REPORT TO

HAMMONDCARE

ON

DETAILED SITE INVESTIGATION (DSI)

FOR

PROPOSED HOSPITAL REDEVELOPMENT

AT

GREENWICH HOSPITAL, 97-115 RIVER ROAD, GREENWICH, NSW

Date: 9 September 2019
Ref: E32507BTrptRev1

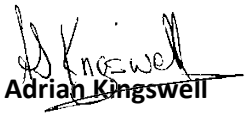
JKEnvironments
www.jkenvironments.com.au

Report prepared by:



Katrina Taylor
Senior Environment Scientist

Report reviewed by:



Adrian Kingswell
Principal Consultant | Environment Scientist

For and on behalf of
JKE
PO BOX 976
NORTH RYDE BC NSW 1670

DOCUMENT REVISION RECORD

Report Reference	Report Status	Report Date
E32507BTrpt	Final Report	30 August 2019
E32507BTrptRev1	Revision	9 September 2019

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Executive Summary

HammondCare ('the client') commissioned Environmental Investigation Services (EIS)[1] to undertake a Detailed Site Investigation (DSI) for the proposed hospital redevelopment at Greenwich Hospital, 97-115 River Road, Greenwich, 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 proposed development area only which occupies the majority of the property with the exception of the south-east corner of the property (heritage curtilage area), as shown on Figure 2. For the purpose of this report, the assessment area has been referred to as 'the site', while the entire hospital property including Pallister House in the south-east corner has been referred to as the wider hospital property.

It is understood the proposed development includes demolition of all existing site buildings/structures (excluding Pallister House) and construction of a new hospital with one level of car parking, and two seniors living buildings with two levels of car parking. The proposed design includes cut and fill earthworks across the site.

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 scope of work included the following:

- Review of site information, including Douglas Partners PSI report and JKE waste classification report (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 site inspection identified an abandoned UST to the south of the main hospital building (refer to Figure 2). A small self-bunded diesel cube (500L) was observed on the eastern side of the main hospital building positioned next to an external (transportable) generator and a small capacity incinerator was observed on the eastern side of the main hospital building. A review of the DP 2018 report indicated several potentially contaminating activities may have occurred on the site and wider hospital property including: placement of fill; use of hazardous materials in previous and existing structures; contaminants associated with building maintenance (e.g. pesticides); the UST and related infrastructure; spillage of hospital wastes; placement of wastes and/or incinerator ash; and naturally occurring elements in the soils and rock underlying the site (e.g. heavy metals).

Soil sampling for this assessment was undertaken from 30 borehole locations and groundwater sampling from three monitoring wells installed in three of the soil boreholes. One soil sample reported an elevated TRH (F2) concentration above the human health and ecological SAC, seven soil samples reported elevated TRH (F3) concentrations above the ecological SAC and one groundwater sample reported an elevated copper concentration above the ecological SAC for freshwater.

JKE consider that the site can be made suitable for the proposed development provided that the following recommendations are implemented to address the data gaps and to better characterise the risks:

1. When the site becomes fully accessible (i.e. after demolition), undertake inspection and additional sampling in the footprints of the buildings and structures, and around the UST. The additional sampling should include as a minimum:
    a. Inspection of the building footprints following demolition for any visible or olfactory indicators of contamination (e.g. odours, staining or fill inclusions). Soil sampling for the CoPC should also be undertaken in the building footprints to close out this data gap and confirm the waste classification; and

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

b. Additional soil sampling in the UST area (tank pit soils and soils around any buried pipework/infrastructure). Additional sampling and analysis should be undertaken at a minimum of four locations (one on each side) around the UST and at least one sample per 5 lineal metres of buried fuel line/infrastructure if encountered, to assess for any residual soil contamination;
c. Additional sampling in the vicinity of BH23 to confirm the presence /extent of TRH in the surface soil.

2. Development and implementation of a Remediation Action Plan (RAP). The RAP will describe a holistic approach to the management and remediation of the UST and associated infrastructure; and
3. A RAP will be a trigger for the requirement for a validation assessment to be undertaken.

Recommendation 1 can be addressed in the RAP as a data gap investigation prior to remediation.

At this stage, JKE consider that there is no requirement to report any site contamination to the NSW EPA under the NSW EPA Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997 (2015)[2].

JKE consider that the report objectives outlined in Section 1.2 have been addressed. The conclusions and recommendations should be read in conjunction with the limitations presented in the body of this report.

[2] NSW EPA, (2015). *Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997* (referred to as Duty to Report Contamination)

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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**
Dial Before You Dig	**DBYD**
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	**HSL**
Health Screening Level-Site Specific Assessment	**HSL-SSA**
International Organisation of Standardisation	**ISO**
JK Environments	**JKE**
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**
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

HammondCare ('the client') commissioned Environmental Investigation Services (EIS)[3] to undertake a Detailed Site Investigation (DSI) for the proposed hospital redevelopment at Greenwich Hospital, 97-115 River Road, Greenwich, 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 proposed development area only which occupies the majority of the property with the exception of the south-east corner of the property (heritage curtilage area), as shown on Figure 2. For the purpose of this report, the assessment area has been referred to as 'the site', while the entire hospital property including Pallister House in the south-east corner has been referred to as the wider hospital property.

