ENVIRONMENTAL INVESTIGATION SERVICES

REPORT

TO

NSW HEALTH INFRASTRUCTURE

ON

ENVIRONMENTAL SITE ASSESSMENT

FOR

PROPOSED BOWRAL & DISTRICT HOSPITAL REDEVELOPMENT

AT

97-103 BOWRAL ROAD, BOWRAL, NSW

13 JUNE 2018 **REF: E31452Krpt**

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EXECUTIVE SUMMARY

NSW Health Infrastructure ('the client') commissioned Environmental Investigation Services (EIS)[1] to undertake an Environmental Site Assessment (ESA) for the proposed Bowral and District Hospital re-development at 97-103 Bowral Road, Bowral, NSW ('the site'). The site location is shown on Figure 1 and the assessment was confined to the site boundaries as shown on Figure 2.

The assessment was limited to the accessible areas of the site (excluding building footprints), as shown on Figure 2. For the purpose of this report, the assessment area has been referred to as 'the site', whilst the whole property has been referred to as 'the wider site'.

This report has been prepared to address condition 10 of the Secretary's Environmental Assessment Requirements (SEARs) dated 30 January 2018:
Assess and quantify any soil and groundwater contamination and demonstrate that the site is suitable for the proposed use in accordance with SEPP55. Relevant policies and guidelines: Managing Land Contamination: Planning Guidelines – SEPP55 Remediation of Land.

It is understood the proposed development involves extending Bowral and District Hospital to the north of the existing hospital. The development will include a new emergency departments and wards.

The scope of work included the following:

- Review of previous reports prepared by Douglas Partners (refer to Section 2.1);
- Preparation of a CSM;
- Design and implementation of a sampling, analysis and quality plan (SAQP);
- Interpretation of the analytical results against the adopted Site Assessment Criteria (SAC);
- Data Quality Assessment; and
- Preparation of a report including a Tier 1 risk assessment.

A Contaminated Land Preliminary Site Investigation (PSI) was previously undertaken by Douglas Partners during August 2016.

Conceptual Site Model Summary:

Source / AEC	CoPC
Fill material – The site appears to have been historically filled to achieve the existing levels. The fill may have been imported from various sources and could be contaminated. DP Geotechnical Report 2016 encountered fill at the site ranging in depth between 0.1m and 1.0m	Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), petroleum hydrocarbons (referred to as total recoverable hydrocarbons – TRHs), benzene, toluene, ethylbenzene and xylene (BTEX), polycyclic aromatic hydrocarbons (PAHs), organochlorine pesticides (OCPs), polychlorinated biphenyls (PCBs), total phenolics and asbestos.
Fuel storage – Two ASTs were identified at the site (see Figure 2). A review of the DP PESI 2016 report also identified former licences for a diesel underground storage tank (UST).	Lead, TRH, BTEX and PAHs
Historical agricultural use – A review of the DP PESI 2016 report indicated that the site may have previously been used for agricultural purposes. This could have resulted in contamination across the site via use of machinery, application of pesticides and building/demolition of various structures.	Heavy metals, TRH, PAHs, OCPs, PCBs and asbestos EIS note that pesticides only became commercially available in the 1940s. Prior to this time pesticides were predominantly heavy metal compounds.

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

Source / AEC	CoPC
Medical Waste Processing / Hospital Waste– Pathogens in medical waste may be present as a result of the generation and storage of medical waste.	Faecal coliforms and total coliforms
Hazardous Building Material – Hazardous building materials may be present as a result of former building and demolition activities. These materials may also be present in the existing buildings/ structures on site. EIS were provided a copy of the existing Hazardous Materials Survey Report dated May 2017.	Asbestos, lead and PCBs

Fieldwork
Fieldwork was undertaken between the 8th and 11th of May 2018. Soil samples were collected from 31 locations as shown on the attached Figure 2. Based on the accessible areas of the site (20,000m^2), this number of locations corresponded to a sampling density of approximately one sample per 645m^2. Groundwater monitoring wells were installed in four of the boreholes: BH03 (MW03), BH21 (MW21), BH28 (MW28) and BH29 (MW29). The monitoring wells were installed to depths of between approximately 5.0m to 6.0m below ground level.

Results and Discussion
Elevated concentrations of CoPC were not encountered above the adopted SAC in any of the soil samples analysed.

Fibre cement fragments (FCF) were encountered on the surface of the site in the vicinity of BH31. None of the fragments could be broken by hand pressure, therefore the material was considered to be in the bonded form.

Elevated concentrations of heavy metals (nickel and chromium) were encountered in groundwater at concentrations greater than the human contact and ecological SAC. These elevations are not considered to represent a significant ecological risk for the following reasons:

1. These elevated heavy metal concentrations are most likely a regional issue as no significant elevations of cadmium, copper, nickel or zinc were detected in any of the soil samples (i.e. there was no indication of a point source on site);
2. Elevated heavy metal concentrations are often encountered in urban groundwater. The elevated concentrations are typically associated with leaking water infrastructure and surface water runoff; and
3. Elevated heavy metal concentrations can be associated with groundwater from shale aquifers. This is due to the high concentrations of dissolved salts associated with groundwater from shale aquifers.

EIS note that the pH of two of the groundwater samples was outside of the acceptable range. This is most likely due to a regional issue and is unlikely to represent a human health or environmental risk to the proposed development. The proposed development will be connected to the mains water supply.

EIS consider that the report objectives outlined in Section 1.2 have been addressed.

Based on the scope of works undertaken, EIS are of the opinion that the CoPC identified at the site pose a low-moderate risk to the receptors.

Conclusion and Recommendations
EIS are of the opinion that the site can be made suitable for the proposed development provided that the following recommendations are implemented to address the data gaps and to minimise/better manage/characterise the risks:

1. There may be a decommissioned UST on site. The Australian Standard AS 4976-2008 (The removal and disposal of underground storage tanks) states that in-situ abandonment should only be considered in the event that removal will cause damage to adjacent structures. EIS note that records relating to the decommissioning date from 1996 and there is no indication whether the decommissioning method involved removal or in-situ abandonment. If the UST was abandoned in-situ in 1996 it may not meet the current requirements of the Australia Standard for in-situ abandonment. The current status of the potential UST should be assessed. This could involve a combination of a Ground Penetrating Radar (GPR) survey of the area and partial excavation to expose the top of the UST. Once the status of the UST has been established a decision can be taken as to whether to remove it and validate the excavation or document that it has been appropriately decommissioned and left in place;
2. Conduct an emu-bob for removal of FCF across the exposed fill soils in the vicinity of BH31 by a suitably licenced asbestos contractor. All FCF disposed of to a NSW EPA licenced facility. Following removal a surface clearance should be undertaken by a SafeWork NSW licenced asbestos assessor. This will provide a safe working environment for site personnel and form part of the waste classification; and
3. An inspection of the site surface should be undertaken in the footprint of the existing site structures following demolition. Prior to demolition all asbestos containing materials should be removed from the buildings that are going to be demolished and disposed of appropriately. This will minimise the risk of contaminating the site surface with asbestos during demolition.

In the event unexpected conditions are encountered during development work or between sampling locations that may pose a contamination risk, all works should stop and an environmental consultant should be engaged to inspect the site and address the issue.

The conclusions and recommendations should be read in conjunction with the limitations presented in the body of the report.

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Appendices:

ABBREVIATIONS

Asbestos Fines/Fibrous Asbestos	**AF/FA**
Ambient Background Concentrations	**ABC**
Added Contaminant Limits	**ACL**
Asbestos Containing Material	**ACM**
Australian Drinking Water Guidelines	**ADWG**
Area of Environmental Concern	**AEC**
Australian Height Datum	**AHD**
Acid Sulfate Soil	**ASS**
Above-Ground Storage Tank	**AST**
Below Ground Level	**BGL**
Benzo(a)pyrene Toxicity Equivalent Factor	**BaP TEQ**
Bureau of Meteorology	**BOM**
Benzene, Toluene, Ethylbenzene, Xylene	**BTEX**
Cation Exchange Capacity	**CEC**
Contaminated Land Management	**CLM**
Contaminant(s) of Potential Concern	**CoPC**
Chain of Custody	**COC**
Conceptual Site Model	**CSM**
Development Application	**DA**
Data Quality Indicator	**DQI**
Data Quality Objective	**DQO**
Detailed Site Investigation	**DSI**
Ecological Investigation Level	**EIL**
Environmental Investigation Services	**EIS**
Ecological Screening Level	**ESL**
Environmental Management Plan	**EMP**
Excavated Natural Material	**ENM**
Environment Protection Authority	**EPA**
Environmental Site Assessment	**ESA**
Ecological Screening Level	**ESL**
Fibre Cement Fragment(s)	**FCF**
General Approval of Immobilisation	**GAI**
Health Investigation Level	**HILs**
Hardness Modified Trigger Values	**HMTV**
Health Screening Level	**HSLs**
International Organisation of Standardisation	**ISO**
Lab Control Spike	**LCS**
Light Non-Aqueous Phase Liquid	**LNAPL**
Map Grid of Australia	**MGA**
National Association of Testing Authorities	**NATA**
National Environmental Protection Measure	**NEPM**
Organochlorine Pesticides	**OCP**
Organophosphate Pesticides	**OPP**
Polycyclic Aromatic Hydrocarbons	**PAH**
Potential ASS	**PASS**
Polychlorinated Biphenyls	**PCBs**

ABBREVIATIONS

Photo-ionisation Detector	**PID**
Protection of the Environment Operations	**POEO**
Practical Quantitation Limit	**PQL**
Quality Assurance	**QA**
Quality Control	**QC**
Remediation Action Plan	**RAP**
Relative Percentage Difference	**RPD**
Site Assessment Criteria	**SAC**
Sampling, Analysis and Quality Plan	**SAQP**
Site Audit Statement	**SAS**
Site Audit Report	**SAR**
Site Specific Assessment	**SSA**
Source, Pathway, Receptor	**SPR**
Specific Contamination Concentration	**SCC**
Standard Penetration Test	**SPT**
Standard Sampling Procedure	**SSP**
Standing Water Level	**SWL**
Trip Blank	**TB**
Toxicity Characteristic Leaching Procedure	**TCLP**
Total Recoverable Hydrocarbons	**TRH**
Trip Spike	**TS**
Upper Confidence Limit	**UCL**
United States Environmental Protection Agency	**USEPA**
Underground Storage Tank	**UST**
Virgin Excavated Natural Material	**VENM**
Volatile Organic Compounds	**VOC**
World Health Organisation	**WHO**
Work Health and Safety	**WHS**

Units

Litres	**L**
Metres BGL	**mBGL**
Metres	**m**
Millivolts	**mV**
Millilitres	**ml or mL**
Milliequivalents	**meq**
micro Siemens per Centimetre	**µS/cm**
Micrograms per Litre	**µg/L**
Milligrams per Kilogram	**mg/kg**
Milligrams per Litre	**mg/L**
Parts Per Million	**ppm**
Percentage	**%**

1 INTRODUCTION

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1.1 Proposed Development Details

It is understood the proposed development involves extending Bowral and District Hospital to the north of the existing hospital. The development will include a new emergency departments and wards.

1.2 Aims and Objectives

The primary aims of the assessment were to identify any past or present potentially contaminating activities at the site, identify the potential for site contamination, and make an assessment of the soil and groundwater contamination conditions. The assessment objectives were to:

- Assess the current site conditions and use(s) via a site walkover inspection;
- Identify potential contamination sources/areas of environmental concern (AEC) and contaminants of potential concern (CoPC);
- Assess the soil and groundwater contamination conditions via implementation of a sampling and analysis program;
- Prepare a conceptual site model (CSM);
- Assess the potential risks posed by contamination to the receptors identified in the CSM (Tier 1 assessment);
- Provide a preliminary waste classification for off-site disposal of soil;
- Assess whether the site is suitable or can be made suitable for the proposed development (from a contamination viewpoint); and
- Assess whether further intrusive investigation and/or remediation is required.

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

1.3 Scope of Work

The assessment was undertaken generally in accordance with an EIS proposal (Ref: EP46984K) of 19 April 2018 and written acceptance from the client of 1 May 2018. The scope of work included the following:

- Review of previous reports prepared by Douglas Partners (refer to Section 2.1);
- Preparation of a CSM;
- Design and implementation of a sampling, analysis and quality plan (SAQP);
- Interpretation of the analytical results against the adopted Site Assessment Criteria (SAC);
- Data Quality Assessment; and
- Preparation of a report including a Tier 1 risk assessment.

The scope of work was undertaken with reference to the National Environmental Protection (Assessment of Site Contamination) Measure 1999 as amended (2013)[3], other guidelines made under or with regards to the Contaminated Land Management Act (1997)[4] and State Environmental Planning Policy No.55 – Remediation of Land (1998)[5]. A list of reference documents/guidelines is included in the appendices.

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[3] National Environment Protection Council (NEPC), (2013). *National Environmental Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013).* (referred to as NEPM 2013)

[4] Contaminated Land Management Act 1997 (NSW) (referred to as CLM Act 1997)

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

2 SITE INFORMATION

2.1 Previous Investigations

2.1.1 Contaminated Land Preliminary Site Investigation (Douglas Partners, September 2016[6])

Douglas Partners undertook a Contaminated Land Preliminary Site Investigation (PSI) during August 2016. The PSI included a review of available site history information and site walkover. The site history review identified the following:

- Land use at the site was identified to have been agricultural/unused until between 1931-1965 when the ownership of the site was transferred to The Berrima District Hospital (now the Bowral and District Hospital);
- A search of the EPA public registers identified a former licence (August 2000) at the site for the generation and/or storage of Hazardous, Industrial or Group A Waste. Non-conformances were recorded for each year between 2001 to 2006, although no details were provided;
- SafeWork NSW records indicated a current licence for the site for the storage of dangerous goods including: hydrogen, ethanol, methanol, alcohols, Giesma Stain (a dying agent for cell preparation), liquid oxygen and diesel. A former licence for an underground storage tank (UST) for diesel storage was also noted. The records noted that decommissioning of the UST had commenced on 12 February 1996 however there was no further information on this UST or its removal;
- The site walkover identified a single storey brick building in the south of the site containing an aboveground diesel fuel storage tank. Access was not gained to the building, and no obvious signs of contamination were observed in the vicinity of the building. No other obvious signs of visible or olfactory contamination were noted;
- The Conceptual Site Model (CSM) identified three main sources of contamination:
  - Fill material across the site associated with the ongoing development of the site;
  - Site activities associated with the sites use as a hospital, including the diesel storage tank, medical waste, the presence of an electrical substation and laundry services; and
  - Hazardous building materials within the existing building and structures at the site.

The report concluded by recommending an intrusive investigation targeting areas of potential environmental concern as per the CSM.

2.1.2 Preliminary Geotechnical Investigation (Douglas Partners, October 2016[7])

Douglas Partners undertook a Preliminary Geotechnical Investigation during October 2016. The investigation included drilling eight boreholes in the north of the site. The investigation identified a

[6] Douglas Partners Pty Ltd (2016), Report on Contaminated Land Preliminary Site Investigation, Proposed Hospital Upgrade, Bowral & District Hospital, Mona Road, Bowral, prepared for Health Infrastructure, (Ref: Project 89199.01 dated September 2016). (Referred to as DP PESI Report 2016)

[7] Douglas Partners Pty Ltd (2016), Report on Preliminary Geotechnical Investigation, Proposed Hospital Upgrade, Bowral & District Hospital, Mona Road, Bowral, prepared for Health Infrastructure, (Ref: Project 89199 dated October 2016). (Referred to as DP Geotech Report 2016)

fill profile of between 0.1m and 1.0m, typically underlain by silty clay natural soils and sandstone or shale bedrock. Groundwater was encountered at depths of 1.1m to 1.2m in two of the boreholes.

2.2 Site Identification

Table 2-1: Site Identification

Lot & Deposited Plan:	Lot 4 in DP858938
Current Land Use:	Bowral and District Hospital
Proposed Land Use:	Continued use as a hospital
Local Government Authority:	Wingecarribee Shire Council
Current Zoning:	SP2 – Infrastructure: Health Services Facilities
Wider Site Area (m^2):	Wider Site Area: ~32,450 Site Area (area of investigation): ~20,000m^2
Geographical Location (decimal degrees) (approx.):	Latitude: -34.484958 Longitude: 150.423479
Site Location Plan:	Figure 1
Sample Location Plan:	Figure 2

2.3 Site Location and Regional Setting

The site is located in an urban area of Bowral, NSW. The site is bounded by Bowral Road to the north, Mona Road to the east, Ascot Road to the south and Sheffield Road to the west. The site is situated approximately 290m to the southwest of Mittagong Creek.

2.4 Topography

The regional topography is characterised by a north-east facing hillside that falls gently towards Mittagong Creek. The site is located towards the toe of the hillside and has a gentle slope towards the north-east at approximately 1°-3°. Parts of the site appear to have been levelled to account for the slope and accommodate the existing development.

2.5 Site Inspection

A walkover inspection of the site was undertaken by EIS on 11 May 2018. The inspection was limited to accessible areas of the site and immediate surrounds. An internal inspection of buildings was not undertaken.

A summary of the other inspection findings are outlined in the following subsections and photographs are provided in the appendices:

2.5.1 Current Site Use and/or Indicators of Former Site Use

At the time of the inspection, the southern and central portions of the site were occupied by numerous hospital buildings, and associated paved footpaths and car park areas. The north-east corner of the site was predominantly grass covered with large mature trees. A new on grade carpark was in the process of being constructed in the north-east section of the site.

2.5.2 Buildings, Structures and Roads

The main hospital buildings were a mix of brick, fibre cement, weatherboard and concrete construction typically on concrete slab and a range of one, two and three storeys. Numerous covered walkways were present between the existing building with concrete and asphaltic concrete paved footpaths, driveways and car park areas.

In the north-east corner of the site between the administration building and Mona Road, a new asphaltic concrete paved carpark with concrete gutters and sections of driveway was in the final stages of construction (refer to Figure 2).

