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WSP

PHASE 2 ENVIRONMENTAL SITE INVESTIGATION

10 Herbert Street, St Leonards, NSW

12/09/2013

Quality Management

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Phase 2 Environmental Site Investigation

10 Herbert Street, St Leonards, NSW

12/09/2013

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List of Abbreviations

ANZECC	Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000)
bgl	Below ground level
BaP	Benzo a pyrene
BTEX	Benzene, toluene, ethyl benzene and xylene
COC	Chain of custody
COPC	Contaminants of potential concern
DQI	Data quality indicators
DQO	Data quality objectives
EIL	Ecological investigation levels
ESA	Environmental Site Assessment
HIL	Health-based investigation levels
HSL	Health-based screening levels
M8	Eight heavy metals including arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc
NAPL	Non aqueous phase liquid
NSW EPA	Over the past few years the environmental regulatory body has undergone a number of name changes, including: Department of Environment and Conservation (DEC); Department of Environment and Climate Change (DECC); Department of Environment, Climate Change and Water (DECCW); and, Office of Environment and Heritage (OEH). For the purpose of currency, the organisation is referred to as NSW EPA in this report. EPA guidelines are referenced by the name of the organisation at the time of publication.
OCP	Organo chlorine pesticides
PAH	Polycyclic aromatic hydrocarbons
pH	Unit of measurement for acidity and alkalinity
PID	Photo ionisation detector
PSH	Phase Separated Hydrocarbons
QA/QC	Quality assurance / quality control
RPD	Relative percentage difference
SAQP	Sampling Analysis and Quality Plan
sVOC	Semi volatile organic compounds
TPH	Total petroleum hydrocarbons (C10 to C36)
UCL	Upper confidence limit
UPSS	Underground Petroleum Storage System
USCS	Unified soil classification system
VOC	Volatile organic compounds
vTPH	Volatile total petroleum hydrocarbons (C6 to C9)
WSP	WSP Environmental Pty Limited trading as WSP Environment & Energy

Executive Summary

WSP have completed a Phase 2 Environmental Site Assessment (ESA) of the property located at 10 Herbert Street, St Leonards, NSW ('the Site'). The site is located in a predominantly commercial / industrial area and is zoned for 'Light Industrial' purposes.

The overarching objective of the ESA was to document the environmental status of the site so that any ongoing liabilities and environmental impediments to a proposed property acquisition and potential property redevelopment can be clearly understood.

WSP investigated 17 borehole locations across the site which provided general site coverage and targeted previously identified areas of potential environmental concern (including USTs, fill material and workshops / maintenance areas).

A layer of concrete between approximately 0.11 – 0.25m thick was encountered at all borehole locations. Underlying fill comprised clayey fill to a maximum encountered depth of 3.0mbgl and fill was underlain by natural shale which was generally encountered at depths of 0.2 - 0.3mbgl across the site.

Concentrations of Asbestos, TPH, BTEX, PAHs, VOCs, OCPs and heavy metals were reported below the laboratory limit of reporting and/or the adopted soil assessment criteria with the exception of B(a)P (commercial/industrial and residential land use) and lead (residential land use). The 95% UCL calculation for these contaminants in fill material was subsequently calculated and reported to be below the adopted soil assessment criteria.

An assessment of site specific risks associated with potential petroleum hydrocarbon contamination was also completed and those risks are considered to be acceptable.

No aboveground infrastructure was observed in the vicinity of the non-operational USTs, GPR scanning indicated a sub-surface anomaly and there was evidence of concrete re-working. Based on these observations, WSP considers it likely that the two non-operational USTs have been decommissioned in situ.

Whilst removal of USTs in accordance with the *Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2008* is considered best practice, WSP note that it is likely that the USTs were decommissioned prior to introduction of the Regulation. Targeted soil boreholes were drilled in the vicinity of each non-operational UST and each borehole refused on hard, natural shale and did not identify any contamination which is considered to pose an unacceptable risk. On the basis of this information, WSP consider that obligations with respect to the non-operational USTs have been met and that the USTs do not pose an unacceptable risk for ongoing commercial/industrial use of the Site.

WSP considers the potential risk to human health and the environment to be low and that the site is suitable for on-going commercial / industrial land use.

WSP also considers that the site is likely to be suitable for residential landuse with accessible soils or limited access to soils. WSP recommends that a further assessment of site specific risks is completed once the proposed use and site layout is developed for this land use scenario. It is also recommended that all USTs be removed prior to Site redevelopment for residential use.

If any material requires excavation and off-site disposal during proposed future redevelopment works, it is likely that the material will be classified as General Solid Waste. On the basis of data collected to date further testing, including TCLP analysis, is likely to be required to support this conclusion.

1 Introduction

1.1 Background

WSP Environmental Pty Ltd (WSP) was engaged by Napier & Blakeley to conduct a Phase 2 Environmental Site Assessment (ESA) of a property located at 10 Herbert Street, St Leonards, NSW ('the Site'). At the time of the ESA, the Site was an operational commercial car dealership and associated vehicle service centre. The Site had a total area of approximately 8,800 m^2.

WSP recently (WSP, 2013) completed a Phase I ESA at the site and identified the following potential contamination risks:

- One 22,500 litre petrol underground storage tank (UST), fuel bowser, associated fuel lines and pit near the western boundary of the site;
- A wash down bay and associated oil/water separator, located within the south western corner of the site;
- A potential UST near the centre of the northern boundary of the Site, adjacent to Frederick Street;
- An oil storeroom in the south eastern corner of the vehicle maintenance area; and
- Potential historical filling activities, particularly in the south western corner of the site, associated with former quarrying activities.

WSP understand that this Phase 2 ESA is required to quantify potential contamination risks at the site prior to a proposed property acquisition and potential property redevelopment.

This report documents the scope and findings from the Phase 2 assessment.

1.2 Objectives

The overarching objective of the ESA was to document the environmental status of the site so that any ongoing liabilities and environmental impediments to the proposed property acquisition and potential redevelopment can be clearly understood.

The ESA aimed to:

- Assess the nature and extent of soil contamination at the site by conducting an intrusive soil investigation;
- Assess the site suitability for on-going commercial / industrial land use;
- Assess the site suitability for a range of other potential future land uses which may be associated with a property redevelopment; and
- Where the site is not considered suitable for future beneficial land use, recommend management or remediation works so that the site can be made suitable.

1.3 Scope of Works

To meet the project objectives, WSP completed the following scope of work. The scope of works was designed to meet the project objectives within the constraints of the site (operational site with buildings covering a significant portion of the site footprint):

- Previous reports were reviewed;
- Occupational Health and Safety documentation was prepared for intrusive site works;

- A site inspection / site walkover was performed prior to commencing intrusive works to assess current conditions and features;
- Following the completion of a Dial Before You Dig search, clearance of underground utilities was conducted using an accredited cable locator for each drilling location;
- The location of the operational UST was confirmed using Ground Penetrating Radar (GPR);
- The potential presence of two non-operational USTs was assessed using GPR and by interrogating residual infrastructure (i.e. fill/dip point);
- Concrete coring was conducted for all sampling locations;
- Four boreholes were installed using a GeoProbe rig and push tube and solid flight auger techniques to a maximum depth of 4.0m below ground level;
- Thirteen boreholes were installed using hand auger techniques to a maximum depth of 1.0m bgl;
- Targeted and representative soil sampling from seventeen (17) boreholes was conducted. Collection of samples from distinct soil strata at each borehole location was undertaken;
- At the conclusion of sampling, all drill locations were reinstated to pre-existing conditions;
- Selected soil samples were submitted to a NATA certified laboratory (Envirolab) for selective analysis of Total Petroleum Hydrocarbons (TPH), Benzene, Toluene, Ethylbenzene and Xylene (BTEX), Polycyclic Aromatic Hydrocarbons (PAH), Volatile Organic Compounds (VOCs), organo-chlorine pesticides (OCPs), heavy metals (M8), Phenols and asbestos;
- Field and laboratory Quality Assurance/Quality Control (QA/QC) procedures were completed in compliance with National Environmental Protection Council (2013 Revision) requirements;
- Analytical data was assessed against adopted site criteria and NSW EPA Waste Classification Guidelines Part 1 – Classifying Waste (2009) for off-site disposal (if required); and,
- This report was prepared in accordance with NSW OEH Guidelines for Consultants Reporting of Contaminated Sites (2011) to detail the findings of the investigation.

1.4 Report Limitations

The findings of this report are based on the scope of work outlined in Section 1.3. WSP performed the services in a manner consistent with the normal level of care and expertise exercised by members of the environmental assessment profession. No warranties, express or implied, are made.

Subject to the scope of work, WSP's assessment was limited strictly to identifying typical environmental conditions associated with the subject property and does not include evaluation of any other issues. This report does not comment on any regulatory obligations based on the findings. This report relates only to the objectives stated and does not relate to any other work undertaken for the Client. It is a report based on the conditions and concentrations observed in soil and groundwater at the time of the sample collection. These conditions may change with time and space.

The absence of any identified hazardous or toxic materials on the subject property should not be interpreted as a guarantee that such materials do not exist on the site.

All conclusions regarding the property area are the professional opinions of the WSP personnel involved with the project, subject to the qualifications made above. While normal assessments of data reliability have been made, WSP assumes no responsibility or liability for errors in any data obtained from regulatory agencies, statements from sources outside of WSP, or developments resulting from situations outside the scope of this project.

WSP is not engaged in environmental assessment and reporting for the purpose of advertising sales promoting, or endorsement of any Client interests, including raising investment capital, recommending investment decisions, or other publicity purposes.

The Client acknowledges that this report is for their exclusive use. Other parties may only gain reliance on this report following receipt of written approval from WSP.

2 Previous Investigations

2.1 Tanknology Australia (2011)

Napier and Blakeley provided this report to WSP as part of the Phase 1 Environmental Due Diligence report which was prepared for the Site (Section 2.2). The following summarises general observations and findings made by Tanknology as presented in their report:

- The test was conducted in association within one 22,500 litre underground tank containing unleaded fuel (Note: WSP assumes this to be the tank located adjacent to the western Site boundary);
- The tank showed no signs of air or water ingress or excessive vacuum decay and no audible faults were detected;
- The tank tested tight;
- The Precision Tank Test used during the assessment exceeded the U.S. EPA required leak detection criteria of 0.38 Litres Per Hour (LPH); and
- Unleaded suction line #1 off tank #1 passed hydrostatic pressure testing with a Final Leak Rate of -0.026 litres per hour.

No recommendations were put forward within the report.

2.2 WSP (2013)

WSP was engaged by Napier & Blakeley Pty Ltd to conduct a Phase 1 Environmental Due Diligence (EDD) Assessment of the Site.

Findings and observations of the Phase I EDD Assessment are summarised below.

- The Site was occupied by two commercial buildings, consisting of showrooms, administrations areas, storerooms and a vehicle service centre. External areas consisted of access driveways, open air car parking and storage areas.
- The Site has historically been used for residential and industrial purposes, including a former quarry with the south western corner of the Site associated with a brick and tile manufacturer.
- The Site was redeveloped between 1956 and 1965 to include the majority of the current Site buildings and layout, however extensive refurbishment works have been undertaken since this time.
- Historical and current surrounding landuse has included commercial/industrial facilities, including the former quarry with regards to the brick and tile manufacturer.
- The following potential sources of contamination were identified at the Site:
  - Uncontrolled filling associated with former quarrying within the south-western portion of the Site;
  - A UST and fuel bowser (including adjacent pit) located adjacent to the western boundary of the Site;
  - A potential UST to the centre of the northern boundary along Frederick Street;
  - A wash down bay;
  - The oil store room.
- No significant issues were identified in relation to general environmental compliance issues including waste management, emissions to air or environmental noise.

WSP considered that the Site represented a moderate risk of environmental liability for the continued commercial/industrial use of the Site and any future Site redevelopment works. WSP recommend that a Targeted Investigation should be undertaken in relation to the environmental issues noted above to document the potential contamination status of the Site.

3 Site Details

3.1 Site Identification

Details of the Site location, ownership, zoning and current Site use are provided in **Table 3.1** below (Refer to Figures 1 and 2, **Appendix A**). The majority of details have been sourced from WSP (2013).

Table 3.1 Site Identification Details

Street Address:	10 Herbert Street, St Leonards, NSW
Legal Description:	Lot C DP401303
Current Site Ownership:	Motive Properties II Pty Ltd
Current Site Use:	Commercial car dealership (multiple brands) and associated vehicle service centre.
Property Size:	Total area of approximately 8,800m^2
Local Government Area:	Willoughby City Council
Zoning:	IN2 – Light Industrial – Willoughby City Council – Local Environmental Plan 2012
Age of Buildings:	Original development between 1956 and 1965.

3.2 Site Layout and Operations

At the time of the Site works, the Site contained two separate commercial buildings, within the western half of the Site and to the eastern boundary. An open air car park/vehicle holding area separated the two buildings.

The building along the eastern boundary consisted of showrooms and offices to the ground floor and vehicle holding /cleaning area to the lower ground floor. It is understood that this building had been originally constructed between 1956 and 1965 but has been extensively refurbished and extended circa 2008.

The building within the western half of the Site consisted of showrooms and offices, a vehicle service centre, storerooms, wash down bay and undercover access driveway to the centre open air car park.

The Site was bound by Herbert Street to the east, Frederick Street to the north and commercial/industrial properties to the west and south.

Additional field observations made during the intrusive works program are presented in Section 8 and photographs taken during the WSP (2013) site inspection and the intrusive works program are included within **Appendix B**.

3.3 WorkCover Dangerous Goods Search

A WorkCover NSW search of the Stored Chemical Information Database (SCID) was completed on 16 July 2013. WorkCover NSW did not locate any records pertaining to the Site.

Napier and Blakeley provided WSP with a copy of Municipality of Willoughby (Willoughby Council) Building Permit records which indicated that previous applications had been made for the installation of Underground Petroleum Storage Systems (UPSS) at the site including:

- 2,000 gallon underground tank and pump (dated 6 November 1969);
- 11,900 litre underground motor spirit storage tank (dated 6 February 1981);

- Underground storage tank (dated 2 April 1981);
- A site plan (undated) accompanying the documentation which indicates an existing 5,950 litre tank and proposed 11,900 litre tank to the centre of the northern boundary along Frederick Street. The location of the tanks as indicated on the plan concurs with WSP field observations regarding potential UPSS being located in this portion of the Site.

It is noted that the records refer to 4 Herbert Street, however the site plan clearly indicates that the documentation refers to the subject site.

A copy of the WorkCover NSW search results and the Willoughby Council documentation is provided in **Appendix C**.

3.4 Surrounding Land Use

The Site is located within a mixed commercial/industrial area. The surrounding land use is summarised in Table 3.2.

Table 3.2 Surrounding Land Use

North	Frederick Street followed by commercial properties
East	Herbert Street followed by commercial properties
South	Commercial/industrial properties
West	Commercial/industrial properties

3.5 Sensitive Environments

The nearest sensitive environments are as follows:

- The nearest residential properties are located approximately 200m east of the Site;
- North Shore Private Hospital is located approximately 175m south-west of the Site; and,
- The closest environmental receptor is Lane Cove River, located 1.5km south of the Site.

4 Environmental Setting

4.1 Topography and Hydrology

Based on a review of local topographical maps and Site observations, the general topography of the Site was found to be relatively flat. This is likely attributed to significant excavations having been undertaken within the eastern half of the Site. The natural topography of the surrounding area was noted to be between 79 meters Australian Height Datum (mAHD) to the western half of the site and 83 mAHD to the northern boundary. The surrounding area was considered to have a slight gradient to the north and north-east.

Through observation of the NSW Land and Property Information Spatial information Exchange database, the nearest surface water receptor is Lane Cove River is located approximately 1,500m south of the Site.

4.2 Soils and Geology

Based on a review of the Geological Survey NSW (1983) *Sydney 1:100,000* Geological sheet 9130, the Site is located over Triassic aged Ashfield Shale, consisting of black to dark grey shale and laminate, which in turn overlies Triassic aged Hawkesbury Sandstone consisting of medium to coarse grained quartz sandstone, very minor shale and laminite lenses.

The Australian Soil Resource Information System (ASRIS) and CSIRO Australia (www.asris.csiro.au), consider that the general soil type of the Site is comprised of Kandosol soils. Kandosols are generally described as having a moderate chemical fertility and water holding capacity.

In addition, a review of the ASRIS - Acid Sulphate Risk map identified that the Site is located within an area of extremely low probability of acid sulphate soil (ASS) occurrence.

4.3 Hydrogeology

A search of the NSW Natural Resource Atlas website (http://www.nratlas.nsw.gov.au) identified two groundwater bores of relevance within a 1 km radius of the Site (refer **Appendix E**).

The groundwater bores identified indicated that the geology in the vicinity of the Site would consist of clay and sandy clay to approximately 4 meters below ground level (mbgl), followed by relatively deep sandstone bedrock to 25 mbgl (approximately) and shale and sandstone lenses to 35 mbgl (approximately). Both groundwater bores recorded water bearing zones from 29 to 32 mbgl (approx.). On the basis of this information, groundwater beneath the Site is expected to be encountered at depths greater than 20 mbgl.

5 Conceptual Site Model

5.1 Potential Sources of Contamination

Based on the summary of historical information detailed in the Phase 1 EDD report (WSP, 2013) and observations made during the site inspection, the following potential sources of contamination have been identified.

5.1.1 Historical On-Site Contamination Sources

WSP (2013) considered that there is a potential for soil and/or groundwater impacts to have occurred within the Site as a result of historical land uses, primarily related to uncontrolled filling activities associated with former quarrying activities of the previous Site owner (brick and tile manufacturer).

Although excavation works had been undertaken within the eastern half of the Site during the original redevelopment, the western half of the Site is not considered to have been subject to excavation works as this area is level with the surrounding topography. As such, any imported uncontrolled fill material within the south western corner is considered to remain in place.

In addition, WSP (2013) identified a potential fill/dip point associated with an underground storage tank (UST) to the centre of the northern boundary. No other infrastructure related to the potential USTs was observed (e.g. bowser, vent pipes) indicating that the potential USTs are no longer operational.

Information sourced from Willoughby Council supports the potential presence of up to two USTs within this portion of the Site.

5.1.2 Current On-Site Contamination Sources

There are currently several potential sources of contamination within the Site.

There is at least one operational UST at the Site and potentially two other USTs with an unidentified status (refer Section 5.1.1).

The refuelling area surrounding the fuel bowser is considered to pose a potential contamination risk due to the presence of a metal grill covered pit. No information was provided as to its function, servicing records and where the contained liquid within the pit is disposed to.

The wash down bay, located within the south western corner, remains a potential source of soil and/or groundwater contamination due to its extensive use and potential hydrocarbon impacted water entering the surrounding environment. In addition, no service/maintenance records were provided in relation to the oil/water separator connected to the wash down bay and this unit also presents a potential source of contamination.

Hydrocarbon sheens were noted to several locations throughout the Site, and in particular to the western half of the Site. These sheens are considered to be the result of the inadequate storage and leaks and spills of hydrocarbon based products. The sheens were identified in areas adjacent to open drains and no information was provided regarding the discharge point for the drainage network. A potential remains that the leaks and spills have entered the surrounding environment through the open drains and cracks/penetrations within the concrete/asphalt hardstand.

Although the majority of stored oil and lubricants were stored in adequate containers and aboveground storage tanks, a moderate quantity of oil/lubricant was noted to the concrete floor of the Main Oil Storeroom. This is considered to be the result of an “overflowing” 44 gallon drum and several incorrectly stored drums. The storeroom did not contain secondary containment and an open drain was located within close proximity. A potential remains for hydrocarbon based liquids to enter the open drain and migrate into the surrounding environment.

5.1.3 Historical and Existing Off-Site Contamination Sources

With the exception of land to the south of the Site, historical and existing landuses of surrounding sites are considered to pose a low risk of soil and/or groundwater impacts to the Site.

Land to the south of the Site had historically been used for quarrying purposes in relation to the manufacturing of bricks and tiles – it should be noted that these activities extended into the south western corner of the subject Site. WSP (2013) considered that the historical importation of fill material within the up-gradient former quarry may have the potential to impact Site soils and/or groundwater.

The potential sources of contamination have been summarised in Table 5.1:

Table 5.1 Potential Sources of Contamination

Source No.	Potential Sources of Contamination	Contaminants of Potential Concern (COPC)
1	Uncontrolled fill materials	TPH, BTEX, PAHs, OCPs, M8 and Asbestos
2	Fill within former quarry pit	TPH, BTEX, PAHs, OCPs, M8 and Asbestos
3	Operational UST and bowser area	TPH, BTEX and M8
4	Potential non-operational USTs	TPH, BTEX and M8
5	Wash down bay and oil store	TPH, BTEX, M8, VOCs, Phenols
6	Oil / water separator	TPH, BTEX, M8, VOCs, Phenols

5.2 Potential Contaminated Media

Based on the site history review (WSP, 2013), the site inspection and the preliminary soil sampling, the potentially impacted media is limited to soil (fill material and underlying natural soils).

Groundwater is likely to be located at a depth greater than 20 mbgl, representing a low groundwater migration potential. The nearest surface water receptor is located at a distance greater than 1km from the site.

5.3 Sensitive Environments and Potential Receptors

The potential for contaminants to migrate from the site is a combination of:

- The nature of the contaminants (i.e. solid/liquid and mobility characteristics);
- The extent of the contaminants (i.e. isolated or widespread);
- The location of the contaminants (i.e. surface soils or at depth);
- The presence of sealed surfaces which may limit infiltration and prevent the migration of surface contaminants to underlying soils and groundwater; and
- The site topography, geology, hydrology and hydrogeology.

Based on the site history review and the site inspection, the sensitive environmental and potential receptors for site based contamination are:

- Current site occupiers;
- Future site occupiers; and
- Construction workers (associated with potential future redevelopment).

6 Detailed Site Investigation Methodology

The following outlines the methodology adopted by WSP for the ESA. This section also provides details on the sampling and analysis rationale for borehole locations, description of field equipment used, decontamination procedures, field and laboratory quality assurance and control, laboratory analytical methods and sample preservation.

6.1 Data Quality Objectives

The DQO process is a systematic planning tool based on the scientific method for establishing criteria for data quality and for developing data collection designs. The DQO defines the experimental process required to test a hypothesis.

The DQO process has been developed to ensure that efforts relating to data collection are cost effective, by eliminating unnecessary, duplicative or overly precise data whilst at the same time, ensuring the data collected is of sufficient quality and quantity to support defensible decision making.

It is recognised that the most efficient way to accomplish these goals is to establish criteria for defensible decision making before data collection begins and develop a data collection design based on these criteria. By using the DQO process to plan the investigation effort, the relevant parties can improve the effectiveness, efficiency and defensibility of a decision in a resource and cost effective manner.

6.1.1 Guidance Documents

DQO have been developed to detail the type of data that is needed to meet the overall objectives of this project. The DQO have been developed with procedures stated in the following guidelines:

- ANZECC/NHMRC (1992) Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites;
- DEC (2006) Guidelines for the NSW Site Auditor Scheme (2nd Edition);
- DECCW (2006) Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997;
- DECCW (2009) Waste Classification Guidelines, Part 1: Classifying Waste (for waste disposal purposes – if required as part of future site redevelopment);
- Revised National Environment Protection Council (2013) National Environment Protection Measure 2013 – Assessment of Site Contamination. Schedule B(1): Guideline on the Investigation Levels for Soil and Groundwater;
- National Environment Protection Council (2013) National Environment Protection Measure 2013 – Assessment of Site Contamination. Schedule B(2): Guideline on Data Collection, Sample Design and Reporting;
- NSW EPA (1995) Sampling Design Guidelines;
- NSW OEH (2011) Guidelines for Consultants Reporting on Contaminated Sites.

6.1.2 Process for DQO Development

The DQO process consists of seven steps, which are designed to clarify the study objectives, define the appropriate type of data and specify tolerable levels of potential decision errors. The seven-step DQO process that is to be adopted for the works is as follows:

- Step 1 – Defining the Problem. The first step in the DQO process is to 'define the problem' that has initiated the investigation
- Step 2 – Identify the Decision. The second step in the process is to define the decision statement that the study will attempt to resolve
- Step 3 – Identify Inputs to the Decision. In this step, the different types of information needed to resolve the decision statement are identified
- Step 4 – Define the Study Boundaries
- Step 5 – Develop a Decision Rule
- Step 6 – Specify Limits on Decision Errors
- Step 7 – Optimise the Design for obtaining the Data

6.1.3 Step 1 – Defining the Problem

The client requires an understanding of the following for the site:

- The extent and concentration of any contamination in soil and (if encountered, groundwater) beneath the site;
- Whether there is any risk to the environment and/or human health as a result of any identified contamination;
- Whether the site is suitable for commercial / industrial purposes, including potential property redevelopment.

6.1.4 Step 2 – Identify the Decision

The relevant decision statement for this environmental investigation is:

- "Does any contamination at the subject site occur at concentrations that pose an unacceptable liability or risk to the environment and / or human health based on a proposed commercial / industrial landuse, including potential redevelopment?"

6.1.5 Step 3 – Identification of Inputs into the Decision

Key data required to resolve the project problem includes concentrations of contaminants of concern in soil collected in the study area, the pathways for contaminant movement (underlying geological and hydrogeological conditions) and the location of sensitive receptors. The investigation strategy sought not only to identify the nature and extent of contamination but to identify the sources of contamination, such that any required management strategy could be focussed on what had caused the contamination.

The contaminants of concern identified were based on potential sources of contamination identified at the site, both current and historical.

The sampling strategy involved the construction of boreholes across the site to give good site coverage and to target areas of environmental concern (USTs, historical filling etc.).

Observations on geological and hydrogeological characteristics are also important information to assist in assessing the potential migration and fate of contamination and the likely rate of distribution.

6.1.6 Step 4 – Defining the Study Boundaries

The ESA was limited to the boundaries of the site; however, consideration has been given to capture potential off-site sources of contamination that may impact the site.

The vertical extent of the study boundary was limited to a maximum depth of the 5m below ground level (bgl). This depth was considered sufficient to allow any potential impact associated with sub-surface structures (e.g. USTs) to be assessed. The temporal boundaries of the study were limited to those dates that the investigation is undertaken.

6.1.7 Step 5 – Developing Decision Rules

This assessment included a comparison of individual sample results to the Revised National Environment Protection Council (2013) National Environment Protection Measure 2013 – Assessment of Site Contamination. Schedule B(1): Guideline on the Investigation Levels for Soil and Groundwater.

The revised NEPM (2013) guidelines provide criteria for the assessment of the vapour risk, environmental risk and site management.

Given that the nature of the proposed redevelopment is unknown, the criteria for ongoing commercial / industrial land use were adopted. These criteria are considered suitable given the current site setting and zoning. Although it is considered unlikely that the site would be redeveloped for a more sensitive land use, the criteria for residential land use with no and minimal access to soils were also considered.

6.1.8 Step 6 – Specify Limits on Decision Errors

There are two types of errors:

- Type I error (false positive decision error) – Rejecting the hypothesis as false when it is really true; and
- Type II error (false negative decision error) – Accepting the hypothesis as true when it is really false.

