extracted	-	11/04/2011	11/04/2011
Date analysed	-	12/04/2011	12/04/2011
TRHC10 - C14	mg/kg	<50	<50
TRHC15 - C28	mg/kg	<100	<100
TRHC29 - C36	mg/kg	<100	<100
Surrogate o-Terphenyl	%	92	97

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	54054-1 BH5 0.3-0.5 24/03/2011 Soil	54054-2 BH5 2.8-3.0 24/03/2011 Soil	54054-3 BH1 0.0-0.3 23/03/2011 Soil	54054-4 BH1 0.5-1.0 23/03/2011 Soil	54054-5 BH10 0.0-0.5 23/03/2011 Soil
Date extracted	-	11/04/2011	11/04/2011	11/04/2011	11/04/2011	11/04/2011
Date analysed	-	11/04/2011	11/04/2011	11/04/2011	11/04/2011	11/04/2011
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.4	<0.1	0.4	<0.1	0.3
Anthracene	mg/kg	<0.1	<0.1	0.1	<0.1	0.1
Fluoranthene	mg/kg	0.5	<0.1	1.1	<0.1	1.0
Pyrene	mg/kg	0.5	<0.1	1.1	<0.1	1.0
Benzo(a)anthracene	mg/kg	0.2	<0.1	0.5	<0.1	0.4
Chrysene	mg/kg	0.3	<0.1	0.6	<0.1	0.5
Benzo(b+k)fluoranthene	mg/kg	0.4	<0.2	1.1	<0.2	0.8
Benzo(a)pyrene	mg/kg	0.29	<0.05	0.73	<0.05	0.51
Indeno(1,2,3-c,d)pyrene	mg/kg	0.2	<0.1	0.4	<0.1	0.3
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.2	<0.1	0.5	<0.1	0.3
Surrogate p-Terphenyl-d_{14}	%	84	84	86	86	88

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	54054-6 BH10 1.0-1.5 23/03/2011 Soil	54054-7 BH4 0.5-0.95 22/03/2011 Soil	54054-8 QC2 - 22/03/2011 Soil	54054-9 BH4 1.5-1.95 22/03/2011 Soil	54054-10 BH11 0.5-0.95 22/03/2011 Soil
Date extracted	-	11/04/2011	11/04/2011	11/04/2011	11/04/2011	11/04/2011
Date analysed	-	11/04/2011	11/04/2011	11/04/2011	11/04/2011	11/04/2011
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.6	<0.1	<0.1	<0.1	0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.6	0.2	<0.1	<0.1	0.1
Pyrene	mg/kg	0.5	0.2	<0.1	<0.1	0.1
Benzo(a)anthracene	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.2	0.1	<0.1	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	0.3	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.21	0.11	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d14	%	87	88	87	86	82

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	54054-11 QC3 - 22/03/2011 Soil	54054-12 BH11 1.0-1.5 22/03/2011 Soil
Date extracted	-	11/04/2011	11/04/2011
Date analysed	-	11/04/2011	11/04/2011
Naphthalene	mg/kg	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	0.1
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	0.2
Pyrene	mg/kg	<0.1	0.2
Benzo(a)anthracene	mg/kg	<0.1	<0.1
Chrysene	mg/kg	<0.1	0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	0.09
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1
Surrogate p-Terphenyl-d_{14}	%	87	87

Organochlorine Pesticides in soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	54054-1 BH5 0.3-0.5 24/03/2011 Soil	54054-2 BH5 2.8-3.0 24/03/2011 Soil	54054-3 BH1 0.0-0.3 23/03/2011 Soil	54054-4 BH1 0.5-1.0 23/03/2011 Soil	54054-5 BH10 0.0-0.5 23/03/2011 Soil
Date extracted	-	11/04/2011	11/04/2011	11/04/2011	11/04/2011	11/04/2011
Date analysed	-	12/04/2011	12/04/2011	12/04/2011	12/04/2011	12/04/2011
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	99	95	92	99	96

Organochlorine Pesticides in soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	54054-6 BH10 1.0-1.5 23/03/2011 Soil	54054-7 BH4 0.5-0.95 22/03/2011 Soil	54054-8 QC2 - 22/03/2011 Soil	54054-9 BH4 1.5-1.95 22/03/2011 Soil	54054-10 BH11 0.5-0.95 22/03/2011 Soil
Date extracted	-	11/04/2011	11/04/2011	11/04/2011	11/04/2011	11/04/2011
Date analysed	-	12/04/2011	12/04/2011	12/04/2011	12/04/2011	12/04/2011
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	96	97	96	96	95

Organochlorine Pesticides in soil			
Our Reference:	UNITS	54054-11	54054-12
Your Reference	----------	QC3	BH11
Depth	----------	-	1.0-1.5
Date Sampled		22/03/2011	22/03/2011
Type of sample		Soil	Soil
Date extracted	-	11/04/2011	11/04/2011
Date analysed	-	12/04/2011	12/04/2011
HCB	mg/kg	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1
Surrogate TCLMX	%	96	97

Organophosphorus Pesticides Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	54054-1 BH5 0.3-0.5 24/03/2011 Soil	54054-2 BH5 2.8-3.0 24/03/2011 Soil	54054-3 BH1 0.0-0.3 23/03/2011 Soil	54054-4 BH1 0.5-1.0 23/03/2011 Soil	54054-5 BH10 0.0-0.5 23/03/2011 Soil
Date extracted	-	11/04/2011	11/04/2011	11/04/2011	11/04/2011	11/04/2011
Date analysed	-	12/04/2011	12/04/2011	12/04/2011	12/04/2011	12/04/2011
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	99	95	92	99	96

Organophosphorus Pesticides Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	54054-6 BH10 1.0-1.5 23/03/2011 Soil	54054-7 BH4 0.5-0.95 22/03/2011 Soil	54054-8 QC2 - 22/03/2011 Soil	54054-9 BH4 1.5-1.95 22/03/2011 Soil	54054-10 BH11 0.5-0.95 22/03/2011 Soil
Date extracted	-	11/04/2011	11/04/2011	11/04/2011	11/04/2011	11/04/2011
Date analysed	-	12/04/2011	12/04/2011	12/04/2011	12/04/2011	12/04/2011
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	96	97	96	96	95

Organophosphorus Pesticides Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	54054-11 QC3 - 22/03/2011 Soil	54054-12 BH11 1.0-1.5 22/03/2011 Soil
Date extracted	-	11/04/2011	11/04/2011
Date analysed	-	12/04/2011	12/04/2011
Diazinon	mg/kg	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1
Surrogate TCLMX	%	96	97

PCBs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	54054-1 BH5 0.3-0.5 24/03/2011 Soil	54054-2 BH5 2.8-3.0 24/03/2011 Soil	54054-3 BH1 0.0-0.3 23/03/2011 Soil	54054-4 BH1 0.5-1.0 23/03/2011 Soil	54054-5 BH10 0.0-0.5 23/03/2011 Soil
Date extracted	-	11/04/2011	11/04/2011	11/04/2011	11/04/2011	11/04/2011
Date analysed	-	12/04/2011	12/04/2011	12/04/2011	12/04/2011	12/04/2011
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1221*	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	99	95	92	99	96

PCBs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	54054-6 BH10 1.0-1.5 23/03/2011 Soil	54054-7 BH4 0.5-0.95 22/03/2011 Soil	54054-8 QC2 - 22/03/2011 Soil	54054-9 BH4 1.5-1.95 22/03/2011 Soil	54054-10 BH11 0.5-0.95 22/03/2011 Soil
Date extracted	-	11/04/2011	11/04/2011	11/04/2011	11/04/2011	11/04/2011
Date analysed	-	12/04/2011	12/04/2011	12/04/2011	12/04/2011	12/04/2011
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1221*	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	96	97	96	96	95

PCBs in Soil			
Our Reference:	UNITS	54054-11	54054-12
Your Reference	----------	QC3	BH11
Depth	----------	-	1.0-1.5
Date Sampled		22/03/2011	22/03/2011
Type of sample		Soil	Soil
Date extracted	-	11/04/2011	11/04/2011
Date analysed	-	12/04/2011	12/04/2011
Arochlor 1016	mg/kg	<0.1	<0.1
Arochlor 1221*	mg/kg	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1
Surrogate TCLMX	%	96	97

Acid Extractable metals in soil						
Our Reference:	UNITS	54054-1	54054-2	54054-3	54054-4	54054-5
Your Reference	----------	BH5	BH5	BH1	BH1	BH10
Depth	----------	0.3-0.5	2.8-3.0	0.0-0.3	0.5-1.0	0.0-0.5
Date Sampled		24/03/2011	24/03/2011	23/03/2011	23/03/2011	23/03/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	11/04/2011	11/04/2011	11/04/2011	11/04/2011	11/04/2011
Date analysed	-	11/04/2011	11/04/2011	11/04/2011	11/04/2011	11/04/2011
Arsenic	mg/kg	7	6	9	7	<4
Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	mg/kg	25	10	23	13	27
Copper	mg/kg	27	10	44	1	25
Lead	mg/kg	77	26	110	11	55
Mercury	mg/kg	0.1	<0.1	0.2	<0.1	<0.1
Nickel	mg/kg	7	1	9	<1	20
Zinc	mg/kg	42	5	91	2	47

Acid Extractable metals in soil						
Our Reference:	UNITS	54054-6	54054-7	54054-8	54054-9	54054-10
Your Reference	----------	BH10	BH4	QC2	BH4	BH11
Depth	----------	1.0-1.5	0.5-0.95	-	1.5-1.95	0.5-0.95
Date Sampled		23/03/2011	22/03/2011	22/03/2011	22/03/2011	22/03/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	11/04/2011	11/04/2011	11/04/2011	11/04/2011	11/04/2011
Date analysed	-	11/04/2011	11/04/2011	11/04/2011	11/04/2011	11/04/2011
Arsenic	mg/kg	4	6	<4	9	10
Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	mg/kg	28	26	17	46	32
Copper	mg/kg	2	5	2	2	4
Lead	mg/kg	28	32	22	23	33
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	3	2	2	5	4
Zinc	mg/kg	7	13	6	6	8

Acid Extractable metals in soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	54054-11 QC3 - 22/03/2011 Soil	54054-12 BH11 1.0-1.5 22/03/2011 Soil
Date digested	-	11/04/2011	11/04/2011
Date analysed	-	11/04/2011	11/04/2011
Arsenic	mg/kg	10	8
Cadmium	mg/kg	<0.5	<0.5
Chromium	mg/kg	29	21
Copper	mg/kg	1	2
Lead	mg/kg	32	36
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	3	1
Zinc	mg/kg	5	5

Moisture						
Our Reference:	UNITS	54054-1	54054-2	54054-3	54054-4	54054-5
Your Reference	----------	BH5	BH5	BH1	BH1	BH10
Depth	----------	0.3-0.5	2.8-3.0	0.0-0.3	0.5-1.0	0.0-0.5
Date Sampled		24/03/2011	24/03/2011	23/03/2011	23/03/2011	23/03/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	11/04/2011	11/04/2011	11/04/2011	11/04/2011	11/04/2011
Date analysed	-	12/04/2011	12/04/2011	12/04/2011	12/04/2011	12/04/2011
Moisture	%	20	15	29	14	11

Moisture						
Our Reference:	UNITS	54054-6	54054-7	54054-8	54054-9	54054-10
Your Reference	----------	BH10	BH4	QC2	BH4	BH11
Depth	----------	1.0-1.5	0.5-0.95	-	1.5-1.95	0.5-0.95
Date Sampled		23/03/2011	22/03/2011	22/03/2011	22/03/2011	22/03/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	11/04/2011	11/04/2011	11/04/2011	11/04/2011	11/04/2011
Date analysed	-	12/04/2011	12/04/2011	12/04/2011	12/04/2011	12/04/2011
Moisture	%	11	20	20	22	22