A geotechnical investigation was undertaken in conjunction with this assessment by JK Geotechnics[4]. The results of the investigation are presented in a separate report (Ref. 32507Rrpt[5]). This report should be read in conjunction with the JK report.

EIS have re-branded to JK Environments. JK Environments, like EIS, will function as the environmental division of Jeffery and Katauskas Pty Ltd and will continue to operate alongside JK Geotechnics.

1.1 Proposed Development Details

It is understood the proposed development includes demolition of all existing site buildings/structures (excluding Pallister House) and construction of a new hospital with one level of car parking, and two seniors living buildings with two levels of car parking. The proposed design includes cut and fill earthworks across the site.

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:

- Provide an appraisal of the past site use(s) based on a review of the Douglas Partners Preliminary Site Investigation (PSI) report[6];
- 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);

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

[4] Geotechnical consulting division of J&K

[5] Referred to as JK Geotechnics (JK 2019 report)

[6] Douglas Partners, (2018). Report on Preliminary Site Investigation (Contamination), Greenwich Hospital, 97-115 River Road, Greenwich, Prepared for HammondCare (Project ref: 86495.00, dated August 2018). (referred to as DP 2018 report).

- 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 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.

1.3 Scope of Work

The assessment was undertaken generally in accordance with a JKE proposal (Ref: EP48756Trev2) of 7 June 2019 and written acceptance from the client of 25 June 2019. The scope of work included the following:

- Review of site information, including Douglas Partners PSI report and JKE waste classification report (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)[7], other guidelines made under or with regards to the Contaminated Land Management Act (1997)[8] and State Environmental Planning Policy No.55 – Remediation of Land (1998)[9]. A list of reference documents/guidelines is included in the appendices.

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

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

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

2 SITE INFORMATION

2.1 Background

2.1.1 Preliminary Site Investigation (Contamination) (Douglas Partners, dated August 2018)

Douglas Partners undertook a PSI of the wider hospital property in August 2018. The scope of the PSI included a review of various historical documents comprising aerial photographs, historical titles deeds, the Section 10.7 planning certificates, SafeWork NSW licence information, NSW EPA contaminated land register, groundwater bore licence details, and a site walkover inspection.

The site history review and site inspection identified the following:

- Historical title deeds indicated that between the 1920s and 2008 the wider hospital site was owned by individuals, the Church of England Property Trust Diocese of Sydney, and Home of Peace Hospitals Limited. HammondCare took over ownership of the site in 2008. The PSI report indicated that the Church of England operated Pallister House as a home for girls in the mid-20th Century, prior to the property becoming a treating hospital in the mid-1960s;
- Aerial photographs indicated that the site was vacant in the 1930s with Pallister House present on the wider hospital property in the south-east. From 1942 onwards new buildings and structures (the existing hospital buildings and structures) were observed to be present on the site;
- The Section 10.7 Certificate for the site indicated that: the land is not significantly contaminated, is not the subject of a management order, is not the subject of an approved voluntary management proposal, is not the subject of an ongoing maintenance order, and is not the subject of a site audit statement;
- The SafeWork NSW licence information reviewed indicated that an underground storage tank (UST) of approximately 5000 L capacity was provided. The information indicated that the UST was located to the west of the boilers and was used to store petrol. The documentation indicated that the UST was installed in 1968 and was still in use in the mid-1990s;
- A review of the EPA contaminated Land Register did not identify the wider hospital property as being significantly contaminated under the Contaminated Land Management Act 1997 as at 21 August 2018. The wider hospital site was not listed on the 2 August 2018 version of the 'List of NSW Contaminated Sites Notified to EPA'; and
- No licenced wells within or near the wider hospital site were identified during a search of licenced groundwater bores, indicating that the regional groundwater table is at significant depth and is not likely to be a beneficial resource for nearby sites;
- The site inspection undertaken as part of the PSI identified the UST gatic cover (which was not opened), in the southwest section of the site (corresponding to the location of the potentially abandoned UST); and
- The Conceptual Site Model (CSM) identified the following potentially contaminating activities may have occurred on the wider hospital site:
    - Placement of filling on the site;
    - The use of hazardous materials in previous and existing structures;
    - Contaminants associated with building maintenance (e.g. pesticides);
    - The UST and related infrastructure;
    - Spillage of hospital wastes;

- Placement of wastes and/or incinerator ash; and
- Naturally occurring elements in the soils and rock underlying the site (e.g. heavy metals).

The report concluded that if characterisation of the site is required a full detailed site investigation (DSI) should be undertaken. Further to this, recommendations were made for a hazardous building materials survey of the existing structures and waste classification for any material to be removed from the site as part of redevelopment.

2.1.2 Waste Classification Assessment (JKE, June 2014)[10]

In mid-2014 JKE were engaged to undertake soil sampling for waste classification purposes for the proposed development of a multi-level carpark in the south-west corner of the wider hospital site. Soil samples were obtained from six boreholes, three drilled in the asphaltic concrete car park and three drilled into the side of the steep batter slope.