The more severe consequences are associated with Type 1 error, as an assumption could be made to the extent that the soils are suitable for reuse on site when the reverse is actually true. Bearing this in mind, WSP proposes to adopt the following probability values to parameter concentrations above and below the adopted site criteria that reflect the tolerable probability for the occurrence of each error:

- Type I error (5%); and
- Type II error (20%).

NSW EPA (1995) states that “Unless a site investigator can demonstrate otherwise, the EPA maintains that all statistical interpretation should be carried out at a confidence level of no lower than 95%”. To ensure compliance with this guideline, an overall acceptable error rate of <= 5% will be adopted for this project.

The pre-determined data quality indicators (DQIs) established for the project are presented in Table 6.1 in relation to precision, accuracy, representativeness, comparability and completeness (PARCC parameters) as required by Step 6 of the DQO process.

Table 6.1 Data Quality Indicators

Data Quality Objective	Frequency Conducted	Data Quality Indicator
Precision		
Inter and Intra-laboratory field duplicates – inorganics	1/20 samples	< 30 to 100% RPD[1]
Inter and Intra-laboratory field duplicates – organics	1/20 samples	< 30 to 100% RPD[1]
Laboratory duplicates – inorganics	1/20 samples	< 50 to 100% RPD[1]
Laboratory duplicates - organics	1/20 samples	< 50 to 100% RPD[1]
Laboratory method blanks	1/20 samples	< LOR[1]
Accuracy		
Matrix inorganic spikes	1/20 samples	70 to 130%
Matrix organic spikes	1/20 samples	60 to 140%
Laboratory control sample – metals	1/20 samples	70 to 130%
Laboratory control sample – organics	1/20 samples	60 to 140%
Representativeness		
Sampling handling appropriate for media and analytes	-	Yes
Rinsate blanks (sampling trowel)	1 per day per equipment	<LOR
Laboratory blanks	1 per sampling event	<LOR
Samples extracted and analysed within holding times.	-	14 days - organics 6 months – inorganics
Comparability		
Standard operating procedures used for sample collection and handling (including decontamination)	All Samples	Yes
Standard analytical methods used for all analyses	All Samples	Yes
Consistent field conditions, sampling staff and laboratory analysis	All Samples	Yes
Limits of reporting appropriate and consistent	All Samples	Yes
Completeness		
Soil description and COCs completed and appropriate	All Samples	Yes
Appropriate documentation	All Samples	Yes
Satisfactory frequency and result for QC samples	-	Yes

The precision, accuracy, repeatability, completeness and comparability of the data generated have been assessed against the DQO. The acceptable limits for data QA include the following:

- Accuracy measured by percent recovery '%R'. Accuracy data is expected to vary within the range of 70-130 %R; and
- Precision was measured using the standard deviation 'SD' or Relative Percent Difference '%RPD'. Replicate data is expected to be less than 30% RPD at concentration levels greater than ten times the laboratory reporting limit, or less than 50% RPD at concentration levels less than ten times the laboratory reporting limit, for material that is homogenous.

If the RPD between duplicates is greater than the pre-determined data quality indicator, a judgment will be made as to whether the excess is critical in relation to the validation of the data set or unacceptable sampling error is occurring in the field.

6.1.9 Step 7 – Optimise Design

The purpose of this step is to identify a resource-effective data collection approach for generating data to meet the project objectives. This was achieved by developing a sampling program that used combined targeted and grid-based sampling strategy as outlined in Section 6.2.

6.2 Sampling and Analysis Plan

The intention of the sampling plan was to provide an assessment of the site with an appropriate number of locations to effectively allow conclusions to be made in relation to the status of the soil and its suitability for ongoing commercial/industrial landuse.

Sampling locations were strategically placed to assess the soil quality across the site, to target known historical sources and to provide adequate site coverage as detailed in Table 6.2.

The Sampling Plan allowed for the formation of fifteen (15) boreholes. WSP note that whilst NSW EPA Sampling Design Guidelines (1995) recommend 20 investigation locations for a site of this size, fifteen locations was considered acceptable to provide adequate site characterisation given the site access restrictions (operational site with buildings covering a significant portion of the site area) and the fact that all identified primary contaminant sources could be targeted.

Target sample depths ranged from 1.0 – 5.0mbgl depending on the purposed of the borehole. Hand auger locations were proposed to a maximum depth of 1m below ground level (bgl) where it was expected that natural soils would be encountered at shallow depth, or where identified sources of contamination were located at the site's surface.

It was proposed to drill selected locations to a maximum depth of 5m bgl to target potential filling within the former quarry footprint and to assess potential impacts in the vicinity of USTs.

Table 6.2 Sampling and Analysis Plan

BH No.	Target Depth (mbgl)	Drilling method	Area of Environmental Concern
1	1.5	Hand auger	Site coverage
2	5	Rig	Operational UST
3	5	Rig	Operational UST
4	1.5	Hand auger	Wash down bay / oil store
5	1	Hand auger	Oil water separator
6	1	Hand auger	Fill within former quarry pit
7	1	Hand auger	Fill within former quarry pit
8	1.5	Hand auger	Site coverage
9	5	Rig	Potential UST
10	5	Rig	Potential UST
11	1	Hand auger	Site coverage
12	1	Hand auger	Site coverage
13	1	Hand auger	Site coverage
14	1	Hand auger	Site coverage
15	1	Hand auger	Site coverage

It is noted that the following amendments to the original sampling plan were made in response to conditions encountered at the site:

- Borehole No. 2 was moved approximately 5m north due to the presence of sub-surface infrastructure associated with the automated site access roller door. It was considered that the revised location would still identify potential impact associated with the adjacent UST;
- Borehole No. 9 was moved approximately 2m to the east to enable rig access. The original location was beneath the car park awning. It was considered that the revised location would still identify potential impact associated with the adjacent, potential UST; and
- Two additional boreholes (BH16 and BH17) were installed in the vicinity of the former quarry pit. This was completed to provide additional data in this portion of the Site, due to early refusal in BH6 and BH7 on shale. It was not known whether the shale was associated with fill material or natural.

It is also noted that a number of boreholes were terminated at shallower depths due to refusal on hard, natural shale material.

6.3 Schedule of Works

An overview of site activities is presented in Table 6.3. Fieldworks including service clearance, soil sampling and site re-instatement was conducted or supervised by WSP's Environmental Scientist Aaron Young.

Table 6.3 Schedule of Works

Date	Description of Site Activities
9 July 2013	■ Service clearance and inspection. ■ Drilling of soil bores and associated sampling utilising a drill rig. ■ Site re-instatement
10-11 July 2013	■ Drilling of soil bores and associated sampling utilising a hand auger. ■ Site re-instatement

6.4 Sampling Methodology

6.4.1 Drilling of Boreholes

Seventeen boreholes were drilled across the site to a maximum depth of 4mbgl. Hand auger, direct push tube and solid flight auger drilling techniques were utilised. One hand auger location was supplemented by concrete corer advancement through shale material. Refer to Figure 3, **Appendix A** for the location of boreholes.

6.4.2 Soil Logging and Sampling

Soil sampling was conducted during the drilling of all boreholes except BH16, where natural shale was encountered immediately beneath the concrete slab and drilling was terminated at 1.1mbgl in shale.

All soil samples were collected directly from the hand auger, push tube or rig auger. All soil samples were split into two parts (primary and secondary samples) with the secondary samples placed into a snap lock plastic bag and screened for volatile organic compounds (VOCs) using a PID. The corresponding primary sample was placed into a laboratory prepared 250ml glass jar with the details of the sample, including the sample name, the job number, the date of sample and the sample depth. For sample integrity, gloves were replaced between each sampling event. For preservation in accordance with NEPM (2013) samples were then stored in an ice filled Esky to keep the samples below approximately 4^0C prior to being couriered to the laboratory.

Each soil sample was described using the Unified Soil Classification System (USCS) and details of any discolouration, staining, odours or other indicators of contamination were also noted. All observations were recorded on borehole logs (**Appendix E**).

Samples with the highest PID reading or those which exhibited visual or olfactory evidence of contamination were submitted for laboratory analysis. If no PID or sensory indication of contamination was noted, representative samples, or samples from the depth most likely to be impacted were submitted for analysis. Non-analysed samples, typically comprising changes in soil type, were retained for future analysis, if required. Calibration certificates for the PID are presented in **Appendix D**.

6.4.3 Sample Storage and Handling

Soil samples were immediately placed in an ice-filled Esky to keep the samples below a temperature of approximately 4.0°C. A chain of custody (CoC) form was filled out with the sample ID and required analyses, and dispatched to the laboratory for analysis.

6.4.4 Laboratory Analysis and Methods

Sample analysis was conducted by Envirolab Services (NATA No. 2901). Selected soil samples were analysed for a combination of heavy metals (M8), TPH, PAHs, BTEX, Phenols, OCPs, VOCs and Asbestos in accordance with the Sampling and Analysis Plan.

All analysis was completed in accordance with NATA accredited procedures are detailed on the laboratory certificates of analysis (**Appendix G**).

6.5 Quality Assurance / Quality Control

For any given project, all investigation data are potentially subject to sampling and data reduction errors. Data quality objectives are therefore established to control the sources of errors and quantify the errors whenever possible. Quality control (QC) procedures are designed to both increase sample data quality and help interpret discrepancies in results.

All work was conducted in accordance with industry-accepted standards and quality assured procedures. Field quality control included rigorous sample collection, decontamination procedures, and sample documentation as outlined in the DQI (Table 6.1).

WSP implemented QC procedures during soil sampling by collecting representative QC samples for subsequent laboratory analyses. Following these analyses, laboratory and sampling data quality objectives were analysed and reported in terms of data precision, accuracy, and completeness.

One duplicate and one triplicate sample were collected for quality assurance to assess the precision, accuracy and comparability of the laboratory analyses. WSP standard field procedures require that samples are collected from discrete locations and not composited. WSP standard field procedures specify that field duplicates and triplicates be collected at the rate of one sample per twenty soil samples collected in the field.

A rinsate sample was collected from the hand auger during soil sampling to assess the potential for cross-contamination.

Trip Blank and Trip Spike samples were transported and analysed with sample batches to assess the potential for loss of volatiles / cross-contamination from volatiles.

Laboratory Quality Assurance (QA) and Quality Control (QC) procedures included sample spikes for organic analysis. The results of the QC testing are presented in the laboratory reports, which also indicate how much of a particular analyte was recovered. Duplicate testing is undertaken by the laboratory to compare the results obtained in analysing samples.

Table 6.4 provides a summary of the Quality Assurance (QA) / Quality Control (QC) for the project, as compared to the project DQO.

Table 6.4 Summary of QA / QC

Data Quality Objective	Frequency	Data Quality Indicator	Number of Samples Analysed	Range of Results	No. Meeting DQI	Comment
Precision						
Intra laboratory field duplicates	1/20 samples	<30 to 100% RPD	2 (16)	0 to 67%	1	The RPD criteria for zinc was not met for sample DUP1. (Table 4, **Appendix F**). Non-compliances are attributed to the heterogeneous nature of the samples and as zinc is not a primary contaminant of concern for the site, the non-compliance is not considered to affect the quality of the data obtained.
Inter laboratory field duplicates	1/20 samples	<30 to100% RPD	0 (16)	NA	NA	Whilst an inter-laboratory sample was collected, it was not analysed by a secondary laboratory. The primary laboratory erroneously analysed this sample and as such it was treated as an additional intra-laboratory duplicate.
Laboratory duplicates	1/20 samples	0 to 100% RPD	2 (16)	0 to 89%	2	100% compliance
Laboratory method blanks	1/20 samples	<LOR	11	<LOR	All	100% compliance
Accuracy						
Laboratory control samples	1/20 samples	Metals: 70 to 130% Organics: 60 – 140%	3 (16)	74 to 133%	3	100% compliance
Matrix spikes	1/20 samples	Organic 60 to 140% Inorganic 70 to 130%	2 (16)	94 to 133%	2	100% compliance
Surrogate spikes (organic)	1/20 samples	60 to 140%	All organics	74 to 110%	All	100% compliance

Data Quality Objective	Frequency	Data Quality Indicator	Number of Samples Analysed	Range of Results	No. Meeting DQI	Comment
Representativeness						
Sample handling appropriate for media and analysis	-	Yes				All samples were collection using new disposable nitrile gloves. Samples were placed in laboratory prepared sample containers with minimal headspace. Sample preservation is detailed on Laboratory Sample Receipt Notices (**Appendix G**).
Rinsate blanks – (sampling trowel)		1 per day per equipment				100% compliance.
Sample extracted and analysed within holding times	-	14 days organics 6 months inorganics				100% compliance
Completeness						
Soil description and COCs completed and appropriate	All samples	Yes				COC's and field documentation complete. Field sheets are provided in **Appendix D** and COCs are provided in **Appendix G**.
Appropriate sample documentation	All samples	Yes				Documentation complete. Laboratory certificates are provided in **Appendix G**.
All critical samples analysed	All samples	Yes				All samples obtained were analysed.
All analytes tested	All samples	Yes				All contaminants of concern tested in each sample.
Appropriate methods and PQLs	All samples	Yes				Appropriate methods and PQL adopted.
Comparability						
SOPs used for sample collection and handling	All samples	Yes				100% compliance with WSP SOPs.
Accredited laboratory methods used	All samples	Yes				100% compliance – NATA accredited methodologies used (**Appendix G**).

Data Quality Objective	Frequency	Data Quality Indicator	Number of Samples Analysed	Range of Results	No. Meeting DQI	Comment
Consistent field conditions, climatic conditions, sampling staff and analysis	All samples	Yes				100% compliance – Aaron Young (WSP) completed all sampling works and Envirolab (NATA accredited) completed all laboratory analysis.
LOR appropriate and consistent	All samples	Yes				LOR consistent and appropriate for comparison with adopted soil criteria (LOR less than adopted criteria for all analytes).

All data quality indicators were achieved with 100% compliance, with the exception of a reported RPD exceedance for zinc in DUP1, and the failure to submit an inter-laboratory duplicate for analysis. WSP do not consider that these non-compliances affect the outcome of the investigation as:

- For the RPD exceedance, the greatest recorded concentrations have been adopted to ensure a conservative site assessment;
- For the RPD exeedance, zinc is not a primary contaminant of concern and all zinc concentrations have been reported below the adopted criteria; and
- The primary laboratory performed quality assurance and quality control checks which demonstrated suitable accuracy.

It is considered that the data set is of acceptable quality for the purposes of the ESA.

7 Assessment Criteria

Due to the current 'light industrial' zoning, the National Environment Protection Measure (2013) Health Investigation Levels (*HIL) D – Commercial or industrial use* for soil have been adopted as the appropriate assessment criteria for human health.

As the client has indicated that a property redevelopment is proposed for the site, the National Environment Protection Measure (2013) Health Investigation Levels (*HIL) A - residential use with access to soils* and *HIL B - residential use with limited access to soils* have also been considered. WSP note however, that based on the current site zoning it is unlikely that residential use will be considered for the proposed development.

The NEPM (2013) Ecological Screening Levels, Management Limits and Soil Health Screening Levels for vapour intrusion were also considered where applicable.

The adopted Soil Assessment Criteria (SAC) for contaminants of concern are presented in **Table 7.1**.

Table 7.1 Adopted NEPM (2013) Assessment Criteria

Parameter	HIL D (mg/kg)	HIL A (mg/kg)	HIL B (mg/kg)	ESL (coarse[1]) (mg/kg) Commercial / Industrial	ESL (coarse[1]) (mg/kg) Urban Residential	Management Limit (coarse[1]) (mg/kg) Commercial / Industrial	Management Limit (coarse[1]) (mg/kg) Urban Residential
TPH C6-C10 (F1)	-	-	-	215	180	700	700
TPH C10-C16 (F2)	-	-	-	170	120	1,000	1,000
TPH C16-C34 (F3) (Fine)	-	-	-	1,700	300	3,500	2,500
TPH C34-C40 (F4) (Fine)	-	-	-	3,300	2,800	10,000	10,000
Benzene	-	-	-	75	50	-	-
Toluene	-	-	-	135	85	-	-
Ethylbenzene	-	-	-	165	70	-	-
Total Xylenes	-	-	-	180	105	-	-
Total PAHs	4000	300	400	-		-	-
Carcinogenic PAHs (as BaP TEQ)	40	3	4	-	-	-	-
Benzo a Pyrene	0.7			-	-	-	-
Arsenic	3,000	100	500	-	-	-	-
Cadmium	900	20	150	-	-	-	-
Chromium (VI)	3,600	100	500	-	-	-	-
Copper	240,000	600	30,000	-	-	-	-
Lead	1,500	300	1,200	-	-	-	-
Mercury	730	40	120	-	-	-	-

Parameter	HIL D (mg/kg)	HIL A (mg/kg)	HIL B (mg/kg)	ESL (coarse[1]) (mg/kg) Commercial / Industrial	ESL (coarse[1]) (mg/kg) Urban Residential	Management Limit (coarse[1]) (mg/kg) Commercial / Industrial	Management Limit (coarse[1]) (mg/kg) Urban Residential
Nickel	6,000	400	1,200	-	-	-	-
Zinc	400,000	7,400	60,000	-	-	-	-
OCPs	Criteria not presented as all results were reported below the laboratory detection limits (LDLs)						
VOCs	Criteria not presented as all results were reported below the laboratory detection limits (LDLs)						
Phenols	Criteria not presented as all results were reported below the laboratory detection limits (LDLs)						
Asbestos	Below LDL of 0.1g/kg						

[1] Ecological Screening Levels and Management Limits for soils with a coarse texture were adopted to provide a conservative site assessment.

Analytical results were also assessed against the DECCW (2009) Waste Classification Guidelines, Part 1: Classifying Waste. If any excavation and soil handling works are required as part of a proposed property redevelopment, an assessment against the Waste Classification Guidelines will provide preliminary information regarding the likely waste disposal requirements for any surplus excavated soils.

The waste classification assessment criteria are summarised in Table 7.2.

Table 7.2 Waste Classification Criteria

	DECC(2009) General Solid Waste			DECC(2009) Restricted Waste		
	CT1[1] (mg/L)	TCLP1[2] (mg/L)	SCC1[3] (mg/kg)	CT2[4] (mg/L)	TCLP2[5] (mg/L)	SCC2[5] (mg/kg)
POLYCYCLIC AROMATIC HYDROCARBONS						
Benzo(a)pyrene	0.8	0.04	10	3.2	0.16	23
Total PAH's	-	-	200	-	-	800
TOTAL PETROLEUM HYDROCARBONS						
TPH C6 – C9 Fraction	-	-	650	-	-	2600
TPH C10 – C36 Fraction	-	-	10,000	-	-	40,000
BTEX						
Benzene	10	5	18	40	2	72
Toluene	288	14.4	518	1152	57.6	2073
Ethylbenzene	600	30	1080	2400	120	4320
Xylenes	1000	50	1800	4000	200	7200
HEAVY METALS						
Arsenic	100	5	500	400	20	2000
Cadmium	20	1	100	80	4	400
Chromium	100	5	1900	400	20	7600

	DECC(2009) General Solid Waste			DECC(2009) Restricted Waste		
	CT1[1] (mg/L)	TCLP1[2] (mg/L)	SCC1[3] (mg/kg)	CT2[4] (mg/L)	TCLP2[5] (mg/L)	SCC2[5] (mg/kg)
Copper	-	-	-	-	-	-
Lead	100	5	1500	400	20	6000
Mercury	4	0.2	50	16	0.8	200
Nickel	40	2	1050	160	8	4200
Zinc	-	-	-	-	-	-
OTHER						
Asbestos	Presence confirms the waste is special waste under Step 1 of DECC(2009) Guideline					

Notes: Values have not been included where not used for assessment.

[1] Contaminant Threshold 1 – for General Solid Waste

[2] Toxicity Characteristic Leaching Procedure Threshold Concentration 1 – for General Solid Waste

[3] Specific Contaminant Concentration Threshold 1 – for General Solid Waste (when TCLP is considered)

[4] Contaminant Threshold 2 – for Restricted Solid Waste

[5] Toxicity Characteristic Leaching Procedure Threshold Concentration 2 – for Restricted Solid Waste

[6] Specific Contaminant Concentration Threshold 2 – for Restricted Solid Waste (when TCLP is considered)

8 Field Observations

8.1 Field Observations

The following section presents an overview of field observations of soil conditions encountered during the ESA. Borehole logs are included in **Appendix E** and copies of field sheets are included in **Appendix D**.

A layer of concrete between approximately 0.11 – 0.25m thick was encountered at all borehole locations. Underlying fill comprised sandy and clayey fill to a maximum encountered depth of 3.0mbgl and fill was underlain by natural shale which was generally encountered at depths of 0.2 - 0.3mbgl across the site.

Natural shale was encountered at greater depth (1 – 3mbgl) in BH1, BH2 and BH3 which is consistent with the CSM that the site was historically cut from west to east to level the site. Shale was also encountered at greater depth (1.1 – 1.2mbgl) in BH9 and BH10 which may be associated with UST installation.

No visual or olfactory signs of contamination were identified within the soil profile, with the following exceptions:

- Brick (BH1), ash (BH3) and tile (BH15) was encountered within shallow fill; and,
- A hydrocarbon odour was observed in BH9 at 1.2mbgl.

The observation of the hydrocarbon odour at BH9 was supported by PID readings. The maximum recorded concentration was 6.4ppm at BH9 at 1.1m bgl. All PID readings from other boreholes were reported below 1ppm. The soil sample obtained from BH9_1.1mbgl was submitted for laboratory analysis.

It is noted that soil samples of fill material from BH1 and BH15 were submitted for analysis to assess the potential impact of the construction materials identified in fill. A soil sample was analysed from greater depth at BH3 (ash observed) however, to assess potential impacts associated with the adjacent UST.

8.2 Underground Storage Tanks

One operational UST was identified in the western portion of the Site. An inspection of the ‘dip stick’ indicated that 7,400L of fuel was held by the UST. Signage on surrounding infrastructure, including bowsers, suggested the UST held unleaded petroleum (ULP).

Evidence of two non-operational USTs was identified in the northern portion of the site, adjacent Frederick Street.

The location of one of the potential USTs was identified by visual evidence of concrete cutting and replacement. A scan completed with ground penetrating radar (GPR) confirmed a sub-surface anomaly beneath the concrete cut, which could potentially indicate that a UST is still present (likely decommissioned in-situ) or that the UST has historically been removed and the anomaly is indicative of back-fill material. No fill or dip points were observed.

The second potential UST was identified by the observation of a potential fill/dip point. The fill/dip point had been concreted shut, and access was not feasible. A scan completed with GPR at this location confirmed a sub-surface anomaly which could potentially indicate that a UST is still present (likely decommissioned in-situ) or that the UST has historically been removed and the anomaly is indicative of back-fill material.

Whilst the decommissioned status of the two non-operational USTs is unknown, it is noted that no aboveground infrastructure was observed at the site and evidence suggests that previous works have been completed in the vicinity of the USTs. As such, WSP consider it reasonable to conclude that the USTs have been historically decommissioned in-situ.

9 Analytical Results and Discussion

The following presents a summary of results for soil samples. Result summary tables are included in **Appendix F** with copies of laboratory certificates included in **Appendix G**. Sampling locations are presented on Figure 3 – **Appendix A** and should be referenced whilst reviewing the results tables.

9.1 Soil Analytical Results

9.1.1 Commercial / Industrial Context

Concentrations of Asbestos, TPH, BTEX, PAHs, VOCs, OCPs and heavy metals were reported below the laboratory limit of reporting and/or the adopted soil assessment criteria for commercial / industrial landuse with the exception of benzo(a)pyrene (B(a)P). Concentrations of B(a)P in soil samples BH1_0.9 (0.91 mg/kg) and BH6_0.18 (0.75 mg/kg) were reported above the adopted ESL criteria of 0.7 mg/kg.

A 95% UCL calculation for B(a)P contamination in fill material was completed and the calculated concentration (0.64mg/kg – average of outputs) is less than the adopted guideline.

It is noted that the soil sample analysed from BH9_1.1mgbl (where a hydrocarbon odour and elevated PID reading were observed) reported all concentrations of contaminants of concern below the adopted criteria.

It is also noted that no significant filling was reported in the location of the suspected quarry backfill in the south-western portion of the site.

9.1.2 Residential Context (Potential Future Redevelopment)

Concentrations of Asbestos, TPH, BTEX, PAHs, VOCs, OCPs and heavy metals were reported below the laboratory limit of reporting and/or the adopted soil assessment criteria for residential landuses (HIL-A and HIL-B), with the following exceptions:

- Concentrations of lead in samples BH4_0.15 (390 mg/kg) and BH8_0.2 (430 mg/kg) were reported above the adopted HIL-A criteria of 300 mg/kg. The concentrations did not exceed the HIL-B criteria of 1,200 mg/kg. A 95% UCL calculation for lead contamination in fill material was completed and the calculated concentration (223mg/kg) is less than both the adopted HIL-A and HIL-B criteria;
- Concentrations of B(a)P in samples BH1_0.9 (0.91 mg/kg) and BH6_0.18 (0.75 mg/kg) were reported above the adopted ESL criteria of 0.7 mg/kg (Coarse – Urban Residential);
- Concentrations of TPH (C16-C34; F3) in samples BH4_0.15 (500 mg/kg) and BH5_0.2 (1,100 mg/kg) were reported above the adopted ESL criteria of 300 mg/kg (Coarse – Urban Residential);
- Concentrations of TPH (C10-C16; F2) in sample BH9_1.1 (160 mg/kg) was reported above the adopted ESL criteria of 120 mg/kg (Coarse – Urban Residential).

9.2 Petroleum Hydrocarbon Contamination

In accordance with NEPM (2013) a specific assessment of petroleum hydrocarbon contamination risks is required at sites where these contaminants have been identified as a potential contaminant of concern.

9.2.1 Soil Vapour Risks

To assist with data interpretation and an assessment of potential risk to human health, Health Screening Levels (HSLs) presented in NEPM (2013) for petroleum hydrocarbons and BTEX in soil have been considered.

Health screening levels (HSL-D) for direct contact with soils at commercial / industrial sites are provided in Table 9.1. The table also provides the maximum concentration for each TPH fraction and BTEX reported during the intrusive investigation.

Based on field observations, HSL criteria for a sandy soil texture have been adopted. It is noted that fill materials were generally described as “sandy and clayey”, so the use of sandy soil criteria is considered a conservative approach.

Table 9.1 HSL-D Soil Health Screening Levels for Vapour Intrusion

Contaminant	Guideline (mg/kg) (Sand) (HSL-D)				Soil Saturation Concentration (Sand)	Maximum Reported Concentration (mg/kg)	Sample Location
	0-1m	1-2m	2-4m	>4m			
TPH C6-C10 (F1)	260	370	630	No Limit	950	35	BH9_1.1m
TPH C10-C16 (F2)	No Limit	No Limit	No Limit	No Limit	560	160	BH9_1.1m
Benzene	3	3	3	3	360	Not Detected	-
Toluene	No Limit	No Limit	No Limit	No Limit	560	Not Detected	-
Ethylbenzene	No Limit	No Limit	No Limit	No Limit	64	Not Detected	-
Xylenes	230	No Limit	No Limit	No Limit	300	Not Detected	-
Naphthalene	No Limit	No Limit	No Limit	No Limit	9	3	BH4_0.15

The maximum concentrations reported for each TPH fraction are below the individual HSL-D Guidelines which indicates that residual hydrocarbon and BTEX contamination in soil is unlikely to present an unacceptable vapour intrusion risk to human health under a commercial/industrial landuse scenario.

