ENVIRONMENTAL INVESTIGATION SERVICES

REPORT

TO

JOHN R BROGAN & ASSOCIATES PTY LTD

ON

PRELIMINARY ENVIRONMENTAL SITE ASSESSMENT

FOR

PROPOSED COMMERCIAL DEVELOPMENT

AT

1-19 BONNYRIGG AVENUE (CNR. ELIZABETH DRIVE), BONNYRIGG, NSW 2177

30 October 2014 **Ref: E27813KGrpt**

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EXECUTIVE SUMMARY

John R Brogan & Associates Pty Ltd ('the client') commissioned Environmental Investigation Services (EIS)[1] to undertake a preliminary Environmental Site Assessment (ESA) for the proposed commercial development at 1-19 Bonnyrigg Avenue, Bonnyrigg ('the site').

The site is identified as Lot 1 & 2 in DP1071647. The site location is shown on Figure 1 and the ESA was confined to the site boundaries as shown on Figure 2. The proposed development area is referred to as 'the site' in this report.

The ESA was undertaken generally in accordance with EIS proposals (Ref: EP8399KG) of 23 September 2014 and (Ref: EP8437KG) of 8 October 2014 and written acceptance from the client of the client dated 10 Oct 2014.

A geotechnical investigation was undertaken in conjunction with the ESA by JK Geotechnics[2]. The results of the investigation are presented in a separate report (Ref. 27813Vrpt-Bonnyrigg, dated 29 Oct 2014[3]).

The objectives of the ESA are to:

- Assess the potential risk for widespread soil and groundwater contamination at the site;
- Assess the potential risk to human health and the environment posed by the contaminants;
- Provide a preliminary waste classification for the off-site disposal of soil/bedrock excavated for the development; and
- Comment on the suitability of the site for the proposed land use.

The site is located in a predominantly commercial area of Bonnyrigg. The site is located on the western side of Bonnyrigg Avenue, at the intersection of Bonnyrigg Avenue and Elizabeth Drive, Bonnyrigg. The regional topography is undulating and generally slopes down to the west, towards "Clear Paddock Creek" which is approximately 15m west of the site. The natural site topography has been altered to accommodate the existing bus depot. A walkover inspection of the site and immediate surrounds was undertaken on 10 October 2014. The inspection was limited to accessible areas of the site and did not include an internal inspection of buildings. Selected site photographs obtained during the inspection are attached in the appendices. At the time of the inspection, the north section of the site consisted of a bus depot and associated buildings. This area of the site was concrete paved. Two aboveground storage tanks (ASTs) were located to the west of the site. A large stockpile of soil, estimated to be approximately 6,500m^3, was located at the south section of the site. The south section of the site was unpaved.

A summary of the site history information is presented below:

- The aerial photographs and land title records indicate that Lot 1 in DP1071647 has been used for commercial purposes (Bus depot) at least since 1950s. Lot 2 in DP1071647 appeared to have been vacant. The bus depot section of the site was the subject of a subject of a soil contamination investigation and associated remedial works in 2001-2002. The remedial works involved stockpiling excavated petroleum impacted soil on the Lot 2 in DP1071647 to the south of the bus depot for land-farming;
- Council records indicate that the site is located in an area of ecological significance;
- NSW EPA records did not indicate any notices for the site; and
- The site inspection of the bus depot undertaken by ERM in 2005 indicated the presence of a number of ASTs. No signs of underground storage tanks (USTs) were observed.

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

[2] Geotechnical consulting division of J&K

[3] Referred to as JK 2014 Report

All chemical analysis results for soil and groundwater were less than the Health Based SAC. Some minor elevations of contaminants above the ecological based SAC were detected in the soil and groundwater. Asbestos cement fragments were detected in three boreholes and also in the stockpile.

Based on the scope of work undertaken, EIS consider that the site can be made suitable for the proposed development provided that the following recommendations are implemented to address the data gaps and to better characterise the risks:

- A Stage 2 ESA should be undertaken to meet the EPA recommended sampling density. The Stage 2 ESA should target the data gaps identified in the report;
- An Asbestos Management Plan should be prepared to address the management of fibre cement fragments that may be disturbed during development;
- A Remedial Action Plan (RAP) should be prepared if the Stage 2 ESA identifies that one is required. If no RAP is required a Construction Management Plan (CMP) should be prepared so that environmental impacts on the adjacent creek are minimised;
- A Hazardous Materials Assessment (Hazmat) for the existing buildings prior to the commencement of demolition works;
- The stockpile located in the south section of the site should be disposed off-site and the stockpile footprint assessed;
- Inspections during demolition and excavation work 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. Inspections should be undertaken by experienced environmental personnel.

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

John R Brogan & Associates Pty Ltd ('the client') commissioned Environmental Investigation Services (EIS)[4] to undertake a preliminary Environmental Site Assessment (ESA) for the proposed commercial development at 1-19 Bonnyrigg Avenue, Bonnyrigg ('the site').

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1.1 Objectives

The objectives of the ESA are to:

- Assess the potential risk for widespread soil and groundwater contamination at the site;
- Assess the potential risk to human health and the environment posed by the contaminants;
- Provide a preliminary waste classification for the off-site disposal of soil/bedrock excavated for the development; and
- Comment on the suitability of the site for the proposed land use.

1.2 Scope of Work

The scope of work included:

- A review of background information made available to EIS;
- Preparation of site specific Data Quality Objectives (DQOs) and Data Quality Indicators (DQIs);
- A review of site information and site history documents;
- A site inspection to identify areas of environmental concern (AEC);

[4] Environmental consulting division of Jeffery & Katauskas Pty Ltd (J&K)

[5] Geotechnical consulting division of J&K

[6] Referred to as JK 2014 Report

- Preparation of a Preliminary Conceptual Site Model (CSM) to outline the AEC, Potential Contaminants of Concern (PCC) and potential receptors;
- Design and implementation of a field sampling and laboratory analysis program;
- Interpretation of the analytical results against the adopted Site Assessment Criteria (SAC); and
- Preparation of a report presenting the results of the assessment.

The report was prepared with reference to regulations/guidelines outlined in the table below. Individual guidelines are also referenced within the text of the report.

Table 1-1: Guidelines

Guidelines/Regulations/Documents
Contaminated Land Management Amendment Act (2008[7])
State Environmental Planning Policy No.55 – Remediation of Land (1998[8])
Guidelines for Consultants Reporting on Contaminated Sites (2011[9])
Guidelines on the Duty to Report Contamination[10]
Guidelines for the NSW Site Auditor Scheme, 2nd Edition (2006[11])
National Environmental Protection (Assessment of Site Contamination) Amendment Measure (2013[12])
NSW EPA Contaminated Sites Sampling Design Guidelines (1995[13])
NSW DECCW Waste Classification Guidelines - Part 1: Classifying Waste (2009[14])

[7] NSW Government Legislation, (2008), *Contaminated Land Management Amendment Act.* (referred to as CLM Amendment Act 2008)

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

[9] NSW Office of Environment and Heritage (OEH), (2011), *Guidelines for Consultants Reporting on Contaminated Sites.* (referred to as Reporting Guidelines 2011)

[10] NSW EPA, (Draft 2011), *Guidelines on the Duty to Report Contamination.* (referred to as Duty to Report Contamination 2011)

[11] NSW DEC, (2006), *Guidelines for the NSW Site Auditor Scheme, 2nd ed.* (referred to as Site Auditor Guidelines 2006)

[12] National Environment Protection Council (NEPC), (2013), *National Environmental Protection (Assessment of Site Contamination) Amendment Measure 2013 (No.1).* (referred to as NEPM 2013)

[13] NSW EPA, (1995), *Contaminated Sites Sampling Design Guidelines.* (referred to as EPA Sampling Design Guidelines 1995)

[14] NSW DECCW, (2009), *Waste Classification Guidelines, Part 1: Classifying Waste.* (referred to as Waste Classification Guidelines 2009)

2 DATA QUALITY ASSESSMENT

2.1 Data Quality Objectives (DQOs)

The DQOs provide a systematic approach for undertaking the assessment and outlines the criteria against which the data can be assessed.

A methodology for establishing the DQOs is presented in the document *Data Quality Objectives Process for Hazardous Waste Site Investigations* (2000[15]). This methodology has been adopted in the NEPM 2013, AS4482.1-2005[16] and the Site Auditor Guidelines 2006. The main steps involved in preparing the DQOs are summarised in the table below:

Table 2-1: DQOs

Step	Input
State the Problem	The presence of contamination may pose a risk to human health and the environment. An ESA is required to assess the potential risk and to comment on the suitability of the site for the proposed landuse.
Identify the Decisions	The assessment aims to address the objectives outlined in **Section 1.1.**
Identify Inputs into the Decision	The following inputs will be used to address the decisions: • Review of site information including regional geology, topography, setting, acid sulfate soil (ASS) potential, hydrogeology, surface water flow and review of major services (see **Section 0**); • Review of site history information (see **Section 4);** • Undertake a site inspection to identify the AEC (see **Section 5**); • Prepare a CSM (see **Section 5**); • Design and implementation of a field sampling program (see **Section 7**); • Design and implementation of a laboratory analysis program (see **Section 7**); • Assessment of analytical data. The DQIs that will be used to assess the analytical data are outlined in **Section 2.2**; and • Compare the analytical results against the SAC outlined in **Section 6**.
Study Boundary	The investigation was confined to the site boundaries as shown in Figure 2.
Develop a Decision Rule	The analytical results will be assessed against the SAC (see **Section 6).**

[15] US EPA, (2000), *Data Quality Objectives Process for Hazardous Waste Site Investigations.* (referred to as US EPA 2000)

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

Step	Input
	The NEPM 2013 recommends using statistical analysis to assess the laboratory data for soil samples against the health based SAC. The data set should be assessed against the following criteria: • The 95% Upper Confidence Limit (UCL) value of the arithmetic mean concentration of each contaminant should be less than the SAC; • The standard deviation (SD) of the results must be less than 50% of the SAC; and • No single value exceeds 250% of the relevant SAC. Statistical calculations are not required if all results are below the SAC.
Specific Limits on Decision Errors	Decision errors are false positive (i.e. stating the site is free of contamination when it is not) or false negative (i.e. stating that the site is contaminated when it is not). The more significant error is the false positive which may result in potential risks to human health and the environment. To account for this, the assessment has assumed that elevated concentrations of contaminants are present in the samples unless demonstrated otherwise.
Optimise the Design for Obtaining Data	The Site Auditor Guidelines 2006 recommend evaluating the data set as a whole to determine any limitations within the data set. The overall data set will be optimised by reviewing the data as the project proceeds. When necessary, adjustments will be made to the sampling or analytical program.

2.2 Data Quality Indicators (DQIs)

The DQIs required to address inputs into the decision include: precision, accuracy, representativeness, completeness and comparability. Reference should be made to the appendices for further information of the DQIs. The DQIs will be addressed as follows:

Table 2-2: DQIs

Indicator	Methods
Completeness	Data and documentation completeness will be achieved by: • Preparation of sampling and analysis plan; • Preparation of chain of custody (COC) records; • Review of the laboratory sample receipt information; • Use of National Association of Testing Authorities (NATA) registered laboratories for all analysis; • Visual, olfactory and PID screening of samples during the investigation; and • Laboratory analysis to target PCC. Any changes to the analytical schedule to be documented.
Comparability	Data comparability will be achieved by:

Indicator	Methods
	• Maintaining consistency in sampling techniques; • Use of appropriate preservation, storage and transport methods; and • Use of consistent analysis techniques and reporting standards by the laboratories.
Representativeness	Data representativeness will be achieved by: • Appropriate coverage of sample locations across accessible areas of the site; and • Representative coverage of analysis for PCC. Any changes to the analytical schedule to be documented.
Precision	Precision will be achieved by: • Calculating the relative percentage difference (RPD) of duplicate samples; • The following acceptance criteria will be used to assess the RPD results: ➢ results > 10 times the practical quantitation limit (PQL), RPDs < 50% are acceptable; ➢ results between 5 and 10 times PQL, RPDs < 75% are acceptable; ➢ results < 5 times PQL, RPDs < 100% are acceptable; and • An explanation is provided if RPD results are outside the acceptance criteria.
Accuracy	Accuracy will be achieved by: • Use of trained and qualified field staff; • Appropriate industry standard sampling equipment and decontamination procedures; • Sampling and screening equipment will be factory calibrated on a regular basis. Calibration will be checked internally prior to use; • Sampling and equipment decontamination; • Collection and analysis of field Quality Assurance (QA) and Quality Control (QC) samples for PCC; • The field QA/QC analysis will include: ➢ 3% of samples as inter-laboratory duplicates; ➢ 8% of samples as intra-laboratory duplicates; ➢ One trip blank (TB) sample per batch; and ➢ One field rinsate (FR) sample of field equipment per day of sampling, and • Acceptable concentrations in TB and FR samples. Non-compliance to be documented in the report; • Appropriate sample preservation, handling, holding time and COC procedure; • Review of the primary laboratory QA/QC data including: RPDs, surrogate recovery, repeat analysis, blanks, laboratory control samples (LCS) and matrix spikes;

Indicator	Methods
	• The following acceptance criteria will be used to assess the primary laboratory QA/QC results. Non-compliance to be documented: ➢ RPDs: o results that are < 5 times the PQL, any RPD is acceptable; and o results > 5 times the PQL, RPDs between 0-50% are acceptable; ➢ LCS recovery and matrix spikes: o 70-130% recovery acceptable for metals and inorganics; o 60-140% recovery acceptable for organics; and o 10-140% recovery acceptable for VOCs; ➢ Surrogate spike recovery: o 60-140% recovery acceptable for general organics; and o 10-140% recovery acceptable for VOCs; ➢ Blanks: All less than PQL; and • Reporting to industry standards.

3 SITE INFORMATION AND PHYSICAL SETTING

3.1 Site Identification

Table 3-1: Site Identification Information

Site Owner:	Westbus Region 3 Pty Ltd
Site Address:	1-19 Bonnyrigg Avenue, Bonnyrigg
Lot & Deposited Plan:	Lot 1 & 2 in DP1071647
Current Land Use:	Commercial
Proposed Land Use:	Commercial
Local Government Authority:	Fairfield City Council
Current Zoning:	Zone 4(c) Special Industrial
Site Area (ha):	2.2
RL (AHD in m) (approx.):	48
Geographical Location (MGA) (approx.):	S: 33^0 53′ 21 E: 150^0 53′ 08
Site Location Plan:	Figure 1
Borehole Location Plan:	Figure 2

3.2 Site Location and Setting

The site is located in a predominantly commercial area of Bonnyrigg. The site is located on the western side of Bonnyrigg Avenue, at the intersection of Bonnyrigg Avenue and Elizabeth Drive, Bonnyrigg.

3.3 Topography

The regional topography is undulating and generally slopes down to the west, towards "Clear Paddock Creek" which is approximately 15m west of the site. The natural site topography has been altered to accommodate the existing bus depot.

3.4 Site Inspection

A walkover inspection of the site and immediate surrounds was undertaken on 10 October 2014. The inspection was limited to accessible areas of the site and did not include an internal inspection of buildings. Selected site photographs obtained during the inspection are attached in the appendices.

At the time of the inspection, the north section of the site consisted of a bus depot and associated buildings. This area of the site was concrete paved. Two aboveground storage tanks (ASTs) were located to the west of the site. A large stockpile of soil, estimated to be approximately 6,500m^3, was located at the south section of the site. The south section of the site was unpaved.

3.5 Surrounding Land Use

The immediate surrounds included the following land uses:

- North – Commercial properties.
- South – Elizabeth Driver / Bonnyrigg Avenue and residential properties beyond.
- East – Commercial and residential properties.
- West – A natural reserve with a creek line (Clear Paddock Creek).

3.6 Underground Services

The 'Dial Before You Dig' (DBYD) plans were reviewed for the assessment. Major services which could pose a potential migratory pathway were not located at the site.

3.7 Regional Geology

A review of the regional geological map of Penrith (1991[17]) indicates that the site is underlain Hawkesbury Sandstone, which typically consists of medium to coarse grained quartz sandstone with minor shale and laminite lenses.

3.8 Acid Sulfate Soil (ASS) Risk Map

A review of the ASS risk maps prepared by Department of Land and Water Conservation (1997[18]) indicates that the site is located in an area of no known of acid sulphate soil.

3.9 Hydrogeology

A review of groundwater bores registered with the NSW Office of Water[19] (NOW) was undertaken by EIS. The search was limited to registered bores located within approximately 500m of the site. The search did not reveal any registered bores within this radius.

3.10 Surface Water Flows

Based on the site and surrounding topography, surface water flows would be expected to enter "Clear Paddock Creek" which is approximately 15m west of the site.

[17] Department of Mineral Resources, (1991), *1:100,000 Geological Map of Penrith (Series 9030).*

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

[19] http://www.waterinfo.nsw.gov.au/gw/, visited on 29 Oct 2014

4 SITE HISTORY ASSESSMENT

4.1 Aerial Photographs

Historical aerial photographs of the site and immediate surrounds were reviewed for the assessment. The majority of the photographs were obtained from the NSW Department of Lands. A summary of the relevant information is presented in the following table:

Table 4-1: Summary of Historical Aerial Photos

Year	Details
1930	The photograph was of relatively poor quality. The site appeared predominantly covered by trees while the surroundings appeared to be occupied by agricultural activities.
1951	The site appeared similar to its appearance in the 1930 aerial photograph, with additional development of the surrounding area for agricultural purposes.
1961	The north-eastern section of the site appeared to have undergone some development, with two to three large-sized buildings visible in the area. The remainder of the site and the surrounding area appeared similar to its appearance in the 1951 photograph.
1970	The buildings at the north-east of the site had been expanded further. The immediate surrounds appeared similar to the 1961 photograph.
1978	The site and immediate surrounds appeared similar to the 1970 photograph.
1986	The site appeared similar to the 1978 photograph. The surrounding areas had undergone significant residential developments since 1978.
1994	The north-eastern section of the site appeared to have further expanded with a paved parking area around the existing buildings. The immediate surrounds appeared similar to the 1986 photograph.
2005	All the infrastructure appeared to have been removed from the site and the site had been re-developed. The site layout was similar to the current appearance. The properties to the immediate north of the site appeared to have undergone significant commercial developments since 1994.
2011 (SIX Maps)	The site and general surroundings appeared to be similar to the 2005 aerial photograph.

4.2 Land Title Search

Land title records were reviewed for the assessment. The record search was performed by Advance Legal Searchers Pty Ltd. Copies of the title records are attached in the appendices.

The search indicated the site was owned by Calabro Bros Pty Ltd from the 1950s to 1989 and Bosnjak Holdings Pty Ltd from 1989 to 2005. The online search indicated that these companies were involved in public transportation (bus companies).

4.3 Council Records

4.3.1 Section 149 Planning Certificate

The s149 (2 and 5) planning certificates were reviewed for the assessment. Copies of the certificates are attached in the appendices. A summary of the relevant information is presented below:

- The site is located in an area of ecological significance. The page 18 of the s149(5) document highlighted number of issues and recommended contacting the Council for further information in the event of development of the site;
- The site is not deemed to be: significantly contaminated; subject to a management order; subject of an approved voluntary management proposal; or subject to an on-going management order under the provisions of the CLM Act 1997;
- The site is not subject to a Site Audit Statement (SAS);
- The site is not located within a Class 1 or 2 ASS risk area; and
- The site is located in a heritage conservation area or draft heritage conservation area, however, no heritage items have been identified at the site.

4.4 WorkCover Records

A review of WorkCover records for the site is currently underway and the results will be forwarded when received.

4.5 NSW EPA Records

The NSW EPA records available online were reviewed for the assessment. Copies of relevant documents are attached in the appendices. A summary of the relevant information is provided in the following table:

Table 4-2: Summary of NSW EPA Online Records

Source	Details
CLM Act 1997[20]	There were no notices for the site under Section 58 of the Act.
NSW EPA List of Contaminated Sites[21]	The site is not listed on the NSW EPA register.
POEO Register[22]	There were no notices for the site on the POEO register.

[20] http://www.epa.nsw.gov.au/prclmapp/searchregister.aspx, visited on 29 Oct 2014
[21] http://www.epa.nsw.gov.au/clm/publiclist.htm, visited on 29 Oct 2014
[22] http://www.epa.nsw.gov.au/prpoeoapp/, visited on 29 Oct 2014

4.6 Previous Reports

EIS were provided with an Environmental Site Assessment for the Westbus Bonnyrigg Depot prepared for Deloitte Touche Tohmatsu by ERM (Ref: 032769RP1 Draft) dated 27 May 2005. The report was a desktop assessment of the site. A summary of the findings is presented below:

- During site development in 2001-2002 soil contamination investigation and soil remediation activities took place across the site. ERM had not reviewed any of the documentation associated with this and appear to have relied on anecdotal evidence from site management;
- During the remediation works petroleum impacted soils were stockpiled on the adjacent site to the south of the bus depot for land-farming treatment;
- Anecdotal evidence obtained from site staff indicated that:
    - The site had been a bus depot since 1949. Prior to this it was a vacant site;
    - There was no knowledge of any USTs at the site. A paint booth may have been located in the east section of the site; and
    - The site was completely excavated and redeveloped in 2002.

During their site inspection ERM observed a number of aboveground storage tanks (ASTs) on the site including:

- Two fuel tanks of 45,000 litre;
- Six oil tanks of various sizes; and
- One tank of anti-freeze of 1,000 litre.

4.7 Summary of Site History

A summary of the site history information is presented below:

- The aerial photographs and land title records indicate that Lot 1 in DP1071647 has been used for commercial purposes (Bus depot) at least since 1950s. Lot 2 in DP1071647 appeared to have been vacant. The bus depot section of the site was the subject of a subject of a soil contamination investigation and associated remedial works in 2001-2002. The remedial works involved stockpiling excavated petroleum impacted soil on the Lot 2 in DP1071647 to the south of the bus depot for land-farming;
- Council records indicate that the site is located in an area of ecological significance;
- NSW EPA records did not indicate any notices for the site; and
- The site inspection of the bus depot undertaken by ERM in 2005 indicated the presence of a number of ASTs. No signs of underground storage tanks (USTs) were observed.

4.8 Integrity of Site History Information

The majority of the site history information has been obtained from government organisations as outlined above. The veracity of the information from these sources is considered to be relatively high. A certain degree of information loss can be expected given the age of the development; gap between aerial photographs; and lack of detailed information prior to the 1900's.

5 PRELIMINARY CONCEPTUAL SITE MODEL (CSM)

5.1 Areas of Environmental Concern (AEC) & Potential Contaminants of Concern (PCC)

The AEC identified in the table below are based on a review of the background information, site history information and site inspection. The AEC are sections of the site that have potentially been impacted by activities, site conditions and/or specific features that could present an environmental concern with regards to potential contamination.

Table 5-1: AEC and PCC

AEC	PCC
Fill Material: Fill material on site may have been historically imported from various sources and can contain elevated concentrations of contaminants.	HM, TPH, BTEX, PAHs, OCPs, OPPs, PCBs and asbestos
Commercial: The site was used as a bus depot since at least 1950s. Aboveground fuel storage tanks and mechanical workshops may have used during this period. Leakage and spillage of fuel during the bus depot operations could have impacted the subsurface soils. There is a possibility that some USTs may have been located at the site.	HM, TPH, BTEX, VOCs, PAHs, PCBs and asbestos
Hazardous Building Materials: The aerial photographs indicate that former buildings at the site were demolished between 1994 and 2005. The use of hazardous building material (e.g. asbestos) in the former buildings could have resulted in potential contamination.	Asbestos, lead and PCBs
Stockpile on Lot 2 in DP1071647: The stockpile is likely to be the material that was excavated during remediation works on the bus depot in 2001-2002 for land-farming (as mentioned in the ERM report).	HM, TPH, BTEX, PAHs and asbestos

Note:
HM – Heavy metals including arsenic, cadmium, chromium, copper, lead, mercury, nickel & zinc
TPH – Total petroleum hydrocarbons including light, mid and heavy fractions
BTEX – Monocyclic aromatic hydrocarbons
VOCs - Volatile organic compounds includes BTEX compounds
PAHs - Polycyclic aromatic hydrocarbons
OCPs - Organochlorine pesticides
OPPs - Organophosphorus pesticides
PCBs - Polychlorinated Biphenyls

5.2 Contamination Fate and Transport

The fate and transport of PCC identified at the site is summarised in the following table:

Table 5-2: Fate and Transport of PCC

PCC	Fate and Transport
Non-volatile contaminants including: metals, heavy fraction PAHs, OCPs, OPPs, PCBs and asbestos	With the exception of asbestos, non-volatile contaminants are predominantly confined to the soil and groundwater medium. The mobility of these contaminants varies depending on: the nature and type of contaminant present (e.g. leachability, viscosity etc.); soil type/porosity; surface water infiltration; groundwater levels; and the rate of groundwater movement. ***Presence of Ash and Slag:*** Non-volatile contaminants associated with ash and slag waste (some heavy metals, heavy fraction PAHs, and sometimes heavy fraction TPHs) are bound within a relatively insoluble matrix. Slag and ash is usually formed as a by-product of combustion at high temperatures which 'locks in' the contaminants within the matrix. ***Presence of Asbestos:*** The potential transport of asbestos fibres is associated with the disturbance of asbestos contaminated soils and release of fibres into the atmosphere. This is likely to occur during excavation works. A number of studies have found that soils effectively filter out asbestos fibres and retain them within the soil matrix. The studies concluded that there is no significant migration of asbestos fibres, either through soil or groundwater. ***Site Conditions:*** Surface water has the potential to run-off into Clear Paddock Creek located to the immediate northwest of the site.
Volatile contaminants including: TPH, BTEX, VOCs and light fraction PAHs	Volatile contaminants are usually more mobile when compared to the non-volatile compounds. The potential for migration of volatile contaminants such as light fraction PAHs and TPH is relatively high in sandy soil with a high water table and declines as soil becomes more clayey and depth of the water increases. These contaminants break down rapidly as a result of microbial activity and availability of nutrients including nitrogen, oxygen etc.

PCC	Fate and Transport
	The mobile contaminants would be expected to move down to the rock surface or groundwater table and migrate down gradient from the source. The mobility would depend on a range of factors such as: soil type/porosity; surface water infiltration; groundwater levels; confining layers within the aquifer; solubility in groundwater etc. ***Site Conditions:*** The potential for migration of volatile contaminants at the subject site is considered to be relatively high due to the following: • The ASTs are located in the west section of the site. Any accidental discharge of fuels may flow into the creek which is very close to Clear Paddock Creek located at the immediate northwest of the site; • Groundwater flows can occur down gradient from the site and has the potential to transport contaminants off-site/to the creek etc.

5.3 Sensitive Receptors and Exposure Pathways

The potential receptors and exposure pathways identified at the site are presented in the following table:

Table 5-3: Potential Receptors and Exposure Pathways

Receptor	Pathway
Human Receptors: • Site occupants; • Site visitors; • Contractors and workers; • Future site occupants; and • Off-site occupants.	• Dermal contact, ingestion and inhalation; • Inhalation of airborne asbestos fibres; and • Abstraction and use of contaminated groundwater.
Environmental Receptors: • Clear Paddock Creek located approximately 15m to west of the site.	• Exposure by direct contact with plants and animals; • Potential discharge of contaminated groundwater into the stormwater system during the basement construction.

6 SITE ASSESSMENT CRITERIA (SAC)

The SAC adopted for this ESA is outlined in the table below. The SAC has been derived from NEPM 2013 and other guidelines as outlined in **Section 1.2**. Explanatory notes are included in the attached appendices.

The guideline values for individual contaminants outlined in Schedule B1 of the NEPM 2013 are reproduced in the appendices. The criterion for the individual contaminants analysed for this assessment are presented in the attached report tables:

Table 6-1: SAC Adopted for this Investigation

Guideline	Applicability
Health Investigation Levels (HILs)	The proposed land use is commercial. The HIL-D criteria has been adopted for this ESA.
Health Screening Levels (HSLs)	The HSL-D criteria for soil and groundwater have been adopted for this ESA.
Ecological Assessment Criteria	The Ecological Investigation Levels (EILs) and Ecological Screening Levels (ESLs) have been adopted for this ESA. The criteria for 'commercial/industrial' have been adopted.
Asbestos in Soil	The 'presence/absence' of asbestos in soil has been adopted as the assessment criterion for the Preliminary Site Investigation (PSI).
Waste Classification (WC) Criteria	The proposed development includes excavation for a basement level. A WC will be required for the off-site disposal of material excavated for the development. The criteria outlined in the Waste Classification Guidelines 2009 have been adopted for this investigation.
Groundwater Investigation Levels (GILs)	The NSW Department of Environment and Conservation (now EPA) *Guidelines for the Assessment and Management of Groundwater Contamination* (2007[23]) require an assessment of environmental values including: 1. Aquatic ecosystems; and 2. Health risk in non-use scenarios. ANZECC 2000: The closest receiving water body in the vicinity of the site is Clear Paddock Creek. This water body predominantly sustains a freshwater ecosystem. Hence the freshwater water trigger values have been adopted for the assessment. The NSW EPA promotes the use of trigger values for the protection of 95% of aquatic ecosystems, except where the contaminants have the potential to bio-accumulate, in which case the 99% trigger values

[23] NSW DEC (2007), *Guidelines for the Assessment and Management of Groundwater Contamination* (referred to as Groundwater Guidelines 2011)

Guideline	Applicability
	are recommended. The 95% trigger values have been adopted for this assessment. Where necessary, the low reliability trigger values are quoted. HSLs for Groundwater: The HSL-D for groundwater have been adopted for this investigation.

7 INVESTIGATION PROCEDURE

7.1 Soil Sampling Plan

The NSW EPA Sampling Design Guidelines 1995 recommend a sampling density for a contamination assessment based on a systematic sampling pattern. Based on the size of the investigation area, the guidelines provide a minimum number of sampling points required for the investigation.

The guidelines recommend sampling from a minimum of 34 evenly spaced sampling points for a site of this size (approximately 2.2ha) for a Stage 2 ESA.

Samples for this investigation were obtained from 17 evenly spaced sampling points as shown on the attached Figure 2. This density is approximately 50% of the minimum sampling density recommended for a Stage 2 ESA.

The sampling locations were placed on a systematic plan with a grid spacing of approximately 35m between sampling locations. A systematic plan was considered suitable to address potential contaminants associated with the fill material at the general site area.

Samples were also obtained from 15 sampling points within the stockpile of soil located at the southwest corner of the site. The sampling locations are shown on the attached Figure 2

Sampling was not undertaken in inaccessible areas of the site such as beneath existing buildings.

7.2 Soil Sampling Methodology

Fieldwork for this investigation was undertaken on 10 October 2014. Sampling locations were set out using a hand held GPS unit. Locations were marked using spray paint. The sampling locations were cleared for underground services prior to drilling/excavation.

The soil sampling was undertaken using three methods:

1. Truck mounted hydraulically operated drill rig equipped with spiral flight augers. Soil samples were obtained from a Standard Penetration Test (SPT) sampler or directly from the auger when conditions did not allow use of the SPT sampler;
2. Four-wheel-drive (4wd) mounted hydraulically push tube rig (EZI-probe). Soil samples were obtained from disposable polyethylene push tube samplers; and
3. Excavator. Soil samples were obtained directly from the bucket of the 5.5T excavator.

The boreholes BH1 to BH7 were sampled using the drill-rig. Borehole BH8 to BH15 were sampled using the EZIprobe. The stockpile samples (S1 to S15) and BH16 & BH17 were sampled using the excavator.

Soil samples were collected from the fill and natural profiles encountered during the investigation. Samples were also obtained when there was a distinct change in lithology or based on the observations made during the investigation.

During sampling, soil at selected depths was split into primary and duplicate samples for field QA/QC analysis.

Samples were placed in glass jars with plastic caps and teflon seals with minimal headspace. Samples for asbestos analysis were placed in zip-lock plastic bags. Sampling personnel used disposable nitrile gloves during sampling activities. The samples were labelled with the job number, sampling location, sampling depth and date.

7.2.1 VOC Screening

A portable Photoionisation Detector (PID) was used to screen the samples for the presence of VOCs and to assist with selection of samples for 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 for VOCs was undertaken on soil samples using the soil sample headspace method. VOC data was obtained from partly filled zip-lock plastic bags following equilibration of the headspace gases. The PID headspace data is presented on the COC documents attached in the appendices.

7.2.2 Decontamination and Sample Preservation

Details of the decontamination procedure adopted during sampling are presented in the appendices. Where applicable, the sampling equipment was decontaminated using a scrubbing brush and potable water and Decon 90 solution (phosphate free detergent)

followed by rinsing with potable water. Rinsate samples were obtained during the decontamination process as part of the field QA/QC.

Decontamination of the EZIprobe sampler is not necessary as the plastic sample recovery tube has to be cut open to recover the sample. A new tube has to be used for each sample.

Soil samples were preserved by immediate storage in an insulated sample container with ice in accordance with AS4482.1-2005 and AS4482.2-1999[24] as summarised in the following table:

Table 7-1: Soil Sample Preservation and Storage

Analyte	Preservation	Storage
Heavy metals	Unpreserved glass jar with Teflon lined lid	Store at <4°, analysis within 28 days.
VOCs (TPH/BTEX)	As above	Store at <4°, analysis within 14 days
PAHs, OCP, OPP & PCBs	As above	Store at <4°, analysis within 14 days
Asbestos	Sealed plastic bag	None

On completion of the fieldwork, the samples were delivered in the insulated sample container to a NATA registered laboratory for analysis under standard COC procedures. Field sampling protocols adopted for this assessment are summarised in the attached appendices.

7.3 Groundwater Assessment Procedure

The assessment included the installation of three (3) groundwater monitoring wells in selected boreholes spread across the site as shown on Figure 2.

7.3.1 Monitoring Well Installation

The monitoring well construction details are documented on the appropriate borehole logs. The well construction details are summarised in the following table:

Table 7-2: Monitoring Well Construction Details

Borehole Ref / Well Number	Installation Depth (BGL) (m)	Surface RL[1] (m)	Casing & Screen[2] Depths (m)	Finishing Details (BGL) (m)
BH2	4	Na	- Casing from 1m to surface	- Sand filter pack from 4m to 1m

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

Borehole Ref / Well Number	Installation Depth (BGL) (m)	Surface RL[1] (m)	Casing & Screen[2] Depths (m)	Finishing Details (BGL) (m)
			- Screen from 4m to 1m	- Bentonite seal/plug from 1 to surface - Finished with gatic cover flush with the surface surrounded by concrete grout.
BH5	6	Na	- Casing from 3m to surface - Screen from 6m to 3m	- Sand filter pack from 6m to 0.5m - Bentonite seal/plug from 0.5 to surface - Finished with gatic cover flush with the surface surrounded by concrete grout
BH6	5.85	Na	- Casing from 2.85m to surface - Screen from 5.85m to 2.85m	- Sand filter pack from 5.85m to 0.5m - Bentonite seal/plug from 0.5 to surface - Finished with gatic cover flush with the surface surrounded by concrete grout

Notes:
[1] RL: Reduced Level (AHD)
[2] 50mm diameter Class 18 PVC has been used for the wells
Na – information not available

7.3.2 Groundwater Sampling

The monitoring wells (BH2, BH5 and BH6) were developed on the day of the installation and sampled six days later. Only BH5 had sufficient water for sampling on the day of sampling and the BH2 and BH6 were dry.

A duplicate sample was obtained by alternate filling of sample containers. This technique was adopted to minimise disturbance of the samples and loss of volatile contaminants associated with mixing of liquids in secondary containers, etc.

7.3.3 Sample Preservation

The samples were preserved in accordance with water sampling requirements detailed in NEPM 2013 and placed in an insulated container with ice. During the investigation, groundwater samples were preserved by immediate storage in an insulated sample

container with ice in accordance with AS/NZS 5667.1:1998[25] as summarised in the following table:

Table 7-3: Groundwater Sample Preservation and Storage

Analyte	Preservation	Storage
Heavy metals	45μm Filter, acidify with nitric acid to pH 1-2	Store at <4°, analysis within 30 days
VOCs (mid to heavy fraction TPH)	Zero headspace, teflon seal	Store at <4°, analysis within 7 days
VOCs (BTEX & light fraction TPH)	Zero headspace, Teflon seal, acidify with HCl to pH 1-2	Store at <4°, analysis within 7 days
VOCs (BTEX & light fraction TPH)	Zero headspace, Teflon seal, acidify with HCl to pH 1-2	Store at <4°, analysis within 7 days

Notes:
1 – Analysing the sample for pH within 6 hours is not practical in most situations. In order to account for this, a calibrated field pH meter is used during sampling.

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.

7.4 Analytical Schedule

The analytical schedule is outlined in the following table:

Table 7-4: Analytical Schedule

PCC	No. of Fill Soil Samples	No. of Stockpile Soil Samples	No. of Natural Soil Samples	No. of Groundwater Samples
Heavy Metals	26	10	1	1
TPH/BTEX	26	10	1	1
PAHs	26	10	1	1
OCPs/OPPs	17	10	0	0
PCBs	17	10	0	0
Asbestos	17	10	Na	Na

7.5 Laboratory Analysis

The samples were analysed by the following laboratories:

Table 7-5: Laboratory Details

Samples	Laboratory	Report Reference
All primary samples, intra-	Envirolab Services Pty Ltd, NATA	117547, 117547-A and

[25] *Water Quality – Part 1: Sampling, Guidance on the Design of Sampling Programs, Sampling Techniques and the Preservation and Handling of Samples,* Standards Australia, 1998 (referred to as AS/NZS 5667.1:1998)

Samples	Laboratory	Report Reference
laboratory duplicates, trip blanks and field rinsate samples	Accreditation Number – 2901 (ISO/IEC 17025 compliance)	117716
Inter-laboratory duplicates	Envirolab Services Pty Ltd (VIC), NATA Accreditation Number – 2901 (ISO/IEC 17025 compliance)	4920

Samples were analysed by the laboratories using the analytical methods detailed in Schedule B(3) of NEPM 2013. Reference should be made to the laboratory reports attached in the appendices for further details.

8 INVESTIGATION RESULTS

8.1 Subsurface Conditions

A summary of the subsurface conditions encountered during the investigation is presented in the table below. Reference should be made to the borehole logs (BH1 to BH17) attached in the appendices for further details.

Table 8-1: Summary of Subsurface Conditions

Profile	Description[1]
Pavement	Concrete pavement was encountered in all boreholes except for BH1, BH2, BH16 and BH17.
Fill	Fill material was encountered at the surface or beneath the pavement in all boreholes except for BH4. BH14 was terminated in the fill at the depth of 2.9m. The fill typically comprised silty clay and contained inclusions of gravel, sand, slag, ash and fibre cement fragments. Hydrocarbon odours were encountered in the fill in boreholes BH8, BH12 and BH14 at depths ranging from 1mBGL to 3mBGL.
Natural Soil	Natural soil was encountered in all the boreholes except for BH14 which was terminated on fill.
Groundwater	Groundwater seepage was not encountered in the boreholes during drilling. All boreholes remained dry on completion of drilling and a short time after.

Note:
1 – Depths described in metres below ground level

8.2 Stockpile of Soil Condition

The fill material encountered in the stockpile samples (S1 to S15) was: silty gravelly clay, brown, low to medium plasticity and contained inclusions of brick fragments, plastic, glass and fibre cement fragments and root fibres.

8.2.1 VOC Screening

PID soil sample headspace readings are presented in attached report tables and the COC documents attached in the appendices. All results were 0 ppm equivalent isobutylene which indicates a lack of PID detectable VOCs.

8.3 Soil Laboratory Results

The soil laboratory results are compared to the relevant SAC in the attached report tables. A summary of the results assessed against the SAC is presented below.

Table 8-2: Summary of Soil Laboratory Results

Analyte	Results Compared to SAC
Heavy Metals	**HILs:** All heavy metal results were below the HIL-D criteria. **EILs:** The zinc results in sample S4 was greater than the commercial/industrial criteria. The remaining results were all less than the commercial/industrial criteria. **WC:** All heavy metal results were less than the CT1 criteria.
TPH	**HSLs:** All TPH results were below the HSL-D criteria. **ESLs:** The $>C_{10}$-C_{16} results in sample BH8 (1.9-2.0) was greater than the commercial/industrial criteria. The remaining results were all less than the commercial/industrial criteria. **WC:** All TPH results were less than the relevant CT1 and SCC1 criteria.
BTEX	**HSLs:** All BTEX results were below the HSL-D criteria. **ESLs:** All BTEX results were below the commercial/industrial criteria. **WC:** All BTEX results were less than the relevant CT1 and SCC1 criteria.
PAHs	**HILs:** All PAH results were below the HIL-D criteria. **HSLs:** All naphthalene results were below the HSL-D criteria. **ESLs:** The B(a)P results in sample BH17(0-0.3) was greater than the commercial/industrial criteria. The remaining results were all less than the commercial/industrial criteria. **EILs:** All naphthalene results were below the EIL-UR&POS criteria.

Analyte	Results Compared to SAC
	WC: All PAH results were less than the relevant CT1 and SCC1 criteria except for two samples BH2 (0.5-0.85) and BH17 (0-0.3) that contained elevated concentrations of B(a)P. TCLP leachates were prepared from the two samples and analysed for PAHs. The results were less than the TCLP1 criteria.
OCPs & OPPs	**HILs:** All OCP and OPP results were below the HIL-D criteria. **EILs:** All DDT results were below the commercial/industrial criteria. **WC:** All OCP and OPP results were less than the relevant CT1 and SCC1 criteria.
PCBs	**HILs:** All PCB results were below the HIL-D criterion. **WC:** All PCB results were less than the SCC1 criterion.
Asbestos	**PSI:** Asbestos cement fragments were detected three (3) boreholes and in six (6) stockpile samples.

8.4 Groundwater Laboratory Results

The groundwater laboratory results are presented in the attached report tables. A summary of the results assessed against the SAC is presented below.

Table 8-3: Summary of Groundwater Laboratory Results

Analyte	Results Compared to SAC
Heavy Metals	**ANZECC 2000:** Copper was detected in the groundwater sample at a concentration of 2µg/L, marginally above the SAC of 1.4µg/L. Cadmium was detected in the groundwater sample at a concentration of 0.3µg/L, marginally above the SAC of 0.2µg/L. Zinc was detected in the groundwater sample at a concentration of 38µg/L, above the SAC of 8µg/L.
TPH & BTEX	**ANZECC 2000:** All BTEX results were below the GIL-ANZECC criteria.

Analyte	Results Compared to SAC
	HSLs: All TPH and BTEX results were below the GIL-HSL criteria.
PAHs	**ANZECC 2000:** All PAH results were below the GIL-ANZECC criteria.

9 QA/QC ASSESSMENT

The QA/QC assessment includes a review of the DQIs established for the investigation (see **Section 2.2**). A summary of the field QA/QC samples are outlined below:

Table 9-1: Field QA/QC Samples

Field QA/QC	Frequency	Sample Details
Intra-laboratory duplicates	8% of Primary Samples	Soil Samples: DupGF1 is a soil duplicate of sample BH8 (0.5-0.8m) DupGF2 is a soil duplicate of sample BH15 (0.33-0.6m) DupSP1 is a soil duplicate of sample S10 Groundwater Samples: DupGW is a water duplicate of sample MW5
Inter-laboratory duplicates	3% of Primary Samples	Soil Samples: DupGF3 is a soil duplicate of sample BH11 (0.3-0.5m)
TB	1 per batch	TB (sand blank) (10/10/2014)
FR	1 per day	FR is a field rinsate from the SPT decontamination process (10/10/2014)

An assessment of the DQIs is summarised in the following table:

Table 9-2: Assessment of DQIs

Completeness
Data and documentation completeness was achieved through the following measures: • COC records were prepared for each batch of samples sent to the labs (refer to appendices); • Laboratory sample receipt information was reviewed for each batch (refer to appendices); • NATA registered laboratories were used for all analysis; • Visual observations and PID screening of samples was undertaken during the investigation as noted on the boreholes logs and COC documents (refer to appendices); and • All soil samples were analysed for the PCC identified in **Section 5.1**
Comparability
Data comparability was achieved through the following measures: • Similar sampling techniques were used during the investigation; • Appropriate preservation, storage and transport methods were adopted for all samples; and • Consistent analysis techniques and reporting standards were adopted by the laboratories.
Representativeness
Data representativeness was achieved through the following measures: • The sampling plan was optimised to obtain adequate coverage of sample locations; and

- The assessment included a representative coverage of analysis for PCC.

Precision

Intra-laboratory RPD Results:

The intra-laboratory soil RPD results are presented in the attached report tables. The results indicated that field precision was acceptable. One marginal elevated RPD of 57% for zinc was not considered significant as both results were below the SAC.

The intra-laboratory groundwater RPD results presented in the attached report tables. The results indicated that field precision was acceptable.

Inter-laboratory RPD Results:

The inter-laboratory soil RPD results are presented in the attached report tables. The results indicated that field precision was acceptable.

Accuracy

Accuracy was achieved through the following measures:

- Trained and qualified field staff were used for the investigation;
- Appropriate industry standard sampling equipment and decontamination procedures were adopted for the investigation as outlined in the attached appendices;
- Sampling and screening equipment are routinely factory calibrated. An in-house calibration check was undertaken prior to using onsite;
- Appropriate sample preservation, handling, holding time and COC procedures were adopted for the investigation.
- The report was prepared generally in accordance with Reporting Guidelines 2011;
- Accuracy of field sampling was assessed as follows:
  - FR Results: The field rinsate results are presented in the attached report tables. All results were below the PQL which indicates that cross-contamination artefacts associated with sampling equipment were not present;
  - TB Results: The trip blank results are presented in the attached report tables and were all less than the PQLs.
- Review of laboratory QA/QC data is summarised below:
  - Laboratory Duplicate RPD Results: Laboratory duplicate RPD results for the soil and groundwater analysis were generally within the acceptance criteria adopted by the laboratory/laboratories;
  - Matrix Spike Recovery: Matrix spike recovery concentrations were within the acceptable limits;
  - Surrogate Spike Recovery: Surrogate spike recovery concentrations were within the acceptable limits; and
  - LCS recovery: LCS recovery concentrations were within the acceptable limits.

The DQIs adopted for this investigation (see **Section 2.2**) have been addressed.