Moisture			
Our Reference:	UNITS	54054-11	54054-12
Your Reference	----------	QC3	BH11
Depth	----------	-	1.0-1.5
Date Sampled		22/03/2011	22/03/2011
Type of sample		Soil	Soil
Date prepared	-	11/04/2011	11/04/2011
Date analysed	-	12/04/2011	12/04/2011
Moisture	%	23	20

Asbestos ID - soils						
Our Reference:	UNITS	54054-1	54054-2	54054-3	54054-4	54054-5
Your Reference	----------	BH5	BH5	BH1	BH1	BH10
Depth	----------	0.3-0.5	2.8-3.0	0.0-0.3	0.5-1.0	0.0-0.5
Date Sampled		24/03/2011	24/03/2011	23/03/2011	23/03/2011	23/03/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	13/04/2011	13/04/2011	13/04/2011	13/04/2011	13/04/2011
Sample mass tested	g	Approx 45	Approx 45	Approx 45	Approx 45	Approx 45
Sample Description	-	Soil	Soil	Soil	Soil	Soil
Asbestos ID in soil	-	No asbestos found at reporting limit of 0.1g/kg	No asbestos found at reporting limit of 0.1g/kg	No asbestos found at reporting limit of 0.1g/kg	No asbestos found at reporting limit of 0.1g/kg	No asbestos found at reporting limit of 0.1g/kg
Trace Analysis	-	Respirable fibres not detected	Respirable fibres not detected	Respirable fibres not detected	Respirable fibres not detected	Respirable fibres not detected

Asbestos ID - soils						
Our Reference:	UNITS	54054-6	54054-7	54054-9	54054-10	54054-12
Your Reference	----------	BH10	BH4	BH4	BH11	BH11
Depth	----------	1.0-1.5	0.5-0.95	1.5-1.95	0.5-0.95	1.0-1.5
Date Sampled		23/03/2011	22/03/2011	22/03/2011	22/03/2011	22/03/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	13/04/2011	13/04/2011	13/04/2011	13/04/2011	13/04/2011
Sample mass tested	g	Approx 45	Approx 45	Approx 45	Approx 45	Approx 45
Sample Description	-	Soil	Soil	Soil	Soil	Soil
Asbestos ID in soil	-	No asbestos found at reporting limit of 0.1g/kg	No asbestos found at reporting limit of 0.1g/kg	No asbestos found at reporting limit of 0.1g/kg	No asbestos found at reporting limit of 0.1g/kg	No asbestos found at reporting limit of 0.1g/kg
Trace Analysis	-	Respirable fibres not detected	Respirable fibres not detected	Respirable fibres not detected	Respirable fibres not detected	Respirable fibres not detected

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105 deg C for a minimum of 4 hours.
ASB-001	Asbestos ID - Qualitative identification of asbestos type fibres in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques.

QUALITY CONTROL vTRH & BTEX in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			11/04/2011	54054-1	11/04/2011 || 11/04/2011	LCS-5	11/04/2011
Date analysed	-			12/04/2011	54054-1	12/04/2011 || 12/04/2011	LCS-5	12/04/2011
vTRH C_6 - C_9	mg/kg	25	Org-016	<25	54054-1	<25 || <25	LCS-5	96%
Benzene	mg/kg	0.5	Org-016	<0.5	54054-1	<0.5 || <0.5	LCS-5	99%
Toluene	mg/kg	0.5	Org-016	<0.5	54054-1	<0.5 || <0.5	LCS-5	95%
Ethylbenzene	mg/kg	1	Org-016	<1	54054-1	<1 || <1	LCS-5	95%
m+p-xylene	mg/kg	2	Org-016	<2	54054-1	<2 || <2	LCS-5	95%
o-Xylene	mg/kg	1	Org-016	<1	54054-1	<1 || <1	LCS-5	94%
Surrogate aaa-Trifluorotoluene	%		Org-016	102	54054-1	95 || 101 || RPD: 6	LCS-5	101%

QUALITY CONTROL sTRH in Soil (C10-C36)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			11/04/2011	54054-1	11/04/2011 || 11/04/2011	LCS-5	11/04/2011
Date analysed	-			12/04/2011	54054-1	12/04/2011 || 12/04/2011	LCS-5	12/04/2011
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	54054-1	<50 || <50	LCS-5	93%
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	54054-1	<100 || <100	LCS-5	98%
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	54054-1	<100 || <100	LCS-5	94%
Surrogate o-Terphenyl	%		Org-003	90	54054-1	88 || 94 || RPD: 7	LCS-5	87%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			11/04/2011	54054-1	11/04/2011 || 11/04/2011	LCS-5	11/04/2011
Date analysed	-			11/04/2011	54054-1	11/04/2011 || 11/04/2011	LCS-5	11/04/2011
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	54054-1	<0.1 || <0.1	LCS-5	90%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	54054-1	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	54054-1	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	54054-1	<0.1 || <0.1	LCS-5	89%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	54054-1	0.4 || 0.3 || RPD: 29	LCS-5	94%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	54054-1	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	54054-1	0.5 || 0.6 || RPD: 18	LCS-5	89%
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	54054-1	0.5 || 0.6 || RPD: 18	LCS-5	91%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	54054-1	0.2 || 0.3 || RPD: 40	[NR]	[NR]

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	54054-1	0.3 || 0.3 || RPD: 0	LCS-5	99%
Benzo(b+k)fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	54054-1	0.4 || 0.5 || RPD: 22	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	54054-1	0.29 || 0.31 || RPD: 7	LCS-5	83%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	54054-1	0.2 || 0.2 || RPD: 0	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	54054-1	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	54054-1	0.2 || 0.2 || RPD: 0	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	88	54054-1	84 || 86 || RPD: 2	LCS-5	87%
QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			11/04/2011	54054-1	11/04/2011 || 11/04/2011	LCS-5	11/04/2011
Date analysed	-			12/04/2011	54054-1	12/04/2011 || 12/04/2011	LCS-5	12/04/2011
HCB	mg/kg	0.1	Org-005	<0.1	54054-1	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	54054-1	<0.1 || <0.1	LCS-5	97%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	54054-1	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	54054-1	<0.1 || <0.1	LCS-5	97%
Heptachlor	mg/kg	0.1	Org-005	<0.1	54054-1	<0.1 || <0.1	LCS-5	95%
delta-BHC	mg/kg	0.1	Org-005	<0.1	54054-1	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	54054-1	<0.1 || <0.1	LCS-5	91%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	54054-1	<0.1 || <0.1	LCS-5	102%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	54054-1	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	54054-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	54054-1	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	54054-1	<0.1 || <0.1	LCS-5	98%
Dieldrin	mg/kg	0.1	Org-005	<0.1	54054-1	<0.1 || <0.1	LCS-5	101%
Endrin	mg/kg	0.1	Org-005	<0.1	54054-1	<0.1 || <0.1	LCS-5	94%
pp-DDD	mg/kg	0.1	Org-005	<0.1	54054-1	<0.1 || <0.1	LCS-5	101%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	54054-1	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	54054-1	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	54054-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	54054-1	<0.1 || <0.1	LCS-5	97%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	54054-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%		Org-005	93	54054-1	99 || 97 || RPD: 2	LCS-5	99%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			11/04/2011	54054-1	11/04/2011 || 11/04/2011	LCS-5	11/04/2011
Date analysed	-			12/04/2011	54054-1	12/04/2011 || 12/04/2011	LCS-5	12/04/2011
Diazinon	mg/kg	0.1	Org-008	<0.1	54054-1	<0.1 || <0.1	[NR]	[NR]
Dimethoate	mg/kg	0.1	Org-008	<0.1	54054-1	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	54054-1	<0.1 || <0.1	[NR]	[NR]
Ronnel	mg/kg	0.1	Org-008	<0.1	54054-1	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	54054-1	<0.1 || <0.1	LCS-5	99%
Fenitrothion	mg/kg	0.1	Org-008	<0.1	54054-1	<0.1 || <0.1	LCS-5	86%
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	54054-1	<0.1 || <0.1	[NR]	[NR]
Ethion	mg/kg	0.1	Org-008	<0.1	54054-1	<0.1 || <0.1	LCS-5	83%
Surrogate TCLMX	%		Org-008	93	54054-1	99 || 97 || RPD: 2	LCS-5	86%

QUALITY CONTROL PCBs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			11/04/2011	54054-1	11/04/2011 || 11/04/2011	LCS-5	11/04/2011
Date analysed	-			12/04/2011	54054-1	12/04/2011 || 12/04/2011	LCS-5	12/04/2011
Arochlor 1016	mg/kg	0.1	Org-006	<0.1	54054-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1221*	mg/kg	0.1	Org-006	<0.1	54054-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1232	mg/kg	0.1	Org-006	<0.1	54054-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1242	mg/kg	0.1	Org-006	<0.1	54054-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1248	mg/kg	0.1	Org-006	<0.1	54054-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1254	mg/kg	0.1	Org-006	<0.1	54054-1	<0.1 || <0.1	LCS-5	90%
Arochlor 1260	mg/kg	0.1	Org-006	<0.1	54054-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%		Org-006	93	54054-1	99 || 97 || RPD: 2	LCS-5	92%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			11/04/2011	54054-1	11/04/2011 || 11/04/2011	LCS-2	11/04/2011
Date analysed	-			11/04/2011	54054-1	11/04/2011 || 11/04/2011	LCS-2	11/04/2011
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	54054-1	7 || 11 || RPD: 44	LCS-2	104%
Cadmium	mg/kg	0.5	Metals-020 ICP-AES	<0.5	54054-1	<0.5 || <0.5	LCS-2	109%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	54054-1	25 || 20 || RPD: 22	LCS-2	105%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	54054-1	27 || 29 || RPD: 7	LCS-2	110%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	54054-1	77 || 92 || RPD: 18	LCS-2	107%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	54054-1	0.1 II 0.2 II RPD: 67	LCS-2	105%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	54054-1	7 II 6 II RPD: 15	LCS-2	110%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	54054-1	42 II 40 II RPD: 5	LCS-2	106%

QUALITY CONTROL Moisture	UNITS	PQL	METHOD	Blank
Date prepared	-			11/04/2011
Date analysed	-			12/04/2011
Moisture	%	0.1	Inorg-008	<0.1

QUALITY CONTROL Asbestos ID - soils	UNITS	PQL	METHOD	Blank
Date analysed	-			[NT]

QUALITY CONTROL vTRH & BTEX in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	54054-10	11/04/2011 II 11/04/2011	54054-2	11/04/2011
Date analysed	-	54054-10	12/04/2011 II 12/04/2011	54054-2	12/04/2011
vTRH C_6 - C_9	mg/kg	54054-10	<25 II <25	54054-2	95%
Benzene	mg/kg	54054-10	<0.5 II <0.5	54054-2	98%
Toluene	mg/kg	54054-10	<0.5 II <0.5	54054-2	94%
Ethylbenzene	mg/kg	54054-10	<1 II <1	54054-2	95%
m+p-xylene	mg/kg	54054-10	<2 II <2	54054-2	95%
o-Xylene	mg/kg	54054-10	<1 II <1	54054-2	94%
Surrogate aaa-Trifluorotoluene	%	54054-10	100 II 79 II RPD: 23	54054-2	101%