Health Screening Levels for direct contact with soils at residential sites (HSL-A and HSL-B) are provided in Table 9.2. The table provides the maximum concentration for each TPH fraction and BTEX reported during the intrusive investigation.

Table 9.2: HSL-A and HSL-B Soil Health Screening Levels for Vapour Intrusion

Contaminant	Guideline (mg/kg) (Sand) (HSL-A and HSL-B)				Soil Saturation Concentration (Clays)	Maximum Reported Concentration (mg/kg)	Sample Location
	0-1m	1-2m	2-4m	>4m			
TPH C6-C10 (F1)	45	70	110	200	950	35	BH9_1.1m
TPH C10-C16 (F2)	110	240	440	No Limit	560	160	BH9_1.1m
Benzene	0.5	0.5	0.5	0.5	360	Not Detected	-
Toluene	160	220	310	540	560	Not Detected	-
Ethylbenzene	55	No Limit	No Limit	No Limit	64	Not Detected	-
Xylenes	40	60	95	170	300	Not Detected	-
Naphthalene	3	No Limit	No Limit	No Limit	9	3	BH4_0.15

The maximum concentrations reported for each TPH fraction are below the individual HSL-A/B Guidelines which indicates that residual hydrocarbon and BTEX contamination in soils is unlikely to present an unacceptable risk vapour intrusion risk to human health under a residential landuse scenario.

It is noted that the HSLs are limited in their application and that the HSLs have been developed on the basis of a number of assumptions including soil type, site activities and exposure pathways.

9.2.2 Human and Ecological Risk Assessment

In accordance with the Tier 1 assessment flowchart for human and ecological risk assessment of petroleum hydrocarbons presented in Schedule B1 of the NEPM (2013) guidelines, HSLs, ESLs and Management Limits were applied and considered for the assessment of this site. Management limits are applied after consideration of ESLs and HSLs.

Based on the above assessment of human risk, the consideration of ecological risk in Section 5.2 (noting the site is situated in a commercial/industrial area) and the potential for off-site migration, all ecological exposure pathways are considered to be absent. Subsequently, ESLs for petroleum hydrocarbons (including B(a)P) are not considered relevant in the context of this site and exceedances discussed in Section 9.1.2 are therefore not considered to preclude ongoing use of the Site.

Furthermore, concentrations of TPH were reported below the Management Limits for a coarse soil texture in a commercial /industrial and also in a residential setting.

9.3 Waste Classification

Following assessment of the results against the DECCW (2009) Waste Classification Guidelines - Part 1: Classifying Waste, the material at the site was classified (in-situ) as a combination of General Solid Waste, Restricted Solid Waste and Hazardous Waste.

Restricted Solid Waste and Hazardous Waste classifications were attributed to the concentrations of lead, nickel and/or B(a)P at isolated sampling locations.

Based on the nature of these contaminants and the marginal exceedances of total concentration criteria, WSP consider that performing Toxicity Characteristic Leaching Procedure (TCLP) on sample locations classified as Restricted or Hazardous Waste would potentially facilitate re-classification of all future excavated site soils as

General Solid Waste. The classification result would vary dependent on the location and scale of excavation works.

10 Conclusions

WSP investigated 17 borehole locations across the site which provided general site coverage and targeted previously identified areas of potential environmental concern (including USTs, fill material and workshops / maintenance areas). It is noted that an operational UST is located in the western portion of the site and two non-operational USTs have been identified in the northern portion of the site.

A layer of concrete between approximately 0.11 – 0.25m thick was encountered at all borehole locations. Underlying fill comprised clayey fill to a maximum encountered depth of 3.0mbgl and fill was underlain by natural shale which was generally encountered at depths of 0.2 - 0.3mbgl across the site.

Concentrations of Asbestos, TPH, BTEX, PAHs, VOCs, OCPs and heavy metals were reported below the laboratory limit of reporting and/or the adopted soil assessment criteria with the exception of B(a)P (commercial/industrial and residential land use) and lead (residential land use). The 95% UCL calculation for these contaminants in fill material was subsequently calculated and reported to be below the adopted soil assessment criteria.

An assessment of site specific risks associated with potential petroleum hydrocarbon contamination was also completed and those risks are considered to be acceptable.

No aboveground infrastructure was observed in the vicinity of the non-operational USTs, GPR scanning indicated a sub-surface anomaly and there was evidence of concrete re-working. Based on these observations, WSP considers it likely that the two non-operational USTs have been decommissioned in situ.

Whilst removal of USTs in accordance with the *Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2008* is considered best practice, WSP note that it is likely that the USTs were decommissioned prior to introduction of the Regulation. Targeted soil boreholes were drilled in the vicinity of each non-operational UST and each borehole refused on hard, natural shale and did not identify any contamination which is considered to pose an unacceptable risk. On the basis of this information, WSP consider that obligations with respect to the non-operational USTs have been met and that the USTs do not pose an unacceptable risk for ongoing commercial/industrial use of the Site.

WSP considers the potential risk to human health and the environment to be low and that the site is suitable for on-going commercial / industrial land use.

WSP also considers that the site is likely to be suitable for residential landuse with accessible soils or limited access to soils. WSP recommends that a further assessment of site specific risks is completed once the proposed use and site layout is developed for this land use scenario. It is also recommended that all USTs be removed prior to Site redevelopment for residential use.

If any material requires excavation and off-site disposal during proposed future redevelopment works, it is likely that the material will be classified as General Solid Waste. On the basis of data collected to date further testing, including TCLP analysis, is likely to be required to support this conclusion.

11 References

- ANZECC/ARMCANZ (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand, Paper No 4, Canberra
- ANZECC/NHMRC (1992) Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites. Australian and New Zealand Environment and Conservation Council and the National Health and Medical Research Council, Canberra
- Australian Soil Resource Information System (ASRIS) - Acid Sulphate Risk Map
- DECCW (2009) Waste Classification Guidelines, Part 1: Classifying Waste
- Department of Health and Ageing and EnHealth Council (2002) Environmental Health Risk Assessment: Guidelines for Assessing Human Health Risks from Environmental Hazards. Commonwealth of Australia, Canberra
- NSW Department of Mineral Resources (1983) – *Sydney 1:100,000 Geological Series Sheet 9130*
- NEPC (2013) National Environment Protection (Assessment of Site Contamination) Measure, Schedule A and Schedules B(1)-B(10). National Environment Protection Council, Adelaide
- NSW DEC (2006) Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (2nd edition). NSW DEC, Sydney
- NSW DEC (2007) Guidelines for Assessment and Management of Groundwater Contamination. NSW DEC Sydney
- NSW DECC (2009) Contaminated Sites: Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 2009. NSW DECC, Sydney
- NSW EPA (1994) Contaminated Sites: Guidelines for Assessing Service Station Sites. NSW EPA, Sydney
- NSW EPA (1995) Contaminated Sites: Sampling Design Guidelines. NSW EPA, Sydney
- NSW EPA (2011) Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites. NSW OEH, Sydney
- WSP (2013) Phase 1 Environmental Due Diligence Assessment

Appendix A – Figures

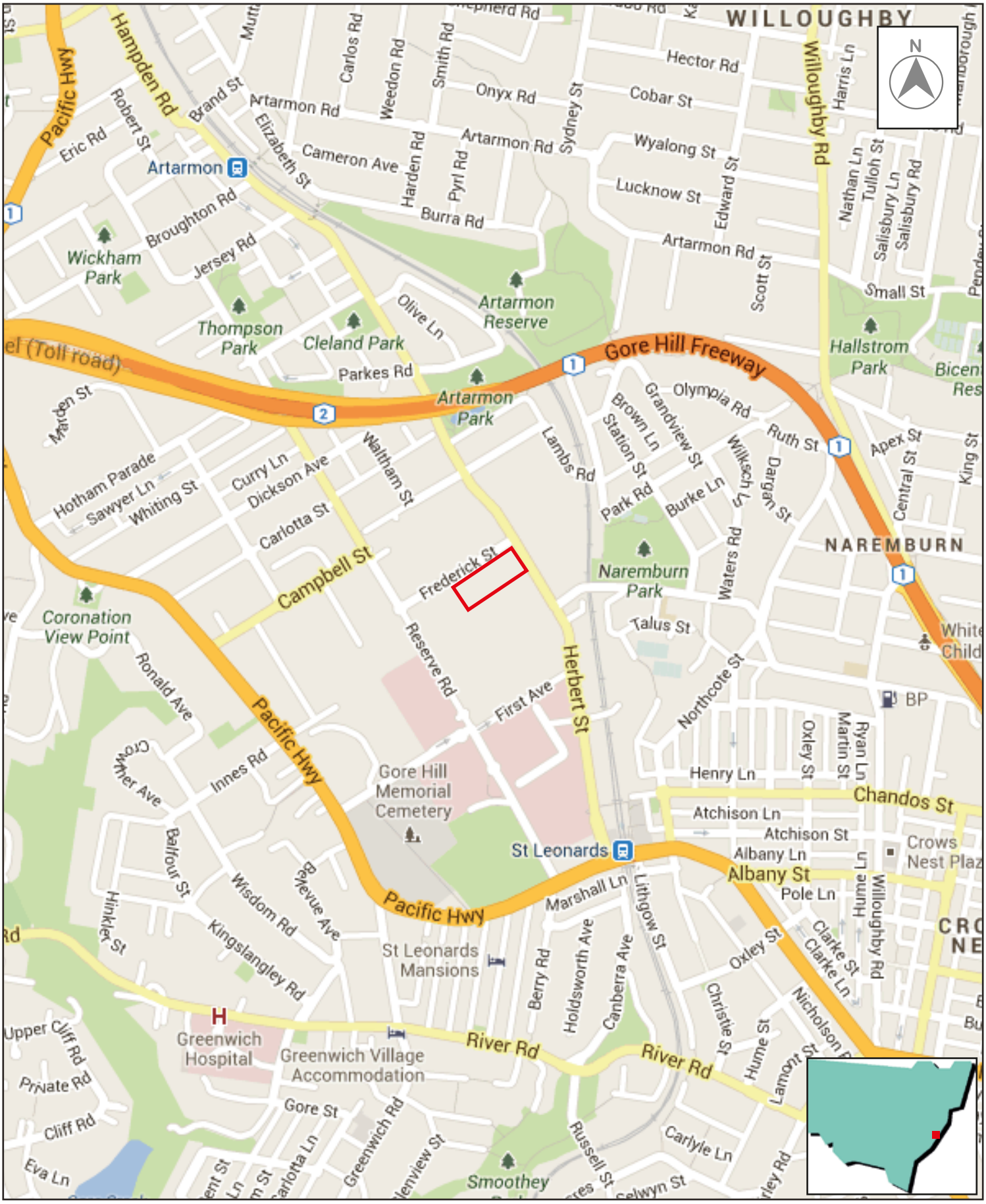

Image Courtesy of Google Maps (2013)

Approximate Scale

0 500

Metres

KEY

Approximate Site Boundary

Site Location

10 Herbert Street, St Leonards, NSW

00040387

FIGURE 1

Photo Courtesy of LPI SIXViewer (2013)

Site Boundary

Operational UST

Non-Operational UST

Oil / Water Separator

Approximate Lateral Extent of Former Quarry Area on Property

Approximate Scale

0 30

Metres

Site Layout

10 Herbert Street, St Leonards, NSW

00040387

FIGURE 2

WSP

Photo Courtesy of LPI SIXViewer (2013)

Site Boundary

Operational UST

Non-Operational UST

Oil / Water Separator

Approximate Lateral Extent of Former Quarry Area on Property

BH1 Borehole Location

Approximate Scale

0 30

Metres

Investigation Locations

10 Herbert Street, St Leonards, NSW

00040387

FIGURE 3

WSP

Appendix B – Photographic Log

WSP	PHOTOGRAPHIC LOG	
Client Name Napier and Blakeley	**Site Location** 10 Herbert, Street, St Leonards NSW	**Project No.** 00040387

Photo No.	**Date**
1	9 July 2013

Description

View of potential non-operational UST location (blue paint) in the driveway in the central northern portion of the site adjacent Frederick Street.

No above ground infrastructure was observed.

WSP	PHOTOGRAPHIC LOG	
Client Name Napier and Blakeley	**Site Location** 10 Herbert, Street, St Leonards NSW	**Project No.** 00040387

Photo No.	**Date**
2	9 July 2013

Description

View of potential non-operational UST location (blue paint) beneath the car park awning in the central northern portion of the site adjacent Frederick Street.

No above ground infrastructure was observed.

Photo No.	**Date**
3	9 July 2013

Description

View of the operational UST location (blue paint) in the western portion of the site.

The bunded bowser area can be seen to the east of the UST.

WSP	PHOTOGRAPHIC LOG	
Client Name Napier and Blakeley	**Site Location** 10 Herbert, Street, St Leonards NSW	**Project No.** 00040387

Photo No.	**Date**
4	10 July 2013

Description

View of BH6. The natural shale underlying sandy and clayey fill material can be seen.

WSP	PHOTOGRAPHIC LOG	
Client Name Napier and Blakeley	**Site Location** 10 Herbert, Street, St Leonards NSW	**Project No.** 00040387

Photo No.	**Date**
5	10 July 2013

Description

View of a portion of the shale core from BH16.

Appendix C – UPSS Records

MUNICIPALITY OF WILLOUGHBY

Telephone: 41 0133 (6 Lines)
PERMIT No. 819/69

411 VICTORIA AVENUE, CHATSWOOD 2067

19th November, 19 69.

LOCAL GOVERNMENT ACT, 1919 (AS AMENDED)
Ordinance No. 71

Mr. Ampol Petroleum Ltd., Box 4090 G.P.O. SYDNEY. 2001.

Dear Sir,

Referring to your application bearing date 6th November, 1969.

for permission to erect Tank & Pump. on Lot Sec.

4 Herbert St., ~~Street~~, owned by Lanock (Grenville)

I have to inform you that subject to the conditions hereinafter appearing, the Council has approved the Plan and Specification submitted by you, and permission is granted to erect the said Tank & Pump in accordance therewith and to the satisfaction of the Building Inspector.

The said approval is given subject to the following conditions:—

(a) That the amendments and additions shown on plans and specifications MUST be complied with.

(b) That all relevant provisions of Ordinance 71 MUST be complied with.

(c) That forty-eight hours' notice shall be given to the Council, in writing, prior to the covering of each the works mentioned in clause 4 (h) of Ordinance 71, viz.—(i) trenches before foundations are laid, (ii) foundations before trenches are filled in, (iii) drains before they are covered in.

(d) That notices shall be given to the Council, in writing, in compliance with the provisions of clause 83 (a) of Ordinance 71, viz.—(i) before permitting any person to use or occupy any uncompleted building and (ii) forthwith upon completion of any unoccupied building.

(e) That the said building shall not without the written permission of Council be used or occupied unless and until the same has been completed in accordance with the approved plans and specifications.

f) The requirements of the Mines and Explosives Department.

Yours faithfully,

Town Clerk.

ORDINANCE 71 — PENALTIES

Clause 84 (a) — Any person who erects a building in contravention of this Ordinance shall be liable to a penalty not exceeding one hundred dollars; and also a daily penalty not exceeding ten dollars per day for any continuance of the offence.

(b) — Any person who neglects to comply with any provision of this Ordinance shall, where a penalty is not elsewhere prescribed, be liable to a penalty not exceeding ten dollars for a first offence or 20 dollars for a second or any subsequent offence; and also in either case a daily penalty not exceeding one dollar per day for any continuance of the offence.

Inspector.................................... Ward........N........ Garbage Service Order No. ....

MUNICIPALITY OF WILLOUGHBY

Application for Approval of Erection of Building

MUNICIPALITY OF WILLOUGHBY RECEIVED - 6 NOV 1969 ANSD.........

The Town Clerk, WILLOUGHBY

APPLICATION NO. 819

PERMIT No. ....

Dear Sir,

I herewith submit two copies of Plans and Specifications of a building proposed to be erected upon the land described below and apply for the Council's approval to such Plans and Specifications. A summary of the Specifications appears below.

The Plan shows the true levels of the street, lowest floor, foundation of front fence and of any yard or LANOCK. open space belonging thereto, and levels of adjacent ground.

Name of Owner Ampol Petroleum Ltd. Address Buchanan St. Balmain

Name of Builder R. E. Charles Pty. Address 20 Albany St Crows Nest

Type of Construction Underground 2000 gal petrol Tank & elec. pump
(Here state dwelling, semi-detached cottage, flats, shop and dwelling, stables, garage, or alterations and additions.)

COST OF BUILDING TO BE ERECTED, $ 1300 Fee Paid $ 6.50 Receipt No. 192

Crossing Fee, $ .... Receipt No. ....

Damage Deposit, $ 10 Receipt No. ....

Sanitary Charge, $ .... Receipt No. ....

Name of Street ~~Frederick~~ Herbert St. North/South/East/West side; Cross Streets Between Herbert and .... (State nearest cross street)

House No. or Name ~~Granville Motors~~ 4 Herbert St

NOTE—Should any Drainage easement or water course exist on the land its position must be clearly shown on the block plan.

D.P. ....

the following Particulars Must be Supplied

PORTION.......... LOT.......... SECTION.......... ESTATE..........

FRONTAGE.......... DEPTH.......... AREA..........

Material for outer Walls.......... Material for Roof..........

No. Storeys.......... No. Flats.......... No. of Rooms, including Kitchen..........

Value of Allotment $.......... Is Sewer Available?.......... Gas?..........

Electric Light?.......... Is Bathroom or Laundry detached from the dwelling?..........

Are the p.c. items for stove, bath, copper, tubs, water supply, sewerage, lighting, fencing, included in the cost of the building? Strike out what is not included.

Signature [signature] for Ampol Petroleum Ltd Postal Address Box 4090 G.P.O. Sydney

(Builder, Owner or Architect) R. E. Charles Phone 43-6276 Date 6/11/69

Inspectors may be interviewed between 9 a.m. and 10 a.m. daily only, or by appointment.

..........PLANS

FOR OFFICE USE ONLY

..........SPEC.

DD Refund 5/6/

Area of Land .... **Area of Building** .... **Area Occupied** .... **Area Occupied** ....%

Inspection Instruction No. .... **T.P. Dev.** IND A GEN E (1) **Fixed Building Line** ....

LEVELS ....

OFFICER'S REPORT ON LAND ....

OFFICER'S REPORT ON BUILDING Appl'n is made to install a 2000 gall. underground petrol tank located 16' in from Frederick St.

Recommended for approval subject to the requirements of the Mines & Explosives Dept.

[signature] 6.11.69

W134—Para-Vogue

MUNICIPALITY OF WILLOUGHBY

FOR OFFICE USE ONLY

Appn. No. 94/81

Ward N.

Application for Approval of Erection of Building

VALUATION NUMBER 7766

HEALTH AND
* -6 FEB 1981 *
BUILDING

The Town Clerk,
Municipality of Willoughby,
Box 57, P.O.
CHATSWOOD. 2067

Dear Sir,

I, the undersigned, hereby make application to Council for the approval of Plans and Specifications of a building, which I propose to erect at the undermentioned premises.

The Plan shows the true levels of the street, lowest floor, foundation of front fence and of any yard or open space belonging thereto, and levels of adjacent ground.

NOTE—Should any Drainage easement or water course exist on the land its position must be clearly shown on the block plan.

Name of Owner LARKE NEAVE INVEST P/L Address 815 PACIFIC HIGHWAY, CHATSWOOD.

Postcode 2067 Phone 412.4044

Name of Builder BONANZA INSTALLATIONS. Address 92 GLENHAVEN ROAD,

GLENHAVEN. Postcode 2154 Phone

Type of Construction INSTALLATION 11,900 LITRE UNDERGROUND MOTOR SPIRIT STORAGE TANK.

COST $ 1,800

(Here state nature of building works covered by this application (i.e. Dwelling, Factory, Home Units, Additions, Garage, etc.)

Materials of External Walls SET ON BED OF SAND AND COVERED WITH 6" CONCRETE.

The following particulars must be supplied

Name of Street ~~FREDERICK~~ HERBERT ~~North~~ ~~South~~ ~~East~~ ~~West~~ side; Between Cross Streets HERBERT and FREDERICK (State nearest cross street)

House No. or Name 4. COR LOT C Reavb Por 320 D.P.

DAMAGE DEPOSIT TO BE REFUNDED TO LANOCK MOTORS PTY. LTD. 4581777

ADDRESS P. O. BOX 417, ARTARMON. POSTCODE 2064

I undertake to comply with the provisions of the Local Government Act 1919 and Ordinances Nos. 70, 80 and 39 and all amendments thereto, and the relevant codes of the Willoughby Municipal Council.

1 State whether applicant is owner/builder/architect/structural engineer or Managing Director/Manager/Secretary thereof.

2 PRINT NAME K. COULSTON.

3 PRINT TITLE GEN. SERVICE & PARTS MANAGER.

SIGNATURE OF APPLICANT K Coulston

DATE 29-1-81

Applicants Address 39 RAGLAN ROAD, MIRANDA.

Inspectors may be interviewed between 9 a.m. and 10 a.m. daily only, or by appointment. Telephone 412 3333

OFFICE USE ONLY

TOWN PLANNING	
ZONING	D.CA18
General Indust	4(a)

DEVELOPMENT CONSENT	
Serial	Date

COPIES SUBMITTED	
PLANS	SPECS.
3	

RECORDED - REGISTER & CARDS

FEES	$ c	RECEIPT No.	DATE
Building	9.00	818	6 FEB 1981
Precommencement Inspection Fee	2.00	818	6 FEB 1981
Additional Plans			
Amended Plans			
Open Space Contribution			
Damage Deposit	150.00	818	6 FEB 1981
B.L.B. Insurance Premium			

MUNICIPALITY OF WILLOUGHBY

BUILDING PERMIT

Ward: NAREMBURN

No. 94/81

Local Government Act 1919 (as amended) Ordinance No. 70

Date 2nd April, 198

APPLICANT: K. Coulston

Address: 39 Raglan Road, MIRANDA 2228

The Council of the Municipality of Willoughby as the Local Authority under the Local Government Act 1919 (as amended) has approved the Plan and Specifications submitted by you, for the erection of:

CLASSIFICATION (Underground storage tank) BUILDING LINE m

LOCATION No. 4 cr Lot C Herbert Street, Artarmon

The application is approved under the provisions of Part XI of such Act, subject to the STANDARD CONDITIONS on the reverse of this permit and in addition to compliance with the following SPECIAL CONDITIONS OF APPROVAL:

1. **Fences, retaining walls and paths** — Levels at street alignment being obtained from the Municipal Engineer prior to the erection of any fence on any street alignment or path laid thereto, and where a retaining wall is necessary to the street alignment of any property, the applicant/owner submitting to the Municipal Engineer full details of such retaining walls.

2. BUILDING NOTIFICATION CARDS BEING SUBMITTED IN ACCORDANCE WITH REQUIREMENTS.

3. Compliance with the terms and conditions of Development Consen No.81/59 dated 11th March, 1981.

4. Formal approval being obtained from the Department of Dangerou Goods prior to commencement of building work.

Municipal Health & Building Surveyor

L. J. Woodward
Town Clerk

(continued on second sheet)

EXISTING 9950 LITRE TANK

87M

70M

4M

EXISTING BOWSER

PROPOSED 11900 LITRE TANK UNDERGROUND

4M

11M

DRIVEWAY

PARTS WAREHOUSE

OFFICE

RAMP

49M

PARKING

PARKING

43M

PARKING

SALES YARD

WORKSHOP

SALES OFFICE

RAMP

94M

N

HERBERT ST

LANOCK MOTORS PTY. LTD.

CNR FREDERICK + HERBERT STS.

ST LEONARDS

NSW GOVERNMENT WorkCover

WorkCover NSW
92-100 Donnison Street, Gosford, NSW 2250
Locked Bag 2906, Lisarow, NSW 2252
T 02 4321 5000 F 02 4325 4145
WorkCover Assistance Service 13 10 50
DX 731 Sydney workcover.nsw.gov.au

Our Ref: D13/084499
Your Ref: Nicolas Kuerzinger

16 July 2013

Attention: Nicolas Kuerzinger
WSP Environmental
Level 1,
41 McLaren St
North Sydney NSW 2060

Dear Mr Kuerzinger,

RE SITE: 10 Herbert St St Leonards NSW

I refer to your site search request received by WorkCover NSW on 28 June 2013 requesting information on licences to keep dangerous goods for the above site.