10 DISCUSSION

10.1 Summary of Soil Contamination (Boreholes)

Elevated concentrations of contaminants were not encountered in the soil samples analysed from the boreholes at concentrations above the health based SAC, as outlined in **Section** 8. However, asbestos cement fragments were detected in the fill in three of the boreholes drilled within the site.

The source of the asbestos cement contamination is considered likely to be associated with the demolition of previous buildings and/or importation of contaminated fill. Two minor elevations above the ecological based SAC were detected in BH8 (TRH>C_{10}-C_{16}) and BH17(BaP)

10.2 Summary of Soil Contamination (Stockpile)

Elevated concentrations of contaminants were not encountered in the stockpile soil samples above the health based SAC. However asbestos was detected in number of stockpile samples.

The source of the asbestos contamination is considered likely to be associated with the demolition of previous buildings in the area. One minor elevation of zinc above the ecological SAC was detected in sample in S4.

10.3 Summary of Groundwater Contamination

Elevated concentrations of cadmium, copper and zinc were encountered in the groundwater sample. These elevations are considered to be naturally occurring as discussed in Section 12.

10.4 Data Gaps

Due to the preliminary nature of the investigation the following data gaps remain:

- Deep fill at the site has not been adequately investigated;
- Inaccessible areas (buildings of the site) have not been investigated;
- The sampling density adopted for this investigation was half the density recommended by the guidelines.

11 WASTE CLASSIFICATION (WC)

11.1 Classification of Fill Soil for Off-Site Disposal

The waste classification for the fill material is summarised in the following table:

Table 11-1: Waste Classification of Fill

Extent	Classification	Disposal Option
Fill material at the site	General Solid Waste (non-putrescible) (GSW) containing asbestos	A licensed NSW EPA landfill capable of receiving the waste stream. The landfill should be contacted to obtain the required approvals prior to commencement of excavation.

Note:
1. Waste Classification Guidelines 2009

Contaminated fill material should not be re-used on site. The fill material must be disposed of to a NSW EPA licensed facility. It is the responsibility of the receiving facility to ensure that the material meets their EPA license conditions. EIS accepts no liability whatsoever for illegal or inappropriate disposal of excavated material.

11.2 Classification of Natural Soil and Bedrock for Off-Site Disposal

The waste classification for the natural material is summarised in the following table:

Table 11-2: Waste Classification of Natural Material

Extent	Classification	Disposal Option
Natural silty clay soil and shale bedrock at the site	Virgin excavated natural material (VENM)	VENM is considered suitable for re-use on the 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. Alternatively, the natural material can be disposed of as VENM to a facility licensed by the NSW EPA to receive the waste stream.

Material classed as VENM must not be mixed with any fill material (including building rubble) as this will invalidate the VENM classification. Where doubt exists about the difference between fill and VENM material an environmental/geotechnical engineer should be contacted.

12 TIER 1 RISK ASSESSMENT AND REVIEW OF CSM

EIS consider that the risk posed by AEC to the receptors identified in **Section 5.3** to be relatively low as detailed below. Additional work should be undertaken to address the data gaps outlined in **Section 10.4** and to better characterise the risks. Fibre cement fragments containing asbestos was encountered within the fill in some sections of the site. Additional samples of the fill should be analysed for asbestos during the Stage 2 ESA.

12.1 Fill Material

As all soil analysis results were below the HIL-D and HSL-D criteria. Therefore these contaminations are considered to pose a very low risk to the human receptors identified in the CSM. These soil results contained minor elevations of contaminants above the EIL and ESL commercial/industrial criteria. These elevations are not considered to pose a risk to ecological receptors on the site as:

- The elevations were marginal;
- There is no evidence of widespread significant elevations across the site; and
- The site is likely to be completely paved as part of the proposed development.

The elevations are not considered to pose a risk to the ecological receptors associated with the adjacent Clear Paddock Creek for the following reasons:

- The contaminants (zinc. BaP, TRH > C_{10}-C_{16}) are not very mobile;
- The zinc elevation was detected in the stockpile that may be removed from the site;
- The TRH > C10-C16 elevation and the BaP elevation were detected in boreholes on the east side of the site (the creek is located on the west side of the site);
- As noted above there is no evidence of widespread significant elevations of these contaminants across the site that could represent a significant source.

12.2 Asbestos

Asbestos cement fragments were detected in three of borehole samples and five of the stockpile samples. The material was not considered friable and is not considered to pose a risk to current site users in its current form as it is either located beneath the existing slab or is located within the stockpile materials. The risk to future site users can be kept low by:

- Maintaining a pavement across the site;
- Disposing of the existing stockpile off-site and obtaining an asbestos clearance following removal; and
- Preparing an Environmental Management Plan that can be implemented in the event that areas of the site are disturbed in the future.

12.3 Groundwater

Some elevations of heavy metals were encountered in the groundwater. EIS are of the opinion that these elevations are naturally occurring for the following reasons:

- Widespread significant elevated concentrations of cadmium, copper and zinc that could represent a source of the heavy metals were not encountered in the soil samples;
- Elevated concentrations of heavy metals (particularly copper and zinc) are frequently encountered in urban groundwater as a results of leaking water infrastructure and urban runoff; and
- Elevated concentrations of heavy metals are often associated with shale bedrock formations.

In the event that groundwater seepage management or dewatering is required as part of the development, dewatering and/or groundwater disposal approvals should be sought from the relevant authorities.

13 CONCLUSIONS

The ESA included a desktop site history assessment, site walkover inspection, soil sampling from 17 boreholes and stockpile soil sampling from 15 locations. All chemical analysis results for soil and groundwater were less than the Health Based SAC. Some minor elevations of contaminants above the ecological based SAC were detected in the soil and groundwater. Asbestos cement fragments was detected in three boreholes and also in the stockpile.

Based on the scope of work undertaken, EIS consider that the site can be made suitable for the proposed development provided that the following recommendations are implemented to address the data gaps and to better characterise the risks:

- A Stage 2 ESA should be undertaken to meet the EPA recommended sampling density. The Stage 2 ESA should target the data gaps identified in **Section 10.4;**
- An Asbestos Management Plan should be prepared to address the management of fibre cement fragments that may be disturbed during development;
- A Remedial Action Plan (RAP) should be prepared if the Stage 2 ESA identifies that one is required. If no RAP is required a Construction Management Plan (CMP) should be prepared so that environmental impacts on the adjacent creek are minimised during development;
- A Hazardous Materials Assessment (Hazmat) for the existing buildings prior to the commencement of demolition works;
- The stockpile located in the south section of the site should be disposed off-site and the stockpile footprint assessed;
- Inspections during demolition and excavation work 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. Inspections should be undertaken by experienced environmental personnel.

13.1 Regulatory Requirement

The regulatory requirements applicable for the site are outlined in the following table:

Table 13-1: Regulatory Requirement

Guideline	Applicability

Guideline	Applicability
Duty to Report Contamination 2008[26]	At this stage, EIS consider that there is no requirement to notify the NSW EPA of the site contamination.
POEO Act 1997	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.
Work Health and Safety Code of Practice 2011[27]	Sites contaminated with asbestos become a 'workplace' when work is carried out there and require a register and asbestos management plan.

[26] NSW Government Legislation, (2008), *Guidelines on the Duty to Report Contamination.* (referred to as Duty to Report Contamination 2008)

[27] WorkCover NSW, (2011), *WHS Regulation: Code of Practice – How to Manage and Control Asbestos in the Workplace.*

14 LIMITATIONS

The report limitations are outlined below:

- EIS accepts no responsibility for any unidentified contamination issues at the site. Any unexpected problems/subsurface features that may be encountered during development works should be inspected by an environmental consultant as soon as possible;
- Previous use of this site may have involved excavation for the foundations of buildings, services, and similar facilities. 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;
- This report has been prepared based on site conditions which existed at the time of the investigation; scope of work and limitation outlined in the EIS proposal; and terms of contract between EIS and the client (as applicable);
- The conclusions presented in this report are based on investigation of conditions at specific locations, chosen to be as representative as possible under the given circumstances, visual observations of the site and immediate surrounds and documents reviewed as described in the report;
- Subsurface soil and rock conditions encountered between investigation locations may be found to be different from those expected. Groundwater conditions may also vary, especially after climatic changes;
- The investigation and preparation of this report have been undertaken in accordance with accepted practice for environmental consultants, with reference to applicable environmental regulatory authority and industry standards, guidelines and the assessment criteria outlined in the report;
- Where information has been provided by third parties, EIS has not undertaken any verification process, except where specifically stated in the report;
- EIS has not undertaken any assessment of off-site areas that may be potential contamination sources or may have been impacted by site contamination, except where specifically stated in the report;
- EIS accept no responsibility for potentially asbestos containing materials that may exist at the site. These materials may be associated with demolition of pre-1990 constructed buildings or fill material at the site;
- EIS have not and will not make any determination regarding finances associated with the site;
- Additional investigation work may be required in the event of changes to the proposed development or landuse. EIS should be contacted immediately in such circumstances;
- Material considered to be suitable from a geotechnical point of view may be unsatisfactory from a soil contamination viewpoint, and vice versa; and

- 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.

LIST OF IN-TEXT TABLES

IMPORTANT INFORMATION ABOUT THIS REPORT

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

The 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 or landscaped areas are modified;
- the proposed development levels are altered, eg 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 Report 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.

Assessment Limitations

Although information provided by a 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 Site Assessments by Design Professionals

Costly problems can occur when other design professionals develop plans based on misinterpretation of an 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 Assessment Report

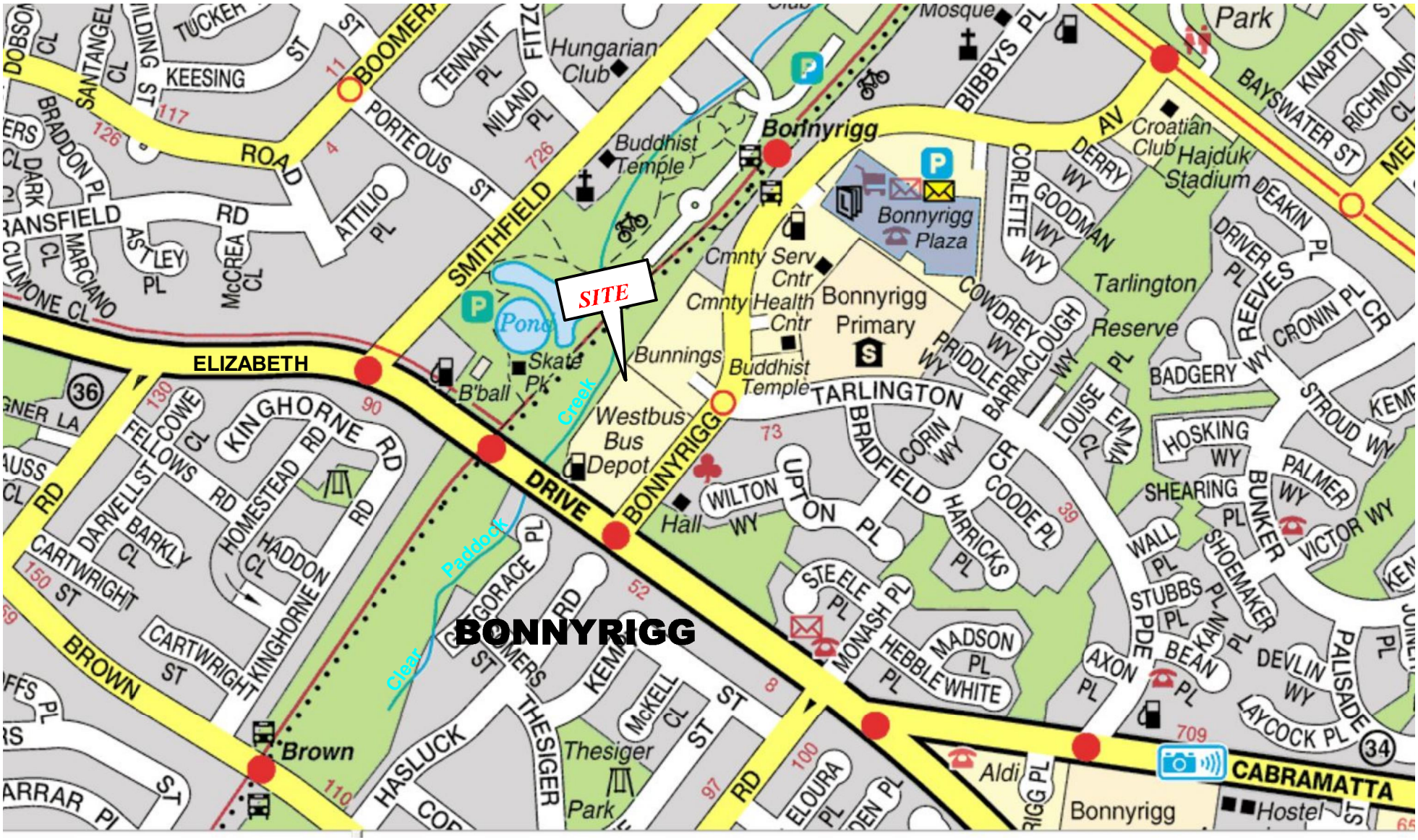
Borehole and test pit logs are prepared by environmental scientists, engineers or geologists based upon interpretation of field conditions and laboratory evaluation of field samples. Logs are normally provided in our reports and these should not be re-drawn for inclusion in site remediation or other 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 rest 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.

REPORT FIGURES



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

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

ENVIRONMENTAL INVESTIGATION SERVICES	Project Number: **E27813KG**	Title: **Site Location Plan**
	Figure: **1**	Address: **1-19 Bonnyrigg Avenue Bonnyrigg, NSW 2145**

LEGEND:

- Approximate site boundary
- BH1 (MW) *(0.5m)* — Borehole / Well Location (Fill Depth)
- Stockpile Sample Location

NOTES:
Figure 2 has been recreated from SixMaps

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 12 24 36 48 60	ENVIRONMENTAL INVESTIGATION SERVICES	Project Number: E27813KG	Title: Borehole/ Well Location Plan
		Figure: 2	Address: Elizabeth Drive (Cnr. Bonnyrigg Ave) Bonnyrigg, NSW 2177

REPORT TABLES

EIS

TABLE A
SOIL LABORATORY RESULTS COMPARED TO HILs
All data in mg/kg unless stated otherwise

			HEAVY METALS								PAHs		ORGANOCHLORINE PESTICIDES (OCPs)							OP PESTICIDES (OPPs)	TOTAL PCBs	ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium VI [2]	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	B(a)P TEQ [3]	HCB	Endosulfan	Methoxychlor	Aldrin & Dieldrin	Chlordane	DDT, DDD & DDE	Heptachlor	Chlorpyrifos		
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0,1	0.1	100
Site Assessment Criteria (SAC) [1]			3000	900	3600	240000	1500	730	6000	400000	4000	40	80	2000	2500	45	530	3600	50	2000	7	Detected/Not Detected
Sample Reference	**Sample Depth**	**Sample Description**																				
S2	-	Fill (stockpile)	5	LPQL	16	21	18	0.1	10	40	0	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	**Asbestos Detected**
S4	-	Fill (stockpile)	5	LPQL	13	20	28	LPQL	8	190	0.27	0.07	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	**Asbestos Detected**
S6	-	Fill (stockpile)	6	LPQL	18	30	31	LPQL	12	85	1.23	0.13	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	**Asbestos Detected**
S7	-	Fill (stockpile)	5	LPQL	14	20	24	LPQL	12	51	0.36	0.06	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	**Asbestos Detected**
S9	-	Fill (stockpile)	7	LPQL	15	20	23	LPQL	7	38	0	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	**Asbestos Detected**
S10	-	Fill (stockpile)	5	LPQL	19	21	29	LPQL	10	97	0	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	**Asbestos Detected**
S11	-	Fill (stockpile)	7	LPQL	15	29	19	LPQL	10	39	0	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
S12	-	Fill (stockpile)	5	LPQL	22	27	20	LPQL	23	76	0	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
S13	-	Fill (stockpile)	7	LPQL	20	27	30	LPQL	12	85	0	LPQL	LPQL	LPQL	LPQL	0.1	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
S15	-	Fill (stockpile)	LPQL	LPQL	16	25	18	LPQL	19	68	1.64	0.24	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH1	0.0-0.3	Fill (silty clay)	8	LPQL	16	23	31	LPQL	10	57	0	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH2	0.0-0.2	Fill (silty clay)	LPQL	LPQL	8	45	14	LPQL	8	42	1.49	0.19	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH2	0.5-0.85	Fill (silty clay)	6	LPQL	18	34	29	LPQL	11	65	8.79	0.89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH3	0.4-0.5	Fill (silty clay)	5	LPQL	16	33	32	LPQL	11	100	0.8	0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH3	0.5-0.95	Fill (silty clay)	6	LPQL	10	19	15	LPQL	11	44	1.33	0.13	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH4	0.4-0..5	Nat (silty clay)	4	LPQL	15	29	16	LPQL	8	38	0.27	0.07	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH5	0.3-0.4	Fill (silty clay)	6	LPQL	13	22	21	LPQL	11	49	0.06	0.06	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH5	0.5-0.95	Fill (silty clay)	5	LPQL	12	19	13	LPQL	6	31	0	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH5	1.8-2.0	Fill (silty clay)	7	LPQL	16	27	20	LPQL	14	55	0	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH6	0.35-0.45	Fill (silty clay)	6	LPQL	14	43	19	LPQL	11	51	0	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH7	0.5-0.95	Fill (silty clay)	7	LPQL	20	21	23	LPQL	8	34	0	LPQL	LPQL	LPQL	LPQL	0.2	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH8	0.5-0.8	Fill (silty clay)	8	LPQL	17	20	16	LPQL	12	35	0	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH8	1.9-2.0	Fill (silty clay)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**Asbestos Detected**
BH8	2.4-2.7	Fill (silty clay)	LPQL	LPQL	15	22	16	LPQL	13	59	1.06	0.06	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH9	1.3-1.5	Fill (silty clay)	7	LPQL	17	22	17	LPQL	10	40	3.03	0.23	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH9	2.5-2.8	Fill (silty clay)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**Asbestos Detected**
BH10	1.2-1.4	Fill (silty clay)	8	LPQL	17	24	21	LPQL	13	42	0	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH11	0.3-0.5	Fill (silty clay)	8	LPQL	16	28	19	LPQL	13	47	0	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH12	0.31-0.5	Fill (silty clay)	4	LPQL	11	21	16	LPQL	10	60	0.26	0.06	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH12	1.5-1.8	Fill (silty clay)	5	LPQL	16	29	32	LPQL	11	98	1.43	0.13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH13	0.25-0.4	Fill (silty clay)	LPQL	LPQL	5	2	12	LPQL	LPQL	4	0	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH13	1.3-1.5	Fill (silty clay)	8	LPQL	18	29	35	LPQL	10	65	0.29	0.09	LPQL	LPQL	LPQL	0.2	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH14	0.43-0.6	Fill (silty clay)	4	LPQL	15	28	17	LPQL	12	45	0.9	0.1	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH14	1.2-1.4	Fill (silty clay)	6	LPQL	16	25	22	LPQL	12	65	0.1	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH15	0.33-0.6	Fill (silty clay)	6	LPQL	20	33	28	LPQL	15	68	1.1	0.1	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH16	0.0-0.25	Fill (silty clay)	6	LPQL	16	22	22	LPQL	8	31	0.06	0.06	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	**Asbestos Detected**
BH17	0.0-0.3	Fill (silty clay)	LPQL	LPQL	13	36	18	LPQL	18	34	34.3	4.4	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
Total Number of Samples			35	35	35	35	35	35	35	35	35	35	27	27	27	27	27	27	27	27	27	27
Maximum Value			8	0	22	45	35	0.1	23	190	34.3	4.4	0	0	0	0.2	0	0	0	0	0	NC

Explanation:

1 - Site Assessment Criteria (SAC): NEPM 2013, HIL-D: 'Commercial/Industrial'

2 - The results are for Total Chromium which includes Chromium III and VI. For initial screening purposes, we have assumed that the samples contain only Chromium VI unless demonstrated otherwise by additional analysis.

3 - B(a)P TEQ - Benzo(a)pyrene Toxicity Equivalence Quotient has been calculated based on 8 carcinogenic PAHs and their Toxic Equivalence Factors (TEFs) outlined in NEPM 2013

Concentration above the SAC **VALUE**

Abbreviations:

PAHs: Polycyclic Aromatic Hydrocarbons
B(a)P: Benzo(a)pyrene
PQL: Practical Quantitation Limit
LPQL: Less than PQL
OPP: Organophosphorus Pesticides
OCP: Organochlorine Pesticides
PCBs: Polychlorinated Biphenyls
UCL: Upper Level Confidence Limit on Mean Value
HILs: Health Investigation Levels
NA: Not Analysed
NC: Not Calculated
NSL: No Set Limit
SAC: Site Assessment Criteria
NEPM: National Environmental Protection Measure

TABLE B
SOIL LABORATORY RESULTS COMPARED TO HSLs
All data in mg/kg unless stated otherwise

					C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	PID [2]
PQL - Envirolab Services					25	50	0.2	0.5	1	3	1	
HSL Land Use Category [1]					**COMMERCIAL/INDUSTRIAL**							
Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**								
S2	-	Fill (stockpile)	1m to <2m	Clay	LPQL	61	LPQL	LPQL	LPQL	LPQL	LPQL	0
S4	-	Fill (stockpile)	1m to <2m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
S6	-	Fill (stockpile)	1m to <2m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
S7	-	Fill (stockpile)	1m to <2m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
S9	-	Fill (stockpile)	1m to <2m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
S10	-	Fill (stockpile)	1m to <2m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
S11	-	Fill (stockpile)	1m to <2m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
S12	-	Fill (stockpile)	1m to <2m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
S13	-	Fill (stockpile)	1m to <2m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
S15	-	Fill (stockpile)	1m to <2m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH1	0.0-0.3	Fill (silty clay)	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH2	0.0-0.2	Fill (silty clay)	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH2	0.5-0.85	Fill (silty clay)	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH3	0.4-0.5	Fill (silty clay)	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH3	0.5-0.95	Fill (silty clay)	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH4	0.4-0..5	Nat (silty clay)	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH5	0.3-0.4	Fill (silty clay)	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH5	0.5-0.95	Fill (silty clay)	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH5	1.8-2.0	Fill (silty clay)	1m to <2m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH6	0.35-0.45	Fill (silty clay)	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH7	0.5-0.95	Fill (silty clay)	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH8	0.5-0.8	Fill (silty clay)	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH8	1.9-2.0	Fill (silty clay)	1m to <2m	Clay	na	na	na	na	na	na	na	na
BH8	2.4-2.7	Fill (silty clay)	2m to <4m	Clay	LPQL	500	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH9	1.3-1.5	Fill (silty clay)	1m to <2m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH9	2.5-2.8	Fill (silty clay)	2m to <4m	Clay	na	na	na	na	na	na	na	na
BH10	1.2-1.4	Fill (silty clay)	1m to <2m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH11	0.3-0.5	Fill (silty clay)	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH12	0.31-0.5	Fill (silty clay)	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH12	1.5-1.8	Fill (silty clay)	1m to <2m	Clay	LPQL	150	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH13	0.25-0.4	Fill (silty clay)	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH13	1.3-1.5	Fill (silty clay)	1m to <2m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH14	0.43-0.6	Fill (silty clay)	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH14	1.2-1.4	Fill (silty clay)	1m to <2m	Clay	LPQL	130	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH15	0.33-0.6	Fill (silty clay)	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH16	0.0-0.25	Fill (silty clay)	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH17	0.0-0.3	Fill (silty clay)	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
Total Number of Samples					35	35	35	35	35	35	35	35
Maximum Value					0	500	0	0	0	0	0	0

Explanation:
1 - Site Assessment Criteria (SAC): NEPM 2013
2 - Field PID values obtained during the investigation
Concentration above the SAC **VALUE**
The guideline corresponding to the elevated value is highlighted in grey in the Site Assessment Criteria Table below
Abbreviations:
UCL: Upper Level Confidence Limit on Mean Value UCL: Upper Level Confidence Lir PQL: Practical Quantitation Limit NC: Not Calculated
HSLs: Health Screening Levels HILs: Health Investigation Levels LPQL: Less than PQL NL: Not Limiting
NA: Not Analysed na: Not Analysed SAC: Site Assessment Criteria NEPM: National Environmental Protection Measure

SITE ASSESSMENT CRITERIA

					C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene
PQL - Envirolab Services					25	50	0.2	0.5	1	3	1
HSL Land Use Category [1]					**COMMERCIAL/INDUSTRIAL**						
Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**							
S2	-	Fill (stockpile)	1m to <2m	Clay	480	NL	6	NL	NL	NL	NL
S4	-	Fill (stockpile)	1m to <2m	Clay	480	NL	6	NL	NL	NL	NL
S6	-	Fill (stockpile)	1m to <2m	Clay	480	NL	6	NL	NL	NL	NL
S7	-	Fill (stockpile)	1m to <2m	Clay	480	NL	6	NL	NL	NL	NL
S9	-	Fill (stockpile)	1m to <2m	Clay	480	NL	6	NL	NL	NL	NL
S10	-	Fill (stockpile)	1m to <2m	Clay	480	NL	6	NL	NL	NL	NL
S11	-	Fill (stockpile)	1m to <2m	Clay	480	NL	6	NL	NL	NL	NL
S12	-	Fill (stockpile)	1m to <2m	Clay	480	NL	6	NL	NL	NL	NL
S13	-	Fill (stockpile)	1m to <2m	Clay	480	NL	6	NL	NL	NL	NL
S15	-	Fill (stockpile)	1m to <2m	Clay	480	NL	6	NL	NL	NL	NL
BH1	0.0-0.3	Fill (silty clay)	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH2	0.0-0.2	Fill (silty clay)	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH2	0.5-0.85	Fill (silty clay)	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH3	0.4-0.5	Fill (silty clay)	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH3	0.5-0.95	Fill (silty clay)	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH4	0.4-0..5	Nat (silty clay)	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH5	0.3-0.4	Fill (silty clay)	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH5	0.5-0.95	Fill (silty clay)	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH5	1.8-2.0	Fill (silty clay)	1m to <2m	Clay	480	NL	6	NL	NL	NL	NL
BH6	0.35-0.45	Fill (silty clay)	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH7	0.5-0.95	Fill (silty clay)	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH8	0.5-0.8	Fill (silty clay)	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH8	1.9-2.0	Fill (silty clay)	1m to <2m	Clay	480	NL	6	NL	NL	NL	NL
BH8	2.4-2.7	Fill (silty clay)	2m to <4m	Clay	NL	NL	9	NL	NL	NL	NL
BH9	1.3-1.5	Fill (silty clay)	1m to <2m	Clay	480	NL	6	NL	NL	NL	NL
BH9	2.5-2.8	Fill (silty clay)	2m to <4m	Clay	NL	NL	9	NL	NL	NL	NL
BH10	1.2-1.4	Fill (silty clay)	1m to <2m	Clay	480	NL	6	NL	NL	NL	NL
BH11	0.3-0.5	Fill (silty clay)	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH12	0.31-0.5	Fill (silty clay)	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH12	1.5-1.8	Fill (silty clay)	1m to <2m	Clay	480	NL	6	NL	NL	NL	NL
BH13	0.25-0.4	Fill (silty clay)	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH13	1.3-1.5	Fill (silty clay)	1m to <2m	Clay	480	NL	6	NL	NL	NL	NL
BH14	0.43-0.6	Fill (silty clay)	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH14	1.2-1.4	Fill (silty clay)	1m to <2m	Clay	480	NL	6	NL	NL	NL	NL
BH15	0.33-0.6	Fill (silty clay)	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH16	0.0-0.25	Fill (silty clay)	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH17	0.0-0.3	Fill (silty clay)	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL

TABLE C
SOIL LABORATORY RESULTS COMPARED TO WASTE CLASSIFICATION GUIDELINES (2009)
All data in mg/kg unless stated otherwise

			HEAVY METALS								PAHs		OC/OP PESTICIDES					Total PCBs	TRH					BTEX COMPOUNDS				ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	B(a)P	Total Endosulfans	Chloropyrifos	Total moderately harmful[2]	Total Scheduled[3]			C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	Total C_{10}-C_{36}	Benzene	Toluene	Ethyl benzene	Total Xylenes	
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.05	0.1	0.1	0.1	0.1		0.1	25	50	100	100	250	0.2	0.5	1	3	100
General Solid Waste CT1 [1]			100	20	100	NSL	100	4	40	NSL	NSL	0.8	60	4	NSL	NSL		NSL	NSL		NSL		NSL	10	288	600	1000	-
General Solid Waste SCC1 [1]			500	100	1900	NSL	1500	50	1050	NSL	200	10	108	7.5	250	50		50	650		NSL		10000	18	518	1080	1800	-
Restricted Solid Waste CT2 [1]			400	80	400	NSL	400	16	160	NSL	NSL	3.2	240	16	NSL	NSL		NSL	NSL		NSL		NSL	40	1152	2400	4000	-
Restricted Solid Waste SCC2 [1]			2000	400	7600	NSL	6000	200	4200	NSL	800	23	432	30	1000	50		50	2600		NSL		40000	72	2073	4320	7200	-
Sample Reference	**Sample Depth**	**Sample Description**																										
S2	-	Fill (stockpile)	5	LPQL	16	21	18	0.1	10	40	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL		LPQL	LPQL	LPQL	110	LPQL	110	LPQL	LPQL	LPQL	LPQL	Asbestos Detected
S4	-	Fill (stockpile)	5	LPQL	13	20	28	LPQL	8	190	0.27	0.07	LPQL	LPQL	LPQL	LPQL		LPQL	LPQL	LPQL	210	160	370	LPQL	LPQL	LPQL	LPQL	Asbestos Detected
S6	-	Fill (stockpile)	6	LPQL	18	30	31	LPQL	12	85	1.23	0.13	LPQL	LPQL	LPQL	LPQL		LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	Asbestos Detected
S7	-	Fill (stockpile)	5	LPQL	14	20	24	LPQL	12	51	0.36	0.06	LPQL	LPQL	LPQL	LPQL		LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	Asbestos Detected
S9	-	Fill (stockpile)	7	LPQL	15	20	23	LPQL	7	38	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL		LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	Asbestos Detected
S10	-	Fill (stockpile)	5	LPQL	19	21	29	LPQL	10	97	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL		LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	Asbestos Detected
S11	-	Fill (stockpile)	7	LPQL	15	29	19	LPQL	10	39	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL		LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
S12	-	Fill (stockpile)	5	LPQL	22	27	20	LPQL	23	76	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL		LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
S13	-	Fill (stockpile)	7	LPQL	20	27	30	LPQL	12	85	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL		LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
S15	-	Fill (stockpile)	LPQL	LPQL	16	25	18	LPQL	19	68	1.64	0.24	LPQL	LPQL	LPQL	LPQL		LPQL	LPQL	LPQL	140	320	460	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH1	0.0-0.3	Fill (silty clay)	8	LPQL	16	23	31	LPQL	10	57	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL		LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH2	0.0-0.2	Fill (silty clay)	LPQL	LPQL	8	45	14	LPQL	8	42	1.49	0.19	LPQL	LPQL	LPQL	LPQL		LPQL	LPQL	LPQL	190	700	890	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH2	0.5-0.85	Fill (silty clay)	6	LPQL	18	34	29	LPQL	11	65	8.79	**0.89**	NA	NA	NA	NA		NA	LPQL	LPQL	190	480	670	LPQL	LPQL	LPQL	LPQL	NA
BH3	0.4-0.5	Fill (silty clay)	5	LPQL	16	33	32	LPQL	11	100	0.8	0.1	NA	NA	NA	NA		NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH3	0.5-0.95	Fill (silty clay)	6	LPQL	10	19	15	LPQL	11	44	1.33	0.13	LPQL	LPQL	LPQL	LPQL		LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH4	0.4-0..5	Nat (silty clay)	4	LPQL	15	29	16	LPQL	8	38	0.27	0.07	NA	NA	NA	NA		NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH5	0.3-0.4	Fill (silty clay)	6	LPQL	13	22	21	LPQL	11	49	0.06	0.06	NA	NA	NA	NA		NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH5	0.5-0.95	Fill (silty clay)	5	LPQL	12	19	13	LPQL	6	31	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL		LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH5	1.8-2.0	Fill (silty clay)	7	LPQL	16	27	20	LPQL	14	55	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL		LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH6	0.35-0.45	Fill (silty clay)	6	LPQL	14	43	19	LPQL	11	51	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL		LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH7	0.5-0.95	Fill (silty clay)	7	LPQL	20	21	23	LPQL	8	34	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL		LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH8	0.5-0.8	Fill (silty clay)	8	LPQL	17	20	16	LPQL	12	35	LPQL	LPQL	NA	NA	NA	NA		NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH8	1.9-2.0	Fill (silty clay)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Asbestos Detected
BH8	2.4-2.7	Fill (silty clay)	LPQL	LPQL	15	22	16	LPQL	13	59	1.06	0.06	LPQL	LPQL	LPQL	LPQL		LPQL	LPQL	170	930	LPQL	1100	LPQL	LPQL	LPQL	LPQL	NA
BH9	1.3-1.5	Fill (silty clay)	7	LPQL	17	22	17	LPQL	10	40	3.03	0.23	LPQL	LPQL	LPQL	LPQL		LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH9	2.5-2.8	Fill (silty clay)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Asbestos Detected
BH10	1.2-1.4	Fill (silty clay)	8	LPQL	17	24	21	LPQL	13	42	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL		LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH11	0.3-0.5	Fill (silty clay)	8	LPQL	16	28	19	LPQL	13	47	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL		LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH12	0.31-0.5	Fill (silty clay)	4	LPQL	11	21	16	LPQL	10	60	0.26	0.06	LPQL	LPQL	LPQL	LPQL		LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH12	1.5-1.8	Fill (silty clay)	5	LPQL	16	29	32	LPQL	11	98	1.43	0.13	NA	NA	NA	NA		NA	LPQL	LPQL	700	370	1070	LPQL	LPQL	LPQL	LPQL	NA
BH13	0.25-0.4	Fill (silty clay)	LPQL	LPQL	5	2	12	LPQL	LPQL	4	LPQL	LPQL	NA	NA	NA	NA		NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH13	1.3-1.5	Fill (silty clay)	8	LPQL	18	29	35	LPQL	10	65	0.29	0.09	LPQL	LPQL	LPQL	LPQL		LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH14	0.43-0.6	Fill (silty clay)	4	LPQL	15	28	17	LPQL	12	45	0.9	0.1	LPQL	LPQL	LPQL	LPQL		LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH14	1.2-1.4	Fill (silty clay)	6	LPQL	16	25	22	LPQL	12	65	0.1	LPQL	NA	NA	NA	NA		NA	LPQL	58	240	110	408	LPQL	LPQL	LPQL	LPQL	NA
BH15	0.33-0.6	Fill (silty clay)	6	LPQL	20	33	28	LPQL	15	68	1.1	0.1	LPQL	LPQL	LPQL	LPQL		LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH16	0.0-0.25	Fill (silty clay)	6	LPQL	16	22	22	LPQL	8	31	0.06	0.06	LPQL	LPQL	LPQL	LPQL		LPQL	LPQL	LPQL	160	260	420	LPQL	LPQL	LPQL	LPQL	Asbestos Detected
BH17	0.0-0.3	Fill (silty clay)	LPQL	LPQL	13	36	18	LPQL	18	34	34.3	**4.4**	LPQL	LPQL	LPQL	LPQL		LPQL	LPQL	LPQL	140	370	510	LPQL	LPQL	LPQL	LPQL	No asbestos detected
Total Number of samples			35	35	35	35	35	35	35	35	35	35	27	27	27	27		27	35	35	35	35	35	35	35	35	35	27
Maximum Value			8	0	22	45	35	0.1	23	190	34.3	4.4	0	0	0	0		0	0	170	930	700	1100	0	0	0	0	NC

Explanation:

[1] - NSW DECCW Waste Classification Guidelines (2009)

[2] - Assessment of Total moderately harmful pesticides includse: Dimethoate, Fenitrothion, Ethion

[3] - Assessment of Total scheduled pesticides include: alpha-BHC, gamma-BHC, beta-BHC, Heptachlor, Aldrin, Heptachlor Epoxide, gamma-Chlordane, alpha-chlordane, pp-DDE, Dieldrin, Endrin, pp-DDD, pp-DDT, Endrin Aldehyde

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

Abbreviations:

PAHs: Polycyclic Aromatic Hydrocarbons
B(a)P: Benzo(a)pyrene
PQL: Practical Quantitation Limit
LPQL: Less than PQL
PID: Photoionisation Detector
PCBs: Polychlorinated Biphenyls
BTEX: Monocyclic Aromatic Hydrocarbons
UCL: Upper Level Confidence Limit on Mean Value
ALPQL: All values less than PQL
NA: Not Analysed
NC: Not Calculated
NSL: No Set Limit
SAC: Site Assessment Criteria
TRH: Total Recoverable Hydrocarbons
CT: Contaminant Threshold
SCC: Specific Contaminant Concentration
HILs: Health Investigation Levels
NEPM: National Environmental Protection Measure

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

			Arsenic	Cadmium	Chromium	Lead	Mercury	Nickel	B(a)P
PQL - Envirolab Services			0.05	0.01	0.01	0.03	0.0005	0.02	0.001
TCLP1 - General Solid Waste [1]			5	1	5	5	0.2	2	0.04
TCLP2 - Restricted Solid Waste [1]			20	4	20	20	0.8	8	0.16
TCLP3 - Hazardous Waste [1]			>20	>4	>20	>20	>0.8	>8	>0.16
Sample Reference	**Sample Depth**	**Sample Description**							
BH2	0.5-0.85	Fill (silty clay)	NA	NA	NA	NA	NA	NA	LPQL
BH17	0.0-0.3	Fill (silty clay)	NA	NA	NA	NA	NA	NA	LPQL
Total Number of samples			0	0	0	0	0	0	2
Maximum Value			0	0	0	0	0	0	0

Explanation:

1 - NSW DECCW Waste Classification Guidelines (2009)

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

Abbreviations:

PQL: Practical Quantitation Limit
LPQL: Less than PQL
B(a)P: Benzo(a)pyrene
NC: Not Calculated
NA: Not Analysed
TCLP: Toxicity Characteristics Leaching Procedure

TABLE E
SUMMARY OF GROUNDAWATER LABORATORY RESULTS COMPARED TO GILs
All results in µg/L unless stated otherwise.

	PQL Envirolab Services	GIL - ANZECC 2000 [1] Fresh Waters	SAMPLE MW5
Metals			
Arsenic (As lll)	1	24	1
Cadmium	0.1	0.2	**0.3**
Chromium (III)	1	3.3[a]	LPQL
Copper	1	1.4	**2**
Lead	1	3.4	LPQL
Total Mercury (inorganic)	0.05	0.06	LPQL
Nickel	1	11	4
Zinc	1	8	**38**
Total Recoverable Hydrocarbons (TRH)			
C_6-C_{10} (F1)	25	NSL	LPQL
>C_{10}-C_{16} (F2)	50	NSL	LPQL
>C_{16}-C_{34} (F3)	100	NSL	LPQL
>C_{34}-C_{40} (F4)	100	NSL	LPQL
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)			
Benzene	1	950	LPQL
Toluene	1	180[a]	LPQL
Ethylbenzene	1	80[a]	LPQL
m+p-xylene	2	75[m]	LPQL
o-xylene	1	350[a]	LPQL
Total xylenes	2	NSL	LPQL
Polycyclic Aromatic Hydrocarbons (PAHs)			
Naphthalene	0.1	16[a]	LPQL
Acenaphthylene	0.1	NSL	LPQL
Acenaphthene	0.1	NSL	LPQL
Fluorene	0.1	NSL	LPQL
Phenanthrene	0.1	0.6[c]	LPQL
Anthracene	0.1	0.01[c]	LPQL
Fluoranthene	0.1	1[c]	LPQL
Pyrene	0.1	NSL	LPQL
Benzo(a)anthracene	0.1	NSL	LPQL
Chrysene	0.1	NSL	LPQL
Benzo(b,k)fluoranthene	0.2	NSL	LPQL
Benzo(a)pyrene	0.1	0.1[c]	LPQL
Indeno(1,2,3-c,d)pyrene	0.1	NSL	LPQL
Dibenzo(a,h)anthracene	0.1	NSL	LPQL
Benzo(g,h,i)perylene	0.1	NSL	LPQL

Explanation:

1 - ANZECC Australian Water Quality Guidelines for Fresh Waters (ANZECC 2000) - Trigger Values for protection of 95% of species

a - In the absence of a high reliability guideline concentration, the moderate or low reliability guideline concentration has been quoted

c - 99% trigger values adopted due to the potential for bioaccumulation effects

m - Guideline value adopted for m-Xylene. We note that the m-Xylene guideline value is 75ug/L and the p-Xylene guideline value is 200ug/L. However these two isomers cannot be distinguished analytically. Therefore EIS have adopted the more conservative guideline value

Concentration above the GIL VALUE

Abbreviations:

NA: Not Analysed

NSL: No Set Limit

GIL - Groundwater Investigation Levels

PQL: Practical Quantitation Limit

LPQL: Less than Practical Quantitation Limit

TABLE F
GROUNDWATER LABORATORY RESULTS COMPARED TO HSLs
All data in µg/L unless stated otherwise

				C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	
PQL - Envirolab Services				10	50	1	1	1	3	1	PID [2]
Land Use Category [1]				**COMMERCIAL/INDUSTRIAL**							
Sample Reference	**Water Depth**	**Depth Category**	**Soil Category**								
MW5	5.23	4m to <8m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
Total Number of Samples				1	1	1	1	1	1	1	1
Maximum Value				0	0	0	0	0	0	0	0

Explanation:
1 - Groundwater Investigation Levels (GILs): NEPM 2013
2 - Field PID values obtained during the investigation

Concentration above the SAC VALUE
Site specific assesment required VALUE

The guideline corresponding to the elevated value is highlighted in grey in the Site Assessment Criteria Table below

Abbreviations:
UCL: Upper Level Confidence Limit on Mean Value
HSLs: Health Screening Levels
NA: Not Analysed
NC: Not Calculated
NL: Not Limiting
PQL: Practical Quantitation Limit
LPQL: Less than PQL
SAC: Site Assessment Criteria
NEPM: National Environmental Protection Measure
SSA: Site Specific Assessment

HSL GROUNDWATER ASSESSMENT CRITERIA

				C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene
PQL - Envirolab Services				10	50	1	1	1	3	1
Land Use Category [1]				**COMMERCIAL/INDUSTRIAL**						
Sample Reference	**Water Depth**	**Depth Category**	**Soil Category**							
MW5	5.23	4m to <8m	Clay	NL	NL	30000	NL	NL	NL	NL

TABLE G
SOIL LABORATORY RESULTS COMPARED TO EILs AND ESLs
All data in mg/kg unless stated otherwise

Land Use Category [1]				COMMERCIAL/INDUSTRIAL																
							AGED HEAVY METALS-EILs						EILs		ESLs						
				pH	CEC ($cmol_c/kg$)	Clay Content (% clay)	Arsenic	Chromium	Copper	Lead	Nickel	Zinc	Naphthalene	DDT	C_6-C_{10} (F1)	$>C_{10}$-C_{16} (F2)	$>C_{16}$-C_{34} (F3)	$>C_{34}$-C_{40} (F4)	Benzene	Toluene	Ethylbenzene	Total Xylenes	B(a)P
PQL - Envirolab Services				-	1	-	4	1	1	1	1	1	0.1	0.1	25	50	100	100	0.2	0.5	1	3	0.05
Ambient Background Concentration (ABC) [2]				-	-	-	NSL	10	8	NSL	5	45	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL
Sample Reference	**Sample Depth**	**Sample Description**	**Soil Texture**																				
S2	-	Fill (stockpile)	Fine	NA	NA	NA	5	16	21	18	10	40	LPQL	LPQL	LPQL	61	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
S4	-	Fill (stockpile)	Fine	NA	NA	NA	5	13	20	28	8	190	LPQL	LPQL	LPQL	LPQL	310	110	LPQL	LPQL	LPQL	LPQL	0.07
S6	-	Fill (stockpile)	Fine	NA	NA	NA	6	18	30	31	12	85	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.13
S7	-	Fill (stockpile)	Fine	NA	NA	NA	5	14	20	24	12	51	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.06
S9	-	Fill (stockpile)	Fine	NA	NA	NA	7	15	20	23	7	38	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
S10	-	Fill (stockpile)	Fine	NA	NA	NA	5	19	21	29	10	97	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
S11	-	Fill (stockpile)	Fine	NA	NA	NA	7	15	29	19	10	39	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
S12	-	Fill (stockpile)	Fine	NA	NA	NA	5	22	27	20	23	76	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
S13	-	Fill (stockpile)	Fine	NA	NA	NA	7	20	27	30	12	85	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
S15	-	Fill (stockpile)	Fine	NA	NA	NA	LPQL	16	25	18	19	68	LPQL	LPQL	LPQL	LPQL	370	390	LPQL	LPQL	LPQL	LPQL	0.24
BH1	0.0-0.3	Fill (silty clay)	Fine	NA	NA	NA	8	16	23	31	10	57	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH2	0.0-0.2	Fill (silty clay)	Fine	NA	NA	NA	LPQL	8	45	14	8	42	LPQL	LPQL	LPQL	LPQL	660	870	LPQL	LPQL	LPQL	LPQL	0.19
BH2	0.5-0.85	Fill (silty clay)	Fine	NA	NA	NA	6	18	34	29	11	65	LPQL	NA	LPQL	LPQL	530	550	LPQL	LPQL	LPQL	LPQL	0.89
BH3	0.4-0.5	Fill (silty clay)	Fine	NA	NA	NA	5	16	33	32	11	100	LPQL	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.1
BH3	0.5-0.95	Fill (silty clay)	Fine	NA	NA	NA	6	10	19	15	11	44	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.13
BH4	0.4-0..5	Nat (silty clay)	Fine	NA	NA	NA	4	15	29	16	8	38	LPQL	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.07
BH5	0.3-0.4	Fill (silty clay)	Fine	NA	NA	NA	6	13	22	21	11	49	LPQL	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.06
BH5	0.5-0.95	Fill (silty clay)	Fine	NA	NA	NA	5	12	19	13	6	31	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH5	1.8-2.0	Fill (silty clay)	Fine	NA	NA	NA	7	16	27	20	14	55	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH6	0.35-0.45	Fill (silty clay)	Fine	NA	NA	NA	6	14	43	19	11	51	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH7	0.5-0.95	Fill (silty clay)	Fine	NA	NA	NA	7	20	21	23	8	34	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH8	0.5-0.8	Fill (silty clay)	Fine	NA	NA	NA	8	17	20	16	12	35	LPQL	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH8	1.9-2.0	Fill (silty clay)	Fine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH8	2.4-2.7	Fill (silty clay)	Fine	NA	NA	NA	LPQL	15	22	16	13	59	LPQL	LPQL	LPQL	500	650	LPQL	LPQL	LPQL	LPQL	LPQL	0.06
BH9	1.3-1.5	Fill (silty clay)	Fine	NA	NA	NA	7	17	22	17	10	40	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.23
BH9	2.5-2.8	Fill (silty clay)	Fine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH10	1.2-1.4	Fill (silty clay)	Fine	NA	NA	NA	8	17	24	21	13	42	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH11	0.3-0.5	Fill (silty clay)	Fine	NA	NA	NA	8	16	28	19	13	47	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH12	0.31-0.5	Fill (silty clay)	Fine	NA	NA	NA	4	11	21	16	10	60	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.06
BH12	1.5-1.8	Fill (silty clay)	Fine	NA	NA	NA	5	16	29	32	11	98	LPQL	NA	LPQL	150	920	140	LPQL	LPQL	LPQL	LPQL	0.13
BH13	0.25-0.4	Fill (silty clay)	Fine	NA	NA	NA	LPQL	5	2	12	LPQL	4	LPQL	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH13	1.3-1.5	Fill (silty clay)	Fine	NA	NA	NA	8	18	29	35	10	65	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.09
BH14	0.43-0.6	Fill (silty clay)	Fine	NA	NA	NA	4	15	28	17	12	45	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.1
BH14	1.2-1.4	Fill (silty clay)	Fine	NA	NA	NA	6	16	25	22	12	65	LPQL	NA	LPQL	130	240	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH15	0.33-0.6	Fill (silty clay)	Fine	NA	NA	NA	6	20	33	28	15	68	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.1
BH16	0.0-0.25	Fill (silty clay)	Fine	NA	NA	NA	6	16	22	22	8	31	LPQL	LPQL	LPQL	LPQL	340	350	LPQL	LPQL	LPQL	LPQL	0.06
BH17	0.0-0.3	Fill (silty clay)	Fine	NA	NA	NA	LPQL	13	36	18	18	34	LPQL	LPQL	LPQL	LPQL	390	480	LPQL	LPQL	LPQL	LPQL	4.4
Total Number of Samples				0	0	0	35	35	35	35	35	35	35	27	35	35	35	35	35	35	35	35	35
Maximum Value				0	0	0	8	22	45	35	23	190	0	0	0	500	920	870	0	0	0	0	4.4