2.5.3 Visible or Olfactory Indicators of Contamination

During the site inspection a single storey brick building in the central section of the site was observed to contain an aboveground storage tank (AST) for diesel fuel (500L). Within 5m of this small structure was a secondary similar structure identified to contain the emergency generator and a smaller diesel AST.

Fibre cements fragments (suspected to contain asbestos) were observed on the site surface in the a location of exposed fil in the central section of the site to the north of the main hospital building where a demountable had recently been removed (see Figure 2).

There were no other visible or olfactory indicators of contamination observed during the site inspection.

2.5.4 Presence of Drums/Chemicals, Waste and Fill Material

Fill materials were identified in numerous areas around the site where exposed soil was present at the site surface. This included landscaped areas, unpaved driveway areas in the vicinity of the Mental Health Building, and the north east corner and eastern boundary of the site.

Medical and contaminated waste storage areas were observed in the central south section of the site (refer to Figure 2) and was stored in locked cages and/or bins stored on concrete pavements.

2.5.5 Drainage and Services

Surface water at the site was expected to flow to the north and north-west towards Halls Creek. Local stormwater drains were observed throughout the site and it was assumed that these discharged into the regional stormwater system.

2.5.6 Sensitive Environments

Sensitive environments such as wetlands, ponds, creeks or extensive areas of natural vegetation were not identified on site or in the immediate surrounds.

2.5.7 Landscaped Areas and Visible Signs of Plant Stress

The north-east corner and eastern side of the site were generally grass covered with various large mature trees and small to medium shrubs located in garden beds around buildings. The vegetation appeared to be in reasonable condition based on a cursory inspection, with no obvious or extensive dieback observed. Grass coverage was generally good, with the exception of some areas beneath large trees and isolated areas adjacent to carparks and footpaths.

2.6 Surrounding Land Use

The surrounding land use to the north, east and west was generally residential and commercial (medical related). To the south of the site was Loserby Park which included a skate park, football field, tennis courts and community centre.

EIS did not observe any land uses in the immediate surrounds that were identified as potential contamination sources for the site.

2.7 Underground Services

The 'Dial Before You Dig' (DBYD) plans were reviewed for the assessment in order to establish whether any major underground services exist at the site or in the immediate vicinity that could act as a preferential pathway for contamination migration. Major services were not identified that would be expected to act as preferential pathways for contamination migration.

3 GEOLOGY AND HYDROGEOLOGY

3.1 Regional Geology

A review of the regional geological map of Wollongong (1966)[8] indicates that the site is underlain by Triassic aged deposits of the Liverpool Sub-Group, which typically consists of shale with some sandstone beds.

3.2 Acid Sulfate Soil (ASS) Risk and Planning

The site is not located in an acid sulfate soil (ASS) risk area according to the risk maps prepared by the Department of Land and Water Conservation.

3.3 Receiving Water Bodies

Surface water bodies were not identified in the immediate vicinity of the site. The closest surface water body is Mittagong Creek located approximately 290m to the north-east of the site. This is down-gradient from site and may be a potential receptor.

3.4 Sydney Drinking Water Catchment

The site is located within the Sydney Drinking Water Catchment Area according to the State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011.

[8] Department of Mineral Resources, (1966). *1:250,000 Geological Map of Wollongong (Series S1 56-9)*

4 CONCEPTUAL SITE MODEL

NEPM (2013) defines a CSM as a representation of site related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The CSM for the site is presented in the following sub-sections and is based on the site information (including the site inspection information) and the review of site history information. Reference should also be made to the figures attached in the appendices.

A review of the CSM in relation to source, pathway and receptor (SPR) linkages has been undertaken as part of the Tier 1 risk assessment process, as outlined in Section 9.

4.1 Potential Contamination Sources/AEC and CoPC

The potential contamination sources/AEC and CoPC are presented in the following table:

Table 4-1: Potential (and/or known) Contamination Sources/AEC and Contaminants of Potential Concern

Source / AEC	CoPC
Fill material – The site appears to have been historically filled to achieve the existing levels. The fill may have been imported from various sources and could be contaminated. DP Geotechnical Report 2016 encountered fill at the site ranging in depth between 0.1m and 1.0m	Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), petroleum hydrocarbons (referred to as total recoverable hydrocarbons – TRHs), benzene, toluene, ethylbenzene and xylene (BTEX), polycyclic aromatic hydrocarbons (PAHs), organochlorine pesticides (OCPs), , polychlorinated biphenyls (PCBs), total phenolics and asbestos.
Fuel storage – Two ASTs were identified at the site (see Figure 2). A review of the DP PESI 2016 report also identified former licences for a diesel underground storage tank (UST).	Lead, TRH, BTEX and PAHs
Historical agricultural use – A review of the DP PESI 2016 report indicated that the site may have previously been used for agricultural purposes. This could have resulted in contamination across the site via use of machinery, application of pesticides and building/demolition of various structures.	Heavy metals, TRH, PAHs, OCPs, PCBs and asbestos EIS note that pesticides only became commercially available in the 1940s. Prior to this time pesticides were predominantly heavy metal compounds.
Medical Waste Processing / Hospital Waste– Pathogens in medical waste may be present as a result of the generation and storage of medical waste.	Faecal coliforms and total coliforms

Source / AEC	CoPC
Hazardous Building Material – Hazardous building materials may be present as a result of former building and demolition activities. These materials may also be present in the existing buildings/ structures on site. EIS were provided a copy of the existing Hazardous Materials Survey Report dated May 2017.	Asbestos, lead and PCBs

4.2 Mechanism for Contamination, Affected Media, Receptors and Exposure Pathways

The mechanisms for contamination, affected media, receptors and exposure pathways relevant to the potential contamination sources/AEC are outlined in the following CSM table:

Table 4-2: CSM

Potential mechanism for contamination	The mechanisms for contamination are most likely to include 'top-down' impacts and spills. There is a potential for sub-surface releases to have occurred if deep fill (or other buried industrial infrastructure) is present, although this is considered to be the least likely mechanism for contamination.
Affected media	Soil/soil vapour and groundwater have been identified as potentially affected media.
Receptor identification	Human receptors include site occupants/users, construction workers and intrusive maintenance workers. Off-site human receptors include adjacent land users, and groundwater users. Ecological receptors include terrestrial organisms and plants within unpaved areas (including the proposed landscaped areas).
Potential exposure pathways	Potential exposure pathways relevant to the human receptors include ingestion, dermal absorption and inhalation of dust (all contaminants) and vapours (volatile TRH, naphthalene and BTEX). The potential for exposure would typically be associated with the construction and excavation works, and use of unpaved areas (i.e. the gardens) and any proposed basement areas (i.e. vapour inhalation or incidental contact with groundwater seepage). Potential exposure pathways for ecological receptors include primary contact and ingestion.
Potential exposure mechanisms	The following have been identified as potential exposure mechanisms for site contamination: • Vapour intrusion into the building (either from soil contamination or

	volatilisation of contaminants from groundwater); • Contact (dermal, ingestion or inhalation) with exposed soils in landscaped areas and/or unpaved areas; • Migration of groundwater off-site and into nearby water bodies, including aquatic ecosystems; and • Migration of groundwater off-site into areas where groundwater is being utilised as a resource (i.e. for irrigation).
Presence of preferential pathways for contaminant movement	The stormwater infrastructure may act as preferential pathways for contaminant migration. This would be dependent on the contaminant type and transport mechanisms.

5 SAMPLING, ANALYSIS AND QUALITY PLAN

5.1 Data Quality Objectives (DQO)

Data Quality Objectives (DQOs) were developed to define the type and quality of data required to achieve the project objectives outlined in Section 1.2. The DQOs were prepared with reference to the process outlined in Schedule B2 of NEPM (2013) and the Guidelines for the NSW Site Auditor Scheme, 3rd Edition (2017)[9]. The seven-step DQO approach for this project is outlined in the following sub-sections.

The DQO process is validated in part by the Data Quality Assurance/Quality Control (QA/QC) Evaluation. The Data (QA/QC) Evaluation is summarised in Section 7.1 and the detailed evaluation is provided in the appendices.

5.1.1 Step 1 - State the Problem

The CSM identified potential sources of contamination/AEC at the site that may pose a risk to human health and the environment. Investigation data is required to assess the contamination status of the site, assess the risks posed by the contaminants in the context of the proposed development/intended land use, and assess whether remediation is required. This information will be considered by the consent authority in exercising its planning functions in relation to the development proposal. A waste classification is required prior to off-site disposal of excavated soil/bedrock. The DQOs were developed by the author of this report and checked by the reviewer. Both the author and reviewer were joint decision-makers in relation to Step 2 of the DQO process.

5.1.2 Step 2 - Identify the Decisions of the Study

The objectives of the assessment are outlined in Section 1.2. The decisions to be made reflect these objectives and are as follows:

- Did the site inspection, or does the background information identify potential contamination sources/AEC at the site?
- Are any results above the SAC?
- Do potential risks associated with contamination exist, and if so, what are they?
- Is remediation required?
- Is the site characterisation sufficient to provide adequate confidence in the above decisions?
- Is the site suitable for the proposed development, or can the site be made suitable subject to further characterisation and/or remediation?

5.1.3 Step 3 - Identify Information Inputs

The primary information inputs required to address the decisions outlined in Step 2 include the following:

[9] NSW EPA (2017). *Guidelines for the NSW Site Auditor Scheme, 3rd ed.* (referred to as Site Auditor Guidelines 2017)

- Existing relevant environmental data from previous reports;
- Site information, including site observations and site history documentation;
- Sampling of potentially affected media, including soil and groundwater;
- Observations of sub-surface variables such as soil type, photo-ionisation detector (PID) concentrations, odours and staining, and groundwater physiochemical parameters;
- Laboratory analysis of soils, fibre cement and groundwater for the CoPC identified in the CSM; and
- Field and laboratory QA/QC data.

5.1.4 Step 4 - Define the Study Boundary

The sampling will be confined to the site boundaries as shown in Figure 2 (spatial boundary). The sampling was completed between the 8th and the 11th May 2018 (temporal boundary). The assessment of potential risk to adjacent land users has been made based on data collected within the site boundary.

Sampling was not undertaken within the existing building footprint due to access constraints.

5.1.5 Step 5 - Develop an Analytical Approach (or Decision Rule)

5.1.5.1 Tier 1 Screening Criteria

The laboratory data will be assessed against relevant Tier 1 screening criteria (referred to as SAC), as outlined in Section 6. Exceedances of the SAC do not necessarily indicate a requirement for remediation or a risk to human health and/or the environment. Exceedances are considered in the context of the CSM and valid SPR-linkages.

For this assessment, the individual results have been assessed as either above or below the SAC. Statistical evaluation of the dataset via calculation of mean values and/or 95% upper confidence limit (UCL) values has not been undertaken due to the spatial distribution of the data and the number of samples submitted for analysis.

5.1.5.2 Field and Laboratory QA/QC

Field QA/QC included analysis of inter-laboratory duplicates, intra-laboratory duplicates, trip spike, trip blank and rinsate samples. Further details regarding the sampling and analysis undertaken, and the acceptable limits adopted is provided in the Data Quality (QA/QC) Evaluation in the appendices.

The suitability of the laboratory data is assessed against the laboratory QA/QC criteria which is outlined in the attached laboratory reports. These criteria were developed and implemented in accordance with the laboratory's National Association of Testing Authorities, Australia (NATA) accreditation and align with the acceptable limits for QA/QC samples as outlined in NEPM (2013) and other relevant guidelines.

In the event that acceptable limits are not met by the laboratory analysis, other lines of evidence are reviewed (e.g. field observations of samples, preservation, handling etc) and, where required, consultation with the laboratory is undertaken in an effort to establish the cause of the non-conformance. Where uncertainty exists, EIS typically adopt the most conservative concentration reported (or in some cases, consider the data from the affected sample as an estimate).

5.1.5.3 Appropriateness of Practical Quantitation Limits (PQLs)

The PQLs of the analytical methods are considered in relation to the SAC to confirm that the PQLs are less than the SAC. In cases where the PQLs are greater than the SAC, a discussion of this is provided.

5.1.6 Step 6 – Specify Limits on Decision Errors

To limit the potential for decision errors, a range of quality assurance processes are adopted. A quantitative assessment of the potential for false positives and false negatives in the analytical results is undertaken with reference to Schedule B(3) of NEPM (2013) using the data quality assurance information collected.

Decision errors can be controlled through the use of hypothesis testing. The test can be used to show either that the baseline condition is false or that there is insufficient evidence to indicate that the baseline condition is false. The null hypothesis is an assumption that is assumed to be true in the absence of contrary evidence. For this assessment, the null hypothesis has been adopted which is that, there is considered to be a complete SPR linkage for the CoPC identified in the CSM unless this linkage can be proven not to (or unlikely to) exist. The null hypothesis has been adopted for this assessment.

5.1.7 Step 7 - Optimise the Design for Obtaining Data

The most resource-effective design will be used in an optimum manner to achieve the assessment objectives. Adjustment of the assessment design can occur following consultation or feedback from project stakeholders. For this investigation, the design was optimised via consideration of the various lines of evidence used to select the sample locations, the media being sampled, and also by the way in which the data were collected.

The sampling plan and methodology are outlined in the following sub-sections.

5.2 Soil Sampling Plan and Methodology

The soil sampling plan and methodology adopted for this assessment is outlined in the table on the next page:

Table 5-1: Soil Sampling Plan and Methodology

Aspect	Input
Sampling Density	Samples were collected from 31 locations as shown on the attached Figure 2. Based on the site area (20,000m^2), this number of locations corresponded to a sampling density of approximately one sample per 645m^2. The sampling plan meets the minimum sampling density for hotspot identification, as outlined in the NSW EPA Contaminated Sites Sampling Design Guidelines (1995)[10].
Sampling Plan	The sampling locations were placed on a judgemental sampling plan and were broadly positioned for site coverage, taking into consideration areas that were not easily accessible. This sampling plan was considered suitable to make an assessment of potential risks associated with the AEC and CoPC identified in the CSM, and assess whether further investigation is warranted.
Set-out and Sampling Equipment	Sampling locations were set out using hand held GPS unit (with an accuracy of ±2m). In-situ sampling locations were cleared for underground services by an external contractor prior to sampling as outlined in the SSP. Samples were collected using: • a hand auger; • a drill rig equipped with spiral flight augers. Soil samples were obtained from a Standard Penetration Test (SPT) split-spoon sampler, or directly from the auger when conditions did not allow use of the SPT sampler; and • a push tube drill rig. Soil samples were obtained from disposable polyethylene push tube samplers.
Sample Collection and Field QA/QC	Soil samples were obtained between 8 May and 11 May 2018 in accordance with the standard sampling procedure (SSP) attached in the appendices. Soil samples were collected from the fill and natural profiles based on field observations. The sample depths are shown on the logs attached in the appendices. Samples were placed in glass jars with plastic caps and teflon seals with minimal headspace. Samples for asbestos analysis were placed in zip-lock plastic bags. During sampling, soil at selected depths was split into primary and duplicate samples for field QA/QC analysis.
Field Screening	A portable Photoionisation Detector (PID) fitted with a 10.6mV lamp was used to screen the samples for the presence of volatile organic compounds (VOCs). PID screening for VOCs was undertaken on soil samples using the soil sample headspace method. VOC data was obtained from partly filled zip-lock plastic bags following equilibration of the headspace gases. PID calibration records are maintained on file by EIS. Fill/spoil at the sampling locations was visually inspected during the works for the presence of fibre cement fragments.

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

Aspect	Input
Decontamination and Sample Preservation	Sampling personnel used disposable nitrile gloves during sampling activities. Re-usable sampling equipment was decontaminated as outlined in the SSP. Soil samples were preserved by immediate storage in an insulated sample container with ice in accordance with the SSP. On completion of the fieldwork, the samples were stored temporarily in fridges in the EIS warehouse before being delivered in the insulated sample container to a NATA registered laboratory for analysis under standard chain of custody (COC) procedures.

5.3 Groundwater Sampling Plan and Methodology

The groundwater sampling plan and methodology is outlined in the table below:

Table 5-2: Groundwater Sampling Plan and Methodology

Aspect	Input
Sampling Plan	Groundwater monitoring wells were installed in BH03 (MW03), BH21 (MW21), BH28 (MW28) and BH29 (MW29). The wells were positioned to gain a snap-shot of the groundwater conditions. Considering the topography and the location of the nearest down-gradient water body, MW03 was considered to be in the up-gradient area of the site and would be expected to provide an indication of groundwater flowing onto (beneath) the site from the south. MW21 was considered to be in the intermediate to down-gradient area of the site and would be expected to give an indication of groundwater flowing across (beneath the site), and MW28 and MW29 were considered to be in the down-gradient area of the site and would be expected to provide an indication of groundwater flowing beyond the down-gradient site boundary.
Monitoring Well Installation Procedure	The monitoring well construction details are documented on the appropriate borehole logs attached in the appendices. The monitoring wells were installed to depths of approximately 5.0m to 6.0m below ground level. The wells were generally constructed as follows: • 50mm diameter Class 18 PVC (machine slotted screen) was installed in the lower section of the well to intersect groundwater; • 50mm diameter Class 18 PVC casing was installed in the upper section of the well (screw fixed); • A 2mm sand filter pack was used around the screen section for groundwater infiltration; • A hydrated bentonite seal/plug was used on top of the sand pack to seal the well; and • A gatic cover was installed at the surface with a concrete plug to limit the inflow of surface water.
Monitoring Well	The monitoring wells were developed on the 9th and 10th of May 2018 using a submersible electrical pump in accordance with the SSP. Due to the hydrogeological conditions,

Aspect	Input
Development	groundwater inflow into the wells was relatively low, therefore the wells were pumped until they were effectively dry, MW28 was unable to be developed due to a lack of groundwater within the development timeframe. The field monitoring records and calibration data are attached in the appendices.
Groundwater Sampling	The monitoring wells were allowed to recharge for approximately five to seven days after development. Groundwater samples were obtained on 17 May 2018. Prior to sampling, the monitoring wells were checked for the presence of Light Non-Aqueous Phase Liquids (LNAPLs) using an inter-phase probe electronic dip meter. The monitoring well head space was checked for VOCs using a calibrated PID unit. The samples were obtained using a peristaltic pump. During sampling, the following parameters were monitored using calibrated field instruments (see SSP): • Standing water level (SWL) using an electronic dip meter; and • pH, temperature, electrical conductivity (EC), dissolved oxygen (DO) and redox potential (Eh) using a YSI Multi-probe water quality meter. Steady state conditions were considered to have been achieved when the difference in the pH measurements was less than 0.2 units and the difference in conductivity was less than 10%. Groundwater samples were obtained directly from the single use PVC tubing and placed in the sample containers. Duplicate samples were obtained by alternate filling of sample containers. This technique was adopted to minimise disturbance of the samples and loss of volatile contaminants associated with mixing of liquids in secondary containers, etc. Groundwater removed from the wells during development and sampling was transported to EIS in jerry cans and stored in holding drums prior to collection by a licensed waste water contractor for off-site disposal. The field monitoring record and calibration data are attached in the appendices.
Decontaminant and Sample Preservation	The decontamination procedure adopted during sampling is outlined in the SSP attached in the appendices. During development, the pump was flushed between monitoring wells with potable water (single-use tubing was used for each well). The pump tubing was discarded after each sampling event and replaced therefore no decontamination procedure was considered necessary. The samples were preserved with reference to the analytical requirements and placed in an insulated container with ice in accordance with the SSP. On completion of the fieldwork, the samples were temporarily stored in a fridge at the EIS office, before being delivered in the insulated sample container to a NATA registered laboratory for analysis under standard COC procedures.