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

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

Yours Sincerely

Brent Jones
Senior Licensing Officer
Dangerous Goods Team

Appendix D – Field Forms & Calibration Certificates

Field Reporting Form

Sheet to be printed on green paper

Job Information	
Date: 10 July 2013	Time: arrive depart
Project Name: N&B Phase 2	Project Number: 40387
Site Location: 10 Herbert St, St Leonards	Operator: AY/GP

Purpose of Visit

* Concrete coring - 8 locations (4, 5, 8, 11, 12, 13, 14, 15)
* 8 11 x BHs (cores + BH6, 7 & 1
* Reinstate BHs
* GPS & Photos.
*

Description of Works and People Met

Sampling Details				
Sampling Conducted:	(Y)	N	NA	
Matrix:	(S)	W	O	
COC Form Submitted:	Y	N	NA	
COC Number:				
Primary Lab:				
Secondary Lab:				

Field Equipment Used						
PID:	Y	N	Calibrated / tested:	Y	N	NA
FID:	Y	N	Calibrated / tested:	Y	N	NA
IP:	Y	N	Calibrated / tested:	Y	N	NA
Water Quality Metre:	Y	N	Calibrated / tested:	Y	N	NA
Pump:	Y	N	Calibrated / tested:	Y	N	NA
Other:	Y	N	Calibrated / tested:	Y	N	NA
Other:	Y	N	Calibrated / tested:	Y	N	NA

Other Outstanding Action Items

Field Reporting Form

Sheet to be printed on green paper

Job Information	
Date: 11 July 2013	Time: arrive depart
Project Name: N&B Phase 2	Project Number: 40387
Site Location: 10 Herbert St, St Leonards	Operator: AY/GP

Purpose of Visit

BHs 5, 8, 11 & 12

Description of Works and People Met

Sampling Details

Sampling Conducted:	(Y)	N	NA	
Matrix:	(S)	W	O	
COC Form Submitted:	Y	N	NA	
COC Number:				
Primary Lab:				
Secondary Lab:				

Field Equipment Used

PID:	(Y)	N	Calibrated / tested: 11/7/13	(Y)	N	NA
FID:	Y	N	Calibrated / tested:	Y	N	NA
IP:	Y	N	Calibrated / tested:	Y	N	NA
Water Quality Metre:	Y	N	Calibrated / tested:	Y	N	NA
Pump:	Y	N	Calibrated / tested:	Y	N	NA
Other:	Y	N	Calibrated / tested:	Y	N	NA
Other:	Y	N	Calibrated / tested:	Y	N	NA

Other Outstanding Action Items

CALIBRATION RECORD
MiniRAE Lite- PID

Date	9/7/13
Job No.	40387
Personnel	AY
Signature	
Zero Calibration Reading	0.0ppm
Calibration Gas	100ppm Isobutylene
Desired Span Calibration Reading	100ppm
Gas Reading After Calibration	100.1ppm

Comments

Date	10/7/13
Job No.	40387
Personnel	AY
Signature	
Zero Calibration Reading	0.0ppm
Calibration Gas	100ppm Isobutylene
Desired Span Calibration Reading	100ppm
Gas Reading After Calibration	100ppm

Comments

CALIBRATION RECORD
MiniRAE Lite - PID

Date	11/7/13
Job No.	40387
Personnel	AY
Signature	
Zero Calibration Reading	0.0ppm
Calibration Gas	100ppm Isobutylene
Desired Span Calibration Reading	100ppm
Gas Reading After Calibration	100ppm

Comments

Date	
Job No.	
Personnel	
Signature	
Zero Calibration Reading	
Calibration Gas	
Desired Span Calibration Reading	
Gas Reading After Calibration	

Comments

Appendix E – Borehole Records

Borehole Log

Hole ID. **BH1**

WSP Environment & Energy
Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**St Leonards Phase 2 ESA**	Hole Depth:	**1.00 m**
Project Number:	**40387**	GW Encountered:	
Location / Site:	**10 Herbert Street, St Leonards NSW**	GW Stabilised:	
Client:		Ground Level:	
Drilling Company:	**WSP**	Top of Casing:	
Drill Method:	**CC / Hand Auger**	Easting:	**332490**
Date Started:	**10/07/2013**	Northing:	**6256619**
Date Completed:	**10/07/2013**	Logged By:	**Aaron Young**

Method	Water Level	Depth (m)	RL (mAHD)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests: PID ppm	Samples / Tests: ID No.	Observations / Comments
CC		0.20				Fill	**CONCRETE**.				
Hand Auger		0.4					**FILL** - Gravelly Sandy CLAY, dark brown.	moist	0.0	BH1_0.3	Brick content. No visual or olfactory signs of contamination.
		0.6									
		0.8							0.0	BH1_0.9	
		1.00									
		1.2					**Refusal at 1.00 m** on Fill (gravel or boulder).				

Observations

Asbestos	No visual evidence of asbestos noted during drilling.
Staining	No visual evidence of contamination (e.g. staining / precipitate) noted during drilling.
Odour	No olfactory (e.g. odour) evidence of contamination noted during drilling.
Groundwater	No groundwater encountered during drilling.

Notes

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Aaron Young** Date: **26/07/2013**

WSP LOG LT ST LEONARDS 40387.GPJ WSP.GDT 26/7/13 11:34:33 AM

Borehole Log

Hole ID. **BH2**

WSP Environment & Energy
Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**St Leonards Phase 2 ESA**	Hole Depth:	**3.30 m**
Project Number:	**40387**	GW Encountered:	
Location / Site:	**10 Herbert Street, St Leonards NSW**	GW Stabilised:	
Client:		Ground Level:	
Drilling Company:	**Matrix Drilling Pty Ltd**	Top of Casing:	
Drill Method:	**CC / Solid Stem Auger**	Easting:	**332494**
Date Started:	**9/07/2013**	Northing:	**6256596**
Date Completed:	**9/07/2013**	Logged By:	**Aaron Young**

Method	Water Level	Depth (m)	RL (mAHD)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests: PID ppm	Samples / Tests: ID No.	Observations / Comments
CC		0.25					**CONCRETE**.				
Solid Stem Auger		0.5				Fill	**FILL** - Gravelly CLAY, dark brown.	moist	0.0	BH2_0.5	No visual or olfactory signs of contamination.
		1.0							0.0	BH2_1.0	
		1.40									
		1.5				Natural	**SHALE, Extremely Weathered** - grey.	moist	0.0	BH2_1.5	No visual or olfactory signs of contamination.
		2.0									
		2.5							0.5	BH2_2.5	
		3.0									
		3.30							0.0	BH2_3.3	
		3.5					**Refusal at 3.30 m** on Shale.				

Observations		Notes
Asbestos	No visual evidence of asbestos noted during drilling.	
Staining	No visual evidence of contamination (e.g. staining / precipitate) noted during drilling.	
Odour	No olfactory (e.g. odour) evidence of contamination noted during drilling.	
Groundwater	No groundwater encountered during drilling.	

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Aaron Young** Date: **26/07/2013**

WSP LOG LT ST LEONARDS 40387.GPJ WSP.GDT 26/7/13 11:34:34 AM

Borehole Log

Hole ID. **BH3**

WSP Environment & Energy
Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**St Leonards Phase 2 ESA**	Hole Depth:	**3.00 m**
Project Number:	**40387**	GW Encountered:	
Location / Site:	**10 Herbert Street, St Leonards NSW**	GW Stabilised:	
Client:		Ground Level:	
Drilling Company:	**Matrix Drilling Pty Ltd**	Top of Casing:	
Drill Method:	**CC / Push Tube / Solid Stem Auger**	Easting:	**332499**
Date Started:	**9/07/2013**	Northing:	**6256586**
Date Completed:	**9/07/2013**	Logged By:	**Aaron Young**

Method	Depth (m)	Material Description	Moisture	Samples / Tests: PID ppm	Samples / Tests: ID No.	Observations / Comments
CC	0.12	**CONCRETE**.				
Push Tube	0.30	**FILL** - Gravelly SAND, light brown.	wet	0.0	BH3_0.2	Ash content.
Push Tube	0.5	**FILL** - Gravelly CLAY, dark brown / red, some sandstone content.	wet	0.0	BH3_0.5	No visual or olfactory signs of contamination.
Push Tube	1.0			0.0	BH3_1.0	
Push Tube	1.5					
Push Tube / Solid Stem Auger	2.0			0.0	BH3_2.0	Push tube refusal at 1.7m.
Solid Stem Auger	2.40	**FILL** - Gravelly CLAY, greyish brown, uniform.	wet			No visual or olfactory signs of contamination.
Solid Stem Auger	2.5					
Solid Stem Auger	3.00			0.0	BH3_3.0	
		Refusal at 3.00 m on Shale.				
	3.5					

Water Level: Fill

USCS Symbol / Material Type: Fill

Observations

Asbestos	No visual evidence of asbestos noted during drilling.
Staining	No visual evidence of contamination (e.g. staining / precipitate) noted during drilling.
Odour	No olfactory (e.g. odour) evidence of contamination noted during drilling.
Groundwater	No groundwater encountered during drilling.

Notes

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Aaron Young** Date: **26/07/2013**

WSP LOG LT ST LEONARDS 40387.GPJ WSP.GDT 26/7/13 11:34:35 AM

Borehole Log

Hole ID. **BH4**

WSP Environment & Energy
Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**St Leonards Phase 2 ESA**	Hole Depth:	**0.50 m**
Project Number:	**40387**	GW Encountered:	
Location / Site:	**10 Herbert Street, St Leonards NSW**	GW Stabilised:	
Client:		Ground Level:	
Drilling Company:	**WSP**	Top of Casing:	
Drill Method:	**CC / Hand Auger**	Easting:	
Date Started:	**10/07/2013**	Northing:	
Date Completed:	**10/07/2013**	Logged By:	**Aaron Young**

Method	Water Level	Depth (m)	RL (mAHD)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests: PID ppm	Samples / Tests: ID No.	Observations / Comments
CC		0.10				Fill	**CONCRETE**.				
Hand Auger		0.20					**FILL** - Gravelly SAND, light brown.	moist	0.0	BH4_0.15	No visual or olfactory signs of contamination.
		0.3					**FILL** - SHALE, brown and grey.	moist			No visual or olfactory signs of contamination.
		0.4							0.0	BH4_0.4	
		0.50					**Refusal at 0.50 m** on Shale.				
		0.6									
		0.7									
		0.8									
		0.9									
		1.0									

Observations

Asbestos	No visual evidence of asbestos noted during drilling.
Staining	No visual evidence of contamination (e.g. staining / precipitate) noted during drilling.
Odour	No olfactory (e.g. odour) evidence of contamination noted during drilling.
Groundwater	No groundwater encountered during drilling.

Notes

No GPS as inside building.

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Aaron Young** Date: **26/07/2013**

Borehole Log

Hole ID. **BH5**

WSP Environment & Energy
Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**St Leonards Phase 2 ESA**	Hole Depth:	**0.33 m**
Project Number:	**40387**	GW Encountered:	
Location / Site:	**10 Herbert Street, St Leonards NSW**	GW Stabilised:	
Client:		Ground Level:	
Drilling Company:	**WSP**	Top of Casing:	
Drill Method:	**CC / Hand Auger**	Easting:	**335525**
Date Started:	**11/07/2013**	Northing:	**6256576**
Date Completed:	**11/01/2013**	Logged By:	**Aaron Young**

Method	Water Level	Depth (m)	RL (mAHD)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests: PID ppm	Samples / Tests: ID No.	Observations / Comments
CC		0.08				Fill	**CONCRETE**.				
Hand Auger		0.1 – 0.3				Fill	**Gravelly Sandy CLAY** - dark brown.	moist	0.0	BH5_0.2	No visual or olfactory signs of contamination.
		0.33					**Refusal at 0.33 m** on Shale, brown and grey.				
		0.4 – 1.0									

Observations

Asbestos	|	No visual evidence of asbestos noted during drilling.
Staining	|	No visual evidence of contamination (e.g. staining / precipitate) noted during drilling.
Odour	|	No olfactory (e.g. odour) evidence of contamination noted during drilling.
Groundwater	|	No groundwater encountered during drilling.

Notes

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Aaron Young** Date: **26/07/2013**

WSP LOG LT ST LEONARDS 40387.GPJ WSP.GDT 26/7/13 11:34:37 AM

Borehole Log

Hole ID. **BH6**

WSP Environment & Energy
Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**St Leonards Phase 2 ESA**	Hole Depth:	**0.30 m**
Project Number:	**40387**	GW Encountered:	
Location / Site:	**10 Herbert Street, St Leonards NSW**	GW Stabilised:	
Client:		Ground Level:	
Drilling Company:	**WSP**	Top of Casing:	
Drill Method:	**CC / Hand Auger**	Easting:	
Date Started:	**10/07/2013**	Northing:	
Date Completed:	**10/07/2013**	Logged By:	**Aaron Young**

Method	Water Level	Depth (m)	RL (mAHD)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests: PID ppm	Samples / Tests: ID No.	Observations / Comments
CC		0.1				Fill	**CONCRETE**.				
Hand Auger		0.15				Fill	**FILL** - Silty CLAY, dark brown, some gravel content.	moist	0.0	BH6_0.18	No visual or olfactory signs of contamination.
		0.20				Natural	**SHALE** - brown and grey.	moist	0.0	BH6_0.25	No visual or olfactory signs of contamination.
		0.30					**Refusal at 0.30 m** on Shale.				
		0.4									
		0.5									
		0.6									
		0.7									
		0.8									
		0.9									
		1.0									

Observations

Asbestos	No visual evidence of asbestos noted during drilling.
Staining	No visual evidence of contamination (e.g. staining / precipitate) noted during drilling.
Odour	No olfactory (e.g. odour) evidence of contamination noted during drilling.
Groundwater	No groundwater encountered during drilling.

Notes

No GPS as inside building.

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Aaron Young** Date: **26/07/2013**

Borehole Log

Hole ID. **BH7**

WSP Environment & Energy
Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**St Leonards Phase 2 ESA**	Hole Depth:	**0.40 m**
Project Number:	**40387**	GW Encountered:	
Location / Site:	**10 Herbert Street, St Leonards NSW**	GW Stabilised:	
Client:		Ground Level:	
Drilling Company:	**WSP**	Top of Casing:	
Drill Method:	**CC / Hand Auger**	Easting:	
Date Started:	**10/07/2013**	Northing:	
Date Completed:	**10/07/2013**	Logged By:	**Aaron Young**

Method	Water Level	Depth (m)	RL (mAHD)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests: PID ppm	Samples / Tests: ID No.	Observations / Comments
CC		0.1				Fill	**CONCRETE**.		0.0	BH7_0.1	
		0.14									
Hand Auger		0.20				Fill	**FILL** - Silty Clayey SAND, greyish brown, some gravel content.	moist			No visual or olfactory signs of contamination.
		0.3				Natural	**SHALE** - dark brown.	moist	0.0	BH7_0.3	No visual or olfactory signs of contamination.
		0.40									
		0.5					**Refusal at 0.40 m** on Shale.				
		0.6									
		0.7									
		0.8									
		0.9									
		1.0									

Observations

Asbestos	No visual evidence of asbestos noted during drilling.
Staining	No visual evidence of contamination (e.g. staining / precipitate) noted during drilling.
Odour	No olfactory (e.g. odour) evidence of contamination noted during drilling.
Groundwater	No groundwater encountered during drilling.

Notes

No GPS as inside building.

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Aaron Young** Date: **26/07/2013**

Borehole Log

Hole ID. **BH8**

WSP Environment & Energy
Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**St Leonards Phase 2 ESA**	Hole Depth:	**0.50 m**
Project Number:	**40387**	GW Encountered:	
Location / Site:	**10 Herbert Street, St Leonards NSW**	GW Stabilised:	
Client:		Ground Level:	
Drilling Company:	**WSP**	Top of Casing:	
Drill Method:	**CC / Hand Auger**	Easting:	
Date Started:	**11/07/2013**	Northing:	
Date Completed:	**11/07/2013**	Logged By:	**Aaron Young**

Method	Water Level	Depth (m)	RL (mAHD)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests: PID ppm	Samples / Tests: ID No.	Observations / Comments
CC		0.1				Fill	**CONCRETE**.		0.1	BH8_0.2	
		0.14									
Hand Auger		0.2				Fill	**FILL** - Gravelly CLAY, dark brown.	moist			No visual or olfactory signs of contamination.
		0.3									
		0.40				Natural	**SHALE** - grey and brown.	moist			No visual or olfactory signs of contamination.
		0.50					**Refusal at 0.50 m** on Shale.				
		0.6									
		0.7									
		0.8									
		0.9									
		1.0									

Observations

Asbestos	No visual evidence of asbestos noted during drilling.
Staining	No visual evidence of contamination (e.g. staining / precipitate) noted during drilling.
Odour	No olfactory (e.g. odour) evidence of contamination noted during drilling.
Groundwater	No groundwater encountered during drilling.

Notes

No GPS as inside building.

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Aaron Young** Date: **26/07/2013**

Borehole Log

Hole ID. **BH9**

WSP Environment & Energy
Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**St Leonards Phase 2 ESA**	Hole Depth:	**4.00 m**
Project Number:	**40387**	GW Encountered:	
Location / Site:	**10 Herbert Street, St Leonards NSW**	GW Stabilised:	
Client:		Ground Level:	
Drilling Company:	**Matrix Drilling Pty Ltd**	Top of Casing:	
Drill Method:	**CC / Push Tube / Solid Stem Auger**	Easting:	**332552**
Date Started:	**9/07/2013**	Northing:	**6256662**
Date Completed:	**9/07/2013**	Logged By:	**Aaron Young**

Method	Water Level	Depth (m)	RL (mAHD)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests: PID ppm	Samples / Tests: ID No.	Observations / Comments
CC		0.16					**CONCRETE**.				
Push Tube		0.40				Fill	**FILL** - Gravelly CLAY, dark brown.	wet			No visual or olfactory signs of contamination.
		0.5					**FILL** - Gravelly SAND, dark brown.	wet	0.0	BH9_0.5	No visual or olfactory signs of contamination.
		1.00					**FILL** - Gravelly CLAY, black.	wet	6.4	BH9_1.1	Hydrocarbon odour.
Solid Stem Auger		1.20				Natural	**SHALE** - grey, moisture encountered intermittently.	dry to wet	0.0	BH9_1.3	Push tube refusal at 1.2m. No visual or olfactory signs of contamination.
		1.5									
		2.0									
		2.5							0.0	BH9_2.5	
		3.0									
		3.5									
		4.00							0.0	BH9_4.0	
							Refusal at 4.00 m on Shale.				

Observations		Notes
Asbestos	No visual evidence of asbestos noted during drilling.	
Staining	No visual evidence of contamination (e.g. staining / precipitate) noted during drilling.	
Odour	Olfactory (e.g. odour) evidence of contamination noted during drilling.	
Groundwater	No groundwater encountered during drilling.	

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Aaron Young** Date: **26/07/2013**

WSP LOG LT ST LEONARDS 40387.GPJ WSP.GDT 26/7/13 11:34:40 AM

Borehole Log

Hole ID. **BH10**

WSP Environment & Energy
Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**St Leonards Phase 2 ESA**	Hole Depth:	**1.60 m**
Project Number:	**40387**	GW Encountered:	
Location / Site:	**10 Herbert Street, St Leonards NSW**	GW Stabilised:	
Client:		Ground Level:	
Drilling Company:	**Matrix Drilling Pty Ltd**	Top of Casing:	
Drill Method:	**CC / Push Tube / Solid Stem Auger**	Easting:	**332556**
Date Started:	**9/07/2013**	Northing:	**6256665**
Date Completed:	**9/07/2013**	Logged By:	**Aaron Young**

Method	Water Level	Depth (m)	RL (mAHD)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests: PID ppm	Samples / Tests: ID No.	Observations / Comments
CC		0.18				Fill	**CONCRETE**.				
Puah		0.2					**FILL** - SAND, brown, fine to coarse grained.	wet			No visual or olfactory signs of contamination.
		0.25					**FILL** - Gravelly CLAY, light brown.	moist to sat'd	0.0	BH10_0.3	No visual or olfactory signs of contamination.
		0.4									
		0.6									
		0.70					**FILL** - Gravelly CLAY, dark brown to black.	moist	0.1	BH10_0.8	No visual or olfactory signs of contamination. Push tube refusal at 0.8m.
Solid Stem Auger		0.8									
		1.0									
		1.10				Natural	**SHALE** - grey.	moist			No visual or olfactory signs of contamination.
		1.2									
		1.4									
		1.60							0.0	BH10_1.5	
		1.8					**Refusal at 1.60 m** on Shale.				
		2.0									

Observations

Asbestos	No visual evidence of asbestos noted during drilling.
Staining	No visual evidence of contamination (e.g. staining / precipitate) noted during drilling.
Odour	No olfactory (e.g. odour) evidence of contamination noted during drilling.
Groundwater	No groundwater encountered during drilling.

Notes

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Aaron Young** Date: **26/07/2013**

WSP LOG LT ST LEONARDS 40387.GPJ WSP.GDT 26/7/13 11:34:41 AM

Borehole Log

Hole ID. **BH11**

WSP Environment & Energy
Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**St Leonards Phase 2 ESA**	Hole Depth:	**0.22 m**
Project Number:	**40387**	GW Encountered:	
Location / Site:	**10 Herbert Street, St Leonards NSW**	GW Stabilised:	
Client:		Ground Level:	
Drilling Company:	**WSP**	Top of Casing:	
Drill Method:	**CC / Hand Auger**	Easting:	**332576**
Date Started:	**11/07/2013**	Northing:	**6256622**
Date Completed:	**11/07/2013**	Logged By:	**Aaron Young**

Method	Water Level	Depth (m)	RL (mAHD)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests: PID ppm	Samples / Tests: ID No.	Observations / Comments
CC		0.1 *0.11*				Fill	**CONCRETE**.				
Hand Auger		*0.20*					**FILL** - Gravelly and Clayey SAND, dark brown.	moist	0.0	BH11_0.15	No visual or olfactory signs of contamination.
		0.22				Nat.	**SHALE** - grey.	moist			No visual or olfactory signs of contamination.
		0.3					**Refusal at 0.22 m** on Shale.				
		0.4									
		0.5									
		0.6									
		0.7									
		0.8									
		0.9									
		1.0									

Observations		Notes
Asbestos	No visual evidence of asbestos noted during drilling.	
Staining	No visual evidence of contamination (e.g. staining / precipitate) noted during drilling.	
Odour	No olfactory (e.g. odour) evidence of contamination noted during drilling.	
Groundwater	No groundwater encountered during drilling.	

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Aaron Young** Date: **26/07/2013**

WSP LOG LT ST LEONARDS 40387.GPJ WSP.GDT 26/7/13 11:34:42 AM

Borehole Log

Hole ID. **BH12**

WSP Environment & Energy
Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**St Leonards Phase 2 ESA**	Hole Depth:	**0.22 m**
Project Number:	**40387**	GW Encountered:	
Location / Site:	**10 Herbert Street, St Leonards NSW**	GW Stabilised:	
Client:		Ground Level:	
Drilling Company:	**WSP**	Top of Casing:	
Drill Method:	**CC / Hand Auger**	Easting:	**332574**
Date Started:	**11/07/2013**	Northing:	**6256654**
Date Completed:	**11/07/2013**	Logged By:	**Aaron Young**

Method	Water Level	Depth (m)	RL (mAHD)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests: PID ppm	Samples / Tests: ID No.	Observations / Comments
CC		0.1				Fill	**CONCRETE**.				
Hand Auger		0.12					**FILL** - Gravelly Clayey SAND, dark brown.	wet	0.1	BH12_0.15	No visual or olfactory signs of contamination.
		0.20									
		0.22				Nat.	**SHALE** - brown and grey.	moist			No visual or olfactory signs of contamination.
							Refusal at 0.22 m on Shale.				
		0.3									
		0.4									
		0.5									
		0.6									
		0.7									
		0.8									
		0.9									
		1.0									

Observations

Asbestos	No visual evidence of asbestos noted during drilling.
Staining	No visual evidence of contamination (e.g. staining / precipitate) noted during drilling.
Odour	No olfactory (e.g. odour) evidence of contamination noted during drilling.
Groundwater	No groundwater encountered during drilling.

Notes

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Aaron Young** Date: **26/07/2013**

WSP LOG LT ST LEONARDS 40387.GPJ WSP.GDT 26/7/13 11:34:43 AM

Borehole Log

Hole ID. **BH13**

WSP Environment & Energy
Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**St Leonards Phase 2 ESA**	Hole Depth:	**0.40 m**
Project Number:	**40387**	GW Encountered:	
Location / Site:	**10 Herbert Street, St Leonards NSW**	GW Stabilised:	
Client:		Ground Level:	
Drilling Company:	**WSP**	Top of Casing:	
Drill Method:	**CC / Hand Auger**	Easting:	
Date Started:	**10/07/2013**	Northing:	
Date Completed:	**10/07/2013**	Logged By:	**Aaron Young**

Method	Water Level	Depth (m)	RL (mAHD)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests: PID ppm	Samples / Tests: ID No.	Observations / Comments
CC		0.1 *0.12*				Fill	**CONCRETE**.				
Hand Auger		0.2 *0.30*				Fill	**FILL** - Gravelly SAND, light brown.	moist	0.0	BH13_0.2	No visual or olfactory signs of contamination.
		0.40				Natural	**SHALE** - grey.	moist			No visual or olfactory signs of contamination.
		0.5 0.6 0.7 0.8 0.9 1.0					**Refusal at 0.40 m** on Shale.				

Observations

Asbestos	|	No visual evidence of asbestos noted during drilling.
Staining	|	No visual evidence of contamination (e.g. staining / precipitate) noted during drilling.
Odour	|	No olfactory (e.g. odour) evidence of contamination noted during drilling.
Groundwater	|	No groundwater encountered during drilling.

Notes

No GPS as beneath showroom.

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Aaron Young** Date: **26/07/2013**

Borehole Log

Hole ID. **BH14**

WSP Environment & Energy
Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**St Leonards Phase 2 ESA**	Hole Depth:	**0.45 m**
Project Number:	**40387**	GW Encountered:	
Location / Site:	**10 Herbert Street, St Leonards NSW**	GW Stabilised:	
Client:		Ground Level:	
Drilling Company:	**WSP**	Top of Casing:	
Drill Method:	**CC / Hand Auger**	Easting:	
Date Started:	**10/07/2013**	Northing:	
Date Completed:	**10/07/2013**	Logged By:	**Aaron Young**

Method	Water Level	Depth (m)	RL (mAHD)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests: PID ppm	Samples / Tests: ID No.	Observations / Comments
CC		0.1 *0.13*				Fill	**CONCRETE**.				
Hand Auger		0.2 *0.25*				Fill	**FILL** - Silty Gravelly SAND, light brown.	moist	0.1	BH14_0.2	No visual or olfactory signs of contamination.
		0.3 *0.40*				Fill	**FILL** - Gravelly CLAY, dark brown.	moist	0.0	BH14_0.3	No visual or olfactory signs of contamination.
		0.45				Nat.	**SHALE** - grey.	moist			No visual or olfactory signs of contamination.
		0.5 0.6 0.7 0.8 0.9 1.0					**Refusal at 0.45 m** on Shale.				

Observations

Asbestos	|	No visual evidence of asbestos noted during drilling.
Staining	|	No visual evidence of contamination (e.g. staining / precipitate) noted during drilling.
Odour	|	No olfactory (e.g. odour) evidence of contamination noted during drilling.
Groundwater	|	No groundwater encountered during drilling.

Notes

No GPS as beneath showroom.

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Aaron Young** Date: **26/07/2013**

WSP LOG LT ST LEONARDS 40387.GPJ WSP.GDT 26/7/13 11:34:44 AM

Borehole Log

Hole ID. **BH15**

WSP Environment & Energy
Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**St Leonards Phase 2 ESA**	Hole Depth:	**0.40 m**
Project Number:	**40387**	GW Encountered:	
Location / Site:	**10 Herbert Street, St Leonards NSW**	GW Stabilised:	
Client:		Ground Level:	
Drilling Company:	**WSP**	Top of Casing:	
Drill Method:	**CC / Hand Auger**	Easting:	
Date Started:	**10/07/2013**	Northing:	
Date Completed:	**10/07/2013**	Logged By:	**Aaron Young**

Method	Water Level	Depth (m)	RL (mAHD)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests: PID ppm	Samples / Tests: ID No.	Observations / Comments
CC		0.1 *0.12*				Fill	**CONCRETE**.				
Hand Auger		0.2 *0.30*				Fill	**FILL** - Gravelly CLAY, dark brown mottled, non cohesive.	moist	0.0	BH15_0.2	Tile content.
		0.40				Natural	**SHALE** - greyish brown.	moist			No visual or olfactory signs of contamination.
		0.5 0.6 0.7 0.8 0.9 1.0					**Refusal at 0.40 m** on Shale.				

Observations

Asbestos	|	No visual evidence of asbestos noted during drilling.
Staining	|	No visual evidence of contamination (e.g. staining / precipitate) noted during drilling.
Odour	|	No olfactory (e.g. odour) evidence of contamination noted during drilling.
Groundwater	|	No groundwater encountered during drilling.

Notes

No GPS as beneath showroom.