Explanation:

1 - Site Assessment Criteria (SAC): NEPM 2013

2 - ABC Values for selected metals has been adopted from the published background concentrations presented in Olszowy et. al., (1995), Trace Element Concentrations in Soils from Rural and Urban New South Wales (the 25th percentile values for new suburbs with high traffic have been quoted)

Concentration above the SAC VALUE

The guideline corresponding to the elevated value is highlighted in grey in the EIL and ESL Assessment Criteria Table below

Abbreviations:

EILs: Ecological Investigation Levels
B(a)P: Benzo(a)pyrene
PQL: Practical Quantitation Limit
UCL: Upper Level Confidence Limit on Mean Value
ESLs: Ecological Screening Levels
NA: Not Analysed
LPQL: Less than PQL
SAC: Site Assessment Criteria
NEPM: National Environmental Protection Measure
NC: Not Calculated
NSL: No Set Limit
ABC: Ambient Background Concentration

TABLE H-1
SOIL INTRA-LABORATORY DUPLICATE RESULTS & RPD CALCULATIONS
All results in mg/kg unless stated otherwise

SAMPLE	ANALYSIS	Envirolab PQL	INITIAL	REPEAT	MEAN	RPD %
Sample Ref = BH8 (0.5-0.8m)	Arsenic	4	8	8	8.0	0
Dup Ref = DUPGF1	Cadmium	0.4	LPQL	LPQL	NC	NC
	Chromium	1	17	19	18.0	11
Envirolab Report: 117547	Copper	1	20	22	21.0	10
	Lead	1	16	16	16.0	0
	Mercury	0.1	LPQL	LPQL	NC	NC
	Nickel	1	12	13	12.5	8
	Zinc	1	35	38	36.5	8
	Naphthalene	0.1	LPQL	LPQL	NC	NC
	Acenaphthylene	0.1	LPQL	LPQL	NC	NC
	Acenaphthene	0.1	LPQL	LPQL	NC	NC
	Fluorene	0.1	LPQL	LPQL	NC	NC
	Phenanthrene	0.1	LPQL	LPQL	NC	NC
	Anthracene	0.1	LPQL	LPQL	NC	NC
	Fluoranthene	0.1	LPQL	LPQL	NC	NC
	Pyrene	0.1	LPQL	LPQL	NC	NC
	Benzo(a)anthracene	0.1	LPQL	LPQL	NC	NC
	Chrysene	0.1	LPQL	LPQL	NC	NC
	Benzo(b)&(k)fluorant	0.2	P	LPQL	NC	NC
	Benzo(a)pyrene	0.05	LPQL	0.07	0.1	NC
	Indeno(123-cd)pyrene	0.1	LPQL	LPQL	NC	NC
	Dibenzo(ah)anthracene	0.1	LPQL	LPQL	NC	NC
	Benzo(ghi)perylene	0.1	LPQL	LPQL	NC	NC
	Benzo(a)pyrene TEQ	0.5	LPQL	LPQL	NC	NC
	Total PAHs	2.05	LPQL	LPQL	NC	NC
	C_6-C_{10} (F1)	25	LPQL	LPQL	NC	NC
	>C_{10}-C_{16} (F2)	50	LPQL	LPQL	NC	NC
	>C_{16}-C_{34} (F3)	100	LPQL	LPQL	NC	NC
	>C_{34}-C_{40} (F4)	100	LPQL	LPQL	NC	NC
	Benzene	0.5	LPQL	LPQL	NC	NC
	Toluene	0.5	LPQL	LPQL	NC	NC
	Ethylbenzene	1	LPQL	LPQL	NC	NC
	m+p-xylene	2	LPQL	LPQL	NC	NC
	o-xylene	1	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 times PQL = RPD value <= 75% are acceptable
Results < 5 times PQL = RPD value <= 100% are acceptable

If result is LPQL then 50% of the PQL is used for the calculation

RPD Results Above the Acceptance Criteria VALUE

Abbreviations:

PQL: Practical Quantitation Limit
LPQL: Less than PQL
NA: Not Analysed
NC: Not Calculated
OCP: Organochlorine Pesticides
OPP: Organophosphorus Pesticides
PCBs: Polychlorinated Biphenyls

TABLE H-2
SOIL INTRA-LABORATORY DUPLICATE RESULTS & RPD CALCULATIONS
All results in mg/kg unless stated otherwise

SAMPLE	ANALYSIS	Envirolab PQL	INITIAL	REPEAT	MEAN	RPD %
Sample Ref = BH15 (0.33-0.6m)	Arsenic	4	5	6	5.5	18
Dup Ref = DUPGF2	Cadmium	0.4	LPQL	LPQL	NC	NC
	Chromium	1	12	20	16.0	50
Envirolab Report: 117547	Copper	1	24	33	28.5	32
	Lead	1	19	28	23.5	38
	Mercury	0.1	LPQL	LPQL	NC	NC
	Nickel	1	12	15	13.5	22
	Zinc	1	50	68	59.0	31
	Naphthalene	0.1	LPQL	LPQL	NC	NC
	Acenaphthylene	0.1	LPQL	LPQL	NC	NC
	Acenaphthene	0.1	LPQL	LPQL	NC	NC
	Fluorene	0.1	LPQL	LPQL	NC	NC
	Phenanthrene	0.1	LPQL	LPQL	NC	NC
	Anthracene	0.1	LPQL	LPQL	NC	NC
	Fluoranthene	0.1	LPQL	LPQL	NC	NC
	Pyrene	0.1	LPQL	LPQL	NC	NC
	Benzo(a)anthracene	0.1	LPQL	LPQL	NC	NC
	Chrysene	0.1	LPQL	LPQL	NC	NC
	Benzo(b)&(k)fluorant	0.2	LPQL	LPQL	NC	NC
	Benzo(a)pyrene	0.05	0.1	0.18	0.1	57
	Indeno(123-cd)pyrene	0.1	LPQL	LPQL	NC	NC
	Dibenzo(ah)anthracene	0.1	LPQL	LPQL	NC	NC
	Benzo(ghi)perylene	0.1	LPQL	LPQL	NC	NC
	Benzo(a)pyrene TEQ	0.5	LPQL	LPQL	NC	NC
	Total PAHs	2.05	LPQL	LPQL	NC	NC
	C_6-C_{10} (F1)	25	LPQL	LPQL	NC	NC
	>C_{10}-C_{16} (F2)	50	LPQL	LPQL	NC	NC
	>C_{16}-C_{34} (F3)	100	LPQL	110	NC	NC
	>C_{34}-C_{40} (F4)	100	LPQL	150	NC	NC
	Benzene	0.5	LPQL	LPQL	NC	NC
	Toluene	0.5	LPQL	LPQL	NC	NC
	Ethylbenzene	1	LPQL	LPQL	NC	NC
	m+p-xylene	2	LPQL	LPQL	NC	NC
	o-xylene	1	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 times PQL = RPD value <= 75% are acceptable
Results < 5 times PQL = RPD value <= 100% are acceptable

If result is LPQL then 50% of the PQL is used for the calculation

RPD Results Above the Acceptance Criteria VALUE

Abbreviations:

PQL: Practical Quantitation Limit
LPQL: Less than PQL
NA: Not Analysed
NC: Not Calculated
OCP: Organochlorine Pesticides
OPP: Organophosphorus Pesticides
PCBs: Polychlorinated Biphenyls

TABLE H-3
SOIL INTRA-LABORATORY DUPLICATE RESULTS & RPD CALCULATIONS
All results in mg/kg unless stated otherwise

SAMPLE	ANALYSIS	Envirolab PQL	INITIAL	REPEAT	MEAN	RPD %
Sample Ref = S10	Arsenic	4	5	6	5.5	18
Dup Ref = DUPSP1	Cadmium	0.4	LPQL	LPQL	NC	NC
	Chromium	1	19	18	18.5	5
Envirolab Report: 117547	Copper	1	21	21	21.0	0
	Lead	1	29	24	26.5	19
	Mercury	0.1	LPQL	LPQL	NC	NC
	Nickel	1	10	8	9.0	22
	Zinc	1	97	54	75.5	**57**
	Naphthalene	0.1	LPQL	LPQL	NC	NC
	Acenaphthylene	0.1	LPQL	LPQL	NC	NC
	Acenaphthene	0.1	LPQL	LPQL	NC	NC
	Fluorene	0.1	LPQL	LPQL	NC	NC
	Phenanthrene	0.1	LPQL	LPQL	NC	NC
	Anthracene	0.1	LPQL	LPQL	NC	NC
	Fluoranthene	0.1	LPQL	LPQL	NC	NC
	Pyrene	0.1	LPQL	LPQL	NC	NC
	Benzo(a)anthracene	0.1	LPQL	LPQL	NC	NC
	Chrysene	0.1	LPQL	LPQL	NC	NC
	Benzo(b)&(k)fluorant	0.2	LPQL	LPQL	NC	NC
	Benzo(a)pyrene	0.05	LPQL	LPQL	NC	NC
	Indeno(123-cd)pyrene	0.1	LPQL	LPQL	NC	NC
	Dibenzo(ah)anthracene	0.1	LPQL	LPQL	NC	NC
	Benzo(ghi)perylene	0.1	LPQL	LPQL	NC	NC
	Benzo(a)pyrene TEQ	0.5	LPQL	LPQL	NC	NC
	Total PAHs	2.05	LPQL	LPQL	NC	NC
	C_6-C_{10} (F1)	25	LPQL	LPQL	NC	NC
	>C_{10}-C_{16} (F2)	50	LPQL	LPQL	NC	NC
	>C_{16}-C_{34} (F3)	100	LPQL	LPQL	NC	NC
	>C_{34}-C_{40} (F4)	100	LPQL	LPQL	NC	NC
	Benzene	0.5	LPQL	LPQL	NC	NC
	Toluene	0.5	LPQL	LPQL	NC	NC
	Ethylbenzene	1	LPQL	LPQL	NC	NC
	m+p-xylene	2	LPQL	LPQL	NC	NC
	o-xylene	1	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 times PQL = RPD value <= 75% are acceptable
Results < 5 times PQL = RPD value <= 100% are acceptable

If result is LPQL then 50% of the PQL is used for the calculation

RPD Results Above the Acceptance Criteria VALUE

Abbreviations:

PQL: Practical Quantitation Limit
LPQL: Less than PQL
NA: Not Analysed
NC: Not Calculated
OCP: Organochlorine Pesticides
OPP: Organophosphorus Pesticides
PCBs: Polychlorinated Biphenyls

TABLE I
SOIL INTER-LABORATORY DUPLICATE RESULTS & RPD CALCULATIONS
All results in mg/kg unless stated otherwise

SAMPLE	ANALYSIS	Envirolab PQL	Envirolab VIC PQL	INITIAL	REPEAT	MEAN	RPD %
Sample Ref = BH11 (0.3-0.5m)	Arsenic	4	4	8	7	7.5	13
Dup Ref = DUPGF3	Cadmium	0.4	0.4	LPQL	LPQL	NC	NC
	Chromium	1	1	16	18	17.0	12
Envirolab Report (Syd): 117547	Copper	1	1	28	28	28.0	0
Envirolab Report (Melb): 4920	Lead	1	1	19	19	19.0	0
	Mercury	0.1	0.1	LPQL	LPQL	NC	NC
	Nickel	1	1	13	13	13.0	0
	Zinc	1	1	47	49	48.0	4
	C_6-C_{10} (F1)	25	25	LPQL	LPQL	NC	NC
	>C_{10}-C_{16} (F2)	50	50	LPQL	LPQL	NC	NC
	>C_{16}-C_{34} (F3)	100	100	LPQL	LPQL	NC	NC
	>C_{34}-C_{40} (F4)	100	100	LPQL	LPQL	NC	NC
	Benzene	0.5	0.5	LPQL	LPQL	NC	NC
	Toluene	0.5	0.5	LPQL	LPQL	NC	NC
	Ethylbenzene	1	1	LPQL	LPQL	NC	NC
	m+p-xylene	2	2	LPQL	LPQL	NC	NC
	o-xylene	1	1	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 times PQL = RPD value <= 75% are acceptable

Results < 5 times PQL = RPD value <= 100% are acceptable

If result is LPQL then 50% of the PQL is used for the calculation

RPD Results Above the Acceptance Criteria VALUE

Abbreviations:

PQL: Practical Quantitation Limit
LPQL: Less than PQL
NA: Not Analysed
NC: Not Calculated
OCP: Organochlorine Pesticides
OPP: Organophosphorus Pesticides
PCBs: Polychlorinated Biphenyls

TABLE J
GROUNDWATER INTRA-LABORATORY DUPLICATE RESULTS & RPD CALCULATIONS
All results in µg/L unless stated otherwise

SAMPLE	ANALYSIS	Envirolab PQL	INITIAL	REPEAT	MEAN	RPD %
Sample Ref = MW5	Arsenic	1	1	1	1	0
Dup Ref = DUPGW	Cadmium	0.1	0.3	0.3	0	0
	Chromium	1	LPQL	LPQL	NC	NC
Envirolab Report: 117716	Copper	1	2	2	2	0
	Lead	1	LPQL	LPQL	NC	NC
	Mercury	0.5	LPQL	LPQL	NC	NC
	Nickel	1	4	4	4	0
	Zinc	1	38	27	33	34
	Naphthalene	0.1	LPQL	LPQL	NC	NC
	Acenaphthylene	0.1	LPQL	LPQL	NC	NC
	Acenaphthene	0.1	LPQL	LPQL	NC	NC
	Fluorene	0.1	LPQL	LPQL	NC	NC
	Phenanthrene	0.1	LPQL	LPQL	NC	NC
	Anthracene	0.1	LPQL	LPQL	NC	NC
	Fluoranthene	0.1	LPQL	LPQL	NC	NC
	Pyrene	0.1	LPQL	LPQL	NC	NC
	Benzo(a)anthracene	0.1	LPQL	LPQL	NC	NC
	Chrysene	0.1	LPQL	LPQL	NC	NC
	Benzo(b)&(k)fluorant	0.2	LPQL	LPQL	NC	NC
	Benzo(a)pyrene	0.1	LPQL	LPQL	NC	NC
	Indeno(123-cd)pyrene	0.1	LPQL	LPQL	NC	NC
	Dibenzo(ah)anthracene	0.1	LPQL	LPQL	NC	NC
	Benzo(ghi)perylene	0.1	LPQL	LPQL	NC	NC
	Benzo(a)pyrene TEQ	0.5	LPQL	LPQL	NC	NC
	Total PAHs	2.1	LPQL	LPQL	NC	NC
	C_6-C_{10} (F1)	10	LPQL	LPQL	NC	NC
	>C_{10}-C_{16} (F2)	50	LPQL	LPQL	NC	NC
	>C_{16}-C_{34} (F3)	100	LPQL	LPQL	NC	NC
	>C_{34}-C_{40} (F4)	100	LPQL	LPQL	NC	NC
	Benzene	1	LPQL	LPQL	NC	NC
	Toluene	1	LPQL	LPQL	NC	NC
	Ethylbenzene	1	LPQL	LPQL	NC	NC
	m+p-xylene	2	LPQL	LPQL	NC	NC
	o-xylene	1	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 times PQL = RPD value <= 75% are acceptable
Results < 5 times PQL = RPD value <= 100% are acceptable

If result is LPQL then 50% of the PQL is used for the calculation

RPD Results Above the Acceptance Criteria VALUE

Abbreviations:

PQL: Practical Quantitation Limit
LPQL: Less than PQL
NA: Not Analysed
NC: Not Calculated
OCP: Organochlorine Pesticides
OPP: Organophosphorus Pesticides
PCBs: Polychlorinated Biphenyls

TABLE K
SUMMARY OF FIELD QA/QC RESULTS

ANALYSIS	Envirolab PQL		TB[S] 10/10/2014 117547	FR[W] 10/10/2014 117547
	mg/kg	µg/L	mg/kg	µg/L
Benzene	1	1	LPQL	LPQL
Toluene	1	1	LPQL	LPQL
Ethylbenzene	1	1	LPQL	LPQL
m+p-xylene	2	2	LPQL	LPQL
o-xylene	1	1	LPQL	LPQL

Explanation:

[W] Sample type (water)

[S] Sample type (sand)

BTEX concentrations in trip spikes are presented as % recovery

Values above PQLs/Acceptance criteria **VALUE**

Abbreviations:

PQL: Practical Quantitation Limit

LPQL: Less than PQL

TB: Trip Blank

FR: Rinsate Sample

Appendix A: Borehole Logs and Explanatory Notes

JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

BOREHOLE LOG

Borehole No. 1 1/1

Client: JOHN R. BROGAN & ASSOCIATES PTY LTD
Project: DUE DILIGENCE INVESTIGATION
Location: CNR. OF ELIZABETH DRIVE AND BONNYRIGG AVENUE, BONNYRIGG, NSW

Job No. 27813V
Date: 10-10-14
Method: SPIRAL AUGER JK350
Logged/Checked by: M.W./F.V.
R.L. Surface: N/A
Datum:

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	■					0			FILL: Sandy gravel, fine to coarse grained grained concrete, igneous and shale, fine to medium sand, trace of ceramic fragments and root fibres.	D			GRASS COVER APPEARS POORLY COMPACTED
	■			■	N = 10 3,4,6	1		CH	SILTY CLAY: high plasticity, light grey mottled red brown, trace of root fibres and fine to medium grained ironstone gravel.	MC>PL	VSt	230 340 340	RESIDUAL
				■	N = 43 15,19,24	2		-	INTERBEDDED SILTY CLAY: high plasticity, light grey AND SHALE: light grey and grey.	MC<PL/ XW	H/ EL	590 >600 >600	
				■	N > 8 20,8/50mm REFUSAL	3		-	SHALE: grey.	DW	VL-L	>600 >600 >600	VERY LOW TO LOW 'TC' BIT RESISTANCE
				■		4			SHALE: grey and dark grey, trace of clay bands.				
				■		5							
						6			END OF BOREHOLE AT 6.0m				
						7							

JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

BOREHOLE LOG

Borehole No. 2 1/1

Client: JOHN R. BROGAN & ASSOCIATES PTY LTD
Project: DUE DILIGENCE INVESTIGATION
Location: CNR. OF ELIZABETH DRIVE AND BONNYRIGG AVENUE, BONNYRIGG, NSW

Job No. 27813V
Date: 10-10-14
Method: SPIRAL AUGER JK350
Logged/Checked by: M.W./F.V.
R.L. Surface: N/A
Datum:

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						0			FILL: Sandy gravel, fine to coarse grained sub rounded to angular igneous, with clay fines.	D			GRASS COVER APPEARS POORLY COMPACTED
					N = 7 3,4,3								
						1		CH	SILTY CLAY: high plasticity, light grey mottled red brown, trace of root fibres and fine to medium grained ironstone gravel.	MC≈PL	VSt-H	400 380	RESIDUAL
					N > 6 11,6/ 100mm							450 400	
					REFUSAL	2		-	SHALE: grey.	DW	L	300	LOW 'TC' BIT RESISTANCE
										XW-DW	EL-VL		VERY LOW RESISTANCE
						3					L		LOW RESISTANCE
						4							PVC STANDPIPE INSTALLED TO 4m DEPTH, SLOTTED BETWEEN 4m & 1m, 2mm SAND FILTER PACK BETWEEN 4m & 1m, BENTONITE SEAL BETWEEN 1m & SURFACE, COMPLETED WITH GATIC COVER
						5			SHALE: grey and dark grey.		L-M		LOW TO MODERATE RESISTANCE
						6			END OF BOREHOLE AT 6.0m				
						7							

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BOREHOLE LOG

Borehole No. 3 1/1

Client: JOHN R. BROGAN & ASSOCIATES PTY LTD
Project: DUE DILIGENCE INVESTIGATION
Location: CNR. OF ELIZABETH DRIVE AND BONNYRIGG AVENUE, BONNYRIGG, NSW

Job No. 27813V
Date: 10-10-14
Method: SPIRAL AUGER JK350
Logged/Checked by: M.W./F.V.
R.L. Surface: N/A
Datum:

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						0			CONCRETE: 340mm.t				10mm DIA. REINFORCEMENT, 70mm TOP COVER
					N = 6 1,3,3			-	FILL: Silty clay, medium plasticity, brown, light grey and grey, trace of slag, ash, root fibres, fine to medium grained sand and fine to coarse grained shale and igneous gravel.	MC>PL		80 60 120 390	APPEARS POORLY COMPACTED
					N = 9 3,4,5	1						90 150 70	
						2							
					N = 20 3,7,13	3		CH	SILTY CLAY: high plasticity, light grey mottled red brown and orange brown, trace of root fibres and fine to medium grained ironstone gravel.	MC>PL	VSt	250 270 250	RESIDUAL
						4							
					N > 14 4,14/75mm REFUSAL			-	SHALE: dark grey, with clay bands.	DW	VSt-H VL-L	380 520 >600	VERY LOW TO LOW 'TC' BIT RESISTANCE
						5			SHALE: dark grey.				
						6			END OF BOREHOLE AT 6.0m				
						7							

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GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

BOREHOLE LOG

Borehole No. 4
1/1

Client: JOHN R. BROGAN & ASSOCIATES PTY LTD
Project: DUE DILIGENCE INVESTIGATION
Location: CNR. OF ELIZABETH DRIVE AND BONNYRIGG AVENUE, BONNYRIGG, NSW

Job No. 27813V
Date: 10-10-14
Method: SPIRAL AUGER JK350
Logged/Checked by: M.W./F.V.
R.L. Surface: N/A
Datum:

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 COMPLET-ION						0			CONCRETE: 280mm.t				10mm DIA. REINFORCEMENT, 95mm TOP COVER
					N = 16 5,8,8	1		CH	SILTY CLAY: high plasticity, light grey mottled red brown, trace of root fibres and fine to medium grained ironstone gravel.	MC<PL	H	>600 >600 >600	RESIDUAL
					N = 42 16,20,22	2		-	SHALE: light grey and red brown.	XW	EL	>600 >600 >600	
									SHALE: dark grey, trace of red brown iron indurated bands and clay bands.	DW	VL		VERY LOW 'TC' BIT RESISTANCE
						3					L		LOW RESISTANCE
						4							
						5					M		MODERATE RESISTANCE
						6			END OF BOREHOLE AT 6.0m				
						7							

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GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

BOREHOLE LOG

Borehole No. 5
1/1

Client: JOHN R. BROGAN & ASSOCIATES PTY LTD
Project: DUE DILIGENCE INVESTIGATION
Location: CNR. OF ELIZABETH DRIVE AND BONNYRIGG AVENUE, BONNYRIGG, NSW

Job No. 27813V
Date: 10-10-14
Method: SPIRAL AUGER JK350
Logged/Checked by: M.W./F.V.
R.L. Surface: N/A
Datum:

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						0			CONCRETE: 270mm.t				8mm DIA. REINFORCEMENT, 75mm TOP COVER
					N = 10 3,5,5			-	FILL: Silty clay, medium plasticity, brown, light grey and red brown, trace of fine to medium grained sand, ash and fine to coarse grained sandstone, shale and ironstone gravel.	MC>PL	St- VSt	230 150 170	APPEARS MODERATELY COMPACTED
					N = 7 5,3,4	1					VSt	320 250 210	
						2							
					N = 11 5,4,7	3		CH	SILTY CLAY: high plasticity, light grey mottled orange brown.	MC>PL	VSt	330 230 290	
						4		-	SHALE: dark grey.	DW	VL		VERY LOW 'TC' BIT RESISTANCE
▼ ON 16-10-14						5			as above, but with red brown iron indurated bands, trace of clay seams.		L		LOW RESISTANCE PVC STANDPIPE INSTALLED TO 6m DEPTH, SLOTTED FROM 6m TO 3m, 2mm SAND FILTER PACK FROM 6m TO 0.5m, BENTONITE SEAL FROM 0.5m TO SURFACE, COMPLETED WITH GATIC COVER
						6			END OF BOREHOLE AT 6.0m				
						7							

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GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

BOREHOLE LOG

Borehole No. 6 1/1

Client: JOHN R. BROGAN & ASSOCIATES PTY LTD
Project: DUE DILIGENCE INVESTIGATION
Location: CNR. OF ELIZABETH DRIVE AND BONNYRIGG AVENUE, BONNYRIGG, NSW

Job No. 27813V
Date: 10-10-14
Method: SPIRAL AUGER JK350
Logged/Checked by: M.W./F.V.
R.L. Surface: N/A
Datum:

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						0			CONCRETE: 320mm.t				8mm DIA. REINFORCEMENT, 55mm TOP COVER
					N = 3 2,1,2	1		-	FILL: Silty clay, medium to high plasticity, brown, trace of ash and fine to medium grained igneous, shale and ironstone gravel.	MC>PL		20 200 400	APPEARS POORLY COMPACTED
					N = 14 4,5,9	2						200 150 380	APPEARS MODERATELY COMPACTED
					SPT 7/10mm REFUSAL	3		-	SHALE: dark grey.	DW	VL-L		VERY LOW TO LOW 'TC' BIT RESISTANCE
						4			as above, but trace of red brown iron indurated bands.		L-M		LOW TO MODERATE RESISTANCE
						5							MODERATE RESISTANCE PVC STANDPIPE INSTALLED TO 5.85m DEPTH, SLOTTED 5.85m TO 2.85m, 2mm SAND FILTER PACK FROM 5.85m TO 0.5m, BENTONITE SEAL FROM 0.5m TO SURFACE, COMPLETED WITH GATIC COVER
						6			END OF BOREHOLE AT 6.2m				
						7							

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BOREHOLE LOG

Borehole No. 7
1/1

Client: JOHN R. BROGAN & ASSOCIATES PTY LTD
Project: DUE DILIGENCE INVESTIGATION
Location: CNR. OF ELIZABETH DRIVE AND BONNYRIGG AVENUE, BONNYRIGG, NSW

Job No. 27813V
Date: 10-10-14
Method: SPIRAL AUGER JK350
Logged/Checked by: M.W./F.V.
R.L. Surface: N/A
Datum:

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 COMPLET-ION						0			CONCRETE: 300mm.t				10mm DIA. REINFORCEMENT, 65,75,95 &105mm TOP COVER
					N = 5 3,2,3			-	FILL: Clayey sand, fine to coarse grained, light brown, with fine to coarse grained sandstone gravel.	M			
						1			FILL: Silty clay, medium to high plasticity, brown and grey, trace of root fibres, slag, fine to coarse grained igneous and ironstone gravel.	MC>PL		340 240 170	APPEARS POORLY COMPACTED
					N = 8 1,4,4	2		CH	SILTY CLAY: high plasticity, light grey mottled red brown and orange brown, trace of root fibres.	MC>PL	VSt	270 240 350	RESIDUAL
					N > 43 8,11, 32/100mm	3					VSt-H	380 510 450	
					REFUSAL			-	INTERBEDDED SILTY CLAY: high plasticity, light grey, AND SHALE: grey and dark grey.	H/ XW-DW	MC>PL / EL-VL		VERY LOW 'TC' BIT RESISTANCE
						4							
						5			SHALE: dark grey.	DW	L		LOW RESISTANCE
											L-M		LOW TO MODERATE RESISTANCE
						6			END OF BOREHOLE AT 6.0m				
						7							

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

EIS

ENVIRONMENTAL LOG

Borehole No. 8

1/1

Environmental logs are not to be used for geotechnical purposes

Client: JOHN R. BROGAN & ASSOCIATES PTY LTD

Project: DUE DILIGENCE INVESTIGATION

Location: CNR. OF ELIZABETH DRIVE AND BONNYRIGG AVENUE, BONNYRIGG, NSW

Job No. E27813KG **Method:** EZIPROBE **R.L. Surface:** N/A

Date: 10-10-14 **Datum:**

Logged/Checked by: G.F./P.B.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLET-ION						0			CONCRETE: 450mm.t				
						1		-	FILL: Silty clay, medium to high plasticity, brown, grey, orange brown and light brown, trace of ash, root fibres, concrete fragments, fine to medium grained sandstone, ironstone, igneous and shale gravel.	MC>PL			HYDROCARBON ODOUR
						2							
						3		SM	SILTY SAND: fine to medium grained, grey.	M			STRONG HYDROCARBON ODOUR
									END OF BOREHOLE AT 3.4m				PROBE REFUSAL ON SHALE BEDROCK
						4							
						5							
						6							
						7							

ENVIRONMENTAL INVESTIGATION SERVICES

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EIS

ENVIRONMENTAL LOG

Borehole No. 9

1/1

Environmental logs are not to be used for geotechnical purposes

Client: JOHN R. BROGAN & ASSOCIATES PTY LTD

Project: DUE DILIGENCE INVESTIGATION

Location: CNR. OF ELIZABETH DRIVE AND BONNYRIGG AVENUE, BONNYRIGG, NSW

Job No. E27813KG **Method:** EZIPROBE **R.L. Surface:** N/A

Date: 10-10-14 **Datum:**

Logged/Checked by: G.F./P.B.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION						0			CONCRETE: 230mm.t				
								-	FILL: Silty clay, medium to high plasticity, brown, dark grey and light brown, trace of ash, concrete fragments, fine to medium grained shale, ironstone and igneous gravel.	MC>PL			
						1							
						2			FILL: Silty clay, high plasticity, brown, dark grey and orange brown, trace of fine to medium grained igneous, ironstone, sandstone and shale gravel and ash.				
						3		CH	SILTY CLAY: high plasticity, light grey mottled orange brown, trace of fine to medium grained ironstone gravel.	MC>PL			
									END OF BOREHOLE AT 3.6m				
						4							
						5							
						6							
						7							

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

EIS

ENVIRONMENTAL LOG

Borehole No. 10 1/1

Environmental logs are not to be used for geotechnical purposes

Client: JOHN R. BROGAN & ASSOCIATES PTY LTD

Project: DUE DILIGENCE INVESTIGATION

Location: CNR. OF ELIZABETH DRIVE AND BONNYRIGG AVENUE, BONNYRIGG, NSW

Job No. E27813KG **Method:** EZIPROBE **R.L. Surface:** N/A

Date: 10-10-14 **Datum:**

Logged/Checked by: G.F./P.B.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLET-ION						0			CONCRETE: 380mm.t				
								-	FILL: Silty clay, medium to high plasticity, light grey, brown and red brown, trace of fine to medium grained shale, ironstone and igneous gravel.	MC>PL			
						1			FILL: Silty clay, medium to high plasticity, brown and dark grey, trace of ash, fine to medium grained igneous, ironstone and shale gravel.				
						2							
						3		CH	SILTY CLAY: high plasticity, red brown mottled light brown, trace of fine to medium grained ironstone gravel.	MC>PL			
									END OF BOREHOLE AT 3.6m				PROBE REFUSAL
						4							
						5							
						6							
						7							

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

EIS

ENVIRONMENTAL LOG

Borehole No. 11 1/1

Environmental logs are not to be used for geotechnical purposes

Client: JOHN R. BROGAN & ASSOCIATES PTY LTD

Project: DUE DILIGENCE INVESTIGATION

Location: CNR. OF ELIZABETH DRIVE AND BONNYRIGG AVENUE, BONNYRIGG, NSW

Job No. E27813KG **Method:** EZIPROBE **R.L. Surface:** N/A

Date: 10-10-14 **Datum:**

Logged/Checked by: G.F./P.B.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLET-ION						0			CONCRETE: 260mm.t				
								-	CONCRETE: 40mm.t FILL: Silty clay, medium to high plasticity, brown, light brown and dark grey, trace of fine to medium grained ironstone, igneous, sandstone and shale gravel.	MC>PL			
						1							
						2		CH	SILTY CLAY: high plasticity, light grey mottled red brown, trace of fine to medium grained ironstone gravel.	MC>PL			
						3			END OF BOREHOLE AT 3.0m				
						4							
						5							
						6							
						7							

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

EIS

ENVIRONMENTAL LOG

Borehole No. 12 1/1

Environmental logs are not to be used for geotechnical purposes

Client: JOHN R. BROGAN & ASSOCIATES PTY LTD

Project: DUE DILIGENCE INVESTIGATION

Location: CNR. OF ELIZABETH DRIVE AND BONNYRIGG AVENUE, BONNYRIGG, NSW

Job No. E27813KG **Method:** EZIPROBE **R.L. Surface:** N/A

Date: 10-10-14 **Datum:**

Logged/Checked by: G.F./P.B.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLET-ION						0			CONCRETE: 310mm.t				
								-	FILL: Silty clay, medium to high plasticity, light brown, brown and orange brown, trace of fine to medium grained sandstone, ironstone and shale gravel.	MC>PL			
						1			FILL: Silty clay, medium to high plasticity, brown and dark grey, trace of fine to medium grained ironstone, igneous, sandstone and shale gravel, ash and glass fragments.				
						2							SLIGHT HYDROCARBON ODOUR
						3		CH	SILTY CLAY: high plasticity, red brown mottled light brown.	MC>PL			
									END OF BOREHOLE AT 3.6m				
						4							
						5							
						6							
						7							

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

EIS

ENVIRONMENTAL LOG

Borehole No. 13 1/1

Environmental logs are not to be used for geotechnical purposes

Client: JOHN R. BROGAN & ASSOCIATES PTY LTD

Project: DUE DILIGENCE INVESTIGATION

Location: CNR. OF ELIZABETH DRIVE AND BONNYRIGG AVENUE, BONNYRIGG, NSW

Job No. E27813KG **Method:** EZIPROBE **R.L. Surface:** N/A

Date: 10-10-14 **Datum:**

Logged/Checked by: G.F./P.B.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLET-ION	■	■				0			CONCRETE: 250mm.t				
	■	■						-	FILL: Silty sandy clay, low to medium plasticity, light grey, red brown and light brown, fine to coarse grained sandstone gravel.	MC<PL MC>PL			
	■	■				1			FILL: Silty clay, high plasticity, brown and dark grey, trace of fine to medium grained igneous, ironstone, sandstone and shale gravel, ash and fine to medium grained sand.				
						2							
	■							CH	SILTY CLAY: high plasticity, light grey and red brown, trace of root fibres.	MC>PL			
						3			END OF BOREHOLE AT 2.9m				PROBE REFUSAL
						4							
						5							
						6							
						7							

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

EIS

ENVIRONMENTAL LOG

Borehole No. 14 1/1

Environmental logs are not to be used for geotechnical purposes

Client: JOHN R. BROGAN & ASSOCIATES PTY LTD

Project: DUE DILIGENCE INVESTIGATION

Location: CNR. OF ELIZABETH DRIVE AND BONNYRIGG AVENUE, BONNYRIGG, NSW

Job No. E27813KG **Method:** EZIPROBE **R.L. Surface:** N/A

Date: 10-10-14 **Datum:**

Logged/Checked by: G.F./P.B.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLET-ION	■	■	■	■		0			CONCRETE: 420mm.t				
								-	FILL: Silty clay, high plasticity, brown, dark grey, grey and orange brown, trace of plastic, ash, fine to coarse grained shale, ironstone and igneous gravel.	MC>PL			HYDROCARBON ODOUR
						1							
						2							
						3			END OF BOREHOLE AT 2.9m				PROBE REFUSAL
						4							
						5							
						6							
						7							

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

EIS

ENVIRONMENTAL LOG

Borehole No. 15 1/1

Environmental logs are not to be used for geotechnical purposes

Client: JOHN R. BROGAN & ASSOCIATES PTY LTD

Project: DUE DILIGENCE INVESTIGATION

Location: CNR. OF ELIZABETH DRIVE AND BONNYRIGG AVENUE, BONNYRIGG, NSW

Job No. E27813KG **Method:** EZIPROBE **R.L. Surface:** N/A

Date: 10-10-14 **Datum:**

Logged/Checked by: G.F./P.B.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLET-ION						0			CONCRETE: 330mm.t				
								-	FILL: Gravelly silty clay, medium plasticity, brown and dark grey, fine to medium grained igneous and	MC>PL			
								CH	ironstone gravel, trace of plastic, ash, glass and fine to medium grained sand.	MC>PL			
						1			SILTY CLAY: high plasticity, light grey mottled red brown, trace of fine to medium grained ironstone gravel.				
									as above, but with shale bands.				POSSIBLY XW SHALE
									END OF BOREHOLE AT 1.7m				PROBE REFUSAL
						2							
						3							
						4							
						5							
						6							
						7							

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

EIS

ENVIRONMENTAL LOG

Borehole No. 16 1/1

Environmental logs are not to be used for geotechnical purposes

Client: JOHN R. BROGAN & ASSOCIATES PTY LTD

Project: DUE DILIGENCE INVESTIGATION

Location: CNR. OF ELIZABETH DRIVE AND BONNYRIGG AVENUE, BONNYRIGG, NSW

Job No. E27813KG **Method:** EXCAVATOR **R.L. Surface:** N/A

Date: 10-10-14 **Datum:**

Logged/Checked by: R.M./P.B.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■		■			0			FILL: Silty gravelly clay, low to medium plasticity, brown, with fibre cement fragments.	MC<PL			GRASS COVER
								CL	FILL: Asphaltic concrete	MC<PL			
	■					1			SILTY CLAY: medium plasticity, grey red.				
									END OF TEST PIT AT 1.3m				
						2							
						3							
						4							
						5							
						6							
						7							

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

EIS

ENVIRONMENTAL LOG

Borehole No. 17

1/1

Environmental logs are not to be used for geotechnical purposes

Client: JOHN R. BROGAN & ASSOCIATES PTY LTD

Project: DUE DILIGENCE INVESTIGATION

Location: CNR. OF ELIZABETH DRIVE AND BONNYRIGG AVENUE, BONNYRIGG, NSW

Job No. E27813KG **Method:** EXCAVATOR **R.L. Surface:** N/A

Date: 10-10-14 **Datum:**

Logged/Checked by: R.M./P.B.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION						0			FILL: Silty gravelly clay, low plasticity, brown, with asphaltic concrete fragments.	MC<PL			GRASS COVER
								CL	SILTY CLAY: medium plasticity, grey red.	MC≈PL			
						1			END OF TEST PIT AT 1.0m				
						2							
						3							
						4							
						5							
						6							
						7							

EXPLANATORY NOTES – ENVIRONMENTAL LOGS

INTRODUCTION

These notes have been provided to supplement the environmental report with regards to drilling and field logging. Not all notes are necessarily relevant to all reports. Where geotechnical borehole logs are utilised for environmental purpose, reference should also be made to the explanatory notes included in the geotechnical report. Environmental logs are not suitable for geotechnical purposes.

The ground is a product of continuing natural and manmade processes and therefore exhibits a variety of characteristics and properties which vary from place to place and can change with time. Environmental studies involve gathering and assimilating limited facts about these characteristics and properties in order to understand the ground on a particular site under certain conditions. These conditions 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 (e.g. sandy clay) as set out below (note that unless stated in the report, the soil classification is based on a qualitative field assessment, not laboratory testing):

Soil Classification	Particle Size
Clay	less than 0.002mm
Silt	0.002 to 0.075mm
Sand	0.075 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 shown in the following table:

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.

DRILLING OR EXCAVATION METHODS

The following is a brief summary of drilling and excavation methods currently adopted by the Company, and some comments on their use and application. All except test pits and hand auger drilling require the use of a mechanical drilling rig.

Test Pits: These are normally excavated with a backhoe or a tracked excavator, allowing close examination of the in-situ soils if it is safe to descend into the pit. The depth of penetration is limited to approximately 3m for a backhoe and up to 6m for an excavator. Limitations of test pits include problems associated with disturbance and difficulty of reinstatement; and the consequent effects on nearby structures. Care must be taken if construction is to be carried out near test pit locations to either properly re-compact 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 fill, 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 in-situ 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 (e.g. 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 locations 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 "Nc" on the borehole logs, together with the number of blows per 150mm penetration.

LOGS

The borehole or test pit logs presented herein are an 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; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must 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 (e.g. bricks, concrete, plastic, slag/ash, 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. 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 has not been undertaken to confirm the soil classifications and rocks strengths indicated on the environmental logs unless noted in the report.

SITE ANOMALIES

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, EIS should be notified immediately.

GRAPHIC LOG SYMBOLS FOR SOIL 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

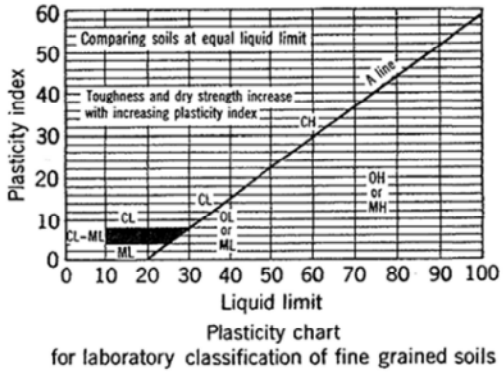
OTHER MATERIALS


CONCRETE


BITUMINOUS CONCRETE, COAL


COLLUVIUM

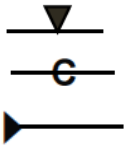
Field Identification Procedures (Excluding particles larger than 75 μm and basing fractions on estimated weights)						Group Symbols [a]	Typical Names	Information Required for Describing Soils	Laboratory Classification Criteria
Coarse-grained soils More than half of material is *larger* than 75 μm sieve 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*)	Use grain size curve in identifying the fractions as given under field identification 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 $C_U = \frac{D_{60}}{D_{10}}$ 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		Dry Strength (crushing characteristics)	Dilatancy (reaction to shaking)	Toughness (consistency near plastic limit)				
	Silts and clays liquid limit less than 50		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 (eg. 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.

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 U50 DB DS ASB ASS SAL	Soil sample taken over depth indicated, for environmental analysis. Undisturbed 50mm diameter tube sample taken over depth indicated. Bulk disturbed sample taken over depth indicated. Small disturbed bag sample taken over depth indicated. Soil sample taken over depth indicated, for asbestos screening. Soil sample taken over depth indicated, for acid sulfate soil analysis. 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 show blows per 150mm penetration. 'R' as noted below.
	N_c = 5 7 3 R	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 PID = 100	Vane shear reading in kPa of Undrained Shear Strength. Photoionisation detector reading in ppm (Soil sample heads pace test).
Moisture (Cohesive Soils) (Cohesionless)	MC > PL MC ≈ PL MC < PL D M W	Moisture content estimated to be greater than plastic limit. Moisture content estimated to be approximately equal to plastic limit. Moisture content estimated to be less than plastic limit. DRY – Runs freely through fingers. MOIST – Does not run freely but no free water visible on soil surface. WET – Free water visible on soil surface.
Strength (Consistency) Cohesive Soils	VS S F St VSt H ( )	VERY SOFT – Unconfined compressive strength less than 25kPa SOFT – Unconfined compressive strength 25-5 0kPa FIRM – Unconfined compressive strength 50-1 00kPa STIFF – Unconfined compressive strength 100- 200kPa VERY STIFF – Unconfined compressive strength 200- 400kPa HARD – Unconfined compressive strength greater than 400kPa Bracketed symbol indicates estimated consistency based o n tactile examination or other tests.
Density Index/ Relative Density (Cohesionless Soils)	VL L MD D VD ( )	**Density Index (ID) Range (%)** / **SPT ' N' Value Range (Blows/300mm)** Very Loose <15 / 0-4 Loose 15-35 / 4-10 Medium Dense 35-65 / 10-30 Dense 65-85 / 30-50 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 'TC' bit T_{60}	Hardened steel 'V' shaped bit. Tungsten carbide wing bit. Penetration of auger string in mm under static load of rig applied by drill head hydraulics without rotation of augers.

LOG SYMBOLS CONTINUED

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 bedding. The test procedure is described by the International Journal of Rock Mechanics, Mining 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 150 mm 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 150 mm long x 50mm dia. can be broken by hand with difficulty. Readily scored with knife.
High:	H	3	A piece of core 150 mm 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 150 mm 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 150 mm long x 50mm dia. is very difficult to break with h and-held hammer . Rings when struck with a hammer.