QUALITY CONTROL sTRH in Soil (C10-C36)	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	54054-2	11/04/2011
Date analysed	-	[NT]	[NT]	54054-2	12/04/2011
TRH C_{10} - C_{14}	mg/kg	[NT]	[NT]	54054-2	97%
TRH C_{15} - C_{28}	mg/kg	[NT]	[NT]	54054-2	107%
TRH C_{29} - C_{36}	mg/kg	[NT]	[NT]	54054-2	98%
Surrogate o-Terphenyl	%	[NT]	[NT]	54054-2	92%

QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	54054-10	11/04/2011 || 11/04/2011	54054-2	11/04/2011
Date analysed	-	54054-10	11/04/2011 || 11/04/2011	54054-2	11/04/2011
Naphthalene	mg/kg	54054-10	<0.1 || <0.1	54054-2	91%
Acenaphthylene	mg/kg	54054-10	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	54054-10	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	54054-10	<0.1 || <0.1	54054-2	92%
Phenanthrene	mg/kg	54054-10	0.1 || 0.6 || RPD: 143	54054-2	97%
Anthracene	mg/kg	54054-10	<0.1 || 0.1	[NR]	[NR]
Fluoranthene	mg/kg	54054-10	0.1 || 0.8 || RPD: 156	54054-2	94%
Pyrene	mg/kg	54054-10	0.1 || 0.8 || RPD: 156	54054-2	95%
Benzo(a)anthracene	mg/kg	54054-10	<0.1 || 0.3	[NR]	[NR]
Chrysene	mg/kg	54054-10	<0.1 || 0.4	54054-2	98%
Benzo(b+k)fluoranthene	mg/kg	54054-10	<0.2 || 0.6	[NR]	[NR]
Benzo(a)pyrene	mg/kg	54054-10	<0.05 || 0.40	54054-2	88%
Indeno(1,2,3-c,d)pyrene	mg/kg	54054-10	<0.1 || 0.2	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	54054-10	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	54054-10	<0.1 || 0.2	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	54054-10	82 || 102 || RPD: 22	54054-2	88%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	54054-10	11/04/2011 || 11/04/2011	54054-2	11/04/2011
Date analysed	-	54054-10	12/04/2011 || 12/04/2011	54054-2	12/04/2011
HCB	mg/kg	54054-10	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	54054-10	<0.1 || <0.1	54054-2	97%
gamma-BHC	mg/kg	54054-10	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	54054-10	<0.1 || <0.1	54054-2	99%
Heptachlor	mg/kg	54054-10	<0.1 || <0.1	54054-2	100%
delta-BHC	mg/kg	54054-10	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	54054-10	<0.1 || <0.1	54054-2	92%
Heptachlor Epoxide	mg/kg	54054-10	<0.1 || <0.1	54054-2	104%
gamma-Chlordane	mg/kg	54054-10	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	54054-10	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	54054-10	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	54054-10	<0.1 || <0.1	54054-2	101%
Dieldrin	mg/kg	54054-10	<0.1 || <0.1	54054-2	102%
Endrin	mg/kg	54054-10	<0.1 || <0.1	54054-2	85%
pp-DDD	mg/kg	54054-10	<0.1 || <0.1	54054-2	68%
Endosulfan II	mg/kg	54054-10	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	54054-10	<0.1 || <0.1	[NR]	[NR]

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Endrin Aldehyde	mg/kg	54054-10	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	54054-10	<0.1 || <0.1	54054-2	100%
Methoxychlor	mg/kg	54054-10	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%	54054-10	95 || 99 || RPD: 4	54054-2	97%
QUALITY CONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	54054-10	11/04/2011 || 11/04/2011	54054-2	11/04/2011
Date analysed	-	54054-10	12/04/2011 || 12/04/2011	54054-2	12/04/2011
Diazinon	mg/kg	54054-10	<0.1 || <0.1	[NR]	[NR]
Dimethoate	mg/kg	54054-10	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos-methyl	mg/kg	54054-10	<0.1 || <0.1	[NR]	[NR]
Ronnel	mg/kg	54054-10	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos	mg/kg	54054-10	<0.1 || <0.1	54054-2	101%
Fenitrothion	mg/kg	54054-10	<0.1 || <0.1	54054-2	91%
Bromophos-ethyl	mg/kg	54054-10	<0.1 || <0.1	[NR]	[NR]
Ethion	mg/kg	54054-10	<0.1 || <0.1	54054-2	97%
Surrogate TCLMX	%	54054-10	95 || 99 || RPD: 4	54054-2	99%
QUALITY CONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	54054-10	11/04/2011 || 11/04/2011	54054-2	11/04/2011
Date analysed	-	54054-10	12/04/2011 || 12/04/2011	54054-2	12/04/2011
Arochlor 1016	mg/kg	54054-10	<0.1 || <0.1	[NR]	[NR]
Arochlor 1221*	mg/kg	54054-10	<0.1 || <0.1	[NR]	[NR]
Arochlor 1232	mg/kg	54054-10	<0.1 || <0.1	[NR]	[NR]
Arochlor 1242	mg/kg	54054-10	<0.1 || <0.1	[NR]	[NR]
Arochlor 1248	mg/kg	54054-10	<0.1 || <0.1	[NR]	[NR]
Arochlor 1254	mg/kg	54054-10	<0.1 || <0.1	54054-2	106%
Arochlor 1260	mg/kg	54054-10	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%	54054-10	95 || 99 || RPD: 4	54054-2	105%

Client Reference: E24782K, St Paul's College

QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	[NT]	[NT]	54054-2	11/04/2011
Date analysed	-	[NT]	[NT]	54054-2	11/04/2011
Arsenic	mg/kg	[NT]	[NT]	54054-2	102%
Cadmium	mg/kg	[NT]	[NT]	54054-2	104%
Chromium	mg/kg	[NT]	[NT]	54054-2	105%
Copper	mg/kg	[NT]	[NT]	54054-2	114%
Lead	mg/kg	[NT]	[NT]	54054-2	102%
Mercury	mg/kg	[NT]	[NT]	54054-2	103%
Nickel	mg/kg	[NT]	[NT]	54054-2	105%
Zinc	mg/kg	[NT]	[NT]	54054-2	100%

Report Comments:

PAH's in soil: The RPD for duplicate results is accepted due to the non homogenous nature of the sample/s.

Asbestos ID was analysed by Approved Identifier: Alex Tam
Asbestos ID was authorised by Approved Signatory: Alex Tam

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

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.

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 batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

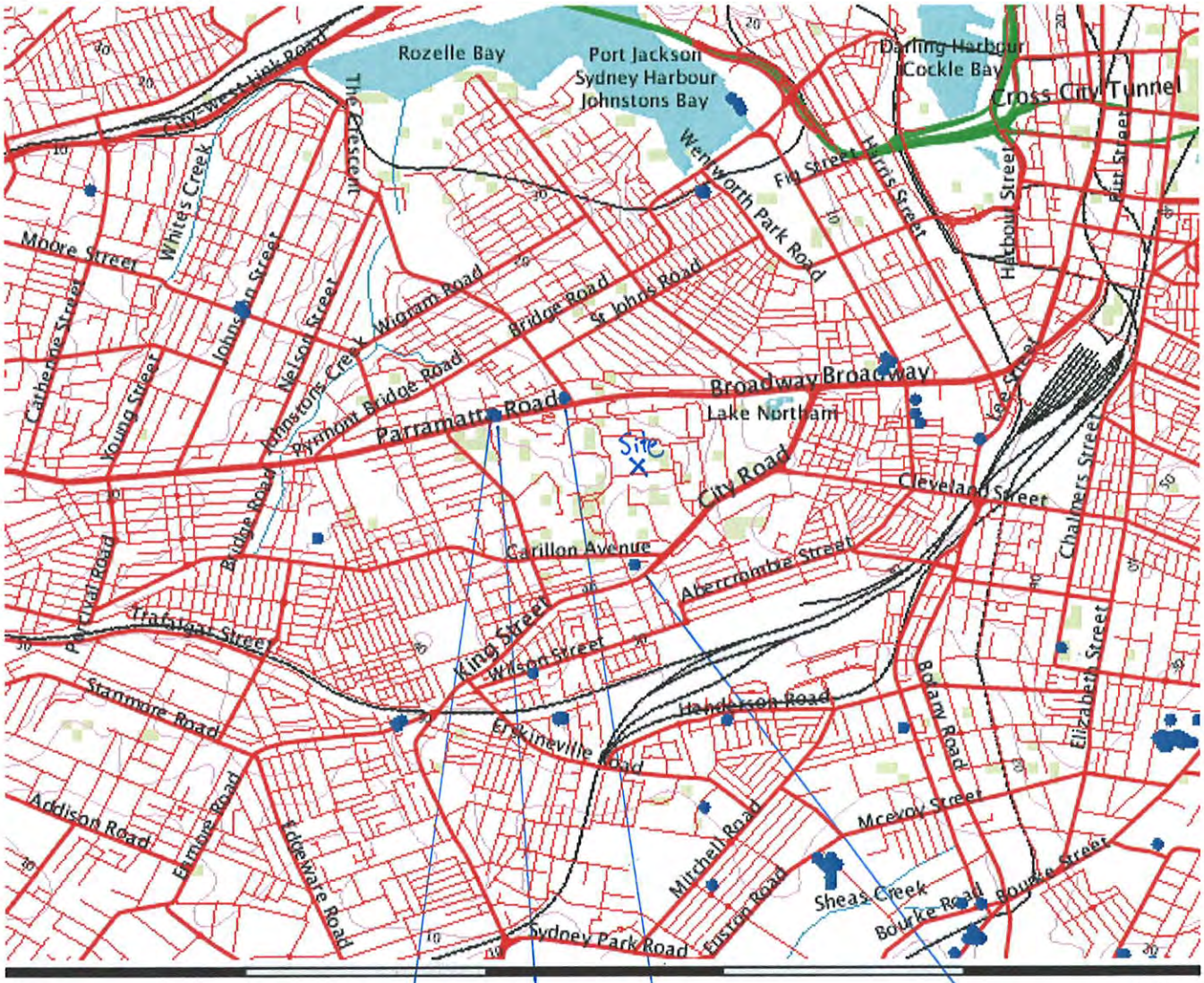
Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

APPENDIX C

(Site History Documents – Groundwater Bore Records)

Map from the NSW Natural Resource Atlas

Map created with NSW Natural Resource Atlas - http://www.nratlas.nsw.gov.au
Tuesday, May 03, 2011



GW109231 GW109230 GW111048 GW110247

Legend

Symbol	Layer	Custodian
	Cities and large towns renderImage: Cannot build image from features	
Cowra	Populated places renderImage: Cannot build image from features	
	Towns	
	Groundwater Bores	
	Catchment Management Authority boundaries	
	Major rivers	

Primary/arterial road
Motorway/freeway
Railway
Runway
Contour
Background

Topographic base map

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Tuesday, May 3, 2011

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW109230

Works Details (top)

GROUNDWATER NUMBER	GW 109230
LIC-NUM	10BL602551
AUTHORISED-PURPOSES	MONITORING BORE
INTENDED-PURPOSES	MONITORING BORE
WORK-TYPE	Bore
WORK-STATUS	
CONSTRUCTION-METHOD	
OWNER-TYPE	Private
COMMENCE-DATE	
COMPLETION-DATE	2008-08-18
FINAL-DEPTH (metres)	1.80
DRILLED-DEPTH (metres)	
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	BREZNIK
GWMA	-
GW-ZONE	-
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	10 - SYDNEY SOUTH COAST
RIVER-BASIN	
AREA-DISTRICT	
CMA-MAP	
GRID-ZONE	
SCALE	
ELEVATION	
ELEVATION-SOURCE	