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Aaron Young** Date: **26/07/2013**

Borehole Log

Hole ID. **BH16**

WSP Environment & Energy
Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**St Leonards Phase 2 ESA**	Hole Depth:	**1.10 m**
Project Number:	**40387**	GW Encountered:	
Location / Site:	**10 Herbert Street, St Leonards NSW**	GW Stabilised:	
Client:		Ground Level:	
Drilling Company:	**Terry's Concrete Cutting**	Top of Casing:	
Drill Method:	**Concrete Core**	Easting:	
Date Started:	**10/07/2013**	Northing:	
Date Completed:	**10/07/2013**	Logged By:	**Aaron Young**

Method	Water Level	Depth (m)	RL (mAHD)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Observations / Comments
Concrete Core		0.14					**CONCRETE**.		
		0.2				Natural	**SHALE** - brown and grey.	damp	No visual or olfactory signs of contamination.
		1.10					**End of Hole at 1.10 m** in Shale.		

Observations

Asbestos	|	No visual evidence of asbestos noted during drilling.
Staining	|	No visual evidence of contamination (e.g. staining / precipitate) noted during drilling.
Odour	|	No olfactory (e.g. odour) evidence of contamination noted during drilling.
Groundwater	|	No groundwater encountered during drilling.

Notes

No GPS as inside building.

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Aaron Young** Date: **26/07/2013**

Borehole Log

Hole ID. **BH17**

WSP Environment & Energy
Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**St Leonards Phase 2 ESA**	Hole Depth:	**0.80 m**
Project Number:	**40387**	GW Encountered:	
Location / Site:	**10 Herbert Street, St Leonards NSW**	GW Stabilised:	
Client:		Ground Level:	
Drilling Company:	**WSP**	Top of Casing:	
Drill Method:	**CC / Hand Auger**	Easting:	
Date Started:	**10/07/2013**	Northing:	
Date Completed:	**10/07/2013**	Logged By:	**Aaron Young**

Method	Water Level	Depth (m)	RL (mAHD)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests: PID ppm	Samples / Tests: ID No.	Samples / Tests: DUP TRIP QC	Observations / Comments
CC		0.1 *0.13*				Fill	**CONCRETE**.					
Hand Auger		0.2 *0.30*				Fill	**FILL** - Silty Gravelly CLAY, grey.	moist	0.1	BH17_0.2	Dup1 Trip1	No visual or olfactory signs of contamination.
		0.40				Fill	**FILL** - SHALE, brown & grey.	moist				No visual or olfactory signs of contamination.
		0.5 0.6 *0.70*				Fill	**FILL** - Silty Gravelly CLAY, grey.	moist	0.1	BH17_0.6		No visual or olfactory signs of contamination.
		0.80				Natural	**SHALE**.					No visual or olfactory signs of contamination.
		0.9 1.0					**Refusal at 0.80 m** on Shale.					

Observations

Asbestos	No visual evidence of asbestos noted during drilling.
Staining	No visual evidence of contamination (e.g. staining / precipitate) noted during drilling.
Odour	No olfactory (e.g. odour) evidence of contamination noted during drilling.
Groundwater	No groundwater encountered during drilling.

Notes

No GPS as inside building.

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Aaron Young** Date: **26/07/2013**

Appendix F – Summary Result Tables

Table 1a: Soil Analytical Results (Commercial/Industrial Criteria)

	Asbestos	Moisture	BTEX					TRH						Heavy Metals							
	Asbestos	Moisture	Benzene	Ethylbenzene	Toluene	Xylene (m & p)	Xylene (o)	C6-C10	>C10-C16	>C16-C34	>C34-C40	F1 (C6-C10 less BTEX)	F2 (>C10-C16 less Naphthalene)	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc
	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.2	0.1	0.2	1	0.5	2	1	25	50	100	100	25	50	4	0.4	1	1	1	0.1	1	1
NEPM 2013 HIL D Soil - Commercial/Industrial														**3000**	**900**	**3600**	**240,000**	**1500**	**180**	**6000**	**400,000**
NEPM 2013 EIL - Commercial/Industrial														**160**							
NEPM 2013 ESL - coarse - Commercial/Industrial			**75**	**165**	**135**	**180**	**180**			**2800**	**3300**	**215**	**170**								
NEPM 2013 Commercial/Industrial - Management limits - coarse										**3500**	**10,000**	**700**	**1000**								
NEPM 2013 HSL D Soil - Commercial/Industrial. Sand 0-<1m	-	-	**3**			**230**	**230**					**260**									
NEPM 2013 HSL D Soil - Commercial/Industrial. Clay 0-<1m	-	-	**4**									**310**									

Field_ID	LocCode	Sample_Depth	Sampled_Date-Time	Matrix	Soil Type	SDG																		
BH1	BH1	0.9	10/07/2013	Soil	Gravelly sandy clay	93743	ND	**7**	<0.2	<1	<0.5	<2	<1	<25	<50	**120**	<100	<25	<50	-	-	-	-	-	-	-	-
BH2	BH2	1	9/07/2013	Soil	Clay	93743	-	**7.4**	<0.2	<1	<0.5	<2	<1	<25	<50	**130**	<100	<25	<50	**12**	<0.4	**10**	**36**	**58**	**0.3**	**25**	**100**
BH3	BH3	2	9/07/2013	Soil	Clay	93743	-	**6.9**	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<25	<50	**7**	<0.4	**13**	**24**	**21**	**0.2**	**20**	**65**
BH4	BH4	0.15	10/07/2013	Soil	Sand	93743	-	**9.9**	<0.2	<1	<0.5	<2	<1	<25	**66**	**500**	<100	<25	**63**	<4	<0.4	**19**	**17**	**390**	**1**	**24**	**100**
BH5	BH5	0.2	11/07/2013	Soil	Sandy clay	93743	-	**11**	<0.2	<1	<0.5	<2	<1	<25	**75**	**1100**	**190**	<25	**75**	**8**	<0.4	**22**	**37**	**36**	**0.2**	**41**	**100**
BH6	BH6	0.18	10/07/2013	Soil	Silty clay	93743	ND	**13**	<0.2	<1	<0.5	<2	<1	<25	<50	**180**	<100	<25	<50	-	-	-	-	-	-	-	-
BH7	BH7	0.1	10/07/2013	Soil	Silty clayey sand	93743	ND	**17**	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<25	<50	-	-	-	-	-	-	-	-
BH8	BH8	0.2	11/07/2013	Soil	Clay	93743	-	**14**	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<25	<50	**9**	<0.4	**10**	**64**	**430**	**0.2**	**11**	**130**
BH9	BH9	1.1	9/07/2013	Soil	Clay	93743	-	**6.7**	<0.2	<1	<0.5	<2	<1	**35**	**160**	**130**	<100	**35**	**160**	**9**	<0.4	**7**	**35**	**18**	**0.2**	**27**	**85**
BH10	BH10	0.8	9/07/2013	Soil	Clay	93743	-	**6.6**	<0.2	<1	<0.5	<2	<1	<25	**59**	**220**	<100	<25	**59**	**10**	<0.4	**7**	**45**	**18**	**0.2**	**26**	**130**
BH11	BH11	0.15	11/07/2013	Soil	Clayey sand	93743	ND	**10**	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<25	<50	-	-	-	-	-	-	-	-
BH12	BH12	0.15	11/07/2013	Soil	Clayey sand	93743	ND	**16**	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<25	<50	-	-	-	-	-	-	-	-
BH13	BH13	0.2	10/07/2013	Soil	Gravelly sand	93743	ND	**6.8**	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<25	<50	-	-	-	-	-	-	-	-
BH14	BH14	0.2	10/07/2013	Soil	Silty sand	93743	ND	**8.8**	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<25	<50	-	-	-	-	-	-	-	-
BH15	BH15	0.2	10/07/2013	Soil	Clay	93743	ND	**14**	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<25	<50	-	-	-	-	-	-	-	-
BH17	BH17	0.2	10/07/2013	Soil	Silty Clay	93743	ND	**32**	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<25	<50	<4	<0.4	**3**	**10**	**5**	**0.2**	**9**	**18**
DUP1	BH17	0.2	10/07/2013	Soil	Silty Clay	93743	ND	**32**	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<25	<50	<4	<0.4	**3**	**12**	**6**	**0.1**	**8**	**26**
TRIP1	BH17	0.2	10/07/2013	Soil	Silty Clay	93743	ND	**38**	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<25	<50	<4	<0.4	**3**	**13**	**6**	<0.1	**9**	**21**
TB	TB	-	10/07/2013	Soil	-	93743	-	**4.4**	<0.2	<1	<0.5	<2	<1	<25	-	-	-	<25	-	-	-	-	-	-	-	-	-
TS	TS	-	10/07/2013	Soil	-	93743	-	-	0.99	0.99	1	0.99	0.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Statistical Summary																											
Number of Results								20	19	20	20	20	20	20	19	18	18	18	19	18	10	10	10	10	10	10	10	10
Number of Detects								9	19	1	1	1	1	1	1	4	7	1	1	4	6	0	10	10	10	9	10	10
Minimum Concentration								0	4.4	<0.2	0.99	<0.5	0.99	0.99	<25	<50	<100	<100	<25	<50	<4	<0.4	3	10	5	<0.1	8	18
Minimum Detect								ND	4.4	0.99	0.99	1	0.99	0.99	35	59	120	190	35	59	7	ND	3	10	5	0.1	8	18
Maximum Concentration								0	38	0.99	<1	1	<2	<1	35	160	1100	190	35	160	12	<0.4	22	64	430	1	41	130
Maximum Detect								ND	38	0.99	0.99	1	0.99	0.99	35	160	1100	190	35	160	12	ND	22	64	430	1	41	130
Average Concentration								0	14	0.14	0.52	0.29	1	0.52	14	39	163	58	14	39	6.3	0.2	9.7	29	99	0.27	20	78
Median Concentration								0	10	0.1	0.5	0.25	1	0.5	12.5	25	50	50	12.5	25	7.5	0.2	8.5	29.5	19.5	0.2	22	92.5
Standard Deviation								0		0.2	0.11	0.17	0.0022	0.11	5.2	34	259	33	5.2	34	3.9	0	6.7	17	165	0.27	11	43
Number of Guideline Exceedances								0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)								0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 1b: Soil Analytical Results (Commercial/Industrial Criteria)

						PAHs																OCP	Phenols	VOCs
						Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b)&(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	Carcinogenic PAHs as B(a)P TEQ	Total PAHs	OCP (sum of detects)	Phenolics Total	VOCs (sum of detects)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL						0.1	0.1	0.1	0.1	0.05	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5		0.1	5	1
NEPM 2013 HIL D Soil - Commercial/Industrial																					**40**	**4000**			
NEPM 2013 EIL - Commercial/Industrial																		**370**							
NEPM 2013 ESL - coarse - Commercial/Industrial										**0.7**															
NEPM 2013 Commercial/Industrial - Management limits - coarse																									
NEPM 2013 HSL D Soil - Commercial/Industrial. Sand 0-<1m																									
NEPM 2013 HSL D Soil - Commercial/Industrial. Clay 0-<1m																									
Field_ID	**LocCode**	**Sample_Depth**	**Sampled_Date-Time**	**Matrix**	**Soil Type**	**SDG**																			
BH1	BH1	0.9	10/07/2013	Soil	Gravelly sandy clay	93743	<0.1	**0.4**	**0.2**	**0.9**	**0.91**	**1.1**	**0.7**	**1**	**0.1**	**1**	**0.1**	**0.7**	**0.1**	**1.3**	**1.8**	**1**	**10.31**	<0.1	-	-
BH2	BH2	1	9/07/2013	Soil	Clay	93743	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH3	BH3	2	9/07/2013	Soil	Clay	93743	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH4	BH4	0.15	10/07/2013	Soil	Sand	93743	-	-	-	-	-	-	-	-	-	-	-	-	**3**	-	-	-	**3**	-	<5	<1
BH5	BH5	0.2	11/07/2013	Soil	Sandy clay	93743	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5	<1
BH6	BH6	0.18	10/07/2013	Soil	Silty clay	93743	<0.1	**0.2**	**0.1**	**0.7**	**0.75**	**1**	**0.6**	**0.7**	**0.1**	**0.9**	<0.1	**0.6**	<0.1	**0.4**	**1.1**	**1**	**7.05**	<0.1	-	-
BH7	BH7	0.1	10/07/2013	Soil	Silty clayey sand	93743	<0.1	<0.1	<0.1	<0.1	**0.08**	<0.2	<0.1	<0.1	<0.1	**0.1**	<0.1	<0.1	<0.1	<0.1	**0.1**	<0.5	**0.28**	<0.1	-	-
BH8	BH8	0.2	11/07/2013	Soil	Clay	93743	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5	<1
BH9	BH9	1.1	9/07/2013	Soil	Clay	93743	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH10	BH10	0.8	9/07/2013	Soil	Clay	93743	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11	BH11	0.15	11/07/2013	Soil	Clayey sand	93743	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	-	<0.1	-	-
BH12	BH12	0.15	11/07/2013	Soil	Clayey sand	93743	<0.1	<0.1	<0.1	<0.1	**0.05**	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	**0.05**	<0.1	-	-
BH13	BH13	0.2	10/07/2013	Soil	Gravelly sand	93743	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	-	<0.1	-	-
BH14	BH14	0.2	10/07/2013	Soil	Silty sand	93743	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	-	<0.1	-	-
BH15	BH15	0.2	10/07/2013	Soil	Clay	93743	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	-	<0.1	-	-
BH17	BH17	0.2	10/07/2013	Soil	Silty Clay	93743	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-
DUP1	BH17	0.2	10/07/2013	Soil	Silty Clay	93743	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-
TRIP1	BH17	0.2	10/07/2013	Soil	Silty Clay	93743	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-
TB	TB	-	10/07/2013	Soil	-	93743	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TS	TS	-	10/07/2013	Soil	-	93743	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Statistical Summary																									
Number of Results							8	8	8	8	8	8	8	8	8	8	8	8	9	8	8	8	5	11	3	3
Number of Detects							0	2	2	2	4	2	2	2	2	3	1	2	2	2	3	2	5	0	0	0
Minimum Concentration							<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	0.05	<0.1	<5	<1
Minimum Detect							ND	0.2	0.1	0.7	0.05	1	0.6	0.7	0.1	0.1	0.1	0.6	0.1	0.4	0.1	1	0.05	ND	ND	ND
Maximum Concentration							<0.1	0.4	0.2	0.9	0.91	1.1	0.7	1	0.1	1	0.1	0.7	3	1.3	1.8	1	10.31	<0.1	<5	<1
Maximum Detect							ND	0.4	0.2	0.9	0.91	1.1	0.7	1	0.1	1	0.1	0.7	3	1.3	1.8	1	10.31	ND	ND	ND
Average Concentration							0.05	0.11	0.075	0.24	0.24	0.34	0.2	0.25	0.063	0.28	0.056	0.2	0.38	0.25	0.41	0.44	4.1	0.05	2.5	0.5
Median Concentration							0.05	0.05	0.05	0.05	0.0375	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.25	3	0.05	2.5	0.5
Standard Deviation							0	0.13	0.053	0.35	0.37	0.44	0.28	0.38	0.023	0.41	0.018	0.28	0.98	0.44	0.67	0.35	4.5	0	0	0
Number of Guideline Exceedances							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 2a: Soil Analytical Results (Residential Criteria)

							Asbestos	Moisture	BTEX					TRH						Heavy Metals								
							Asbestos	Moisture	Benzene	Ethylbenzene	Toluene	Xylene (m & p)	Xylene (o)	C6-C10	>C10-C16	>C16-C34	>C34-C40	F1 (C6-C10 less BTEX)	F2 (>C10-C16 less Naphthalene)	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc
							mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL							0.2	0.1	0.2	1	0.5	2	1	25	50	100	100	25	50	4	0.4	1	1	1	0.1	1	1
NEPM 2013 HIL A Soil - Residential, Access to Soil																				**100**	**20**	**100**	**6000**	**300**	**10**	**400**	**7400**
NEPM 2013 HIL B Soil - Residential, Limited Access to Soil																				**500**	**150**	**500**	**30,000**	**1200**	**30**	**1200**	**60,000**
NEPM 2013 EIL - Urban Residential & Public Open Space																				**100**							
NEPM 2013 ESL - coarse - Urban Residential & Public Open Space									**50**	**70**	**85**	**105**	**105**			**300**	**2800**	**180**	**120**								
NEPM 2013 Residential - Management limits - coarse																**2500**	**10,000**	**700**	**1000**								
NEPM 2013 HSL A/B Soil - Residential. Sand 0-<1m									**0.5**	**55**	**160**	**40**	**40**					**45**	**110**								
NEPM 2013 HSL A/B Soil - Residential. Clay 0-<1m									**0.7**		**480**	**110**	**110**					**50**	**280**								
Field_ID	**LocCode**	**Sample_Depth_Range**	**Sampled_Date-Time**	**Matrix**	**Soil**	**SDG**																						
BH1	BH1	0.9	10/07/2013	Soil	Gravelly sandy clay	93743	ND	**7**	<0.2	<1	<0.5	<2	<1	<25	<50	**120**	<100	<25	<50	-	-	-	-	-	-	-	-
BH2	BH2	1	9/07/2013	Soil	Clay	93743	-	**7.4**	<0.2	<1	<0.5	<2	<1	<25	<50	**130**	<100	<25	<50	**12**	<0.4	**10**	**36**	**58**	**0.3**	**25**	**100**
BH3	BH3	2	9/07/2013	Soil	Clay	93743	-	**6.9**	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<25	<50	**7**	<0.4	**13**	**24**	**21**	**0.2**	**20**	**65**
BH4	BH4	0.15	10/07/2013	Soil	Sand	93743	-	**9.9**	<0.2	<1	<0.5	<2	<1	<25	**66**	**500**	<100	<25	**63**	<4	<0.4	**19**	**17**	**390**	**1**	**24**	**100**
BH5	BH5	0.2	11/07/2013	Soil	Sandy clay	93743	-	**11**	<0.2	<1	<0.5	<2	<1	<25	**75**	**1100**	**190**	<25	**75**	**8**	<0.4	**22**	**37**	**36**	**0.2**	**41**	**100**
BH6	BH6	0.18	10/07/2013	Soil	Silty clay	93743	ND	**13**	<0.2	<1	<0.5	<2	<1	<25	<50	**180**	<100	<25	<50	-	-	-	-	-	-	-	-
BH7	BH7	0.1	10/07/2013	Soil	Silty clayey sand	93743	ND	**17**	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<25	<50	-	-	-	-	-	-	-	-
BH8	BH8	0.2	11/07/2013	Soil	Clay	93743	-	**14**	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<25	<50	**9**	<0.4	**10**	**64**	**430**	**0.2**	**11**	**130**
BH9	BH9	1.1	9/07/2013	Soil	Clay	93743	-	**6.7**	<0.2	<1	<0.5	<2	<1	**35**	**160**	**130**	<100	**35**	**160**	**9**	<0.4	**7**	**35**	**18**	**0.2**	**27**	**85**
BH10	BH10	0.8	9/07/2013	Soil	Clay	93743	-	**6.6**	<0.2	<1	<0.5	<2	<1	<25	**59**	**220**	<100	<25	**59**	**10**	<0.4	**7**	**45**	**18**	**0.2**	**26**	**130**
BH11	BH11	0.15	11/07/2013	Soil	Clayey sand	93743	ND	**10**	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<25	<50	-	-	-	-	-	-	-	-
BH12	BH12	0.15	11/07/2013	Soil	Clayey sand	93743	ND	**16**	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<25	<50	-	-	-	-	-	-	-	-
BH13	BH13	0.2	10/07/2013	Soil	Gravelly sand	93743	ND	**6.8**	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<25	<50	-	-	-	-	-	-	-	-
BH14	BH14	0.2	10/07/2013	Soil	Silty sand	93743	ND	**8.8**	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<25	<50	-	-	-	-	-	-	-	-
BH15	BH15	0.2	10/07/2013	Soil	Clay	93743	ND	**14**	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<25	<50	-	-	-	-	-	-	-	-
BH17	BH17	0.2	10/07/2013	Soil	Silty Clay	93743	ND	**32**	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<25	<50	<4	<0.4	**3**	**10**	**5**	**0.2**	**9**	**18**
DUP1	BH17	0.2	10/07/2013	Soil	Silty Clay	93743	ND	**32**	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<25	<50	<4	<0.4	**3**	**12**	**6**	**0.1**	**8**	**26**
TRIP1	BH17	0.2	10/07/2013	Soil	Silty Clay	93743	ND	**38**	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<25	<50	<4	<0.4	**3**	**13**	**6**	<0.1	**9**	**21**
TB	TB	-	10/07/2013	Soil	-	93743	-	**4.4**	<0.2	<1	<0.5	<2	<1	<25	-	-	-	<25	-	-	-	-	-	-	-	-	-
TS	TS	-	10/07/2013	Soil	-	93743	-	-	**0.99**	**0.99**	**1**	**0.99**	**0.99**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Statistical Summary																												
Number of Results							20	19	20	20	20	20	20	19	18	18	18	19	18	10	10	10	10	10	10	10	10
Number of Detects							9	19	1	1	1	1	1	1	4	7	1	1	4	6	0	10	10	9	10	10	10
Minimum Concentration							0	4.4	<0.2	0.99	<0.5	0.99	0.99	<25	<50	<100	<100	<25	<50	<4	<0.4	3	10	5	<0.1	8	18
Minimum Detect							ND	4.4	0.99	0.99	1	0.99	0.99	35	59	120	190	35	59	7	ND	3	10	5	0.1	8	18
Maximum Concentration							0	38	0.99	<1	1	<2	<1	35	160	1100	190	35	160	12	<0.4	22	64	430	1	41	130
Maximum Detect							ND	38	0.99	0.99	1	0.99	0.99	35	160	1100	190	35	160	12	ND	22	64	430	1	41	130
Average Concentration							0	14	0.14	0.52	0.29	1	0.52	14	39	163	58	14	39	6.3	0.2	9.7	29	99	0.27	20	78
Median Concentration							0	10	0.1	0.5	0.25	1	0.5	12.5	25	50	50	12.5	25	7.5	0.2	8.5	29.5	19.5	0.2	22	92.5
Standard Deviation							0		0.2	0.11	0.17	0.0022	0.11	5.2	34	259	33	5.2	34	3.9	0	6.7	17	165	0.27	11	43
Number of Guideline Exceedances							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 2a: Soil Analytical Results (Residential Criteria)

							PAHs															OCPs	Phenols	VOCs
							Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b)&(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	Carcinogenic PAHs as B(a)P TEQ	Total PAHs	OCP (sum of detects)	Phenolics Total	VOCs (sum of detects)
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL							0.1	0.1	0.1	0.1	0.05	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.5	0.1	5	1
NEPM 2013 HIL A Soil - Residential, Access to Soil																						3	300			
NEPM 2013 HIL B Soil - Residential, Limited Access to Soil																			-	-	-	4	400			
NEPM 2013 EIL - Urban Residential & Public Open Space																			170	-	-	-	-			
NEPM 2013 ESL - coarse - Urban Residential & Public Open Space											0.7															
NEPM 2013 Residential - Management limits - coarse																										
NEPM 2013 HSL A/B Soil - Residential. Sand 0-<1m																										
NEPM 2013 HSL A/B Soil - Residential. Clay 0-<1m																										
Field_ID	**LocCode**	**Sample_Depth_Range**	**Sampled_Date-Time**	**Matrix**	**Soil**	**SDG**																				
BH1	BH1	0.9	10/07/2013	Soil	Gravelly sandy clay	93743	<0.1	**0.4**	**0.2**	**0.9**	**0.91**	**1.1**	**0.7**	**1**	**0.1**	**1**	**0.1**	**0.7**	**0.1**	**1.3**	**1.8**	**1**	**10.31**	<0.1	-	-
BH2	BH2	1	9/07/2013	Soil	Clay	93743	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH3	BH3	2	9/07/2013	Soil	Clay	93743	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH4	BH4	0.15	10/07/2013	Soil	Sand	93743	-	-	-	-	-	-	-	-	-	-	-	-	**3**	-	-	-	**3**	-	<5	<1
BH5	BH5	0.2	11/07/2013	Soil	Sandy clay	93743	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5	<1
BH6	BH6	0.18	10/07/2013	Soil	Silty clay	93743	<0.1	**0.2**	**0.1**	**0.7**	**0.75**	**1**	**0.6**	**0.7**	**0.1**	**0.9**	<0.1	**0.6**	<0.1	**0.4**	**1.1**	**1**	**7.05**	<0.1	-	-
BH7	BH7	0.1	10/07/2013	Soil	Silty clayey sand	93743	<0.1	<0.1	<0.1	<0.1	**0.08**	<0.2	<0.1	<0.1	<0.1	**0.1**	<0.1	<0.1	<0.1	<0.1	**0.1**	<0.5	**0.28**	<0.1	-	-
BH8	BH8	0.2	11/07/2013	Soil	Clay	93743	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5	<1
BH9	BH9	1.1	9/07/2013	Soil	Clay	93743	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH10	BH10	0.8	9/07/2013	Soil	Clay	93743	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11	BH11	0.15	11/07/2013	Soil	Clayey sand	93743	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	-	<0.1	-	-
BH12	BH12	0.15	11/07/2013	Soil	Clayey sand	93743	<0.1	<0.1	<0.1	<0.1	**0.05**	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	**0.05**	<0.1	-	-
BH13	BH13	0.2	10/07/2013	Soil	Gravelly sand	93743	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	-	<0.1	-	-
BH14	BH14	0.2	10/07/2013	Soil	Silty sand	93743	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	-	<0.1	-	-
BH15	BH15	0.2	10/07/2013	Soil	Clay	93743	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	-	<0.1	-	-
BH17	BH17	0.2	10/07/2013	Soil	Silty Clay	93743	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-
DUP1	BH17	0.2	10/07/2013	Soil	Silty Clay	93743	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-
TRIP1	BH17	0.2	10/07/2013	Soil	Silty Clay	93743	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-
TB	TB	-	10/07/2013	Soil	-	93743	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TS	TS	-	10/07/2013	Soil	-	93743	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Statistical Summary																										
Number of Results							8	8	8	8	8	8	8	8	8	8	8	9	8	8	8	5	11	3	3	
Number of Detects							0	2	2	2	4	2	2	2	2	3	1	2	2	2	3	2	5	0	0	0
Minimum Concentration							<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	0.05	<0.1	<5	<1
Minimum Detect							ND	0.2	0.1	0.7	0.05	1	0.6	0.7	0.1	0.1	0.1	0.6	0.1	0.4	0.1	1	0.05	ND	ND	ND
Maximum Concentration							<0.1	0.4	0.2	0.9	0.91	1.1	0.7	1	0.1	1	0.1	0.7	3	1.3	1.8	1	10.31	<0.1	<5	<1
Maximum Detect							ND	0.4	0.2	0.9	0.91	1.1	0.7	1	0.1	1	0.1	0.7	3	1.3	1.8	1	10.31	ND	ND	ND
Average Concentration							0.05	0.11	0.075	0.24	0.24	0.34	0.2	0.25	0.063	0.28	0.056	0.2	0.38	0.25	0.41	0.44	4.1	0.05	2.5	0.5
Median Concentration							0.05	0.05	0.05	0.05	0.0375	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.25	3	0.05	2.5	0.5
Standard Deviation							0	0.13	0.053	0.35	0.37	0.44	0.28	0.38	0.023	0.41	0.018	0.28	0.98	0.44	0.67	0.35	4.5	0	0	0
Number of Guideline Exceedances							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 3a: Waste Classification Results