ROCK STRENGTH

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

Appendix B: Laboratory Reports and Chain of Custody Documents

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 117547

Client:

Environmental Investigation Services
PO Box 976
North Ryde BC
NSW 1670

Attention: Para Bokalawela

Sample log in details:

Your Reference:	**E27813KG, Bonnyrigg**
No. of samples:	41 Soils, 1 Water, 9 Materials
Date samples received / completed instructions received	13/10/14 / 13/10/14

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:	20/10/14 / 20/10/14
Date of Preliminary Report:	Not Issued

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

Results Approved By:

Jacinta Hurst
Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	117547-1	117547-2	117547-3	117547-4	117547-5
Your Reference	----------	S2	S4	S6	S7	S9
Depth	----------	-	-	-	-	-
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil+M	Soil+M	Soil+M	Soil+M	Soil+M
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
TRHC$_6$ - C$_9$	mg/kg	<25	<25	<25	<25	<25
TRHC$_6$ - C$_{10}$	mg/kg	<25	<25	<25	<25	<25
vTPHC$_6$ - C$_{10}$ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	98	95	98	95	95

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	117547-6	117547-7	117547-8	117547-9	117547-10
Your Reference	----------	S10	S11	S12	S13	S15
Depth	----------	-	-	-	-	-
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil+M	Soil	Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
TRHC$_6$ - C$_9$	mg/kg	<25	<25	<25	<25	<25
TRHC$_6$ - C$_{10}$	mg/kg	<25	<25	<25	<25	<25
vTPHC$_6$ - C$_{10}$ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	99	99	97	101	98

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	117547-11	117547-12	117547-13	117547-14	117547-15
Your Reference	----------	BH1	BH2	BH2	BH3	BH3
Depth	----------	0.0-0.3	0.0-0.2	0.5-0.85	0.4-0.5	0.5-0.95
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
TRHC$_6$ - C$_9$	mg/kg	<25	<25	<25	<25	<25
TRHC$_6$ - C$_{10}$	mg/kg	<25	<25	<25	<25	<25
vTPHC$_6$ - C$_{10}$ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	102	103	100	98	97

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	117547-16	117547-17	117547-18	117547-19	117547-20
Your Reference	----------	BH4	BH5	BH5	BH5	BH6
Depth	----------	0.4-0..5	0.3-0.4	0.5-0.95	1.8-2.0	0.35-0.45
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
TRHC$_6$ - C$_9$	mg/kg	<25	<25	<25	<25	<25
TRHC$_6$ - C$_{10}$	mg/kg	<25	<25	<25	<25	<25
vTPHC$_6$ - C$_{10}$ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	101	102	102	107	101

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	117547-21	117547-22	117547-24	117547-25	117547-27
Your Reference	----------	BH7	BH8	BH8	BH9	BH10
Depth	----------	0.5-0.95	0.5-0.8	2.4-2.7	1.3-1.5	1.2-1.4
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	16/10/2014	16/10/2014	16/10/2014	16/10/2014	16/10/2014
TRHC$_6$ - C$_9$	mg/kg	<25	<25	<25	<25	<25
TRHC$_6$ - C$_{10}$	mg/kg	<25	<25	<25	<25	<25
vTPHC$_6$ - C$_{10}$ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	77	76	76	75	75

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	117547-28	117547-29	117547-30	117547-31	117547-32
Your Reference	----------	BH11	BH12	BH12	BH13	BH13
Depth	----------	0.3-0.5	0.31-0.5	1.5-1.8	0.25-0.4	1.3-1.5
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	16/10/2014	16/10/2014	16/10/2014	16/10/2014	16/10/2014
TRHC$_6$ - C$_9$	mg/kg	<25	<25	<25	<25	<25
TRHC$_6$ - C$_{10}$	mg/kg	<25	<25	<25	<25	<25
vTPHC$_6$ - C$_{10}$ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	72	74	76	73	78

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	117547-33	117547-34	117547-35	117547-36	117547-37
Your Reference	----------	BH14	BH14	BH15	BH16	BH17
Depth	----------	0.43-0.6	1.2-1.4	0.33-0.6	0.0-0.25	0.0-0.3
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil+M	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	16/10/2014	16/10/2014	16/10/2014	16/10/2014	16/10/2014
TRHC$_6$ - C$_9$	mg/kg	<25	<25	<25	<25	<25
TRHC$_6$ - C$_{10}$	mg/kg	<25	<25	<25	<25	<25
vTPHC$_6$ - C$_{10}$ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	77	78	76	74	76

vTRH(C6-C10)/BTEXN in Soil					
Our Reference:	UNITS	117547-38	117547-39	117547-40	117547-41
Your Reference	----------	DupSP1	DupGF1	DupGF2	TB
Depth	----------	-	-	-	-
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	16/10/2014	16/10/2014	16/10/2014	16/10/2014
TRHC$_6$ - C$_9$	mg/kg	<25	<25	<25	[NA]
TRHC$_6$ - C$_{10}$	mg/kg	<25	<25	<25	[NA]
vTPHC$_6$ - C$_{10}$ less BTEX (F1)	mg/kg	<25	<25	<25	[NA]
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	[NA]
Surrogate aaa-Trifluorotoluene	%	76	77	75	78

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	117547-1	117547-2	117547-3	117547-4	117547-5
Your Reference	----------	S2	S4	S6	S7	S9
Depth	----------	-	-	-	-	-
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil+M	Soil+M	Soil+M	Soil+M	Soil+M
Date extracted	-	14/10/2014	14/10/2014	16/10/2014	14/10/2014	14/10/2014
Date analysed	-	14/10/2014	14/10/2014	17/10/2014	17/10/2014	14/10/2014
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	110	210	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	160	<100	<100	<100
TRH>C$_{10}$-C$_{16}$	mg/kg	61	<50	<50	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	61	<50	<50	<50	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	310	<100	<100	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	110	<100	<100	<100
Surrogate o-Terphenyl	%	88	112	97	84	97

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	117547-6	117547-7	117547-8	117547-9	117547-10
Your Reference	----------	S10	S11	S12	S13	S15
Depth	----------	-	-	-	-	-
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil+M	Soil	Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	140
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100	320
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	<100	<100	<100	370
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100	<100	390
Surrogate o-Terphenyl	%	91	99	99	92	91

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	117547-11	117547-12	117547-13	117547-14	117547-15
Your Reference	----------	BH1	BH2	BH2	BH3	BH3
Depth	----------	0.0-0.3	0.0-0.2	0.5-0.85	0.4-0.5	0.5-0.95
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	190	190	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	700	480	<100	<100
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	660	530	<100	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	870	550	<100	<100
Surrogate o-Terphenyl	%	93	99	95	91	92

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	117547-16	117547-17	117547-18	117547-19	117547-20
Your Reference	----------	BH4	BH5	BH5	BH5	BH6
Depth	----------	0.4-0..5	0.3-0.4	0.5-0.95	1.8-2.0	0.35-0.45
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
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
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	<100	<100	<100	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	94	103	85	91	90

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	117547-21	117547-22	117547-24	117547-25	117547-27
Your Reference	----------	BH7	BH8	BH8	BH9	BH10
Depth	----------	0.5-0.95	0.5-0.8	2.4-2.7	1.3-1.5	1.2-1.4
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	170	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	930	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100	<100
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50	500	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50	500	<50	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	<100	650	<100	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	85	93	131	99	88

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	117547-28	117547-29	117547-30	117547-31	117547-32
Your Reference	----------	BH11	BH12	BH12	BH13	BH13
Depth	----------	0.3-0.5	0.31-0.5	1.5-1.8	0.25-0.4	1.3-1.5
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	700	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	370	<100	<100
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50	150	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50	150	<50	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	<100	920	<100	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	140	<100	<100
Surrogate o-Terphenyl	%	94	94	108	84	91

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	117547-33	117547-34	117547-35	117547-36	117547-37
Your Reference	----------	BH14	BH14	BH15	BH16	BH17
Depth	----------	0.43-0.6	1.2-1.4	0.33-0.6	0.0-0.25	0.0-0.3
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil+M	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	58	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	240	<100	160	140
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	110	<100	260	370
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	130	<50	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	130	<50	<50	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	240	<100	340	390
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100	350	480
Surrogate o-Terphenyl	%	83	96	102	111	85

svTRH (C10-C40) in Soil				
Our Reference:	UNITS	117547-38	117547-39	117547-40
Your Reference	----------	DupSP1	DupGF1	DupGF2
Depth	----------	-	-	-
Date Sampled		10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014
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	120
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	<100	110
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	150
Surrogate o-Terphenyl	%	84	85	92

PAHs in Soil						
Our Reference:	UNITS	117547-1	117547-2	117547-3	117547-4	117547-5
Your Reference	----------	S2	S4	S6	S7	S9
Depth	----------	-	-	-	-	-
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil+M	Soil+M	Soil+M	Soil+M	Soil+M
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	0.3	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	0.1	0.3	0.1	<0.1
Pyrene	mg/kg	<0.1	0.1	0.3	0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	0.07	0.13	0.06	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ NEPM B1	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total Positive PAHs	mg/kg	NIL (+)VE	0.27	1.2	0.42	NIL (+)VE
Surrogate p-Terphenyl-d14	%	87	101	102	96	94

PAHs in Soil						
Our Reference:	UNITS	117547-6	117547-7	117547-8	117547-9	117547-10
Your Reference	----------	S10	S11	S12	S13	S15
Depth	----------	-	-	-	-	-
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil+M	Soil	Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	0.3
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	0.24
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
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	0.2
Benzo(a)pyrene TEQ NEPM B1	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total Positive PAHs	mg/kg	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE	1.9
Surrogate p-Terphenyl-d14	%	99	101	98	97	99

PAHs in Soil						
Our Reference:	UNITS	117547-11	117547-12	117547-13	117547-14	117547-15
Your Reference	----------	BH1	BH2	BH2	BH3	BH3
Depth	----------	0.0-0.3	0.0-0.2	0.5-0.85	0.4-0.5	0.5-0.95
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	16/10/2014	16/10/2014	16/10/2014	16/10/2014
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	0.1	0.6	0.1	0.1
Anthracene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	0.2	1.5	0.2	0.3
Pyrene	mg/kg	<0.1	0.2	1.5	0.2	0.3
Benzo(a)anthracene	mg/kg	<0.1	<0.1	0.7	0.1	0.2
Chrysene	mg/kg	<0.1	0.1	0.7	0.1	0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	0.3	1.4	<0.2	0.2
Benzo(a)pyrene	mg/kg	<0.05	0.19	0.89	0.1	0.13
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.1	0.7	<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	0.3	0.6	<0.1	<0.1
Benzo(a)pyrene TEQ NEPM B1	mg/kg	<0.5	<0.5	1.2	<0.5	<0.5
Total Positive PAHs	mg/kg	NIL (+)VE	1.5	8.7	0.78	1.4
Surrogate p-Terphenyl-d14	%	97	88	101	104	105

PAHs in Soil						
Our Reference:	UNITS	117547-16	117547-17	117547-18	117547-19	117547-20
Your Reference	----------	BH4	BH5	BH5	BH5	BH6
Depth	----------	0.4-0..5	0.3-0.4	0.5-0.95	1.8-2.0	0.35-0.45
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	16/10/2014	16/10/2014	16/10/2014	16/10/2014	16/10/2014
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.07	0.06	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ NEPM B1	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total Positive PAHs	mg/kg	0.29	0.060	NIL (+)VE	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	103	102	103	99	98

PAHs in Soil						
Our Reference:	UNITS	117547-21	117547-22	117547-24	117547-25	117547-27
Your Reference	----------	BH7	BH8	BH8	BH9	BH10
Depth	----------	0.5-0.95	0.5-0.8	2.4-2.7	1.3-1.5	1.2-1.4
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	16/10/2014	16/10/2014	16/10/2014	16/10/2014	16/10/2014
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	0.4	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	0.3	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	0.2	0.3	<0.1
Anthracene	mg/kg	<0.1	<0.1	0.2	0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	0.2	0.7	<0.1
Pyrene	mg/kg	<0.1	<0.1	0.2	0.6	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	0.1	0.3	<0.1
Chrysene	mg/kg	<0.1	<0.1	0.1	0.3	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	0.4	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	0.06	0.23	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ NEPM B1	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total Positive PAHs	mg/kg	NIL (+)VE	NIL (+)VE	1.8	3.0	NIL (+)VE
Surrogate p-Terphenyl-d14	%	99	107	94	104	99

PAHs in Soil						
Our Reference:	UNITS	117547-28	117547-29	117547-30	117547-31	117547-32
Your Reference	----------	BH11	BH12	BH12	BH13	BH13
Depth	----------	0.3-0.5	0.31-0.5	1.5-1.8	0.25-0.4	1.3-1.5
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	16/10/2014	16/10/2014	16/10/2014	16/10/2014	16/10/2014
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	0.1	0.2	<0.1	0.1
Pyrene	mg/kg	<0.1	0.1	0.3	<0.1	0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	0.06	0.13	<0.05	0.09
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Benzo(a)pyrene TEQ NEPM B1	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total Positive PAHs	mg/kg	NIL (+)VE	0.29	1.7	NIL (+)VE	0.39
Surrogate p-Terphenyl-d14	%	101	98	106	102	105

PAHs in Soil						
Our Reference:	UNITS	117547-33	117547-34	117547-35	117547-36	117547-37
Your Reference	----------	BH14	BH14	BH15	BH16	BH17
Depth	----------	0.43-0.6	1.2-1.4	0.33-0.6	0.0-0.25	0.0-0.3
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil+M	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	16/10/2014	16/10/2014	16/10/2014	16/10/2014	16/10/2014
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	0.1	0.1	<0.1	1.3
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.3
Fluoranthene	mg/kg	0.2	<0.1	0.1	<0.1	4.6
Pyrene	mg/kg	0.2	<0.1	0.2	<0.1	4.5
Benzo(a)anthracene	mg/kg	0.1	<0.1	0.1	<0.1	2.4
Chrysene	mg/kg	0.1	<0.1	0.1	<0.1	2.2
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	0.2	<0.2	6.4
Benzo(a)pyrene	mg/kg	0.1	<0.05	0.1	0.06	4.4
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	<0.1	0.1	<0.1	4.4
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.4
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	0.1	<0.1	3.4
Benzo(a)pyrene TEQ NEPM B1	mg/kg	<0.5	<0.5	<0.5	<0.5	6.1
Total Positive PAHs	mg/kg	0.87	0.11	1.2	0.060	34
Surrogate p-Terphenyl-d14	%	97	102	102	109	94

PAHs in Soil				
Our Reference:	UNITS	117547-38	117547-39	117547-40
Your Reference	----------	DupSP1	DupGF1	DupGF2
Depth	----------	-	-	-
Date Sampled		10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	16/10/2014	16/10/2014	16/10/2014
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	0.4
Anthracene	mg/kg	<0.1	<0.1	0.1
Fluoranthene	mg/kg	<0.1	<0.1	0.5
Pyrene	mg/kg	<0.1	0.1	0.5
Benzo(a)anthracene	mg/kg	<0.1	<0.1	0.2
Chrysene	mg/kg	<0.1	<0.1	0.2
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	0.3
Benzo(a)pyrene	mg/kg	<0.05	0.07	0.18
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
Benzo(a)pyrene TEQ NEPM B1	mg/kg	<0.5	<0.5	<0.5
Total Positive PAHs	mg/kg	NIL (+)VE	0.18	2.6
Surrogate p-Terphenyl-d14	%	109	103	100

Organochlorine Pesticides in soil						
Our Reference:	UNITS	117547-1	117547-2	117547-3	117547-4	117547-5
Your Reference	----------	S2	S4	S6	S7	S9
Depth	----------	-	-	-	-	-
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil+M	Soil+M	Soil+M	Soil+M	Soil+M
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
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 TCMX	%	85	92	94	89	102

Organochlorine Pesticides in soil						
Our Reference:	UNITS	117547-6	117547-7	117547-8	117547-9	117547-10
Your Reference	----------	S10	S11	S12	S13	S15
Depth	----------	-	-	-	-	-
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil+M	Soil	Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
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 TCMX	%	95	95	95	95	96

Organochlorine Pesticides in soil						
Our Reference:	UNITS	117547-11	117547-12	117547-15	117547-18	117547-19
Your Reference	----------	BH1	BH2	BH3	BH5	BH5
Depth	----------	0.0-0.3	0.0-0.2	0.5-0.95	0.5-0.95	1.8-2.0
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
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 TCMX	%	95	103	104	92	100

Organochlorine Pesticides in soil						
Our Reference:	UNITS	117547-20	117547-21	117547-24	117547-25	117547-27
Your Reference	----------	BH6	BH7	BH8	BH9	BH10
Depth	----------	0.35-0.45	0.5-0.95	2.4-2.7	1.3-1.5	1.2-1.4
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
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	0.2	<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 TCMX	%	99	120	120	101	97

Organochlorine Pesticides in soil						
Our Reference:	UNITS	117547-28	117547-29	117547-32	117547-33	117547-35
Your Reference	----------	BH11	BH12	BH13	BH14	BH15
Depth	----------	0.3-0.5	0.31-0.5	1.3-1.5	0.43-0.6	0.33-0.6
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
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	0.2	<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 TCMX	%	96	119	110	105	100

Organochlorine Pesticides in soil				
Our Reference:	UNITS	117547-36	117547-37	117547-38
Your Reference	----------	BH16	BH17	DupSP1
Depth	----------	0.0-0.25	0.0-0.3	-
Date Sampled		10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil+M	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014
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 TCMX	%	94	84	93

Organophosphorus Pesticides						
Our Reference:	UNITS	117547-1	117547-2	117547-3	117547-4	117547-5
Your Reference	----------	S2	S4	S6	S7	S9
Depth	----------	-	-	-	-	-
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil+M	Soil+M	Soil+M	Soil+M	Soil+M
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
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 TCMX	%	85	92	94	89	102

Organophosphorus Pesticides						
Our Reference:	UNITS	117547-6	117547-7	117547-8	117547-9	117547-10
Your Reference	----------	S10	S11	S12	S13	S15
Depth	----------	-	-	-	-	-
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil+M	Soil	Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
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 TCMX	%	95	95	95	95	96

Organophosphorus Pesticides						
Our Reference:	UNITS	117547-11	117547-12	117547-15	117547-18	117547-19
Your Reference	----------	BH1	BH2	BH3	BH5	BH5
Depth	----------	0.0-0.3	0.0-0.2	0.5-0.95	0.5-0.95	1.8-2.0
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
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 TCMX	%	95	103	104	92	100

Organophosphorus Pesticides						
Our Reference:	UNITS	117547-20	117547-21	117547-24	117547-25	117547-27
Your Reference	----------	BH6	BH7	BH8	BH9	BH10
Depth	----------	0.35-0.45	0.5-0.95	2.4-2.7	1.3-1.5	1.2-1.4
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
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 TCMX	%	99	120	120	101	97

Organophosphorus Pesticides						
Our Reference:	UNITS	117547-28	117547-29	117547-32	117547-33	117547-35
Your Reference	----------	BH11	BH12	BH13	BH14	BH15
Depth	----------	0.3-0.5	0.31-0.5	1.3-1.5	0.43-0.6	0.33-0.6
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
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 TCMX	%	96	119	110	105	100

Organophosphorus Pesticides				
Our Reference:	UNITS	117547-36	117547-37	117547-38
Your Reference	----------	BH16	BH17	DupSP1
Depth	----------	0.0-0.25	0.0-0.3	-
Date Sampled		10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil+M	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014
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 TCMX	%	94	84	93

PCBs in Soil						
Our Reference:	UNITS	117547-1	117547-2	117547-3	117547-4	117547-5
Your Reference	----------	S2	S4	S6	S7	S9
Depth	----------	-	-	-	-	-
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil+M	Soil+M	Soil+M	Soil+M	Soil+M
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
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	%	85	92	94	89	102

PCBs in Soil						
Our Reference:	UNITS	117547-6	117547-7	117547-8	117547-9	117547-10
Your Reference	----------	S10	S11	S12	S13	S15
Depth	----------	-	-	-	-	-
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil+M	Soil	Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
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	%	95	95	95	95	96

PCBs in Soil						
Our Reference:	UNITS	117547-11	117547-12	117547-15	117547-18	117547-19
Your Reference	----------	BH1	BH2	BH3	BH5	BH5
Depth	----------	0.0-0.3	0.0-0.2	0.5-0.95	0.5-0.95	1.8-2.0
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
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	%	95	103	104	92	100

PCBs in Soil						
Our Reference:	UNITS	117547-20	117547-21	117547-24	117547-25	117547-27
Your Reference	----------	BH6	BH7	BH8	BH9	BH10
Depth	----------	0.35-0.45	0.5-0.95	2.4-2.7	1.3-1.5	1.2-1.4
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
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	120	120	101	97

PCBs in Soil						
Our Reference:	UNITS	117547-28	117547-29	117547-32	117547-33	117547-35
Your Reference	----------	BH11	BH12	BH13	BH14	BH15
Depth	----------	0.3-0.5	0.31-0.5	1.3-1.5	0.43-0.6	0.33-0.6
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
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	119	110	105	100

PCBs in Soil				
Our Reference:	UNITS	117547-36	117547-37	117547-38
Your Reference	----------	BH16	BH17	DupSP1
Depth	----------	0.0-0.25	0.0-0.3	-
Date Sampled		10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil+M	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014
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	%	94	84	93

Acid Extractable metals in soil						
Our Reference:	UNITS	117547-1	117547-2	117547-3	117547-4	117547-5
Your Reference	----------	S2	S4	S6	S7	S9
Depth	----------	-	-	-	-	-
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil+M	Soil+M	Soil+M	Soil+M	Soil+M
Date digested	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Arsenic	mg/kg	5	5	6	5	7
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	16	13	18	14	15
Copper	mg/kg	21	20	30	20	20
Lead	mg/kg	18	28	31	24	23
Mercury	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	10	8	12	12	7
Zinc	mg/kg	40	190	85	51	38

Acid Extractable metals in soil						
Our Reference:	UNITS	117547-6	117547-7	117547-8	117547-9	117547-10
Your Reference	----------	S10	S11	S12	S13	S15
Depth	----------	-	-	-	-	-
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil+M	Soil	Soil	Soil	Soil
Date digested	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Arsenic	mg/kg	5	7	5	7	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	19	15	22	20	16
Copper	mg/kg	21	29	27	27	25
Lead	mg/kg	29	19	20	30	18
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	10	10	23	12	19
Zinc	mg/kg	97	39	76	85	68

Acid Extractable metals in soil						
Our Reference:	UNITS	117547-11	117547-12	117547-13	117547-14	117547-15
Your Reference	----------	BH1	BH2	BH2	BH3	BH3
Depth	----------	0.0-0.3	0.0-0.2	0.5-0.85	0.4-0.5	0.5-0.95
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Arsenic	mg/kg	8	<4	6	5	6
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	16	8	18	16	10
Copper	mg/kg	23	45	34	33	19
Lead	mg/kg	31	14	29	32	15
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	10	8	11	11	11
Zinc	mg/kg	57	42	65	100	44

Acid Extractable metals in soil						
Our Reference:	UNITS	117547-16	117547-17	117547-18	117547-19	117547-20
Your Reference	----------	BH4	BH5	BH5	BH5	BH6
Depth	----------	0.4-0..5	0.3-0.4	0.5-0.95	1.8-2.0	0.35-0.45
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Arsenic	mg/kg	4	6	5	7	6
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	15	13	12	16	14
Copper	mg/kg	29	22	19	27	43
Lead	mg/kg	16	21	13	20	19
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	8	11	6	14	11
Zinc	mg/kg	38	49	31	55	51

Acid Extractable metals in soil						
Our Reference:	UNITS	117547-21	117547-22	117547-24	117547-25	117547-27
Your Reference	----------	BH7	BH8	BH8	BH9	BH10
Depth	----------	0.5-0.95	0.5-0.8	2.4-2.7	1.3-1.5	1.2-1.4
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Arsenic	mg/kg	7	8	<4	7	8
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	20	17	15	17	17
Copper	mg/kg	21	20	22	22	24
Lead	mg/kg	23	16	16	17	21
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	8	12	13	10	13
Zinc	mg/kg	34	35	59	40	42

Acid Extractable metals in soil						
Our Reference:	UNITS	117547-28	117547-29	117547-30	117547-31	117547-32
Your Reference	----------	BH11	BH12	BH12	BH13	BH13
Depth	----------	0.3-0.5	0.31-0.5	1.5-1.8	0.25-0.4	1.3-1.5
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Arsenic	mg/kg	8	4	5	<4	8
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	16	11	16	5	18
Copper	mg/kg	28	21	29	2	29
Lead	mg/kg	19	16	32	12	35
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	13	10	11	<1	10
Zinc	mg/kg	47	60	98	4	65

Acid Extractable metals in soil						
Our Reference:	UNITS	117547-33	117547-34	117547-35	117547-36	117547-37
Your Reference	----------	BH14	BH14	BH15	BH16	BH17
Depth	----------	0.43-0.6	1.2-1.4	0.33-0.6	0.0-0.25	0.0-0.3
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil+M	Soil
Date digested	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Arsenic	mg/kg	4	6	6	6	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	15	16	20	16	13
Copper	mg/kg	28	25	33	22	36
Lead	mg/kg	17	22	28	22	18
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	12	12	15	8	18
Zinc	mg/kg	45	65	68	31	34

Acid Extractable metals in soil				
Our Reference:	UNITS	117547-38	117547-39	117547-40
Your Reference	----------	DupSP1	DupGF1	DupGF2
Depth	----------	-	-	-
Date Sampled		10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil
Date digested	-	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	14/10/2014	14/10/2014	14/10/2014
Arsenic	mg/kg	6	8	5
Cadmium	mg/kg	<0.4	<0.4	<0.4
Chromium	mg/kg	18	19	12
Copper	mg/kg	21	22	24
Lead	mg/kg	24	16	19
Mercury	mg/kg	<0.1	<0.1	<0.1
Nickel	mg/kg	8	13	12
Zinc	mg/kg	54	38	50

Moisture						
Our Reference:	UNITS	117547-1	117547-2	117547-3	117547-4	117547-5
Your Reference	----------	S2	S4	S6	S7	S9
Depth	----------	-	-	-	-	-
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil+M	Soil+M	Soil+M	Soil+M	Soil+M
Date prepared	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
Moisture	%	14	8.1	13	10	14

Moisture						
Our Reference:	UNITS	117547-6	117547-7	117547-8	117547-9	117547-10
Your Reference	----------	S10	S11	S12	S13	S15
Depth	----------	-	-	-	-	-
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil+M	Soil	Soil	Soil	Soil
Date prepared	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
Moisture	%	14	11	12	12	9.6

Moisture						
Our Reference:	UNITS	117547-11	117547-12	117547-13	117547-14	117547-15
Your Reference	----------	BH1	BH2	BH2	BH3	BH3
Depth	----------	0.0-0.3	0.0-0.2	0.5-0.85	0.4-0.5	0.5-0.95
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
Moisture	%	11	1.8	9.0	18	18

Moisture						
Our Reference:	UNITS	117547-16	117547-17	117547-18	117547-19	117547-20
Your Reference	----------	BH4	BH5	BH5	BH5	BH6
Depth	----------	0.4-0..5	0.3-0.4	0.5-0.95	1.8-2.0	0.35-0.45
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
Moisture	%	19	18	14	19	17

Moisture						
Our Reference:	UNITS	117547-21	117547-22	117547-24	117547-25	117547-27
Your Reference	----------	BH7	BH8	BH8	BH9	BH10
Depth	----------	0.5-0.95	0.5-0.8	2.4-2.7	1.3-1.5	1.2-1.4
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
Moisture	%	16	15	17	19	16

Moisture						
Our Reference:	UNITS	117547-28	117547-29	117547-30	117547-31	117547-32
Your Reference	----------	BH11	BH12	BH12	BH13	BH13
Depth	----------	0.3-0.5	0.31-0.5	1.5-1.8	0.25-0.4	1.3-1.5
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
Moisture	%	16	13	17	11	15

Moisture						
Our Reference:	UNITS	117547-33	117547-34	117547-35	117547-36	117547-37
Your Reference	----------	BH14	BH14	BH15	BH16	BH17
Depth	----------	0.43-0.6	1.2-1.4	0.33-0.6	0.0-0.25	0.0-0.3
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil+M	Soil
Date prepared	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
Moisture	%	16	18	14	9.2	3.1

Moisture				
Our Reference:	UNITS	117547-38	117547-39	117547-40
Your Reference	----------	DupSP1	DupGF1	DupGF2
Depth	----------	-	-	-
Date Sampled		10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil
Date prepared	-	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014
Moisture	%	13	16	13

Asbestos ID - soils						
Our Reference:	UNITS	117547-7	117547-8	117547-9	117547-10	117547-11
Your Reference	----------	S11	S12	S13	S15	BH1
Depth	----------	-	-	-	-	0.0-0.3
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	17/10/2014	17/10/2014	17/10/2014	17/10/2014	17/10/2014
Sample mass tested	g	Approx 70g	Approx 60g	Approx 60g	Approx 60g	Approx 50g
Sample Description	-	Brown fine grain soil & rocks	Brown fine grain soil & rocks	Brown fine grain soil & rocks	Brown fine grain soil & rocks	Brown fine grain soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils						
Our Reference:	UNITS	117547-12	117547-15	117547-18	117547-19	117547-20
Your Reference	----------	BH2	BH3	BH5	BH5	BH6
Depth	----------	0.0-0.2	0.5-0.95	0.5-0.95	1.8-2.0	0.35-0.45
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	17/10/2014	17/10/2014	17/10/2014	17/10/2014	17/10/2014
Sample mass tested	g	Approx 50g	Approx 70g	Approx 70g	Approx 60g	Approx 35g
Sample Description	-	Brown fine grain soil & rocks	Brown fine grain soil & rocks	Brown fine grain soil & rocks	Brown fine grain soil & rocks	Brown fine grain soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils						
Our Reference:	UNITS	117547-21	117547-27	117547-28	117547-29	117547-32
Your Reference	----------	BH7	BH10	BH11	BH12	BH13
Depth	----------	0.5-0.95	1.2-1.4	0.3-0.5	0.31-0.5	1.3-1.5
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	17/10/2014	17/10/2014	17/10/2014	17/10/2014	17/10/2014
Sample mass tested	g	Approx 60g	Approx 60g	Approx 50g	Approx 60g	Approx 50g
Sample Description	-	Brown fine grain soil & rocks	Brown fine grain soil & rocks	Brown fine grain soil & rocks	Brown fine grain soil & rocks	Brown fine grain soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils				
Our Reference:	UNITS	117547-33	117547-35	117547-37
Your Reference	----------	BH14	BH15	BH17
Depth	----------	0.43-0.6	0.33-0.6	0.0-0.3
Date Sampled		10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil
Date analysed	-	17/10/2014	17/10/2014	17/10/2014
Sample mass tested	g	Approx 70g	Approx 60g	Approx 75g
Sample Description	-	Brown fine grain soil & rocks	Brown fine grain soil & rocks	Brown fine grain soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - materials						
Our Reference:	UNITS	117547-1	117547-2	117547-3	117547-4	117547-5
Your Reference	----------	S2	S4	S6	S7	S9
Depth	----------	-	-	-	-	-
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil+M	Soil+M	Soil+M	Soil+M	Soil+M
Date analysed	-	16/10/2014	16/10/2014	16/10/2014	16/10/2014	16/10/2014
Mass / Dimension of Sample	-	65x32x6mm	65x36x5mm	136x60x5mm	62x50x10mm	45x41x5mm
Sample Description	-	Grey compressed fibre cement material	Grey compressed fibre cement material	Grey compressed fibre cement material	Beige compressed fibre cement material	Beige compressed fibre cement material
Asbestos ID in materials	-	Chrysotile asbestos detected	Chrysotile asbestos detected Amosite asbestos detected	Chrysotile asbestos detected	Chrysotile asbestos detected Amosite asbestos detected	Chrysotile asbestos detected

Asbestos ID - materials					
Our Reference:	UNITS	117547-6	117547-23	117547-26	117547-36
Your Reference	----------	S10	BH8	BH9	BH16
Depth	----------	-	1.9-2.0	2.5-2.8	0.0-0.25
Date Sampled		10/10/2014	10/10/2014	10/10/2014	10/10/2014
Type of sample		Soil+M	Soil+M	Soil+M	Soil+M
Date analysed	-	16/10/2014	16/10/2014	16/10/2014	16/10/2014
Mass / Dimension of Sample	-	45x40x6mm	36x31x4mm	20x20x5mm	80x63x5mm
Sample Description	-	Grey compressed fibre cement material	Grey compressed fibre cement material	Brown compressed fibre cement material	Beige compressed fibre cement material
Asbestos ID in materials	-	Chrysotile asbestos detected Amosite asbestos detected Crocidolite asbestos detected	Chrysotile asbestos detected Amosite asbestos detected Crocidolite asbestos detected	Chrysotile asbestos detected	Chrysotile asbestos detected

BTEX in Water		
Our Reference:	UNITS	117547-42
Your Reference	----------	FR
Depth	----------	-
Date Sampled		10/10/2014
Type of sample		Rinsate
Date extracted	-	14/10/2014
Date analysed	-	14/10/2014
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Surrogate Dibromofluoromethane	%	93
Surrogate toluene-d8	%	101
Surrogate 4-BFB	%	101

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. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
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+/-5 deg C for a minimum of 12 hours.
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			14/10/2014	117547-1	14/10/2014 || 14/10/2014	LCS-4	14/10/2014
Date analysed	-			16/10/2014	117547-1	15/10/2014 || 15/10/2014	LCS-4	15/10/2014
TRHC$_6$ - C$_9$	mg/kg	25	Org-016	<25	117547-1	<25 || <25	LCS-4	110%
TRHC$_6$ - C$_{10}$	mg/kg	25	Org-016	<25	117547-1	<25 || <25	LCS-4	110%
Benzene	mg/kg	0.2	Org-016	<0.2	117547-1	<0.2 || <0.2	LCS-4	99%
Toluene	mg/kg	0.5	Org-016	<0.5	117547-1	<0.5 || <0.5	LCS-4	107%
Ethylbenzene	mg/kg	1	Org-016	<1	117547-1	<1 || <1	LCS-4	110%
m+p-xylene	mg/kg	2	Org-016	<2	117547-1	<2 || <2	LCS-4	117%
o-Xylene	mg/kg	1	Org-016	<1	117547-1	<1 || <1	LCS-4	114%
naphthalene	mg/kg	1	Org-014	<1	117547-1	<1 || <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	83	117547-1	98 || 105 || RPD: 7	LCS-4	100%

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			14/10/2014	117547-1	14/10/2014 || 14/10/2014	LCS-4	14/10/2014
Date analysed	-			14/10/2014	117547-1	14/10/2014 || 14/10/2014	LCS-4	14/10/2014
TRHC$_{10}$ - C$_{14}$	mg/kg	50	Org-003	<50	117547-1	<50 || 70	LCS-4	133%
TRHC$_{15}$ - C$_{28}$	mg/kg	100	Org-003	<100	117547-1	110 || 650 || RPD: 142	LCS-4	135%
TRHC$_{29}$ - C$_{36}$	mg/kg	100	Org-003	<100	117547-1	<100 || <100	LCS-4	111%
TRH>C$_{10}$-C$_{16}$	mg/kg	50	Org-003	<50	117547-1	61 || 260 || RPD: 124	LCS-4	133%
TRH>C$_{16}$-C$_{34}$	mg/kg	100	Org-003	<100	117547-1	<100 || 540	LCS-4	135%
TRH>C$_{34}$-C$_{40}$	mg/kg	100	Org-003	<100	117547-1	<100 || <100	LCS-4	111%
Surrogate o-Terphenyl	%		Org-003	88	117547-1	88 || 140 || RPD: 46	LCS-4	114%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			14/10/2014	117547-1	14/10/2014 || 14/10/2014	LCS-4	14/10/2014
Date analysed	-			14/10/2014	117547-1	15/10/2014 || 15/10/2014	LCS-4	15/10/2014
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	117547-1	<0.1 || <0.1	LCS-4	93%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	117547-1	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	117547-1	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	117547-1	<0.1 || <0.1	LCS-4	93%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	117547-1	<0.1 || <0.1	LCS-4	91%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	117547-1	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	117547-1	<0.1 || <0.1	LCS-4	90%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	117547-1	<0.1 || <0.1	LCS-4	91%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	117547-1	<0.1 || <0.1	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	117547-1	<0.1 || <0.1	LCS-4	85%
Benzo(b,j+k) fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	117547-1	<0.2 || <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	117547-1	<0.05 || <0.05	LCS-4	110%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	117547-1	<0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	117547-1	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	117547-1	<0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	113	117547-1	87 || 93 || RPD: 7	LCS-4	98%
QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			14/10/2014	117547-1	14/10/2014 || 14/10/2014	LCS-4	14/10/2014
Date analysed	-			15/10/2014	117547-1	15/10/2014 || 15/10/2014	LCS-4	15/10/2014
HCB	mg/kg	0.1	Org-005	<0.1	117547-1	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	117547-1	<0.1 || <0.1	LCS-4	88%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	117547-1	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	117547-1	<0.1 || <0.1	LCS-4	83%
Heptachlor	mg/kg	0.1	Org-005	<0.1	117547-1	<0.1 || <0.1	LCS-4	91%
delta-BHC	mg/kg	0.1	Org-005	<0.1	117547-1	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	117547-1	<0.1 || <0.1	LCS-4	94%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	117547-1	<0.1 || <0.1	LCS-4	90%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	117547-1	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	117547-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	117547-1	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	117547-1	<0.1 || <0.1	LCS-4	81%
Dieldrin	mg/kg	0.1	Org-005	<0.1	117547-1	<0.1 || <0.1	LCS-4	91%
Endrin	mg/kg	0.1	Org-005	<0.1	117547-1	<0.1 || <0.1	LCS-4	90%
pp-DDD	mg/kg	0.1	Org-005	<0.1	117547-1	<0.1 || <0.1	LCS-4	90%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	117547-1	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	117547-1	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	117547-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	117547-1	<0.1 || <0.1	LCS-4	94%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	117547-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCMX	%		Org-005	92	117547-1	85 || 87 || RPD: 2	LCS-4	85%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			14/10/2014	117547-1	14/10/2014 || 14/10/2014	LCS-4	14/10/2014
Date analysed	-			15/10/2014	117547-1	15/10/2014 || 15/10/2014	LCS-4	15/10/2014
Diazinon	mg/kg	0.1	Org-008	<0.1	117547-1	<0.1 || <0.1	[NR]	[NR]
Dimethoate	mg/kg	0.1	Org-008	<0.1	117547-1	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	117547-1	<0.1 || <0.1	[NR]	[NR]
Ronnel	mg/kg	0.1	Org-008	<0.1	117547-1	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	117547-1	<0.1 || <0.1	LCS-4	84%
Fenitrothion	mg/kg	0.1	Org-008	<0.1	117547-1	<0.1 || <0.1	LCS-4	83%
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	117547-1	<0.1 || <0.1	[NR]	[NR]
Ethion	mg/kg	0.1	Org-008	<0.1	117547-1	<0.1 || <0.1	LCS-4	88%
Surrogate TCMX	%		Org-008	92	117547-1	85 || 87 || RPD: 2	LCS-4	97%
QUALITY CONTROL PCBs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			14/10/2014	117547-1	14/10/2014 || 14/10/2014	LCS-4	14/10/2014
Date analysed	-			15/10/2014	117547-1	15/10/2014 || 15/10/2014	LCS-4	15/10/2014
Arochlor 1016	mg/kg	0.1	Org-006	<0.1	117547-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1221	mg/kg	0.1	Org-006	<0.1	117547-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1232	mg/kg	0.1	Org-006	<0.1	117547-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1242	mg/kg	0.1	Org-006	<0.1	117547-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1248	mg/kg	0.1	Org-006	<0.1	117547-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1254	mg/kg	0.1	Org-006	<0.1	117547-1	<0.1 || <0.1	LCS-4	124%
Arochlor 1260	mg/kg	0.1	Org-006	<0.1	117547-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%		Org-006	92	117547-1	85 || 87 || RPD: 2	LCS-4	100%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date digested	-			14/10/2014	117547-1	14/10/2014 || 14/10/2014	LCS-2	14/10/2014
Date analysed	-			14/10/2014	117547-1	14/10/2014 || 14/10/2014	LCS-2	14/10/2014
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	117547-1	5 || 5 || RPD: 0	LCS-2	89%
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	117547-1	<0.4 || <0.4	LCS-2	90%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	117547-1	16 || 17 || RPD: 6	LCS-2	93%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	117547-1	21 || 21 || RPD: 0	LCS-2	94%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	117547-1	18 || 19 || RPD: 5	LCS-2	90%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	117547-1	0.1 || <0.1	LCS-2	103%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	117547-1	10 || 11 || RPD: 10	LCS-2	92%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	117547-1	40 || 44 || RPD: 10	LCS-2	91%
QUALITY CONTROL BTEX in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			14/10/2014	[NT]	[NT]	LCS-W1	14/10/2014
Date analysed	-			14/10/2014	[NT]	[NT]	LCS-W1	14/10/2014
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	101%
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	96%
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	99%
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	LCS-W1	106%
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	105%
Surrogate Dibromofluoromethane	%		Org-016	106	[NT]	[NT]	LCS-W1	101%
Surrogate toluene-d8	%		Org-016	95	[NT]	[NT]	LCS-W1	97%
Surrogate 4-BFB	%		Org-016	94	[NT]	[NT]	LCS-W1	106%

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117547-11	14/10/2014 || 14/10/2014	LCS-5	14/10/2014
Date analysed	-	117547-11	15/10/2014 || 15/10/2014	LCS-5	16/10/2014
$TRHC_6 - C_9$	mg/kg	117547-11	<25 || <25	LCS-5	101%
$TRHC_6 - C_{10}$	mg/kg	117547-11	<25 || <25	LCS-5	101%
Benzene	mg/kg	117547-11	<0.2 || <0.2	LCS-5	93%
Toluene	mg/kg	117547-11	<0.5 || <0.5	LCS-5	82%
Ethylbenzene	mg/kg	117547-11	<1 || <1	LCS-5	110%
m+p-xylene	mg/kg	117547-11	<2 || <2	LCS-5	110%
o-Xylene	mg/kg	117547-11	<1 || <1	LCS-5	115%
naphthalene	mg/kg	117547-11	<1 || <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%	117547-11	102 || 100 || RPD: 2	LCS-5	79%

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117547-11	14/10/2014 || 14/10/2014	LCS-5	14/10/2014
Date analysed	-	117547-11	15/10/2014 || 15/10/2014	LCS-5	15/10/2014
TRHC$_{10}$ - C$_{14}$	mg/kg	117547-11	<50 || <50	LCS-5	124%
TRHC$_{15}$ - C$_{28}$	mg/kg	117547-11	<100 || <100	LCS-5	124%
TRHC$_{29}$ - C$_{36}$	mg/kg	117547-11	<100 || <100	LCS-5	108%
TRH>C$_{10}$-C$_{16}$	mg/kg	117547-11	<50 || <50	LCS-5	124%
TRH>C$_{16}$-C$_{34}$	mg/kg	117547-11	<100 || <100	LCS-5	124%
TRH>C$_{34}$-C$_{40}$	mg/kg	117547-11	<100 || <100	LCS-5	108%
Surrogate o-Terphenyl	%	117547-11	93 || 84 || RPD: 10	LCS-5	108%
QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117547-11	14/10/2014 || 14/10/2014	LCS-5	14/10/2014
Date analysed	-	117547-11	15/10/2014 || 16/10/2014	LCS-5	16/10/2014
Naphthalene	mg/kg	117547-11	<0.1 || <0.1	LCS-5	93%
Acenaphthylene	mg/kg	117547-11	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	117547-11	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	117547-11	<0.1 || <0.1	LCS-5	92%
Phenanthrene	mg/kg	117547-11	<0.1 || <0.1	LCS-5	90%
Anthracene	mg/kg	117547-11	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	117547-11	<0.1 || <0.1	LCS-5	89%
Pyrene	mg/kg	117547-11	<0.1 || <0.1	LCS-5	91%
Benzo(a)anthracene	mg/kg	117547-11	<0.1 || <0.1	[NR]	[NR]
Chrysene	mg/kg	117547-11	<0.1 || <0.1	LCS-5	84%
Benzo(b,j+k)fluoranthene	mg/kg	117547-11	<0.2 || <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	117547-11	<0.05 || <0.05	LCS-5	104%
Indeno(1,2,3-c,d)pyrene	mg/kg	117547-11	<0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	117547-11	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	117547-11	<0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	117547-11	97 || 95 || RPD: 2	LCS-5	95%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117547-11	14/10/2014 || 14/10/2014	LCS-5	14/10/2014
Date analysed	-	117547-11	15/10/2014 || 15/10/2014	LCS-5	15/10/2014
HCB	mg/kg	117547-11	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	117547-11	<0.1 || <0.1	LCS-5	92%
gamma-BHC	mg/kg	117547-11	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	117547-11	<0.1 || <0.1	LCS-5	85%
Heptachlor	mg/kg	117547-11	<0.1 || <0.1	LCS-5	87%
delta-BHC	mg/kg	117547-11	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	117547-11	<0.1 || <0.1	LCS-5	97%
Heptachlor Epoxide	mg/kg	117547-11	<0.1 || <0.1	LCS-5	93%
gamma-Chlordane	mg/kg	117547-11	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	117547-11	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	117547-11	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	117547-11	<0.1 || <0.1	LCS-5	83%
Dieldrin	mg/kg	117547-11	<0.1 || <0.1	LCS-5	94%
Endrin	mg/kg	117547-11	<0.1 || <0.1	LCS-5	90%
pp-DDD	mg/kg	117547-11	<0.1 || <0.1	LCS-5	91%
Endosulfan II	mg/kg	117547-11	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	117547-11	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	117547-11	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	117547-11	<0.1 || <0.1	LCS-5	94%
Methoxychlor	mg/kg	117547-11	<0.1 || <0.1	[NR]	[NR]
Surrogate TCMX	%	117547-11	95 || 92 || RPD: 3	LCS-5	89%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117547-11	14/10/2014 || 14/10/2014	LCS-5	14/10/2014
Date analysed	-	117547-11	15/10/2014 || 15/10/2014	LCS-5	15/10/2014
Diazinon	mg/kg	117547-11	<0.1 || <0.1	[NR]	[NR]
Dimethoate	mg/kg	117547-11	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos-methyl	mg/kg	117547-11	<0.1 || <0.1	[NR]	[NR]
Ronnel	mg/kg	117547-11	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos	mg/kg	117547-11	<0.1 || <0.1	LCS-5	88%
Fenitrothion	mg/kg	117547-11	<0.1 || <0.1	LCS-5	85%
Bromophos-ethyl	mg/kg	117547-11	<0.1 || <0.1	[NR]	[NR]
Ethion	mg/kg	117547-11	<0.1 || <0.1	LCS-5	96%
Surrogate TCMX	%	117547-11	95 || 92 || RPD: 3	LCS-5	99%
QUALITY CONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117547-11	14/10/2014 || 14/10/2014	LCS-5	14/10/2014
Date analysed	-	117547-11	15/10/2014 || 15/10/2014	LCS-5	15/10/2014
Arochlor 1016	mg/kg	117547-11	<0.1 || <0.1	[NR]	[NR]
Arochlor 1221	mg/kg	117547-11	<0.1 || <0.1	[NR]	[NR]
Arochlor 1232	mg/kg	117547-11	<0.1 || <0.1	[NR]	[NR]
Arochlor 1242	mg/kg	117547-11	<0.1 || <0.1	[NR]	[NR]
Arochlor 1248	mg/kg	117547-11	<0.1 || <0.1	[NR]	[NR]
Arochlor 1254	mg/kg	117547-11	<0.1 || <0.1	LCS-5	131%
Arochlor 1260	mg/kg	117547-11	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%	117547-11	95 || 92 || RPD: 3	LCS-5	102%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	117547-11	14/10/2014 || 14/10/2014	LCS-3	14/10/2014
Date analysed	-	117547-11	14/10/2014 || 14/10/2014	LCS-3	14/10/2014
Arsenic	mg/kg	117547-11	8 || 5 || RPD: 46	LCS-3	93%
Cadmium	mg/kg	117547-11	<0.4 || <0.4	LCS-3	91%
Chromium	mg/kg	117547-11	16 || 11 || RPD: 37	LCS-3	96%
Copper	mg/kg	117547-11	23 || 22 || RPD: 4	LCS-3	97%
Lead	mg/kg	117547-11	31 || 20 || RPD: 43	LCS-3	94%
Mercury	mg/kg	117547-11	<0.1 || <0.1	LCS-3	105%
Nickel	mg/kg	117547-11	10 || 9 || RPD: 11	LCS-3	95%
Zinc	mg/kg	117547-11	57 || 49 || RPD: 15	LCS-3	94%