The subsurface profile encountered in the carpark area generally consisted of fill to a depth of between 2.3m to 5.3m underlain by sandstone bedrock. The fill material was varied and included silty sand and silty clay with various amounts of gravel. Silty clay fill material was also encountered in the batter slope to depths of 0.5m to 0.6m (hand auger refusal). Foreign materials including bricks, metal fragments and plastic were observed within the batter slope fill profile.

2.2 Site Identification

Table 2-1: Site Identification

Current Site Owner:	HammondCare
Site Address:	97-115 River Road, Greenwich, NSW
Lot & Deposited Plan:	Lot 3 in DP584287
Current Land Use:	Hospital
Proposed Land Use:	Continued used as a hospital, with addition of seniors living (high-density residential)
Local Government Authority:	Lane Cove Municipal Council
Current Zoning:	SP2 – Infrastructure
Site Area (m^2):	22,580
Geographical Location (decimal degrees) (approx.):	Latitude: -33.827331 Longitude: 151.183528

[1010] JKE, (2014). Letter report to Hammond Care RE: Waste Classification Assessment, Proposed Development, Greenwich Hospital, 97-115 River Road, Greenwich, NSW. (Report ref: E23789Klet, dated 12 June 2014). (Referred to as JKE 2014 report).

2.3 Site Location and Regional Setting

The site is located in a predominantly residential area of Greenwich. The site is bounded by River Road to the north. The site is located approximately 75m to the north-east of the Gore Creek and 275m to the north-east of the Lane Cove River.

2.4 Topography

The site is located within undulating regional topography and sites on the southern edge of a topographic spur that falls steeply to the east, south and west. A significant fill batter slope exists along the western boundary. 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 JKE on 22 July 2019. The inspection was limited to accessible areas of the site and immediate surrounds. An internal inspection of buildings was not undertaken. Selected site photographs obtained during the inspection are attached in the appendices. A summary of the other inspection findings are outlined in the following subsections:

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

At the time of the inspection, the main hospital buildings are located in the central to west portion of the site and include wards, theatres, two gas-fired boiler units, two emergency generators, clinical and general waste facilities, oxygen storage and maintenance equipment. A building to the east of the main hospital building contains non-clinical facilities. The eastern portion of the site is predominantly gardens and landscaped areas, with the remainder of the site occupied by access roads and parking areas, with large trees generally around the site boundaries as well as in the eastern portion of the site.

2.5.2 Buildings, Structures and Roads

The main hospital buildings were a mix of brick, fibre cement, and concrete construction typically on concrete slab and between one and four storeys. Concrete and asphaltic concrete paved footpaths, driveways and car park areas were interspersed between the buildings and landscaped areas.

2.5.3 Visible or Olfactory Indicators of Contamination

During the site inspection a gatic cover assumed to be associated with the abandoned UST was observed to the south of the main hospital building (refer to Figure 2). The gatic cover was lifted and the pipework was observed to make a 90° turn and extend towards the north-east (building housing the hospital generator). An existing groundwater well was observed approximately 2m to the north-west of the gatic cover. The well extended to a depth of 4.2m BGL and was dry. A small self-bunded diesel cube (500L) was observed on the eastern side of the main hospital building positioned next to an external (transportable) generator (refer to Figure 2).

A small capacity incinerator was observed on the eastern side of the main hospital building (refer to 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 garden and landscaped areas, and unpaved or boundaries of carpark areas generally in the east of the site.

Gas cylinders and flammable materials were observed to be stored appropriately in locked cages in paved storage areas and generally in the vicinity of the maintenance office (refer to Figure 2).

2.5.5 Drainage and Services

Surface water at the site was expected to flow to the south and south-west. 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

Gore Creek Reserve, an area zoned as E2 - Environmental Conservation, and Gore Creek extends along the south-west boundary of the site. These features are situated down gradient of the site and are considered to be sensitive environments.

2.5.7 Landscaped Areas and Visible Signs of Plant Stress

A majority of the eastern side of the site was grass covered with interspersed medium to large mature trees and small to medium shrubs. Medium to large trees were observed along the north, west and south boundaries of the site and small to medium shrubs were located in garden beds and around buildings across the site. The steep batter slope in the south-west corner of the site was densely vegetated with native and exotic shrubs and a small grass covered area was observed along the southern boundary (adjacent to the empty pool). The vegetation across the site 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

During the site inspection, JKE observed the following land uses in the immediate surrounds:

- North – Greenwich Public School and residential properties;
- South – Pallister House within the hospital grounds, residential properties and Gore Creek Reserve;
- East – Garden and landscaped areas of the hospital, St Vincents Road and residential properties beyond; and
- West – Residential properties.

JKE 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.

2.8 Site History Summary

The DP 2018 PSI report included a review of various site history documentation sources. Based on a review of this information, and observations made by JKE, a time line summary of the historical land uses and activities is presented in the table below. The information presented in the table is based on a weight of evidence assessment of the site history documentation and observations made by JKE.