							Asbestos	Moisture	BTEX						TRH										Heavy Metals							
							Asbestos	Moisture	Benzene	Ethylbenzene	Toluene	Xylene (m & p)	Xylene (o)	Total Xylene	C6-C10	>C10-C16	>C16-C34	>C34-C40	F1 (C6-C10 less BTEX)	F2 (>C10-C16 less Naphthalene)	C6-C9	>C10-C14	>C15-C28	>C29-C36	>C10-C36 (sum of detects)	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc
							mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL							0.2	0.1	0.2	1	0.5	2	1	1	25	50	100	100	25	50	100	100	100	100	100	4	0.4	1	1	1	0.1	1	1
NSW DECC Waste Classification - General Solid Waste - No Leaching (CT1)									**10**		**288**			**1000**							**650**				**10,000**	**100**	**20**	**100**		**100**	**4**	**40**	
NSW DECC Waste Classification -Restricted Solid Waste - No Leaching (CT2)									**40**		**1152**			**4000**							**2600**				**40,000**	**400**	**80**	**400**		**400**	**16**	**160**	
NSW DECC Waste Classification -General Solid Waste - With Leaching (TCLP1/SCC1)																													**5 / 1500**		**2 / 1050**	
NSW DECC Waste Classification - Restricted Solid Waste - With Leaching (TCLP2/SCC2)																													**20 / 6000**		**8 / 4200**	
Field_ID	**LocCode**	**Sample_Depth_Range**	**Sampled_Date-Time**	**Waste Classification**	**SDG**																											
BH1	BH1	0.9	10/07/2013	Restricted Solid Waste	93743	ND	**7**	<0.2	<1	<0.5	<2	<1	<3	<25	<50	**120**	<100	<25	<50	<25	<50	<100	<50	**<100**	-	-	-	-	-	-	-	-
BH2	BH2	1	9/07/2013	General Solid Waste	93743	-	**7.4**	<0.2	<1	<0.5	<2	<1	<3	<25	<50	**130**	<100	<25	<50	<25	<50	**380**	**180**	**560**	**12**	<0.4	**10**	**36**	**58**	**0.3**	**25**	**100**
BH3	BH3	2	9/07/2013	General Solid Waste	93743	-	**6.9**	<0.2	<1	<0.5	<2	<1	<3	<25	<50	<100	<100	<25	<50	<25	<50	<100	<50	<100	**7**	<0.4	**13**	**24**	**21**	**0.2**	**20**	**65**
BH4	BH4	0.15	10/07/2013	Restricted Solid Waste	93743	-	**9.9**	<0.2	<1	<0.5	<2	<1	<3	<25	**66**	**500**	<100	<25	**63**	<25	<50	<100	<50	**<100**	<4	<0.4	**19**	**17**	**390**	**1**	**24**	**100**
BH5	BH5	0.2	11/07/2013	Restricted Solid Waste	93743	-	**11**	<0.2	<1	<0.5	<2	<1	<3	<25	**75**	**1100**	**190**	<25	**75**	<25	<50	**780**	**410**	**1190**	**8**	<0.4	**22**	**37**	**36**	**0.2**	**41**	**100**
BH6	BH6	0.18	10/07/2013	General Solid Waste	93743	ND	**13**	<0.2	<1	<0.5	<2	<1	<3	<25	<50	**180**	<100	<25	<50	<25	<50	<100	**110**	**110**	-	-	-	-	-	-	-	-
BH7	BH7	0.1	10/07/2013	General Solid Waste	93743	ND	**17**	<0.2	<1	<0.5	<2	<1	<3	<25	<50	<100	<100	<25	<50	<25	<50	<100	<50	<100	-	-	-	-	-	-	-	-
BH8	BH8	0.2	11/07/2013	Hazardous Waste	93743	-	**14**	<0.2	<1	<0.5	<2	<1	<3	<25	<50	<100	<100	<25	<50	<25	<50	<100	<50	<100	**9**	<0.4	**10**	**64**	**430**	**0.2**	**11**	**130**
BH9	BH9	1.1	9/07/2013	General Solid Waste	93743	-	**6.7**	<0.2	<1	<0.5	<2	<1	<3	**35**	**160**	**130**	<100	**35**	**160**	<25	**160**	**130**	<50	**290**	**9**	<0.4	**7**	**35**	**18**	**0.2**	**27**	**85**
BH10	BH10	0.8	9/07/2013	General Solid Waste	93743	-	**6.6**	<0.2	<1	<0.5	<2	<1	<3	<25	**59**	**220**	<100	<25	**59**	<25	<50	**180**	<50	**180**	**10**	<0.4	**7**	**45**	**18**	**0.2**	**26**	**130**
BH11	BH11	0.15	11/07/2013	General Solid Waste	93743	ND	**10**	<0.2	<1	<0.5	<2	<1	<3	<25	<50	<100	<100	<25	<50	<25	<50	<100	<50	<100	-	-	-	-	-	-	-	-
BH12	BH12	0.15	11/07/2013	General Solid Waste	93743	ND	**16**	<0.2	<1	<0.5	<2	<1	<3	<25	<50	<100	<100	<25	<50	<25	<50	<100	<50	<100	-	-	-	-	-	-	-	-
BH13	BH13	0.2	10/07/2013	General Solid Waste	93743	ND	**6.8**	<0.2	<1	<0.5	<2	<1	<3	<25	<50	<100	<100	<25	<50	<25	<50	<100	<50	<100	-	-	-	-	-	-	-	-
BH14	BH14	0.2	10/07/2013	General Solid Waste	93743	ND	**8.8**	<0.2	<1	<0.5	<2	<1	<3	<25	<50	<100	<100	<25	<50	<25	<50	<100	<50	<100	-	-	-	-	-	-	-	-
BH15	BH15	0.2	10/07/2013	General Solid Waste	93743	ND	**14**	<0.2	<1	<0.5	<2	<1	<3	<25	<50	<100	<100	<25	<50	<25	<50	<100	<50	<100	-	-	-	-	-	-	-	-
BH17	BH17	0.2	10/07/2013	General Solid Waste	93743	ND	**32**	<0.2	<1	<0.5	<2	<1	<3	<25	<50	<100	<100	<25	<50	<25	<50	<100	<50	<100	<4	<0.4	**3**	**13**	**6**	**0.2**	**9**	**26**
Statistical Summary																																
Number of Results							16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	8	8	8	8	8	8	8	8
Number of Detects							7	16	0	0	0	0	0	0	1	4	7	1	1	4	0	1	4	3	5	6	0	8	8	8	8	8	8
Minimum Concentration							0	6.6	<0.2	<1	<0.5	<2	<1	<3	<25	<50	<100	<100	<25	<50	<25	<50	<100	<50	<100	<4	<0.4	3	13	6	0.2	9	26
Minimum Detect							ND	6.6	ND	ND	ND	ND	ND	ND	35	59	120	190	35	59	ND	160	130	110	110	7	ND	3	13	6	0.2	9	26
Maximum Concentration							0	32	<0.2	<1	<0.5	<2	<1	<3	35	160	1100	190	35	160	<25	160	780	410	1190	12	<0.4	22	64	430	1	41	130
Maximum Detect							ND	32	ND	ND	ND	ND	ND	ND	35	160	1100	190	35	160	ND	160	780	410	1190	12	ND	22	64	430	1	41	130
Average Concentration							0	12	0.1	0.5	0.25	1	0.5	1.5	14	41	177	59	14	41	13	33	129	64	180	7.4	0.2	11	34	122	0.31	23	92
Median Concentration							0	9.95	0.1	0.5	0.25	1	0.5	1.5	12.5	25	50	50	12.5	25	12.5	25	50	25	50	8.5	0.2	10	35.5	28.5	0.2	24.5	100
Standard Deviation							0	0	0	0	0	0	0	0	5.6	36	272	35	5.6	36	0	34	194	102	302	3.6	0	6.4	16	179	0.28	10	34
Number of Guideline Exceedances							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Assessment levels taken from:
National Environmental Protection Measure (NEPM) Waste Classification Guidelines

Notes:

*	There are currently no guidelines for Chromium (III + VI). The Chromium VI criteria was therefore adopted for total Chromium
ND	Non-Detect
-	Not tested / analysed
<0.001	Grey text indicates concentration is below the laboratory limit of reporting

Asbestos results : asbestos detected at reporting limit of 0.1g/kg and/or respirable fibres
NES Not Enough Sample to conduct the test
TCLP = Toxicity Chracteristic Leaching Procedure

Table 1b: Waste Classification Results

						PAHs														OCPs	Phenols	VOCs
						Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b)&(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	Carcinogenic PAHs as B(a)P TEQ	Total PAHs	QCP (sum of detects)	Phenolics Total	VOCs (sum of detects)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL						0.1	0.1	0.1	0.1	0.05	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5		0.1	5	1
NSW DECC Waste Classification - General Solid Waste - No Leaching (CT1)										**0.8**											**200**			
NSW DECC Waste Classification -Restricted Solid Waste - No Leaching (CT2)										**3.2**											**800**			
NSW DECC Waste Classification -General Solid Waste - With Leaching (TCLP1/SCC1)										**0.04 / 10**														
NSW DECC Waste Classification - Restricted Solid Waste - With Leaching (TCLP2/SCC2)										**0.16 / 23**														
Field_ID	**LocCode**	**Sample_Depth_Range**	**Sampled_Date-Time**	**Waste Classification**	**SDG**																			
BH1	BH1	0.9	10/07/2013	Restricted Solid Waste	93743	<0.1	**0.4**	**0.2**	**0.9**	**0.91**	**1.1**	**0.7**	**1**	**0.1**	**1**	**0.1**	**0.7**	**0.1**	**1.3**	**1.8**	**1**	**10.31**	<0.1	-	-
BH2	BH2	1	9/07/2013	General Solid Waste	93743	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH3	BH3	2	9/07/2013	General Solid Waste	93743	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH4	BH4	0.15	10/07/2013	Restricted Solid Waste	93743	-	-	-	-	-	-	-	-	-	-	-	-	**3**	-	-	-	**3**	-	<5	<1
BH5	BH5	0.2	11/07/2013	Restricted Solid Waste	93743	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5	<1
BH6	BH6	0.18	10/07/2013	General Solid Waste	93743	<0.1	**0.2**	**0.1**	**0.7**	**0.75**	**1**	**0.6**	**0.7**	**0.1**	**0.9**	<0.1	**0.6**	<0.1	**0.4**	**1.1**	**1**	**7.05**	<0.1	-	-
BH7	BH7	0.1	10/07/2013	General Solid Waste	93743	<0.1	<0.1	<0.1	<0.1	**0.08**	<0.2	<0.1	<0.1	<0.1	**0.1**	<0.1	<0.1	<0.1	<0.1	**0.1**	<0.5	**0.28**	<0.1	-	-
BH8	BH8	0.2	11/07/2013	Hazardous Waste	93743	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5	<1
BH9	BH9	1.1	9/07/2013	General Solid Waste	93743	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH10	BH10	0.8	9/07/2013	General Solid Waste	93743	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11	BH11	0.15	11/07/2013	General Solid Waste	93743	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	-	<0.1	-	-
BH12	BH12	0.15	11/07/2013	General Solid Waste	93743	<0.1	<0.1	<0.1	<0.1	**0.05**	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	**0.05**	<0.1	-	-
BH13	BH13	0.2	10/07/2013	General Solid Waste	93743	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	-	<0.1	-	-
BH14	BH14	0.2	10/07/2013	General Solid Waste	93743	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	-	<0.1	-	-
BH15	BH15	0.2	10/07/2013	General Solid Waste	93743	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	-	<0.1	-	-
BH17	BH17	0.2	10/07/2013	General Solid Waste	93743	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-
Statistical Summary																									
Number of Results						8	8	8	8	8	8	8	8	8	8	8	8	9	8	8	8	5	9	3	3
Number of Detects						0	2	2	2	4	2	2	2	2	3	1	2	2	2	3	2	5	0	0	0
Minimum Concentration						<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	0.05	<0.1	<5	<1
Minimum Detect						ND	0.2	0.1	0.7	0.05	1	0.6	0.7	0.1	0.1	0.1	0.6	0.1	0.4	0.1	1	0.05	ND	ND	ND
Maximum Concentration						<0.1	0.4	0.2	0.9	0.91	1.1	0.7	1	0.1	1	0.1	0.7	3	1.3	1.8	1	10.31	<0.1	<5	<1
Maximum Detect						ND	0.4	0.2	0.9	0.91	1.1	0.7	1	0.1	1	0.1	0.7	3	1.3	1.8	1	10.31	ND	ND	ND
Average Concentration						0.05	0.11	0.075	0.24	0.24	0.34	0.2	0.25	0.063	0.28	0.056	0.2	0.38	0.25	0.41	0.44	4.1	0.05	2.5	0.5
Median Concentration						0.05	0.05	0.05	0.05	0.0375	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.25	3	0.05	2.5	0.5
Standard Deviation						0	0.13	0.053	0.35	0.37	0.44	0.28	0.38	0.023	0.41	0.018	0.28	0.98	0.44	0.67	0.35	4.5	0	0	0
Number of Guideline Exceedances						0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)						0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Assessment levels taken from:

National Environmental Protection Measure (NEPM) Waste Classification Guidelines

Notes:

* There are currently no guidelines for Chromium (III + VI). The Chromium VI criteria was therefore adopted for total Chromium

ND Non-Detect

\- Not tested / analysed

<0.001 Grey text indicates concentration is below the laboratory limit of reporting

Asbestos results : asbestos detected at reporting limit of 0.1g/kg and/or respirable fibres

NES Not Enough Sample to conduct the test

TCLP = Toxicity Chracteristic Leaching Procedure

Table 4: RPD Calculations

SDG	93743	93743		93743	93743	
Field_ID	BH17	DUP1	**RPD**	BH17	TRIP1	**RPD**
Sampled_	10/07/2013	10/07/2013		10/07/2013	10/07/2013	

Method_Type	**ChemName**	**Units**	**EQL**						
8 metals in soil	Arsenic	mg/kg	4	<4.0	<4.0	0	<4.0	<4.0	0
	Cadmium	mg/kg	0.4	<0.4	<0.4	0	<0.4	<0.4	0
	Chromium (III+VI)	mg/kg	1	3.0	3.0	0	3.0	3.0	0
	Copper	mg/kg	1	10.0	12.0	18	10.0	13.0	26
	Lead	mg/kg	1	5.0	6.0	18	5.0	6.0	18
	Mercury	mg/kg	0.1	0.2	0.1	67	0.2	<0.1	67
	Nickel	mg/kg	1	9.0	8.0	12	9.0	9.0	0
	Zinc	mg/kg	1	**18.0**	**26.0**	**36**	18.0	21.0	15
Moisture	Moisture	%	0.1	32.0	32.0	0	32.0	38.0	17
Organochlorine Pesticides	4,4-DDE	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	a-BHC	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Aldrin	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	b-BHC	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Chlordane (cis)	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Chlordane (trans)	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	d-BHC	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	DDD	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	DDT	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Dieldrin	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Endosulfan I	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Endosulfan II	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Endrin	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Endrin aldehyde	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	g-BHC (Lindane)	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Heptachlor	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Hexachlorobenzene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Methoxychlor	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
TRH Soil C10-C40 NEPM draft	C10 - C14	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0
	C15 - C28	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0
	C29-C36	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0
	>C10-C16	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0
	>C16-C34	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0
	>C34-C40	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0
	F2 (>C10-C16 less Naphthal	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0
vTRH & BTEXN in Soil NEPM	Benzene	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
	Ethylbenzene	mg/kg	1	<1.0	<1.0	0	<1.0	<1.0	0
	Naphthalene	mg/kg	1	<1.0	<1.0	0	<1.0	<1.0	0
	Toluene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	C6 - C9	mg/kg	25	<25.0	<25.0	0	<25.0	<25.0	0
	Xylene (m & p)	mg/kg	2	<2.0	<2.0	0	<2.0	<2.0	0
	Xylene (o)	mg/kg	1	<1.0	<1.0	0	<1.0	<1.0	0
	C6-C10	mg/kg	25	<25.0	<25.0	0	<25.0	<25.0	0
	F1 (C6-C10 less BTEX)	mg/kg	25	<25.0	<25.0	0	<25.0	<25.0	0

*RPDs have only been considered where a concentration is greater than 0 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 100 (0-5 x EQL); 75 (5-10 x EQL); 30 (> 10 x EQL)

***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

Table 5: UCL Calculations - B(a)P

General UCL Statistics for Data Sets with Non-Detects

User Selected Options

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

BaP

General Statistics

Number of Valid Data	8	Number of Detected Data	4
Number of Distinct Detected Data	4	Number of Non-Detect Data	4
		Percent Non-Detects	50.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.05	Minimum Detected	-2.996
Maximum Detected	0.91	Maximum Detected	-0.0943
Mean of Detected	0.448	Mean of Detected	-1.476
SD of Detected	0.447	SD of Detected	1.498
Minimum Non-Detect	0.05	Minimum Non-Detect	-2.996
Maximum Non-Detect	0.05	Maximum Non-Detect	-2.996

Warning: There are only 4 Distinct Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.827	Shapiro Wilk Test Statistic	0.834
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.236	Mean	-2.582
SD	0.369	SD	1.537
95% DL/2 (t) UCL	0.484	95% H-Stat (DL/2) UCL	4.095

Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.0166	Mean in Log Scale	-3.747
SD	0.566	SD in Log Scale	2.77
95% MLE (t) UCL	0.396	Mean in Original Scale	0.226
95% MLE (Tiku) UCL	0.485	SD in Original Scale	0.376
		95% t UCL	0.478
		95% Percentile Bootstrap UCL	0.442
		95% BCA Bootstrap UCL	0.509

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only
k star (bias corrected)	0.385	Data appear Normal at 5% Significance Level
Theta Star	1.162	
nu star	3.08	

A-D Test			
Statistic	0.518	Nonparametric Statistics	
5% A-D Critical Value	0.668	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.668	Mean	0.249
5% K-S Critical Value	0.404	SD	0.338
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.138
		95% KM (t) UCL	0.51
Assuming Gamma Distribution		95% KM (z) UCL	0.476
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.484
Minimum	0.05	95% KM (bootstrap t) UCL	0.412
Maximum	1.006	95% KM (BCA) UCL	0.79
Mean	0.448	95% KM (Percentile Bootstrap) UCL	0.77
Median	0.355	95% KM (Chebyshev) UCL	0.85
SD	0.398	97.5% KM (Chebyshev) UCL	1.111
k star	0.747	99% KM (Chebyshev) UCL	1.622
Theta star	0.599		
Nu star	11.95	**Potential UCLs to Use**	
AppChi2	5.197	**95% KM (t) UCL**	0.51
95% Gamma Approximate UCL	1.029	**95% KM (Percentile Bootstrap) UCL**	0.77
95% Adjusted Gamma UCL	N/A	**Mean =**	**0.64**

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

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Table 6: UCL Calculations (Lead)

General UCL Statistics for Full Data Sets

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

C0

General Statistics			
Number of Valid Observations	20	Number of Distinct Observations	9
Raw Statistics		**Log-transformed Statistics**	
Minimum	1	Minimum of Log Data	0
Maximum	430	Maximum of Log Data	6.064
Mean	49.9	Mean of log Data	1.685
Median	3	SD of log Data	2.051
SD	124.2		
Coefficient of Variation	2.489		
Skewness	2.831		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.437	Shapiro Wilk Test Statistic	0.799
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	97.92	95% H-UCL	349.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	118
95% Adjusted-CLT UCL (Chen-1995)	114.4	97.5% Chebyshev (MVUE) UCL	154.3
95% Modified-t UCL (Johnson-1978)	100.8	99% Chebyshev (MVUE) UCL	225.7
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.296	Data do not follow a Discernable Distribution (0.05)	
Theta Star	168.9		
MLE of Mean	49.9		
MLE of Standard Deviation	91.79		
nu star	11.82		
Approximate Chi Square Value (.05)	5.109	**Nonparametric Statistics**	
Adjusted Level of Significance	0.038	95% CLT UCL	95.58
Adjusted Chi Square Value	4.764	95% Jackknife UCL	97.92
		95% Standard Bootstrap UCL	96.65
Anderson-Darling Test Statistic	2.437	95% Bootstrap-t UCL	433.3
Anderson-Darling 5% Critical Value	0.843	95% Hall's Bootstrap UCL	351.1
Kolmogorov-Smirnov Test Statistic	0.268	95% Percentile Bootstrap UCL	94.15
Kolmogorov-Smirnov 5% Critical Value	0.21	95% BCA Bootstrap UCL	109.1
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	170.9
		97.5% Chebyshev(Mean, Sd) UCL	223.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	326.2
95% Approximate Gamma UCL	115.4		
95% Adjusted Gamma UCL	123.8		
Potential UCL to Use		**Use 97.5% Chebyshev (Mean, Sd) UCL**	**223.3**

Appendix G – Laboratory Certificates

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

SAMPLE RECEIPT ADVICE

Client:

WSP Environmental Pty Ltd
Level 1, 41 McLaren St
North Sydney NSW 2060

ph: 8925 6700
Fax: 8925 6799

Attention: Stephen Barnett, Aaron Young

Sample log in details:

Your reference:	**40387.01, Herbert St, St Leonards**
Envirolab Reference:	**93743**
Date received:	11/07/13
Date results expected to be reported:	**18/07/13**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	20 soils, 1 water
Turnaround time requested:	Standard
Temperature on receipt	6
Cooling Method:	Ice
Sampling Date Provided:	YES

Comments:

Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples.

Contact details:

Please direct any queries to Aileen Hie or Jacinta Hurst
ph: 02 9910 6200 fax: 02 9910 6201
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

CHAIN OF CUSTODY - Client

ENVIROLAB SERVICES

Client:	WSP Environmental Pty Ltd	**Client Project Name and Number:**	**Envirolab Services**
Project Mgr:	Stephen Barnett (stephen.barnett@wspgroup.com)	40387.01 Herbert Street, St Leonards	12 Ashley St, Chatswood, NSW, 2067
Sampler:	Aaron Young	**PO No.:** 40387.01	
Address:	Lev 1, 41 McLaren St North Sydney	**Envirolab Services Quote No. :**	**Phone:** 02 9910 6200
		Date results required:	**Fax:** 02 9910 6201
Email:	aaron.young@wspgroup.com	**Or choose:** standard	**E-mail:** ahie@envirolabservices.com.au
Phone:	89256700, mobile: 0448 977 940 **Fax:** 89070999	*Note: Inform lab in advance if urgent turnaround is required - surcharge applies*	**Contact:** Aileen Hie

Sample information				Tests Required														Comments
Envirolab Sample ID	Client Sample ID	Date sampled	Type of sample	TPH	BTEX	PAHs	8 Metals	VOCs	OCPs	Asbestos	Hold	TPH C6-C9	Phenols					Provide as much information about the sample as you can
1	BH1 _ 0.9m	10/7/13	Soil	X	X	X			X	X								
2	BH2 _ 1.0m	9/7/13		X	X		X											
3	BH3 _ 2.0m	9/7/13		X	X		X											
4	BH4 _ 0.15m	10/7/13		X	X		X	X					X					
5	BH5 _ 0.2m	11/7/13		X	X		X	X					X					
6	BH6 _ 0.18m	10/7/13		X	X	X			X	X								
7	BH7 _ 0.10m	10/7/13		X	X	X			X	X								
8	DH8 _ 0.2m	11/7/13		X	X		X	X	-	-			X					
9	BH9 _ 1.1m	9/7/13		X	X		X											
10	BH10 _ 0.8m	9/7/13		X	X		X											
11	BH11 _ 0.15m	11/7/13		X	X	X			X	X								
12	BH12 _ 0.15m	11/7/13		X	X	X			X	X								
13	BH13 _ 0.2m	10/7/13		X	X	X			X	X								
14	BH14 _ 0.2m	10/7/13		X	X	X			X	X								
15	BH15 _ 0.2m	10/7/13		X	X	X			X	X								

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

Job No: 93743

Date Received: 11/7/13
Time Received: 15:45
Received by: PT
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Relinquished by (company):	WSP	**Received by (company):**	Samples Received: Cool or Ambient (circle one)
Print Name:	Aaron young	**Print Name:** Prabath	Temperature Recieved at: (if applicable)
Date & Time:	11/7/13	**Date & Time:** 11/7/13 15:45	Transported by: Hand delivered / courier
Signature:		**Signature:** PT	Page No: 1 of 2

CHAIN OF CUSTODY - Client

ENVIROLAB SERVICES

Client:	WSP Environmental Pty Ltd
Project Mgr:	Stephen Barnett (stephen.barnett@wspgroup.com)
Sampler:	Aaron Young
Address:	Lev 1, 41 McLaren St North Sydney
Email:	aaron.young@wspgroup.com
Phone:	89256700, mobile: 0448 977 940 Fax: 89070999

Client Project Name and Number:	40387.01 Herbert Street, St Leonards
PO No.:	40387.01
Envirolab Services Quote No. :	
Date results required:	
Or choose	standard

Note: Inform lab in advance if urgent turnaround is required - surcharge applies

Envirolab Services
12 Ashley St, Chatswood, NSW, 2067
Phone: 02 9910 6200
Fax: 02 9910 6201
E-mail: ahie@envirolabservices.com.au
Contact: Aileen Hie

Sample Information | **Tests Required** | **Comments**

Envirolab Sample ID	Client Sample ID	Date sampled	Type of sample	TPH C6-C36	BTEX	PAHs	8 Metals	VOCs	OCPs	Asbestos	Hold	TPH C6-C9	Phenols						Provide as much information about the sample as you can
16	BH17_0.2m	10/7/13	Soil	X	X		X		X	X									
17	TS	"	↓		X														
18	TB				X							X							
19	Rinsate		Water	X	X	X	X	X	X										
20	DUP1		Soil	X	X		X		X	X									
21	TRIP1		Soil	X	X		X		X	X									

Relinquished by (company):	WSP	**Received by (company):**	ELS
Print Name:	Aaron young	**Print Name:**	Prathibha
Date & Time:	11/7/13	**Date & Time:**	11/7/13 15:45
Signature:		**Signature:**	PT

Samples Received: Cool or Ambient (circle one)
Temperature Recieved at: (if applicable)
Transported by: Hand delivered / courier

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 93743

Client:
WSP Environmental Pty Ltd
Level 1, 41 McLaren St
North Sydney
NSW 2060

Attention: Stephen Barnett, Aaron Young

Sample log in details:

Your Reference:	**40387.01, Herbert St, St Leonards**		
No. of samples:	20 soils, 1 water		
Date samples received / completed instructions received	11/07/13	/	11/07/13

TRH_S_NEPM in soil # Percent recovery is not possible to report as the high concentration of analytes in the sample/s have caused interference.