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117547-21	14/10/2014 || 14/10/2014	117547-2	14/10/2014
Date analysed	-	117547-21	16/10/2014 || 16/10/2014	117547-2	15/10/2014
TRHC$_6$ - C$_9$	mg/kg	117547-21	<25 || <25	117547-2	104%
TRHC$_6$ - C$_{10}$	mg/kg	117547-21	<25 || <25	117547-2	104%
Benzene	mg/kg	117547-21	<0.2 || <0.2	117547-2	95%
Toluene	mg/kg	117547-21	<0.5 || <0.5	117547-2	102%
Ethylbenzene	mg/kg	117547-21	<1 || <1	117547-2	103%
m+p-xylene	mg/kg	117547-21	<2 || <2	117547-2	109%
o-Xylene	mg/kg	117547-21	<1 || <1	117547-2	107%
naphthalene	mg/kg	117547-21	<1 || <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%	117547-21	77 || 76 || RPD: 1	117547-2	93%
QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117547-21	14/10/2014 || 14/10/2014	117547-2	14/10/2014
Date analysed	-	117547-21	15/10/2014 || 15/10/2014	117547-2	14/10/2014
TRHC$_{10}$ - C$_{14}$	mg/kg	117547-21	<50 || <50	117547-2	131%
TRHC$_{15}$ - C$_{28}$	mg/kg	117547-21	<100 || <100	117547-2	103%
TRHC$_{29}$ - C$_{36}$	mg/kg	117547-21	<100 || <100	117547-2	104%
TRH>C$_{10}$-C$_{16}$	mg/kg	117547-21	<50 || <50	117547-2	131%
TRH>C$_{16}$-C$_{34}$	mg/kg	117547-21	<100 || <100	117547-2	103%
TRH>C$_{34}$-C$_{40}$	mg/kg	117547-21	<100 || <100	117547-2	104%
Surrogate o-Terphenyl	%	117547-21	85 || 94 || RPD: 10	117547-2	70%
QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117547-21	14/10/2014 || 14/10/2014	117547-2	14/10/2014
Date analysed	-	117547-21	16/10/2014 || 16/10/2014	117547-2	15/10/2014
Naphthalene	mg/kg	117547-21	<0.1 || <0.1	117547-2	94%
Acenaphthylene	mg/kg	117547-21	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	117547-21	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	117547-21	<0.1 || <0.1	117547-2	92%
Phenanthrene	mg/kg	117547-21	<0.1 || <0.1	117547-2	92%
Anthracene	mg/kg	117547-21	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	117547-21	<0.1 || <0.1	117547-2	91%
Pyrene	mg/kg	117547-21	<0.1 || <0.1	117547-2	92%
Benzo(a)anthracene	mg/kg	117547-21	<0.1 || <0.1	[NR]	[NR]
Chrysene	mg/kg	117547-21	<0.1 || <0.1	117547-2	85%
Benzo(b,j+k)fluoranthene	mg/kg	117547-21	<0.2 || <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	117547-21	<0.05 || <0.05	117547-2	111%
Indeno(1,2,3-c,d)pyrene	mg/kg	117547-21	<0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	117547-21	<0.1 || <0.1	[NR]	[NR]

QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Benzo(g,h,i)perylene	mg/kg	117547-21	<0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	117547-21	99 || 100 || RPD: 1	117547-2	101%
QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117547-21	14/10/2014 || 14/10/2014	117547-2	14/10/2014
Date analysed	-	117547-21	15/10/2014 || 15/10/2014	117547-2	15/10/2014
HCB	mg/kg	117547-21	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	117547-21	<0.1 || <0.1	117547-2	90%
gamma-BHC	mg/kg	117547-21	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	117547-21	<0.1 || <0.1	117547-2	84%
Heptachlor	mg/kg	117547-21	<0.1 || <0.1	117547-2	92%
delta-BHC	mg/kg	117547-21	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	117547-21	<0.1 || <0.1	117547-2	95%
Heptachlor Epoxide	mg/kg	117547-21	<0.1 || <0.1	117547-2	92%
gamma-Chlordane	mg/kg	117547-21	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	117547-21	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	117547-21	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	117547-21	0.2 || 0.1 || RPD: 67	117547-2	82%
Dieldrin	mg/kg	117547-21	<0.1 || <0.1	117547-2	93%
Endrin	mg/kg	117547-21	<0.1 || <0.1	117547-2	92%
pp-DDD	mg/kg	117547-21	<0.1 || <0.1	117547-2	92%
Endosulfan II	mg/kg	117547-21	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	117547-21	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	117547-21	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	117547-21	<0.1 || <0.1	117547-2	97%
Methoxychlor	mg/kg	117547-21	<0.1 || <0.1	[NR]	[NR]
Surrogate TCMX	%	117547-21	120 || 101 || RPD: 17	117547-2	91%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117547-21	14/10/2014 || 14/10/2014	117547-2	14/10/2014
Date analysed	-	117547-21	15/10/2014 || 15/10/2014	117547-2	15/10/2014
Diazinon	mg/kg	117547-21	<0.1 || <0.1	[NR]	[NR]
Dimethoate	mg/kg	117547-21	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos-methyl	mg/kg	117547-21	<0.1 || <0.1	[NR]	[NR]
Ronnel	mg/kg	117547-21	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos	mg/kg	117547-21	<0.1 || <0.1	117547-2	83%
Fenitrothion	mg/kg	117547-21	<0.1 || <0.1	117547-2	82%
Bromophos-ethyl	mg/kg	117547-21	<0.1 || <0.1	[NR]	[NR]
Ethion	mg/kg	117547-21	<0.1 || <0.1	117547-2	86%
Surrogate TCMX	%	117547-21	120 || 101 || RPD: 17	117547-2	94%
QUALITY CONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117547-21	14/10/2014 || 14/10/2014	117547-2	14/10/2014
Date analysed	-	117547-21	15/10/2014 || 15/10/2014	117547-2	15/10/2014
Arochlor 1016	mg/kg	117547-21	<0.1 || <0.1	[NR]	[NR]
Arochlor 1221	mg/kg	117547-21	<0.1 || <0.1	[NR]	[NR]
Arochlor 1232	mg/kg	117547-21	<0.1 || <0.1	[NR]	[NR]
Arochlor 1242	mg/kg	117547-21	<0.1 || <0.1	[NR]	[NR]
Arochlor 1248	mg/kg	117547-21	<0.1 || <0.1	[NR]	[NR]
Arochlor 1254	mg/kg	117547-21	<0.1 || <0.1	117547-2	125%
Arochlor 1260	mg/kg	117547-21	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%	117547-21	120 || 101 || RPD: 17	117547-2	98%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	117547-21	14/10/2014 || 14/10/2014	117547-2	14/10/2014
Date analysed	-	117547-21	14/10/2014 || 14/10/2014	117547-2	14/10/2014
Arsenic	mg/kg	117547-21	7 || 8 || RPD: 13	117547-2	90%
Cadmium	mg/kg	117547-21	<0.4 || <0.4	117547-2	82%
Chromium	mg/kg	117547-21	20 || 17 || RPD: 16	117547-2	86%
Copper	mg/kg	117547-21	21 || 26 || RPD: 21	117547-2	94%
Lead	mg/kg	117547-21	23 || 20 || RPD: 14	117547-2	95%
Mercury	mg/kg	117547-21	<0.1 || <0.1	117547-2	99%
Nickel	mg/kg	117547-21	8 || 10 || RPD: 22	117547-2	85%
Zinc	mg/kg	117547-21	34 || 48 || RPD: 34	117547-2	79%

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117547-33	14/10/2014 || 14/10/2014	117547-24	14/10/2014
Date analysed	-	117547-33	16/10/2014 || 16/10/2014	117547-24	16/10/2014
TRHC$_6$ - C$_9$	mg/kg	117547-33	<25 || <25	117547-24	90%
TRHC$_6$ - C$_{10}$	mg/kg	117547-33	<25 || <25	117547-24	90%
Benzene	mg/kg	117547-33	<0.2 || <0.2	117547-24	82%
Toluene	mg/kg	117547-33	<0.5 || <0.5	117547-24	73%
Ethylbenzene	mg/kg	117547-33	<1 || <1	117547-24	98%
m+p-xylene	mg/kg	117547-33	<2 || <2	117547-24	99%
o-Xylene	mg/kg	117547-33	<1 || <1	117547-24	103%
naphthalene	mg/kg	117547-33	<1 || <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%	117547-33	77 || 75 || RPD: 3	117547-24	75%

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117547-33	14/10/2014 || 14/10/2014	117547-24	14/10/2014
Date analysed	-	117547-33	15/10/2014 || 15/10/2014	117547-24	15/10/2014
TRHC$_{10}$ - C$_{14}$	mg/kg	117547-33	<50 || <50	117547-24	89%
TRHC$_{15}$ - C$_{28}$	mg/kg	117547-33	<100 || <100	117547-24	111%
TRHC$_{29}$ - C$_{36}$	mg/kg	117547-33	<100 || <100	117547-24	81%
TRH>C$_{10}$-C$_{16}$	mg/kg	117547-33	<50 || <50	117547-24	89%
TRH>C$_{16}$-C$_{34}$	mg/kg	117547-33	<100 || <100	117547-24	111%
TRH>C$_{34}$-C$_{40}$	mg/kg	117547-33	<100 || <100	117547-24	81%
Surrogate o-Terphenyl	%	117547-33	83 || 87 || RPD: 5	117547-24	76%

QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117547-33	14/10/2014 || 14/10/2014	117547-24	14/10/2014
Date analysed	-	117547-33	16/10/2014 || 16/10/2014	117547-24	16/10/2014
Naphthalene	mg/kg	117547-33	<0.1 || <0.1	117547-24	90%
Acenaphthylene	mg/kg	117547-33	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	117547-33	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	117547-33	<0.1 || <0.1	117547-24	93%
Phenanthrene	mg/kg	117547-33	0.1 || 0.1 || RPD: 0	117547-24	92%
Anthracene	mg/kg	117547-33	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	117547-33	0.2 || 0.1 || RPD: 67	117547-24	88%
Pyrene	mg/kg	117547-33	0.2 || 0.1 || RPD: 67	117547-24	91%
Benzo(a)anthracene	mg/kg	117547-33	0.1 || <0.1	[NR]	[NR]
Chrysene	mg/kg	117547-33	0.1 || <0.1	117547-24	81%
Benzo(b,j+k)fluoranthene	mg/kg	117547-33	<0.2 || <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	117547-33	0.1 || 0.07 || RPD: 35	117547-24	99%
Indeno(1,2,3-c,d)pyrene	mg/kg	117547-33	0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	117547-33	<0.1 || <0.1	[NR]	[NR]

QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Benzo(g,h,i)perylene	mg/kg	117547-33	<0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	117547-33	97 || 98 || RPD: 1	117547-24	98%
QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117547-33	14/10/2014 || 14/10/2014	117547-24	14/10/2014
Date analysed	-	117547-33	15/10/2014 || 15/10/2014	117547-24	15/10/2014
HCB	mg/kg	117547-33	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	117547-33	<0.1 || <0.1	117547-24	88%
gamma-BHC	mg/kg	117547-33	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	117547-33	<0.1 || <0.1	117547-24	82%
Heptachlor	mg/kg	117547-33	<0.1 || <0.1	117547-24	87%
delta-BHC	mg/kg	117547-33	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	117547-33	<0.1 || <0.1	117547-24	96%
Heptachlor Epoxide	mg/kg	117547-33	<0.1 || <0.1	117547-24	93%
gamma-Chlordane	mg/kg	117547-33	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	117547-33	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	117547-33	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	117547-33	<0.1 || <0.1	117547-24	82%
Dieldrin	mg/kg	117547-33	<0.1 || <0.1	117547-24	78%
Endrin	mg/kg	117547-33	<0.1 || <0.1	117547-24	90%
pp-DDD	mg/kg	117547-33	<0.1 || <0.1	117547-24	84%
Endosulfan II	mg/kg	117547-33	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	117547-33	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	117547-33	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	117547-33	<0.1 || <0.1	117547-24	91%
Methoxychlor	mg/kg	117547-33	<0.1 || <0.1	[NR]	[NR]
Surrogate TCMX	%	117547-33	105 || 91 || RPD: 14	117547-24	117%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117547-33	14/10/2014 || 14/10/2014	117547-24	14/10/2014
Date analysed	-	117547-33	15/10/2014 || 15/10/2014	117547-24	15/10/2014
Diazinon	mg/kg	117547-33	<0.1 || <0.1	[NR]	[NR]
Dimethoate	mg/kg	117547-33	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos-methyl	mg/kg	117547-33	<0.1 || <0.1	[NR]	[NR]
Ronnel	mg/kg	117547-33	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos	mg/kg	117547-33	<0.1 || <0.1	117547-24	82%
Fenitrothion	mg/kg	117547-33	<0.1 || <0.1	117547-24	79%
Bromophos-ethyl	mg/kg	117547-33	<0.1 || <0.1	[NR]	[NR]
Ethion	mg/kg	117547-33	<0.1 || <0.1	117547-24	83%
Surrogate TCMX	%	117547-33	105 || 91 || RPD: 14	117547-24	89%
QUALITY CONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117547-33	14/10/2014 || 14/10/2014	117547-24	14/10/2014
Date analysed	-	117547-33	15/10/2014 || 15/10/2014	117547-24	15/10/2014
Arochlor 1016	mg/kg	117547-33	<0.1 || <0.1	[NR]	[NR]
Arochlor 1221	mg/kg	117547-33	<0.1 || <0.1	[NR]	[NR]
Arochlor 1232	mg/kg	117547-33	<0.1 || <0.1	[NR]	[NR]
Arochlor 1242	mg/kg	117547-33	<0.1 || <0.1	[NR]	[NR]
Arochlor 1248	mg/kg	117547-33	<0.1 || <0.1	[NR]	[NR]
Arochlor 1254	mg/kg	117547-33	<0.1 || <0.1	117547-24	120%
Arochlor 1260	mg/kg	117547-33	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%	117547-33	105 || 91 || RPD: 14	117547-24	93%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	117547-33	14/10/2014 || 14/10/2014	117547-24	14/10/2014
Date analysed	-	117547-33	14/10/2014 || 14/10/2014	117547-24	14/10/2014
Arsenic	mg/kg	117547-33	4 || 4 || RPD: 0	117547-24	70%
Cadmium	mg/kg	117547-33	<0.4 || <0.4	117547-24	94%
Chromium	mg/kg	117547-33	15 || 15 || RPD: 0	117547-24	77%
Copper	mg/kg	117547-33	28 || 29 || RPD: 4	117547-24	71%
Lead	mg/kg	117547-33	17 || 14 || RPD: 19	117547-24	77%
Mercury	mg/kg	117547-33	<0.1 || <0.1	117547-24	97%
Nickel	mg/kg	117547-33	12 || 11 || RPD: 9	117547-24	73%
Zinc	mg/kg	117547-33	45 || 49 || RPD: 9	117547-24	115%

QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date extracted	-	117547-24	14/10/2014 || 14/10/2014
Date analysed	-	117547-24	16/10/2014 || 15/10/2014
Naphthalene	mg/kg	117547-24	<0.1 || <0.1
Acenaphthylene	mg/kg	117547-24	<0.1 || <0.1
Acenaphthene	mg/kg	117547-24	0.4 || 0.4 || RPD: 0
Fluorene	mg/kg	117547-24	0.3 || 0.4 || RPD: 29
Phenanthrene	mg/kg	117547-24	0.2 || 0.5 || RPD: 86
Anthracene	mg/kg	117547-24	0.2 || 0.2 || RPD: 0
Fluoranthene	mg/kg	117547-24	0.2 || 0.1 || RPD: 67
Pyrene	mg/kg	117547-24	0.2 || 0.1 || RPD: 67
Benzo(a)anthracene	mg/kg	117547-24	0.1 || <0.1
Chrysene	mg/kg	117547-24	0.1 || <0.1
Benzo(b,j+k)fluoranthene	mg/kg	117547-24	<0.2 || <0.2
Benzo(a)pyrene	mg/kg	117547-24	0.06 || <0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	117547-24	<0.1 || <0.1
Dibenzo(a,h)anthracene	mg/kg	117547-24	<0.1 || <0.1
Benzo(g,h,i)perylene	mg/kg	117547-24	<0.1 || <0.1
Surrogate p-Terphenyl-d14	%	117547-24	94 || 101 || RPD: 7

QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	[NT]	[NT]	LCS-4	14/10/2014
Date analysed	-	[NT]	[NT]	LCS-4	14/10/2014
Arsenic	mg/kg	[NT]	[NT]	LCS-4	89%
Cadmium	mg/kg	[NT]	[NT]	LCS-4	89%
Chromium	mg/kg	[NT]	[NT]	LCS-4	92%
Copper	mg/kg	[NT]	[NT]	LCS-4	94%
Lead	mg/kg	[NT]	[NT]	LCS-4	90%
Mercury	mg/kg	[NT]	[NT]	LCS-4	97%
Nickel	mg/kg	[NT]	[NT]	LCS-4	91%
Zinc	mg/kg	[NT]	[NT]	LCS-4	90%

Report Comments:

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

Asbestos samples 117547-7 to 10 & 37:
Excessive sample volume was provided for asbestos analysis. A portion of the supplied sample was sub-sampled according to Envirolab procedures. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g (50mL) of sample in its own container as per AS4964-2004.

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

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 batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.
Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.
Spikes for Physical and Aggregate Tests are not applicable.
For VOCs in water samples, three vials are required for duplicate or spike analysis.

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

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

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

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD	EIS Job Number: E27813KG	ENVIRONMENTAL INVESTIGATION SERVICES
12 ASHLEY STREET		REAR OF 115 WICKS ROAD
CHATSWOOD NSW 2067		MACQUARIE PARK, NSW 2113
P: (02) 99106200	Date Results Required: STANDARD	P: 02-9888 5000 F: 02-9888 5001
F: (02) 99106201		Attention: Para Bokalawela
Attention: Aileen	Page: 1 of 2	

Location:	Bonnyrigg	Sample Preserved in Esky on Ice
Sampler:	Rob Muller, Geoff Fletcher, Michelle Watson	Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 2	Combo 3	Combo 6	Combo 6a	8 Metals	PAHs	TRH/BTEX	BTEX	Asbestos			
10/10/2014	1	S2	-	G, A	0.0	Fill: stockpile			X						X			
10/10/2014	2	S4	-	G, A	0.0	Fill: stockpile			X						X			
10/10/2014	3	S6	-	G, A	0.0	Fill: stockpile			X						X			
10/10/2014	4	S7	-	G, A	0.0	Fill: stockpile			X						X			
10/10/2014	5	S9	-	G, A	0.0	Fill: stockpile			X						X			
10/10/2014	6	S10	-	G, A	0.0	Fill: stockpile			X						X			
10/10/2014	7	S11	-	G, A	0.0	Fill: stockpile				X								
10/10/2014	8	S12	-	G, A	0.0	Fill: stockpile				X								
10/10/2014	9	S13	-	G, A	0.0	Fill: stockpile				X								
10/10/2014	10	S15	-	G, A	0.0	Fill: stockpile				X								
10/10/2014	11	BH1	0.0-0.3	G, A	0.0	Fill				X								
10/10/2014	12	BH2	0.0-0.2	G, A	0.0	Fill				X								
10/10/2014	13	BH2	0.5-0.85	G	0.0	Fill		X										
10/10/2014	14	BH3	0.4-0.5	G	0.0	Fill		X										
10/10/2014	15	BH3	0.5-0.95	G, A	0.0	Fill				X								
10/10/2014	16	BH4	0.4-0.5	G	0.0	Silty clay		X										
10/10/2014	17	BH5	0.3-0.4	G	0.0	Fill		X										
10/10/2014	18	BH5 (BH4)	0.5-0.95	G, A	0.0	Fill				X								
10/10/2014	19	BH5	1.8-2.0	G, A	0.0	Fill				X								
10/10/2014	20	BH6	0.35-0.45	G, A	0.0	Fill				X								
10/10/2014	21	BH7	0.5-0.95	G, A	0.0	Fill				X								
10/10/2014	22	BH8	0.5-0.8	G	0.0	Fill		X										
10/10/2014	23	BH8	1.9-2.0	A	-	Fill									X			
10/10/2014	24	BH8	2.4-2.7	G	0.0	Fill			X									
10/10/2014	25	BH9	1.3-1.5	G	0.0	Fill			X									

ENVIROLAB

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

Job No: 117547
Date Received: 13-10
Time Received: 18:00
Received by: LR
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Remarks (comments/detection limits required):

Sample Containers:
G - 250mg Glass Jar
A - Ziplock Asbestos Bag
P - Plastic Bag

Relinquished By:	Date:	Time:	Received By:	Date:
Rob Muller	13/10/14	3pm		

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD	EIS Job Number: E27813KG	ENVIRONMENTAL INVESTIGATION SERVICES
12 ASHLEY STREET		REAR OF 115 WICKS ROAD
CHATSWOOD NSW 2067	Date Results Required: STANDARD	MACQUARIE PARK, NSW 2113
P: (02) 99106200		P: 02-9888 5000 F: 02-9888 5001
F: (02) 99106201	Page: 2 of 2	Attention: Para Bokalawela
Attention: Aileen		

Location:	Bonnyrigg	Sample Preserved in Esky on Ice
Sampler:	Rob Muller, Geoff Fletcher, Michelle Watson	Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 2	Combo 3	Combo 6	Combo 6a	8 Metals	PAHs	TRH/BTEX	BTEX	Asbestos			
10/10/2014	26	BH9	2.5-2.8	A	-	Fill									X			
10/10/2014	27	BH10	1.2-1.4	G,A	0.0	Fill				X								
10/10/2014	28	BH11	0.3-0.5	G,A	0.0	Fill				X								
10/10/2014	29	BH12	0.31-0.5	G,A	0.0	Fill				X								
10/10/2014	30	BH12	1.5-1.8	G	0.0	Fill		X										
10/10/2014	31	BH13	0.25-0.4	G	0.0	Fill		X										
10/10/2014	32	BH13	1.3-1.5	G,A	0.0	Fill				X								
10/10/2014	33	BH14	0.43-0.6	G,A	0.0	Fill				X								
10/10/2014	34	BH14	1.2-1.4	G	0.0	Fill		X										
10/10/2014	35	BH15	0.33-0.6	G,A	0.0	Fill				X								
10/10/2014	36	TP16	0.0-0.25	G,A	0.0	Fill			X						X			
10/10/2014	37	TP17	0.0-0.3	G,A	0.0	Fill				X								
10/10/2014	38	DUPSP1	-	G	0.0	Duplicate			X									
10/10/2014	39	DUPGF1	-	G	0.0	Duplicate		X										
10/10/2014	40	DUPGF2	-	G	0.0	Duplicate		X										
10/10/2014		DUPGF3	-	G	0.0	Duplicate		X	See remarks below									
10/10/2014	41	TB	-	G	0.0	Trip blank								X				
10/10/2014	42	FR	-	2xV	0.0	Field rinsate								X				

Remarks (comments/detection limits required):

Please send DUPGF3 to Envirolab Melbourne for inter-lab analysis

Sample Containers:
G - 250mg Glass Jar
V - 40mL vial
A - Ziplock Asbestos Bag
P - Plastic Bag

Relinquished By:	Date:	Time:	Received By:	Date:
Rob Muller	13/10/14	3pm		

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 117547-A

Client:

Environmental Investigation Services
PO Box 976
North Ryde BC
NSW 1670

Attention: Para Bokalawela

Sample log in details:

Your Reference:	**E27813KG, Bonnyrigg**
No. of samples:	Additional testing on 2 soils
Date samples received / completed instructions received	13/10/14 / 21/10/14

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:	28/10/14 / 24/10/14
Date of Preliminary Report:	Not Issued

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

Results Approved By:

Jacinta Hurst
Laboratory Manager

PAHs in TCLP (USEPA 1311)			
Our Reference:	UNITS	117547-A-13	117547-A-37
Your Reference	----------	BH2	BH17
Depth	----------	0.5-0.85	0.0-0.3
Date Sampled		10/10/2014	10/10/2014
Type of sample		Soil	Soil
pH of soil for fluid# determ.	pH units	9.1	9.1
pH of soil for fluid # determ. (acid)	pH units	1.5	1.5
Extraction fluid used	-	1	1
pH of final Leachate	pH units	5.1	5.1
Date extracted	-	23/10/2014	23/10/2014
Date analysed	-	23/10/2014	23/10/2014
Naphthalene in TCLP	mg/L	<0.001	<0.001
Acenaphthylene in TCLP	mg/L	<0.001	<0.001
Acenaphthene in TCLP	mg/L	<0.001	<0.001
Fluorene in TCLP	mg/L	<0.001	<0.001
Phenanthrene in TCLP	mg/L	<0.001	<0.001
Anthracene in TCLP	mg/L	<0.001	<0.001
Fluoranthene in TCLP	mg/L	<0.001	<0.001
Pyrene in TCLP	mg/L	<0.001	<0.001
Benzo(a)anthracene in TCLP	mg/L	<0.001	<0.001
Chrysene in TCLP	mg/L	<0.001	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001	<0.001
Total +ve PAH's	mg/L	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	92	99

Method ID	Methodology Summary
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439 and USEPA 1311 and in house method INORG-004.
EXTRACT.7	Toxicity Characteristic Leaching Procedure (TCLP).
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Org-012 subset	Leachates are extracted with Dichloromethane and analysed by GC-MS.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.

QUALITY CONTROL PAHs in TCLP (USEPA 1311)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			23/10/2014	[NT]	[NT]	LCS-W1	23/10/2014
Date analysed	-			23/10/2014	[NT]	[NT]	LCS-W1	23/10/2014
Naphthalene in TCLP	mg/L	0.001	Org-012 subset	<0.001	[NT]	[NT]	LCS-W1	115%
Acenaphthylene in TCLP	mg/L	0.001	Org-012 subset	<0.001	[NT]	[NT]	[NR]	[NR]
Acenaphthene in TCLP	mg/L	0.001	Org-012 subset	<0.001	[NT]	[NT]	[NR]	[NR]
Fluorene in TCLP	mg/L	0.001	Org-012 subset	<0.001	[NT]	[NT]	LCS-W1	103%
Phenanthrene in TCLP	mg/L	0.001	Org-012 subset	<0.001	[NT]	[NT]	LCS-W1	107%
Anthracene in TCLP	mg/L	0.001	Org-012 subset	<0.001	[NT]	[NT]	[NR]	[NR]
Fluoranthene in TCLP	mg/L	0.001	Org-012 subset	<0.001	[NT]	[NT]	LCS-W1	102%
Pyrene in TCLP	mg/L	0.001	Org-012 subset	<0.001	[NT]	[NT]	LCS-W1	104%
Benzo(a)anthracene in TCLP	mg/L	0.001	Org-012 subset	<0.001	[NT]	[NT]	[NR]	[NR]
Chrysene in TCLP	mg/L	0.001	Org-012 subset	<0.001	[NT]	[NT]	LCS-W1	102%
Benzo(bjk)fluoranthene in TCLP	mg/L	0.002	Org-012 subset	<0.002	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene in TCLP	mg/L	0.001	Org-012 subset	<0.001	[NT]	[NT]	LCS-W1	116%
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	0.001	Org-012 subset	<0.001	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene in TCLP	mg/L	0.001	Org-012 subset	<0.001	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene in TCLP	mg/L	0.001	Org-012 subset	<0.001	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012	125	[NT]	[NT]	LCS-W1	113%

Report Comments:

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

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 batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.
Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.
Spikes for Physical and Aggregate Tests are not applicable.
For VOCs in water samples, three vials are required for duplicate or spike analysis.

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

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

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

Simon Song

From: Jacinta Hurst
Sent: Monday, 20 October 2014 9:59 PM
To: Simon Song
Subject: Fwd: TCLP Request - 117547 Bonnyrigg (Our Ref: E27813KG)

Regards,

Jacinta Hurst | Sydney Laboratory Manager | Envirolab Services Pty Ltd

Great Chemistry, Great Service.

12 Ashley Street Chatswood NSW 2067
T 612 9910 6200 **F** 612 9910 6201 **M** 0407 003 037
jhurst@envirolab.com.au | www.envirolab.com.au

Follow this link to provide feedback on our service.

Latest Links Below:

Information on QA/QC requirements and Temperature Recording of Samples on receipt at the laboratory

Our "RECOMMENDED PRESERVATION & HOLDING TIMES (RHT)" chart that includes minimal sample volumes required

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

Sent from my iPhone

117547 A
Std TAT
due 28/10.

Begin forwarded message:

> **From:** Para Bokalawela <pbokalawela@jkgroup.net.au>
> **Date:** 20 October 2014 19:33:35 AEDT
> **To:** enquiries <enquiries@envirolab.com.au>, Jacinta Hurst <JHurst@envirolab.com.au>
> **Subject: TCLP Request - 117547 Bonnyrigg (Our Ref: E27813KG)**
>
> Hi Jacinta,
>
> Please do TCLP for PAH for the following samples:
>
> - BH2 (0.5-0.85) -13
> - BH17 (0-0.3) -37
>
> Regards,
>
> Para Bokalawela *(Mob: 0425 859 209)*
> Senior Environmental Engineer

Environmental Investigation Services
CONSULTING ENVIRONMENTAL ENGINEERS AND SCIENTISTS

Tel: 02 9888 5000
Fax: 02 9888 5001
pbokalawela@jkgroup.net.au
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PO Box 976
North Ryde BC NSW 1670

115 Wicks Road
Macquarie Park NSW 2113

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 117716

Client:

Environmental Investigation Services
PO Box 976
North Ryde BC
NSW 1670

Attention: Para, Rob Muller

Sample log in details:

Your Reference:	**E27813KG, Bonnyrigg**
No. of samples:	4 Waters
Date samples received / completed instructions received	16/10/2014 / 16/10/2014

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:	23/10/14 / 23/10/14
Date of Preliminary Report:	Not Issued

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

Results Approved By:

Jacinta Hurst
Laboratory Manager

vTRH(C6-C10)/BTEXN in Water Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	117716-1 MW5 16/10/2014 Water	117716-2 DUPGW 16/10/2014 Water	117716-3 TS 15/10/2014 Water	117716-4 TB 16/10/2014 Water
Date extracted	-	16/10/2014	16/10/2014	16/10/2014	16/10/2014
Date analysed	-	17/10/2014	17/10/2014	17/10/2014	17/10/2014
TRHC$_6$ - C$_9$	µg/L	<10	<10	[NA]	[NA]
TRHC$_6$ - C$_{10}$	µg/L	<10	<10	[NA]	[NA]
TRHC$_6$ - C$_{10}$ less BTEX (F1)	µg/L	<10	<10	[NA]	[NA]
Benzene	µg/L	<1	<1	81%	<1
Toluene	µg/L	<1	<1	81%	<1
Ethylbenzene	µg/L	<1	<1	98%	<1
m+p-xylene	µg/L	<2	<2	87%	<2
o-xylene	µg/L	<1	<1	109%	<1
Naphthalene	µg/L	<1	<1	[NA]	[NA]
Surrogate Dibromofluoromethane	%	104	104	104	108
Surrogate toluene-d8	%	97	99	94	94
Surrogate 4-BFB	%	101	101	102	124

svTRH (C10-C40) in Water			
Our Reference:	UNITS	117716-1	117716-2
Your Reference	----------	MW5	DUPGW
Date Sampled	----------	16/10/2014	16/10/2014
Type of sample		Water	Water
Date extracted	-	17/10/2014	17/10/2014
Date analysed	-	17/10/2014	17/10/2014
TRHC$_{10}$ - C$_{14}$	µg/L	<50	<50
TRHC$_{15}$ - C$_{28}$	µg/L	<100	<100
TRHC$_{29}$ - C$_{36}$	µg/L	<100	<100
TRH>C$_{10}$ - C$_{16}$	µg/L	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	µg/L	<50	<50
TRH>C$_{16}$ - C$_{34}$	µg/L	<100	<100
TRH>C$_{34}$ - C$_{40}$	µg/L	<100	<100
Surrogate o-Terphenyl	%	85	83

PAHs in Water - Low Level Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	117716-1 MW5 16/10/2014 Water	117716-2 DUPGW 16/10/2014 Water
Date extracted	-	17/10/2014	17/10/2014
Date analysed	-	17/10/2014	17/10/2014
Naphthalene	µg/L	<0.1	<0.1
Acenaphthylene	µg/L	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5
Total +ve PAH's	µg/L	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	89	92

HM in water - dissolved			
Our Reference:	UNITS	117716-1	117716-2
Your Reference	----------	MW5	DUPGW
Date Sampled	----------	16/10/2014	16/10/2014
Type of sample		Water	Water
Date prepared	-	17/10/2014	17/10/2014
Date analysed	-	17/10/2014	17/10/2014
Arsenic-Dissolved	µg/L	1	1
Cadmium-Dissolved	µg/L	0.3	0.3
Chromium-Dissolved	µg/L	<1	<1
Copper-Dissolved	µg/L	2	2
Lead-Dissolved	µg/L	<1	<1
Mercury-Dissolved	µg/L	<0.05	<0.05
Nickel-Dissolved	µg/L	4	4
Zinc-Dissolved	µg/L	38	27

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. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-013	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. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Metals-022 ICP-MS	Determination of various metals by ICP-MS.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			16/10/2014	[NT]	[NT]	LCS-W1	16/10/2014
Date analysed	-			17/10/2014	[NT]	[NT]	LCS-W1	17/10/2014
TRH C_6 - C_9	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W1	103%
TRH C_6 - C_{10}	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W1	103%
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	102%
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	102%
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	111%
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	LCS-W1	99%
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	126%
Naphthalene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Surrogate Dibromofluoromethane	%		Org-016	103	[NT]	[NT]	LCS-W1	103%
Surrogate toluene-d8	%		Org-016	99	[NT]	[NT]	LCS-W1	100%
Surrogate 4-BFB	%		Org-016	93	[NT]	[NT]	LCS-W1	97%
QUALITY CONTROL svTRH (C10-C40) in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			17/10/2014	[NT]	[NT]	LCS-W1	17/10/2014
Date analysed	-			17/10/2014	[NT]	[NT]	LCS-W1	17/10/2014
TRH C_{10} - C_{14}	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W1	124%
TRH C_{15} - C_{28}	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	108%
TRH C_{29} - C_{36}	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	118%
TRH>C_{10} - C_{16}	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W1	124%
TRH>C_{16} - C_{34}	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	108%
TRH>C_{34} - C_{40}	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	118%
Surrogate o-Terphenyl	%		Org-003	99	[NT]	[NT]	LCS-W1	79%
QUALITY CONTROL PAHs in Water - Low Level	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			17/10/2014	[NT]	[NT]	LCS-W1	17/10/2014
Date analysed	-			17/10/2014	[NT]	[NT]	LCS-W1	17/10/2014
Naphthalene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-W1	87%
Acenaphthylene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluorene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-W1	84%
Phenanthrene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-W1	86%

QUALITY CONTROL PAHs in Water - Low Level	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Anthracene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-W1	85%
Pyrene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-W1	86%
Benzo(a)anthracene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Chrysene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-W1	81%
Benzo(b,j+k) fluoranthene	µg/L	0.2	Org-012 subset	<0.2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-W1	98%
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	98	[NT]	[NT]	LCS-W1	99%
QUALITY CONTROL HM in water - dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			17/10/2014	117716-1	17/10/2014 || 17/10/2014	LCS-W1	17/10/2014
Date analysed	-			17/10/2014	117716-1	17/10/2014 || 17/10/2014	LCS-W1	17/10/2014
Arsenic-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	117716-1	1 || <1	LCS-W1	95%
Cadmium-Dissolved	µg/L	0.1	Metals-022 ICP-MS	<0.1	117716-1	0.3 || 0.3 || RPD: 0	LCS-W1	98%
Chromium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	117716-1	<1 || <1	LCS-W1	95%
Copper-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	117716-1	2 || 2 || RPD: 0	LCS-W1	95%
Lead-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	117716-1	<1 || <1	LCS-W1	98%
Mercury-Dissolved	µg/L	0.05	Metals-021 CV-AAS	<0.05	117716-1	<0.05 || <0.05	LCS-W1	100%
Nickel-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	117716-1	4 || 4 || RPD: 0	LCS-W1	95%
Zinc-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	117716-1	38 || 39 || RPD: 3	LCS-W1	94%

QUALITY CONTROL HM in water - dissolved	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	[NT]	[NT]	117716-2	17/10/2014
Date analysed	-	[NT]	[NT]	117716-2	21/10/2014
Arsenic-Dissolved	µg/L	[NT]	[NT]	117716-2	101%
Cadmium-Dissolved	µg/L	[NT]	[NT]	117716-2	90%
Chromium-Dissolved	µg/L	[NT]	[NT]	117716-2	89%
Copper-Dissolved	µg/L	[NT]	[NT]	117716-2	84%
Lead-Dissolved	µg/L	[NT]	[NT]	117716-2	88%
Mercury-Dissolved	µg/L	[NT]	[NT]	117716-2	96%
Nickel-Dissolved	µg/L	[NT]	[NT]	117716-2	86%
Zinc-Dissolved	µg/L	[NT]	[NT]	117716-2	87%

Report Comments:

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

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 batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.
Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.
Spikes for Physical and Aggregate Tests are not applicable.
For VOCs in water samples, three vials are required for duplicate or spike analysis.

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

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

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

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD	EIS Job Number: E27813KG	ENVIRONMENTAL INVESTIGATION SERVICES
12 ASHLEY STREET		REAR OF 115 WICKS ROAD
CHATSWOOD NSW 2067		MACQUARIE PARK, NSW 2113
P: (02) 99106200	Date Results Required: STANDARD	P: 02-9888 5000 F: 02-9888 5001
F: (02) 99106201		
Attention: Aileen	Page: 1 of 1	Attention: Para Bokalawela/Rob Muller

Location:	Bonnyrigg	Sample Preserved in Esky on Ice
Sampler:	Rob Muller	Tests Required

Date Sampled	Lab Ref:	Sample Number	Sample Containers	PID	Sample Description	Combo 2	Combo 3L	VOCs	pH / EC	8 Metals	PAHs	TRH/BTEX	BTEX	Hardness			
16/10/2014	1	MW5	G2, 2 x V, H				X										
16/10/2014	2	DUPGW	G2, 2 x V, H				X										
15/10/2014	3	TS	1 x V										X				
16/10/2014	4	TB	2 x V										X				

ENVIROLAB

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

Job No: 117716

Date Received: 16/10/14
Time Received: 14:00
Received by: PT
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Remarks (comments/detection limits required):	Sample Containers:
All analysis PQLs to ANZECC (2000) Detection Limits Please	G1 - 500mL Amber Glass Bottle G2 - 1L Amber Glass Bottle V - BTEX Vial H - HNO3 Wash PVC PVC - HDPE Plastic Bottles

Relinquished By:	Date:	Time:	Received By:	Date:
Rob Muller	16/10/14	12 noon	PT	16/10/14

A division of Envirolab Group

Envirolab Services Pty Ltd - Melbourne
ABN 37 112 535 645 - 02
1 Dalmore Drive, Scoresby VIC 3179 Australia
Ph +613 9763 2500 Fax +613 9763 2633
melbourne@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 4920

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

Attention: Para Bokalawela

Sample log in details:

Your Reference:	**E27813KG - Bonnyrigg**
No. of samples:	1 Soil
Date samples received / completed instructions received	16/10/2014 / 16/10/2014

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:	22/10/14 / 22/10/14
Date of Preliminary Report:	Not issued

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

Results Approved By:

Analisa Mathrick
Laboratory Supervisor

Suk Lee
Senior Chemist

ACCREDITED FOR TECHNICAL COMPETENCE

vTRH(C6-C10)/BTEXN in Soil		
Our Reference:	UNITS	4920-1
Your Reference	----------	DUPGF3
Date Sampled	----------	10/10/2014
Type of sample		Soil
Date extracted	-	16/10/14
Date analysed	-	18/10/14
vTRH C_6 - C_9	mg/kg	<25
vTRH C_6 - C_{10}	mg/kg	<25
TRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	108

TRH Soil C10-C40 NEPM		
Our Reference:	UNITS	4920-1
Your Reference	----------	DUPGF3
Date Sampled	----------	10/10/2014
Type of sample		Soil
Date extracted	-	16/10/2014
Date analysed	-	16/10/2014
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	<100
TRH C_{29} - C_{36}	mg/kg	<100
Total +ve TRH (C10-C36)	mg/kg	<50
TRH >C_{10}-C_{16}	mg/kg	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50
TRH >C_{16}-C_{34}	mg/kg	<100
TRH >C_{34}-C_{40}	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	83

PAHs in Soil		
Our Reference:	UNITS	4920-1
Your Reference	----------	DUPGF3
Date Sampled	----------	10/10/2014
Type of sample		Soil
Date extracted	-	16/10/14
Date analysed	-	18/10/14
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j&k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Total +ve PAH's	mg/kg	<0.05
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc (Half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc (PQL)	mg/kg	<0.5
Surrogate p-Terphenyl-d_{14}	%	70

Acid Extractable metals in soil		
Our Reference:	UNITS	4920-1
Your Reference	----------	DUPGF3
Date Sampled	----------	10/10/2014
Type of sample		Soil
Date digested	-	17/10/14
Date analysed	-	20/10/14
Arsenic	mg/kg	7
Cadmium	mg/kg	<0.4
Chromium	mg/kg	18
Copper	mg/kg	28
Lead	mg/kg	19
Mercury	mg/kg	<0.1
Nickel	mg/kg	13
Zinc	mg/kg	49

Moisture		
Our Reference:	UNITS	4920-1
Your Reference	----------	DUPGF3
Date Sampled	----------	10/10/2014
Type of sample		Soil
Date prepared	-	16/10/2014
Date analysed	-	17/10/2014
Moisture	%	17

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. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore" Total +ve TRH" is simply a sum of the positive individual TRH fractions.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'TEQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'TEQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'TEQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
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 12 hours.

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			16/10/14	[NT]	[NT]	LCS	16/10/14
Date analysed	-			18/10/14	[NT]	[NT]	LCS	18/10/14
vTRH C_6 - C_9	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS	112%
vTRH C_6 - C_{10}	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS	89%
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	LCS	117%
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	LCS	118%
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS	117%
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	LCS	119%
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS	119%
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	108	[NT]	[NT]	LCS	97%

QUALITY CONTROL TRH Soil C10-C40 NEPM	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			16/10/2014	[NT]	[NT]	LCS	16/10/2014
Date analysed	-			16/10/2014	[NT]	[NT]	LCS	16/10/2014
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS	90%
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS	73%
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS	92%
TRH >C_{10}-C_{16}	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS	82%
TRH >C_{16}-C_{34}	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS	72%
TRH >C_{34}-C_{40}	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS	92%
Surrogate o-Terphenyl	%		Org-003	89	[NT]	[NT]	LCS	85%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			16/10/14	[NT]	[NT]	LCS	16/10/14
Date analysed	-			18/10/14	[NT]	[NT]	LCS	18/10/14
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS	85%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS	87%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS	89%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS	91%
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS	93%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS	60%
Benzo(b,j&k) fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	[NT]	[NT]	LCS	91%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d_{14}	%		Org-012	78	[NT]	[NT]	LCS	71%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date digested	-			17/10/14	[NT]	[NT]	LCS	17/10/14
Date analysed	-			20/10/14	[NT]	[NT]	LCS	20/10/14
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	LCS	102%
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	[NT]	[NT]	LCS	104%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS	105%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS	103%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS	103%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	LCS	108%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS	102%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS	103%

QUALITY CONTROL Moisture	UNITS	PQL	METHOD	Blank
Date prepared	-			[NT]
Date analysed	-			[NT]
Moisture	%	0.1	Inorg-008	[NT]

Report Comments:

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

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.
Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.
Spikes for Physical and Aggregate Tests are not applicable.
For VOCs in water samples, three vials are required for duplicate or spike analysis.