5.4 Analytical Schedule

The analytical schedule is outlined in the following table:

Table 5-3: Analytical Schedule

Analyte/CoPC	Fill Samples	Natural Soil Samples	Fibre Cement Material Samples	Groundwater Samples
Heavy Metals	45	10	-	4
TRH/BTEX	45	10	-	4
VOCs	-	-	-	4
PAHs	45	10	-	4
OCPs	30	10	-	-
PCBs	30	10	-	-
Total phenolics	30	10	-	-
Asbestos	30	-	2	-
Faecal coliforms / Total coliforms	4	-	-	-
pH/CEC/Clay Content (%)	2	-	-	-
pH/EC	-	-	-	4
Toxicity characteristic leachate procedure (TCLP) Metals and/or PAHs for waste classification purposes	9	-	-	-

5.4.1 Laboratory Analysis

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

Table 5-4: Laboratory Details

Samples	Laboratory	Report Reference
All primary samples and field QA/QC samples including (intra-laboratory duplicates, trip blanks, trip spikes and field rinsate samples)	Envirolab Services Pty Ltd NSW, NATA Accreditation Number – 2901 (ISO/IEC 17025 compliance)	191478, 191478A and 191978
Inter-laboratory duplicates	Envirolab Services Pty Ltd VIC, NATA Accreditation Number – 2901 (ISO/IEC 17025 compliance)	13772

6 SITE ASSESSMENT CRITERIA (SAC)

The SAC were derived from the NEPM 2013 and other guidelines as discussed in the following sub-sections. The guideline values for individual contaminants are presented in the attached report tables and further explanation of the various criteria adopted is provided in the appendices.

6.1 Soil

Soil data were compared to relevant Tier 1 screening criteria in accordance with NEPM (2013) as outlined below.

6.1.1 Human Health

- Health Investigation Levels (HILs) for a 'commercial/industrial' land use exposure scenario (HIL-D);
- Health Screening Levels (HSLs) for a 'commercial/industrial' land use exposure scenario (HSL-D). HSLs were calculated based on the soil type and the depth of the sample from the existing ground surface as the proposed building floor level is expected to be constructed approximately at the existing grade;
- Where exceedances of the HSLs were reported for hydrocarbons (TRH/BTEX and naphthalene), the soil health screening levels for direct contact presented in the CRC Care Technical Report No. 10 – Heath screening levels for hydrocarbons in soil and groundwater Part 1: Technical development document (2011)[11] were considered;
- Asbestos was assessed on the basis of presence/absence. Asbestos HSLs were not adopted as detailed asbestos quantification was not undertaken; and
- Samples taken from the vicinity of the medical waste storage area were analysed for faecal coliforms in order to provide a general screening for significant microbiological contamination. The guideline adopted for faecal coliforms will be the microbiological standard for stabilised grade A product in Environmental Guidelines: Use and Disposal of Biosolids Products (EPA 1997). Faecal coliforms will be compared to the standard for E. coli of <1,000 MPN/g.

6.1.2 Environment (Ecological – terrestrial ecosystems)

- Ecological Investigation Levels (EILs) and Ecological Screening Levels (ESLs) for an ''commercial/industrial' land use exposure scenario. These have only been applied to the top 2m of soil as outlined in NEPM (2013). The criteria for benzo(a)pyrene has been increased from the value presented in NEPM (2013) based on the information presented in the CRC Care Technical Report No. 39 – Risk-based management and guidance for benzo(a)pyrene (2017)[12];

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[11] Cooperative Research Centre for Contamination Assessment and Remediation of the Environment (CRC Care), (2011). Technical Report No. 10 - *Health screening levels for hydrocarbons in soil and groundwater Part 1: Technical development document*

[12] CRC Care, (2011). *Technical Report No. 39 - Risk-based management and guidance for benzo(a)pyrene*

- ESLs were calculated based on the soil type. EILs for selected metals were calculated using average site specific soil parameters for pH, cation exchange capacity and clay content (two samples were analysed for soil parameters. Their average values were: pH 9.25, CEC 6 meq/100g and clay content 24.5%w/w. These average values were used to calculate appropriate EILs for the site). These data were used to select the added contaminant limit (ACL) values presented in Schedule B(1) of NEPM (2013), and published ambient background concentration (ABC) presented in the document titled Trace Element Concentrations in Soils from Rural and Urban Areas of Australia (1995)[13]. This method is considered to be adequate for the Tier 1 screening.

6.1.3 Waste Classification

Data for the waste classification assessment were assessed in accordance with the Waste Classification Guidelines, Part 1: Classifying Waste (2014)[14] as outlined in the following table:

Table 6-1: Waste Categories

Category	Description
General Solid Waste (non-putrescible)	• If Specific Contaminant Concentration (SCC) ≤ Contaminant Threshold (CT1) then Toxicity Characteristics Leaching Procedure (TCLP) not needed to classify the soil as general solid waste; and • If TCLP ≤ TCLP1 and SCC ≤ SCC1 then treat as general solid waste.
Restricted Solid Waste (non-putrescible)	• If SCC ≤ CT2 then TCLP not needed to classify the soil as restricted solid waste; and • If TCLP ≤ TCLP2 and SCC ≤ SCC2 then treat as restricted solid waste.
Hazardous Waste	• If SCC > CT2 then TCLP not needed to classify the soil as hazardous waste; and • If TCLP > TCLP2 and/or SCC > SCC2 then treat as hazardous waste.
Virgin Excavated Natural Material (VENM)	Natural material (such as clay, gravel, sand, soil or rock fines) that meet the following: • That has been excavated or quarried from areas that are not contaminated with manufactured chemicals, or with process residues, as a result of industrial, commercial mining or agricultural activities; • That does not contain sulfidic ores or other waste; and • Includes excavated natural material that meets such criteria for virgin excavated natural material as may be approved from time to time by a notice published in the NSW Government Gazette.

[13] Olszowy, H., Torr, P., and Imray, P., (1995), *Trace Element Concentrations in Soils from Rural and Urban Areas of Australia. Contaminated Sites Monograph Series No. 4*. Department of Human Services and Health, Environment Protection Agency, and South Australian Health Commission.

[14] NSW EPA, (2014). *Waste Classification Guidelines, Part 1: Classifying Waste.* (referred to as Waste Classification Guidelines 2014)

6.2 Groundwater

Groundwater data were compared to relevant Tier 1 screening criteria in accordance with NEPM (2013), following an assessment of environmental values in accordance with the Guidelines for the Assessment and Management of Groundwater Contamination (2007)[15]. Environmental values for this assessment include aquatic ecosystems, human uses, and human-health risks in non-use scenarios.

6.2.1 Human Health

- HSLs for a 'low-high density residential' exposure scenario (HSL-D). HSLs were calculated based on the soil type and the observed depth to groundwater;
- The NEPM (2013) HSLs were applicable for this project as the groundwater was recorded at depths shallower than 2m in two of the four boreholes. On this basis, EIS have undertaken a site specific assessment (SSA) for the Tier 1 screening of human health risks posed by volatile contaminants in groundwater. The assessment included selection of alternative Tier 1 criteria that were considered suitably protective of human health. These criteria are based on drinking water guidelines and have been referred to as HSL-SSA. The criteria were based on the following (as shown in the attached report tables):
    - Australian Drinking Water Guidelines (2011)[16] for BTEX compounds and selected VOCs;
    - World Health Organisation (WHO) document titled Petroleum Products in Drinking-water, Background document for the development of WHO Guidelines for Drinking Water Quality (2008)[17] for petroleum hydrocarbons;
    - USEPA Region 9 screening levels for naphthalene (threshold value for tap water); and
    - The use of the laboratory PQLs for other contaminants where there were no Australian guidelines.
- The Australian Drinking Water Guidelines (2011)[18] were adopted as screening criteria for consumption of groundwater as the site is within the Sydney drinking water catchment area; and
- The guidelines for recreational water quality (primary and secondary contact) presented in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000)[19] were adopted as screening criteria to assess potential human-health risks in the nearest receiving water body as it may be used for recreational purposes.

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[15] NSW Department of Environment and Conservation, (2007). *Guidelines for the Assessment and Management of Groundwater Contamination*

[16] National Health and Medical Research Council (NHMRC), (2011). *National Water Quality Management Strategy, Australian Drinking Water Guidelines* (referred to as ADWG 2011)

[17] World Health Organisation (WHO), (2008). *Petroleum Products in Drinking-water, Background document for the development of WHO Guidelines for Drinking Water Quality* (referred to as WHO 2008)

[18] National Health and Medical Research Council (NHMRC), (2011). *National Water Quality Management Strategy, Australian Drinking Water Guidelines* (referred to as ADWG 2011)

[19] ANZECC, (2000), *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.* (referred to as ANZECC 2000)

6.2.2 Environment (Ecological - aquatic ecosystems)

- Groundwater Investigation Levels (GILs) for 95% trigger values for protection of freshwater species presented in ANZECC 2000. The 99% trigger values were adopted where required to account for bioaccumulation. Low and moderate reliability trigger values were also adopted for some contaminants where high-reliability trigger values don't exist.

7 RESULTS

7.1 Summary of Data (QA/QC) Evaluation

The data evaluation is presented in the appendices. In summary, EIS are of the opinion that the data are adequately precise, accurate, representative, comparable and complete to serve as a basis for interpretation to achieve the investigation objectives.

7.2 Subsurface Conditions

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

Table 7-1: Summary of Subsurface Conditions

Profile	Description
Pavement	Asphaltic Concrete (AC)/Concrete pavement was encountered at the surface in BH1, BH2, BH3, BH4, BH6, BH7, BH8, BH9, BH14, BH26, BH27, and BH28 and ranged in thickness between 50mm to 170mm.
Fill	Fill was encountered at the surface or beneath the pavement in all boreholes and extended to depths of approximately 0.2m to 1.6m. The fill typically comprised silty clay, gravelly sand, silty sand, sandy gravel, sandy silty clay, gravelly sandy clay with inclusions of igneous gravel, ash, shale gravels, ironstone gravels, root fibres, sand, brick, river pebbles, concrete fragments, quartz, sandstone gravels, and building rubble (bricks, concrete, glass, and asphaltic concrete fragments). Neither odours nor staining were observed in the fill during the investigation. Asbestos containing material in the form of fibre cement fragments (FCF) was observed in the fill at BH31 only.
Natural Soil	Silty clay and shaley clay natural soils were encountered below the fill soils in BH1, BH2, BH3, BH4, BH5, BH6 BH7, BH8, BH9, BH11, BH14, BH15, BH16, BH17, BH18, BH19, BH20, BH21, BH25, BH26, BH27, BH28, BH29, BH30, and BH13. Neither odours nor staining were observed in the natural soils during the investigation.
Bedrock	Shale bedrock was encountered beneath the natural soils in BH21, BH28 and BH29 at between 3.6m and 4.5m. Neither odours nor staining were observed in the bedrock during the investigation.
Groundwater	Groundwater seepage was not encountered in the boreholes during drilling.

7.3 Field Screening

A summary of the field screening results are presented in the table below.

Table 7-2: Summary of Field Screening

Aspect	Details
PID Screening of Soil Samples for VOCs	PID soil sample headspace readings are presented in attached report tables and the COC documents attached in the appendices. All results were 0ppm isobutylene equivalents which indicates a lack of PID detectable VOCs.
Groundwater Depth & Flow	Groundwater seepage was not encountered during drilling. A standing water level (SWL) was measured in boreholes BH3, BH21, BH28 and BH29 at depths ranging from 3.6m to 4.75m a short time after completion of drilling. The remaining boreholes were dry during and a short time after completion of drilling.
Groundwater Field Parameters	Field measurements recorded during sampling were as follows: - pH ranged from 5.48 to 6.69; - EC ranged from 624µS/cm to 3264µS/cm; - Eh ranged from 0.2mV to 143.1mV; and - DO ranged from 0.5ppm to 2.1ppm.
LNAPLs petroleum hydrocarbons	Phase separated product (i.e. LNAPL) were not detected using the interphase probe during groundwater sampling.

7.4 Soil Laboratory Results

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

7.4.1 Human Health and Environmental (Ecological) Assessment

Table 7-3: Summary of Soil Laboratory Results – Human Health and Environmental (Ecological)

Analyte	Results Compared to SAC
Heavy Metals	All heavy metals results were below the SAC.
TRH	All TRH results were below the SAC.
BTEX	All BTEX results were below the SAC.
PAHs	All PAH and carcinogenic PAH results were below the SAC.
OCPs	All OCP results were below the SAC.
PCBs	All PCB results were below the SAC. All PCB concentrations were below the laboratory PQLs.

Analyte	Results Compared to SAC
Total Phenolics	All total phenolic results were below the SAC. All total phenolics concentrations were below the laboratory PQLs.
Coliforms	All faecal coliforms results were below the laboratory PQLs.
Asbestos	Asbestos was detected in the fragments of fibre cement analysed for the investigations. Asbestos was not detected in the soil samples analysed for the investigations.

7.4.2 Waste Classification Assessment

The laboratory results were assessed against the criteria presented in Part 1 of the Waste Classification Guidelines, as summarised previously in this report. The results are presented in the report tables attached in the appendices. A summary of the results is presented below.

Table 7-4: Summary of Soil Laboratory Results Compared to CT and SCC Criteria

Analyte	No. of Samples Analysed	No. of Results > CT Criteria	No. of Results > SCC Criteria	Comments
Heavy Metals	55	8	0	The chromium concentrations exceeded the CT1 criterion in two fill samples collected from BH12 (0.0-0.15m) and BH22 (0.0-0.15m). The maximum chromium concentration was 320mg/kg. The lead concentrations exceeded the CT1 criterion in two fill samples collected from BH11 (0.0-0.2m) and BH17 (0.0-0.2m). The maximum lead concentration was 560mg/kg. The nickel concentrations exceeded the CT1 criterion in five fill samples collected from BH14 (0.05-0.15m), BH22 (0.0-0.15m), BH26 (0.05-0.2m), BH27 (0.05-0.3m) and BH28 (0.1-0.25). The maximum nickel concentration was 190mg/kg.
TRH	55	0	0	-

Analyte	No. of Samples Analysed	No. of Results > CT Criteria	No. of Results > SCC Criteria	Comments
BTEX	55	0	0	-
Total PAHs	55	0	0	-
Benzo(a)pyrene	55	1	0	The benzo(a)pyrene concentration exceeded the CT1 criterion in sample BH24 (0.0-0.1). The benzo(a)pyrene concentration was 0.87mg/kg.
OCPs	40	0	0	-
PCBs	40	0	0	-
Asbestos	30	-	-	Asbestos was not detected in the soil samples analysed.

Table 7-5: Summary of Soil Laboratory Results Compared to TCLP Criteria

Analyte	No. of Samples Analysed	No. of Results > TCLP Criteria	Comments
Chromium	2	0	All results were below the TCLP1 criterion.
Lead	2	0	All results were below the TCLP1 criterion.
Nickel	5	0	All results were below the TCLP1 criterion.
Benzo(a)pyrene	1	0	All results were below the TCLP1 criterion.

7.5 Groundwater Laboratory Results

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

Table 7-6: Summary of Groundwater Laboratory Results – Human Health and Environmental (Ecological)

Analyte	Results Compared to SAC
Heavy Metals	Nickel concentrations in MW21 and MW29 were above the human health SAC. Copper in one sample (MW28) and nickel and zinc in all four samples were above the ecological SAC. All other heavy metals results were below the SAC.
TRH	All TRH results were below the SAC.
BTEX	All BTEX results were below the SAC.
Other VOCs	All VOC results were below the SAC.
PAHs	All PAH results were below the SAC.
Other Parameters	The results for pH, EC and hardness are summarised below: • pH ranged from 5.8 to 6.9; and • EC ranged from 1,100µS/cm to 2,600µS/cm.

8 WASTE CLASSIFICATION ASSESSMENT

8.1 Preliminary Waste Classification of Fill

Table 8-1: Preliminary Waste Classification

Material	Classification	Disposal Options
Fill material in the vicinity of BH31, in the footprint of the former demountable building	General Solid Waste (non-putrescible) containing asbestos	A NSW landfill licenced to receive the waste stream. The landfill should be contacted to obtain the required approvals prior to commencement of excavation.
Fill material across the remainder of the site.	General Solid Waste (non-putrescible)	A NSW landfill licenced to receive the waste stream. The landfill should be contacted to obtain the required approvals prior to commencement of excavation.