NORTHING	6249055.00
EASTING	331802.00
LATITUDE	33 53' 8"
LONGITUDE	151 10' 52"
GS-MAP	
AMG-ZONE	56
COORD-SOURCE	
REMARK	

Form-A (top)

COUNTY	CUMBERLAND
PARISH	PETERSHAM
PORTION-LOT-DP	1//179617

Licensed (top)

COUNTY	CUMBERLAND
PARISH	PETERSHAM
PORTION-LOT-DP	1 179617

Water Bearing Zones (top)

no details

Drillers Log (top)

no details

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Tuesday, May 3, 2011

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW109231

Works Details (top)

GROUNDWATER NUMBER	GW109231
LIC-NUM	10BL602551
AUTHORISED-PURPOSES	MONITORING BORE
INTENDED-PURPOSES	MONITORING BORE
WORK-TYPE	Bore
WORK-STATUS	
CONSTRUCTION-METHOD	
OWNER-TYPE	Private
COMMENCE-DATE	
COMPLETION-DATE	2008-08-18
FINAL-DEPTH (metres)	3.20
DRILLED-DEPTH (metres)	
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	BREZNIK
GWMA	-
GW-ZONE	-
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	10 - SYDNEY SOUTH COAST
RIVER-BASIN	
AREA-DISTRICT	
CMA-MAP	
GRID-ZONE	
SCALE	
ELEVATION	
ELEVATION-SOURCE	

NORTHING	6249063.00
EASTING	331787.00
LATITUDE	33 53' 7"
LONGITUDE	151 10' 52"
GS-MAP	
AMG-ZONE	56
COORD-SOURCE	
REMARK	

Form-A (top)

COUNTY	CUMBERLAND
PARISH	PETERSHAM
PORTION-LOT-DP	1//178740

Licensed (top)

COUNTY	CUMBERLAND
PARISH	PETERSHAM
PORTION-LOT-DP	1 179617

Water Bearing Zones (top)

no details

Drillers Log (top)

no details

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Tuesday, May 3, 2011

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW110247

Works Details (top)

GROUNDWATER NUMBER	GW110247
LIC-NUM	10BL603148
AUTHORISED-PURPOSES	DOMESTIC
INTENDED-PURPOSES	DOMESTIC
WORK-TYPE	Bore
WORK-STATUS	
CONSTRUCTION-METHOD	Rotary Air
OWNER-TYPE	Private
COMMENCE-DATE	
COMPLETION-DATE	2009-07-16
FINAL-DEPTH (metres)	210.00
DRILLED-DEPTH (metres)	210.00
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	MOORE THEOLOGICAL COLLEGE CL
GWMA	-
GW-ZONE	-
STANDING-WATER-LEVEL	31.00
SALINITY	4400.00
YIELD	0.13

Site Details (top)

REGION	10 - SYDNEY SOUTH COAST
RIVER-BASIN	
AREA-DISTRICT	
CMA-MAP	
GRID-ZONE	
SCALE	
ELEVATION	
ELEVATION-SOURCE	

NORTHING	6248363.00
EASTING	332357.00
LATITUDE	33 53' 30"
LONGITUDE	151 11' 13"
GS-MAP	
AMG-ZONE	56
COORD-SOURCE	
REMARK	

Form-A (top)

COUNTY	CUMBERLAND
PARISH	PETERSHAM
PORTION-LOT-DP	28//939363

Licensed (top)

COUNTY	CUMBERLAND
PARISH	PETERSHAM
PORTION-LOT-DP	28 939363

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter;
ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1		Hole	Hole	0.00	2.50	204			Rotary Air
1		Hole	Hole	2.50	108.00	162			Down Hole Hammer
1		Hole	Hole	108.00	210.00	156			Down Hole Hammer
1	1	Casing	Steel	-0.30	5.70	156			Driven into Hole; Suspended in Clamps
1	1	Casing	PVC Class 9	-0.30	41.70	140			Screwed and Glued; Suspended in Clamps

Water Bearing Zones (top)

FROM-DEPTH (metres)	TO-DEPTH (metres)	THICKNESS (metres)	ROCK-CAT-DESC	S-W-L	D-D-L	YIELD	TEST-HOLE-DEPTH (metres)	DURATION	SALINITY
22.00	23.00	1.00				0.05		0.25	3750.00
74.00	76.00	2.00				0.10		0.25	3300.00

188.00	188.50	0.50	31.00	0.13	0.25	4400.00

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	2.00	2.00	CLAY BROWN		
2.00	4.50	2.50	CLAY GREY		
4.50	22.00	17.50	SHALE GREY		
22.00	23.00	1.00	SHALE SOFT		
23.00	33.00	10.00	SHALE HARD		
33.00	74.00	41.00	SANDSTONE GREY		
74.00	76.00	2.00	SANDSTONE AND QUARTZ FINE		
76.00	134.00	58.00	SANDSTONE GREY		
134.00	135.50	1.50	SANDSTONE QUARTZ FINE		
135.50	153.50	18.00	SANDSTONE GREY		
153.50	154.00	0.50	SANDSTONE QUARTZ FINE		
154.00	168.00	14.00	SANDSTONE GREY		
168.00	170.00	2.00	SANDSTONE SHALE BEDDING		
170.00	188.00	18.00	SANDSTONE GREY		
188.00	188.50	0.50	SANDSTONE QUARTZ		
188.50	210.00	21.50	SANDSTONE GREY		

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Tuesday, May 3, 2011

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW111408

Works Details (top)

GROUNDWATER NUMBER	GW111408
LIC-NUM	10BL604530
AUTHORISED-PURPOSES	MONITORING BORE
INTENDED-PURPOSES	MONITORING BORE
WORK-TYPE	Well
WORK-STATUS	
CONSTRUCTION-METHOD	Auger - Solid Flight
OWNER-TYPE	Private
COMMENCE-DATE	
COMPLETION-DATE	2011-02-05
FINAL-DEPTH (metres)	4.40
DRILLED-DEPTH (metres)	4.40
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	REIL DEALERSHIP
GWMA	-
GW-ZONE	-
STANDING-WATER-LEVEL	2.07
SALINITY	
YIELD	

Site Details (top)

REGION	10 - SYDNEY SOUTH COAST
RIVER-BASIN	
AREA-DISTRICT	
CMA-MAP	
GRID-ZONE	
SCALE	
ELEVATION	
ELEVATION-SOURCE	

NORTHING	6249142.00
EASTING	332066.00
LATITUDE	33 53' 5"
LONGITUDE	151 11' 3"
GS-MAP	
AMG-ZONE	56
COORD-SOURCE	
REMARK	

Form-A (top)

COUNTY	CUMBERLAND
PARISH	PETERSHAM
PORTION-LOT-DP	8//30884

Licensed (top)

COUNTY	CUMBERLAND
PARISH	PETERSHAM
PORTION-LOT-DP	8 30884

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter;
ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1		Hole	Hole	0.00	4.40	125			Auger - Solid Flight
1	1	Casing	PVC Class 18	0.00	1.30	60	50		Screwed; Seated on Bottom; End cap
1	1	Opening	Slots - Horizontal	1.30	4.40	60			PVC Class 18; Casing - Machine Slotted; Screwed
1		Annulus	Crushed Aggregate	0.70	4.40				Graded; GS: 0-0mm

Water Bearing Zones (top)

FROM-DEPTH (metres)	TO-DEPTH (metres)	THICKNESS (metres)	ROCK-CAT-DESC	S-W-L	D-D-L	YIELD	TEST-HOLE-DEPTH (metres)	DURATION	SALINITY
0.00	0.00	0.00		2.07					

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	0.22	0.22	CONCRETE SLAB		
0.22	0.50	0.28	GRAVEL ROADBASE		
0.50	1.10	0.60	FILLING,GREY BROWN AND GREY,SILTY CLAY		
1.10	4.40	3.30	CLAY,GREY,SILTY WITH TRACE OF IRONSTONE,GRAVEL,DAMP		

(Site History Documents – Historical Land Title Records)

RM

4 APR 2011

ADVANCE LEGAL SEARCHERS PTY LIMITED

(ACN 147 943 842)
ABN 82 147 943 842

P.O. Box 149
Yagoona NSW 2199

Telephone: +612 9754 1590
Mobile: 0412 169 809
Facsimile: +612 9754 1364
Email: alsearch@optusnet.com.au

30th March, 2011

ENVIRONMENTAL INVESTIGATION SERVICES
PO BOX 976,
NORTH RYDE BC NSW 1670

Attention: Rob Muller

RE: **9 City Road, Camperdown (site of St Paul's College)**
Job No. E24782K

Current Search

Folio Identifier 1966/1117595 (title attached)
DP 1117595 (plan attached)
Dated 24th March, 2011
Registered Proprietor:
KIM SANTOW
HENRIE NICHOLAS
GAVIN BROWN
ROBERT OTTO ALBERT
IVAN FRANCIS HEAD
(TRUSTEES OF ST PAUL'S COLLEGE)

Title Tree
Lot 1966 DP 1117595

Folio Identifier 1966/1117595

Folio Identifier 576/752049

See Notes (a) & (b)

(a)

Certificate of Title Volume 1375 Folio 60

****

(b)

Deed of Trust Book 4228 No. 531

Deed of Trust Book 4050 No. 603

Deed of Trust Book 3707 No. 116

Deed of Trust Book 2985 No. 597

Deed of Trust Book 2927 No. 865

Deed of Trust Book 2418 No. 183

Deed of Trust Book 1921 No. 36

Conveyance Book 1380 No. 960

****

University and College Lands (Saint Paul's College) Act 1966

University and College Lands (Saint Paul's College and Wesley College) Act 1957

Summary of proprietor(s)
Lot 1966 DP 1117595

Year	Proprietor
	(Lot 1966 DP 1117595)
2007 – todate	Kim Santow Henrie Nicholas Gavin Brown Robert Otto Albert Ivan Francis Head
	(Lot 576 DP 752049)
2007 – 2007	Kim Santow Henrie Nicholas Gavin Brown Robert Otto Albert Ivan Francis Head
1999 – 2007	Leonie Judith Kramer Gavin Brown John Robert Lehane Robert Otto Albert Ivan Francis Head

See Notes (a) & (b)

Note (a)

	(Land commencing on north western building line of Newton Road Parish of Petersham – Area – 4 Acres 3 Roods 29 Perches – CTVol 1375 Fol 60)
1995 – 1999	Dame Leonie Kramer Donald Mc Nicol John Robert Felix Lehane Robert Otto Albert Ivan Francis Head
1994 – 1995	Dame Leonie Kramer Donald Mc Nicol John Robert Felix Lehane Robert Otto Albert Maxwell McNee Thomas
1970 – 1994	Sir Ivan Neil Dougherty, fellow of senate – University of Sydney Bruce Rodda Williams, vice chancellor – University of Sydney Brian Kemmis White, fellow of St Paul's College Frank Elliot Trigg, fellow of St Paul's College Reverend Alexander Peter Bruce Bennie, warden of St Paul's College
1969 – 1970	Charles George McDonald, chancellor – University of Sydney Sir Ivan Neil Dougherty, fellow of senate – University of Sydney Brian Kemmis Whie, fellow of St Paul's College Frank Elliot Trigg, fellow of St Paul's College Reverend Alexander Peter Bruce Bennie, warder of St Paul's College
1957 – 1969	Sir Charles Bickerton Blackburn, Knight & Chancellor – Uni. Of Sydney William John Victor Windeyr, major general and deputy chancellor - University of Sydney Geoffrey Vandeleur Davy, esquire Brian Kemmis White, barrister Felix Raymond Arnott, Clerk in Holy Orders *(University and College Lands (Saint Paul's College) Act 1966)*
1957 – 1957	Sir Robert Strachan Wallace Alfred Becker Stewart White, esquire Geoffrey Vandeleur Davy, esquire *(Univesrity and College Lands (Saint Paul's College and Wesley College) Act 1957)*