Table 2-2: Summary of Historical Land Uses

Year(s)	Potential Land Use / Activities
Pre-1930 to late 1930s	Aerial photographs reviewed for the DP 2018 report indicated that Pallister House was present on the wider hospital site prior to 1930. Aerial photographs and land titles suggest that the site may have been utilised for residential purposes.
1940s to mid-1960s	Aerial photographs and land title records indicate that the site and wider hospital site were owned by the Church of England and operated Pallister House as a home for girls during this period.
Circa 1960s - onwards	Land title records indicated that the site became a treating hospital in the mid -1960s. Aerial photographs indicated development of former and existing hospital buildings and structures from this time. The site may have been filled during this time to generate existing site levels.
1968 – mid-1990s	SafeWork NSW records indicated that the UST located to the south-west of the boilers was installed at the site and used to store petrol (refer to Figure 2). The UST was in use until around the mid-1990s. Facilities maintenance personnel indicated that the tank is no longer in use.

3 GEOLOGY AND HYDROGEOLOGY

3.1 Regional Geology

A review of the regional geological map of Sydney (1983)[11] indicated that the site is underlain by Hawkesbury Sandstone, which typically consists of medium to coarse grained quartz sandstone with minor shale and laminite lenses.

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 Hydrogeology

Hydrogeological information presented in the DP report indicated that there were no licenced groundwater bores within or near the wider Hospital site.

Previous investigations undertaken by JKE (refer to Section 2.1.2) indicated that the subsurface conditions at the site consisted of relatively low permeability (residual) soils overlying shallow bedrock. The potential for viable groundwater abstraction and use of groundwater under these conditions is considered to be low. There is a reticulated water supply in the area and consumption of groundwater is not expected to occur. Use of groundwater is not proposed as part of the development.

Considering the local topography and surrounding land features, JKE would generally expect groundwater to flow towards the south to south-west.

3.4 Receiving Water Bodies

Surface water bodies were not identified in the immediate vicinity of the site. The closest surface water body is Gore Creek located approximately 75m to the south-west of the site, which in turn feeds into the Lane Cove River which is only 275m south of the site. Both of these features are down-gradient of the site and are considered to be potential receptors.

[11] Department of Mineral Resources, (1983). *1:100,000 Geological Map of Sydney (Series 9130)*

5 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 the DP 2018 report. Reference should also be made to the figures attached in the appendices.

5.1 Potential Contamination Sources/AEC and CoPC

The conceptual site model has been reviewed after consideration of the preliminary CSM presented in the DP 2018 report. 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 10.

Table 5-1: 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 (including onsite incinerator waste / spillage of hospital waste) and could be contaminated. Previous investigations in the south-west corner of the site by JKE in 2014 indicated fill material to a maximum depth of 5.3m.	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), organophosphate pesticides (OPPs), polychlorinated biphenyls (PCBs) and asbestos.
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.	Asbestos, lead and PCBs
Use of pesticides – Pesticides may have been used beneath the buildings and/or around the site.	Heavy metals and OCPs
Fuel storage – At least one UST was identified at the site (see Figure 2). SafeWork NSW records presented in the DP 2018 report indicated that the UST may have been used to store petrol. An above-ground diesel cube was also observed on the site (see Figure 2).	Lead, TRH, BTEX and PAHs

JKE note that herbicides have not been included as CoPC as herbicides are not commonly found at residual concentrations likely to pose a risk to human health or the environment (NSW DEC 2005, *Guidelines for Assessing Former Orchards and Market Gardens*).

5.2 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 5-2: CSM

Potential mechanism for contamination	The potential 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 and groundwater have been identified as potentially affected media. The potential for soil vapour impacts is considered to be relatively low. However soil vapour will be considered if significant concentrations of VOCs are encountered in the soil or groundwater.
Receptor identification	Human receptors include site occupants/users (including adults and children), construction workers and intrusive maintenance workers. Off-site human receptors include adjacent land users, groundwater users and recreational water users within Lane Cove River. Ecological receptors include terrestrial organisms and plants within unpaved areas (including the proposed landscaped areas), and freshwater ecology in Gore Creek and Lane Cove River.
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 future use of the site. Potential exposure pathways for ecological receptors include primary contact and ingestion. Exposure during future site use could occur via direct contact with soil in unpaved areas such as gardens, inhalation of airborne asbestos fibres during soil disturbance, or inhalation of vapours within enclosed spaces such as buildings and basements. There may be an exposure pathway for groundwater via Gore Creek or the Lane Cove River.
Potential exposure mechanisms	The following have been identified as potential exposure mechanisms for site contamination: • 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 those being used for recreation; 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 system may act as a preferential pathway for contamination migration. This would be most relevant to contaminants that are mobile within soil or groundwater.

6 SAMPLING, ANALYSIS AND QUALITY PLAN

6.1 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)[12]. 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 8.1 and the detailed evaluation is provided in the appendices.

6.1.1 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. The assessment was constrained in-part, by access limitations associated with the existing structures on site.

6.1.2 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:

- 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?
- What is the waste classification for the fill/soil and natural soil/bedrock under the NSW EPA Waste Classification Guidelines (2014)?

6.1.3 Step 3 - Identify Information Inputs

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

- Existing relevant environmental data from previous reports;

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

- 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 and groundwater for the CoPC identified in the CSM; and
- Field and laboratory QA/QC data.

6.1.4 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 22 and 25 July 2019 (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 footprints or in the access roads and driveways with the exception of BH1, due to access constraints.

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

6.1.5.1 Tier 1 Screening Criteria

The laboratory data will be assessed against relevant Tier 1 screening criteria (referred to as SAC), as outlined in Section 7. 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.