8.2 Classification of Natural Soil and Bedrock

Based on the scope of work undertaken for this assessment, and at the time of reporting, EIS are of the opinion that the natural soil and bedrock at the site meets the definition of **VENM** for off-site disposal or re-use purposes. VENM is considered suitable for re-use on-site, or alternatively, the information included in this report may be used to assess whether the material is suitable for beneficial reuse at another site as fill material. In accordance with Part 1 of the Waste Classification Guidelines, the VENM is pre-classified as general solid waste and can also be disposed of accordingly to a facility that is licensed to accept it.

9 DISCUSSION AND CONCLUSIONS

9.1 Tier 1 Risk Assessment and Review of CSM

For a contaminant to represent a risk to a receptor, the following three conditions must be present:

1. Source – The presence of a contaminant;
2. Pathway – A mechanism or action by which a receptor can become exposed to the contaminant; and
3. Receptor – The human or ecological entity which may be adversely impacted following exposure to contamination.

If one of the above components is missing, the potential for adverse risks is relatively low.

9.1.1 Soil

Elevated concentrations of CoPC were not encountered above the adopted SAC in any of the soil samples analysed.

9.1.2 Asbestos in Fibre Cement Fragments

Fibre cement fragments (FCF) were encountered on the surface of the site in the vicinity of BH31. Part of a demountable building had recently been removed and exposed fill containing building and demolition rubble was observed across the area (see Figure 2). The source of this FCF is considered to be associated with imported fill in this area based on the visible building and demolition rubble within the material (rubble, glass, brick, asphaltic concrete, asphalt, sandstone and igneous gravel, ash, and sand). None of the fragments could be broken by hand pressure, therefore the material was considered to be in the bonded form.

Building and demolition rubble was not observed within the fill profile at BH21 nor BH22, these boreholes were located approximately 20m to the south and 21`m to the north-east of BH31 respectively (refer to Figure 2). Based on the site observations made during the fieldwork, the asbestos contaminated fill is considered to be limited to the former demountable building footprint in the vicinity of BH31 and to extend to an approximate depth of 0.2m bgl. At the time of the fieldwork this area was secured with man-proof fencing preventing access by the general public however, contractors were observed to be operating in this area. Due to the identification of the FCF on the site surface and within shallow fill soils, there is a complete source-pathway-receptor (SPR) linkage. EIS are of the opinion that the risk posed to human receptors is low to moderate and will require remediation and/or management.

9.1.3 Groundwater

Elevated nickel concentrations were encountered at MW21 and MW29 at concentrations greater than the human contact (drinking water) SAC. An elevation of chromium was encountered in the groundwater at MW21 at a concentrations greater than the ecological SAC. These elevations are not considered to represent a significant ecological risk for the following reasons:

1. These elevated heavy metal concentrations are most likely a regional issue as no significant elevations of cadmium, copper, nickel or zinc were detected in any of the soil samples (i.e. there was no indication of a point source on site);
2. Elevated heavy metal concentrations are often encountered in urban groundwater. The elevated concentrations are typically associated with leaking water infrastructure and surface water runoff; and
3. Elevated heavy metal concentrations can be associated with groundwater from shale aquifers. This is due to the high concentrations of dissolved salts associated with groundwater from shale aquifers.

EIS note that the pH of two of the groundwater samples was outside of the acceptable range. This is most likely due to a regional issue and is unlikely to represent a human health or environmental risk to the proposed development. The proposed development will be connected to the mains water supply.

9.2 Decision Statements

The decision statements are addressed below:

Did the site inspection, or does the background information identify potential contamination sources/AEC at the site?

The site inspection identified fibre cement fragments on the site surface and within fill in the vicinity of BH31 where a demountable building had been recently removed. A diesel AST was identified within a small brick building located in the central section of the site. The review of the DP 2016 PSI report and geotechnical report identified a fill profile of between 0.1m and 1.0m across the site. The PSI report also indicated that a diesel UST which had been located in the central section of the site to the west of the existing AST (see Figure 2), was decommissioned in 1996, however it was unclear as to whether the UST was removed or decommissioned in-situ.

Are any results above the SAC?

The two representative samples of FCF were found to contain asbestos. None of the soil results were above the adopted SAC. None of the groundwater results were above the SAC.

Do potential risks associated with contamination exist, and if so, what are they?

Yes, there is a human health risk from the asbestos containing FCF identified at the site. There is potential for residual soil contamination to be present in the immediate vicinity of the decommissioned UST, and areas beneath the existing structures have not been included in the assessment.

Is there a requirement for remediation or further investigation?

Further investigation is considered necessary. Based on the current data the site surface will need to be cleared of FCF and the presence/absence of the UST should be confirmed.

Is the site suitable for the proposed development, or can the site be made suitable subject to further characterisation and/or remediation?

EIS are of the opinion that the site can be made suitable for the proposed development outlined in Section 1.1, subject to the implementation of the recommendations outlined in Section 10.

9.3 Data Gaps

The assessment has identified the following data gaps:

- Due to site access constraints, the presence of the former diesel UST identified in the DP PSI Report 2016 has not been fully assessed. It should be noted that monitoring well MW21 was positioned down-gradient of the former UST and the groundwater sample obtained from this monitoring well did not encounter any CoPC that are typically associated with a UST used for the storage of diesel. Furthermore, soil samples obtained within the vicinity of the former UST (BH08, BH09 and BH10) did not encounter any elevated concentrations of contaminants in soil; and
- Areas beneath the existing buildings have not been included in the assessment.

10 CONCLUSIONS AND RECOMMENDATIONS

EIS consider that the report objectives outlined in Section 1.2 have been addressed.

Based on the scope of works undertaken, EIS are of the opinion that the CoPC identified at the site pose a low-moderate risk to the receptors.

EIS are of the opinion that the site can be made suitable for the proposed development provided that the following recommendations are implemented to address the data gaps and to minimise/better manage/characterise the risks:

1. There may be a decommissioned UST on site. The Australian Standard AS 4976-2008 (The removal and disposal of underground storage tanks) states that in-situ abandonment should only be considered in the event that removal will cause damage to adjacent structures. EIS note that records relating to the decommissioning date from 1996 and there is no indication whether the decommissioning method involved removal or in-situ abandonment. If the UST was abandoned in-situ in 1996 it may not meet the current requirements of the Australia Standard for in-situ abandonment. The current status of the potential UST should be assessed. This could involve a combination of a Ground Penetrating Radar (GPR) survey of the area and partial excavation to expose the top of the UST. Once the status of the UST has been established a decision can be taken as to whether to remove it and validate the excavation or document that it has been appropriately decommissioned and left in place;
2. Conduct an emu-bob for removal of FCF across the exposed fill soils in the vicinity of BH31 by a suitably licenced asbestos contractor. All FCF disposed of to a NSW EPA licenced facility. Following removal a surface clearance should be undertaken by a SafeWork NSW licenced asbestos assessor. This will provide a safe working environment for site personnel and form part of the waste classification; and
3. An inspection of the site surface should be undertaken in the footprint of the existing site structures following demolition. Prior to demolition all asbestos containing materials should be removed from the buildings that are going to be demolished and disposed of appropriately. This will minimise the risk of contaminating the site surface with asbestos during demolition.

In the event unexpected conditions are encountered during development work or between sampling locations that may pose a contamination risk, all works should stop and an environmental consultant should be engaged to inspect the site and address the issue.

10.1 Regulatory Requirement

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

Table 10-1: Regulatory Requirement

Guideline	Applicability
Duty to Report Contamination 2015[20]	Please note that in the event the recommendations for additional work and remediation/management are not undertaken, there may be justification to notify the EPA. EIS can be contacted for further advice regarding notification.
POEO Act 1997	Section 143 of the POEO Act 1997 states that if waste is transported to a place that cannot lawfully be used as a waste facility for that waste, then the transporter and owner of the waste are each guilty of an offence. The transporter and owner of the waste have a duty to ensure that the waste is disposed of in an appropriate manner.
Work Health and Safety Code of Practice 2011[21]	Sites contaminated with asbestos become a 'workplace' when work is carried out there and require a register and asbestos management plan.
Guidelines for Implementing the POEO (UPSS) Regulation 2008[22]	The guidelines are designed to assist those responsible for UPSS to comply with the Regulation and summarise current industry best practice.

[20] NSW Department of Environment and Climate Change, (2015). *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997.* (referred to as Duty to Report Contamination 2015)

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

[22] NSW Department of Environment and Climate Change, (2008), *Guidelines for Implementing the Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2008*. (referred to as UPSS 2008).

11 LIMITATIONS

The report limitations are outlined below:

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

LIST OF IN-TEXT TABLES

IMPORTANT INFORMATION ABOUT THIS REPORT

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

The Report is based on a Unique Set of Project Specific Factors
This report has been prepared in response to specific project requirements as stated in the EIS proposal document which may have been limited by instructions from the client. This report should be reviewed, and if necessary, revised if any of the following occur:

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

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

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

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

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

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

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

Logs Should not be Separated from the Assessment Report
Borehole and test pit logs are prepared by environmental scientists, engineers or geologists based upon interpretation of field conditions and laboratory evaluation of field samples. Logs are normally provided in our reports and these should not be re-drawn for inclusion in site remediation or other design drawings, as subtle but significant drafting errors or omissions may occur in the transfer process. Photographic reproduction can eliminate this problem, however contractors can still misinterpret the logs during bid preparation if separated from the text of the assessment. If this occurs, delays, disputes and unanticipated costs may result. In all cases it is necessary to refer to the rest of the report to obtain a proper understanding of the assessment. Please note that logs with the 'Environmental Log' header are not suitable for geotechnical purposes as they have not been peer reviewed by a Senior Geotechnical Engineer.

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

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

REPORT FIGURES

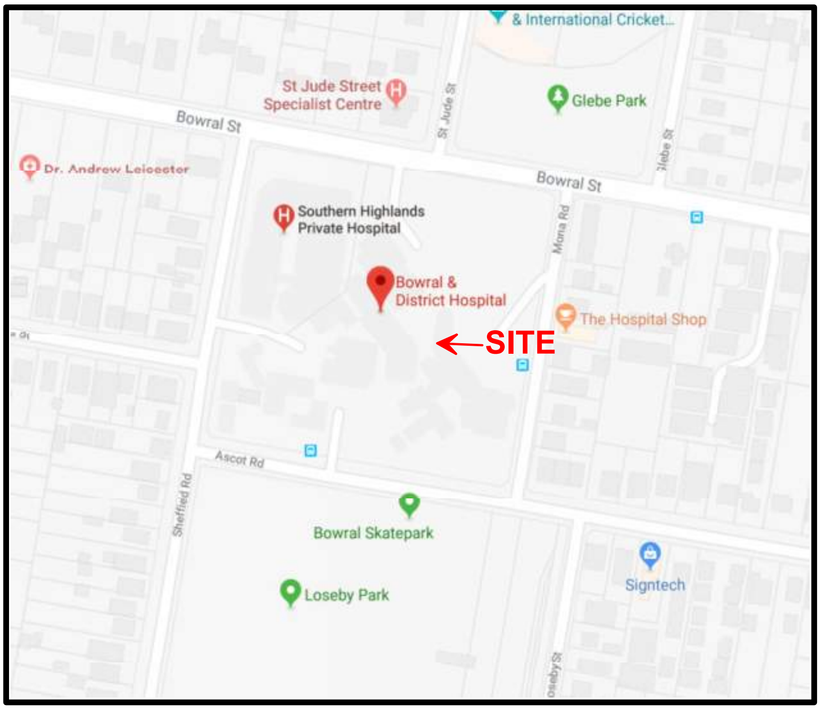

Image Sources:
https://maps.six.nsw.gov.au/
https://www.google.com.au/maps/

Title: **SITE LOCATION PLAN**		
Location: 97-103 BOWRAL ROAD BOWRAL, NSW		
Report No: E31452Krpt	Figure No: 1	
ENVIRONMENTAL INVESTIGATION SERVICES		

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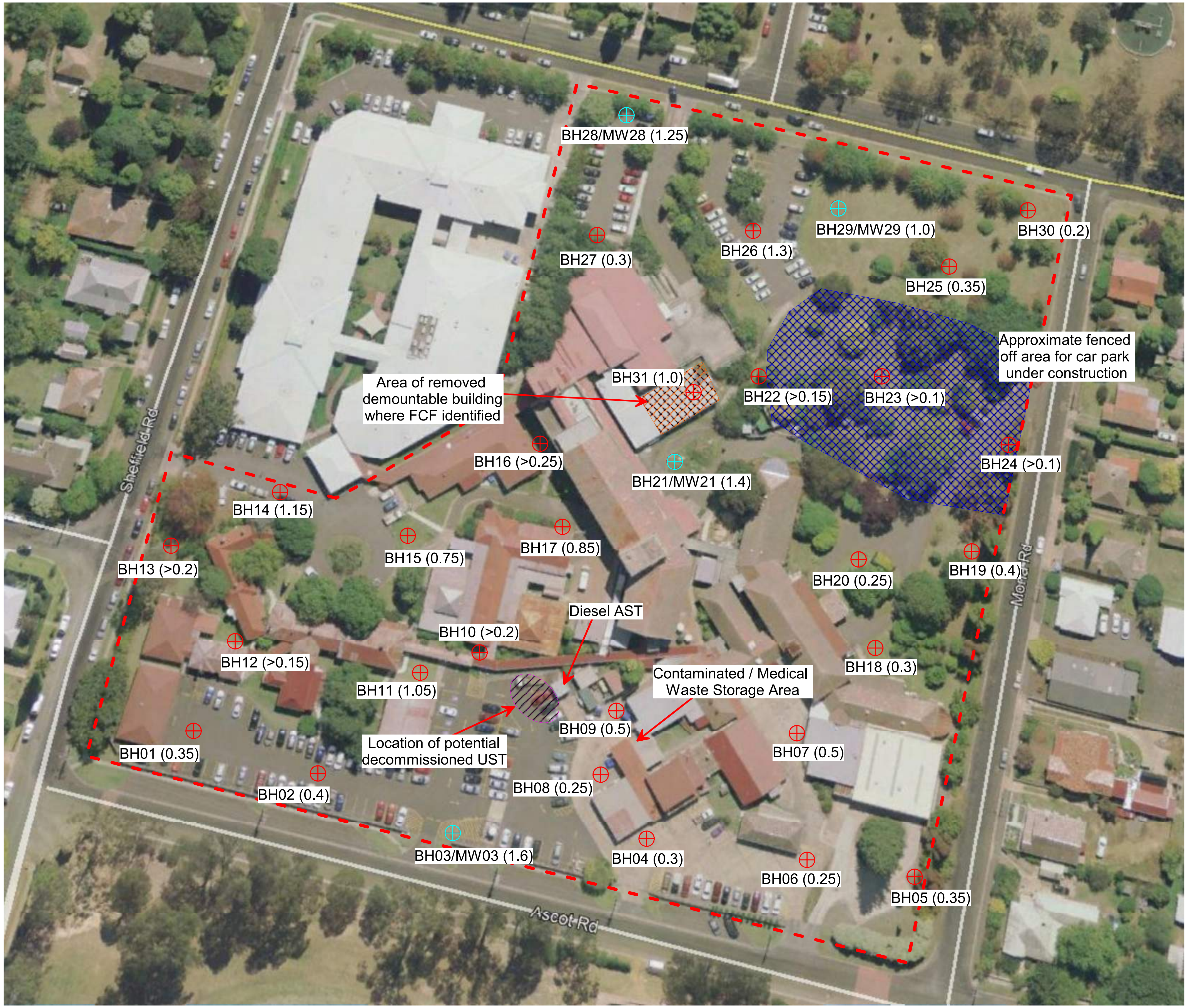

LEGEND:

- APPROXIMATE SITE BOUNDARY
- BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL
- BOREHOLE/GROUNDWATER WELL LOCATION, NUMBER AND DEPTH OF FILL

Scale: 0 20 40 60 80 100 Metres

Notes: scale is approximate. This plan should be read in conjunction with the EIS report.

Title:	SAMPLE LOCATION & SITE FEATURES PLAN
Location:	97-103 BOWRAL ROAD, BOWRAL, NSW
Report No:	E31452Krpt
Figure No:	2

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LABORATORY SUMMARY TABLES

ABBREVIATIONS AND EXPLANATIONS

Abbreviations used in the Tables:

ABC: Ambient Background Concentration
ACM: Asbestos Containing Material
ADWG: AustralianDrinking Water Guidelines
AF: Asbestos Fines
ANZECC: Australian and New Zealand Environment Conservation Council
B(a)P: Benzo(a)pyrene
CEC: Cation Exchange Capacity
CRC: Cooperative Research Centre
CT: Contaminant Threshold
EILs: Ecological Investigation Levels
ESLs: Ecological Screening Levels
FA: Fibrous Asbestos
GIL: Groundwater Investigation Levels
HILs: Health Investigation Levels
HSLs: Health Screening Levels
HSL-SSA: Health Screening Level-SiteSpecific Assessment
NA: Not Analysed
NC: Not Calculated
NEPM: National Environmental Protection Measure
NHMRC: National Health and Medical Research Council
NL: Not Limiting
NSL: No Set Limit
OCP: Organochlorine Pesticides
OPP: Organophosphorus Pesticides
PAHs: Polycyclic Aromatic Hydrocarbons
ppm: Parts per million
PCBs: Polychlorinated Biphenyls
PCE: Perchloroethylene (Tetrachloroethylene or Teterachloroethene)
pH_{KCL} : pH of filtered 1:20, 1M KCL extract, shaken overnight
pH_{ox} : pH of filtered 1:20 1M KCl after peroxide digestion
PQL: Practical Quantitation Limit
RS: Rinsate Sample
RSL: Regional Screening Levels
SAC: Site Assessment Criteria
SCC: Specific Contaminant Concentration
S_{Cr}: Chromium reducible sulfur
S_{POS}: Peroxide oxidisable Sulfur
SSA: Site Specific Assessment
SSHSLs: Site Specific Health Screening Levels
TAA: Total Actual Acidity in 1M KCL extract titrated to pH6.5
TB: Trip Blank
TCA: 1,1,1 Trichloroethane (methyl chloroform)
TCE: Trichloroethylene (Trichloroethene)
TCLP: Toxicity Characteristics Leaching Procedure
TPA: Total Potential Acidity, 1M KCL peroxide digest
TS: Trip Spike
TRH: Total Recoverable Hydrocarbons
TSA: Total Sulfide Acidity (TPA-TAA)
UCL: Upper Level Confidence Limit on Mean Value
USEPA United States Environmental Protection Ager
VOCC: Volatile Organic Chlorinated Compounds
WHO: World Health Organisation

Table Specific Explanations:

HIL Tables:

- The chromium results are for Total Chromium which includes Chromium III and VI. For initial screening purposes, we have assumed that the samples contain only Chromium VI unless demonstrated otherwise by additional analysis.
- Carcinogenic PAHs is a toxicity weighted sum of analyte concentrations for a specific list of PAH compounds relative to B(a)P. It is also refered to as the B(a)P Toxic Equivalence Quotient (TEQ).
- Statistical calculations are undertaken using ProUCL (USEPA). Statistical calculation is usually undertaken using data from fill samples.