1942 – 1957	Sir Percival Halse Rogers, KBE, Chancellor – University of Sydney Sir Robert Strachan Wallace, KBE, Vice Chancellor – Uni of Sydney Alfred Becker Stewart White, esquire Geoffrey Vandeleur Davy, esquire Reverend Canon Arthur Henry Garnsey
1942 – 1942	Alfred Becker Stewart White, esquire Reverend Canon Arthur Henry Garnsey
1924 – 1942	Alfred Becker Stewart White, esquire Reverend Canon Arthur Henry Garnsey The Honourable, Sir William Portus Cullen The Honourable, Mr Justice Philip Whistler Street Francis Alfred Allison Russell, esquire
1901 – 1924	Sydney University, grantee

*****

Note (b)

	(Part of 126 Acres Parish of Petersham – Area 10 Acres 1 Rood 31 Perches – Trust Bk 4087 No. 861)
1995 – 1999	Dame Leonie Kramer Donald Mc Nicol John Robert Felix Lehane Robert Otto Albert Ivan Francis Head
	(Part of 126 Acres Parish of Petersham – Area 10 Acres 1 Rood 31 Perches – Trust Bk 4228 No. 531)
1994 – 1995	Dame Leonie Kramer Donald Mc Nicol John Robert Felix Lehane Robert Otto Albert Maxwell McNee Thomas
	(Part of 126 Acres Parish of Petersham – Area 10 Acres 1 Rood 31 Perches – Trust Bk 4050 No. 603)
1970 – 1994	Sir Ivan Neil Dougherty, fellow of senate – University of Sydney Bruce Rodda Williams, vice chancellor – University of Sydney Brian Kemmis White, fellow of St Paul's College Frank Elliot Trigg, fellow of St Paul's College Reverend Alexander Peter Bruce Bennie, warder of St Paul's College
	(Part of 126 Acres Parish of Petersham – Area 10 Acres 1 Rood 31 Perches – Trust Bk 3707 No. 116)
1969 – 1970	Charles George McDonald, chancellor – University of Sydney Sir Ivan Neil Dougherty, fellow of senate – University of Sydney Brian Kemmis Whie, fellow of St Paul's College Frank Elliot Trigg, fellow of St Paul's College Reverend Alexander Peter Bruce Bennie, warden of St Paul's College
	(Part of 126 Acres Parish of Petersham – Area 10 Acres 1 Rood 31 Perches – Trust Bk 2985 No. 597)
1957 – 1969	Sir Charles Bickerton Blackburn, Knight & Chancellor – Uni. Of Sydney William John Victor Windeyr, major general and deputy chancellor - University of Sydney Geoffrey Vandeleur Davy, esquire Brian Kemmis White, barrister Felix Raymond Arnott, Clerk in Holy Orders *(University and College Lands (Saint Paul's College) Act 1966)*

	(Part of 126 Acres Parish of Petersham – Area 10 Acres 1 Rood 31 Perches – Trust Bk 2927 No. 865)
1957 – 1957	Sir Robert Strachan Wallace Alfred Becker Stewart White, esquire Geoffrey Vandeleur Davy, esquire *(Univesrity and College Lands (Saint Paul's College and Wesley College) Act 1957)*
	(Part of 126 Acres Parish of Petersham – Area 10 Acres 1 Rood 31 Perches – Trust Bk 2418 No. 183)
1942 – 1957	Sir Percival Halse Rogers, KBE, Chancellor – University of Sydney Sir Robert Strachan Wallace, KBE, Vice Chancellor – Uni of Sydney Alfred Becker Stewart White, esquire Geoffrey Vandeleur Davy, esquire Reverend Canon Arthur Henry Garnsey
	(Part of 126 Acres Parish of Petersham – Area 10 Acres 1 Rood 31 Perches – Trust Bk 1921 No. 36)
1942 – 1942	Alfred Becker Stewart White, esquire Reverend Canon Arthur Henry Garnsey
	(Part of 126 Acres Parish of Petersham – Area 10 Acres 1 Rood 31 Perches – Conv Bk 1380 No. 960)
1924 – 1942	Alfred Becker Stewart White, esquire Reverend Canon Arthur Henry Garnsey The Honourable, Sir William Portus Cullen The Honourable, Mr Justice Philip Whistler Street Francis Alfred Allison Russell, esquire
1855 – 1924	Sydney University, grantee

*****

Land & Property Management Authority
Land & Property Information

Cadastral Records Enquiry Report

Ref : BOX 97 - CAMPERDOWN

Requested Parcel : Lot 1966 DP 1117595

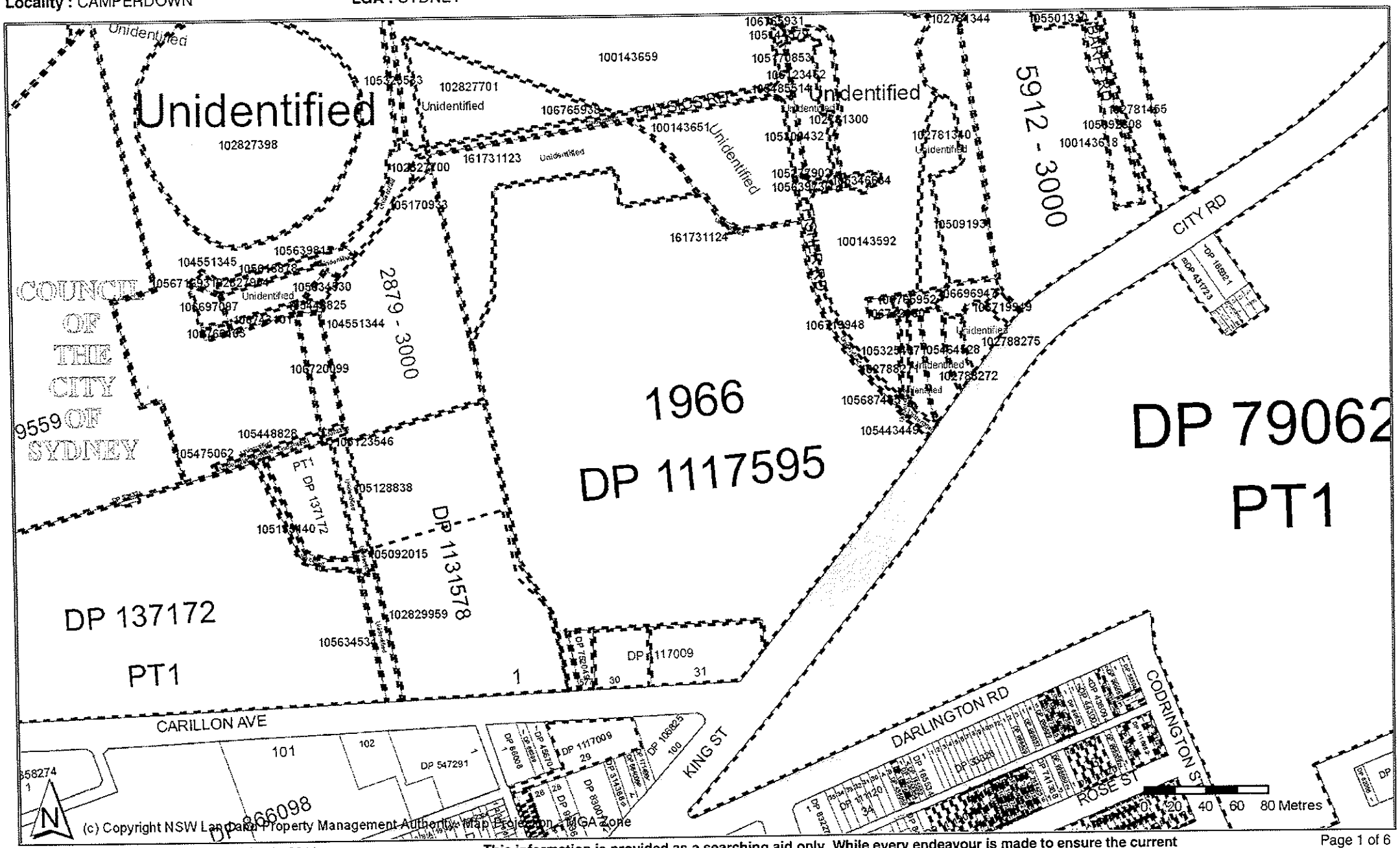
Identified Parcel : Lot 1966 DP 1117595

Locality : CAMPERDOWN

LGA : SYDNEY

Parish : PETERSHAM

County : CUMBERLAND



Report Generated 11:04:28 AM, 25 March, 2011

This information is provided as a searching aid only. While every endeavour is made to ensure the current cadastral pattern is accurately reflected, the Registrar General cannot guarantee the information provided. For all ACTIVITY PRIOR to SEPT 2002 you must refer to the RGs Charting and Reference Maps.

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 1966/1117595

SEARCH DATE	TIME	EDITION NO	DATE
24/3/2011	2:03 PM	1	4/9/2007

LAND

LOT 1966 IN DEPOSITED PLAN 1117595
AT CAMPERDOWN
LOCAL GOVERNMENT AREA SYDNEY
PARISH OF PETERSHAM COUNTY OF CUMBERLAND
TITLE DIAGRAM DP1117595

FIRST SCHEDULE

KIM SANTOW
HENRIC NICHOLAS
GAVIN BROWN
ROBERT OTTO ALBERT
IVAN FRANCIS HEAD
AS JOINT TENANTS (CA118958)

SECOND SCHEDULE (3 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 LAND EXCLUDES MINERALS EXCEPTED FROM THE CROWN GRANT OF PORTION 576
3 LIMITED TITLE. LIMITATION PURSUANT TO SECTION 28T(4) OF THE REAL PROPERTY ACT, 1900. THE BOUNDARIES OF THE LAND COMPRISED HEREIN HAVE NOT BEEN INVESTIGATED BY THE REGISTRAR GENERAL.