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

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

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

117547

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD	EIS Job Number: E27813KG	ENVIRONMENTAL INVESTIGATION SERVICES
12 ASHLEY STREET		REAR OF 115 WICKS ROAD
CHATSWOOD NSW 2067	Date Results Required: STANDARD	MACQUARIE PARK, NSW 2113
P: (02) 99106200		P: 02-9888 5000 F: 02-9888 5001
F: (02) 99106201	Page: 2 of 2	Attention: Para Bokalawela
Attention: Aileen		

Location: Bonnyrigg

Sampler: Rob Muller, Geoff Fletcher, Michelle Watson

Sample Preserved in Esky on Ice

Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 2	Combo 3	Combo 6	Combo 6a	8 Metals	PAHs	TRH/BTEX	BTEX	Asbestos
10/10/2014	26	BH9	2.5-2.8	A	-	Fill									X
10/10/2014	27	BH10	1.2-1.4	G,A	0.0	Fill				X					
10/10/2014	28	BH11	0.3-0.5	G,A	0.0	Fill				X					
10/10/2014	29	BH12	0.31-0.5	G,A	0.0	Fill				X					
10/10/2014	30	BH12	1.5-1.8	G	0.0	Fill		X							
10/10/2014	31	BH13	0.25-0.4	G	0.0	Fill		X							
10/10/2014	32	BH13	1.3-1.5	G,A	0.0	Fill				X					
10/10/2014	33	BH14	0.43-0.6	G,A	0.0	Fill				X					
10/10/2014	34	BH14	1.2-1.4	G	0.0	Fill		X							
10/10/2014	35	BH15	0.33-0.6	G,A	0.0	Fill				X					
10/10/2014	36	TP16	0.0-0.25	G,A	0.0	Fill			X						X
10/10/2014	37	TP17	0.0-0.3	G,A	0.0	Fill				X					
10/10/2014	38	DUPSP1	-	G	0.0	Duplicate			X						
10/10/2014	39	DUPGF1	-	G	0.0	Duplicate		X							
10/10/2014	40	DUPGF2	-	G	0.0	Duplicate		X							
10/10/2014		DUPGF3	-	G	0.0	Duplicate		X	See remarks below						
10/10/2014	41	TB	-	G	0.0	Trip blank								X	
10/10/2014	42	FR	-	2xV	0.0	Field rinsate								X	

Envirolab Services
1a Dalmore Drive
Caribbean Park
Scoresby VIC 3179
Ph: (03) 9763 2500

Job No: 49110
Date Received: 15/10
Time Received: 11:15am
Received by: BM
Temp: Cool/Ambient 14.5°C
Cooling: Ice/Icepack
Security: Intact/Broken/None

Remarks (comments/detection limits required):

Please send DUPGF3 to Envirolab Melbourne for inter-lab analysis

Sample Containers:
G - 250mg Glass Jar V - 40mL vial
A - Ziplock Asbestos Bag
P - Plastic Bag

Relinquished By:	Date:	Time:	Received By:	Date:
Rob Muller	13/10/14	3pm	~~ESB~~	
ELS-LSB	14/10/14 11.45			

Appendix C: Site Information and Site History Documents

Appendix C2: Historical Land Title Records

PB

9 OCT 2014

ADVANCE LEGAL SEARCHERS PTY LIMITED

(ACN 147 943 842)
ABN 82 147 943 842

P.O. Box 149
Yagoona NSW 2199

Telephone: +612 9644 1679
Mobile: 0412 169 809
Facsimile: +612 8076 3026
Email: alsearch@optusnet.com.au

9th October, 2014

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

Attention: Para Bokalawela,

RE: **Elizabeth Drive & Bonnyrigg Avenue, Bonnyrigg**
Ref: E27813KG

Note 1:	**Lot 1**	**DP1071647**	(page 1)
Note 2:	**Lot 2**	**DP1071647**	(page 5)

Note 1:

Current Search

Folio Identifiers 1/1071647 (title attached)
DP 1071647 (plan attached)
Dated 04th October, 2014
Registered Proprietor:
WESTBUS REGION 3 PTY LIMITED

Title Tree
Lot 1 DP 1071647

Folio Identifiers 1/1071647

(a)	(b)
Folio Identifier 901/1002518	Folio Identifier 456/817546
Folio Identifier B/373901	Folio Identifier J2/360465
CTVol 6390 Folio 228	CTVol 5931 Folio 193
CTVol 5931 Folio 181	/

Certificate of Title Volume 4305 Folio's 69 & 70

Certificate of Title Volume 3034 Folio 165

Certificate of Title Volume 2325 Folio 9

Certificate of Title Volume 1713 Folio 11

*****

Summary of Proprietors
Lot 1 DP 1071647

Year	Proprietor
	(Lot 1 DP 1071647)
2005 – todate	Westbus Region 3 Pty Limited
2004 – 2005	Bosnjak Holdings Pty Limited

See notes (a) & (b)

Note (a)

	(Lot 901 DP1002518)
1989 – 2004	Bosnjak Holdings Pty Limited
	(Lot B DP 373901)
1998 – 1999	Bosnjak Holdings Pty Limited
1989 – 1998	Bosnjack Holdings Pty Limited
	(Lot B DP 373901 – CTVol 6390 Fol 228)
1989 – 1989	Bosnjack Holdings Pty Limited
1959 – 1989	Calabro Bros Pty Limited
1951 – 1959	Francesco Calabro, bootmaker
	(Lot 3J DP360466 – CTVol 5931 Fol 181)
1949 – 1951	Francesco Calabro, bootmaker
1949 – 1949	Rosario Girgenti, market gardener
	(Portion 52 Parish St Luke – Area 45 Acres 2 Roods 26 Perches – CTVol 4305 Fol 69 & 70)
1929 – 1949	Arthur Samuel Gee, master butcher Annie Gee
	(Portion 52 Parish St Luke – Area 45 Acres 2 Roods 26 Perches – CTVol 3034 Fol 165)
1929 – 1929	Jacob Diamond, retired Merchant Mark Harris, retired merchant
1928 – 1929	Edith May Mary Alice Bull
1920 – 1928	Lewis Daniel Bull, gentleman
	(Portion 52 & 50 Parish St Luke – Area 70 Acres 2 Roods 26 Perches – CTVol 2325 Fol 9)
1912 – 1920	Lewis Daniel Bull, gentleman
	(Portion 52 Parish St Luke and other lands – Area 592 Acres 0 Roods 18 Perches – CTVol 1713 Fol 11)
1906 – 1912	Anthony Hordern Bull, general shopkeeper
1906 – 1906	Nathaniel George Bull, junior, draper

*****

Note (b)

	(Lot 456 DP817546)
1992 – 2004	Bosnjak Holdings Pty Limited
1992 – 1992	New South Wales Land and Housing Corporation
	(Lot J2 DP360465)
1990 – 1992	New South Wales Land and Housing Corporation
	(Lot J2 DP360465 – CTVol 5931 Fol 193)
1973 – 1989	New South Wales Land and Housing Corporation
1959 – 1973	Calabro Bros Pty Limited
1949 – 1959	Giovanni Calabro, boot repairer
	(Portion 52 Parish St Luke – Area 45 Acres 2 Roods 26 Perches – CTVol 4305 Fol 69 & 70)
1929 – 1949	Arthur Samuel Gee, master butcher Annie Gee
	(Portion 52 Parish St Luke – Area 45 Acres 2 Roods 26 Perches – CTVol 3034 Fol 165)
1929 – 1929	Jacob Diamond, retired Merchant Mark Harris, retired merchant
1928 – 1929	Edith May Mary Alice Bull
1920 – 1928	Lewis Daniel Bull, gentleman
	(Portion 52 & 50 Parish St Luke – Area 70 Acres 2 Roods 26 Perches – CTVol 2325 Fol 9)
1912 – 1920	Lewis Daniel Bull, gentleman
	(Portion 52 Parish St Luke and other lands – Area 592 Acres 0 Roods 18 Perches – CTVol 1713 Fol 11)
1906 – 1912	Anthony Hordern Bull, general shopkeeper
1906 – 1906	Nathaniel George Bull, junior, draper

*****

Note 2:

Current Search

Folio Identifiers 2/1071647 (title attached)
DP 1071647 (plan attached)
Dated 04th October, 2014
Registered Proprietor:
WESTBUS REGION 3 PTY LIMITED

Title Tree
Lot 2 DP 1071647

Folio Identifiers 2/1071647

Folio Identifier 456/817546

Folio Identifier J2/360465

Certificate of Title Volume 5931 Folio 193

Certificate of Title Volume 4305 Folio's 69 & 70

Certificate of Title Volume 3034 Folio 165

Certificate of Title Volume 2325 Folio 9

Certificate of Title Volume 1713 Folio 11

*****

Summary of Proprietors
Lot 2 DP 1071647

Year	Proprietor
	(Lot 2 DP 1071647)
2005 – todate	Westbus Region 3 Pty Limited
2004 – 2005	Bosnjak Holdings Pty Limited
	(Lot 456 DP817546)
1992 – 2004	Bosnjak Holdings Pty Limited
1992 – 1992	New South Wales Land and Housing Corporation
	(Lot J2 DP360465)
1989 – 1992	New South Wales Land and Housing Corporation
	(Lot J2 DP360465 – CTVol 5931 Fol 193)
1973 – 1989	New South Wales Land and Housing Corporation
1959 – 1973	Calabro Bros Pty Limited
1949 – 1959	Giovanni Calabro, boot repairer
	(Portion 52 Parish St Luke – Area 45 Acres 2 Roods 26 Perches – CTVol 4305 Fol 69 & 70)
1929 – 1949	Arthur Samuel Gee, master butcher Annie Gee
	(Portion 52 Parish St Luke – Area 45 Acres 2 Roods 26 Perches – CTVol 3034 Fol 165)
1929 – 1929	Jacob Diamond, retired Merchant Mark Harris, retired merchant
1928 – 1929	Edith May Mary Alice Bull
1920 – 1928	Lewis Daniel Bull, gentleman
	(Portion 52 & 50 Parish St Luke – Area 70 Acres 2 Roods 26 Perches – CTVol 2325 Fol 9)
1912 – 1920	Lewis Daniel Bull, gentleman
	(Portion 52 Parish St Luke and other lands – Area 592 Acres 0 Roods 18 Perches – CTVol 1713 Fol 11)
1906 – 1912	Anthony Hordern Bull, general shopkeeper
1906 – 1906	Nathaniel George Bull, junior, draper

*****

Land & Property Information

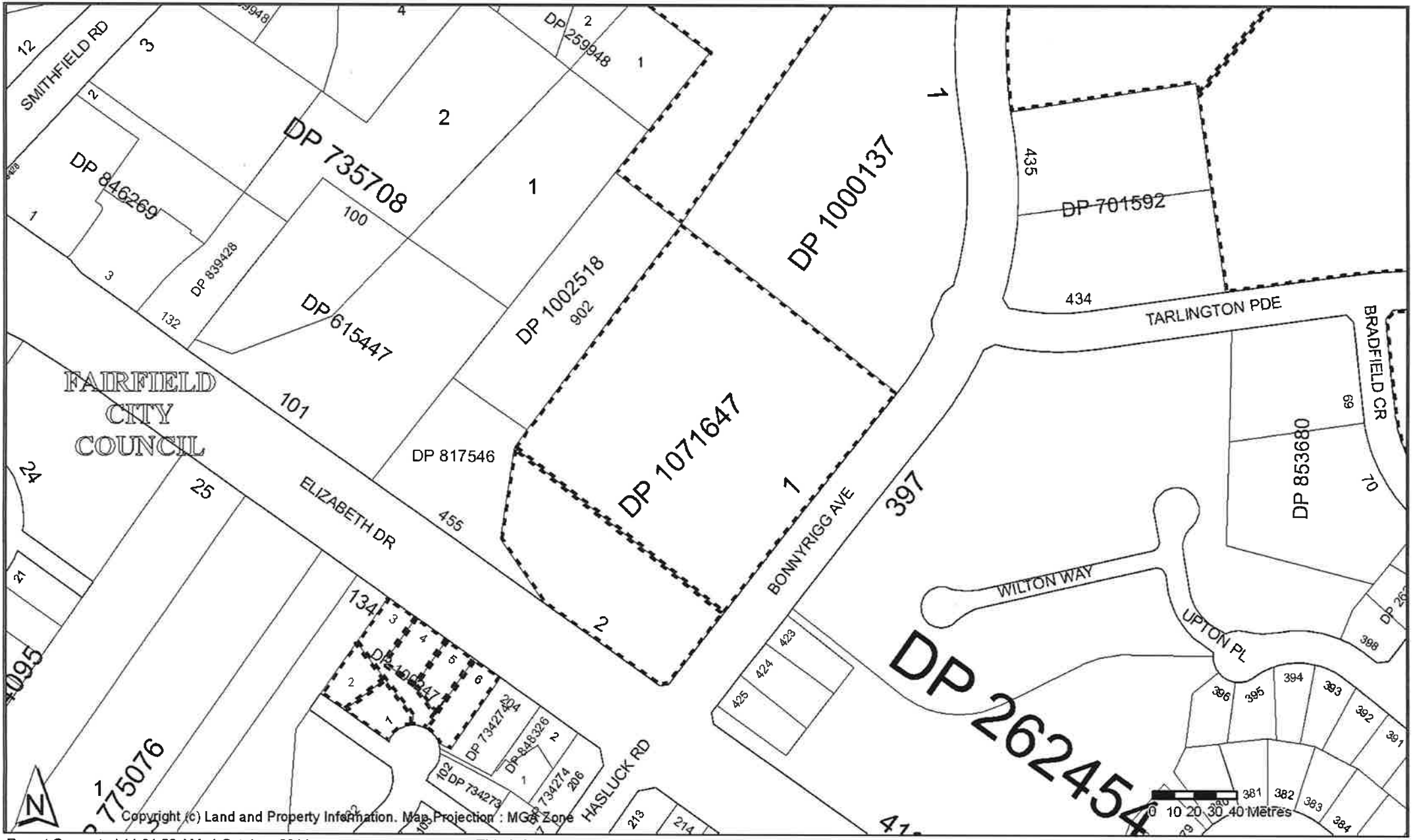
Cadastral Records Enquiry Report

Ref : EIS - Bonnyrigg

Requested Parcel : Lot 1 DP 1071647

Identified Parcel : Lot 1 DP 1071647

Locality : BONNYRIGG **LGA :** FAIRFIELD **Parish :** ST LUKE **County :** CUMBERLAND



Report Generated 11:01:52 AM, 4 October, 2014

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: 1/1071647

SEARCH DATE	TIME	EDITION NO	DATE
4/10/2014	10:52 AM	3	24/11/2011

LAND

LOT 1 IN DEPOSITED PLAN 1071647
AT BONNYRIGG
LOCAL GOVERNMENT AREA FAIRFIELD
PARISH OF ST LUKE COUNTY OF CUMBERLAND
TITLE DIAGRAM DP1071647

FIRST SCHEDULE

WESTBUS REGION 3 PTY LIMITED (T AB918067)

SECOND SCHEDULE (3 NOTIFICATIONS)

1 SUBJECT TO RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S) AFFECTING THE PART SHOWN SO INDICATED IN THE TITLE DIAGRAM
2 6068067 COVENANT AFFECTING THE PART SHOWN SO BURDENED IN THE TITLE DIAGRAM.
3 AG616051 EASEMENT FOR PADMOUNT SUBSTATION 2.75 WIDE AFFECTING THE SITE DESIGNATED (E) IN PLAN WITH AG616051

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
4/10/2014 10:54AM

FOLIO: 1/1071647

First Title(s): VOL 140 FOL 209
Prior Title(s): 456/817546 901/1002518

Recorded	Number	Type of Instrument	C.T. Issue
13/8/2004	DP1071647	DEPOSITED PLAN	FOLIO CREATED EDITION 1
16/11/2005	AB918067	TRANSFER	EDITION 2
24/11/2011	AG616051	TRANSFER GRANTING EASEMENT	EDITION 3

*** END OF SEARCH ***

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
4/10/2014 10:57AM

FOLIO: 901/1002518

First Title(s): VOL 140 FOL 209
Prior Title(s): B/373901

Recorded	Number	Type of Instrument	C.T. Issue
15/6/1999	DP1002518	DEPOSITED PLAN	LOT RECORDED FOLIO NOT CREATED
26/8/1999	6068067	TRANSFER	FOLIO CREATED EDITION 1
20/7/2004	AA813186	DISCHARGE OF MORTGAGE	EDITION 2
13/8/2004	DP1071647	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
4/10/2014 10:58AM

FOLIO: B/373901

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 6390 FOL 228

Recorded	Number	Type of Instrument	C.T. Issue
2/9/1989		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
23/11/1989		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
13/8/1998	5194060	DISCHARGE OF MORTGAGE	
13/8/1998	5194061	CHANGE OF NAME	
13/8/1998	5194062	MORTGAGE	EDITION 1
15/6/1999	DP1002518	DEPOSITED PLAN	
26/8/1999	6068066	DISCHARGE OF MORTGAGE	
26/8/1999	6068067	TRANSFER	FOLIO CANCELLED

*** END OF SEARCH ***

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 2/1071647

SEARCH DATE	TIME	EDITION NO	DATE
4/10/2014	10:53 AM	2	16/11/2005

LAND

LOT 2 IN DEPOSITED PLAN 1071647
AT BONNYRIGG
LOCAL GOVERNMENT AREA FAIRFIELD
PARISH OF ST LUKE COUNTY OF CUMBERLAND
TITLE DIAGRAM DP1071647

FIRST SCHEDULE

WESTBUS REGION 3 PTY LIMITED (T AB918067)

SECOND SCHEDULE (1 NOTIFICATION)

1 DP1071647 RESTRICTION(S) ON THE USE OF LAND

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
4/10/2014 10:55AM

FOLIO: 2/1071647

First Title(s): VOL 140 FOL 209
Prior Title(s): 456/817546 901/1002518

Recorded	Number	Type of Instrument	C.T. Issue
13/8/2004	DP1071647	DEPOSITED PLAN	FOLIO CREATED EDITION 1
16/11/2005	AB918067	TRANSFER	EDITION 2

*** END OF SEARCH ***

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
4/10/2014 10:56AM

FOLIO: 456/817546

First Title(s): VOL 140 FOL 209
Prior Title(s): J2/360465

Recorded	Number	Type of Instrument	C.T. Issue
4/6/1992	DP817546	DEPOSITED PLAN	FOLIO CREATED EDITION 1
15/7/1992	E610001	TRANSFER	EDITION 2
13/8/1998	5194012	MORTGAGE	EDITION 3
20/7/2004	AA813256	DISCHARGE OF MORTGAGE	EDITION 4
13/8/2004	DP1071647	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***

tef:EIS - Bonnyrigg /Src:T
RP 13 STAMP DUTY

Y695029

OFFICE OF STATE REVENUE (N.S.W. TREASURY) 1988/89 $8 NO STAMP DUTY IS PAYABLE ON THIS INSTRUMENT

TRANSFER

REAL PROPERTY ACT, 1900

T

B | 1 of 1 | X | R 1.
$ 56

Torrens Title Reference	If Part Only, Delete Whole and Give Details	Location
DESCRIPTION OF LAND Note (a) VOLUME 9931 FOLIO 193 Ø • VOLUME 5260 FOLIO 142 • VOLUME 5195 FOLIO 240 VOLUME 9258 FOLIO 138 • Ø NOW J2/360465	~~WHOLE~~ PART BEING LOT 7 IN DEPOSITED PLAN 446450 PART BEING LOT 5 IN DEPOSITED PLAN 245617	BONNYRIGG

TRANSFEROR Note (b)

NEW SOUTH WALES LAND AND HOUSING CORPORATION

ESTATE Note (c)

(the abovenamed TRANSFEROR) hereby acknowledges receipt of the consideration of $ 87,000.00 and transfers an estate in fee simple in the land above described to the TRANSFEREE

TRANSFEREE Note (d)

THE ROADS AND TRAFFIC AUTHORITY.

OFFICE USE ONLY

OVER.

TENANCY Note (e)

~~XXXXXXXXXXXXXXXXXXXXXXXXXX~~

PRIOR ENCUMBRANCES Note (f)

subject to the following PRIOR ENCUMBRANCES 1. ..... 2. ..... 3. .....

DATE 16 OCTOBER 1989.

D

We hereby certify this dealing to be correct for the purposes of the Real Property Act, 1900.

EXECUTION Note (g)

Signed in my presence by the transferor who is personally known to me

Signature of Witness

T. WIGNESWARAN
SENIOR CONVEYANCING OFFICER
Name of Witness (BLOCK LETTERS)

23-31, MOORE ST, LIVERPOOL
Address and occupation of Witness

SIGNED by me GEOFFREY HOWARTH as Delegate of the New South Wales Land and Housing Corporation and I hereby certify that I have no notice of the revocation of such delegation.

Signature of TRANSFEROR

Note (g)

Signed in my presence by the transferee who is personally known to me

Signature of Witness

Name of Witness (BLOCK LETTERS)

BRENDEN DAVID PEACE
CLERK
309 CASTLEREAGH STREET SYDNEY

Address and occupation of Witness

Signature of Transferee

THU MAE
SOLICITOR
SYDNEY

TO BE COMPLETED BY LODGING PARTY Notes (h) and (i)

LODGED BY ROADS + TRAFFIC AUTHORITY OF NSW
260 ELIZABETH ST, SYDNEY
DX 13 SYDNEY
MR PEACE 218-6875.
Ref 156.1722
Delivery Box Number 556X

LOCATION OF DOCUMENTS

CT	OTHER	
		Herewith
/		In L.T.O. with
		Produced by 4116Q

OFFICE USE ONLY

Checked	Passed	REGISTERED - -19
EBT /	RFS	29 MAR 1990
Signed	Extra Fee	
RAL KW		

Secondary Directions

Delivery Directions 5260-142 / 5195-240 / 9258-138 / J2/360465 | CT NO CT. 4116Q

4 RAS

Man. endt complete 28/3/90

RP 13

INSTRUCTIONS FOR COMPLETION

This dealing should be marked by the Stamp Duties Division, Department of Finance before lodgment by hand at the Land Titles Office.

Typewriting and handwriting should be clear, legible and in permanent dense black or dark blue non copying ink.

Alterations are not to be made by erasure; the words rejected are to be ruled through and initialled by the parties to the dealing in the left hand margin.

If the space provided is insufficient, additional sheets of the same size and quality of paper and having the same margins as this form should be used. Each additional sheet must be identified as an annexure and signed by the parties and the attesting witnesses.

If it is intended to create easements, covenants, &c., use forms RP13A, RP13B, RP13C as appropriate.

Rule up all blanks.

The following instructions relate to the SIDE NOTES on the form.

(a) Description of land:
- (i) TORRENS TITLE REFERENCE.—For a manual reference insert the Volume and Folio (e.g., Vol 8514 Fol 126) – For a computer folio insert the folio identifier (e.g., 12 7019241) Title references should be listed in numerical sequence.
- (ii) PART/WHOLE.—If part only of the land in the folio of the Register is being transferred, delete the word "WHOLE" and insert the lot and plan number, portion, &c. See also sections 327 and 327AA of the Local Government Act, 1919.
- (iii) LOCATION.—Insert the locality shown on the Certificate of Title/Crown Grant, e.g., at Chullora. If the locality is not shown, insert the Parish and County, e.g., Ph. Lismore Co. Rous.

(b) Show the full name of the transferor(s).

(c) If the estate being transferred is a lesser estate than an estate in fee simple, delete "fee simple" and insert appropriate estate.

(d) Show the full name, address and occupation or description of the transferee(s).

(e) Delete if only one transferee. If more than one transferee, delete either "joint tenants" or "tenants in common", and, if the transferees hold as tenants in common, state the shares in which they hold.

(f) In the memorandum of prior encumbrances, state only the registered number of any mortgage, lease, charge or writ to which this dealing is subject.

(g) Execution:

GENERALLY
- (i) Should there by insufficient space for execution of this dealing, use an annexure sheet.
- (ii) The certificate of correctness under the Real Property Act, 1900, must be signed by all parties to the transfer, each party to execute the dealing in the presence of an adult witness, not being a party to the dealing, to whom he/she is personally known. The solicitor for the transferee may sign the certificate on behalf of the transferee, the solicitor's name (not that of his/her firm), to be typewritten or printed adjacent to his/her signature. Any person falsely or negligently certifying is liable to the penalties provided by section 117 of the Real Property Act, 1900.

ATTORNEY
- (iii) If the transfer is executed by an attorney for the transferor/transferee pursuant to a registered power of attorney, the form of attestation must set out the full name of the attorney, and the form of execution must indicate the source of his/her authority, e.g., "AB by his/her attorney (or receiver or delegate, as the case may be) XY pursuant to power of attorney registered Book No. , and I declare that I have no notice of the revocation of the said power of attorney".

AUTHORITY
- (iv) If the transfer is executed pursuant to an authority (other than specified in (iii)) the form of execution must indicate the statutory, judicial or other authority pursuant to which the transfer has been executed.

CORPORATION
- (v) If the transfer is executed by a corporation under seal, the form of execution should include a statement that the seal has been properly affixed, e.g., in accordance with the Articles of Association of the corporation. Each person attesting the affixing of the seal must state his/her position (e.g., director, secretary) in the corporation.

(h) Insert the name, postal address, Document Exchange reference, telephone number and delivery box number of the lodging party.

(i) The lodging party is to complete the LOCATION OF DOCUMENTS panel. Place a tick in the appropriate box to indicate the whereabouts of the Certificate of Title. List, in an abbreviated form, other documents lodged, e.g., stat. dec. for statutory declaration, pbte for probate, L/A. for letters of administration, &c.

OFFICE USE ONLY

FIRST SCHEDULE DIRECTIONS

(A) FOLIO IDENTIFIER	(B) DIRECTION	(C) NAME
5195-240 5260-142	5	ROADS AND TRAFFIC AUTHORITY OF NEW SOUTH WALES as to the residue being part of lot 5 in DP245617
9258-138	PROP	NEW SOUTH WALES LAND AND HOUSING CORPORATION as to the whole excluding part of lot 5 in DP245617 and ROADS AND TRAFFIC AUTHORITY OF NEW SOUTH WALES as to the said part of lot 5 in DP245617.
~~J2/360465~~	~~CAN~~	~~NEW SOUTH WALES LAND AND HOUSING CORPORATION as to the whole excluding lot 7 in DP446450 and ROADS AND TRAFFIC AUTHORITY OF NEW SOUTH WALES as to the said lot 7 in DP~~

SECOND SCHEDULE AND OTHER DIRECTIONS

(D) FOLIO IDENTIFIER	(E) DIRECTION	(F) NOTFN TYPE	(G) DEALING NUMBER	(H) DETAILS
5195-240 5260-142 9258-138	ON	AA		Lot 5 in DP245617 in road.
J2/360465	ON	AA		~~Lot 7 in DP446450 in road.~~ Land excludes lot 7 in DP446450.

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
4/10/2014 10:58AM

FOLIO: J2/360465

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 5931 FOL 193

Recorded	Number	Type of Instrument	C.T. Issue
2/9/1989		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
20/11/1989		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
29/3/1990	Y695029	TRANSFER	EDITION 1
7/5/1991	Z603800	TRANSFER GRANTING EASEMENT	EDITION 2
4/6/1992	DP817546	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***

RP13

[redacted]

TRANSFER

Real Property Act, 1900

E 610001 U

Office of State Revenue use only

220192 4728 04 20037559702 $2.00

OFFICE OF STATE REVENUE (N.S.W. TREASURY) S13 APPLICATION NOTED

(A) **LAND TRANSFERRED**

Show no more than 20 References to Title
If appropriate, specify the share transferred

PART J2/360456
NOW BEING WHOLE ~~104~~ 456/ 817546

(B) **LODGED BY**

L.T.O. Box	Name, Address or DX and Telephone
570E	MARSDENS
	REFERENCE (max. 15 characters): JHM:LD

(C) **TRANSFEROR** NEW SOUTH WALES LAND AND HOUSING CORPORATION

(D) acknowledges receipt of the consideration of $1,760,000.00

and as regards the land specified above transfers to the transferee an estate in fee simple

(E) subject to the following **ENCUMBRANCES** 1. ..... 2. ..... 3. .....

(F) **TRANSFEREE**

T

(G) BOSNJAK HOLDINGS PTY. LIMITED *A.C.N. 000 341 435*

as joint tenants/tenants in common

(H) We certify this dealing correct for the purposes of the Real Property Act, 1900. **DATE OF EXECUTION** 11-6-92

Signed in my presence by ~~the transferor~~ KIM FRANCIS WATSON who is personally known to me.

Kim Watson

.....
Signature of Witness

J. HOLD
Name of Witness (BLOCK LETTERS)

23-31 MOORE ST LIVERPOOL
Address of Witness

SIGNED by me KIM FRANCIS WATSON as Delegate of the New South Wales Land and Housing Corporation and I hereby certify that I have no notice of the revocation of such delegation.

.....
~~Signature of Transferor~~

Signed in my presence by the transferee who is personally known to me.

.....
Signature of Witness

.....
Name of Witness (BLOCK LETTERS)

.....
Address of Witness

.....
Solicitor for ~~Signature of~~ Transferee
J.H. MARSDEN

☞ INSTRUCTIONS FOR FILLING OUT THIS FORM ARE AVAILABLE FROM THE LAND TITLES OFFICE

CHECKED BY (office use only)

Rig 12 EM 23

Licence: 026CN/0617/96

TRANSFER
including ~~easement~~ cove
New South Wales
Real Property Act 1900

0006007G

Office of State Revenue use only

OFFICE OF STATE REVENUE (N.S.W. TREASURY)
100/07 DS
NO STAMP DUTY IS PAYABLE ON THIS INSTRUMENT

(A) LAND TRANSFERRED
If appropriate, specify the share transferred.

902/1002518
being part R/373901

(B) TENEMENTS

Servient (land burdened)	~~Dominant (land benefited)~~ Authority Benefited
901/1002518	The Minister administering the Environmental Planning & Assessment Act, 1979

(C) LODGED BY

LTO Box	Name, Address or DX and Telephone
864L	TRESS, COCKS & MADDOX 135 KING STREET SYDNEY, DX 123 SYDNEY PHONE: 9221 2744 REFERENCE (optional): RAL 985329 864L

(D) TRANSFEROR BOSNJAK HOLDINGS PTY LIMITED (ACN 000 341 435)

(E) acknowledges receipt of the consideration of $250,000.00 transfers to the transferee

(F) an estate in fee simple and the transferor
(G)
- ~~grants an easement as set out in Schedule One hereto~~
- ~~reserves an easement as set out in Schedule Two hereto~~
- and the transferee ~~or~~ covenants with the transferor ~~or~~ in the terms set out in schedule three hereto

(H) Encumbrances (if applicable) 1. 2. 3. 4.

(I) TRANSFEREE

T	**The Minister administering the Environmental Planning & Assessment Act, 1979**

(J) ~~TENANCY~~: OVER

(K) We certify this dealing correct for the purposes of the Real Property Act 1900. DATE 29 July 1999

Signed in my presence by the transferor who is personally known to me.

THE COMMON SEAL of BOSNJAK HOLDINGS PTY LIMITED was hereunto affixed by authority of the Board and in the presence of:

Bosnjak Holdings Pty Ltd A.C.N. 000 341 435 COMMON SEAL

Signature of Witness

Name of Witness (BLOCK LETTERS)

Address of Witness

ROBERT ASH Secretary

SLAVKO JAMES JOSEPH BOSNJAK Director

Signature of Transferor

Signed in my presence by the transferee who is personally known to me.

Signature of Witness

Name of Witness (BLOCK LETTERS)

Address of Witness

Richard Lissenden.

Signature of Transferee's Solicitor - RICHARD LISSENDEN

CHECKED BY (LTO use)

af:EIS - Bonnyrigg /Src:T

Form: 97-10CN
Licence: 10V/0167/95
Printed: 0897LTO

Instructions for filling out this form are available from the Land Titles Office

Application to Record

CHANGE OF NA

New South Wales
Real Property Act 1900
Crown Land Acts 1989
Western Lands Act 1901

5194061P

(A) **LAND**

Volume 6390 Folio 228 NOW BEING 8/373901

(B) **REGISTERED DEALING** if applicable.

(C) **LODGED BY**

LTO Box	Name, Address or DX and Telephone
45A	National Australia Bank Limited 255 George Street, Sydney 25[illegible]1111 FAX 237-1284 Reference (15 character maximum): NCO528

(D) **REGISTERED PROPRIETOR** whose name is to be changed.

BOSNJACK HOLDINGS PTY LIMITED
A.C.N. 000 341 435

(E) **NEW NAME** in full.

CN	BOSNJAK HOLDINGS PTY LIMITED A.C.N. 000 341 435

(F) I, the registered proprietor, apply to have my new name recorded in the Register in respect of the above land/registered dealing.

(G) **STATUTORY DECLARATION BY THE APPLICANT**

I, *[new name]* Slavko James Joseph Bosnjak, solemnly and sincerely declare that

1. I am identical with the registered proprietor referred to above;
2. On ..... 19 ..... at .....
   in the State of ..... I married .....;
3. I am a Director of Bosnjak Holdings Pty Limited. Original Transfer lodged had the company's name spelt inoorrectly.

I make this solemn declaration conscientiously believing the same to be true and by virtue of the Oaths Act 1900, and I certify this application correct for the purposes of the Real Property Act 1900.

Made and subscribed at Sydney in the State of New South Wales,
on 22 June 1998 in the presence of

Signature of Witness

JAN REDFERN.
Name of Witness (BLOCK LETTERS)

1 MACQUARIE PLACE, SYDNEY.
Address and Qualification of Witness
SOLICITOR.

Signature of Applicant

Checked by (LTO use) .....

STATUTORY DECLARATION
Refinancing Exemption under Section 84CAA of the Stamp Duties Act

I/We Slavko James Joseph Bosnjak of 1 Booralla Road, EDENSOR PARK NSW 2132 apply, under and subject to the Stamp Duties Act 1920, for the stamp duty concession provided under Section 84CAA of the Act and do hereby solemnly and sincerely declare as follows:

1. I am a duly authorised Director of Bosnjak Holdings Pty Limited A.C.N. 000 341 435

2. I wish to confirm that the name listed in the First Schedule on Certificate of Title Volume 6390 Folio 228 (now being Folio Identifier B/373901) as Bosnjack Holdings Pty Limited is one in the same company as Bosnjak Holdings Pty Limited.

AND I/We make this solemn declaration conscientiously believing the same to be true and by virtue of the provisions of the Oaths Act 1900.

MADE AND SIGNED at Parramatta this 19th day of March 1998 before me:

C. DeBono JP
Witness (J.P/Solicitor)

CHARLES DEBONO

(Signature/s of Declarant/s)

(Signature/s of Declarant/s)

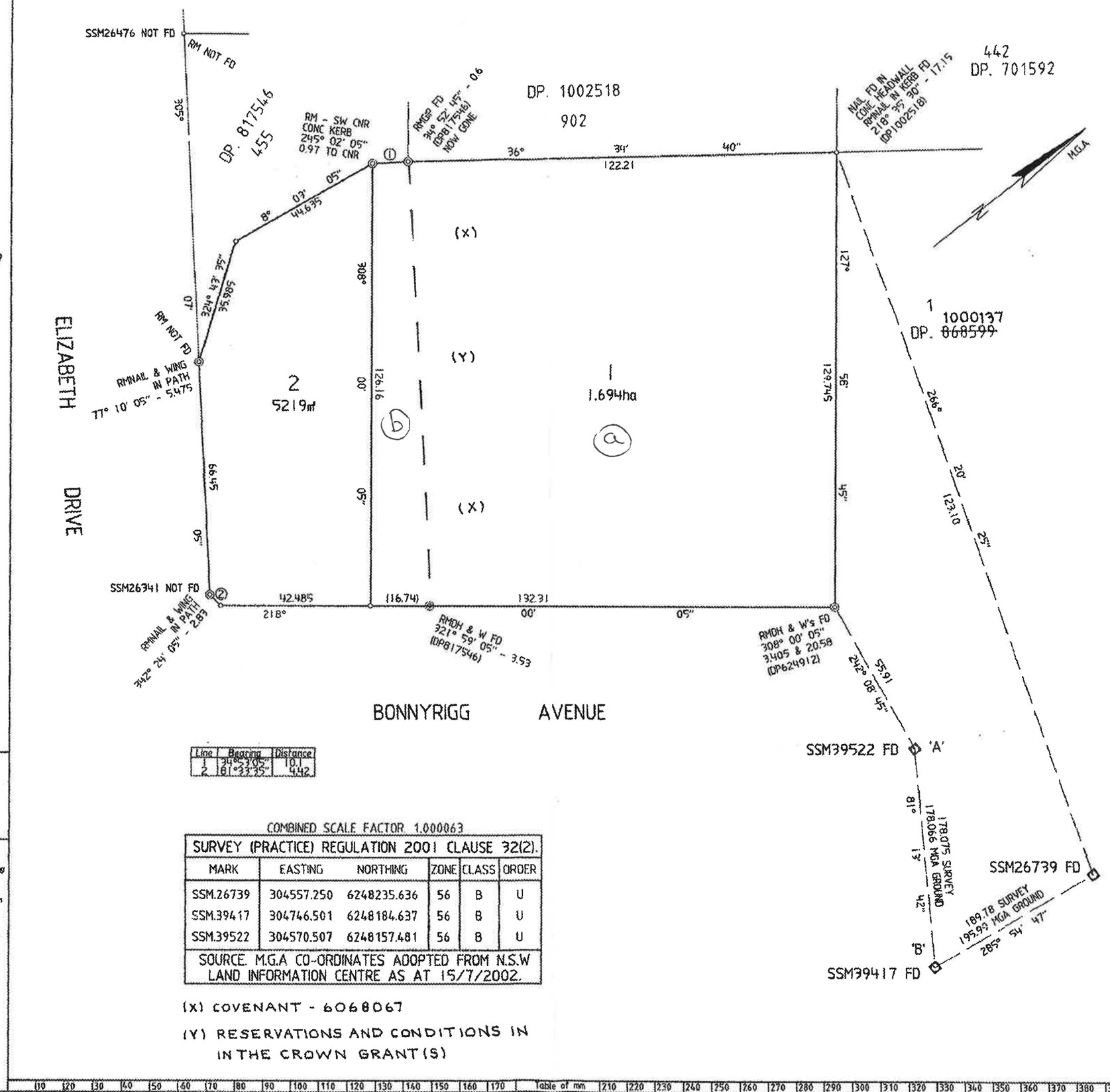
PLAN FORM 2 — Plan Drawing only to appear in this space

SIGNATURE AND SEALS ONLY.

Bonnyrigg Holdings Pty Ltd ABN 000 201 267

KEVIN HARRIS
COMPANY SECRETARY

O. ECKFORD
MANAGING DIRECTOR



Line	Bearing	Distance
1	34° 52' 05"	10.1
2	81° 33' 35"	4.42

COMBINED SCALE FACTOR 1.000063

SURVEY (PRACTICE) REGULATION 2001 CLAUSE 32(2).

MARK	EASTING	NORTHING	ZONE	CLASS	ORDER
SSM.26739	304557.250	6248235.636	56	B	U
SSM.39417	304746.501	6248184.637	56	B	U
SSM.39522	304570.507	6248157.481	56	B	U

SOURCE. M.G.A CO-ORDINATES ADOPTED FROM N.S.W LAND INFORMATION CENTRE AS AT 15/7/2002.

(X) COVENANT - 6068067

(Y) RESERVATIONS AND CONDITIONS IN IN THE CROWN GRANT(S)

Crown Lands Office Approval

PLAN APPROVED ..... Authorised Officer

Land District .....

Paper No. .....

Field Book ..... pages .....

Subdivision Certificate

I hereby certify that the provisions of s.109J of the Environmental Planning and Assessment Act 1979 have been satisfied in relation to the proposed SUBDIVISION set out herein

* (Insert "subdivision" or "new road")

* Authorised Person/General Manager/Accredited Certifier

(insert "new road", "subdivision" or "consolidation") set out herein

Consent Authority FAIRFIELD COUNCIL

Date of Endorsement 14.5.2004

Accreditation no .....

Subdivision Certificate no 8482

File no. DA 1490/2001

* In the plan is to be lodged electronically in the land Titles Office should include a signature in an electronic or digital format approved by the Registrar-General.

*Delete whichever is inapplicable

DP1071647

Registered AW 13.08.2004 *

Title System TORRENS

Purpose SUBDIVISION

Ref.Map. U8245-63

Last Plan. DP817546, DP1002518

PLAN OF SUBDIVISION OF LOT 901 IN DP.1002518 AND LOT 456 IN DP.817546

lengths are in metres. Reduction Ratio 1:800

L.G.A. FAIRFIELD

Locality. BONNYRIGG

Parish ST. LUKE

County. CUMBERLAND

This is sheet 1 of my plan in ~~sheets~~. (Delete if inapplicable).

Surveyors (Practice) Regulation 2001

I JOHN HOWIE of BRITTEN AND ASSOCIATES of P.O.BOX 171A FAIRFIELD HEIGHTS NSW 2165

a surveyor registered under the Surveyors Act 1929, certify that the survey represented in this plan is accurate, has been made in accordance with the Surveyors (Practice) Regulation 2001 and was completed on 15th JULY 2002

The survey relates to LOTS 1 AND 2

(specify the land actually surveyed, or specify any land shown in the plan that is not the subject of the survey)

Signature ..... Dated 16/7/02

Surveyor registered under the Surveyors Act 1929

Datum Line 'A' - 'B'

Type Urban/Rural

Plans used in preparation of survey/compilation.

DP. 624912
DP. 817546
DP. 1002518

PANEL FOR USE ONLY for statements of intention to dedicate public roads, to create public reserves, drainage reserves, easements, restrictions on the use of land or positive covenants

PURSUANT TO SEC. 88B OF THE CONVEYANCING ACT IT IS INTENDED TO CREATE:

1. RESTRICTION ON USE OF LAND.

* OFFICE USE ONLY

SURVEYOR'S REFERENCE. 8370C - CHECK LIST - ORIGINAL SIGNED IN BLUE INK. WARNING. CREASING OR FOLDING WILL LEAD TO REJECTION

Appendix C4: Council Section 149 Certificates

PB

16 OCT 2014

FairfieldCity
Celebrating diversity

Fairfield City Council, Administration Centre, 86 Avoca Road, Wakeley 2176
Tel: (02) 9725 0222 Fax: (02) 9725 4249 ABN: 83 140 439 239
All communications to:
Fairfield City Council, PO Box 21, Fairfield NSW 1860
Email address: mail@fairfieldcity.nsw.gov.au

14 October 2014

Environmental Investigation Services (EIS)
115 Wicks Road
MACQUARIE PARK NSW 2113

Dear Sir/ Madam

Following is your planning certificate as requested. Should you have any further queries please contact Council's City Development Group on (02) 9725 0821.

PLANNING CERTIFICATE
(under section 149 of the Environmental Planning and Assessment Act 1979 as amended)

Applicant:	**Environmental Investigation Services (EIS)**
Certificate No.:	**29990/2014**
Applicant's Reference:	**Mr Para Bokalawela**
Issue Date:	**14 October 2014**
Receipt No.:	**2090969**

PROPERTY ADDRESS:	**1-9 Bonnyrigg Avenue BONNYRIGG**
LEGAL DESCRIPTION:	**Lot: 2 DP: 1071647**

Elizabeth Workman

for
Alan Young
City Manager
Fairfield City Council

PLEASE NOTE: This is page 1 of 21. Should this certificate or any subsequent copy not contain this many pages, please confirm with council prior to acting on the basis of information contained in this certificate.

Information provided under
Section 149(2) of the Environmental Planning and Assessment Act 1979

Notes:

(1) The following prescribed matters may apply to the land to which this certificate relates.

(2) Where this certificate refers to a specific allotment (or allotments) within a strata plan, the certificate is issued for the whole of the land within the strata plan, not just the specific allotment(s) referred to, and any information contained in the certificate may relate to the whole, or any part, of the strata plan.

(3) The following information is provided pursuant to Section 149(2) of the Environmental Planning and Assessment Act 1979 as prescribed by Schedule 4 of the Environmental Planning and Assessment Regulation 2000 and is applicable as at the date of this certificate.

(4) Information provided in this certificate should be interpreted in conjunction with the relevant plans, policies and documents held at Council. In order to obtain copies of these documents you may purchase them by either contacting Council's City Development Group on (02) 9725 0848 or attending Council's Administration Centre at 86 Avoca Road, Wakeley.

---

1. Names of relevant planning instruments and DCPs

(1) The name of each environmental planning instrument that applies to the carrying out of development on the land.

State Environmental Planning Policies (SEPP)

SEPP (Major Development) 2005

SEPP (Miscellaneous Consent Provisions) 2007

SEPP No. 50 - Canal Estate Development

SEPP No. 19 - Bushland in Urban Areas

SEPP No. 32 - Urban Consolidation (Redevelopment of Urban Land)

SEPP (State and Regional Development) 2011

SEPP No. 33 - Hazardous and Offensive Development

SEPP No. 64 - Advertising and Signage

SEPP (Repeal of Concurrence and Referral Provisions) 2008

SEPP No. 55 - Remediation of Land

SEPP No. 65 - Design Quality of Residential Flat Development

SEPP (Affordable Rental Housing) 2009

SEPP (Mining, Petroleum Production and Extractive Industries) 2007

SEPP No. 62 - Sustainable Aquaculture

SEPP (Infrastructure) 2007

SEPP (Exempt and Complying Development Codes) 2008

Regional Environmental Plans (Deemed SEPP)

Sydney Regional Environmental Plan No. 9 - Extractive Industry (No 2-1995)

The Greater Metropolitan Regional Environmental Plan No. 2 - Georges River Catchment

Local Environmental Plans (LEP)

Fairfield Local Environmental Plan 1994
Government Gazette No. 104 - 12th August 1994.
As Amended.

NOTE: Fairfield Local Environmental Plan 2013 DOES NOT APPLY to the land due to Deferral of Bonnyrigg Town Centre area. Further details in relation to the deferred matter can be obtained under a 149 part (5) certificate.