6.1.5.2 Field and Laboratory QA/QC

Field QA/QC included analysis of inter-laboratory duplicates, intra-laboratory duplicates, trip spike, and trip blank 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, JKE typically adopt the most conservative concentration reported (or in some cases, consider the data from the affected sample as an estimate).

6.1.5.3 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.

6.1.6 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.

6.1.7 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.

6.2 Soil Sampling Plan and Methodology

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

Table 6-1: Soil Sampling Plan and Methodology

Aspect	Input
Sampling Density	The sampling density for asbestos in soil included sampling at the minimum sampling density recommended in the Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009)[13] (endorsed in NEPM 2013). This density met the

[13] Western Australian (WA) Department of Health (DoH), (2009). Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia. (referred to as WA DoH 2009)

Aspect	Input
	investigation regime outlined in Table 1 of the WA DoH (2009) guidelines for a site with a 'suspect' likelihood of asbestos. Samples for other contaminants were collected from 30 locations as shown on the attached Figure 2. Based on the site area (22,370m^2), this number of locations corresponded to a sampling density of approximately one sample per 754m^2. The sampling plan was not designed to meet the minimum sampling density for hotspot identification, as outlined in the NSW EPA Contaminated Sites Sampling Design Guidelines (1995)[14].
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 a 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 from BH1 to BH10 were collected using 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. Samples from BH19, BH20, BH23, BH24, and BH25 were collected using a hand auger, Samples from BH11 to BH18, BH21, BH22, and BH26 to BH30 were collected using a push tube/spiral auger drill rig. Soil samples were obtained from disposable polyethylene push tube samplers.
Sample Collection and Field QA/QC	Soil samples were obtained between 22 and 25 July 2019 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 JKE.

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

Aspect	Input
	The field screening for asbestos quantification included the following: • A representative 10L sample was collected from fill at 1m intervals, or from each distinct fill profile where possible. The bulk sample intervals are shown on the attached borehole/test pit logs; • Due to the cohesive nature of the soils, each sample was subsequently placed on a contrasting support (blue tarpaulin) and inspected for the presence of fibre cement. Any soil clumps/nodules were disaggregated; • The condition of fibre cement or any other suspected asbestos materials was noted on the field records; and • If observed, any fragments of fibre cement in the 10L sample were collected, placed in a zip-lock bag and assigned a unique identifier. Calculations for asbestos content were undertaken based on the requirements outlined in Schedule B1 of NEPM (2013), as summarised in Section 7.1.
Decontami-nation 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 JKE warehouse before being delivered in the insulated sample container to a NATA registered laboratory for analysis under standard chain of custody (COC) procedures.

6.3 Groundwater Sampling Plan and Methodology

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

Table 6-2: Groundwater Sampling Plan and Methodology

Aspect	Input
Sampling Plan	Groundwater monitoring wells were installed in BH2 (MW2), BH4 (MW4) and BH7 (MW7). The wells were positioned to gain a snap-shot of the groundwater conditions and target the UST (MW4). Considering the topography and the location of the nearest down-gradient water body, MW7 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 north. MW2 and MW4 were considered to be in the intermediate to down-gradient areas of the site and would be expected to provide an indication of groundwater flowing across (beneath) the site and 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 2.2m to 7.1m 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.

Aspect	Input
Monitoring Well Development	The monitoring wells were dry on the day of development (25 July 2019). The field monitoring records are attached in the appendices.
Groundwater Sampling	The monitoring wells were allowed to recharge for approximately five to seven days after development. MW2 and MW4 were dry on the day of sampling. A groundwater sample was obtained from MW7 on 1 August 2019. All monitoring wells were checked for the presence of Light Non-Aqueous Phase Liquids (LNAPLs) using an inter-phase probe electronic dip meter during the sampling event. All monitoring wells head space were checked for VOCs using a calibrated PID unit. The MW7 sample was 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. Groundwater removed from the wells during development and sampling was transported to JKE in jerry cans and stored in holding drums prior to collection by a licensed waste water contractor for off-site disposal. The field monitoring records are attached in the appendices.
Decontaminant and Sample Preservation	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 JKE office, before being delivered in the insulated sample container to a NATA registered laboratory for analysis under standard COC procedures.

6.4 Analytical Schedule

The analytical schedule (for primary samples) is outlined in the following table:

Table 6-3: Analytical Schedule (Primary Samples)

Analyte/CoPC	Fill Samples	Natural Soil Samples	Groundwater Samples
Heavy Metals	32	5	1
TRH/BTEX	32	5	1
PAHs	32	5	1
OCPs/OPPs	30	0	0
PCBs	30	0	0

Analyte/CoPC	Fill Samples	Natural Soil Samples	Groundwater Samples
VOCs	8	0	1
Asbestos	26	0	0
pH/CEC/Clay Content (%)	3	0	0
pH/EC	0	0	1
Toxicity characteristic leachate procedure (TCLP) Metals for waste classification purposes	7	0	0

6.4.1 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 6-4: Laboratory Details

Samples	Laboratory	Report Reference
All primary samples and field QA/QC samples including (intra-laboratory duplicates, trip blank and trip spike samples)	Envirolab Services Pty Ltd NSW, NATA Accreditation Number – 2901 (ISO/IEC 17025 compliance)	222520, 222520-A and 223069
Inter-laboratory duplicates	Envirolab Services Pty Ltd VIC, NATA Accreditation Number – 2901 (ISO/IEC 17025 compliance)	17565

7 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.