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
24/3/2011 2:05PM

FOLIO: 1966/1117595

First Title(s): OLD SYSTEM VOL 1375 FOL 60
Prior Title(s): 576/752049 BK 4520 NO 876

Recorded	Number	Type of Instrument	C.T. Issue
4/9/2007	DP1117595	DEPOSITED PLAN	LOT RECORDED FOLIO NOT CREATED
4/9/2007	CA118958	CONVERSION ACTION	FOLIO CREATED EDITION 1

*** END OF SEARCH ***

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
24/3/2011 2:06PM

FOLIO: 576/752049

First Title(s): VOL 1375 FOL 60
Prior Title(s): VOL 1375 FOL 60

Recorded	Number	Type of Instrument	C.T. Issue
22/2/1999	DP752049	DEPOSITED PLAN	FOLIO CREATED EDITION 1
20/7/1999	6002517	DEPARTMENTAL DEALING	
8/5/2001	7591050	DEPARTMENTAL DEALING	
8/5/2003	9577498	DEPARTMENTAL DEALING	
20/8/2007	AD354347	DEPARTMENTAL DEALING	
25/8/2007	AD266378	NOTICE OF DEATH	
25/8/2007	AD234733	APPLICATION	EDITION 2
4/9/2007	AD393741	DEPARTMENTAL DEALING	FOLIO CANCELLED

*** END OF SEARCH ***

(Site History Documents – Council Records)

City of Sydney Archives

Item Search Results

Search criteria: Title="St Paul's College" (use Exact Phrase)

1 2 Next Page >

Total **31** results

Series No

Series 11: Minutes of the Finance Committee I

Title	Start ~ End Date
Minutes of the Finance Committee: making of fair annual charges for bridges, tunnels, pipelines etc under or over roadways; resumption and road widenings; creation of position of Catering Manager for Meals on Wheels; floodlighting of Town Hall; future leasing of Capitol Theatre; sale of Council prop	07 Feb 1972 ~ 11 Dec 1972

Series 26: Letters Received

Title	Start ~ End Date
Letter: Henry D Pitt, (A.D.C.) Govt House Sydney to TC. Order of presentation to His Excellency at the House on the 19th will be .. After the Legislature, The University, St Paul's College, St John's College, Army & Navy, Offices of Ministers, The Corporation of the City. No deviation from order wh	17 Jan 1861 ~ 17 Jan 1861

Series 34: Town Clerk's Department Correspondence Files

Title	Start ~ End Date
St Paul's College, University of Sydney. To erect a three-storey addition to provide additional accommodation & facilities for students and tutors & to carry out alterations. For Council's comment.	16 Sep 1961 ~ 10 Nov 1961
Portrait of Former Chief Justice, Sir Alfred Stephen. Loan to St Paul's College, University of Sydney.	24 Nov 1972 ~ 04 Jul 1974
Cyril Blackett - re deviation at St. Paul's College.	13 Feb 1920 ~ 17 Feb 1920
St. Paul's College, University of Sydney - development application [plans attached]	15 Jun 1950 ~ 11 Jul 1950

Series 50: Deed Packets I

Peter
9418 619 922

Title	Start ~ End Date
St. Paul's College. Temporary Chapel. Building Deviation. Bond. [TC 3993/1914]	23 Sep 1914 ~ 23 Sep 1914
St. Paul's College. Erection temporary chapel. Bond. [TC 3993/1914]	02 Apr 1919 ~ 02 Apr 1919
St. Paul's College. Temporary Building. Bond. [TC 515/20]	10 Mar 1920 ~ 22 Oct 1928

Series 59: Building Application Files

Title	Start ~ End Date
University of Sydney. St. Paul's College. New building Chapel.	18 Dec 1958 ~ 15 Mar 1960
University of Sydney, St Paul's College. Student's residential wing	30 Oct 1961 ~ 26 Jun 1962

Series 62: Development Application Files

Title	Start ~ End Date
University of Sydney. Additions to St Paul's College.	23 Dec 1958 ~ 26 May 1959
City Rd. Sydney (University of Sydney). Alterations & additions to St Paul's College buildings.	25 Sep 1961 ~ 04 Mar 1964
St. Paul's College, University of Sydney, City Road, Sydney. Erect one squash court in university college. Dennis, Odling & Reed	22 Jun 1973 ~ 04 Sep 1974

Series 116: Central Activity Files

Title	Start ~ End Date
University of Sydney, St.Paul's College, City Rd. Use "The Gatehouse Lodge" as office of Graduate & Community Relations involving alterations. Clive Lucas & Partners P/L (plans)	24 Mar 1986 ~ 27 Aug 1986

Series 126: Building Application Plans

Title	Start ~ End Date
City Rd, Darlington. (St Paul's College, University of Sydney) Internal Alterations to Grnd Flr. [M]	01 Jan 1985 ~ 31 Dec 1985
City Rd, Chippendale, (St. Paul's College, University of Sydney). Alterations to Women's Lodge. Dennis & Odling & Reed. [M]	01 Jan 1984 ~ 31 Dec 1984
City Rd Jason G Taylor new wing to St. Paul's College university ground [M]	01 Jan 1920 ~ 31 Dec 1920
St Paul's College T Lyons alterations [M]	01 Jan 1911 ~ 31 Dec 1911
University of Sydney (St. Paul's College dressing pavilion) [R]	01 Jan 1927 ~ 31 Dec 1927

University of Sydney (St. Paul's College - new student quarters) [R]	01 Jan 1947 ~ 31 Dec 1947
University of Sydney (St. Paul's College Chapel) [R] [M]	01 Jan 1958 ~ 31 Dec 1958
University of Sydney (St. Paul's College - student's residential) [R]	01 Jan 1961 ~ 31 Dec 1961
University of Sydney (St. Paul's College) [R]	01 Jan 1964 ~ 31 Dec 1964
University of Sydney (St. Paul's College - extensions) [R] [M]	01 Jan 1964 ~ 31 Dec 1964
University of Sydney (St. Paul's College - library building) [R]	01 Jan 1967 ~ 31 Dec 1967
University of Sydney (St. Paul's College) [F] [M]	01 Jan 1914 ~ 31 Dec 1914
University of Sydney (St. Paul's College - temporary bedrooms) [F]	01 Jan 1920 ~ 31 Dec 1920
University of Sydney (St. Paul's College) [F]	01 Jan 1920 ~ 31 Dec 1920
City Rd C W Norman St. Paul's College university ground temporary bedrooms [M]	01 Jan 1920 ~ 31 Dec 1920

1 2 Next Page >

Return to Search page

Simple Search | Advanced Search | Structured Search

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Last Update: Sunday, 10 April 2011

City of Sydney Archives

Item Search Results

Search criteria: Title="St Paul's College" (use Exact Phrase)

< Previous Page 1 2

Series No Total **31** results

Series 305: Interim Development Application Files

Title	Start ~ End Date
Interim Development application: St Paul's College. University Grounds. Proposed New Students quarters	06 Dec 1946 ~ 24 Feb 1947

< Previous Page 1 2

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Building and development plans by item title

Series	Container	Outsize	Roll	Flat	Micro	Imaged	Fragile	GRR	Item No	Item title
126	2984		R					GRR19606	2096/57	University of Sydney (St. Paul's College - library building)
126	2541		R					GRR19123	1181/64	University of Sydney (St. Paul's College)
126	2603		R		M			GRR19187	2744/64	University of Sydney (St. Paul's College - extensions)
126	2227		R					GRR18809	2291/61	University of Sydney (St. Paul's College - student's residential)
126	1924		R		M			GRR18483	2636/58	University of Sydney (St. Paul's College Chapel)
126	334		R					GRR16844	0844/27	University of Sydney (St. Paul's College dressing pavilion)
126	1224		R					GRR17752	0112/47	University of Sydney (St. Paul's College - new student quarters)
126	G08/22			F				GRR25713	0146/20	University of Sydney (St. Paul's College - temporary bedrooms)
126	G08/24			F				GRR25720	0600/20	University of Sydney (St. Paul's College)
126	G07/24			F	M			GRR25639	0774/14	University of Sydney (St. Paul's College)
126					M				0579/84	City Rd, Chippendale, (St. Paul's College, University of Sydney). Alterations to Women's Lodge. Dennis & Odling & Reed.
126					M				1837/85	City Rd, Darlington. (St Paul's College, University of Sydney) Internal Alterations to Grnd Flr.

Building and development plans by item title

Series	Container	Outsize	Roll	Flat	Micro	Imaged	Fragile	GRR	Item No	Item title
126	991		R					GRR17515	0029/40	City Rd (St. Pauls College)
126					M				0673/82	University of Sydney (St Pauls College)

Applications Details

9 City Road , CAMPERDOWN NSW 2050

Property Applications: S/SK/1996/1012, ALTS & ADDS TO THE DENISON WIN G SECTION OF ST PAULS COLLEGE (Convert roof space to 2 units

Property Applications: S/SK/1997/822, ALTERATIONS AND ADDITIONS TO C OLLEGE BUILDING (Alterations a nd additions to St Pauls Colle

Property Applications: S/SK/1997/722, APPLICATION FOR PLACE OF PUBLI C ENTERTAINMENT (St Paul's ann ual college formal ball. Tempo

Property Applications: S/SK/1997/619, APPLICATION FOR PLACE OF PUBLI C ENTERTAINMENT (To provide en tertainment to the dinning hal

Property Applications: S/SK/1998/193, ERECT TWO MARQUEES FOR EVENT (Erect two tents.)

Property Applications: D/1996/1022, CONSTRUCT TWO TUTORS FLATS WIT HIN BUILDING (DENISON WING) (C reation of two 'tutors' units

Property Applications: D/1997/469, ALTS AND ADDS TO EXISTING COLL EGE FOR RESIDENTIAL ACCOM (Alt erations and additions to St P

Property Applications: D/1998/867, ERECT TEMPORARY STRUCTURES TO HOLD FORMAL BALL (Erect tepora ry structure.)

Property Applications: D/1999/1009, COLLEGE TO BE USED FOR ENTERTA INMENT VENUE (Use premises as an entertainment venue.)

Property Applications: D/1999/1414, ERECT 2 TEMPORARY MARQUEES (Er ection of two temporary marque s for 8th January 2000.)

Property Applications: D/1999/141, USE COLLEGE FOR ENTERTAINMENT VENUE INSTALL MARQUEE (Use pre mises for public entertainment

Property Applications: D/2000/55, TEMPORARY USE AS PRE 17 - 18 M ARCH 2000 (Use premises for pu blic entertainment.)

Property Applications: S/SO/2001/92, Place of public entertainment.

Property Applications: S/SO/2002/143, APPROVAL FOR DANCE PARTY TO CA TER FOR 1500 PEOPLE

Property Applications: S/SO/2002/724, college formal.Black tie eve nt with entertainment includin g DJ, dancing, mock casino, wa

Property Applications: S/SO/2003/139, We intend to hold the St Paul' s College Informal on April 16 th 2003. The event will run f

Property Applications: B/2003/199, Temporary structure marquis & steeple structure

Property Applications: B/2003/206, Pope for 400 patrons

Property Applications: B/2003/207, Temporary structure & temporary Pope

Property Applications: B/2004/154, Erect 2 marquees for the university social function and use as Temporary Place of Public Entertainment

Property Applications: B/2004/905, Temporary Structure (400sqm) Formal Black Tie Event, Including POPE Lic

Property Applications: B/2005/265, Marquee for university dance

Property Applications: D/2005/366, Use of St Paul's College for public entertainment between 7pm and 2am and installation of 2 temporary marquees for dance party event on the 23 march 2005

Property Applications: D/2005/1569, Use of St. Paul's college for a one off public entertainment event on 21 October 2005, between 6.30pm and 2.00am and installation of 2 temporary marquees.

Property Applications: B/2005/1198, End of year dinner and dance party running from 6.30pm to 2am installing marquees as per DA

Property Applications: D/2006/114, Use of St Paul's College for a one off public entertainment event on 29 March 2006, between 7:00pm and 2:00am and installation of 2 temporary marquees and a tent.

Property Applications: B/2006/152, Temporary Structure for College Dance Party on 29th March 2006 used as Place of Public Entertainment

Property Applications: D/2006/1161, Internal alterations including the removal of existing kitchen timber floor and replacement with a concrete slab.

Property Applications: D/2006/1672, Installation of a temporary marquee at the quadrangle of St Paul's College on 13 October 2006 for the purpose of the Student's Club Formal Ball.

Property Applications: B/2006/1072, installation of a marquee in the quadrangle for St Paul's College Student club formal ball on 13 October 2006

Property Applications: B/2006/1393, New kitchen fitout

Property Applications: D/2007/226, Outdoor dance party to be held in the quadrangle building of St Paul's College on 21 and 22 March 2007 between the hours of 7pm and 2am.