(2) The name of each proposed environmental planning instrument that will apply to the carrying out of development on the land and that is or has been the subject of community consultation or on public exhibition under the Act (unless the Director-General has notified the council that the making of the proposed instrument has been deferred indefinitely or has not been approved)

Draft SEPP (Competition) 2010

(3) The name of each development control plan that applies to the carrying out of development on the land.

The land is subject to adopted Development Control Plans. (See attached schedule).

(4) In this clause, proposed environmental planning instrument includes a planning proposal for a LEP or a draft environmental planning instrument.

2. Zoning and land use under relevant LEP

For each environmental planning instrument or proposed instrument referred to in clause 1 (other than a SEPP or proposed SEPP) that includes the land in any zone (however described):

Under Fairfield Local Environmental Plan 2013, this land is a deferred matter. The provisions of Fairfield Local Environmental Plan 1994 apply to the site until such time as a Planning Proposal to consider application of relevant provisions of the Standard LEP Order to the site has been prepared. Please contact Council on 9725 0222 for further information.

FAIRFIELD LOCAL ENVIRONMENTAL PLAN 1994

(a) WHAT IS THE IDENTITY OF THE ZONE?

Zone 4(c) Special Industrial

(b) WHAT IS PERMITTED WITHOUT DEVELOPMENT CONSENT?

Nil.

(c) WHAT IS PERMITTED ONLY WITH DEVELOPMENT CONSENT?

Any purpose other than a purpose included in item (d).

(d) WHAT IS PROHIBITED?
Abattoirs, aged and disabled person's housing, amusement parks, animal establishments, brothels, business premises, camping grounds and caravan parks, dwelling houses (except caretaker's dwelling houses), entertainment facilities, extractive industry, forestry, gaming taverns, generating works, group homes, hazardous industry, hazardous storage establishments, health consulting rooms, helicopter landing sites, heliports, home businesses, hospitals, hostels, hotels, industry, hazardous storage establishments, health consulting rooms, helicopter landing sites, heliports, home businesses, hospitals, hostels, hotels, industry, institutions, intensive agriculture, junkyards, medical centres, mines, multi-unit housing, offensive industry, offensive storage establishments, residential flat buildings,

roadside stalls, sawmills, serviced apartments, shops (except take-away food shops), stock and sales yards, transport depots.

Additional uses that are permitted with development consent.

Bus depot.

Clause 25H of Fairfield LEP 1994 applies to the land and, subject to development consent, allows multi-unit housing, residential flat buildings and two of the following, incorporated within the ground or first floors of a building (for example, a residential flat building): (i) business premises; (ii) community facilities; (iii) dwellings; (iv) entertainment facilities; (v) refreshment rooms; (vi) shops.

(e) Whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling house on the land and, if so, the minimum land dimensions so fixed.

No development standards that fix the minimum land dimensions for the erection of a dwelling house apply to this land. Controls in other policies and plans may apply.

(f) Whether the land includes or comprises critical habitat.

No.

(g) Whether the land is in a conservation area (however described).

No

(h) Whether an item of environmental heritage (however described) is situated on the land.

No.

Attention is drawn however to Clause 31 of Fairfield Local Environmental Plan 1994: "When determining an application for consent to carry out development on land in the vicinity of a heritage item, the Council must take into consideration the likely effect of the proposed development on the heritage significance of that heritage item and on its setting."

2A. Zoning and land use under State Environmental Planning Policy (Sydney Region Growth Centres) 2006

Not applicable.

3. **Complying development**

(1) The extent to which the land is land on which complying development may be carried out under each of the codes for complying development because of the provisions of clauses 1.17A (1) (c) to (e), (2), (3) and (4) 1.18 (1) (c3) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

General Housing Code:
No. The General Housing Code does not apply to this land.

Housing Alterations Code:
Complying development under the Housing Alterations Code may be carried out on the land.

Commercial and Industrial Alterations Code:
Complying development under the Commercial and Industrial Alterations Code may be carried out on the land.

Commercial and Industrial (New Buildings and Additions) Code:
Complying Development under the Commercial and Industrial (New Buildings and Additions) Code may be carried out on the land.

Subdivision Code:
Complying development under the Subdivision Code may be carried out on the land.

Rural Housing Code:
No. The Rural Housing Code does not apply to this land.

General Development Code:
Complying development under the General Development Code may be carried out on the land.

Demolition Code:
Complying development under the Demolition Code may be carried out on the land.

Fire Safety Code:
Complying development under the Fire Safety Code may be carried out on the land.

(2) The extent to which complying development may not be carried out on that land because of the provisions of clauses 1.17A (1) (c) to (e), (2), (3) and (4), 1.18 (1) (c3) and 1.19 of that Policy and the reasons why it may not be carried out under those clauses.

Note: The General Housing Code does not apply to all or part of the land.

Note: The Rural Housing Code does not apply to all or part of the land.

(3) If the council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land, a statement that a restriction applies to the land, but it may not apply to all of the land, and that council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land.

Council does not have any relevant statement to make in relation to any further restrictions that may apply to complying development being carried out on the land. All information in relation to the extent that complying development can be carried out on the land is provided under Part 3(1) & (2) of this certificate.

Note: Clause 3 refers only to land based exclusions as listed in Clauses 1.17A (1)(c) to (e), (2), (3) and (4), 1.18 (1) (c3) and 1.19 of the SEPP (Exempt and Complying Development Codes) 2008. To be complying development, the development must be complying development that meets the standards and other requirements specified for that development as required by the SEPP. Please contact your accredited certifier or Council for further information.

4. Coastal Protection

Whether or not the land is affected by the operation of section 38 or 39 of the *Coastal Protection Act* 1979, but only to the extent that the council has been notified by the Department of Public Works.

No, this land is not affected.

4A Information relating to beaches and coasts

(1) Whether an order has been made under Part 4D of the Coastal Protection Act 1979 in relation to emergency coastal protection works (within the meaning of that Act) on the land (or on public land adjacent to that land), except where the council is satisfied that such an order has been fully complied with.

No order under Part 4D of the *Coastal Protection Act 1979*, has been made.

(2)

1. whether the council has been notified under section 55X of the Coastal Protection Act 1979 that emergency coastal protection works (within the meaning of that Act) have been placed on the land (or on public land adjacent to that land), and

Council has not received any such notification.

2. if works have been so placed—whether the council is satisfied that the works have been removed and the land restored in accordance with that Act.

Not applicable.

(3) such information (if any) as is required by the regulations under section 56B of the Coastal Protection Act 1979 to be included in the planning certificate and of which the council has been notified pursuant to those regulations.

No such information is available.

4B Annual charges for coastal protection services under *Local Government Act 1993.*

Whether the owner (or any previous owner) of the land has consented in writing to the land being subject to annual charges under section 496B of the Local Government Act 1993 for coastal protection services that relate to existing coastal protection works (within the meaning of section 553B of that Act).
Note. "Existing coastal protection works" are works to reduce the impact of coastal hazards on land (such as seawalls, revetments, groynes and beach nourishment) that existed before the commencement of section 553B of the Local Government Act 1993.

No annual charges under section 553B of the *Local Government Act 1993*, are applicable to the land.

5. Mine Subsidence

Whether or not the land is proclaimed to be a mine subsidence district within the meaning of section 15 of the *Mine Subsidence Compensation Act* 1961.

No, this land is not affected.

6. Road widening and road realignment

Whether or not the land is affected by any road widening or road realignment under Division 2 or Part 3 of the *Roads Act* 1993, any environmental planning instrument, or any resolution of the council.

Fairfield Local Environmental Plan 2013 does not apply to the land.

The land is not affected by any road widening proposal under Division 2 of Part 3 of the Roads Act or Fairfield Local Environmental Plan 1994.

The land is affected by provisions restricting vehicular access. For further details contact Council's City Services Department.

7. **Council and other public authority policies on hazard risk restrictions**

Whether or not the land is affected by a policy:

(b) adopted by the council, or

(c) adopted by any other public authority and notified to the council for the express purpose of its adoption by that authority being referred to in planning certificates issued by the council,

that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulfate soils or any other risk, other than flooding.

Council's policies on hazard risk restrictions are as follows:

(i) Landslip

Under Fairfield Local Environmental Plan 2013, the land is not affected by a policy adopted by Council or adopted by any other public authority and notified to Council (for the express purpose of its adoption by that authority being referred to in Planning Certificates issued by Council) that restricts development on the land because of the likelihood of landslide risk or subsidence.

(ii) Bushfire

Council has been supplied by the NSW Rural Fire Service with a hazard map for the purposes of a bush fire risk management plan applying to land within the Fairfield local government area. Based on that map, it appears the land referred to in this certificate is not bush fire prone as defined in section 4 of the Environmental Planning and Assessment Act 1979.

(iii) Tidal Inundation

The land is not affected by a policy adopted by Council or adopted by any other public authority and notified to Council (for the express purpose of its adoption by that authority being referred to in Planning Certificates issued by Council) that restricts development on the land because of the likelihood of tidal inundation.

(iv) Subsidence

No, the land is not so affected

(v) Acid Sulfate Soils

The land is not affected by a policy adopted by Council or adopted by any other public authority and notified to Council (for the express purpose of its adoption by that authority being referred to in Planning Certificates issued by Council) that restricts development on the land because of the likelihood of acid sulfate soils.

(vi) Any other risks

No, the land is not so affected

7A. Flood related development controls information

1. Whether or not development on that land or part of the land for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) is subject to flood related development controls.

This land is subject to the flood related development controls included in the Fairfield City-Wide Development Control Plan 2013 in relation to the above development types. These controls apply (either directly, or indirectly by reference in site-specific DCPs) to all land in the Fairfield Local Government Area.

Generally, development controls will apply to development if the land (or part of the land) is within the floodplain or is affected by overland flooding.

This parcel is within the floodplain and identified as being partly within a Low flood risk precinct and partly not affected by mainstream flooding. The term mainstream flooding means inundation of normally dry land occurring when water overflows the natural or artificial banks of a stream, river, estuary, lake or dam. The term Low Flood Risk Precinct is defined as all land within the floodplain (i.e. within the extent of the probable maximum flood) but not identified within either a High Flood Risk or a Medium Flood Risk Precinct. The Low Flood Risk Precinct is that area above the 100-year flood event.

Part or all of this land is within the floodplain and may be affected by local overland flooding. This parcel is not in an area in which Council's current programme of overland flood risk mapping has been completed. The term local overland flooding means inundation by local runoff rather than overbank discharge from a stream, river, estuary, lake or dam.

2. Whether or not development on that land or part of the land for any other purpose is subject to flood related development controls.

This land is subject to the flood related development controls included in the Fairfield City-Wide Development Control Plan 2013 in relation to the above development types. These controls apply (either directly, or indirectly by reference in site-specific DCPs) to all land in the Fairfield Local Government Area.

Generally, development controls will apply to development if the land (or part of the land) is within the floodplain or is affected by overland flooding.

This parcel is within the floodplain and identified as being partly within a Low flood risk precinct and partly not affected by mainstream flooding. The term mainstream flooding means inundation of normally dry land occurring when water overflows the natural or artificial banks of a stream, river, estuary, lake or dam. The term Low Flood Risk Precinct is defined as all land within the floodplain (i.e. within the extent of the probable maximum flood) but not identified within either a High Flood Risk or a Medium Flood Risk Precinct. The Low Flood Risk Precinct is that area above the 100-year flood event.

Part or all of this land is within the floodplain and may be affected by local overland flooding. This parcel is not in an area in which Council's current programme of overland flood risk mapping has been completed. The term local overland flooding means inundation by local runoff rather than overbank discharge from a stream, river, estuary, lake or dam.

The flood information is the current information to date. However, Council reviews flood studies on an on-going basis and new information may become available in future. Please contact Council's Natural Resources Branch on 9725 0222 for any updated information.

Note:

3. Words and expressions in this clause have the same meanings as in the instrument set out in the Schedule to the Standard Instrument (Local Environmental Plans) Order 2006.

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8. Land reserved for acquisition

Whether or not any environmental planning instrument or proposed environmental planning instrument referred to in clause 1 makes provision in relation to the acquisition of the land by a public authority, as referred to in section 27 of the Act.

Fairfield Local Environmental Plan 2013 does not apply to the land.

Under Fairfield Local Environmental Plan 1994, the land is not reserved for acquisition.

9. Contributions plans

The name of each contributions plan applying to the land.

Fairfield City Council Direct (Section 94) Development Contributions Plan 2011 applies to this land.

Fairfield City Council Indirect (Section 94A) Development Contributions Plan 2011 applies to all land within the City of Fairfield.

9A. Biodiversity certified land

Is the land biodiversity certified land (within the meaning of Part 7AA of the Threatened Species Conservation Act 1995?

The land is not biodiversity certified land.

10. Biobanking agreements

If the land is land to which a biobanking agreement under Part 7A of the Threatened Species Conservation Act 1995 relates, a statement to that effect (but only if the council has been notified of the existence of the agreement by the Director-General of the Department of Environment, Climate Change and Water).

No such agreement applies to the land.

11. Bush fire prone land

Whether all, or part, of the land is bush fire prone land (as defined in the Environmental Planning and Assessment Act 1979).

Council has been supplied by the NSW Rural Fire Service with a hazard map for the purposes of a bush fire risk management plan applying to land within the Fairfield local government area. Based on that map, it appears the land referred to in this certificate is not bush fire prone as defined in section 4 of the Environmental Planning and Assessment Act 1979.

12. Property vegetation plans

Whether or not the land is land to which a property vegetation plan under the Native Vegetation Act 2003 applies (but only if the council has been notified of the existence of the plan by the person or body that approved the plan under the Act).

No

13. Orders under Trees (Disputes between Neighbours) Act 2006

Whether an order has been made under the Trees (Disputes between Neighbours) Act 2006 to carry out work in relation to a tree on the land (but only if the council has been notified of the order).

No

14. Directions under Part 3A

If there is a direction by the Minister in force under section 75P (2) (c1) of the Act that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land under Part 4 of the Act does not have effect, a statement to that effect identifying the provision that does not have effect.

No such direction applies to the land.

15. Site compatibility certificates and conditions for seniors housing

If the land is land to which State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 applies:

(a) a statement of whether there is a current site compatibility certificate (seniors housing),of which the council is aware in respect of proposed development on the land and, if there is a certificate, the statement is to include:
  (i) the period for which the certificate is current, and
  (ii) that a copy may be obtained from the head office of the Department of Planning, and

No such certificate applies to the land.

(b) a statement setting out any terms of a kind referred to in clause 18 (2) of that Policy that have been imposed as a condition of consent to a development application granted after 11 October 2007 in respect of the land.

No such terms apply to the land.

16. Site compatibility certificates for infrastructure

A statement of whether there is a valid site compatibility certificate (infrastructure), of which the council is aware in respect of proposed development on the land and, if there is a certificate, the statement is to include:

(a) the period for which the certificate is valid, and
(b) that a copy may be obtained from the head office of the Department of Planning.

No such certificate applies to the land.

17. Site compatibility certificates and conditions for affordable rental housing

(1) A statement to the whether there is a current site compatibility certificate (affordable rental housing), of which the council is aware, in respect of proposed development on the land and, if there is a certificate, the statement is to include:

(a) the period for which the certificate is current, and
(b) that a copy may be obtained from the head office of the Department of Planning.

No such certificate applies to the land.

(2) A statement setting out any terms of a kind referred to in clause 17(1) or 38(1) of *State Environmental Planning Policy (Affordable Rental Housing) 2009* that has been imposed as a condition of consent to a development application in respect of the land.

No such terms apply to the land.

18. Paper subdivision information

(1) The name of any development plan adopted by a relevant authority that applies to the land or that is proposed to be subject to a consent ballot.

(2) The date of any subdivision order that applies to the land.

(3) Words and expressions used in this clause have the same meaning as they have in Part 16C of this Regulation.

No such plan or order applies to the land

19. Site verification certificates

A statement of whether there is a current site verification certificate, of which the council is aware, in respect of the land and, if there is a certificate, the statement is to include:

(a) the matter certified by the certificate, and

Note. A site verification certificate sets out the Director-General's opinion as to whether the land concerned is or is not biophysical strategic agricultural land or critical industry cluster land—see Division 3 of Part 4AA of State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

(b) the date on which the certificate ceases to be current (if any), and

(c) that a copy may be obtained from the head office of the Department of Planning and Infrastructure.

No such certificate applies to the land

Note. The following matters are prescribed by section 59 (2) of the Contaminated Land Management Act 1997 as additional matters to be specified in a planning certificate:

(a) that the land to which the certificate relates is significantly contaminated land within the meaning of that Act—if the land (or part of the land) is significantly contaminated land at the date when the certificate is issued,
(b) that the land to which the certificate relates is subject to a management order within the meaning of that Act—if it is subject to such an order at the date when the certificate is issued,
(c) that the land to which the certificate relates is the subject of an approved voluntary management proposal within the meaning of that Act—if it is the subject of such an approved proposal at the date when the certificate is issued,
(d) that the land to which the certificate relates is subject to an ongoing maintenance order within the meaning of that Act—if it is subject to such an order at the date when the certificate is issued,
(e) that the land to which the certificate relates is the subject of a site audit statement within the meaning of that Act—if a copy of such a statement has been provided at any time to the local authority issuing the certificate.

Continuously updated information in relation to the above matters can also be found by searching the records of the Environmental Protection Authority (EPA) at the website of the Department of the Environment and Climate Change. The search page can be found at: http://www.environment.nsw.gov.au/clmapp/searchregister.aspx

The following information is available to Council but may not be current:

Council has adopted by resolution a policy (commencing 1 August 2000), on contaminated land which may restrict the development of land. This policy is implemented when zoning or land use changes are proposed on lands which have previously been used for certain purposes. Consideration of Council's adopted policy and the application of provisions under the State Legislation is warranted.

The land is not within an investigation area or remediation site under Part 3 of the Contaminated Land Management Act 1997.

The land is not subject to an investigation order or a remediation order within the meaning of the Contaminated Land Management Act 1997.

The land is not subject to a voluntary investigation proposal (or voluntary remediation proposal) that is the subject of the Environment Protection Authority's agreement under Section 19 or 26 of the Contaminated Land Management Act 1997.

The land is not subject of a site audit statement within the meaning of the Contaminated Land Management Act 1997.

Note 2. Any advice received by Council pursuant to section 26(2) of the Nation Building and Jobs Plan (State Infrastructure Delivery) Act 2009, is included below.

No such certificate applies to the land.

The following additional information is provided under Section 149(5) of the Environmental Planning and Assessment Act 1979

Note:

(1) When information pursuant to section 149(5) is requested, the Council is under no obligation to furnish any of the information supplied herein pursuant to that section. Council draws your attention to section 149(6), which states that a Council shall not incur any liability in respect of any advice provided in good faith pursuant to subsection (5). The absence of any reference to any matter affecting the land shall not imply that the land is not affected by any matter not referred to in this certificate.

Under Fairfield Local Environmental Plan 2013, the land is contained within an area designated as a 'Deferred Matter' until such time as a strategic review of planning issues relevant to the Bonnyrigg Town Centre has been undertaken and a planning proposal prepared to apply relevant provisions of the NSW Standard Instrument LEP Order 2006. Please contact Council on 9725 0222 if you have any further enquiries regarding the above.

Information from NSW National Parks and Wildlife Service indicates that the land either contains or is in close proximity to an area possibly containing remnant vegetation associated with a Cumberland Plain Endangered Ecological Community. NPWS have identified the community as Sydney Coastal River-Flat Forest (Alluvial Woodland) that is listed as endangered under Pt. 3 Sch. 1 of the NSW Threatened Species Conservation Act 1995.

Council is in receipt of information by the NSW National Parks and Wildlife Service indicating the land either contains or is in close proximity to an area possibly containing remnant vegetation associated with a Cumberland Plains Endangered Ecological Community that is listed under the Threatened Species Conservation Act. On request Council will supply such information available from its records; however, interested parties must take and rely on their own advice and enquiries.

NPWS mapping indicates that the remnant vegetation is part of an area that is greater than 0.5 hectares with tree cover with agriculture but no major urban or suburban development.

The attached Flood Information Sheet provides flood levels where they are available together with other relevant flooding information.

The subject land is affected by a Tree Preservation Order under Fairfield Local Environmental Plan 1994.

Land must not be cleared or filled except with the consent of Council.

The applicant's attention is drawn to the Department of Infrastructure, Planning and Natural Resources map at the 1:100,000 scale 'Salinity Potential in Western Sydney 2002' that indicates there is potential for salinity in the Region. The map can be viewed at Council's Customer Service Centre (86 Avoca Road Wakeley).

Council's policy 'Building in Saline Environments', applies to all areas of Fairfield City and requires use of construction measures and materials in new development to minimise risk of salt damage to buildings from urban salinity.

On 15th April 2014, the Australian Government announced that it intends to proceed with an airport at Badgerys Creek in the Liverpool City Council area. The original Environmental Impact Statement prepared for the airport site in the late 1990's included options and aircraft flight paths that impact on various parts of Fairfield City. At this stage, Council does not have any up-to-date information regarding the Badgerys Creek Airport. You should make your own enquiries with the Commonwealth Government Department responsible via the website http://www.infrastructure.gov.au/aviation.

Fairfield Local Environmental Plan 1994 requires development consent for the demolition of a building.

FAIRFIELD CITY COUNCIL
DEVELOPMENT CONTROL PLANS – 1 September 2014

Fairfield City Wide DCP

Title	Adopted by Council*	Effective Date
Fairfield CityWide Development Control Plan 2013	13 November 2012	31 May 2013
Amendment No.1 change maximum height permissible for detached secondary dwellings, clarify requirements and correct various anomalies, incorporate outdoor dining policy into a number of site specific DCPs (see table below)	11 February 2014	5 March 2014
Amendment No.2 amend chapter 2 to reference Site Specific DCP – Wetherill Park Market Town	20 March 2013	7 March 2014
Amendment No.3 Introduce Chapter 4B - Secondary Dwellings in Rural Area - Horsley Park and Cecil Park	11 December 2013	14 March 2014
Amendment No. 4 amends Chapter 9 Industrial Development Site Specific Controls for 449 Victoria Street and 96 Newton Road, Wetherill Park	24 September 2013	21 March 2014
Amendment No.5 amends Chapters 2 and 10 and Appendix B to ensure provisions within the DCP are in line with the SEPP (Exempt and Complying Development Codes) 2008	13 May 2014	28 May 2014
Amendment No. 5A amends Chapter 6A – Multi Dwelling Housing – Town house and Villas: Site Specific DCP – 46 & 50 Cobbett Street, Wetherill Park.	12 March 2013	22 August 2014
Draft Amendment No. 6 including increase to building heights for detached granny flats, removal of reference to minimum lot sizes for R1 zoned lands, inclusion of new controls and provisions relating to neighbourhood shops and pad mounted sub stations, clarify requirements and correct a number of anomalies associated with secondary dwellings, dual occupancy, narrow lots and residential flat buildings and other minor inconsequential amendments.	12 August 2014	3 September 2014
Draft Amendment No. 6A amends Chapter 14 Subdivision – Applying to land located on 630 Elizabeth Drive and 9-10 Schubert Place, Bonnyrigg Heights to facilitate a future road link between Stivala Place and Schubert Place.	12 August 2014	3 September 2014
Draft Amendment No.7 proposed amendments include – Additional Controls for Child Care Centres, Boarding Houses and Granny Flats; Revised Heritage Chapter; New provisions relating to CCTV for specific land uses, and; Acoustic measures for development in the Rural Area	On Public Exhibition from 27 August 2014 to 24 September 2014	Currently on Public Exhibition

Place Based and Site Specific DCPs

Title	Adopted by Council*	Effective Date
Bonnyrigg Town Centre DCP.28(2010) - Amendment No.1 (Awning controls and amendment to area subject to Bonnyrigg Town centre DCP – 3.11.2010) - Amendment No.2 (Outdoor Dining Controls –5.3.2014)		28 May 2004
Cabramatta Town Centre DCP (5/2000) - Amendment No.1 (Outdoor Dining Controls –5.3.2014) - Draft Amendment No. 2 (New clause regarding Model Submission – 3.09.2014)	13 November 2012	31 May 2013

Title	Adopted by Council*	Effective Date
Fairfield City Centre DCP 2013 - Amendment No.1 (Outdoor Dining Controls – 5.3. 2014) - Draft Amendment No. 2 (Remove reference to PublicArt Guide and update signage controls reference – 3.09.2014)	13 November 2012	31 May 2013
Canley Corridor DCP No.37 (2013) (Canley Vale and Canley Heights town centres) - Amendment No.1: (Development Controls for Adams Reserve 12.9.2006) - Amendment No.2: (Development Controls for 45-47 Peel St, Canley Heights 9.4.2008) - Amendment No.3: (Awnings controls 3.11.2010) - Amendment No.4: (Development Controls for 190 Canley Vale Rd, Canley Heights 19.4.2011) - Amendment No.5: (References to Fairfield LEP 2013 31.5.2013) - Amendment No.6: (Outdoor Dining Controls –5.3.2014) - Draft Amendment No. 7 (Remove reference to Public Art Guide – 3.09.2014)	13 November 2012	31 May 2013
Fairfield Heights Local Centre DCP 2013	13 November 2012	31 May 2013
Prairiewood Town Centre – Southern Precinct DCP 2013	13 November 2012	31 May 2013
Site Specific DCP – Wetherill Park Market Town	20 March 2013	7 March 2014

Master Plans

Prairiewood Masterplan (December 2005)	13 November 2012	31 May 2013
Fairfield Town Centre Masterplans – The Crescent and Barbara Street Precincts (May 2007)		May 2007

Structure Plans

Villawood Town Centre		February 2008

* Note: Some *"In Force"* Development Control Plans may be under review, check with Council for date of last amendment.

Fairfield City Council
Administration Centre
86 Avoca Road
WAKELEY NSW 2176
PO Box 21
FAIRFIELD NSW 1860
Telephone: (02) 9725 0222
Facsimile: (02) 9609 3257

Flood Information Sheet

Applicant's Details:

Applicant's Name	**Environmental Investigation Services (EIS)**
Postal Address	**115 Wicks Rd MACQUARIE PARK NSW 2113**
Phone	
Fax	

Property Particulars:

House No.	**1-9**
Street & Suburb	**Bonnyrigg Ave BONNYRIGG**
Lot Description	**Lot 2 DP 1071647**

Council has adopted a policy on flooding which may restrict the development of land. The Fairfield City-Wide Development Control Plan 2013 (which includes provisions for flood management) applies to all of the Fairfield Local Government area.

Part or all of this land may be affected by mainstream flooding.

Part or all of this land may be affected by local overland flooding.

MAINSTREAM FLOODING

Description

This parcel is identified as being partly within a **Low** Flood Risk Precinct and partly **not affected** by mainstream flooding.

Mainstream Flood Details

Size of Flood	Flood Level (m AHD)
Probable Maximum Flood (PMF)	42.4-42.6
100 Year ARI	Not Applicable
50 Year ARI	Not Applicable
20 Year ARI	Not Applicable

Flood levels in the vicinity of the above property have been extracted from the Sinclair Knight Merz & Fairfield Consulting Services (2008) *Flood Study for Orphan School Creek, Green Valley Creek and Clear Paddock Creek.*

LOCAL OVERLAND FLOODING

Description

Part or all of the land may be affected by local overland flooding. This parcel is **not** in an area covered by overland flood risk mapping completed by Council.

An overland flood notation may be placed on a property based on information from a number of sources. Typical sources include: information from residents, investigation of local drainage problems and hydraulic analysis of local catchments by engineering consultants and Council staff.

Local Overland Flood Details

A preliminary analysis of this catchment to quantify the amount of stormwater in the vicinity of this property has not been carried out.

Size of Flood	Flood Level (m AHD)	Flow (m^3/s)	Velocity (m/s)
Probable Maximum Flood (PMF)	Not Known	Not Known	Not Known
100 Year ARI	Not Known	Not Known	Not Known
50 Year ARI	Not Known	Not Known	Not Known
20 Year ARI	Not Known	Not Known	Not Known

15 October 2014

Glossary over page

GLOSSARY

m AHD	metres Australian Height Datum (AHD).
Australian Height Datum (AHD)	A common national plane of level approximately equivalent to the height above sea level. All flood levels, floor levels and ground levels are normally provided in metres AHD.
Average Recurrence Interval (ARI)	The long term average number of years between the occurrence of a flood as big as the selected event. For example, floods with a discharge as great as the 20 year ARI event will occur on average once every 20 years. ARI is another way of expressing the likelihood of occurrence of a flood event.
flood	A relatively high stream flow that overtops the natural or artificial banks in any part of a stream, river, estuary, lake or dam. It also includes local overland flooding associated with major drainage before entering a watercourse, or coastal inundation resulting from raised sea levels, or waves overtopping the coastline.
flood risk precinct	An area of land with similar flood risks and where similar development controls may be applied by a Council to manage the flood risk. The flood risk is determined based on the existing development in the precinct or assuming the precinct is developed with normal residential uses. Usually the floodplain is categorised into three flood risk precincts 'low', 'medium' and 'high', although other classifications can sometimes be used. **High Flood Risk:** This has been defined as the area of land below the 100-year flood event that is either subject to a high hydraulic hazard or where there are significant evacuation difficulties. **Medium Flood Risk:** This has been defined as land below the 100-year flood level that is not within a High Flood Risk Precinct. This is land that is not subject to a high hydraulic hazard or where there are no significant evacuation difficulties. **Low Flood Risk:** This has been defined as all land within the floodplain (i.e. within the extent of the probable maximum flood) but not identified within either a High Flood Risk or a Medium Flood Risk Precinct. The Low Flood Risk Precinct is that area above the 100-year flood event.
local overland flooding	The inundation of normally dry land by local runoff rather than overbank discharge from a stream, river, estuary, lake or dam.
mainstream flooding	The inundation of normally dry land occurring when water overflows the natural or artificial banks of a stream, river, estuary, lake or dam.
probable maximum flood (PMF)	The largest flood that could conceivably occur at a particular location.

FairfieldCity
Celebrating diversity

Fairfield City Council, Administration Centre, 86 Avoca Road, Wakeley 2176
Tel: (02) 9725 0222 Fax: (02) 9725 4249 ABN: 83 140 439 239
All communications to:
Fairfield City Council, PO Box 21, Fairfield NSW 1860
Email address: mail@fairfieldcity.nsw.gov.au

14 October 2014

Environmental Investigation Services (EIS)
115 Wicks Road
MACQUARIE PARK NSW 2113

Dear Sir/ Madam

Following is your planning certificate as requested. Should you have any further queries please contact Council's City Development Group on (02) 9725 0821.

PLANNING CERTIFICATE
(under section 149 of the Environmental Planning and Assessment Act 1979 as amended)

Applicant:	**Environmental Investigation Services (EIS)**
Certificate No.:	**29989/2014**
Applicant's Reference:	**Mr Para Bokalawela**
Issue Date:	**14 October 2014**
Receipt No.:	**2090969**

PROPERTY ADDRESS:	**11-19 Bonnyrigg Avenue BONNYRIGG**
LEGAL DESCRIPTION:	**Lot: 1 DP: 1071647**

Elizabeth Workman

for
Alan Young
City Manager
Fairfield City Council

PLEASE NOTE: This is page 1 of 21. Should this certificate or any subsequent copy not contain this many pages, please confirm with council prior to acting on the basis of information contained in this certificate.

Information provided under
Section 149(2) of the Environmental Planning and Assessment Act 1979

Notes:

(1) The following prescribed matters may apply to the land to which this certificate relates.

(2) Where this certificate refers to a specific allotment (or allotments) within a strata plan, the certificate is issued for the whole of the land within the strata plan, not just the specific allotment(s) referred to, and any information contained in the certificate may relate to the whole, or any part, of the strata plan.

(3) The following information is provided pursuant to Section 149(2) of the Environmental Planning and Assessment Act 1979 as prescribed by Schedule 4 of the Environmental Planning and Assessment Regulation 2000 and is applicable as at the date of this certificate.

(4) Information provided in this certificate should be interpreted in conjunction with the relevant plans, policies and documents held at Council. In order to obtain copies of these documents you may purchase them by either contacting Council's City Development Group on (02) 9725 0848 or attending Council's Administration Centre at 86 Avoca Road, Wakeley.

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1. Names of relevant planning instruments and DCPs

(1) The name of each environmental planning instrument that applies to the carrying out of development on the land.

State Environmental Planning Policies (SEPP)

SEPP (Major Development) 2005

SEPP (Miscellaneous Consent Provisions) 2007

SEPP No. 50 - Canal Estate Development

SEPP No. 19 - Bushland in Urban Areas

SEPP No. 32 - Urban Consolidation (Redevelopment of Urban Land)

SEPP (State and Regional Development) 2011

SEPP No. 33 - Hazardous and Offensive Development

SEPP No. 64 - Advertising and Signage

SEPP (Repeal of Concurrence and Referral Provisions) 2008

SEPP No. 55 - Remediation of Land

SEPP No. 65 - Design Quality of Residential Flat Development

SEPP (Affordable Rental Housing) 2009

SEPP (Mining, Petroleum Production and Extractive Industries) 2007

SEPP No. 62 - Sustainable Aquaculture

SEPP (Infrastructure) 2007

SEPP (Exempt and Complying Development Codes) 2008

Regional Environmental Plans (Deemed SEPP)

Sydney Regional Environmental Plan No. 9 - Extractive Industry (No 2-1995)

The Greater Metropolitan Regional Environmental Plan No. 2 - Georges River Catchment

Local Environmental Plans (LEP)

Fairfield Local Environmental Plan 1994
Government Gazette No. 104 - 12th August 1994.
As Amended.

NOTE: Fairfield Local Environmental Plan 2013 DOES NOT APPLY to the land due to Deferral of Bonnyrigg Town Centre area. Further details in relation to the deferred matter can be obtained under a 149 part (5) certificate.

(2) The name of each proposed environmental planning instrument that will apply to the carrying out of development on the land and that is or has been the subject of community consultation or on public exhibition under the Act (unless the Director-General has notified the council that the making of the proposed instrument has been deferred indefinitely or has not been approved)

Draft SEPP (Competition) 2010

(3) The name of each development control plan that applies to the carrying out of development on the land.

The land is subject to adopted Development Control Plans. (See attached schedule).

(4) In this clause, proposed environmental planning instrument includes a planning proposal for a LEP or a draft environmental planning instrument.

2. Zoning and land use under relevant LEP

For each environmental planning instrument or proposed instrument referred to in clause 1 (other than a SEPP or proposed SEPP) that includes the land in any zone (however described):

Under Fairfield Local Environmental Plan 2013, this land is a deferred matter. The provisions of Fairfield Local Environmental Plan 1994 apply to the site until such time as a Planning Proposal to consider application of relevant provisions of the Standard LEP Order to the site has been prepared. Please contact Council on 9725 0222 for further information.

FAIRFIELD LOCAL ENVIRONMENTAL PLAN 1994

(a) WHAT IS THE IDENTITY OF THE ZONE?

Zone 4(c) Special Industrial

(b) WHAT IS PERMITTED WITHOUT DEVELOPMENT CONSENT?

Nil.

(c) WHAT IS PERMITTED ONLY WITH DEVELOPMENT CONSENT?

Any purpose other than a purpose included in item (d).

(d) WHAT IS PROHIBITED?
Abattoirs, aged and disabled person's housing, amusement parks, animal establishments, brothels, business premises, camping grounds and caravan parks, dwelling houses (except caretaker's dwelling houses), entertainment facilities, extractive industry, forestry, gaming taverns, generating works, group homes, hazardous industry, hazardous storage establishments, health consulting rooms, helicopter landing sites, heliports, home businesses, hospitals, hostels, hotels, industry, hazardous storage establishments, health consulting rooms, helicopter landing sites, heliports, home businesses, hospitals, hostels, hotels, industry, institutions, intensive agriculture, junkyards, medical centres, mines, multi-unit housing, offensive industry, offensive storage establishments, residential flat buildings,

roadside stalls, sawmills, serviced apartments, shops (except take-away food shops), stock and sales yards, transport depots.

Additional uses that are permitted with development consent.

Bus depot.

Clause 25H of Fairfield LEP 1994 applies to the land and, subject to development consent, allows multi-unit housing, residential flat buildings and two of the following, incorporated within the ground or first floors of a building (for example, a residential flat building): (i) business premises; (ii) community facilities; (iii) dwellings; (iv) entertainment facilities; (v) refreshment rooms; (vi) shops.

(e) Whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling house on the land and, if so, the minimum land dimensions so fixed.

No development standards that fix the minimum land dimensions for the erection of a dwelling house apply to this land. Controls in other policies and plans may apply.

(f) Whether the land includes or comprises critical habitat.

No.

(g) Whether the land is in a conservation area (however described).

No

(h) Whether an item of environmental heritage (however described) is situated on the land.

No.

Attention is drawn however to Clause 31 of Fairfield Local Environmental Plan 1994: "When determining an application for consent to carry out development on land in the vicinity of a heritage item, the Council must take into consideration the likely effect of the proposed development on the heritage significance of that heritage item and on its setting."

2A. Zoning and land use under State Environmental Planning Policy (Sydney Region Growth Centres) 2006

Not applicable.

3. **Complying development**

(1) The extent to which the land is land on which complying development may be carried out under each of the codes for complying development because of the provisions of clauses 1.17A (1) (c) to (e), (2), (3) and (4) 1.18 (1) (c3) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

General Housing Code:
No. The General Housing Code does not apply to this land.

Housing Alterations Code:
Complying development under the Housing Alterations Code may be carried out on the land.

Commercial and Industrial Alterations Code:
Complying development under the Commercial and Industrial Alterations Code may be carried out on the land.

Commercial and Industrial (New Buildings and Additions) Code:
Complying Development under the Commercial and Industrial (New Buildings and Additions) Code may be carried out on the land.

Subdivision Code:
Complying development under the Subdivision Code may be carried out on the land.

Rural Housing Code:
No. The Rural Housing Code does not apply to this land.

General Development Code:
Complying development under the General Development Code may be carried out on the land.

Demolition Code:
Complying development under the Demolition Code may be carried out on the land.

Fire Safety Code:
Complying development under the Fire Safety Code may be carried out on the land.

(2) The extent to which complying development may not be carried out on that land because of the provisions of clauses 1.17A (1) (c) to (e), (2), (3) and (4), 1.18 (1) (c3) and 1.19 of that Policy and the reasons why it may not be carried out under those clauses.

Note: The General Housing Code does not apply to all or part of the land.

Note: The Rural Housing Code does not apply to all or part of the land.

(3) If the council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land, a statement that a restriction applies to the land, but it may not apply to all of the land, and that council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land.

Council does not have any relevant statement to make in relation to any further restrictions that may apply to complying development being carried out on the land. All information in relation to the extent that complying development can be carried out on the land is provided under Part 3(1) & (2) of this certificate.

Note: Clause 3 refers only to land based exclusions as listed in Clauses 1.17A (1)(c) to (e), (2), (3) and (4), 1.18 (1) (c3) and 1.19 of the SEPP (Exempt and Complying Development Codes) 2008. To be complying development, the development must be complying development that meets the standards and other requirements specified for that development as required by the SEPP. Please contact your accredited certifier or Council for further information.

4. Coastal Protection

Whether or not the land is affected by the operation of section 38 or 39 of the *Coastal Protection Act* 1979, but only to the extent that the council has been notified by the Department of Public Works.

No, this land is not affected.

4A Information relating to beaches and coasts

(1) Whether an order has been made under Part 4D of the Coastal Protection Act 1979 in relation to emergency coastal protection works (within the meaning of that Act) on the land (or on public land adjacent to that land), except where the council is satisfied that such an order has been fully complied with.

No order under Part 4D of the *Coastal Protection Act 1979*, has been made.

(2)

1. whether the council has been notified under section 55X of the Coastal Protection Act 1979 that emergency coastal protection works (within the meaning of that Act) have been placed on the land (or on public land adjacent to that land), and

Council has not received any such notification.

2. if works have been so placed—whether the council is satisfied that the works have been removed and the land restored in accordance with that Act.

Not applicable.

(3) such information (if any) as is required by the regulations under section 56B of the Coastal Protection Act 1979 to be included in the planning certificate and of which the council has been notified pursuant to those regulations.

No such information is available.

4B Annual charges for coastal protection services under *Local Government Act 1993.*

Whether the owner (or any previous owner) of the land has consented in writing to the land being subject to annual charges under section 496B of the Local Government Act 1993 for coastal protection services that relate to existing coastal protection works (within the meaning of section 553B of that Act).
Note. "Existing coastal protection works" are works to reduce the impact of coastal hazards on land (such as seawalls, revetments, groynes and beach nourishment) that existed before the commencement of section 553B of the Local Government Act 1993.

No annual charges under section 553B of the *Local Government Act 1993*, are applicable to the land.

5. Mine Subsidence

Whether or not the land is proclaimed to be a mine subsidence district within the meaning of section 15 of the *Mine Subsidence Compensation Act* 1961.

No, this land is not affected.

6. Road widening and road realignment

Whether or not the land is affected by any road widening or road realignment under Division 2 or Part 3 of the *Roads Act* 1993, any environmental planning instrument, or any resolution of the council.

Fairfield Local Environmental Plan 2013 does not apply to the land.

The land is not affected by any road widening proposal under Division 2 of Part 3 of the Roads Act or Fairfield Local Environmental Plan 1994.

The land is affected by provisions restricting vehicular access. For further details contact Council's City Services Department.

7. **Council and other public authority policies on hazard risk restrictions**

Whether or not the land is affected by a policy:

(b) adopted by the council, or

(c) adopted by any other public authority and notified to the council for the express purpose of its adoption by that authority being referred to in planning certificates issued by the council,

that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulfate soils or any other risk, other than flooding.

Council's policies on hazard risk restrictions are as follows:

(i) Landslip

Under Fairfield Local Environmental Plan 2013, the land is not affected by a policy adopted by Council or adopted by any other public authority and notified to Council (for the express purpose of its adoption by that authority being referred to in Planning Certificates issued by Council) that restricts development on the land because of the likelihood of landslide risk or subsidence.

(ii) Bushfire

Council has been supplied by the NSW Rural Fire Service with a hazard map for the purposes of a bush fire risk management plan applying to land within the Fairfield local government area. Based on that map, it appears the land referred to in this certificate is not bush fire prone as defined in section 4 of the Environmental Planning and Assessment Act 1979.

(iii) Tidal Inundation

The land is not affected by a policy adopted by Council or adopted by any other public authority and notified to Council (for the express purpose of its adoption by that authority being referred to in Planning Certificates issued by Council) that restricts development on the land because of the likelihood of tidal inundation.

(iv) Subsidence

No, the land is not so affected

(v) Acid Sulfate Soils

The land is not affected by a policy adopted by Council or adopted by any other public authority and notified to Council (for the express purpose of its adoption by that authority being referred to in Planning Certificates issued by Council) that restricts development on the land because of the likelihood of acid sulfate soils.

(vi) Any other risks

No, the land is not so affected

7A. Flood related development controls information

1. Whether or not development on that land or part of the land for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) is subject to flood related development controls.

   This land is subject to the flood related development controls included in the Fairfield City-Wide Development Control Plan 2013 in relation to the above development types. These controls apply (either directly, or indirectly by reference in site-specific DCPs) to all land in the Fairfield Local Government Area.

   Generally, development controls will apply to development if the land (or part of the land) is within the floodplain or is affected by overland flooding.

This parcel is within the floodplain and identified as being partly within a Low flood risk precinct and partly not affected by mainstream flooding. The term mainstream flooding means inundation of normally dry land occurring when water overflows the natural or artificial banks of a stream, river, estuary, lake or dam. The term Low Flood Risk Precinct is defined as all land within the floodplain (i.e. within the extent of the probable maximum flood) but not identified within either a High Flood Risk or a Medium Flood Risk Precinct. The Low Flood Risk Precinct is that area above the 100-year flood event.

Part or all of this land is within the floodplain and may be affected by local overland flooding. This parcel is not in an area in which Council's current programme of overland flood risk mapping has been completed. The term local overland flooding means inundation by local runoff rather than overbank discharge from a stream, river, estuary, lake or dam.

2. Whether or not development on that land or part of the land for any other purpose is subject to flood related development controls.

This land is subject to the flood related development controls included in the Fairfield City-Wide Development Control Plan 2013 in relation to the above development types. These controls apply (either directly, or indirectly by reference in site-specific DCPs) to all land in the Fairfield Local Government Area.

Generally, development controls will apply to development if the land (or part of the land) is within the floodplain or is affected by overland flooding.

This parcel is within the floodplain and identified as being partly within a Low flood risk precinct and partly not affected by mainstream flooding. The term mainstream flooding means inundation of normally dry land occurring when water overflows the natural or artificial banks of a stream, river, estuary, lake or dam. The term Low Flood Risk Precinct is defined as all land within the floodplain (i.e. within the extent of the probable maximum flood) but not identified within either a High Flood Risk or a Medium Flood Risk Precinct. The Low Flood Risk Precinct is that area above the 100-year flood event.

Part or all of this land is within the floodplain and may be affected by local overland flooding. This parcel is not in an area in which Council's current programme of overland flood risk mapping has been completed. The term local overland flooding means inundation by local runoff rather than overbank discharge from a stream, river, estuary, lake or dam.

The flood information is the current information to date. However, Council reviews flood studies on an on-going basis and new information may become available in future. Please contact Council's Natural Resources Branch on 9725 0222 for any updated information.

Note:

3. Words and expressions in this clause have the same meanings as in the instrument set out in the Schedule to the Standard Instrument (Local Environmental Plans) Order 2006.

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8. Land reserved for acquisition

Whether or not any environmental planning instrument or proposed environmental planning instrument referred to in clause 1 makes provision in relation to the acquisition of the land by a public authority, as referred to in section 27 of the Act.

Fairfield Local Environmental Plan 2013 does not apply to the land.

Under Fairfield Local Environmental Plan 1994, the land is not reserved for acquisition.

9. Contributions plans

The name of each contributions plan applying to the land.

Fairfield City Council Direct (Section 94) Development Contributions Plan 2011 applies to this land.

Fairfield City Council Indirect (Section 94A) Development Contributions Plan 2011 applies to all land within the City of Fairfield.

9A. Biodiversity certified land

Is the land biodiversity certified land (within the meaning of Part 7AA of the Threatened Species Conservation Act 1995?

The land is not biodiversity certified land.