7.1 Soil

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

7.1.1 Human Health

- Health Investigation Levels (HILs) for a 'residential with accessible soils' exposure scenario (HIL-A);
- Health Screening Levels (HSLs) for a 'low-high density residential' exposure scenario (HSL-A & HSL-B). HSLs were calculated based on conservative assumptions including a 'sand' type and a depth interval of 0m to 1m;
- 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 – Health screening levels for hydrocarbons in soil and groundwater Part 1: Technical development document (2011)[15] were considered;
- The practical quantitation limit (PQL) of the VOC analysis was adopted as an initial screening of the VOC results; and
- Asbestos was assessed on the basis of presence/absence. Asbestos was assessed against the HSL-A criteria. A summary of the asbestos criteria is provided in the table below:

Table 7-1: Details for Asbestos SAC

Guideline	Applicability
Asbestos in Soil	The HSL-A criteria were adopted for the assessment of asbestos in soil. The SAC adopted for asbestos were derived from the NEPM 2013 and are based on WA DoH (2009) guidance. The SAC include the following: • <0.01% w/w bonded asbestos containing material (ACM) in soil; and • <0.001% w/w asbestos fines/fibrous asbestos (AF/FA) in soil. The NEPM (2013) and WA DoH (2009) also specify that the surface should be free of visible asbestos. Concentrations for bonded ACM concentrations in soil are based on the following equation which is presented in Schedule B1 of NEPM (2013): $\%\ w/w\ asbestos\ in\ soil = \frac{\%\ asbestos\ content \times bonded\ ACM\ (kg)}{Soil\ volume\ (L) \times soil\ density\ (kg/L)}$

[15] 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*

7.1.2 Environment (Ecological – terrestrial ecosystems)

- Ecological Investigation Levels (EILs) and Ecological Screening Levels (ESLs) for an 'urban residential and public open space' (URPOS) exposure scenario. These have only been applied to the top 2m of soil as outlined in NEPM (2013). The criterion for benzo(a)pyrene has been increased from the value presented in NEPM (2013) based on the Canadian Soil Quality Guidelines[16];
- ESLs were adopted based on the soil type; and
- EILs for selected metals were calculated using site specific soil parameters for pH, cation exchange capacity and clay content based on average calculated parameters from three samples (pH 8.3, CEC 23.7cmol$_c$/kg and clay content 8.7% clay). 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)[17]. This method is considered to be adequate for the Tier 1 screening.

7.1.3 Management Limits for Petroleum Hydrocarbons

Management limits for petroleum hydrocarbons (as presented in Schedule B1 of NEPM 2013) were considered (if required) following evaluation of human health and ecological risks, and risks to groundwater.

7.1.4 Waste Classification

Data for the waste classification assessment were assessed in accordance with the Waste Classification Guidelines, Part 1: Classifying Waste (2014)[18] as outlined in the following table:

Table 7-2: 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;

[16] Canadian Council of Ministers of the Environment, (1999). *Canadian soil quality guidelines for the protection of environmental and human health: Benzo(a)Pyrene (1997)* (referred to as the Canadian Soil Quality Guidelines)

[17] 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.

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

Category	Description
	• 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.

7.2 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)[19]. Environmental values for this assessment include aquatic ecosystems, human uses, and human-health risks in non-use scenarios.

7.2.1 Human Health

- HSLs for a 'low-high density residential' exposure scenario (HSL-A/HSL-B). HSLs were calculated based on the soil type and the observed depth to groundwater; and
- The Australian Drinking Water Guidelines 2011 (updated 2018)[20] were multiplied by a factor of 10 to assess potential risks associated with incidental/recreational-type exposure to groundwater (e.g. within down-gradient water bodies or with seepage water in theexcavation). These have been deemed as 'recreational' SAC.

7.2.2 Environment (Ecological - aquatic ecosystems)

Groundwater Investigation Levels (GILs) for 95% protection of freshwater species were adopted based on the Default Guideline Values in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2018)[21].

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

[20] National Health and Medical Research Council (NHMRC), (2018). *National Water Quality Management Strategy, Australian Drinking Water Guidelines 2011* (referred to as ADWG 2011)

[21] Australian and New Zealand Governments (ANZG), (2018). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia (referred to as ANZG 2018)

8 RESULTS

8.1 Summary of Data (QA/QC) Evaluation

The data evaluation is presented in the appendices. In summary, JKE 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.