Property Applications: B/2007/139, Temporary marquee and POPE for outdoor dance party held entirely within the quadrangle at St Paul's College MAX 1500 people

Property Applications: D/2007/1752, Use of temporary structures at the quadrangle of St Paul's College between 6.30PM on 12 October

2007 and 2.00AM on 13 October 2007 for the purposes of an end of year student function.

Property Applications: B/2007/920, Use of two marques as a POPE for a private function for collegue residents and their invited guests. [redacted]

Property Applications: D/2008/81, Outdoortemporary events to be held in the quadrangle building of St Paul's College on 19 and 20 March 2008 [redacted]

Property Applications: D/2008/740, Outdoor temporary event to be held in the quadrangle building of St Paul's College on 29 May 2008. [redacted]

Property Applications: D/2008/1506, Place of Public Entertainment and erection of a temporary stage, marquee and dance floor within the grounds of St Pauls College, University of Sydney, between 8.00pm 10th October 2008 to 12.30am 11th October 2008. [redacted]

Property Applications: D/2009/76, Use of St Paul's College grounds for a dance party on 18 March 2009 and associated facilities including a temporary stage and marquee. [redacted]

Property Applications: D/2009/578, Use of St Paul's College grounds for a Jazz dinner and dance on 22nd May 2009 including a temporary stage and marquee [redacted]

Property Applications: D/2009/903, POPE renewal /592/2004 [redacted]

Property Applications: D/2009/951, Place of Public entertainment renewal for St Paul's College. [redacted]

Property Applications: D/2009/610, Inflable marque tent to cover stage for private formal function [redacted]

Property Applications: D/2010/235, Erection of temporary structures for dance party on the grounds of St Paul's College (Sydney University) on March 17, between 6.30pm and midnight for a maximum 800 people. [redacted]

Property Applications: D/2011/214, Erection of temporary structures for a dance party on the grounds of St Paul's College (Sydney University) on 16th March 2011 between 5:00pm and 11:45pm for a maximum of 800 people. [redacted]

IT

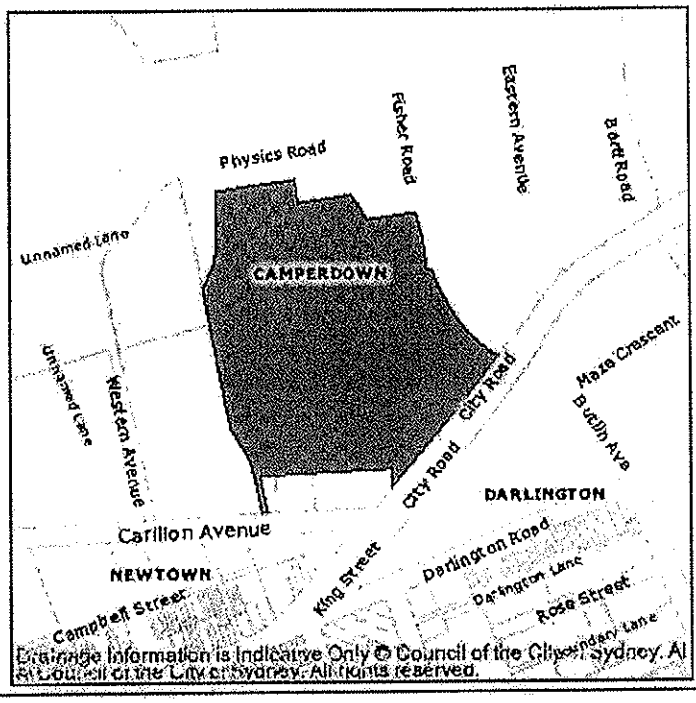
Lot 1966 DP 1117595

%Close

StatusDefault Include Sub-Properties

Planning Report

8/04/2011



Address:	9 City Road CAMPERDOWN NSW 2050
Owner:	
Property Description:	Lot 1966 DP 1117595
Ward:	South Sydney 8 May 2003

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Planning Report

8/04/2011

Application No:	Type:	Description:
D/2005/1569	Development Applications	Use of St. Paul's college for a one off public entertainment event on 21 October 2005, between 6.30pm and 2.00am and installation of 2 temporary marquees.
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B/2006/1393	Building Related Applications	New kitchen fitout
B/2006/1072	Building Related Applications	installation of a marquee in the quadrangle for St Paul's College Student club formal ball on 13 October 2006
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B/2009/610	Building Related Applications	Inflable marque tent to cover stage for private formal function
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B/2003/207	Building Related Applications	Temporary structure & temporary Pope
B/2003/199	Building Related Applications	Temporary structure marquis & steeple structure
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B/2007/920	Building Related Applications	Use of two marques as e POPE for a private function for collegue residents and their invited guests.

Zone:	Description:
SS5SPU	Special Uses 5 SSLEP 1998

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(Site History Documents – WorkCover Records)

RM

11 APR 2011

Our Ref: D11/044480
Your Ref: Rob Muller

08 April 2011

Attention: Rob Muller
Environmental Investigation Services
PO Box 976
NORTH RYDE BC NSW 1670

Dear Mr Muller,

RE SITES: 9 City Road (Lot 1966 DP1117595) Camperdown

I refer to your site search request received by WorkCover NSW on 08 April 2011 requesting information on licences to keep dangerous goods for the above site.

A search of the Stored Chemical Information Database (SCID) and the microfiche records held by WorkCover NSW has not located any records pertaining to the above mentioned premises.

If you have any further queries please contact the Dangerous Goods Licensing Team on (02) 4321 5500.

Yours Sincerely

Diana Hayes
Senior Licensing Officer
Dangerous Goods Team

APPENDIX D

(Sampling Protocols and QA/QC Definitions)

SOIL AND GROUNDWATER SAMPLING PROTOCOLS

These protocols specify the basic procedures to be used when sampling soils or groundwater for environmental site assessments undertaken by EIS. The purpose of these protocols is to provide standard methods for: sampling, decontamination procedures for sampling equipment, sample preservation, sample storage and sample handling. Deviations from these procedures must be recorded.

Soil Sampling

a) Prepare a test pit/borehole log.

b) Layout sampling equipment on clean plastic sheeting to prevent direct contact with ground surface. The work area should be at a distance from the drill/rig excavator such that the drill rig/excavator can operate in a safe manner.

c) Ensure all sampling equipment has been decontaminated prior to use.

d) Remove any surface debris from the immediate area of the sampling location.

e) Collect samples and place in glass jar with a Teflon seal. This should be undertaken as quickly as possibly to prevent the loss of volatiles. If possible, fill the glass jars completely.

f) Collect samples for asbestos analysis and place in a zip-lock plastic bag.

g) Label the jar and/or bag with the EIS job number, sample location (e.g. BH1), sampling depth interval and date. If more than one sample container is used, this should also be indicated (e.g. 2 = Sample jar 1 of 2 jars).

h) Photoionisation detector (PID) screening of volatile organic compounds (VOCs) should be undertaken on samples using the soil sample headspace method. Headspace measurements are taken following equilibration of the headspace gasses in partly filled zip-lock plastic bags. PID headspace data is recorded on the borehole/test pit log and the chain of custody forms.

i) Record the lithology of the sample and sample depth on the borehole/test pit log in accordance with AS1726-1993[21].

j) Store the sample in a sample container cooled with ice or chill packs. On completion of the sampling the sample container should be delivered to the lab immediately or stored in the refrigerator prior to delivery to the lab. All samples are preserved in accordance with AS 4482.1:2005, AS 4482.2:1999 and AS/NZS 5667.1:1998.

k) Check for the presence of groundwater after completion of each borehole using an electronic dip metre or water whistle. Boreholes should be left open until the end of fieldwork. All groundwater levels in the boreholes should be rechecked on the completion of the fieldwork.

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[21] *Geotechnical Site Investigations*, Standards Australia 1993 (AS1726-1993)

l) Backfill the boreholes/test pits with the excavation cuttings or clean sand prior to leaving the site.

Decontamination Procedures for Soil Sampling Equipment

a) All of the equipment associated with the soil sampling procedure should be decontaminated between every sampling location.

b) The following equipment and materials are required for the decontamination procedure:
   - Phosphate free detergent (Decon 90)
   - Potable water
   - Stiff brushes
   - Plastic sheets

c) Ensure the decontamination materials are clean prior to proceeding with the decontamination.

d) Fill both buckets with clean potable water and add phosphate free detergent to one bucket.

e) In the bucket containing the detergent scrub the sampling equipment until all the material attached to the equipment has been removed.

f) Rinse sampling equipment in the bucket containing potable water.

g) Place cleaned equipment on clean plastic sheets.

If all materials are not removed by this procedure, high-pressure water cleaning is recommended. If any equipment is not completely decontaminated by both these processes that equipment should not be used until it has been thoroughly cleaned.

Groundwater Sampling

Groundwater samples are more sensitive to contamination than soil samples and therefore adhesion to this protocol is particularly important to obtain reliable, reproducible results. The recommendations detailed in AS/NZS 5667.1:1998 are considered to form a minimum standard.

The basis of this protocol is to maintain the security of the borehole and obtain accurate and representative groundwater samples. The following procedure should be used for collection of groundwater samples from previously installed groundwater monitoring wells.

a) After monitoring well installation, at least three bore volumes should be pumped from the monitoring wells (well development) to remove any water introduced during the drilling process and/or the water that is disturbed during installation of the monitoring well. This should be completed prior to purging and sampling.

b) Groundwater monitoring wells should then be left to recharge for at least three days before purging and sampling. Prior to purging or sampling the condition of each well should observed and any anomalies recorded on the field data sheets. The following information should be noted: the condition of the well, noting any signs of damage, tampering or complete destruction; the condition and operation of the well lock; the condition of the protective casing and the cement footing (raised or cracked); and, the presence of water between protective casing and well.

c) Take the groundwater level from the collar of the piezometer/monitoring well using an electronic dip meter. The collar level should be taken (if required) during the site visit using a dumpy level and staff.

d) Purging and sampling of piezometers/monitoring wells is done on the same site visit when using micro-purge (or low flow) techniques. Layout and organize all equipment associated with groundwater sampling in a location where they will not interfere with the sampling procedure and will not pose a risk of contaminating samples. Equipment generally required includes:
   - Micropore filtration system or Stericup single-use filters (for heavy metals samples).
   - Filter paper for Micropore filtration system.
   - Bucket with volume increments.
   - Sample containers: Teflon bottles with 1 ml nitric acid, 75mL glass vials with 1 mL hydrochloric acid, 1 L amber glass bottles.
   - Bucket with volume increments.
   - Flow cell.
   - pH/EC/Eh/T meters.
   - Plastic drums used for transportation of purged water.
   - Esky and ice.
   - Nitrile gloves.
   - Distilled water (for cleaning).
   - Electronic dip meter.
   - Micro-purge pump pack and pump head.
   - Air and water tubing for Micro-purge.
   - Groundwater sampling forms.

e) If single-use stericup filtration is not being used, clean the Micropore filtration system thoroughly with distilled water prior to use and between each sample. Filter paper should be changed between samples. 0.45um filter paper should be placed below the glass fibre filter paper in the filtration system.

f) Ensure all non-disposable sampling equipment is decontaminated or that new disposable equipment is available prior to any work commencing at a new location. The procedure for decontamination of groundwater equipment is outlined at the end of this section.

g) Disposable gloves should be used whenever samples are taken to protect the sampler and to assist in avoidance of contamination.

h) Groundwater samples are obtained from the monitoring wells using low flow/micro-purge sampling equipment to reduce the disturbance of the water column and loss of volatiles.

i) During pumping to purge the well, the pH, temperature, conductivity, dissolved oxygen, redox potential and groundwater levels are monitored (where possible) using calibrated field instruments to assess the development of steady state conditions. Steady state conditions are generally considered to have been achieved when the difference in the pH measurements was less than 0.2 units and the difference in conductivity was less than 10%.

j) All measurements are recorded on specific data sheets.

k) Once steady state conditions are considered to have been achieved, groundwater samples are obtained directly from the pump tubing and placed in appropriate glass bottles, BTEX vials or plastic bottles.

l) All samples are preserved in accordance with water sampling requirements detailed in the NEPM 1999 and placed in an insulated container with ice. Groundwater samples are preserved by immediate storage in an insulated sample container with ice in accordance with AS/NZS 5667.1:1998.

m) Record the sample on the appropriate log in accordance with AS1726:1993. At the end of each water sampling complete a chain of custody form.