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:	18/07/13	/	18/07/13
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

VOCs in soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	93743-4 BH4 0.15m 10/07/2013 Soil	93743-5 BH5 0.2m 11/07/2013 Soil	93743-8 BH8 0.2m 11/07/2013 Soil
Date extracted	-	12/07/2013	12/07/2013	12/07/2013
Date analysed	-	13/07/2013	13/07/2013	13/07/2013
Dichlorodifluoromethane	mg/kg	<1	<1	<1
Chloromethane	mg/kg	<1	<1	<1
Vinyl Chloride	mg/kg	<1	<1	<1
Bromomethane	mg/kg	<1	<1	<1
Chloroethane	mg/kg	<1	<1	<1
Trichlorofluoromethane	mg/kg	<1	<1	<1
1,1-Dichloroethene	mg/kg	<1	<1	<1
trans-1,2-dichloroethene	mg/kg	<1	<1	<1
1,1-dichloroethane	mg/kg	<1	<1	<1
cis-1,2-dichloroethene	mg/kg	<1	<1	<1
bromochloromethane	mg/kg	<1	<1	<1
chloroform	mg/kg	<1	<1	<1
2,2-dichloropropane	mg/kg	<1	<1	<1
1,2-dichloroethane	mg/kg	<1	<1	<1
1,1,1-trichloroethane	mg/kg	<1	<1	<1
1,1-dichloropropene	mg/kg	<1	<1	<1
Cyclohexane	mg/kg	<1	<1	<1
carbon tetrachloride	mg/kg	<1	<1	<1
Benzene	mg/kg	<0.2	<0.2	<0.2
dibromomethane	mg/kg	<1	<1	<1
1,2-dichloropropane	mg/kg	<1	<1	<1
trichloroethene	mg/kg	<1	<1	<1
bromodichloromethane	mg/kg	<1	<1	<1
trans-1,3-dichloropropene	mg/kg	<1	<1	<1
cis-1,3-dichloropropene	mg/kg	<1	<1	<1
1,1,2-trichloroethane	mg/kg	<1	<1	<1
Toluene	mg/kg	<0.5	<0.5	<0.5
1,3-dichloropropane	mg/kg	<1	<1	<1
dibromochloromethane	mg/kg	<1	<1	<1
1,2-dibromoethane	mg/kg	<1	<1	<1
tetrachloroethene	mg/kg	<1	<1	<1
1,1,1,2-tetrachloroethane	mg/kg	<1	<1	<1
chlorobenzene	mg/kg	<1	<1	<1
Ethylbenzene	mg/kg	<1	<1	<1
bromoform	mg/kg	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2
styrene	mg/kg	<1	<1	<1
1,1,2,2-tetrachloroethane	mg/kg	<1	<1	<1
o-Xylene	mg/kg	<1	<1	<1

VOCs in soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	93743-4 BH4 0.15m 10/07/2013 Soil	93743-5 BH5 0.2m 11/07/2013 Soil	93743-8 BH8 0.2m 11/07/2013 Soil
1,2,3-trichloropropane	mg/kg	<1	<1	<1
isopropylbenzene	mg/kg	<1	<1	<1
bromobenzene	mg/kg	<1	<1	<1
n-propyl benzene	mg/kg	<1	<1	<1
2-chlorotoluene	mg/kg	<1	<1	<1
4-chlorotoluene	mg/kg	<1	<1	<1
1,3,5-trimethyl benzene	mg/kg	<1	<1	<1
tert-butyl benzene	mg/kg	<1	<1	<1
1,2,4-trimethyl benzene	mg/kg	<1	<1	<1
1,3-dichlorobenzene	mg/kg	<1	<1	<1
sec-butyl benzene	mg/kg	<1	<1	<1
1,4-dichlorobenzene	mg/kg	<1	<1	<1
4-isopropyl toluene	mg/kg	<1	<1	<1
1,2-dichlorobenzene	mg/kg	<1	<1	<1
n-butyl benzene	mg/kg	<1	<1	<1
1,2-dibromo-3-chloropropane	mg/kg	<1	<1	<1
1,2,4-trichlorobenzene	mg/kg	<1	<1	<1
hexachlorobutadiene	mg/kg	<1	<1	<1
1,2,3-trichlorobenzene	mg/kg	<1	<1	<1
Surrogate Dibromofluorometha	%	117	106	109
Surrogate aaa-Trifluorotoluene	%	109	104	115
Surrogate Toluene-d_8	%	98	97	99
Surrogate 4-Bromofluorobenzene	%	85	83	79

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	93743-1	93743-2	93743-3	93743-4	93743-5
Your Reference	----------	BH1	BH2	BH3	BH4	BH5
Depth	----------	0.9m	1.0m	2.0m	0.15m	0.2m
Date Sampled		10/07/2013	09/07/2013	09/07/2013	10/07/2013	11/07/2013
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/07/2013	12/07/2013	12/07/2013	12/07/2013	12/07/2013
Date analysed	-	13/07/2013	13/07/2013	13/07/2013	13/07/2013	13/07/2013
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	3	<1
Surrogate aaa-Trifluorotoluene	%	110	119	113	109	104

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	93743-6	93743-7	93743-8	93743-9	93743-10
Your Reference	----------	BH6	BH7	BH8	BH9	BH10
Depth	----------	0.18m	0.10m	0.2m	1.1m	0.8m
Date Sampled		10/07/2013	10/07/2013	11/07/2013	09/07/2013	09/07/2013
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/07/2013	12/07/2013	12/07/2013	12/07/2013	12/07/2013
Date analysed	-	13/07/2013	13/07/2013	13/07/2013	13/07/2013	13/07/2013
TRHC$_6$ - C$_9$	mg/kg	<25	<25	<25	<25	<25
TRHC$_6$ - C$_{10}$	mg/kg	<25	<25	<25	35	<25
vTPHC$_6$ - C$_{10}$ less BTEX (F1)	mg/kg	<25	<25	<25	35	<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	%	110	108	114	115	108

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	93743-11	93743-12	93743-13	93743-14	93743-15
Your Reference	----------	BH11	BH12	BH13	BH14	BH15
Depth	----------	0.15m	0.15m	0.2m	0.2m	0.2m
Date Sampled		11/07/2013	11/07/2013	10/07/2013	10/07/2013	10/07/2013
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/07/2013	12/07/2013	12/07/2013	12/07/2013	12/07/2013
Date analysed	-	13/07/2013	13/07/2013	13/07/2013	13/07/2013	13/07/2013
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	%	109	108	108	114	103

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	93743-16	93743-17	93743-18	93743-20	93743-21
Your Reference	----------	BH17	TS	TB	DUP1	TRIP1
Depth	----------	0.2m	-	-	-	-
Date Sampled		10/07/2013	10/07/2013	10/07/2013	10/07/2013	10/07/2013
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/07/2013	12/07/2013	12/07/2013	12/07/2013	12/07/2013
Date analysed	-	13/07/2013	13/07/2013	13/07/2013	13/07/2013	13/07/2013
TRHC$_6$ - C$_9$	mg/kg	<25	[NA]	<25	<25	<25
TRHC$_6$ - C$_{10}$	mg/kg	<25	[NA]	<25	<25	<25
vTPHC$_6$ - C$_{10}$ less BTEX (F1)	mg/kg	<25	[NA]	<25	<25	<25
Benzene	mg/kg	<0.2	99%	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	100%	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	99%	<1	<1	<1
m+p-xylene	mg/kg	<2	99%	<2	<2	<2
o-Xylene	mg/kg	<1	99%	<1	<1	<1
naphthalene	mg/kg	<1	[NA]	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	100	102	109	98	99

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	93743-1	93743-2	93743-3	93743-4	93743-5
Your Reference	----------	BH1	BH2	BH3	BH4	BH5
Depth	----------	0.9m	1.0m	2.0m	0.15m	0.2m
Date Sampled		10/07/2013	09/07/2013	09/07/2013	10/07/2013	11/07/2013
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/07/2013	12/07/2013	12/07/2013	12/07/2013	12/07/2013
Date analysed	-	15/07/2013	15/07/2013	15/07/2013	15/07/2013	15/07/2013
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	380	780
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	180	410
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50	<50	66	75
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50	<50	63	75
TRH>C$_{16}$-C$_{34}$	mg/kg	120	130	<100	500	1,100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100	<100	190
Surrogate o-Terphenyl	%	115	#	108	#	#

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	93743-6	93743-7	93743-8	93743-9	93743-10
Your Reference	----------	BH6	BH7	BH8	BH9	BH10
Depth	----------	0.18m	0.10m	0.2m	1.1m	0.8m
Date Sampled		10/07/2013	10/07/2013	11/07/2013	09/07/2013	09/07/2013
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/07/2013	12/07/2013	12/07/2013	12/07/2013	12/07/2013
Date analysed	-	15/07/2013	15/07/2013	15/07/2013	15/07/2013	15/07/2013
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	160	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	130	180
TRHC$_{29}$ - C$_{36}$	mg/kg	110	<100	<100	<100	<100
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50	<50	160	59
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50	<50	160	59
TRH>C$_{16}$-C$_{34}$	mg/kg	180	<100	<100	130	220
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	117	101	100	#	#

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	93743-11	93743-12	93743-13	93743-14	93743-15
Your Reference	----------	BH11	BH12	BH13	BH14	BH15
Depth	----------	0.15m	0.15m	0.2m	0.2m	0.2m
Date Sampled		11/07/2013	11/07/2013	10/07/2013	10/07/2013	10/07/2013
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/07/2013	12/07/2013	12/07/2013	12/07/2013	12/07/2013
Date analysed	-	15/07/2013	15/07/2013	15/07/2013	15/07/2013	15/07/2013
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	%	101	102	112	110	111

svTRH (C10-C40) in Soil				
Our Reference:	UNITS	93743-16	93743-20	93743-21
Your Reference	----------	BH17	DUP1	TRIP1
Depth	----------	0.2m	-	-
Date Sampled		10/07/2013	10/07/2013	10/07/2013
Type of sample		Soil	Soil	Soil
Date extracted	-	12/07/2013	12/07/2013	12/07/2013
Date analysed	-	15/07/2013	15/07/2013	15/07/2013
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100
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	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100
Surrogate o-Terphenyl	%	98	97	99

PAHs in Soil						
Our Reference:	UNITS	93743-1	93743-6	93743-7	93743-11	93743-12
Your Reference	----------	BH1	BH6	BH7	BH11	BH12
Depth	----------	0.9m	0.18m	0.10m	0.15m	0.15m
Date Sampled		10/07/2013	10/07/2013	10/07/2013	11/07/2013	11/07/2013
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/07/2013	12/07/2013	12/07/2013	12/07/2013	12/07/2013
Date analysed	-	12/07/2013	12/07/2013	12/07/2013	12/07/2013	12/07/2013
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.4	0.2	<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	1.3	0.4	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.2	0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	1.0	0.9	0.1	<0.1	<0.1
Pyrene	mg/kg	1.8	1.1	0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.9	0.7	<0.1	<0.1	<0.1
Chrysene	mg/kg	1.0	0.7	<0.1	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	1.1	1.0	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.91	0.75	0.08	<0.05	0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	0.7	0.6	<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	0.7	0.6	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ NEPM B1	mg/kg	1	1	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	10	7.1	0.34	NIL (+)VE	0.05
Surrogate p-Terphenyl-d14	%	99	97	99	103	101

PAHs in Soil				
Our Reference:	UNITS	93743-13	93743-14	93743-15
Your Reference	----------	BH13	BH14	BH15
Depth	----------	0.2m	0.2m	0.2m
Date Sampled		10/07/2013	10/07/2013	10/07/2013
Type of sample		Soil	Soil	Soil
Date extracted	-	12/07/2013	12/07/2013	12/07/2013
Date analysed	-	12/07/2013	12/07/2013	12/07/2013
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	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05
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 +ve PAH's	mg/kg	NIL (+)VE	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	103	99	101

Organochlorine Pesticides in soil						
Our Reference:	UNITS	93743-1	93743-6	93743-7	93743-11	93743-12
Your Reference	----------	BH1	BH6	BH7	BH11	BH12
Depth	----------	0.9m	0.18m	0.10m	0.15m	0.15m
Date Sampled		10/07/2013	10/07/2013	10/07/2013	11/07/2013	11/07/2013
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/07/2013	12/07/2013	12/07/2013	12/07/2013	12/07/2013
Date analysed	-	13/07/2013	13/07/2013	13/07/2013	13/07/2013	13/07/2013
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	%	105	105	98	97	97

Organochlorine Pesticides in soil						
Our Reference:	UNITS	93743-13	93743-14	93743-15	93743-16	93743-20
Your Reference	----------	BH13	BH14	BH15	BH17	DUP1
Depth	----------	0.2m	0.2m	0.2m	0.2m	-
Date Sampled		10/07/2013	10/07/2013	10/07/2013	10/07/2013	10/07/2013
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/07/2013	12/07/2013	12/07/2013	12/07/2013	12/07/2013
Date analysed	-	13/07/2013	13/07/2013	13/07/2013	13/07/2013	13/07/2013
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	%	99	100	98	100	102

Organochlorine Pesticides in soil		
Our Reference:	UNITS	93743-21
Your Reference	----------	TRIP1
Depth	----------	-
Date Sampled		10/07/2013
Type of sample		Soil
Date extracted	-	12/07/2013
Date analysed	-	13/07/2013
HCB	mg/kg	<0.1
alpha-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Surrogate TCMX	%	101

Total Phenolics in Soil				
Our Reference:	UNITS	93743-4	93743-5	93743-8
Your Reference	----------	BH4	BH5	BH8
Depth	----------	0.15m	0.2m	0.2m
Date Sampled		10/07/2013	11/07/2013	11/07/2013
Type of sample		Soil	Soil	Soil
Date extracted	-	12/07/2013	12/07/2013	12/07/2013
Date analysed	-	12/07/2013	12/07/2013	12/07/2013
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5

Acid Extractable metals in soil						
Our Reference:	UNITS	93743-2	93743-3	93743-4	93743-5	93743-8
Your Reference	----------	BH2	BH3	BH4	BH5	BH8
Depth	----------	1.0m	2.0m	0.15m	0.2m	0.2m
Date Sampled		09/07/2013	09/07/2013	10/07/2013	11/07/2013	11/07/2013
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	12/07/2013	12/07/2013	12/07/2013	12/07/2013	12/07/2013
Date analysed	-	15/07/2013	15/07/2013	15/07/2013	15/07/2013	15/07/2013
Arsenic	mg/kg	12	7	<4	8	9
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	10	13	19	22	10
Copper	mg/kg	36	24	17	37	64
Lead	mg/kg	58	21	390	36	430
Mercury	mg/kg	0.3	0.2	1.0	0.2	0.2
Nickel	mg/kg	25	20	24	41	11
Zinc	mg/kg	100	65	100	100	130

Acid Extractable metals in soil						
Our Reference:	UNITS	93743-9	93743-10	93743-16	93743-20	93743-21
Your Reference	----------	BH9	BH10	BH17	DUP1	TRIP1
Depth	----------	1.1m	0.8m	0.2m	-	-
Date Sampled		09/07/2013	09/07/2013	10/07/2013	10/07/2013	10/07/2013
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	12/07/2013	12/07/2013	12/07/2013	12/07/2013	12/07/2013
Date analysed	-	15/07/2013	15/07/2013	15/07/2013	15/07/2013	15/07/2013
Arsenic	mg/kg	9	10	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	7	7	3	3	3
Copper	mg/kg	35	45	10	12	13
Lead	mg/kg	18	18	5	6	6
Mercury	mg/kg	0.2	0.2	0.2	0.1	<0.1
Nickel	mg/kg	27	26	9	8	9
Zinc	mg/kg	85	130	18	26	21

Moisture						
Our Reference:	UNITS	93743-1	93743-2	93743-3	93743-4	93743-5
Your Reference	----------	BH1	BH2	BH3	BH4	BH5
Depth	----------	0.9m	1.0m	2.0m	0.15m	0.2m
Date Sampled		10/07/2013	09/07/2013	09/07/2013	10/07/2013	11/07/2013
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	12/07/13	12/07/13	12/07/13	12/07/13	12/07/13
Date analysed	-	15/07/13	15/07/13	15/07/13	15/07/13	15/07/13
Moisture	%	7.0	7.4	6.9	9.9	11

Moisture						
Our Reference:	UNITS	93743-6	93743-7	93743-8	93743-9	93743-10
Your Reference	----------	BH6	BH7	BH8	BH9	BH10
Depth	----------	0.18m	0.10m	0.2m	1.1m	0.8m
Date Sampled		10/07/2013	10/07/2013	11/07/2013	09/07/2013	09/07/2013
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	12/07/13	12/07/13	12/07/13	12/07/13	12/07/13
Date analysed	-	15/07/13	15/07/13	15/07/13	15/07/13	15/07/13
Moisture	%	13	17	14	6.7	6.6

Moisture						
Our Reference:	UNITS	93743-11	93743-12	93743-13	93743-14	93743-15
Your Reference	----------	BH11	BH12	BH13	BH14	BH15
Depth	----------	0.15m	0.15m	0.2m	0.2m	0.2m
Date Sampled		11/07/2013	11/07/2013	10/07/2013	10/07/2013	10/07/2013
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	12/07/13	12/07/13	12/07/13	12/07/13	12/07/13
Date analysed	-	15/07/13	15/07/13	15/07/13	15/07/13	15/07/13
Moisture	%	10	16	6.8	8.8	14

Moisture					
Our Reference:	UNITS	93743-16	93743-18	93743-20	93743-21
Your Reference	----------	BH17	TB	DUP1	TRIP1
Depth	----------	0.2m	-	-	-
Date Sampled		10/07/2013	10/07/2013	10/07/2013	10/07/2013
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	12/07/13	12/07/13	12/07/13	12/07/13
Date analysed	-	15/07/13	15/07/13	15/07/13	15/07/13
Moisture	%	32	4.4	32	38

Asbestos ID - soils						
Our Reference:	UNITS	93743-1	93743-6	93743-7	93743-11	93743-12
Your Reference	----------	BH1	BH6	BH7	BH11	BH12
Depth	----------	0.9m	0.18m	0.10m	0.15m	0.15m
Date Sampled		10/07/2013	10/07/2013	10/07/2013	11/07/2013	11/07/2013
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	17/07/2013	17/07/2013	17/07/2013	17/07/2013	17/07/2013
Sample mass tested	g	Approx 45g	Approx 45g	Approx 45g	Approx 45g	Approx 45g
Sample Description	-	Dark grey coarse-grained soil & rocks	Dark grey coarse-grained soil & rocks	Dark grey coarse-grained soil & rocks	Dark grey coarse-grained soil & rocks	Dark grey coarse-grained 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 respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected

Asbestos ID - soils						
Our Reference:	UNITS	93743-13	93743-14	93743-15	93743-16	93743-20
Your Reference	----------	BH13	BH14	BH15	BH17	DUP1
Depth	----------	0.2m	0.2m	0.2m	0.2m	-
Date Sampled		10/07/2013	10/07/2013	10/07/2013	10/07/2013	10/07/2013
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	17/07/2013	17/07/2013	17/07/2013	17/07/2013	17/07/2013
Sample mass tested	g	Approx 45g	Approx 45g	Approx 45g	Approx 45g	Approx 40g
Sample Description	-	Dark grey coarse-grained soil & rocks	Dark grey coarse-grained soil & rocks	Dark grey coarse-grained soil & rocks	Dark grey coarse-grained soil & rocks	Grey powdery ashed soil & debris
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 respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected

Asbestos ID - soils		
Our Reference:	UNITS	93743-21
Your Reference	----------	TRIP1
Depth	----------	-
Date Sampled		10/07/2013
Type of sample		Soil
Date analysed	-	17/07/2013
Sample mass tested	g	Approx 45g
Sample Description	-	Grey powdery ashed soil & debris
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No respirable fibres detected

VOCs in water		
Our Reference:	UNITS	93743-19
Your Reference	----------	RINSATE
Depth	----------	-
Date Sampled		10/07/2013
Type of sample		water
Date extracted	-	12/07/2013
Date analysed	-	12/07/2013
Dichlorodifluoromethane	µg/L	<10
Chloromethane	µg/L	<10
Vinyl Chloride	µg/L	<10
Bromomethane	µg/L	<10
Chloroethane	µg/L	<10
Trichlorofluoromethane	µg/L	<10
1,1-Dichloroethene	µg/L	<1
Trans-1,2-dichloroethene	µg/L	<1
1,1-dichloroethane	µg/L	<1
Cis-1,2-dichloroethene	µg/L	<1
Bromochloromethane	µg/L	<1
Chloroform	µg/L	<1
2,2-dichloropropane	µg/L	<1
1,2-dichloroethane	µg/L	<1
1,1,1-trichloroethane	µg/L	<1
1,1-dichloropropene	µg/L	<1
Cyclohexane	µg/L	<1
Carbon tetrachloride	µg/L	<1
Benzene	µg/L	<1
Dibromomethane	µg/L	<1
1,2-dichloropropane	µg/L	<1
Trichloroethene	µg/L	<1
Bromodichloromethane	µg/L	<1
trans-1,3-dichloropropene	µg/L	<1
cis-1,3-dichloropropene	µg/L	<1
1,1,2-trichloroethane	µg/L	<1
Toluene	µg/L	<1
1,3-dichloropropane	µg/L	<1
Dibromochloromethane	µg/L	<1
1,2-dibromoethane	µg/L	<1
Tetrachloroethene	µg/L	<1
1,1,1,2-tetrachloroethane	µg/L	<1
Chlorobenzene	µg/L	<1
Ethylbenzene	µg/L	<1
Bromoform	µg/L	<1
m+p-xylene	µg/L	<2
Styrene	µg/L	<1
1,1,2,2-tetrachloroethane	µg/L	<1
o-xylene	µg/L	<1
1,2,3-trichloropropane	µg/L	<1

VOCs in water		
Our Reference:	UNITS	93743-19
Your Reference	----------	RINSATE
Depth	----------	-
Date Sampled		10/07/2013
Type of sample		water
Isopropylbenzene	µg/L	<1
Bromobenzene	µg/L	<1
n-propyl benzene	µg/L	<1
2-chlorotoluene	µg/L	<1
4-chlorotoluene	µg/L	<1
1,3,5-trimethyl benzene	µg/L	<1
Tert-butyl benzene	µg/L	<1
1,2,4-trimethyl benzene	µg/L	<1
1,3-dichlorobenzene	µg/L	<1
Sec-butyl benzene	µg/L	<1
1,4-dichlorobenzene	µg/L	<1
4-isopropyl toluene	µg/L	<1
1,2-dichlorobenzene	µg/L	<1
n-butyl benzene	µg/L	<1
1,2-dibromo-3-chloropropane	µg/L	<1
1,2,4-trichlorobenzene	µg/L	<1
Hexachlorobutadiene	µg/L	<1
1,2,3-trichlorobenzene	µg/L	<1
Surrogate Dibromofluoromethane	%	101
Surrogate toluene-d8	%	97
Surrogate 4-BFB	%	96

vTRH(C6-C10)/BTEXN in Water		
Our Reference:	UNITS	93743-19
Your Reference	----------	RINSATE
Depth	----------	-
Date Sampled		10/07/2013
Type of sample		water
Date extracted	-	12/07/2013
Date analysed	-	12/07/2013
$TRHC_6$ - C_9	µg/L	<10
$TRHC_6$ - C_{10}	µg/L	<10
$TRHC_6$ - C_{10} less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	101
Surrogate toluene-d8	%	97
Surrogate 4-BFB	%	96

svTRH (C10-C40) in Water		
Our Reference:	UNITS	93743-19
Your Reference	----------	RINSATE
Depth	----------	-
Date Sampled		10/07/2013
Type of sample		water
Date extracted	-	12/07/2013
Date analysed	-	15/07/2013
TRHC$_{10}$ - C$_{14}$	µg/L	<50
TRHC$_{15}$ - C$_{28}$	µg/L	<100
TRHC$_{29}$ - C$_{36}$	µg/L	<100
TRH>C$_{10}$ - C$_{16}$	µg/L	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	µg/L	<50
TRH>C$_{16}$ - C$_{34}$	µg/L	<100
TRH>C$_{34}$ - C$_{40}$	µg/L	<100
Surrogate o-Terphenyl	%	115

PAHs in Water		
Our Reference:	UNITS	93743-19
Your Reference	----------	RINSATE
Depth	----------	-
Date Sampled		10/07/2013
Type of sample		water
Date extracted	-	12/07/2013
Date analysed	-	13/07/2013
Naphthalene	µg/L	<1
Acenaphthylene	µg/L	<1
Acenaphthene	µg/L	<1
Fluorene	µg/L	<1
Phenanthrene	µg/L	<1
Anthracene	µg/L	<1
Fluoranthene	µg/L	<1
Pyrene	µg/L	<1
Benzo(a)anthracene	µg/L	<1
Chrysene	µg/L	<1
Benzo(b+k)fluoranthene	µg/L	<2
Benzo(a)pyrene	µg/L	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1
Dibenzo(a,h)anthracene	µg/L	<1
Benzo(g,h,i)perylene	µg/L	<1
Benzo(a)pyrene TEQ	µg/L	<5
Total +ve PAH's	µg/L	NIL (+)VE
Surrogate p-Terphenyl-d14	%	97

OCP in water		
Our Reference:	UNITS	93743-19
Your Reference	----------	RINSATE
Depth	----------	-
Date Sampled		10/07/2013
Type of sample		water
Date extracted	-	12/07/2013
Date analysed	-	13/07/2013
HCB	µg/L	<0.2
alpha-BHC	µg/L	<0.2
gamma-BHC	µg/L	<0.2
beta-BHC	µg/L	<0.2
Heptachlor	µg/L	<0.2
delta-BHC	µg/L	<0.2
Aldrin	µg/L	<0.2
Heptachlor Epoxide	µg/L	<0.2
gamma-Chlordane	µg/L	<0.2
alpha-Chlordane	µg/L	<0.2
Endosulfan I	µg/L	<0.2
pp-DDE	µg/L	<0.2
Dieldrin	µg/L	<0.2
Endrin	µg/L	<0.2
pp-DDD	µg/L	<0.2
Endosulfan II	µg/L	<0.2
pp-DDT	µg/L	<0.2
Endrin Aldehyde	µg/L	<0.2
Endosulfan Sulphate	µg/L	<0.2
Methoxychlor	µg/L	<0.2
Surrogate TCMX	%	101

Metals in Water - Dissolved		
Our Reference:	UNITS	93743-19
Your Reference	----------	RINSATE
Depth	----------	-
Date Sampled		10/07/2013
Type of sample		water
Date digested	-	12/07/2013
Date analysed	-	12/07/2013
Arsenic - Dissolved	mg/L	<0.05
Cadmium - Dissolved	mg/L	<0.01
Chromium - Dissolved	mg/L	<0.01
Copper - Dissolved	mg/L	<0.01
Lead - Dissolved	mg/L	<0.03
Mercury - Dissolved	mg/L	<0.0005
Nickel - Dissolved	mg/L	<0.02
Zinc - Dissolved	mg/L	<0.02

Method ID	Methodology Summary
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-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.
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.
Inorg-030	Total Phenolics - determined colorimetrically following disitillation, based upon APHA 22nd ED 5530 D.
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.
Org-013	Water samples are analysed directly by purge and trap GC-MS.