EIL/ESL Table:

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

Waste Classification and TCLP Table:

- Data assessed using the NSW EPA Waste Classification Guidelines, Part 1: Classifying Waste (2014).
- The assessment of Total Moderately Harmful pesticides includes: Dichlorovos, Dimethoate, Fenitrothion, Ethion, Malathion and Parathion.
- Assessment of Total Scheduled pesticides include: HBC, alpha-BHC, gamma-BHC, beta-BHC, Heptachlor, Aldrin, Heptachlor Epoxide, gamma-Chlordane, alpha-chlordane, pp-DDE, Dieldrin, Endrin, pp-DDD, pp-DDT, Endrin Aldehyde.

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TABLE A
SOIL LABORATORY RESULTS COMPARED TO NEPM 2013.
HIL-D: 'Commercial/Industrial'

All data in mg/kg unless stated otherwise			HEAVY METALS								PAHs		ORGANOCHLORINE PESTICIDES (OCPs)							TOTAL PCBs	Total Phenolics	ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium VI	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	Carcinogenic PAHs	HCB	Endosulfan	Methoxychlor	Aldrin & Dieldrin	Chlordane	DDT, DDD & DDE	Heptachlor			
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	100
Site Assessment Criteria (SAC)			3000	900	3600	240000	1500	730	6000	400000	4000	40	80	2000	2500	45	530	3600	50	1	1	Detected/Not Detected
Sample Reference	**Sample Depth**	**Sample Description**																				
BH01	0.05-0.3	Fill: gravelly sand	<4	<0.4	2	190	6	<0.1	6	35	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH01	0.35-0.55	Silty clay	6	<0.4	53	10	11	<0.1	7	15	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH02	0.05-0.2	Fill: gravelly sand	<4	<0.4	2	220	7	<0.1	6	40	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH02	0.4-0.6	Silty clay	NA	NA	NA	NA	9	NA	NA	NA	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH03	0.14-0.3	Fill: gravelly sand	<4	<0.4	1	190	7	<0.1	4	33	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH03	1.7-1.95	Silty clay	<4	<0.4	15	9	13	<0.1	<1	3	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH04	0.17-0.3	Fill: silty clay	<4	<0.4	25	8	11	<0.1	5	14	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH04	0.4-0.6	Silty clay	<4	<0.4	46	7	10	<0.1	6	10	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH05	0.0-0.2	Fill: silty sand	5	<0.4	16	13	26	<0.1	5	120	3.6	0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH05	0.5-0.7	Silty clay	NA	NA	NA	NA	10	NA	NA	NA	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH06	0.15-0.25	Fill: sandy gravel	<4	<0.4	12	21	8	<0.1	5	23	2.8	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH06	0.4-0.6	Silty clay	<4	<0.4	38	4	9	<0.1	5	7	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH07	0.1-0.2	Fill brick and sand	<4	<0.4	5	20	2	<0.1	8	14	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH07	0.5-0.7	Silty clay	<4	<0.4	29	4	9	<0.1	5	7	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH08	0.25-0.35	Fill: silty clay	<4	<0.4	33	6	11	<0.1	5	8	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH08	0.5-0.6	Silty clay	<4	<0.4	36	6	11	<0.1	6	8	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH09	0.2-0.4	Fill: silty sand	<4	<0.4	17	6	12	<0.1	3	8	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH09	0.6-0.8	Silty clay	<4	<0.4	32	6	9	<0.1	4	6	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH10	0.0-0.15	Fill: silty sand	<4	<0.4	6	6	25	<0.1	2	60	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH10	0.15-0.2	Silty clay	NA	NA	NA	NA	47	NA	NA	NA	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH11	0.0-0.2	Fill: sandy silty clay	4	<0.4	16	19	560	0.9	6	260	2	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH11	0.5-0.7	Silty clay	NA	NA	NA	NA	19	NA	NA	NA	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH12	0.0-0.15	Fill: silty clay	<4	<0.4	130	28	38	<0.1	10	110	0.2	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH13	0.0-0.2	Silty clay	4	<0.4	38	12	43	<0.1	12	61	3.7	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH14	0.05-0.15	Fill: sandy gravel	<4	<0.4	27	35	3	<0.1	51	27	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH14	0.4-0.6	Silty clay	4	<0.4	51	11	14	<0.1	8	16	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH15	0.0-0.2	Fill: silty clay	<4	<0.4	15	6	35	<0.1	3	21	0.2	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH15	1.0-1.2	Silty clay	NA	NA	NA	NA	13	NA	NA	NA	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH16	0.0-0.2	Fill: silty clay	<4	<0.4	33	18	33	<0.1	19	58	0.3	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH17	0.0-0.2	Fill: silty clay	<4	<0.4	33	66	180	0.3	9	410	3.4	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH17	0.85-1.0	Silty clay	6	<0.4	35	14	13	<0.1	5	36	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH18	0.0-0.3	Fill: silty clay	<4	<0.4	19	14	66	0.2	5	45	9.1	1.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH18	0.5-0.7	Silty clay	NA	NA	NA	NA	44	NA	NA	NA	0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH19	0.0-0.2	Fill: silty clay	<4	<0.4	26	7	93	0.2	4	39	2.3	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH19	0.4-0.6	Silty clay	<4	<0.4	48	4	13	<0.1	8	9	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH20	0.0-0.2	Fill: silty clay	<4	<0.4	32	11	18	<0.1	5	19	6.2	0.7	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH20	0.4-0.6	Silty clay	<4	<0.4	44	4	13	<0.1	6	8	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH21	0.0-0.2	Fill: silty clay	<4	<0.4	27	32	34	0.1	6	99	2.6	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH21	1.7-1.95	Silty clay	24	<0.4	24	12	10	<0.1	<1	8	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH22	0.0-0.15	Fill: silty clay	<4	<0.4	320	12	18	<0.1	190	30	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH23	0.0-0.1	Fill: silty clay	<4	<0.4	40	4	17	<0.1	13	16	1.6	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH24	0.0-0.1	Fill: silty clay	<4	<0.4	50	10	32	<0.1	19	31	11	1.3	<0.1	<0.1	<0.1	3.2	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH25	0.0-0.2	Fill: silty clay	7	<0.4	50	5	11	<0.1	3	8	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH25	0.5-0.7	Silty clay	NA	NA	NA	NA	12	NA	NA	NA	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH26	0.05-0.2	Fill: sandy gravel	<4	<0.4	18	81	2	<0.1	46	31	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH26	1.5-1.7	Silty clay	7	<0.4	10	31	13	<0.1	4	18	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH27	0.05-0.3	Fill: sandy gravel	<4	<0.4	17	37	2	<0.1	56	29	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH27	0.5-0.7	Silty clay	NA	NA	NA	NA	12	NA	NA	NA	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH28	0.1-0.25	Fill: gravelly sand	<4	<0.4	16	30	17	<0.1	52	31	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH28	1.7-1.95	Silty clay	NA	NA	NA	NA	12	NA	NA	NA	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH29	0.0-0.2	Fill: silty clay	<4	<0.4	13	12	20	<0.1	3	22	1.2	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH29	1.7-1.95	Silty clay	NA	NA	NA	NA	9	NA	NA	NA	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH30	0.0-0.2	Fill: silty clay	<4	<0.4	29	7	20	<0.1	4	15	3.9	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
BH30	0.3-0.5	Silty clay	<4	<0.4	23	11	11	<0.1	4	8	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH31	0.0-0.2	Fill: silty clay	5	<0.4	20	9	20	0.1	3	63	1.4	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	Not Detected
SF1	surface	Material	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**Detected**
SF2	surface	Material	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**Detected**
Total Number of Samples			45	45	45	45	55	45	45	45	55	55	40	40	40	40	40	40	40	40	40	42
Maximum Value			24	<PQL	320	220	560	0.9	190	410	11	1.3	<PQL	<PQL	<PQL	3.2	<PQL	<PQL	<PQL	<PQL	<PQL	Detected

Concentration above the SAC **VALUE**

Standard deviation exceeds data assessment criteria VALUE

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

					C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	Field PID Measurement
PQL - Envirolab Services					25	50	0.2	0.5	1	1	1	ppm
NEPM 2013 HSL Land Use Category					**HSL-D: COMMERCIAL/INDUSTRIAL**							
Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**								
BH01	0.05-0.3	Fill: gravelly sand	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH01	0.35-0.55	Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH02	0.05-0.2	Fill: gravelly sand	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH02	0.4-0.6	Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH03	0.14-0.3	Fill: gravelly sand	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH03	1.7-1.95	Silty clay	1m to <2m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH04	0.17-0.3	Fill: silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH04	0.4-0.6	Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH05	0.0-0.2	Fill: silty sand	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH05	0.5-0.7	Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH06	0.15-0.25	Fill: sandy gravel	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH06	0.4-0.6	Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH07	0.1-0.2	Fill brick and sand	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH07	0.5-0.7	Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH08	0.25-0.35	Fill: silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH08	0.5-0.6	Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH09	0.2-0.4	Fill: silty sand	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH09	0.6-0.8	Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH10	0.0-0.15	Fill: silty sand	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH10	0.15-0.2	Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH11	0.0-0.2	Fill: sandy silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH11	0.5-0.7	Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH12	0.0-0.15	Fill: silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH13	0.0-0.2	Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH14	0.05-0.15	Fill: sandy gravel	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH14	0.4-0.6	Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH15	0.0-0.2	Fill: silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH15	1.0-1.2	Silty clay	1m to <2m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH16	0.0-0.2	Fill: silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH17	0.0-0.2	Fill: silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH17	0.85-1.0	Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH18	0.0-0.3	Fill: silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH18	0.5-0.7	Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH19	0.0-0.2	Fill: silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH19	0.4-0.6	Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH20	0.0-0.2	Fill: silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH20	0.4-0.6	Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH21	0.0-0.2	Fill: silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH21	1.7-1.95	Silty clay	1m to <2m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH22	0.0-0.15	Fill: silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH23	0.0-0.1	Fill: silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH24	0.0-0.1	Fill: silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH25	0.0-0.2	Fill: silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH25	0.5-0.7	Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH26	0.05-0.2	Fill: sandy gravel	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH26	1.5-1.7	Silty clay	1m to <2m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH27	0.05-0.3	Fill: sandy gravel	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH27	0.5-0.7	Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH28	0.1-0.25	Fill: gravelly sand	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH28	1.7-1.95	Silty clay	1m to <2m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH29	0.0-0.2	Fill: silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH29	1.7-1.95	Silty clay	1m to <2m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH30	0.0-0.2	Fill: silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH30	0.3-0.5	Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH31	0.0-0.2	Fill: silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
Total Number of Samples					55	55	55	55	55	55	55	55
Raw Max value					0	0	0	0	0	0	0	0
Maximum Value					<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL

Concentration above the SAC **VALUE**

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

SITE ASSESSMENT CRITERIA

					C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene
PQL - Envirolab Services					25	50	0.2	0.5	1	1	1
NEPM 2013 HSL Land Use Category					**HSL-D: COMMERCIAL/INDUSTRIAL**						
Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**							
BH01	0.05-0.3	Fill: gravelly sand	0m to < 1m	Sand	260	NL	3	NL	NL	230	NL
BH01	0.35-0.55	Silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH02	0.05-0.2	Fill: gravelly sand	0m to < 1m	Sand	260	NL	3	NL	NL	230	NL
BH02	0.4-0.6	Silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH03	0.14-0.3	Fill: gravelly sand	0m to < 1m	Sand	260	NL	3	NL	NL	230	NL
BH03	1.7-1.95	Silty clay	1m to <2m	Clay	480	NL	6	NL	NL	NL	NL
BH04	0.17-0.3	Fill: silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH04	0.4-0.6	Silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH05	0.0-0.2	Fill: silty sand	0m to < 1m	Sand	260	NL	3	NL	NL	230	NL
BH05	0.5-0.7	Silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH06	0.15-0.25	Fill: sandy gravel	0m to < 1m	Sand	260	NL	3	NL	NL	230	NL
BH06	0.4-0.6	Silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH07	0.1-0.2	Fill brick and sand	0m to < 1m	Sand	260	NL	3	NL	NL	230	NL
BH07	0.5-0.7	Silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH08	0.25-0.35	Fill: silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH08	0.5-0.6	Silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH09	0.2-0.4	Fill: silty sand	0m to < 1m	Sand	260	NL	3	NL	NL	230	NL
BH09	0.6-0.8	Silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH10	0.0-0.15	Fill: silty sand	0m to < 1m	Sand	260	NL	3	NL	NL	230	NL
BH10	0.15-0.2	Silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH11	0.0-0.2	Fill: sandy silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH11	0.5-0.7	Silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH12	0.0-0.15	Fill: silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH13	0.0-0.2	Silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH14	0.05-0.15	Fill: sandy gravel	0m to < 1m	Sand	260	NL	3	NL	NL	230	NL
BH14	0.4-0.6	Silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH15	0.0-0.2	Fill: silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH15	1.0-1.2	Silty clay	1m to <2m	Clay	480	NL	6	NL	NL	NL	NL
BH16	0.0-0.2	Fill: silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH17	0.0-0.2	Fill: silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH17	0.85-1.0	Silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH18	0.0-0.3	Fill: silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH18	0.5-0.7	Silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH19	0.0-0.2	Fill: silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH19	0.4-0.6	Silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH20	0.0-0.2	Fill: silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH20	0.4-0.6	Silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH21	0.0-0.2	Fill: silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH21	1.7-1.95	Silty clay	1m to <2m	Clay	480	NL	6	NL	NL	NL	NL
BH22	0.0-0.15	Fill: silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH23	0.0-0.1	Fill: silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH24	0.0-0.1	Fill: silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH25	0.0-0.2	Fill: silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH25	0.5-0.7	Silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH26	0.05-0.2	Fill: sandy gravel	0m to < 1m	Sand	260	NL	3	NL	NL	230	NL
BH26	1.5-1.7	Silty clay	1m to <2m	Clay	480	NL	6	NL	NL	NL	NL
BH27	0.05-0.3	Fill: sandy gravel	0m to < 1m	Sand	260	NL	3	NL	NL	230	NL
BH27	0.5-0.7	Silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH28	0.1-0.25	Fill: gravelly sand	0m to < 1m	Sand	260	NL	3	NL	NL	230	NL
BH28	1.7-1.95	Silty clay	1m to <2m	Clay	480	NL	6	NL	NL	NL	NL
BH29	0.0-0.2	Fill: silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH29	1.7-1.95	Silty clay	1m to <2m	Clay	480	NL	6	NL	NL	NL	NL
BH30	0.0-0.2	Fill: silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH30	0.3-0.5	Silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
BH31	0.0-0.2	Fill: silty clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL

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TABLE C
SOIL LABORATORY RESULTS COMPARED TO NEPM 2013 EILs AND ESLs
All data in mg/kg unless stated otherwise