Decontamination Procedures for Groundwater Sampling Equipment

a) All of the equipment associated with the groundwater sampling procedure (other than single-use items) should be decontaminated between every sampling location.

b) The following equipment and materials are required for the decontamination procedure:
   - Phosphate free detergent.
   - Potable water.
   - Distilled water
   - Plastic Sheets or bulk bags (plastic bags)

c) Fill one bucket with clean potable water and phosphate free detergent, and one bucket with distilled water.

d) Flush potable water and detergent through pump head. Wash sampling equipment and pump head using brushes in the bucket containing detergent until all materials attached to the equipment are removed.

e) Flush pump head with distilled water.

f) Change water and detergent solution after each sampling location.

g) Rinse sampling equipment in the bucket containing distilled water.

h) Place cleaned equipment on clean plastic sheets.

i) If all materials are not removed by this procedure that equipment should not be used until it has been thoroughly cleaned

QA/QC DEFINITIONS

The QA/QC terms used in this report are defined below. The definitions are in accordance with US EPA publication SW-846, entitled *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (1994[22]) methods and those described in *Environmental Sampling and Analysis, A Practical Guide,* (H. Keith 1991[23]).

Practical Quantitation Limit (PQL), Limit of Reporting (LOR) and Estimated Quantitation Limit (EQL)

These terms all refer to the concentration above which results can be expressed with a minimum 95% confidence level. The laboratory reporting limits are generally set at ten times the standard deviation for the Method Detection limit (MDL) for each specific analyte. For the purposes of this report the LOR, PQL, and EQL are considered to be equivalent.

When assessing laboratory data it should be borne in mind that values at or near the PQL have two important limitations. *"The uncertainty of the measurement value can approach, and even equal, the reported value. Secondly, confirmation of the analytes reported is virtually impossible unless identification uses highly selective methods. These issues diminish when reliably measurable amounts of analytes are present. Accordingly, legal and regulatory actions should be limited to data at or above the reliable detection limit"* Keith 1991.

Precision

The degree to which data generated from repeated measurements differ from one another due to random errors. Precision is measured using the standard deviation or Relative Percent Difference (RPD). Acceptable targets for precision in this report will be less than 50% RPD for concentrations greater than ten times the PQL, less than 75% RPD for concentrations between five and ten times the PQL and less than 100% RPD for concentrations that are less than five times the PQL.

Accuracy

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[22] *SW-846: Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,* US EPA, 1994 (US EPA SW-846)

[23] *Environmental Sampling and Analysis, A Practical Guide*, Keith, H, 1991 (Keith 1991)

Accuracy is a measure of the agreement between an experimental result and the true value of the parameter being measured. The assessment of accuracy for an analysis can be achieved through the analysis of known reference materials or assessed by the analysis of surrogates, field blanks, trip spikes and matrix spikes.

The proximity of an averaged result to the true value, where all random errors have been statistically removed. Accuracy is measured by percent recovery. Acceptable limits for accuracy generally lie between 70% to 130% recoveries. Certain laboratory methods may allow for values that lie outside these limits.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is primarily dependent upon the design and implementation of the sampling program. Representativeness of the data is partially ensured by the avoidance of contamination, adherence to sample handing and analysis protocols and use of proper chain-of-custody and documentation procedures.

Completeness

Completeness is a measure of the number of valid measurements in a data set compared to the total number of measurements made and overall performance against DQIs. The following information is assessed for completeness:

- Chain-of-custody forms;
- Sample receipt form;
- All sample results reported;
- All blank data reported;
- All laboratory duplicate and RPDs calculated;
- All surrogate spike data reported;
- All matrix spike and lab control spike (LCS) data reported and RPDs calculated;
- Spike recovery acceptable limits reported; and
- NATA stamp on reports.

Comparability

Comparability is the evaluation of the similarity of conditions (e.g. sample depth, sample homogeneity) under which separate sets of data are produced. Data comparability checks include a bias assessment that may arise from the following sources:

- Collection and analysis of samples by different personnel;

- Use of different techniques;
- Collection and analysis by the same personnel using the same methods but at different times; and
- Spatial and temporal changes (due to environmental dynamics).

Blanks

The purpose of laboratory and field blanks is to check for artifacts and interferences that may arise during sampling and analysis.

Matrix Spikes

Samples are spiked with laboratory grade standards to detect interactive effects between the sample matrix and the analytes being measured. Matrix Spikes are reported as a percent recovery and are prepared for 1 in every 20 samples. Sample batches that contain less than 20 samples may be reported with a Matrix Spike from another batch. The percent recovery is calculated using the formula;

$$\frac{\text{(Spike Sample Result} - \text{Sample Result)}}{\text{Concentration of Spike Added}} \times 100$$

Acceptable recovery limits are 70% to 130%.

Surrogate Spikes

Samples are spiked with a known concentration of compounds that are chemically related to the analyte being investigated but unlikely to be detected in the environment. The purpose of the Surrogate Spikes is to check the accuracy of the analytical technique. Surrogate Spikes are reported as percent recovery.

Duplicates

Laboratory duplicates measure precision, expressed as Relative Percent Difference. Duplicates are prepared from a single field sample and analysed as two separate extraction procedures in the laboratory. The RPD is calculated using the formula where D1 is the sample concentration and D2 is the duplicate sample concentration:

$$\frac{(D1 - D2)}{\{(D1 + D2)/2\}} \times 100$$

APPENDIX E

(Equipment Calibration Records)

JOB NO: E24782K
LOCATION: St Paul's College

FIELD CALIBRATION FORM

PID

Make: MiniRAE	Model: 2000	Unit: PID 1	Date of last factory calibration: N/A
Date of calibration: 23/3/2011		Name of Calibrator: Rob Muller	
Calibration gas: Iso-butylene		Calibration Gas Concentration: 100.0 ppm	
Measured reading: 99.8-102 ppm		Error in measured reading: ± 0.2-2 ppm	
Measured reading Acceptable (Yes/No):			

DISSOLVED OXYGEN

Make:	Model: Aqua DY
Date of calibration:	Name of Calibrator:
Span value: 70% to 130%%	
Measured value:	
Measured reading Acceptable (Yes/No):	

pH METER

Make: Orion	Model: Four star	
Date of calibration:	Name of Calibrator:	
Buffer 1: Theoretical pH = 7.01± 0.01	Expiry date:	Lot No:
Buffer 2: Theoretical pH = 4.01± 0.01	Expiry date:	Lot No:
Measured reading of Buffer 1:		
Measured reading of Buffer 2:		
Slope:	Measured reading Acceptable (Yes/No):	

CONDUCTIVITY METER

Make: Orion		Model: Four star	
Date:	Name of Calibrator:		Temperature: °C
Calibration solution:		Expiry date:	Lot No:
Theoretical conductivity at temperature (see solution container):			µS/cm
Measured conductivity: µS/cm		Measured reading Acceptable (Yes/No):	

REDOX METER

Make: Orion	Model: Four star	
Date of calibration:	Name of Calibrator:	
Calibration solution:	Expiry date:	Lot No:
Theoretical redox value:	240mV	
Measured redox reading: mV	Measured reading Acceptable (Yes/No):	

JOB NO: E24782K
LOCATION: St Paul's College

FIELD CALIBRATION FORM

PID

Make: MiniRAE	Model: 2000	Unit: PID1	Date of last factory calibration: N/A
Date of calibration: 8/4/2011		Name of Calibrator: Todd Hore	
Calibration gas: Iso-butylene		Calibration Gas Concentration: 100.0 ppm	
Measured reading: 100 ppm		Error in measured reading: ± 0 ppm	
Measured reading Acceptable (Yes/No):			

DISSOLVED OXYGEN

Make:	Model: Aqua DY
Date of calibration:	Name of Calibrator:
Span value: 70% to 130%%	
Measured value:	
Measured reading Acceptable (Yes/No):	

pH METER

Make: Orion	Model: Four star	
Date of calibration:	Name of Calibrator:	
Buffer 1: Theoretical pH = 7.01± 0.01	Expiry date:	Lot No:
Buffer 2: Theoretical pH = 4.01± 0.01	Expiry date:	Lot No:
Measured reading of Buffer 1:		
Measured reading of Buffer 2:		
Slope:	Measured reading Acceptable (Yes/No):	

CONDUCTIVITY METER

Make: Orion	Model: Four star	
Date:	Name of Calibrator:	Temperature: °C
Calibration solution:	Expiry date:	Lot No:
Theoretical conductivity at temperature (see solution container):		µS/cm
Measured conductivity: µS/cm	Measured reading Acceptable (Yes/No):	

REDOX METER

Make: Orion	Model: Four star	
Date of calibration:	Name of Calibrator:	
Calibration solution:	Expiry date:	Lot No:
Theoretical redox value:	240mV	
Measured redox reading: mV	Measured reading Acceptable (Yes/No):	

APPENDIX F

(95% UCL Calculation for B(a)P Concentration in Fill Soil)

General UCL Statistics for Full Data Sets

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

BaP

General Statistics

Number of Valid Observations	8	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	0.06	Minimum of Log Data	-2.813
Maximum	0.9	Maximum of Log Data	-0.105
Mean	0.399	Mean of log Data	-1.237
Median	0.345	SD of log Data	0.933
SD	0.298		
Std. Error of Mean	0.105		
Coefficient of Variation	0.747		
Skewness	0.658		

Warning: There are only 8 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set, the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.938	Shapiro Wilk Test Statistic	0.957
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.598	95% H-UCL	1.418
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.033
95% Adjusted-CLT UCL (Chen-1995)	0.598	97.5% Chebyshev (MVUE) UCL	1.299
95% Modified-t UCL (Johnson-1978)	0.602	99% Chebyshev (MVUE) UCL	1.821
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.159	Data appear Normal at 5% Significance Level	
Theta Star	0.344		
MLE of Mean	0.399		
MLE of Standard Deviation	0.37		
nu star	18.55		
Approximate Chi Square Value (.05)	9.787	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0195	95% CLT UCL	0.572
Adjusted Chi Square Value	8.228	95% Jackknife UCL	0.598
		95% Standard Bootstrap UCL	0.562
Anderson-Darling Test Statistic	0.156	95% Bootstrap-t UCL	0.636
Anderson-Darling 5% Critical Value	0.726	95% Hall's Bootstrap UCL	0.649
Kolmogorov-Smirnov Test Statistic	0.12	95% Percentile Bootstrap UCL	0.57

Kolmogorov-Smirnov 5% Critical Value	0.298	95% BCA Bootstrap UCL	0.589
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.858
		97.5% Chebyshev(Mean, Sd) UCL	1.056
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.446
95% Approximate Gamma UCL	0.756		
95% Adjusted Gamma UCL	0.899		
Potential UCL to Use		Use 95% Student's-t UCL	0.598

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.