QUALITY CONTROL VOCs in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			12/07/2013	93743-4	12/07/2013 || 12/07/2013	LCS-5	12/07/2013
Date analysed	-			13/07/2013	93743-4	13/07/2013 || 13/07/2013	LCS-5	13/07/2013
Dichlorodifluoromethane	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
Chloromethane	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
Vinyl Chloride	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
Bromomethane	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
Chloroethane	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
Trichlorofluoromethane	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
1,1-Dichloroethene	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
trans-1,2-dichloroethene	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
1,1-dichloroethane	mg/kg	1	Org-014	<1	93743-4	<1 || <1	LCS-5	112%
cis-1,2-dichloroethene	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
bromochloromethane	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
chloroform	mg/kg	1	Org-014	<1	93743-4	<1 || <1	LCS-5	121%
2,2-dichloropropane	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
1,2-dichloroethane	mg/kg	1	Org-014	<1	93743-4	<1 || <1	LCS-5	125%
1,1,1-trichloroethane	mg/kg	1	Org-014	<1	93743-4	<1 || <1	LCS-5	133%
1,1-dichloropropene	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
Cyclohexane	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
carbon tetrachloride	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
Benzene	mg/kg	0.2	Org-014	<0.2	93743-4	<0.2 || <0.2	[NR]	[NR]
dibromomethane	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
1,2-dichloropropane	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
trichloroethene	mg/kg	1	Org-014	<1	93743-4	<1 || <1	LCS-5	113%
bromodichloromethane	mg/kg	1	Org-014	<1	93743-4	<1 || <1	LCS-5	112%
trans-1,3-dichloropropene	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
cis-1,3-dichloropropene	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
1,1,2-trichloroethane	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
Toluene	mg/kg	0.5	Org-014	<0.5	93743-4	<0.5 || <0.5	[NR]	[NR]
1,3-dichloropropane	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
dibromochloromethane	mg/kg	1	Org-014	<1	93743-4	<1 || <1	LCS-5	115%
1,2-dibromoethane	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
tetrachloroethene	mg/kg	1	Org-014	<1	93743-4	<1 || <1	LCS-5	114%
1,1,1,2-tetrachloroethane	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
chlorobenzene	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
Ethylbenzene	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
bromoform	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
m+p-xylene	mg/kg	2	Org-014	<2	93743-4	<2 || <2	[NR]	[NR]
styrene	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
1,1,2,2-tetrachloroethane	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
o-Xylene	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
1,2,3-trichloropropane	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]

QUALITY CONTROL VOCs in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
isopropylbenzene	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
bromobenzene	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
n-propyl benzene	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
2-chlorotoluene	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
4-chlorotoluene	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
1,3,5-trimethyl benzene	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
tert-butyl benzene	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
1,2,4-trimethyl benzene	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
1,3-dichlorobenzene	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
sec-butyl benzene	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
1,4-dichlorobenzene	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
4-isopropyl toluene	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
1,2-dichlorobenzene	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
n-butyl benzene	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
1,2-dibromo-3-chloropropane	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
1,2,4-trichlorobenzene	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
hexachlorobutadiene	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
1,2,3-trichlorobenzene	mg/kg	1	Org-014	<1	93743-4	<1 || <1	[NR]	[NR]
Surrogate Dibromofluorometha	%		Org-014	109	93743-4	117 || 111 || RPD: 5	LCS-5	107%
Surrogate aaa-Trifluorotoluene	%		Org-014	103	93743-4	109 || 109 || RPD: 0	LCS-5	110%
Surrogate Toluene-d_8	%		Org-014	96	93743-4	98 || 97 || RPD: 1	LCS-5	101%
Surrogate 4-Bromofluorobenzene	%		Org-014	83	93743-4	85 || 79 || RPD: 7	LCS-5	74%

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	-			12/07/2013	93743-1	12/07/2013 || 12/07/2013	LCS-5	12/07/2013
Date analysed	-			13/07/2013	93743-1	13/07/2013 || 13/07/2013	LCS-5	13/07/2013
TRHC$_6$ - C$_9$	mg/kg	25	Org-016	<25	93743-1	<25 || <25	LCS-5	117%
TRHC$_6$ - C$_{10}$	mg/kg	25	Org-016	<25	93743-1	<25 || <25	LCS-5	117%
Benzene	mg/kg	0.2	Org-016	<0.2	93743-1	<0.2 || <0.2	LCS-5	102%
Toluene	mg/kg	0.5	Org-016	<0.5	93743-1	<0.5 || <0.5	LCS-5	111%
Ethylbenzene	mg/kg	1	Org-016	<1	93743-1	<1 || <1	LCS-5	122%
m+p-xylene	mg/kg	2	Org-016	<2	93743-1	<2 || <2	LCS-5	125%
o-Xylene	mg/kg	1	Org-016	<1	93743-1	<1 || <1	LCS-5	134%
naphthalene	mg/kg	1	Org-014	<1	93743-1	<1 || <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	103	93743-1	110 || 112 || RPD: 2	LCS-5	112%
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	-			12/07/2013	93743-1	12/07/2013 || 12/07/2013	LCS-5	12/07/2013
Date analysed	-			15/07/2013	93743-1	15/07/2013 || 15/07/2013	LCS-5	15/07/2013
TRHC$_{10}$ - C$_{14}$	mg/kg	50	Org-003	<50	93743-1	<50 || <50	LCS-5	94%
TRHC$_{15}$ - C$_{28}$	mg/kg	100	Org-003	<100	93743-1	<100 || <100	LCS-5	114%
TRHC$_{29}$ - C$_{36}$	mg/kg	100	Org-003	<100	93743-1	<100 || <100	LCS-5	100%
TRH>C$_{10}$-C$_{16}$	mg/kg	50	Org-003	<50	93743-1	<50 || <50	LCS-5	94%
TRH>C$_{16}$-C$_{34}$	mg/kg	100	Org-003	<100	93743-1	120 || <100	LCS-5	117%
TRH>C$_{34}$-C$_{40}$	mg/kg	100	Org-003	<100	93743-1	<100 || <100	LCS-5	100%
Surrogate o-Terphenyl	%		Org-003	97	93743-1	115 || 105 || RPD: 9	LCS-5	109%
QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			12/07/2013	93743-1	12/07/2013 || 12/07/2013	LCS-5	12/07/2013
Date analysed	-			12/07/2013	93743-1	12/07/2013 || 12/07/2013	LCS-5	12/07/2013
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	93743-1	0.1 || <0.1	LCS-5	89%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	93743-1	0.4 || 0.3 || RPD: 29	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	93743-1	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	93743-1	0.1 || <0.1	LCS-5	90%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	93743-1	1.3 || 0.5 || RPD: 89	LCS-5	84%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	93743-1	0.2 || 0.1 || RPD: 67	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	93743-1	1.0 || 0.5 || RPD: 67	LCS-5	77%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	93743-1	1.8 || 0.9 || RPD: 67	LCS-5	77%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	93743-1	0.9 || 0.5 || RPD: 57	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	93743-1	1.0 || 0.5 || RPD: 67	LCS-5	83%
Benzo(b+k)fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	93743-1	1.1 || 0.7 || RPD: 44	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	93743-1	0.91 || 0.58 || RPD: 44	LCS-5	97%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	93743-1	0.7 || 0.5 || RPD: 33	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	93743-1	0.1 || 0.1 || RPD: 0	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	93743-1	0.7 || 0.5 || RPD: 33	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	82	93743-1	99 || 98 || RPD: 1	LCS-5	89%
QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			12/07/2013	93743-1	12/07/2013 || 12/07/2013	LCS-5	12/07/2013
Date analysed	-			13/07/2013	93743-1	13/07/2013 || 13/07/2013	LCS-5	13/07/2013
HCB	mg/kg	0.1	Org-005	<0.1	93743-1	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	93743-1	<0.1 || <0.1	LCS-5	108%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	93743-1	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	93743-1	<0.1 || <0.1	LCS-5	104%
Heptachlor	mg/kg	0.1	Org-005	<0.1	93743-1	<0.1 || <0.1	LCS-5	103%
delta-BHC	mg/kg	0.1	Org-005	<0.1	93743-1	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	93743-1	<0.1 || <0.1	LCS-5	109%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	93743-1	<0.1 || <0.1	LCS-5	109%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	93743-1	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	93743-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	93743-1	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	93743-1	<0.1 || <0.1	LCS-5	108%
Dieldrin	mg/kg	0.1	Org-005	<0.1	93743-1	<0.1 || <0.1	LCS-5	110%
Endrin	mg/kg	0.1	Org-005	<0.1	93743-1	<0.1 || <0.1	LCS-5	97%
pp-DDD	mg/kg	0.1	Org-005	<0.1	93743-1	<0.1 || <0.1	LCS-5	96%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	93743-1	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	93743-1	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	93743-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	93743-1	<0.1 || <0.1	LCS-5	101%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	93743-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCMX	%		Org-005	94	93743-1	105 || 104 || RPD: 1	LCS-5	99%

QUALITY CONTROL Total Phenolics in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			12/07/2013	[NT]	[NT]	LCS-1	12/07/2013
Date analysed	-			12/07/2013	[NT]	[NT]	LCS-1	12/07/2013
Total Phenolics (as Phenol)	mg/kg	5	Inorg-030	<5	[NT]	[NT]	LCS-1	88%
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	-			15/07/2013	93743-4	12/07/2013 || 12/07/2013	LCS-1	12/07/2013
Date analysed	-			15/07/2013	93743-4	15/07/2013 || 15/07/2013	LCS-1	15/07/2013
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	93743-4	<4 || 4	LCS-1	98%
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	93743-4	<0.4 || <0.4	LCS-1	102%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	93743-4	19 || 14 || RPD: 30	LCS-1	102%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	93743-4	17 || 20 || RPD: 16	LCS-1	101%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	93743-4	390 || 410 || RPD: 5	LCS-1	99%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	93743-4	1.0 || 1.6 || RPD: 46	LCS-1	110%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	93743-4	24 || 19 || RPD: 23	LCS-1	102%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	93743-4	100 || 150 || RPD: 40	LCS-1	99%

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

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

QUALITY CONTROL VOCs in water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			12/07/2013	[NT]	[NT]	LCS-W1	12/07/2013
Date analysed	-			12/07/2013	[NT]	[NT]	LCS-W1	12/07/2013
Dichlorodifluoromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Chloromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Vinyl Chloride	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Bromomethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Chloroethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Trichlorofluoromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
1,1-Dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Trans-1,2-dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,1-dichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-W1	113%
Cis-1,2-dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Bromochloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Chloroform	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-W1	112%
2,2-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2-dichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-W1	110%
1,1,1-trichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-W1	113%
1,1-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Cyclohexane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Carbon tetrachloride	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Dibromomethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Trichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-W1	127%
Bromodichloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-W1	111%
trans-1,3-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
cis-1,3-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,1,2-trichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Toluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,3-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Dibromochloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-W1	111%
1,2-dibromoethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Tetrachloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-W1	112%
1,1,1,2-tetrachloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]

QUALITY CONTROL VOCs in water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Chlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Ethylbenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Bromoform	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
m+p-xylene	µg/L	2	Org-013	<2	[NT]	[NT]	[NR]	[NR]
Styrene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,1,2,2-tetrachloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
o-xylene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2,3-trichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Isopropylbenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Bromobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
n-propyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
2-chlorotoluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
4-chlorotoluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,3,5-trimethyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Tert-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2,4-trimethyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,3-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Sec-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,4-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
4-isopropyl toluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
n-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2-dibromo-3-chloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2,4-trichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Hexachlorobutadiene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2,3-trichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Surrogate Dibromofluoromethane	%		Org-013	103	[NT]	[NT]	LCS-W1	102%
Surrogate toluene-d8	%		Org-013	100	[NT]	[NT]	LCS-W1	104%
Surrogate 4-BFB	%		Org-013	99	[NT]	[NT]	LCS-W1	106%

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			12/07/2013	[NT]	[NT]	LCS-W1	12/07/2013
Date analysed	-			12/07/2013	[NT]	[NT]	LCS-W1	12/07/2013
TRH C_6 - C_9	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W1	100%
TRH C_6 - C_{10}	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W1	100%
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	96%
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	99%
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	103%
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	LCS-W1	100%
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	102%
Naphthalene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Surrogate Dibromofluoromethane	%		Org-016	103	[NT]	[NT]	LCS-W1	99%
Surrogate toluene-d8	%		Org-016	100	[NT]	[NT]	LCS-W1	97%
Surrogate 4-BFB	%		Org-016	99	[NT]	[NT]	LCS-W1	100%

QUALITY CONTROL svTRH (C10-C40) in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			12/07/2013	[NT]	[NT]	LCS-W1	12/07/2013
Date analysed	-			15/07/2013	[NT]	[NT]	LCS-W1	15/07/2013
TRH C_{10} - C_{14}	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W1	89%
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	109%
TRH>C_{10} - C_{16}	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W1	89%
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	109%
Surrogate o-Terphenyl	%		Org-003	117	[NT]	[NT]	LCS-W1	97%

QUALITY CONTROL PAHs in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			12/07/2013	[NT]	[NT]	LCS-W2	12/07/2013
Date analysed	-			13/07/2013	[NT]	[NT]	LCS-W2	13/07/2013
Naphthalene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W2	95%
Acenaphthylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluorene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W2	110%
Phenanthrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W2	97%

QUALITY CONTROL PAHs in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W2	97%
Pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W2	104%
Benzo(a)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Chrysene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W2	97%
Benzo(b+k)fluoranthene	µg/L	2	Org-012 subset	<2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W2	101%
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	96	[NT]	[NT]	LCS-W2	96%
QUALITY CONTROL OCP in water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			12/07/2013	[NT]	[NT]	LCS-W1	12/07/2013
Date analysed	-			13/07/2013	[NT]	[NT]	LCS-W1	13/07/2013
HCB	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NR]	[NR]
alpha-BHC	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	LCS-W1	113%
gamma-BHC	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NR]	[NR]
beta-BHC	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	LCS-W1	121%
Heptachlor	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	LCS-W1	97%
delta-BHC	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NR]	[NR]
Aldrin	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	LCS-W1	100%
Heptachlor Epoxide	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	LCS-W1	101%
gamma-Chlordane	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NR]	[NR]
alpha-Chlordane	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NR]	[NR]
Endosulfan I	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NR]	[NR]
pp-DDE	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	LCS-W1	94%
Dieldrin	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	LCS-W1	102%
Endrin	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	LCS-W1	94%
pp-DDD	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	LCS-W1	91%
Endosulfan II	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NR]	[NR]
pp-DDT	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NR]	[NR]
Endrin Aldehyde	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NR]	[NR]
Endosulfan Sulphate	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	LCS-W1	105%
Methoxychlor	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NR]	[NR]

QUALITY CONTROL OCP in water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Surrogate TCMX	%		Org-005	107	[NT]	[NT]	LCS-W1	103%
QUALITY CONTROL Metals in Water - Dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			12/07/2013	[NT]	[NT]	LCS-W1	12/07/2013
Date analysed	-			12/07/2013	[NT]	[NT]	LCS-W1	12/07/2013
Arsenic - Dissolved	mg/L	0.05	Metals-020 ICP-AES	<0.05	[NT]	[NT]	LCS-W1	98%
Cadmium - Dissolved	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	LCS-W1	100%
Chromium - Dissolved	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	LCS-W1	102%
Copper - Dissolved	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	LCS-W1	99%
Lead - Dissolved	mg/L	0.03	Metals-020 ICP-AES	<0.03	[NT]	[NT]	LCS-W1	99%
Mercury - Dissolved	mg/L	0.0005	Metals-021 CV-AAS	<0.0005	[NT]	[NT]	LCS-W1	88%
Nickel - Dissolved	mg/L	0.02	Metals-020 ICP-AES	<0.02	[NT]	[NT]	LCS-W1	101%
Zinc - Dissolved	mg/L	0.02	Metals-020 ICP-AES	<0.02	[NT]	[NT]	LCS-W1	102%

QUALITY CONTROL VOCs in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	93743-5	12/07/2013
Date analysed	-	[NT]	[NT]	93743-5	13/07/2013
Dichlorodifluoromethane	mg/kg	[NT]	[NT]	[NR]	[NR]
Chloromethane	mg/kg	[NT]	[NT]	[NR]	[NR]
Vinyl Chloride	mg/kg	[NT]	[NT]	[NR]	[NR]
Bromomethane	mg/kg	[NT]	[NT]	[NR]	[NR]
Chloroethane	mg/kg	[NT]	[NT]	[NR]	[NR]
Trichlorofluoromethane	mg/kg	[NT]	[NT]	[NR]	[NR]
1,1-Dichloroethene	mg/kg	[NT]	[NT]	[NR]	[NR]
trans-1,2-dichloroethene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,1-dichloroethane	mg/kg	[NT]	[NT]	93743-5	110%
cis-1,2-dichloroethene	mg/kg	[NT]	[NT]	[NR]	[NR]
bromochloromethane	mg/kg	[NT]	[NT]	[NR]	[NR]
chloroform	mg/kg	[NT]	[NT]	93743-5	123%
2,2-dichloropropane	mg/kg	[NT]	[NT]	[NR]	[NR]
1,2-dichloroethane	mg/kg	[NT]	[NT]	93743-5	125%
1,1,1-trichloroethane	mg/kg	[NT]	[NT]	93743-5	133%
1,1-dichloropropene	mg/kg	[NT]	[NT]	[NR]	[NR]
Cyclohexane	mg/kg	[NT]	[NT]	[NR]	[NR]

QUALITY CONTROL VOCs in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
carbon tetrachloride	mg/kg	[NT]	[NT]	[NR]	[NR]
Benzene	mg/kg	[NT]	[NT]	[NR]	[NR]
dibromomethane	mg/kg	[NT]	[NT]	[NR]	[NR]
1,2-dichloropropane	mg/kg	[NT]	[NT]	[NR]	[NR]
trichloroethene	mg/kg	[NT]	[NT]	93743-5	113%
bromodichloromethane	mg/kg	[NT]	[NT]	93743-5	112%
trans-1,3-dichloropropene	mg/kg	[NT]	[NT]	[NR]	[NR]
cis-1,3-dichloropropene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,1,2-trichloroethane	mg/kg	[NT]	[NT]	[NR]	[NR]
Toluene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,3-dichloropropane	mg/kg	[NT]	[NT]	[NR]	[NR]
dibromochloromethane	mg/kg	[NT]	[NT]	93743-5	115%
1,2-dibromoethane	mg/kg	[NT]	[NT]	[NR]	[NR]
tetrachloroethene	mg/kg	[NT]	[NT]	93743-5	112%
1,1,1,2-tetrachloroethane	mg/kg	[NT]	[NT]	[NR]	[NR]
chlorobenzene	mg/kg	[NT]	[NT]	[NR]	[NR]
Ethylbenzene	mg/kg	[NT]	[NT]	[NR]	[NR]
bromoform	mg/kg	[NT]	[NT]	[NR]	[NR]
m+p-xylene	mg/kg	[NT]	[NT]	[NR]	[NR]
styrene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,1,2,2-tetrachloroethane	mg/kg	[NT]	[NT]	[NR]	[NR]
o-Xylene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,2,3-trichloropropane	mg/kg	[NT]	[NT]	[NR]	[NR]
isopropylbenzene	mg/kg	[NT]	[NT]	[NR]	[NR]
bromobenzene	mg/kg	[NT]	[NT]	[NR]	[NR]
n-propyl benzene	mg/kg	[NT]	[NT]	[NR]	[NR]
2-chlorotoluene	mg/kg	[NT]	[NT]	[NR]	[NR]
4-chlorotoluene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,3,5-trimethyl benzene	mg/kg	[NT]	[NT]	[NR]	[NR]
tert-butyl benzene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,2,4-trimethyl benzene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,3-dichlorobenzene	mg/kg	[NT]	[NT]	[NR]	[NR]
sec-butyl benzene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,4-dichlorobenzene	mg/kg	[NT]	[NT]	[NR]	[NR]
4-isopropyl toluene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,2-dichlorobenzene	mg/kg	[NT]	[NT]	[NR]	[NR]
n-butyl benzene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,2-dibromo-3-chloropropane	mg/kg	[NT]	[NT]	[NR]	[NR]
1,2,4-trichlorobenzene	mg/kg	[NT]	[NT]	[NR]	[NR]
hexachlorobutadiene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,2,3-trichlorobenzene	mg/kg	[NT]	[NT]	[NR]	[NR]

QUALITY CONTROL VOCs in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Surrogate Dibromofluorometha	%	[NT]	[NT]	93743-5	107%
Surrogate aaa-Trifluorotoluene	%	[NT]	[NT]	93743-5	112%
Surrogate Toluene-d_8	%	[NT]	[NT]	93743-5	100%
Surrogate 4-Bromofluorobenzene	%	[NT]	[NT]	93743-5	77%
QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	93743-4	12/07/2013 || 12/07/2013	93743-6	12/07/2013
Date analysed	-	93743-4	13/07/2013 || 13/07/2013	93743-6	13/07/2013
TRHC_6 - C_9	mg/kg	93743-4	<25 || <25	93743-6	106%
TRHC_6 - C_{10}	mg/kg	93743-4	<25 || <25	93743-6	106%
Benzene	mg/kg	93743-4	<0.2 || <0.2	93743-6	94%
Toluene	mg/kg	93743-4	<0.5 || <0.5	93743-6	102%
Ethylbenzene	mg/kg	93743-4	<1 || <1	93743-6	110%
m+p-xylene	mg/kg	93743-4	<2 || <2	93743-6	111%
o-Xylene	mg/kg	93743-4	<1 || <1	93743-6	119%
naphthalene	mg/kg	93743-4	3 || 3 || RPD: 0	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%	93743-4	109 || 109 || RPD: 0	93743-6	111%
QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	93743-15	12/07/2013 || 12/07/2013	93743-6	12/07/2013
Date analysed	-	93743-15	15/07/2013 || 15/07/2013	93743-6	15/07/2013
TRHC_{10} - C_{14}	mg/kg	93743-15	<50 || <50	93743-6	93%
TRHC_{15} - C_{28}	mg/kg	93743-15	<100 || <100	93743-6	123%
TRHC_{29} - C_{36}	mg/kg	93743-15	<100 || <100	93743-6	#
TRH>C_{10}-C_{16}	mg/kg	93743-15	<50 || <50	93743-6	93%
TRH>C_{16}-C_{34}	mg/kg	93743-15	<100 || <100	93743-6	123%
TRH>C_{34}-C_{40}	mg/kg	93743-15	<100 || <100	93743-6	#
Surrogate o-Terphenyl	%	93743-15	111 || 110 || RPD: 1	93743-6	107%

QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	93743-15	12/07/2013 || 12/07/2013	93743-6	12/07/2013
Date analysed	-	93743-15	12/07/2013 || 12/07/2013	93743-6	12/07/2013
Naphthalene	mg/kg	93743-15	<0.1 || <0.1	93743-6	86%
Acenaphthylene	mg/kg	93743-15	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	93743-15	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	93743-15	<0.1 || <0.1	93743-6	87%
Phenanthrene	mg/kg	93743-15	<0.1 || <0.1	93743-6	87%
Anthracene	mg/kg	93743-15	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	93743-15	<0.1 || 0.1	93743-6	91%
Pyrene	mg/kg	93743-15	<0.1 || 0.1	93743-6	90%
Benzo(a)anthracene	mg/kg	93743-15	<0.1 || <0.1	[NR]	[NR]
Chrysene	mg/kg	93743-15	<0.1 || <0.1	93743-6	86%
Benzo(b+k)fluoranthene	mg/kg	93743-15	<0.2 || <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	93743-15	<0.05 || 0.07	93743-6	106%
Indeno(1,2,3-c,d)pyrene	mg/kg	93743-15	<0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	93743-15	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	93743-15	<0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	93743-15	101 || 103 || RPD: 2	93743-6	88%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	93743-15	12/07/2013 || 12/07/2013	93743-6	12/07/2013
Date analysed	-	93743-15	13/07/2013 || 13/07/2013	93743-6	13/07/2013
HCB	mg/kg	93743-15	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	93743-15	<0.1 || <0.1	93743-6	100%
gamma-BHC	mg/kg	93743-15	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	93743-15	<0.1 || <0.1	93743-6	98%
Heptachlor	mg/kg	93743-15	<0.1 || <0.1	93743-6	96%
delta-BHC	mg/kg	93743-15	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	93743-15	<0.1 || <0.1	93743-6	102%
Heptachlor Epoxide	mg/kg	93743-15	<0.1 || <0.1	93743-6	102%
gamma-Chlordane	mg/kg	93743-15	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	93743-15	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	93743-15	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	93743-15	<0.1 || <0.1	93743-6	101%
Dieldrin	mg/kg	93743-15	<0.1 || <0.1	93743-6	104%
Endrin	mg/kg	93743-15	<0.1 || <0.1	93743-6	93%
pp-DDD	mg/kg	93743-15	<0.1 || <0.1	93743-6	110%
Endosulfan II	mg/kg	93743-15	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	93743-15	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	93743-15	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	93743-15	<0.1 || <0.1	93743-6	101%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Methoxychlor	mg/kg	93743-15	<0.1 || <0.1	[NR]	[NR]
Surrogate TCMX	%	93743-15	98 || 97 || RPD: 1	93743-6	93%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	[NT]	[NT]	93743-5	12/07/2013
Date analysed	-	[NT]	[NT]	93743-5	15/07/2013
Arsenic	mg/kg	[NT]	[NT]	93743-5	84%
Cadmium	mg/kg	[NT]	[NT]	93743-5	83%
Chromium	mg/kg	[NT]	[NT]	93743-5	96%
Copper	mg/kg	[NT]	[NT]	93743-5	116%
Lead	mg/kg	[NT]	[NT]	93743-5	70%
Mercury	mg/kg	[NT]	[NT]	93743-5	99%
Nickel	mg/kg	[NT]	[NT]	93743-5	75%
Zinc	mg/kg	[NT]	[NT]	93743-5	##
QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD		
Date extracted	-	93743-15	12/07/2013 || 12/07/2013		
Date analysed	-	93743-15	13/07/2013 || 13/07/2013		
TRHC$_6$ - C$_9$	mg/kg	93743-15	<25 || <25		
TRHC$_6$ - C$_{10}$	mg/kg	93743-15	<25 || <25		
Benzene	mg/kg	93743-15	<0.2 || <0.2		
Toluene	mg/kg	93743-15	<0.5 || <0.5		
Ethylbenzene	mg/kg	93743-15	<1 || <1		
m+p-xylene	mg/kg	93743-15	<2 || <2		
o-Xylene	mg/kg	93743-15	<1 || <1		
naphthalene	mg/kg	93743-15	<1 || <1		
Surrogate aaa-Trifluorotoluene	%	93743-15	103 || 111 || RPD: 7		

Report Comments:

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

METALS_S: ## Percent recovery is not possible to report due to the inhomogeneous nature of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

Asbestos: 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.

Total Recoverable Hydrocarbons in soil:# Percent recovery is not possible to report due to interference from analytes (other than those being tested) in the sample/s.

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

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.