Land Use Category				COMMERCIAL/INDUSTRIAL																			
							AGED HEAVY METALS-EILs						EILs		ESLs								
				pH	CEC ($cmol_c$/kg)	Clay Content (% clay)	Arsenic	Chromium	Copper	Lead	Nickel	Zinc	Naphthalene	DDT	C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)	Benzene	Toluene	Ethylbenzene	Total Xylenes	B(a)P
PQL - Envirolab Services				-	1	-	4	1	1	1	1	1	0.1	0.1	25	50	100	100	0.2	0.5	1	3	0.05
Ambient Background Concentration (ABC)				-	-	-	NSL	8	18	104	5	77	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL
Sample Reference	**Sample Depth**	**Sample Description**	**Soil Texture**																				
BH01	0.05-0.3	Fill: gravelly sand	Coarse	9.25	6	24.5	<4	2	200	6	6	35	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH01	0.35-0.55	Silty clay	Fine	9.25	6	24.5	6	53	10	11	7	15	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH02	0.05-0.2	Fill: gravelly sand	Coarse	9.25	6	24.5	<4	2	220	7	6	40	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH02	0.4-0.6	Silty clay	Fine	9.25	6	24.5	NA	NA	NA	9	NA	NA	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH03	0.14-0.3	Fill: gravelly sand	Coarse	9.25	6	24.5	<4	1	190	7	4	33	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH03	1.7-1.95	Silty clay	Fine	9.25	6	24.5	<4	15	9	13	<1	3	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH04	0.17-0.3	Fill: silty clay	Fine	9.25	6	24.5	<4	25	8	11	5	14	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH04	0.4-0.6	Silty clay	Fine	9.25	6	24.5	<4	46	7	10	6	10	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH05	0.0-0.2	Fill: silty sand	Coarse	9.25	6	24.5	5	17	15	25	5	140	<0.1	<0.1	<25	<50	100	<100	<0.2	<0.5	<1	<1	0.86
BH05	0.5-0.7	Silty clay	Fine	9.25	6	24.5	NA	NA	NA	10	NA	NA	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH06	0.15-0.25	Fill: sandy gravel	Coarse	9.25	6	24.5	<4	12	21	8	5	23	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	0.3
BH06	0.4-0.6	Silty clay	Fine	9.25	6	24.5	<4	38	4	9	5	7	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH07	0.1-0.2	Fill brick and sand	Coarse	9.25	6	24.5	<4	5	20	2	8	14	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH07	0.5-0.7	Silty clay	Fine	9.25	6	24.5	<4	29	4	9	5	7	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH08	0.25-0.35	Fill: silty clay	Fine	9.25	6	24.5	<4	33	6	11	5	8	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH08	0.5-0.6	Silty clay	Fine	9.25	6	24.5	<4	36	6	11	6	8	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH09	0.2-0.4	Fill: silty sand	Coarse	9.25	6	24.5	<4	20	8	12	4	10	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH09	0.6-0.8	Silty clay	Fine	9.25	6	24.5	<4	32	6	9	4	6	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH10	0.0-0.15	Fill: silty sand	Coarse	9.25	6	24.5	<4	6	6	25	2	60	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH10	0.15-0.2	Silty clay	Fine	9.25	6	24.5	NA	NA	NA	47	NA	NA	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH11	0.0-0.2	Fill: sandy silty clay	Fine	9.25	6	24.5	<4	6	6	25	2	60	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH11	0.5-0.7	Silty clay	Fine	9.25	6	24.5	NA	NA	NA	47	NA	NA	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH12	0.0-0.15	Fill: silty clay	Fine	9.25	6	24.5	<4	130	28	38	10	110	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	0.06
BH13	0.0-0.2	Silty clay	Fine	9.25	6	24.5	4	38	12	43	12	61	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	0.3
BH14	0.05-0.15	Fill: sandy gravel	Coarse	9.25	6	24.5	<4	28	43	3	53	31	<0.1	<0.1	<25	<50	<100	130	<0.2	<0.5	<1	<1	<0.05
BH14	0.4-0.6	Silty clay	Fine	9.25	6	24.5	4	51	11	14	8	16	<0.1	<0.1	<25	<50	<100	120	<0.2	<0.5	<1	<1	<0.05
BH15	0.0-0.2	Fill: silty clay	Fine	9.25	6	24.5	<4	15	6	35	3	21	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	0.05
BH15	1.0-1.2	Silty clay	Fine	9.25	6	24.5	NA	NA	NA	13	NA	NA	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH16	0.0-0.2	Fill: silty clay	Fine	9.25	6	24.5	<4	33	18	33	19	58	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	0.09
BH17	0.0-0.2	Fill: silty clay	Fine	9.25	6	24.5	<4	33	66	180	9	410	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	0.3
BH17	0.85-1.0	Silty clay	Fine	9.25	6	24.5	6	35	14	13	5	36	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH18	0.0-0.3	Fill: silty clay	Fine	9.25	6	24.5	<4	19	14	66	5	45	<0.1	<0.1	<25	<50	140	<100	<0.2	<0.5	<1	<1	0.75
BH18	0.5-0.7	Silty clay	Fine	9.25	6	24.5	NA	NA	NA	44	NA	NA	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	0.05
BH19	0.0-0.2	Fill: silty clay	Fine	9.25	6	24.5	<4	26	7	93	4	39	<0.1	<0.1	<25	<50	140	<100	<0.2	<0.5	<1	<1	0.2
BH19	0.4-0.6	Silty clay	Fine	9.25	6	24.5	<4	48	4	13	8	9	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH20	0.0-0.2	Fill: silty clay	Fine	9.25	6	24.5	<4	32	11	18	5	19	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	0.53
BH20	0.4-0.6	Silty clay	Fine	9.25	6	24.5	<4	44	4	13	6	8	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH21	0.0-0.2	Fill: silty clay	Fine	9.25	6	24.5	<4	27	32	34	6	99	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	0.3
BH21	1.7-1.95	Silty clay	Fine	9.25	6	24.5	24	24	12	10	<1	8	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH22	0.0-0.15	Fill: silty clay	Fine	9.25	6	24.5	<4	320	12	18	190	30	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH23	0.0-0.1	Fill: silty clay	Fine	9.25	6	24.5	<4	40	4	17	13	16	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	0.2
BH24	0.0-0.1	Fill: silty clay	Fine	9.25	6	24.5	<4	48	9	28	17	28	<0.1	<0.1	<25	<50	110	<100	<0.2	<0.5	<1	<1	0.74
BH25	0.0-0.2	Fill: silty clay	Fine	9.25	6	24.5	7	50	5	11	3	8	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH25	0.5-0.7	Silty clay	Fine	9.25	6	24.5	NA	NA	NA	12	NA	NA	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH26	0.05-0.2	Fill: sandy gravel	Coarse	9.25	6	24.5	<4	18	81	2	46	31	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH26	1.5-1.7	Silty clay	Fine	9.25	6	24.5	7	10	31	13	4	18	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH27	0.05-0.3	Fill: sandy gravel	Coarse	9.25	6	24.5	<4	17	37	2	56	29	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH27	0.5-0.7	Silty clay	Fine	9.25	6	24.5	NA	NA	NA	12	NA	NA	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH28	0.1-0.25	Fill: gravelly sand	Coarse	9.25	6	24.5	<4	17	29	16	50	32	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	0.08
BH28	1.7-1.95	Silty clay	Fine	9.25	6	24.5	NA	NA	NA	12	NA	NA	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH29	0.0-0.2	Fill: silty clay	Fine	9.25	6	24.5	<4	13	12	20	3	22	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	0.1
BH29	1.7-1.95	Silty clay	Fine	9.25	6	24.5	NA	NA	NA	9	NA	NA	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH30	0.0-0.2	Fill: silty clay	Fine	9.25	6	24.5	<4	29	7	20	4	15	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	0.4
BH30	0.3-0.5	Silty clay	Fine	9.25	6	24.5	<4	23	11	11	4	8	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH31	0.0-0.2	Fill: silty clay	Fine	9.25	6	24.5	5	20	9	20	3	63	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	0.1
Total Number of Samples				55	55	55	45	45	45	55	45	45	55	55	55	55	55	55	55	55	55	55	55
Maximum Value				9.25	6	24.5	24	320	220	180	190	410	<PQL	<PQL	<PQL	<PQL	140	130	<PQL	<PQL	<PQL	<PQL	0.86

Concentration above the SAC VALUE

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

EIL AND ESL ASSESSMENT CRITERIA

Land Use Category				COMMERCIAL/INDUSTRIAL																			
							AGED HEAVY METALS-EILs						EILs		ESLs								
				pH	CEC ($cmol_c$/kg)	Clay Content (% clay)	Arsenic	Chromium	Copper	Lead	Nickel	Zinc	Naphthalene	DDT	C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)	Benzene	Toluene	Ethylbenzene	Total Xylenes	B(a)P
PQL - Envirolab Services				-	1	-	4	1	1	1	1	1	0.1	0.1	25	50	100	100	0.2	0.5	1	3	0.05
Ambient Background Concentration (ABC)				-	-	-	NSL	8	18	104	5	77	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL
Sample Reference	**Sample Depth**	**Sample Description**	**Soil Texture**																				
BH01	0.05-0.3	Fill: gravelly sand	Coarse	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	1700	3300	75	135	165	180	172
BH01	0.35-0.55	Silty clay	Fine	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172
BH02	0.05-0.2	Fill: gravelly sand	Coarse	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	1700	3300	75	135	165	180	172
BH02	0.4-0.6	Silty clay	Fine	9.25	6	24.5	--	--	--	1904	--	--	370	640	215	170	2500	6600	95	135	185	95	172
BH03	0.14-0.3	Fill: gravelly sand	Coarse	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	1700	3300	75	135	165	180	172
BH03	1.7-1.95	Silty clay	Fine	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172
BH04	0.17-0.3	Fill: silty clay	Fine	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172
BH04	0.4-0.6	Silty clay	Fine	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172
BH05	0.0-0.2	Fill: silty sand	Coarse	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	1700	3300	75	135	165	180	172
BH05	0.5-0.7	Silty clay	Fine	9.25	6	24.5	--	--	--	1904	--	--	370	640	215	170	2500	6600	95	135	185	95	172
BH06	0.15-0.25	Fill: sandy gravel	Coarse	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	1700	3300	75	135	165	180	172
BH06	0.4-0.6	Silty clay	Fine	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172
BH07	0.1-0.2	Fill brick and sand	Coarse	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	1700	3300	75	135	165	180	172
BH07	0.5-0.7	Silty clay	Fine	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172
BH08	0.25-0.35	Fill: silty clay	Fine	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172
BH08	0.5-0.6	Silty clay	Fine	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172
BH09	0.2-0.4	Fill: silty sand	Coarse	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172
BH09	0.6-0.8	Silty clay	Fine	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172
BH10	0.0-0.15	Fill: silty sand	Coarse	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	1700	3300	75	135	165	180	172
BH10	0.15-0.2	Silty clay	Fine	9.25	6	24.5	--	--	--	1904	--	--	370	640	215	170	2500	6600	95	135	185	95	172
BH11	0.0-0.2	Fill: sandy silty clay	Fine	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172
BH11	0.5-0.7	Silty clay	Fine	9.25	6	24.5	--	--	--	1904	--	--	370	640	215	170	2500	6600	95	135	185	95	172
BH12	0.0-0.15	Fill: silty clay	Fine	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172
BH13	0.0-0.2	Silty clay	Fine	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172
BH14	0.05-0.15	Fill: sandy gravel	Coarse	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	1700	3300	75	135	165	180	172
BH14	0.4-0.6	Silty clay	Fine	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172
BH15	0.0-0.2	Fill: silty clay	Fine	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172
BH15	1.0-1.2	Silty clay	Fine	9.25	6	24.5	--	--	--	1904	--	--	370	640	215	170	2500	6600	95	135	185	95	172
BH16	0.0-0.2	Fill: silty clay	Fine	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172
BH17	0.0-0.2	Fill: silty clay	Fine	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172
BH17	0.85-1.0	Silty clay	Fine	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172
BH18	0.0-0.3	Fill: silty clay	Fine	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172
BH18	0.5-0.7	Silty clay	Fine	9.25	6	24.5	--	--	--	1904	--	--	370	640	215	170	2500	6600	95	135	185	95	172
BH19	0.0-0.2	Fill: silty clay	Fine	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172
BH19	0.4-0.6	Silty clay	Fine	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172
BH20	0.0-0.2	Fill: silty clay	Fine	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172
BH20	0.4-0.6	Silty clay	Fine	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172
BH21	0.0-0.2	Fill: silty clay	Fine	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172
BH21	1.7-1.95	Silty clay	Fine	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172
BH22	0.0-0.15	Fill: silty clay	Fine	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172
BH23	0.0-0.1	Fill: silty clay	Fine	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172
BH24	0.0-0.1	Fill: silty clay	Fine	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172
BH25	0.0-0.2	Fill: silty clay	Fine	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172
BH25	0.5-0.7	Silty clay	Fine	9.25	6	24.5	--	--	--	1904	--	--	370	640	215	170	2500	6600	95	135	185	95	172
BH26	0.05-0.2	Fill: sandy gravel	Coarse	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	1700	3300	75	135	165	180	172
BH26	1.5-1.7	Silty clay	Fine	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172
BH27	0.05-0.3	Fill: sandy gravel	Coarse	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	1700	3300	75	135	165	180	172
BH27	0.5-0.7	Silty clay	Fine	9.25	6	24.5	--	--	--	1904	--	--	370	640	215	170	2500	6600	95	135	185	95	172
BH28	0.1-0.25	Fill: gravelly sand	Coarse	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	1700	3300	75	135	165	180	172
BH28	1.7-1.95	Silty clay	Fine	9.25	6	24.5	--	--	--	1904	--	--	370	640	215	170	2500	6600	95	135	185	95	172
BH29	0.0-0.2	Fill: silty clay	Fine	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172
BH29	1.7-1.95	Silty clay	Fine	9.25	6	24.5	--	--	--	1904	--	--	370	640	215	170	2500	6600	95	135	185	95	172
BH30	0.0-0.2	Fill: silty clay	Fine	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172
BH30	0.3-0.5	Silty clay	Fine	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172
BH31	0.0-0.2	Fill: silty clay	Fine	9.25	6	24.5	160	668	298	1904	295	697	370	640	215	170	2500	6600	95	135	185	95	172

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TABLE D
SOIL LABORATORY RESULTS COMPARED TO WASTE CLASSIFICATION GUIDELINES
All data in mg/kg unless stated otherwise

			HEAVY METALS								PAHs		OC/OP PESTICIDES				Total PCBs	TRH					BTEX COMPOUNDS				ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	B(a)P	Total Endosulfans	Chloropyrifos	Total Moderately Harmful	Total Scheduled		C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	Total C_{10}-C_{36}	Benzene	Toluene	Ethyl benzene	Total Xylenes	
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.05	0.1	0.1	0.1	0.1	0.1	25	50	100	100	250	0.2	0.5	1	3	100
General Solid Waste CT1			100	20	100	NSL	100	4	40	NSL	200	0.8	60	4	250	<50	<50	650		NSL		10,000	10	288	600	1,000	-
General Solid Waste SCC1			500	100	1900	NSL	1500	50	1050	NSL	200	10	108	7.5	250	<50	<50	650		NSL		10,000	18	518	1,080	1,800	-
Restricted Solid Waste CT2			400	80	400	NSL	400	16	160	NSL	800	3.2	240	16	1000	<50	<50	2600		NSL		40,000	40	1,152	2,400	4,000	-
Restricted Solid Waste SCC2			2000	400	7600	NSL	6000	200	4200	NSL	800	23	432	30	1000	<50	<50	2600		NSL		40,000	72	2,073	4,320	7,200	-
Sample Reference	**Sample Depth**	**Sample Description**																									
BH01	0.05-0.3	Fill: gravelly sand	<4	<0.4	2	190	6	<0.1	6	35	<0.05	<0.05	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	Not Detected
BH01	0.35-0.55	Silty clay	6	<0.4	53	10	11	<0.1	7	15	<0.05	<0.05	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	NA
BH02	0.05-0.2	Fill: gravelly sand	<4	<0.4	2	220	7	<0.1	6	40	<0.05	<0.05	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	Not Detected
BH02	0.4-0.6	Silty clay	NA	NA	NA	NA	9	NA	NA	NA	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	NA
BH03	0.14-0.3	Fill: gravelly sand	<4	<0.4	1	190	7	<0.1	4	33	<0.05	<0.05	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	Not Detected
BH03	1.7-1.95	Silty clay	<4	<0.4	15	9	13	<0.1	<1	3	<0.05	<0.05	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	NA
BH04	0.17-0.3	Fill: silty clay	<4	<0.4	25	8	11	<0.1	5	14	<0.05	<0.05	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	Not Detected
BH04	0.4-0.6	Silty clay	<4	<0.4	46	7	10	<0.1	6	10	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	NA
BH05	0.0-0.2	Fill: silty sand	5	<0.4	16	13	26	<0.1	5	120	3.6	0.4	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	Not Detected
BH05	0.5-0.7	Silty clay	NA	NA	NA	NA	10	NA	NA	NA	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	NA
BH06	0.15-0.25	Fill: sandy gravel	<4	<0.4	12	21	8	<0.1	5	23	2.8	0.3	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	Not Detected
BH06	0.4-0.6	Silty clay	<4	<0.4	38	4	9	<0.1	5	7	<0.05	<0.05	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	NA
BH07	0.1-0.2	Fill brick and sand	<4	<0.4	5	20	2	<0.1	8	14	<0.05	<0.05	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	Not Detected
BH07	0.5-0.7	Silty clay	<4	<0.4	29	4	9	<0.1	5	7	<0.05	<0.05	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	NA
BH08	0.25-0.35	Fill: silty clay	<4	<0.4	33	6	11	<0.1	5	8	<0.05	<0.05	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	Not Detected
BH08	0.5-0.6	Silty clay	<4	<0.4	36	6	11	<0.1	6	8	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	NA
BH09	0.2-0.4	Fill: silty sand	<4	<0.4	17	6	12	<0.1	3	8	<0.05	<0.05	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	Not Detected
BH09	0.6-0.8	Silty clay	<4	<0.4	32	6	9	<0.1	4	6	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	NA
BH10	0.0-0.15	Fill: silty sand	<4	<0.4	6	6	25	<0.1	2	60	<0.05	<0.05	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	Not Detected
BH10	0.15-0.2	Silty clay	NA	NA	NA	NA	47	NA	NA	NA	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	NA
BH11	0.0-0.2	Fill: sandy silty clay	4	<0.4	16	19	**560**	0.9	6	260	2	0.2	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	Not Detected
BH11	0.5-0.7	Silty clay	NA	NA	NA		19	NA	NA	NA	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	NA
BH12	0.0-0.15	Fill: silty clay	<4	<0.4	**130**	28	38	<0.1	10	110	0.2	0.06	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	Not Detected
BH13	0.0-0.2	Silty clay	4	<0.4	38	12	43	<0.1	12	61	3.7	0.3	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	NA
BH14	0.05-0.15	Fill: sandy gravel	<4	<0.4	27	35	3	<0.1	**51**	27	<0.05	<0.05	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	Not Detected
BH14	0.4-0.6	Silty clay	4	<0.4	51	11	14	<0.1	8	16	<0.05	<0.05	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	NA
BH15	0.0-0.2	Fill: silty clay	<4	<0.4	15	6	35	<0.1	3	21	0.2	0.05	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	Not Detected
BH15	1.0-1.2	Silty clay	NA	NA	NA	NA	13	NA	NA	NA	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	NA
BH16	0.0-0.2	Fill: silty clay	<4	<0.4	33	18	33	<0.1	19	58	0.3	0.09	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	Not Detected
BH17	0.0-0.2	Fill: silty clay	<4	<0.4	33	66	**180**	0.3	9	410	3.4	0.3	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	Not Detected
BH17	0.85-1.0	Silty clay	6	<0.4	35	14	13	<0.1	5	36	<0.05	<0.05	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	NA
BH18	0.0-0.3	Fill: silty clay	<4	<0.4	19	14	66	0.2	5	45	9.1	0.75	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	100	<PQL	<0.2	<0.5	<1	<1	Not Detected
BH18	0.5-0.7	Silty clay	NA	NA	NA	NA	44	NA	NA	NA	0.05	0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	NA
BH19	0.0-0.2	Fill: silty clay	<4	<0.4	26	7	93	0.2	4	39	2.3	0.2	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	Not Detected
BH19	0.4-0.6	Silty clay	<4	<0.4	48	4	13	<0.1	8	9	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	NA
BH20	0.0-0.2	Fill: silty clay	<4	<0.4	32	11	18	<0.1	5	19	6.2	0.53	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	Not Detected
BH20	0.4-0.6	Silty clay	<4	<0.4	44	4	13	<0.1	6	8	<0.05	<0.05	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	NA
BH21	0.0-0.2	Fill: silty clay	<4	<0.4	27	32	34	0.1	6	99	2.6	0.3	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	Not Detected
BH21	1.7-1.95	Silty clay	24	<0.4	24	12	10	<0.1	<1	8	<0.05	<0.05	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	NA
BH22	0.0-0.15	Fill: silty clay	<4	<0.4	**320**	12	18	<0.1	**190**	30	<0.05	<0.05	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	Not Detected
BH23	0.0-0.1	Fill: silty clay	<4	<0.4	40	4	17	<0.1	13	16	1.6	0.2	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	Not Detected
BH24	0.0-0.1	Fill: silty clay	<4	<0.4	50	10	32	<0.1	19	31	11	**0.87**	<0.1	<0.1	NA	3.2	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	Not Detected
BH25	0.0-0.2	Fill: silty clay	7	<0.4	50	5	11	<0.1	3	8	<0.05	<0.05	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	Not Detected
BH25	0.5-0.7	Silty clay	NA	NA	NA	NA	12	NA	NA	NA	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	NA
BH26	0.05-0.2	Fill: sandy gravel	<4	<0.4	18	81	2	<0.1	**46**	31	<0.05	<0.05	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	Not Detected
BH26	1.5-1.7	Silty clay	7	<0.4	10	31	13	<0.1	4	18	<0.05	<0.05	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	NA
BH27	0.05-0.3	Fill: sandy gravel	<4	<0.4	17	37	2	<0.1	**56**	29	<0.05	<0.05	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	Not Detected
BH27	0.5-0.7	Silty clay	NA	NA	NA	NA	12	NA	NA	NA	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	NA
BH28	0.1-0.25	Fill: gravelly sand	<4	<0.4	16	30	17	<0.1	**52**	31	<0.05	<0.05	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	Not Detected
BH28	1.7-1.95	Silty clay	NA	NA	NA	NA	12	NA	NA	NA	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	NA
BH29	0.0-0.2	Fill: silty clay	<4	<0.4	13	12	20	<0.1	3	22	1.2	0.1	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	Not Detected
BH29	1.7-1.95	Silty clay	NA	NA	NA	NA	9	NA	NA	NA	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	NA
BH30	0.0-0.2	Fill: silty clay	<4	<0.4	29	7	20	<0.1	4	15	3.9	0.4	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	Not Detected
BH30	0.3-0.5	Silty clay	<4	<0.4	23	11	11	<0.1	4	8	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	NA
BH31	0.0-0.2	Fill: silty clay	5	<0.4	20	9	20	0.1	3	63	1.4	0.1	<0.1	<0.1	NA	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	Not Detected
																						<PQL					
																						<PQL					
Total Number of samples			45	45	45	45	55	45	45	45	55	55	40	40	0	40	40	55	55	55	55	56	55	55	55	55	30
Maximum Value			24	<PQL	320	220	560	0.9	190	410	11	0.87	<PQL	<PQL	<PQL	3.2	<PQL	<PQL	<PQL	<PQL	100	<PQL	<PQL	<PQL	<PQL	<PQL	NC