8.2 Subsurface Conditions

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

Table 8-1: Summary of Subsurface Conditions

Profile	Description
Pavement	Asphaltic Concrete (AC)/Concrete pavement was encountered at the surface in BH1, BH3, BH4, BH5, BH6, BH14, BH16, BH17, BH18, BH21, BH22 and BH30 and ranged in thickness from approximately 45mm 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 4.1m. BH11 through to BH20, BH23, BH24, BH25 and BH30 were terminated in the fill at a maximum depth of approximately 4.1m BGL. The fill typically comprised silty sandy gravel, clayey sand, silty clay, sand, silty sand, silty sandy clay, silty gravelly sand, sandy clay, silty clayey sand, sandy gravel with inclusions of igneous, ironstone and sandstone gravel, root fibres, ash, slag, clay nodules, sand, quartz gravel, brick fragments, concrete fragments, and terracotta pipe and mulch, . Neither staining nor odours were observed in the fill material during the fieldwork. Potential asbestos containing materials were not observed in the fill material during the fieldwork.
Natural Soil	Clayey sand, sandy clay, and sand natural soils were encountered beneath the fill in BH4, BH5, BH6, BH21, BH22, BH26 BH27, BH28 and BH29 from depths of between 0.3m to 2.2m. Neither staining nor odours were observed in the natural soil during the fieldwork.
Bedrock	Sandstone bedrock was encountered beneath the fill or natural soil in BH1, BH2, BH3, BH4 From depths of 0.2m
Groundwater	Groundwater seepage was not encountered in the boreholes during drilling. All boreholes remained dry on completion of drilling and a short time after.

8.3 Field Screening

A summary of the field screening results are presented in the following table:

Table 8-2: Summary of Field Screening

Aspect	Details
PID Screening of Soil Samples for VOCs	PID soil sample headspace readings are presented in the 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.

Aspect	Details
Bulk Screening for Asbestos	The bulk field screening results are summarised in the attached report tables. ACM was not encountered in any of the boreholes during the field screening.
Groundwater Depth & Flow	Groundwater seepage was not encountered in any of the boreholes during drilling. All boreholes were dry during and a short time after completion of drilling. Two of the three monitoring wells installed at the site remained dry seven days after installation. A SWL of 6.35mBGL was measured in MW7 installed at the site. The groundwater relative level (RL) calculated on this measurement was RL46.25. The groundwater RL indicated that excavation may intercept groundwater.
Groundwater Field Parameters	Field measurements recorded during sampling were as follows: - pH 6.38; - EC 258.9µS/cm; - Eh 33.0mV; and - DO 3.4mg/L.
LNAPLs petroleum hydrocarbons	Phase separated product (i.e. LNAPL) were not detected using the interphase probe during the groundwater sampling event.

8.4 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:

8.4.1 Human Health and Environmental (Ecological) Assessment

Table 8-3: 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	The TRH F2 concentration in one sample (BH23 0.0-0.1m) of 210mg/kg, exceeded the HSL-A/B of 110mg/kg. The TRH F2 concentration in one sample (BH23 0.0-0.1m) of 210mg/kg, exceeded the ecological criterion of 120mg/kg. The TRH F3 concentrations in seven samples (BH5 0.1-0.2m, BH13 0.0-0.2m, BH14 0.05-0.25m, BH17 0.05-0.25m, BH18 0.05-0.25m, BH210.05-0.3m and BH23 0.0-0.1m) ranging between 310mg/kg and 1,600mg/kg exceeded the ecological criterion of 300mg/kg. All other TRH results were below the SAC.
BTEXN	All BTEX results were below the SAC.
PAHs	All PAH results were below the SAC.
OCPs and OPPs	All OCP and OPP results were below the SAC.
PCBs	All PCB results were below the SAC.

Analyte	Results Compared to SAC
VOCs	All VOC results were below the SAC.
Asbestos	All asbestos results were below the SAC (i.e. asbestos was absent in the samples analysed for the investigation).

8.4.2 Management Limits

Table 8-4: Summary of Soil Laboratory Results – Management Limits

Analyte	Results Compared to SAC
TRH	All TRH results were below the SAC.
BTEXN	All BTEXN results were below the SAC.

8.4.3 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. A summary of the results is presented in the following table:

Table 8-5: 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	37	12	0	Lead concentrations exceeded the CT1 criterion in three fill samples collected from BH2 (0.0-0.1m), BH14 (1.0-1.2m) and BH23 (0.0-0.1m). The maximum lead concentration was 160mg/kg. Nickel concentrations exceeded the CT1 criterion in nine fill samples collected from BH1 (0.2-0.3m), BH4 (0.1-0.2m), BH5 (0.1-0.2m), BH6 (0.1-0.2m), BH14 (0.05-0.25m), BH17 (0.05-0.25), BH18 (0.05-0.25m), BH22 (0.05-0.2m) and BH30 (0.05-0.15m). The maximum nickel concentration was 110mg/kg.
TRH	37	0	0	-
BTEX	37	0	0	-
Total PAHs	37	0	0	-
Benzo(a)pyrene	37	1	0	The benzo(a)pyrene concentration in one sample BH2 (2.5-2.7) exceeded the CT1 criterion. The benzo(a)pyrene concentration was 1.8mg/kg.

Analyte	No. of Samples Analysed	No. of Results > CT Criteria	No. of Results > SCC Criteria	Comments
OCPs & OPPs	30	0	0	-
PCBs	30	0	0	-
VOCs	8	0	0	-
Asbestos	26	-	-	Asbestos was not detected in the samples analysed.