10. Biobanking agreements

If the land is land to which a biobanking agreement under Part 7A of the Threatened Species Conservation Act 1995 relates, a statement to that effect (but only if the council has been notified of the existence of the agreement by the Director-General of the Department of Environment, Climate Change and Water).

No such agreement applies to the land.

11. Bush fire prone land

Whether all, or part, of the land is bush fire prone land (as defined in the Environmental Planning and Assessment Act 1979).

Council has been supplied by the NSW Rural Fire Service with a hazard map for the purposes of a bush fire risk management plan applying to land within the Fairfield local government area. Based on that map, it appears the land referred to in this certificate is not bush fire prone as defined in section 4 of the Environmental Planning and Assessment Act 1979.

12. Property vegetation plans

Whether or not the land is land to which a property vegetation plan under the Native Vegetation Act 2003 applies (but only if the council has been notified of the existence of the plan by the person or body that approved the plan under the Act).

No

13. Orders under Trees (Disputes between Neighbours) Act 2006

Whether an order has been made under the Trees (Disputes between Neighbours) Act 2006 to carry out work in relation to a tree on the land (but only if the council has been notified of the order).

No

14. Directions under Part 3A

If there is a direction by the Minister in force under section 75P (2) (c1) of the Act that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land under Part 4 of the Act does not have effect, a statement to that effect identifying the provision that does not have effect.

No such direction applies to the land.

15. Site compatibility certificates and conditions for seniors housing

If the land is land to which State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 applies:

(a) a statement of whether there is a current site compatibility certificate (seniors housing),of which the council is aware in respect of proposed development on the land and, if there is a certificate, the statement is to include:
  (i) the period for which the certificate is current, and
  (ii) that a copy may be obtained from the head office of the Department of Planning, and

No such certificate applies to the land.

(b) a statement setting out any terms of a kind referred to in clause 18 (2) of that Policy that have been imposed as a condition of consent to a development application granted after 11 October 2007 in respect of the land.

No such terms apply to the land.

16. Site compatibility certificates for infrastructure

A statement of whether there is a valid site compatibility certificate (infrastructure), of which the council is aware in respect of proposed development on the land and, if there is a certificate, the statement is to include:

(a) the period for which the certificate is valid, and
(b) that a copy may be obtained from the head office of the Department of Planning.

No such certificate applies to the land.

17. Site compatibility certificates and conditions for affordable rental housing

(1) A statement to the whether there is a current site compatibility certificate (affordable rental housing), of which the council is aware, in respect of proposed development on the land and, if there is a certificate, the statement is to include:

(a) the period for which the certificate is current, and
(b) that a copy may be obtained from the head office of the Department of Planning.

No such certificate applies to the land.

(2) A statement setting out any terms of a kind referred to in clause 17(1) or 38(1) of *State Environmental Planning Policy (Affordable Rental Housing) 2009* that has been imposed as a condition of consent to a development application in respect of the land.

No such terms apply to the land.

18. Paper subdivision information

(1) The name of any development plan adopted by a relevant authority that applies to the land or that is proposed to be subject to a consent ballot.

(2) The date of any subdivision order that applies to the land.

(3) Words and expressions used in this clause have the same meaning as they have in Part 16C of this Regulation.

No such plan or order applies to the land

19. Site verification certificates

A statement of whether there is a current site verification certificate, of which the council is aware, in respect of the land and, if there is a certificate, the statement is to include:

(a) the matter certified by the certificate, and

Note. A site verification certificate sets out the Director-General's opinion as to whether the land concerned is or is not biophysical strategic agricultural land or critical industry cluster land—see Division 3 of Part 4AA of State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

(b) the date on which the certificate ceases to be current (if any), and

(c) that a copy may be obtained from the head office of the Department of Planning and Infrastructure.

No such certificate applies to the land

Note. The following matters are prescribed by section 59 (2) of the Contaminated Land Management Act 1997 as additional matters to be specified in a planning certificate:

(a) that the land to which the certificate relates is significantly contaminated land within the meaning of that Act—if the land (or part of the land) is significantly contaminated land at the date when the certificate is issued,
(b) that the land to which the certificate relates is subject to a management order within the meaning of that Act—if it is subject to such an order at the date when the certificate is issued,
(c) that the land to which the certificate relates is the subject of an approved voluntary management proposal within the meaning of that Act—if it is the subject of such an approved proposal at the date when the certificate is issued,
(d) that the land to which the certificate relates is subject to an ongoing maintenance order within the meaning of that Act—if it is subject to such an order at the date when the certificate is issued,
(e) that the land to which the certificate relates is the subject of a site audit statement within the meaning of that Act—if a copy of such a statement has been provided at any time to the local authority issuing the certificate.

Continuously updated information in relation to the above matters can also be found by searching the records of the Environmental Protection Authority (EPA) at the website of the Department of the Environment and Climate Change. The search page can be found at: http://www.environment.nsw.gov.au/clmapp/searchregister.aspx

The following information is available to Council but may not be current:

Council has adopted by resolution a policy (commencing 1 August 2000), on contaminated land which may restrict the development of land. This policy is implemented when zoning or land use changes are proposed on lands which have previously been used for certain purposes. Consideration of Council's adopted policy and the application of provisions under the State Legislation is warranted.

The land is not within an investigation area or remediation site under Part 3 of the Contaminated Land Management Act 1997.

The land is not subject to an investigation order or a remediation order within the meaning of the Contaminated Land Management Act 1997.

The land is not subject to a voluntary investigation proposal (or voluntary remediation proposal) that is the subject of the Environment Protection Authority's agreement under Section 19 or 26 of the Contaminated Land Management Act 1997.

The land is not subject of a site audit statement within the meaning of the Contaminated Land Management Act 1997.

Note 2. Any advice received by Council pursuant to section 26(2) of the Nation Building and Jobs Plan (State Infrastructure Delivery) Act 2009, is included below.

No such certificate applies to the land.

The following additional information is provided under Section 149(5) of the Environmental Planning and Assessment Act 1979

Note:

(1) When information pursuant to section 149(5) is requested, the Council is under no obligation to furnish any of the information supplied herein pursuant to that section. Council draws your attention to section 149(6), which states that a Council shall not incur any liability in respect of any advice provided in good faith pursuant to subsection (5). The absence of any reference to any matter affecting the land shall not imply that the land is not affected by any matter not referred to in this certificate.

Under Fairfield Local Environmental Plan 2013, the land is contained within an area designated as a 'Deferred Matter' until such time as a strategic review of planning issues relevant to the Bonnyrigg Town Centre has been undertaken and a planning proposal prepared to apply relevant provisions of the NSW Standard Instrument LEP Order 2006. Please contact Council on 9725 0222 if you have any further enquiries regarding the above.

Information from NSW National Parks and Wildlife Service indicates that the land either contains or is in close proximity to an area possibly containing remnant vegetation associated with a Cumberland Plain Endangered Ecological Community. NPWS have identified the community as Sydney Coastal River-Flat Forest (Alluvial Woodland) that is listed as endangered under Pt. 3 Sch. 1 of the NSW Threatened Species Conservation Act 1995.

Council is in receipt of information by the NSW National Parks and Wildlife Service indicating the land either contains or is in close proximity to an area possibly containing remnant vegetation associated with a Cumberland Plains Endangered Ecological Community that is listed under the Threatened Species Conservation Act. On request Council will supply such information available from its records; however, interested parties must take and rely on their own advice and enquiries.

NPWS mapping indicates that the remnant vegetation is part of an area that is greater than 0.5 hectares with tree cover with agriculture but no major urban or suburban development.

The attached Flood Information Sheet provides flood levels where they are available together with other relevant flooding information.

The subject land is affected by a Tree Preservation Order under Fairfield Local Environmental Plan 1994.

Land must not be cleared or filled except with the consent of Council.

The applicant's attention is drawn to the Department of Infrastructure, Planning and Natural Resources map at the 1:100,000 scale 'Salinity Potential in Western Sydney 2002' that indicates there is potential for salinity in the Region. The map can be viewed at Council's Customer Service Centre (86 Avoca Road Wakeley).

Council's policy 'Building in Saline Environments', applies to all areas of Fairfield City and requires use of construction measures and materials in new development to minimise risk of salt damage to buildings from urban salinity.

On 15th April 2014, the Australian Government announced that it intends to proceed with an airport at Badgerys Creek in the Liverpool City Council area. The original Environmental Impact Statement prepared for the airport site in the late 1990's included options and aircraft flight paths that impact on various parts of Fairfield City. At this stage, Council does not have any up-to-date information regarding the Badgerys Creek Airport. You should make your own enquiries with the Commonwealth Government Department responsible via the website http://www.infrastructure.gov.au/aviation.

Fairfield Local Environmental Plan 1994 requires development consent for the demolition of a building.

FAIRFIELD CITY COUNCIL
DEVELOPMENT CONTROL PLANS – 1 September 2014

Fairfield City Wide DCP

Title	Adopted by Council*	Effective Date
Fairfield CityWide Development Control Plan 2013	13 November 2012	31 May 2013
Amendment No.1 change maximum height permissible for detached secondary dwellings, clarify requirements and correct various anomalies, incorporate outdoor dining policy into a number of site specific DCPs (see table below)	11 February 2014	5 March 2014
Amendment No.2 amend chapter 2 to reference Site Specific DCP – Wetherill Park Market Town	20 March 2013	7 March 2014
Amendment No.3 Introduce Chapter 4B - Secondary Dwellings in Rural Area - Horsley Park and Cecil Park	11 December 2013	14 March 2014
Amendment No. 4 amends Chapter 9 Industrial Development Site Specific Controls for 449 Victoria Street and 96 Newton Road, Wetherill Park	24 September 2013	21 March 2014
Amendment No.5 amends Chapters 2 and 10 and Appendix B to ensure provisions within the DCP are in line with the SEPP (Exempt and Complying Development Codes) 2008	13 May 2014	28 May 2014
Amendment No. 5A amends Chapter 6A – Multi Dwelling Housing – Town house and Villas: Site Specific DCP – 46 & 50 Cobbett Street, Wetherill Park.	12 March 2013	22 August 2014
Draft Amendment No. 6 including increase to building heights for detached granny flats, removal of reference to minimum lot sizes for R1 zoned lands, inclusion of new controls and provisions relating to neighbourhood shops and pad mounted sub stations, clarify requirements and correct a number of anomalies associated with secondary dwellings, dual occupancy, narrow lots and residential flat buildings and other minor inconsequential amendments.	12 August 2014	3 September 2014
Draft Amendment No. 6A amends Chapter 14 Subdivision – Applying to land located on 630 Elizabeth Drive and 9-10 Schubert Place, Bonnyrigg Heights to facilitate a future road link between Stivala Place and Schubert Place.	12 August 2014	3 September 2014
Draft Amendment No.7 proposed amendments include – Additional Controls for Child Care Centres, Boarding Houses and Granny Flats; Revised Heritage Chapter; New provisions relating to CCTV for specific land uses, and; Acoustic measures for development in the Rural Area	On Public Exhibition from 27 August 2014 to 24 September 2014	Currently on Public Exhibition

Place Based and Site Specific DCPs

Title	Adopted by Council*	Effective Date
Bonnyrigg Town Centre DCP.28(2010) - Amendment No.1 (Awning controls and amendment to area subject to Bonnyrigg Town centre DCP – 3.11.2010) - Amendment No.2 (Outdoor Dining Controls –5.3.2014)		28 May 2004
Cabramatta Town Centre DCP (5/2000) - Amendment No.1 (Outdoor Dining Controls –5.3.2014) - Draft Amendment No. 2 (New clause regarding Model Submission – 3.09.2014)	13 November 2012	31 May 2013

Title	Adopted by Council*	Effective Date
Fairfield City Centre DCP 2013 - Amendment No.1 (Outdoor Dining Controls – 5.3. 2014) - Draft Amendment No. 2 (Remove reference to PublicArt Guide and update signage controls reference – 3.09.2014)	13 November 2012	31 May 2013
Canley Corridor DCP No.37 (2013) (Canley Vale and Canley Heights town centres) - Amendment No.1: (Development Controls for Adams Reserve 12.9.2006) - Amendment No.2: (Development Controls for 45-47 Peel St, Canley Heights 9.4.2008) - Amendment No.3: (Awnings controls 3.11.2010) - Amendment No.4: (Development Controls for 190 Canley Vale Rd, Canley Heights 19.4.2011) - Amendment No.5: (References to Fairfield LEP 2013 31.5.2013) - Amendment No.6: (Outdoor Dining Controls –5.3.2014) - Draft Amendment No. 7 (Remove reference to Public Art Guide – 3.09.2014)	13 November 2012	31 May 2013
Fairfield Heights Local Centre DCP 2013	13 November 2012	31 May 2013
Prairiewood Town Centre – Southern Precinct DCP 2013	13 November 2012	31 May 2013
Site Specific DCP – Wetherill Park Market Town	20 March 2013	7 March 2014

Master Plans

Prairiewood Masterplan (December 2005)	13 November 2012	31 May 2013
Fairfield Town Centre Masterplans – The Crescent and Barbara Street Precincts (May 2007)		May 2007

Structure Plans

Villawood Town Centre		February 2008

* Note: Some *"In Force"* Development Control Plans may be under review, check with Council for date of last amendment.

Fairfield City Council
Administration Centre
86 Avoca Road
WAKELEY NSW 2176
PO Box 21
FAIRFIELD NSW 1860
Telephone: (02) 9725 0222
Facsimile: (02) 9609 3257

Flood Information Sheet

Applicant's Details:

Applicant's Name	**Environmental Investigation Services (EIS)**
Postal Address	**115 Wicks Rd MACQUARIE PARK NSW 2113**
Phone	
Fax	

Property Particulars:

House No.	**11-19**
Street & Suburb	**Bonnyrigg Ave BONNYRIGG**
Lot Description	**Lot 1 DP 1071647**

Council has adopted a policy on flooding which may restrict the development of land. The Fairfield City-Wide Development Control Plan 2013 (which includes provisions for flood management) applies to all of the Fairfield Local Government area.

Part or all of this land may be affected by mainstream flooding.

Part or all of this land may be affected by local overland flooding.

MAINSTREAM FLOODING

Description

This parcel is identified as being partly within a **Low** Flood Risk Precinct and partly **not affected** by mainstream flooding.

Mainstream Flood Details

Size of Flood	Flood Level (m AHD)
Probable Maximum Flood (PMF)	41.6-42.4
100 Year ARI	Not Applicable
50 Year ARI	Not Applicable
20 Year ARI	Not Applicable

Flood levels in the vicinity of the above property have been extracted from the Sinclair Knight Merz & Fairfield Consulting Services (2008) *Flood Study for Orphan School Creek, Green Valley Creek and Clear Paddock Creek.*

LOCAL OVERLAND FLOODING

Description

Part or all of the land may be affected by local overland flooding. This parcel is **not** in an area covered by overland flood risk mapping completed by Council.

An overland flood notation may be placed on a property based on information from a number of sources. Typical sources include: information from residents, investigation of local drainage problems and hydraulic analysis of local catchments by engineering consultants and Council staff.

Local Overland Flood Details

A preliminary analysis of this catchment to quantify the amount of stormwater in the vicinity of this property has not been carried out.

Size of Flood	Flood Level (m AHD)	Flow (m^3/s)	Velocity (m/s)
Probable Maximum Flood (PMF)	Not Known	Not Known	Not Known
100 Year ARI	Not Known	Not Known	Not Known
50 Year ARI	Not Known	Not Known	Not Known
20 Year ARI	Not Known	Not Known	Not Known

15 October 2014

Glossary over page

GLOSSARY

m AHD	metres Australian Height Datum (AHD).
Australian Height Datum (AHD)	A common national plane of level approximately equivalent to the height above sea level. All flood levels, floor levels and ground levels are normally provided in metres AHD.
Average Recurrence Interval (ARI)	The long term average number of years between the occurrence of a flood as big as the selected event. For example, floods with a discharge as great as the 20 year ARI event will occur on average once every 20 years. ARI is another way of expressing the likelihood of occurrence of a flood event.
flood	A relatively high stream flow that overtops the natural or artificial banks in any part of a stream, river, estuary, lake or dam. It also includes local overland flooding associated with major drainage before entering a watercourse, or coastal inundation resulting from raised sea levels, or waves overtopping the coastline.
flood risk precinct	An area of land with similar flood risks and where similar development controls may be applied by a Council to manage the flood risk. The flood risk is determined based on the existing development in the precinct or assuming the precinct is developed with normal residential uses. Usually the floodplain is categorised into three flood risk precincts 'low', 'medium' and 'high', although other classifications can sometimes be used. **High Flood Risk:** This has been defined as the area of land below the 100-year flood event that is either subject to a high hydraulic hazard or where there are significant evacuation difficulties. **Medium Flood Risk:** This has been defined as land below the 100-year flood level that is not within a High Flood Risk Precinct. This is land that is not subject to a high hydraulic hazard or where there are no significant evacuation difficulties. **Low Flood Risk:** This has been defined as all land within the floodplain (i.e. within the extent of the probable maximum flood) but not identified within either a High Flood Risk or a Medium Flood Risk Precinct. The Low Flood Risk Precinct is that area above the 100-year flood event.
local overland flooding	The inundation of normally dry land by local runoff rather than overbank discharge from a stream, river, estuary, lake or dam.
mainstream flooding	The inundation of normally dry land occurring when water overflows the natural or artificial banks of a stream, river, estuary, lake or dam.
probable maximum flood (PMF)	The largest flood that could conceivably occur at a particular location.

Appendix C6: NSW EPA Records

EPA NSW

Healthy Environment, Healthy Community, Healthy Business

Home > Contaminated land > Record of notices

Search results

Your search for:Text: 1 Bonnyrigg Avenue Bonnyrigg
LGA: Fairfield City Council

Search Again
Refine Search

did not find any records in our database.

If a site does not appear on the record it may still be affected by contamination. For example:

- Contamination may be present but the site has not been regulated by the EPA under the Contaminated Land Management Act 1997 or the Environmentally Hazardous Chemicals Act 1985.
- The EPA may be regulating contamination at the site through a licence or notice under the Protection of the Environment Operations Act 1997 (POEO Act).
- Contamination at the site may be being managed under the planning process.

Search TIP

To search for a specific site, search by LGA (local government area) and carefully review all sites listed.

... more search tips

More information about particular sites may be available from:

- The POEO public register
- The appropriate planning authority: for example, on a planning certificate issued by the local council under section 149 of the Environmental Planning and Assessment Act.

See What's in the record and What's not in the record.

29 October 2014

Connect Fee

Wel
Pub

Healthy Environment, Healthy Community, Healthy Business

Search results

Your search for: **General Search** with the following criteria

Suburb - BONNYRIGG
Name - 1-19 Bonnyrigg Avenye

returned 0 result

Search Again

Appendix D: Report Explanatory Notes

Appendix D1: Abbreviations

Abbreviations

ABC	Ambient Background Concentrations
ACL	Added Contaminant Limits
AC	Asbestos Cement
ACM	Asbestos-Containing Material
ADWG	Australian Drinking Water Guidelines
AEC	Area of Environmental Concern
AF	Asbestos Fines
AHD	Australian Height Datum
As	Arsenic
ASL	Asbestos Health Screening Levels
ASS	Acid Sulfate Soil
AST	Above Ground Storage Tank
BA	Building Application
Bgl	Below Ground Level
BH	Borehole
BOM	Bureau of Meteorology
BTEX	Benzene, Toluene, Ethylbenzene, Xylene
CLM	Contaminated Land Management
CMP	Construction Management Plan
COC	Chain of Custody Documentation
Cr	Chromium
CSM	Conceptual Site Model
CT	Contamination Threshold
Cu	Copper
DA	Development Application
DBYD	Dial Before You Dig
DQI	Data Quality Indicators
DQOs	Data Quality Objective
DSI	Detailed Site Investigation
EAC	Ecological Assessment Criteria
EC	Electrical Conductivity
EILs	Ecological Investigation Levels
EMP	Environmental Management Plan
ENM	Excavated Natural Material
EPA	Environmental Protection Agency
ESA	Environmental Site Assessment
ESL	Ecological Screening Level
FA	Fibrous Asbestos
FR	Field Rinsate
GAI	General Approvals of Immobilisation
GSW	General Solid Waste
HILs	Health Based Investigation Level
HM	Heavy Metals
HMTV	Hardness Modified Trigger Values
HSLs	Health Screening Level
HW	Hazardous Waste
ISO	International Organisation of Standardisation
JK	Jeffery and Katauskas
LCS	Lab Control Spike
LNAPL	Light Non-Aqueous Phase Liquid
MGA	Map Grid of Australia
MW	Monitoring Well
NATA	National Association of Testing Authorities

Abbreviations

NEPM	National Environmental Protection Measure
NSW	New South Wales
OCP	Organochlorine Pesticides
OPP	Organophosphate Pesticides
PAH	Polycyclic Aromatic Hydrocarbons
Pb	Lead
PCB	Polychlorinated Biphenyls
PCC	Potential Contaminants of Concern
PID	Photo-ionisation Detector
PQL	Practical Quantitation Limit
PSI	Preliminary Site Investigation
PVC	Polyvinyl chloride
QA	Quality Assurance
QC	Quality Control
RAP	Remediation Action Plan
RL	Reduced Level
RPD	Relative Percentage Difference
RSW	Restricted Solid Waste
SAC	Site Assessment Criteria
SAQP	Sampling, Analysis and Quality Plan
SAS	Site Audit Statement
SAR	Site Audit Report
SCC	Specific Contamination Concentration
SD	Standard Deviation
SIX	Six Maps
SPT	Hardness Modified Trigger Values
sVOC	Semi-Volatile Organic Compounds
SWL	Standard Water Level
TB	Trip Blank
TCLP	Toxicity Characteristic Leaching Procedure
TPH	Total Petroleum Hydrocarbons
TS	Trip Spike
UCL	Upper Confidence Limit
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VENM	Virgin Excavated Natural Material
VOC	Volatile Organic Compounds
VOCC	Volatile Organic Chlorinated Compound
WA	Western Australia
WHS	Workplace, Health and Safety
Zn	Zinc

Appendix D2: SAC Explanatory Notes

SAC EXPLANATORY NOTES

A brief summary of the SAC applicable to this investigation is presented below. Reference should be made to the NEPM 2013 for further information.

1. Health Investigation Levels (HILs) - Soil

The NEPM 2013 includes Health Based Investigation Levels (HILs) for a range of contaminants based on the risk of exposure, duration of exposure, toxicity and land use (availability). The HILs are scientifically based, generic assessment criteria designed to be used in the first stage of an assessment of potential risks to human health from exposure to contaminants (Tier 1 or 'screening stage').

The HILs are generally applicable to the top 3m of the soil profile for low-density residential land use. However, site specific conditions should determine the applicability of the HILs to soils below this depth for other land uses.

The HILs are divided into four categories outlined in the following table:

Table 1.1: HILs Categories – Soil

Category/Column	Land Use
HIL A	Residential with garden/accessible soil (home-grown produce contributing less than 10% of vegetable and fruit intake, no poultry); also includes children's day-care centres, preschools and primary schools.
HIL B	Residential with minimal opportunities for soil access, includes dwellings with fully and permanently paved yard space such as high-rise buildings and flats.
HIL C	Public open spaces like parks, playgrounds, playing fields (e.g. ovals), secondary schools and footpaths. Does not include undeveloped public open spaces such as urban bushland and reserves.
HIL D	Commercial/Industrial includes premises such as shops, offices, factories and industrial sites.

Where the proposed land use includes more than one land use category (for example a mixed-use development including residential/retail/commercial land uses) the exposure setting of the most 'sensitive' ground floor site use is considered to be the most appropriate.

2. Interim Soil Vapour HILs for Volatile Organic Chlorinated Compounds (VOCCs)

The NEPM 2013 includes interim soil vapour HILs for selected VOCCs [see Table 1A(2) of Schedule B (1), NEPM 2013] to assess the vapour inhalation/intrusion pathway. The interim guidelines provide Tier 1 guidance for health risks for soil contamination sources and groundwater plumes associated with VOCCs. These values may be applied for general site

assessments and sub-slab environments for evaluation of potential health risks for the 0-1m sub-slab profile. The VOCCs HILs for residential A and B (see landuse in Table 1.1 above) land uses are combined.

3. Health Screening Levels (HSLs) for Petroleum Compounds

The NEPM 2013 has adopted the HSLs for total petroleum hydrocarbon (TPH) compounds developed by the Cooperative Research Centre for Contamination Assessment and Remediation of the Environment (CRC CARE). The HSLs have been derived based on the recommended total recoverable hydrocarbons (TRH) analytical method which includes BTEX compounds and naphthalene.

HSLs have been derived for soil, groundwater and soil vapour and apply to exposure to petroleum hydrocarbons through the dominant vapour inhalation exposure pathway only. HSLs are applicable to the ground floor land use only.

HSLs are derived by taking into account multiple factors (referred to as the 'multiple lines of evidence approach') which are summarised in the table below.

Table 1.2: Multiple Factors Governing Site Specific HSLs

Factor	Description
Land use	HIL A to HIL D outlined in Table 1.1. The HSLs for Residential A and B land uses are combined. HSLs are applicable to the ground floor land use only.
Soil Type	The below classification is based on the soil texture classification in Table A1 of the standard AS1726: • Sand – Coarse grained soil; • Silt – Fine grained soil – silts and clays (liquid limit <50%); and • Clay – Fine grained soil – silts and clays (liquid limit >50%). Where there is reasonable doubt, a more conservative approach should be adopted or laboratory testing for particle size should be undertaken.
Soil Depth (mBGL)[1]	The soil depth range is outlined below: • 0m to <1m; • 1m to <2m; • 2m to <4m; and • >4m (4m+).
Groundwater (mBGL)[1]	Presence of moisture/groundwater is an important factor. The depth of occurrence, land use (outlined above) and soil type (outlined above) should be taken into account. The depth of occurrence is outlined below: • 2m to <4m; • 4m to <8m; and

Factor	Description
	• >8m (8m+).
Soil Vapour (mBGL)[1]	Presence of soil vapour, depth of occurrence, land use (outlined above) and soil type (outlined above) should be taken into account. The depth of occurrence is outlined below: • 0m to <1m; • 1m to <2m; • 2m to <4m; • 4m to <8m; and • >8m (8m+). Soil vapour measurements can provide a more accurate representation of vapour risk. This is preferred where contaminated groundwater is present at less than 2m below ground or basement levels.
Contaminants	BTEX, Naphthalene and TPH fractions F1-F4: • F1: C_6 – C_{10}. The BTEX concentration must be subtracted to obtain F1 value; • F2: >C_{10} – C_{16}. The naphthalene concentration must be subtracted to obtain the F2 value; • F3: >C_{16} – C_{34}; and • F4: >C_{34}. The F3 and F4 fractions are non-volatile and therefore not of concern for vapour intrusion. Exposure to these compounds can occur via direct contact. Reference should be made to the NEPM 2013 in the event direct contact can occur.

Bio-degradation	Account for bio-degradation due to the presence of oxygen:
	• Concentration of oxygen greater than >5% in soil vapour at a depth of 1m below the surface immediately adjacent to the concrete slab;
	• Maximum slab width of less than 15m, with oxygen access on both sides. A distance of 7-8m from the exposed soil at the slab boundary is considered the maximum lateral under-slab penetration of oxygen;
	• Provided the above conditions are met, the following bio-degradation factors can be applied:
	  ➢ Factor of x10 for depths to source of 2 to <4m; and
	  ➢ Factor of x100 for depths to source of 4m+ where the vapour source strength is 100mg/L (100,000mg/m^3) or less.
	• Bio-degradation is not applicable for depths less than 2m; and
	• Not applicable to ecological receptors; and

Factor	Description
	• Reference should also be made to management limits.
Other Factors	Consideration should also be given to the following: • Check the status and condition of the slab for the presence of cracks and deterioration. This can act as a preferential pathway; • Potential for direct contact to workers; and • The soil saturation concentration of a contaminant occurs when the pore water is at its solubility limit and soil vapour is at the maximum. When the HSLs exceed this limit, the vapour in soil or above the groundwater cannot result in an unacceptable vapour risk and is denoted as NL (not limited) in the HSLs tables.

Note:
mBGL – meters below ground level

a) Limitations of HSLs

A site specific approach of direct intervention should be development in the following cases:

- Identified contamination has an atypical petroleum composition;
- Groundwater contaminated with petroleum hydrocarbons is present at less than 2m below ground or basement surface;
- Contaminated groundwater or LNAPL is entering or in contact with a basement or building foundations;
- The impacted soil source thickness is >2m;
- A preferential migration pathway is present that could connect a vapour source to a building; and
- Hydrocarbon odour is present in buildings or utilities which indicate a preferential migratory pathway and an immediate human health risk.

b) Silica Gel Clean-Up

Soil samples are initially analysed for TRH 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).

Silica gel clean-up should remove these other compounds and result in a more accurate result for petroleum hydrocarbons. If undertaken these results have been referred to as TPH_{sgel} within this report.

4. Ecological Assessment Criteria (EAC)

The NEPM 2013 includes a methodology for developing site specific EAC for the protection of terrestrial ecosystems from site contamination. The EAC provide the basis for a Tier 1 site assessment of ecological risk. The factors to take into account for deriving site specific EAC are outlined in the following table:

Table 1.3: Factors for Deriving Site Specific EAC

Factor	Description
Land Use Setting	The EAC are applicable for the following generic land use settings based on protection of ecological significance: • Areas of ecological significance (99% protection); • Urban residential areas and public open space (80% protection); and • Commercial/Industrial land use (60% protection).
Application Depth	The EAC are applicable to the top 2m of soil at the finished surface/ground level which corresponds to the root zone and habitation zone of many species.
Ecological Investigation Levels (EILs)	EILs are derived for the following contaminants: • Aged contaminants (>2 years): Chromium III (CrIII), Copper (Cu), Lead (Pb), Nickel (Ni) and Zinc (Zn). The methodology for deriving site specific EILs for aged contaminants are outlined in below; and • Other contaminants with published EILs: Arsenic (As), DDT (pesticide) and Naphthalene (a PAH compound). EILs for fresh contaminants (i.e. present for less than 2 years) should be specifically derived for the site as outlined in NEPM 2013.
Ecological Screening Levels (ESLs)	ESLs apply to TRH fractions F1-F4 (see Table 1.2); BTEX and Benzo(a)pyrene (a PAH compound).

a) Ecological Investigation Levels (EILs)

The NEPM 2013 provides generic EILs for Arsenic, DDT and Naphthalene that are applicable to all soils as a total soil contaminant concentration. The EILs for the remaining aged contaminants (Cr III, Cu, Ni, Pb and Zn) are derived using the following methodology:

Table 1.4: Steps for Deriving Site Specific EILs

Step	Description
Step 1 – Soil Property	Analyse the soil samples for the following: • CEC ($cmol_c/kg$) to determine EILs for Cu, Ni and Zn; • pH (to determine EILs for Cu); and • Clay content (% clay) (to determine the EIL for CrIII).
Step 2 – Establish Added Contaminant Limits (ACLs)	The ACL is the added concentration of a contaminant above which further appropriate investigation and evaluation of the impact on ecological values is required. The ACL take into account the biological availability of the elements in various soils. For establishing the site specific ACLs, consideration should be given to the soil parameters outlined in Step 1. The ACL for Cu may be determined by pH or CEC. The lower of the determined value should

Step	Description
	be selected for the EIL calculation. The ACL for Pb is taken directly from the published data.
Step 3 – Calculate the Ambient Background Concentration (ABC)	The ABC takes into account the naturally occurring background levels and contaminant levels introduced by anthropogenic activity like emissions from vehicles etc. The NEPM 2013 provides the following methods for calculating the ABC: • Method 1: The preferred method is to measure the ABC at an appropriate reference site where there is a high naturally occurring background; • Method 2: Obtain ABC from the urban metal level studies undertaken by Olszowy et al. (1995) or Hamon et al. (2004). The ABC in this method varies based on the contaminant and the soil iron and/or manganese concentrations; and • Method 3: ABCs for individual suburbs which high and low traffic areas for NSW are available for CrIII, Cu, Pb, Ni and Zn from Olszowy et al. (1995) (see NEPM 2013 Schedule B5b).
Step 4 – Calculate the EIL	EIL is calculated by summing the ACL and ABC: **EIL = ACL + ABC**

b) Ecological Screening Levels (ESLs) for Petroleum Compounds

Similar to the HSLs outlined above, the NEPM 2013 has adopted the ESLs for TPH compounds developed by the Canadian Council of the Ministers of the Environment (CCME) in the publication *Canada-wide Standard for Petroleum Hydrocarbons (PHC) in soil* (CCME 2008[28]). Site specific ESLs are derived based on fresh contamination and should not be applied directly to the assessment of sediments. The following factors apply:

Table 1.5: Multiple Factors for Site Specific ESLs

Factor	Description
Land Use Setting and Application Depth	Refer to Table 1.1.
Soil Type	• Fine Grained – includes clays and silts; and • Coarse Grained – sands and gravels.
Contaminants	BTEX, Benzo(a)pyrene and TPH fractions F1-F4: • F1: C_6 – C_{10}. The BTEX concentration must be subtracted to obtain F1 value; • F2: $>C_{10}$ – C_{16}. The naphthalene concentration must be

[28] CCME, (2008), *Canada-wide Standard for Petroleum Hydrocarbons (PHC) in soil* (referred to as CWS PHC)

Factor	Description
	subtracted to obtain the F2 value; • F3: $>C_{16} - C_{34}$; and • F4: $>C_{34}$. The ESLs for F1 and F2 is of moderate reliability.

5. Management Limits for Petroleum Hydrocarbons

The NEPM 2013 has adopted the physical and aesthetic management limits outlined in the CWS PHC publication. These limits are applied after considering the relevant HSLs and ESLs for adverse effects of TPH contamination including: presence of free phase (LNAPL); fire hazards; explosive hazards; effects on buried infrastructure; and aesthetic considerations.

These limits are relevant for operating sites where significant sub-slab leakage of petroleum compounds has occurred and when decommissioning industrial and commercial sites.

6. Asbestos in Soil

The NEPM 2013 includes guidelines for the assessment of asbestos in soil. Asbestos is identified to occur as:

- ACM (asbestos containing material);
- Bonded ACM – e.g. fibro frags >7mm (identified during site inspection/sampling);
- Fibrous Asbestos (FA) – friable materials e.g. insulation products, weathered fibro that can be crushed by hand pressure, crumbled, woven materials etc (identified during site inspection/sampling); and
- Asbestos Fines (AF) –free fibres, fibre bundles, fibro frags <7mm (considered friable), generally only identified by laboratory.

The guidelines recommend undertaking a preliminary site investigation (PSI) if the site history or site inspection indicates the possibility or occurrence of potential asbestos contamination. In the event a detailed site investigation (DSI) is required, the NEPM 2013 recommends using the Western Australian (WA) Asbestos Guidelines 2009[29].

a) Criteria for PSI

EIS has adopted the 'presence/absence' method for the PSI in accordance with AS4964-2004[30]. If asbestos is present, the status of the asbestos material (friable or bonded/non-friable) is further considered due to the implications associated with site remediation and/or management. The presence of asbestos may require a DSI as outlined below.

b) Criteria for DSI

[29] WA Department of Health, (2009), *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia.* Published May 2009 (referred to as Western Australian Asbestos Guidelines 2009)

[30] Australian Standard 4964, (2004), *Method for the Qualitative Identification of Asbestos in Bulk Samples.* (referred to as AS4964)

The Western Australian Asbestos Guidelines 2009 prescribe a site investigative model for a DSI. The WA guidelines are based on various studies but generally use the Dutch guidelines with a conservation factor of 10. The asbestos health screening levels (HSLs) adopted by NEPM 2013 is outlined in the table below:

Table 1.6: ASLs for DSI

Form of Asbestos	HSLs (w/w)			
	Residential A[1]	Residential B[2]	Recreational C[3]	Commercial / Industrial D[4]
Bonded ACM	0.01%	0.04%	0.02%	0.05%
FA and AF[5] (Friable)	0.001%			
All forms	No Visible Asbestos at the Surface			

Notes:

1 to 4 – Refer to the landuse categories for HILs outlined in Table 1.1

5 – The guideline value only applies for analysis quantified by gravimetric procedures (see Section 4.10 of NEPM 2013). This is not applicable to free fibres.

The following considerations should be made for determining asbestos concentrations in soil:

- The occurrence of asbestos at the surface should be recorded on a grid system of 10m x 10m;
- Non-impacted soils should be excluded from the calculations to avoid dilution effects;
- Separate determination should be made for each stratum/unit of fill or soil;
- Averaging or using statistical procedures is not appropriate;
- Sub-surface samples obtained from boreholes and/or trenches, the calculation should be carried out per sample; and
- A weight-of-evidence approach is recommended for determining whether the exceedances are of concern.

The amount of asbestos in ACM for a measured/estimated amount of soil is expressed as a % weight for weight (%w/w). This can be estimated using the following expression:

$$\%\frac{w}{w} asbestos\ in\ soil = \frac{\%\ asbestos\ content\ \times bonded\ ACM\ (kg)}{soil\ volume\ (L) \times soil\ density\ (\frac{kg}{L})}$$

The % asbestos content within bonded ACM is estimated to be 15% by enHealth (2005). Soil density for sandy soils is approximately 1.65kg/L.

c) Limitation of adopting the Western Australian Asbestos Guidelines 2009

The following limitations have been identified for using the WA asbestos guidelines:

- The guidelines assume that the asbestos contamination is confined to the top 10cm of the soil profile;
- The guidelines are applicable to sandy soils which are the predominant soil type encountered in WA;
- The sampling methodology recommended in the guideline (wet soil, raking, tilling) may not be adequate in clayey and silty conditions;

- The presence of asbestos below the HSLs may still pose a risk to site receptors which will require remediation or management; and
- The sampling density recommend in the guideline (2 x NSW EPA density) may not be achievable for sites which are less than 500m^3 in area.

7. Waste Classification Criteria for Off-Site Disposal of Soil

Any material excavated for the proposed development will require a waste classification for off-site disposal in accordance with the Waste Classification Guidelines 2009.

Soils are classed into the following categories based on the chemical contaminant criteria outlined in the guidelines:

Table 1.7: Waste Categories

Category	Description
General Solid Waste (non-putrescible) (GSW)	• If SCC ≤ CT1 then TCLP not needed to classify the soil as GSW • If TCLP ≤ TCLP1 and SCC ≤ SCC1 then treat as GSW
Restricted Solid Waste (non-putrescible) (RSW)	• If SCC ≤ CT2 then TCLP not needed to classify the soil as RSW • If TCLP ≤ TCLP2 and SCC ≤ SCC2 then treat as RSW
Hazardous Waste (HW)	• If SCC > CT2 then TCLP not needed to classify the soil as HW • If TCLP > TCLP2 and/or SCC > SCC2 then treat as HW
Excavated Natural Material (ENM)	The criteria to classify material as ENM are outlined in The Excavated Natural Material Exemption (2012[31]).
Virgin Excavated Natural Material (VENM)	Natural material (such as clay, gravel, sand, soil or rock fines) that meet the following: • that has been excavated or quarried from areas that are not contaminated with manufactured chemicals, or with process residues, as a result of industrial, commercial mining or agricultural activities; • that does not contain sulfidic ores or other waste; and • includes excavated natural material that meets such criteria for virgin excavated natural material as may be approved from time to time by a notice published in the NSW Government Gazette.

Note:
SCC – Specific Contaminant Concentration
CT – Contaminant Threshold

[31] Protection of the Environment Operations (Waste) Regulation 2005 – General Exemption Under Part 6, Clase 51 and 51A, The excavated natural material exemption, 2012 (ENM exemption 2012)

TCLP – Toxicity Characteristics Leaching Procedure

a) General Approvals of Immobilisation (GAI)

Significant amounts of waste ash and gravely slag were available in the late nineteenth and early twentieth century as a result of the use of coal for industrial and domestic heating purposes. Widespread use of ash/slag waste (either as ash or mixed with other soil and waste materials) as fill material was common in the suburbs of Sydney at this time.

To account for the presence of ash and slag, the NSW EPA has published the following:

Table 1.8: GAIs

Approval Number	Waste Stream	Contaminants	Waste Assessment Requirements
1999/05[32]	Ash, ash-contaminated natural excavated materials or coal-contaminated natural excavated material	B(a)P and PAHs	The SCC limits for PAHs and B(a)P outlined in the Waste Classification Guidelines 2009 do not apply for the assessment of this waste stream. The material can be classified according to the leachable concentration (TCLP) value of B(a)P alone. Disposal restrictions apply for material classified under this GAI.
2009/07[33]	Metallurgical furnace slag or metallurgical furnace slag contaminated natural excavated materials	Beryllium, Chromium (VI), lead, nickel, PAHs and B(a)P	The SCC limits for these contaminants outlined in the Waste Classification Guidelines 2009 do not apply for the assessment of this waste stream. The material can be classified according to their leachable concentrations (TCLP) values alone.

Note:

SCC – Specific Contaminant Concentration

TCLP – Toxicity Characteristics Leaching Procedure

B(a)P - Benzo(a)pyrene

PAHs – Polycyclic Aromatic Hydrocarbons

8. Groundwater Investigation Levels (GILs)

The appropriate settings for current and potential uses of groundwater should be identified for establishing the GILs. Contaminated groundwater may pose a risk to receptors at the point of extraction or as a result of discharge into the receiving environment and groundwater resources. The assessment should be designed to consider the risk of groundwater contamination to all potential on site and off site receptors.

[32] http://www.environment.nsw.gov.au/resources/waste/GenImmobApp_1999-05_Ash_ACNEM_or_CCNEM.pdf (GAI 1999/05)

[33] http://www.environment.nsw.gov.au/resources/waste/2009-07_Metallurgical_furnace_slag.pdf (GAI 2009/07)

In assessing groundwater contamination, NEPM 2013 has adopted the framework outlined in the National Water Quality Management Strategy which includes the following guidelines:

- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (AWQG) (2000). This includes a framework for developing guidelines for aquifer assessment. The guidelines provide water quality parameters for aquatic ecosystems (fresh and marine waters), industrial, agricultural, recreational and irrigation uses;
- Australian Drinking Water Guidelines (ADWG) (2011). Includes the Australian Drinking Water Guidelines used to assess drinking water quality; and
- Guidelines for Managing Risk in Recreational Water (GMRRW) (NHMRC 2008).

The NEPM 2013 has adopted HSLs for the assessment of petroleum hydrocarbons in groundwater.

The presence of elevated contaminants above the GILs triggers further investigation to assess the source(s) and the extent of the contamination. Guidance on the remediation and management of contaminated groundwater is outlined in *NSW DECCW Guidelines for the Assessment and Management of Groundwater Contamination (2007[34])*.

a) Hardness Modified Trigger Values (HMTVs)

Water hardness can affect the bioavailability of metals/metalloids in fresh water. Consequently, Section 3.4.3.2 of the ANZECC 2000 guidelines includes algorithms to derive hardness modified trigger values (HMTVs) for metals/metalloid concentrations in fresh water.

[34] NSW DECCW, (2007), *Guidelines for the Assessment and Management of Groundwater Contamination.* (referred to as Groundwater Contamination Guidelines 2007)

Appendix D4: 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

1. Prepare a test pit/borehole log or for stockpile sampling made a note of the sample description.
2. 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 machine can operate in a safe manner.
3. Ensure all sampling equipment has been decontaminated prior to use.
4. Remove any surface debris from the immediate area of the sampling location.
5. Collect samples and place in glass jar with a Teflon seal. This should be undertaken as quickly as possible to prevent the loss of any volatiles. If possible, fill the glass jars completely.
6. Collect samples for asbestos analysis and place in a zip-lock plastic bag.
7. Label the sampling containers with the EIS job number, sample location (eg. BH1), sampling depth interval and date. If more than one sample container is used, this should also be indicated (eg. 2 = Sample jar 1 of 2 jars).
8. 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.
9. Record the lithology of the sample and sample depth on the borehole/test pit log generally in accordance with AS1726-1993[35].
10. 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 the standards outlined in the report.
11. 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.
12. Backfill the boreholes/test pits with the excavation cuttings or clean sand prior to leaving the site.

Decontamination Procedures for Soil Sampling Equipment

1. All sampling equipment should be decontaminated between every sampling location. This excludes single use PVC tubing used for push tubes etc.
2. Equipment and materials required for the decontamination procedure is outlined below:
   - Phosphate free detergent (Decon 90);
   - Potable water;
   - Stiff brushes; and
   - Plastic sheets.
3. Ensure the decontamination materials are clean prior to proceeding with the decontamination.
4. Fill both buckets with clean potable water and add phosphate free detergent to one bucket.

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

5. In the bucket containing the detergent, scrub the sampling equipment until all the material attached to the equipment has been removed.
6. Rinse sampling equipment in the bucket containing potable water.
7. 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.

1. 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.
2. 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.
3. 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.
4. Purging and sampling of piezometers/monitoring wells is done on the same site visit when using micro-purge (or other 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;
    - Low flow pump pack and associated tubing; and
    - Groundwater sampling forms.
5. If single-use stericup filtration is not 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.

6. 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.
7. Disposable gloves should be used whenever samples are taken to protect the sampler and to assist in avoidance of contamination.
8. 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.
9. 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%.
10. All measurements are recorded on specific data sheets.
11. 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.
12. All samples are preserved in accordance with water sampling requirements detailed in the NEPM 2013 and placed in an insulated container with ice. Groundwater samples are preserved by immediate storage in an insulated sample container with ice as outlined in the report text.
13. 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

1. All equipment associated with the groundwater sampling procedure (other than single-use items) should be decontaminated between every sampling location.
2. The following equipment and materials are required for the decontamination procedure:
    - Phosphate free detergent;
    - Potable water;
    - Distilled water; and
    - Plastic Sheets or bulk bags (plastic bags).
3. Fill one bucket with clean potable water and phosphate free detergent, and one bucket with distilled water.
4. 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.
5. Flush pump head with distilled water.
6. Change water and detergent solution after each sampling location.
7. Rinse sampling equipment in the bucket containing distilled water.
8. Place cleaned equipment on clean plastic sheets.
9. 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[36]) methods and those described in *Environmental Sampling and Analysis, A Practical Guide,* (H. Keith 1991[37]).

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

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:

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

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

- 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 (eg. 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 below. Acceptable recovery limits are 70% to 130%.

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

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:

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