Concentration above the CT1	VALUE
Concentration above SCC1	VALUE
Concentration above the SCC2	VALUE

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

			Chromium	Lead	Nickel	B(a)P
PQL - Envirolab Services			0.01	0.03	0.02	0.001
TCLP1 - General Solid Waste			5	5	2	0.04
TCLP2 - Restricted Solid Waste			20	20	8	0.16
TCLP3 - Hazardous Waste			>20	>20	>8	>0.16
Sample Reference	**Sample Depth**	**Sample Description**				
BH11	0.0-0.2	Fill: sandy silty clay	NA	0.2	NA	NA
BH12	0.0-0.15	Fill: silty clay	<0.01	NA	NA	NA
BH14	0.05-0.15	Fill: sandy gravel	NA	NA	<0.02	NA
BH17	0.0-0.2	Fill: silty clay	NA	0.1	NA	NA
BH22	0.0-0.15	Fill: silty clay	<0.01	NA	<0.02	NA
BH24	0.0-0.1	Fill: silty clay	NA	NA	NA	<0.001
BH26	0.05-0.2	Fill: sandy gravel	NA	NA	0.03	NA
BH27	0.05-0.3	Fill: sandy gravel	NA	NA	0.07	NA
BH28	0.1-0.25	Fill: gravelly sand	NA	NA	0.02	NA
Total Number of samples			2	2	5	1
Maximum Value			<PQL	0.2	0.07	<PQL

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

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

				C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	PID
PQL - Envirolab Services				10	50	1	1	1	3	1	
NEPM 2013 - Land Use Category				**HSL-D: COMMERCIAL/INDUSTRIAL**							
Sample Reference	**Water Depth**	**Depth Category**	**Soil Category**								
MW03	3.25	2m to <4m	Clay	<10	<50	<1	<1	<1	<1	<0.2	7
MW21	2.05	2m to <4m	Clay	<10	<50	<1	<1	<1	<1	<0.2	0
MW28	1.25	0m to <2m	Clay	<10	<50	<1	<1	<1	<1	<0.2	1
MW29	1.24	0m to <2m	Clay	<10	<50	<1	<1	<1	<1	<0.2	1
Total Number of Samples				4	4	4	4	4	4	4	4
Maximum Value				<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	7

Concentration above the SAC	VALUE
Site specific assesment (SSA) required	VALUE

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

HSL GROUNDWATER ASSESSMENT CRITERIA

				C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene
PQL - Envirolab Services				10	50	1	1	1	3	1
NEPM 2013 - Land Use Category				**HSL-D: COMMERCIAL/INDUSTRIAL**						
Sample Reference	**Water Depth**	**Depth Category**	**Soil Category**							
MW03	3.25	2m to <4m	Clay	NL	NL	30000	NL	NL	NL	NL
MW21	2.05	2m to <4m	Clay	NL	NL	30000	NL	NL	NL	NL
MW28	1.25	0m to <2m	Clay	NL	SSA	SSA	SSA	SSA	SSA	SSA
MW29	1.24	0m to <2m	Clay	NL	SSA	SSA	SSA	SSA	SSA	SSA

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TABLE G

GROUNDWATER LABORATORY RESULTS COMPARED TO SITE SPECIFIC HSLs - RISK ASSESSMENT

All results in µg/L unless stated otherwise.

	PQL Envirolab Services	NHMRC ADWG 2011	WHO 2008	USEPA RSL Tapwater 2017	SAMPLES			
					MW03	MW21	MW28	MW29
Total Recoverable Hydrocarbons (TRH)								
C_6-C_9 Aliphatics (assessed using F1)	10	NSL	15000	-				
>C_9-C_{14} Aliphatics (assessed using F2)	50	NSL	100	-				
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)								
Benzene	1	1	-	-	<1	<1	<1	<1
Toluene	1	800	-	-	<1	<1	<1	<1
Ethylbenzene	1	300	-	-	<1	<1	<1	<1
Total xylenes	2	600	-	-	<1	<1	<1	<1
Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	0.2	-	-	6.1	<0.2	<0.2	<0.2	<0.2
Volatile Organic Compounds (VOCs), including chlorinated VOCs								
Vinyl Chloride	**10**	0.3	-	-	<10	<10	<10	<10
1,1-Dichloroethene	1	30	-	-	<1	<1	<1	<1
Chloroform	1	250	-	-	<1	<1	<1	<1
Bromodichloromethane	1		-	-	<1	<1	<1	<1
1,2-dichloroethane	1	3	-	-	<1	<1	<1	<1
Chlorobenzene	1	300	-	-	<1	<1	<1	<1
1,3-dichlorobenzene	1	300	-	-	<1	<1	<1	<1
1,4-dichlorobenzene	1	40	-	-	<1	<1	<1	<1
1,2-dichlorobenzene	1	1500	-	-	<1	<1	<1	<1

Concentration above the HSL -SSA: VALUE

PQL exceeds GIL: **BOLD/RED**

NOTE: please go through and identify all GILs > than PQL

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TABLE H

SUMMARY OF GROUNDAWATER LABORATORY RESULTS COMPARED TO HUMAN CONTACT GILs

All results in µg/L unless stated otherwise.

	PQL Envirolab Services	ANZECC 2000 Recreational	NHMRC ADWG 2011	SAMPLES			
				MW03	MW21	MW28	MW29
Inorganic Compounds and Parameters							
pH	0.1	6.5 - 8.5	6.5 - 8.5	**6**	**5.8**	6.9	6.5
Electrical Conductivity (µS/cm)	1	NSL	NSL	2600	1100	2100	2100
Metals and Metalloids							
Arsenic (As III)	1	50	10	2	2	5	5
Cadmium	0.1	5	2	0.8	0.4	<0.1	<0.1
Chromium (total)	1	50	50	<1	<1	<1	<1
Copper	1	1000	2000	1	4	<1	<1
Lead	1	50	10	<1	<1	<1	<1
Total Mercury (inorganic)	0.05	1	1	<0.05	<0.05	<0.05	<0.05
Nickel	1	100	20	13	**22**	14	**21**
Zinc	1	5000	3000	49	120	26	11
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)							
Benzene	1	10	1	<1	<1	<1	<1
Toluene	1	NSL	800	<1	<1	<1	<1
Ethylbenzene	1	NSL	300	<1	<1	<1	<1
m+p-xylene	2	NSL	NSL	<2	<2	<2	<2
o-xylene	1	NSL	NSL	<1	<1	<1	<1
Total xylenes	2	NSL	600	<1	<1	<1	<1
Volatile Organic Compounds (VOCs), including chlorinated VOCs							
Dichlorodifluoromethane	10	NSL	NSL	<10	<10	<10	<10
Chloromethane	10	NSL	NSL	<10	<10	<10	<10
Vinyl Chloride	10	NSL	0.3	<10	<10	<10	<10
Bromomethane	10	NSL	NSL	<10	<10	<10	<10
Chloroethane	10	NSL	NSL	<10	<10	<10	<10
Trichlorofluoromethane	10	NSL	NSL	<10	<10	<10	<10
1,1-Dichloroethene	**1**	0.3	30	<1	<1	<1	<1
Trans-1,2-dichloroethene	1	NSL	NSL	<1	<1	<1	<1
1,1-dichloroethane	1	NSL	NSL	<1	<1	<1	<1
Cis-1,2-dichloroethene	1	NSL	NSL	<1	<1	<1	<1
Bromochloromethane	1	NSL	250	<1	<1	<1	<1
Chloroform	1	NSL		<1	<1	<1	<1
2,2-dichloropropane	1	NSL	NSL	<1	<1	<1	<1
1,2-dichloroethane	1	10	3	<1	<1	<1	<1
1,1,1-trichloroethane	1	NSL	NSL	<1	<1	<1	<1
1,1-dichloropropene	1	NSL	NSL	<1	<1	<1	<1
Cyclohexane	1	NSL	NSL	<1	<1	<1	<1
Carbon tetrachloride	1	3	NSL	<1	<1	<1	<1
Benzene	1	NSL	see BTEX	<1	<1	<1	<1
Dibromomethane	1	NSL	NSL	<1	<1	<1	<1
1,2-dichloropropane	1	NSL	NSL	<1	<1	<1	<1
Trichloroethene	1	30	NSL	<1	<1	<1	<1
Bromodichloromethane	1	NSL	NSL	<1	<1	<1	<1
trans-1,3-dichloropropene	1	NSL	NSL	<1	<1	<1	<1
cis-1,3-dichloropropene	1	NSL	NSL	<1	<1	<1	<1
1,1,2-trichloroethane	1	NSL	NSL	<1	<1	<1	<1
Toluene	1	NSL	see BTEX	<1	<1	<1	<1
1,3-dichloropropane	1	NSL	NSL	<1	<1	<1	<1
Dibromochloromethane	1	NSL	NSL	<1	<1	<1	<1
1,2-dibromoethane	1	NSL	NSL	<1	<1	<1	<1
Tetrachloroethene	1	10	NSL	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	1	NSL	NSL	<1	<1	<1	<1
Chlorobenzene	1	NSL	300	<1	<1	<1	<1
Ethylbenzene	1	NSL	see BTEX	<1	<1	<1	<1
Bromoform	1	NSL	NSL	<1	<1	<1	<1
m+p-xylene	2	NSL	see BTEX	<2	<2	<2	<2
Styrene	1	NSL	NSL	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	1	NSL	NSL	<1	<1	<1	<1
o-xylene	1	NSL	see BTEX	<1	<1	<1	<1
1,2,3-trichloropropane	1	NSL	NSL	<1	<1	<1	<1
Isopropylbenzene	1	NSL	NSL	<1	<1	<1	<1
Bromobenzene	1	NSL	NSL	<1	<1	<1	<1
n-propyl benzene	1	NSL	NSL	<1	<1	<1	<1
2-chlorotoluene	1	NSL	NSL	<1	<1	<1	<1
4-chlorotoluene	1	NSL	NSL	<1	<1	<1	<1
1,3,5-trimethyl benzene	1	NSL	NSL	<1	<1	<1	<1
Tert-butyl benzene	1	NSL	NSL	<1	<1	<1	<1
1,2,4-trimethyl benzene	1	NSL	NSL	<1	<1	<1	<1
1,3-dichlorobenzene	1	NSL	300	<1	<1	<1	<1
Sec-butyl benzene	1	NSL	NSL	<1	<1	<1	<1
1,4-dichlorobenzene	1	NSL	40	<1	<1	<1	<1
4-isopropyl toluene	1	NSL	NSL	<1	<1	<1	<1
1,2-dichlorobenzene	1	NSL	1500	<1	<1	<1	<1
n-butyl benzene	1	NSL	NSL	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	1	NSL	NSL	<1	<1	<1	<1
1,2,4-trichlorobenzene	1	NSL	NSL	<1	<1	<1	<1
Hexachlorobutadiene	1	NSL	NSL	<1	<1	<1	<1
1,2,3-trichlorobenzene	1	NSL	NSL	<1	<1	<1	<1
Polycyclic Aromatic Hydrocarbons (PAHs)							
Naphthalene	0.2	NSL	NSL	<0.2	<0.2	<0.2	<0.2
Acenaphthylene	0.1	NSL	NSL	<0.1	<0.1	<0.1	<0.1
Acenaphthene	0.1	NSL	NSL	<0.1	<0.1	<0.1	<0.1
Fluorene	0.1	NSL	NSL	<0.1	<0.1	<0.1	<0.1
Phenanthrene	0.1	NSL	NSL	<0.1	<0.1	<0.1	<0.1
Anthracene	0.1	NSL	NSL	<0.1	<0.1	<0.1	<0.1
Fluoranthene	0.1	NSL	NSL	<0.1	<0.1	<0.1	<0.1
Pyrene	0.1	NSL	NSL	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	0.1	NSL	NSL	<0.1	<0.1	<0.1	<0.1
Chrysene	0.1	NSL	NSL	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	0.2	NSL	NSL	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	**0.1**	0.01	0.01	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	0.1	NSL	NSL	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	0.1	NSL	NSL	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	0.1	NSL	NSL	<0.1	<0.1	<0.1	<0.1

Concentration above the GIL	VALUE
PQL exceeds GIL	**BOLD/RED**

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TABLE I

SUMMARY OF GROUNDAWATER LABORATORY RESULTS COMPARED TO ECOLOGICAL GILs SAC

All results in µg/L unless stated otherwise.

	PQL Envirolab Services	ANZECC 2000 Fresh Waters	SAMPLES			
			MW03	MW21	MW28	MW29
Inorganic Compounds and Parameters						
pH	0.1	6.5 - 8.5	**6**	**5.8**	6.9	6.5
Electrical Conductivity (µS/cm)	1	NSL	2600	1100	2100	2100
Metals and Metalloids						
Arsenic (As III)	1	24	2	2	5	5
Cadmium	0.1	0.2	0.8	0.4	<0.1	<0.1
Chromium (VI)	1	1	<1	<1	<1	<1
Copper	1	1.4	1	**4**	<1	<1
Lead	1	3.4	<1	<1	<1	<1
Total Mercury (inorganic)	0.05	0.06	<0.05	<0.05	<0.05	<0.05
Nickel	1	11	13	22	14	21
Zinc	1	8	49	120	26	11
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)						
Benzene	1	950	<1	<1	<1	<1
Toluene	1	180	<1	<1	<1	<1
Ethylbenzene	1	80	<1	<1	<1	<1
m+p-xylene	2	75	<2	<2	<2	<2
o-xylene	1	350	<1	<1	<1	<1
Total xylenes	2	NSL	<1	<1	<1	<1
Volatile Organic Compounds (VOCs), including chlorinated VOCs						
Dichlorodifluoromethane	10	NSL	<10	<10	<10	<10
Chloromethane	10	NSL	<10	<10	<10	<10
Vinyl Chloride	10	100	<10	<10	<10	<10
Bromomethane	10	NSL	<10	<10	<10	<10
Chloroethane	10	NSL	<10	<10	<10	<10
Trichlorofluoromethane	10	NSL	<10	<10	<10	<10
1,1-Dichloroethene	1	700	<1	<1	<1	<1
Trans-1,2-dichloroethene	1	NSL	<1	<1	<1	<1
1,1-dichloroethane	1	90	<1	<1	<1	<1
Cis-1,2-dichloroethene	1	NSL	<1	<1	<1	<1
Bromochloromethane	1	NSL	<1	<1	<1	<1
Chloroform	1	370	<1	<1	<1	<1
2,2-dichloropropane	1	NSL	<1	<1	<1	<1
1,2-dichloroethane	1	1900	<1	<1	<1	<1
1,1,1-trichloroethane	1	270	<1	<1	<1	<1
1,1-dichloropropene	1	NSL	<1	<1	<1	<1
Cyclohexane	1	NSL	<1	<1	<1	<1
Carbon tetrachloride	1	240	<1	<1	<1	<1
Benzene	1	see BTEX	<1	<1	<1	<1
Dibromomethane	1	NSL	<1	<1	<1	<1
1,2-dichloropropane	1	900	<1	<1	<1	<1
Trichloroethene	1	NSL	<1	<1	<1	<1
Bromodichloromethane	1	NSL	<1	<1	<1	<1
trans-1,3-dichloropropene	1	NSL	<1	<1	<1	<1
cis-1,3-dichloropropene	1	NSL	<1	<1	<1	<1
1,1,2-trichloroethane	1	6500	<1	<1	<1	<1
Toluene	1	see BTEX	<1	<1	<1	<1
1,3-dichloropropane	1	1100	<1	<1	<1	<1
Dibromochloromethane	1	NSL	<1	<1	<1	<1
1,2-dibromoethane	1	NSL	<1	<1	<1	<1
Tetrachloroethene	1	70	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	1	NSL	<1	<1	<1	<1
Chlorobenzene	1	55	<1	<1	<1	<1
Ethylbenzene	1	see BTEX	<1	<1	<1	<1
Bromoform	1	NSL	<1	<1	<1	<1
m+p-xylene	2	see BTEX	<2	<2	<2	<2
Styrene	1	NSL	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	1	400	<1	<1	<1	<1
o-xylene	1	see BTEX	<1	<1	<1	<1
1,2,3-trichloropropane	1	NSL	<1	<1	<1	<1
Isopropylbenzene	1	30	<1	<1	<1	<1
Bromobenzene	1	NSL	<1	<1	<1	<1
n-propyl benzene	1	NSL	<1	<1	<1	<1
2-chlorotoluene	1	NSL	<1	<1	<1	<1
4-chlorotoluene	1	NSL	<1	<1	<1	<1
1,3,5-trimethyl benzene	1	NSL	<1	<1	<1	<1
Tert-butyl benzene	1	NSL	<1	<1	<1	<1
1,2,4-trimethyl benzene	1	NSL	<1	<1	<1	<1
1,3-dichlorobenzene	1	260	<1	<1	<1	<1
Sec-butyl benzene	1	NSL	<1	<1	<1	<1
1,4-dichlorobenzene	1	60	<1	<1	<1	<1
4-isopropyl toluene	1	NSL	<1	<1	<1	<1
1,2-dichlorobenzene	1	160	<1	<1	<1	<1
n-butyl benzene	1	NSL	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	1	NSL	<1	<1	<1	<1
1,2,4-trichlorobenzene	1	85	<1	<1	<1	<1
Hexachlorobutadiene	1	NSL	<1	<1	<1	<1
1,2,3-trichlorobenzene	1	3	<1	<1	<1	<1
Polycyclic Aromatic Hydrocarbons (PAHs)						
Naphthalene	0.2	16	<0.2	<0.2	<0.2	<0.2
Acenaphthylene	0.1	NSL	<0.1	<0.1	<0.1	<0.1
Acenaphthene	0.1	NSL	<0.1	<0.1	<0.1	<0.1
Fluorene	0.1	NSL	<0.1	<0.1	<0.1	<0.1
Phenanthrene	0.1	0.6	<0.1	<0.1	<0.1	<0.1
Anthracene	**0.1**	0.01	<0.1	<0.1	<0.1	<0.1
Fluoranthene	0.1	1	<0.1	<0.1	<0.1	<0.1
Pyrene	0.1	NSL	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	0.1	NSL	<0.1	<0.1	<0.1	<0.1
Chrysene	0.1	NSL	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	0.2	NSL	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	0.1	0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	0.1	NSL	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	0.1	NSL	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	0.1	NSL	<0.1	<0.1	<0.1	<0.1

Concentration above the GIL	VALUE
PQL exceeds GIL	**BOLD/RED**

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

SAMPLE	ANALYSIS	Envirolab PQL	INITIAL	REPEAT	MEAN	RPD %
Sample Ref = BH03 (0.14-0.3)	Arsenic	4	<4	<4	NC	NC
Dup Ref = DUPKT1	Cadmium	0.4	<0.4	<0.4	NC	NC
	Chromium	1	1	1	1.0	0
Envirolab Report: 191478	Copper	1	190	180	185.0	5
	Lead	1	7	7	7.0	0
	Mercury	0.1	<0.1	<0.1	NC	NC
	Nickel	1	4	4	4.0	0
	Zinc	1	33	32	32.5	3
	Naphthalene	0.1	<0.1	<0.1	NC	NC
	Acenaphthylene	0.1	<0.1	<0.1	NC	NC
	Acenaphthene	0.1	<0.1	<0.1	NC	NC
	Fluorene	0.1	<0.1	<0.1	NC	NC
	Phenanthrene	0.1	<0.1	<0.1	NC	NC
	Anthracene	0.1	<0.1	<0.1	NC	NC
	Fluoranthene	0.1	<0.1	<0.1	NC	NC
	Pyrene	0.1	<0.1	<0.1	NC	NC
	Benzo(a)anthracene	0.1	<0.1	<0.1	NC	NC
	Chrysene	0.1	<0.1	<0.1	NC	NC
	Benzo(b,j+k)fluoranthene	0.2	<0.2	<0.2	NC	NC
	Benzo(a)pyrene	0.05	<0.05	<0.05	NC	NC
	Indeno(123-cd)pyrene	0.1	<0.1	<0.1	NC	NC
	Dibenzo(ah)anthracene	0.1	<0.1	<0.1	NC	NC
	Benzo(ghi)perylene	0.1	<0.1	<0.1	NC	NC
	Total OCPs	0.1	<0.1	<0.1	NC	NC
	Total PCBs	0.1	<0.1	<0.1	NC	NC
	Total phenolics	0.5	<0.5	<0.5	NC	NC
	TRH C_6-C_{10} (F1)	25	<25	<25	NC	NC
	TRH >C_{10}-C_{16} (F2)	50	<50	<50	NC	NC
	TRH >C_{16}-C_{34} (F3)	100	<100	<100	NC	NC
	TRH >C_{34}-C_{40} (F4)	100	<100	<100	NC	NC
	Benzene	0.2	<0.2	<0.2	NC	NC
	Toluene	0.5	<0.5	<0.5	NC	NC
	Ethylbenzene	1	<1	<1	NC	NC
	m+p-xylene	2	<2	<2	NC	NC
	o-xylene	1	<1	<1	NC	NC

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

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

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

RPD Results Above the Acceptance Criteria — VALUE

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

SAMPLE	ANALYSIS	Envirolab PQL	INITIAL	REPEAT	MEAN	RPD %
Sample Ref = BH29 (0.0-0.2)	Arsenic	4	<4	<4	NC	NC
Dup Ref = DUPKT2	Cadmium	0.4	<0.4	<0.4	NC	NC
	Chromium	1	13	18	15.5	32
Envirolab Report: 191478	Copper	1	12	11	11.5	9
	Lead	1	20	22	21.0	10
	Mercury	0.1	<0.1	<0.1	NC	NC
	Nickel	1	3	3	3.0	0
	Zinc	1	22	22	22.0	0
	Naphthalene	0.1	<0.1	<0.1	NC	NC
	Acenaphthylene	0.1	<0.1	<0.1	NC	NC
	Acenaphthene	0.1	<0.1	<0.1	NC	NC
	Fluorene	0.1	<0.1	<0.1	NC	NC
	Phenanthrene	0.1	0.1	0.1	0.1	0
	Anthracene	0.1	<0.1	<0.1	NC	NC
	Fluoranthene	0.1	0.2	0.2	0.2	0
	Pyrene	0.1	0.2	0.2	0.2	0
	Benzo(a)anthracene	0.1	0.1	0.1	0.1	0
	Chrysene	0.1	0.1	0.1	0.1	0
	Benzo(b,j+k)fluoranthene	0.2	0.2	0.2	0.2	0
	Benzo(a)pyrene	0.05	0.1	0.1	0.1	0
	Indeno(123-cd)pyrene	0.1	<0.1	<0.1	NC	NC
	Dibenzo(ah)anthracene	0.1	<0.1	<0.1	NC	NC
	Benzo(ghi)perylene	0.1	<0.1	<0.1	NC	NC
	Total OCPs	0.1	<0.1	<0.1	NC	NC
	Total PCBs	0.1	<0.1	<0.1	NC	NC
	Total phenolics	0.5	<0.5	<0.5	NC	NC
	TRH C6-C10 (F1)	25	<25	<25	NC	NC
	TRH >C10-C16 (F2)	50	<50	<50	NC	NC
	TRH >C16-C34 (F3)	100	<100	<100	NC	NC
	TRH >C34-C40 (F4)	100	<100	<100	NC	NC
	Benzene	0.2	<0.2	<0.2	NC	NC
	Toluene	0.5	<0.5	<0.5	NC	NC
	Ethylbenzene	1	<1	<1	NC	NC
	m+p-xylene	2	<2	<2	NC	NC
	o-xylene	1	<1	<1	NC	NC

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

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

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

RPD Results Above the Acceptance Criteria — VALUE

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

SAMPLE	ANALYSIS	Envirolab PQL	Envirolab VIC PQL	INITIAL	REPEAT	MEAN	RPD %
Sample Ref = BH28 (0.1-0.25)	Arsenic	4	4	<4	<4	NC	NC
Dup Ref = DUPKT3	Cadmium	0.4	0.4	<0.4	<0.4	NC	NC
	Chromium	1	1	16	15	15.5	6
Envirolab Report: 191478	Copper	1	1	30	33	31.5	10
Envirolab VIC Report: 13772	Lead	1	1	17	15	16.0	13
	Mercury	0.1	0.1	<0.1	<0.1	NC	NC
	Nickel	1	1	52	55	53.5	6
	Zinc	1	1	31	30	30.5	3
	Naphthalene	0.1	0.1	<0.1	<0.1	NC	NC
	Acenaphthylene	0.1	0.1	<0.1	<0.1	NC	NC
	Acenaphthene	0.1	0.1	<0.1	<0.1	NC	NC
	Fluorene	0.1	0.1	<0.1	<0.1	NC	NC
	Phenanthrene	0.1	0.1	<0.1	<0.1	NC	NC
	Anthracene	0.1	0.1	<0.1	<0.1	NC	NC
	Fluoranthene	0.1	0.1	<0.1	0.1	0.1	67
	Pyrene	0.1	0.1	<0.1	0.1	0.1	67
	Benzo(a)anthracene	0.1	0.1	<0.1	0.1	0.1	67
	Chrysene	0.1	0.1	<0.1	<0.1	NC	NC
	Benzo(b,j+k)fluoranthene	0.2	0.2	<0.2	<0.2	NC	NC
	Benzo(a)pyrene	0.05	0.05	<0.05	0.17	0.1	149
	Indeno(123-cd)pyrene	0.1	0.1	<0.1	<0.1	NC	NC
	Dibenzo(ah)anthracene	0.1	0.1	<0.1	<0.1	NC	NC
	Benzo(ghi)perylene	0.1	0.1	<0.1	0.1	0.1	67
	Total OCPs	0.1	0.1	<0.1	<0.1	NC	NC
	Total PCBs	0.1	0.1	<0.1	<0.1	NC	NC
	TRH C6-C10 (F1)	25	25	<25	<25	NC	NC
	TRH >C10-C16 (F2)	50	50	<50	<50	NC	NC
	TRH >C16-C34 (F3)	100	100	<100	<100	NC	NC
	TRH >C34-C40 (F4)	100	100	<100	<100	NC	NC
	Benzene	0.2	0.2	<0.2	<0.2	NC	NC
	Toluene	0.5	0.5	<0.5	<0.5	NC	NC
	Ethylbenzene	1	1	<1	<1	NC	NC
	m+p-xylene	2	2	<2	<2	NC	NC
	o-xylene	1	1	<1	<1	NC	NC

Explanation:

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

Results > 10 times PQL = RPD value <= 50% are acceptable

Results between 5 & 10 times PQL = RPD value <= 75% are acceptable

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

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

RPD Results Above the Acceptance Criteria — VALUE

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

SAMPLE	ANALYSIS	Envirolab PQL	Envirolab VIC PQL	INITIAL	REPEAT	MEAN	RPD %
Sample Ref = BH21 (0.0-0.2)	Arsenic	4	4	<4	<4	NC	NC
Dup Ref = DUPKT4	Cadmium	0.4	0.4	<0.4	<0.4	NC	NC
	Chromium	1	1	27	21	24.0	25
Envirolab Report: 191478	Copper	1	1	32	31	31.5	3
Envirolab VIC Report: 13772	Lead	1	1	34	32	33.0	6
	Mercury	0.1	0.1	0.1	0.1	0.1	0
	Nickel	1	1	6	5	5.5	18
	Zinc	1	1	99	93	96.0	6
	Naphthalene	0.1	0.1	<0.1	<0.1	NC	NC
	Acenaphthylene	0.1	0.1	<0.1	0.2	0.1	120
	Acenaphthene	0.1	0.1	<0.1	<0.1	NC	NC
	Fluorene	0.1	0.1	<0.1	<0.1	NC	NC
	Phenanthrene	0.1	0.1	0.3	1.1	0.7	114
	Anthracene	0.1	0.1	<0.1	0.2	0.1	120
	Fluoranthene	0.1	0.1	0.4	1.5	1.0	116
	Pyrene	0.1	0.1	0.4	1.3	0.9	106
	Benzo(a)anthracene	0.1	0.1	0.2	0.7	0.5	111
	Chrysene	0.1	0.1	0.2	0.6	0.4	100
	Benzo(b,j+k)fluoranthene	0.2	0.2	0.4	1.1	0.8	93
	Benzo(a)pyrene	0.05	0.05	0.3	0.68	0.5	78
	Indeno(123-cd)pyrene	0.1	0.1	0.2	0.3	0.3	40
	Dibenzo(ah)anthracene	0.1	0.1	<0.1	<0.1	NC	NC
	Benzo(ghi)perylene	0.1	0.1	0.2	0.4	0.3	67
	Total OCPs	0.1	0.1	<0.1	<0.1	NC	NC
	Total PCBs	0.1	0.1	<0.1	<0.1	NC	NC
	TRH C6-C10 (F1)	25	25	<25	<25	NC	NC
	TRH >C10-C16 (F2)	50	50	<50	<50	NC	NC
	TRH >C16-C34 (F3)	100	100	<100	<100	NC	NC
	TRH >C34-C40 (F4)	100	100	<100	<100	NC	NC
	Benzene	0.2	0.2	<0.2	<0.2	NC	NC
	Toluene	0.5	0.5	<0.5	<0.5	NC	NC
	Ethylbenzene	1	1	<1	<1	NC	NC
	m+p-xylene	2	2	<2	<2	NC	NC
	o-xylene	1	1	<1	<1	NC	NC

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

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

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

RPD Results Above the Acceptance Criteria — VALUE

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

SAMPLE	ANALYSIS	Envirolab PQL	INITIAL	REPEAT	MEAN	RPD %
Sample Ref = MW29	Arsenic	1	5	5	5	0.000
Dup Ref = MWDUP1	Cadmium	0.1	<0.1	<0.1	NC	NC
	Chromium	1	<1	<1	NC	NC
Envirolab Report: 191978	Copper	1	<1	<1	NC	NC
	Lead	1	<1	<1	NC	NC
	Mercury	0.05	<0.05	<0.05	NC	NC
	Nickel	1	21	21	21	0
	Zinc	1	11	11	11	0
	Naphthalene	0.2	<0.2	<0.2	NC	NC
	Acenaphthylene	0.1	<0.1	<0.1	NC	NC
	Acenaphthene	0.1	<0.1	<0.1	NC	NC
	Fluorene	0.1	<0.1	<0.1	NC	NC
	Phenanthrene	0.1	<0.1	<0.1	NC	NC
	Anthracene	0.1	<0.1	<0.1	NC	NC
	Fluoranthene	0.1	<0.1	<0.1	NC	NC
	Pyrene	0.1	<0.1	<0.1	NC	NC
	Benzo(a)anthracene	0.1	<0.1	<0.1	NC	NC
	Chrysene	0.1	<0.1	<0.1	NC	NC
	Benzo(b,j+k)fluoranthene	0.2	<0.2	<0.2	NC	NC
	Benzo(a)pyrene	0.1	<0.1	<0.1	NC	NC
	Indeno(123-cd)pyrene	0.1	<0.1	<0.1	NC	NC
	Dibenzo(ah)anthracene	0.1	<0.1	<0.1	NC	NC
	Benzo(ghi)perylene	0.1	<0.1	<0.1	NC	NC
	TRH C6-C10 (F1)	10	<25	<25	NC	NC
	TRH >C10-C16 (F2)	50	<50	<50	NC	NC
	TRH >C16-C34 (F3)	100	<100	<100	NC	NC
	TRH >C34-C40 (F4)	100	<100	<100	NC	NC
	Benzene	1	<1	<1	NC	NC
	Toluene	1	<1	<1	NC	NC
	Ethylbenzene	1	<1	<1	NC	NC
	m+p-xylene	2	<2	<2	NC	NC
	o-xylene	1	<1	<1	NC	NC

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

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

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

RPD Results Above the Acceptance Criteria VALUE

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