Table 8-6: Summary of Soil Laboratory Results Compared to TCLP Criteria

Analyte	No. of Samples Analysed	No. of Results > TCLP Criteria	Comments
Lead	2	0	The two fill samples with the highest lead concentrations were analysed for TCLP lead. Both samples returned results below the TCLP1 criterion.
Nickel	5	0	The five fill samples with the highest nickel concentrations were analysed for TCLP nickel. All samples returned results below the TCLP1 criterion.

8.5 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 in the following table:

Table 8-7: Summary of Groundwater Laboratory Results – Human Health and Environmental (Ecological)

Analyte	Results Compared to SAC
Heavy Metals	The copper concentration of 2µg/kg in MW7 exceeded the ANZG criteria of 1.4µg/L. 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	Results for pH and EC are summarised below: • pH 6.7; and • EC 270µS/cm

9 WASTE CLASSIFICATION ASSESSMENT

Due to the presence of PAHs in sample BH2 (2.5-2.7m), further assessment of the sandstone in the vicinity of BH2 is required prior to classification of this material. Where excavation of the sandstone is required in this section of the site following removal of the overlying fill material, the sandstone should be resampled.

9.1 Preliminary Waste Classification of Fill

Based on the results of the assessment, and at the time of reporting, the fill material at the site (excluding the material in the vicinity of the UST and associated buried infrastructure) is given a preliminary classification of **General Solid Waste (non-putrescible)**. This classification should be confirmed via inspection of the site surface in building footprints following demolition and additional soil sampling at the site as recommended in Section 11.

Surplus fill should be disposed of to a facility that is appropriately licensed to receive this waste stream. The facility should be contacted to obtain the required approvals prior to commencement of excavation.

9.2 Preliminary Classification of Natural Soil and Bedrock

Two localised issues need to be addressed prior to assigning a final classification to the natural soil and bedrock. Firstly the status of the natural soil and bedrock in the immediate vicinity of the UST and associated infrastructure needs be addressed. The second issue is the clarification of the presence of PAHs in the bedrock in the vicinity of BH2. Based on the scope of work undertaken for this assessment, and at the time of reporting, JKE are of the opinion that the majority of the natural soil and bedrock at the site is likely to meet the definition of **VENM** for off-site disposal or re-use purposes. This VENM classification should be confirmed via visual inspection following removal of 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.

10 DISCUSSION

10.1 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.

10.1.1 Soil

TRH (F2) was identified in fill above the human health based SAC in one location and TRH (F2 and F3) were identified in fill above the ecological SAC in seven locations.

The data suggests that the TRH is likely to be a surficial impact associated with imported silty sand fill at the BH23 location. There is a potential that the TRH is associated with a localised spill hydrocarbon-based liquid at this location. A sample of the underlying fill material (0.3-0.4m) did not report elevated concentrations of TRH above the human health or ecological SAC. As the HSL exceedance (BH23) was identified in a borehole located outside of the existing building footprints, the data does not conclusively demonstrate that there is a potentially complete SPR linkage for TRH (vapour intrusion) at this location.

TRH exceedances encountered in BH5, 17, 18 and BH21 were located beneath the asphaltic concrete pavement are not considered to pose an unacceptable risk to ecological receptors in the current site configuration. Three exceedances were located in surficial/exposed soils in landscaped areas of the site (BH13, BH14, and BH23), therefore in the current site configuration there is a complete SPR linkage (ecological SAC) at these locations.

In the context of the proposed development, the elevated concentrations of TRH encountered in the fill above the ecological SAC are not considered to pose an unacceptable risk to ecological site receptors for the following reasons:

- The site is a hospital located in an urban setting and is not located in an ecological sensitive area which could impact any endangered species on site therefore it would be reasonable to assume there are no endangered or species on site; and
- The existing flora does not show any significant signs of stress; and
- The proposed development will extend to these areas of the site and reduce future exposure to any existing flora and fauna; and

No asbestos materials were encountered on the site surface or in the soil during the fieldwork for the assessment. Asbestos was not detected in any of the 26 soil samples analysed for the assessment. Only three (BH13, BH14, and BH20) of the 30 sample locations encountered building and demolition waste (in the form of trace concrete, brick and terracotta pipe fragments). The presence of trace building and demolition

waste in the fill at the site makes the potential occurrence of asbestos in the subsurface possible and sampling was completed from boreholes using auger drilling methods which limits the disturbance of the soil. However, based on the site observations and soil results, risks associated with the potential occurrence of asbestos in fill are considered to be low, and JKE are of the opinion that they can be addressed via the implementation of an unexpected finds protocol (UFP) in the RAP.

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

10.1.2 Groundwater

The one groundwater sample obtained (MW7) encountered a copper concentration greater than the ANZG-Freshwater criterion of 1.4µg/L. The source of the copper in the groundwater is considered likely to be a regional issue for the following reasons:

- Elevated heavy metal concentrations (particularly copper) associated with leaking water infrastructure and surface water runoff are typically encountered in urban groundwater; and
- Elevated heavy metal concentrations were not encountered in the fill soil at the site, therefore fill is not considered to be a point source.

Based on the proposed development, and the likelihood of groundwater being intersected during construction, it should be noted that additional sampling and analysis may be required to support future application for a temporary construction dewatering application.

10.2 Decision Statements

The decision statements are addressed below:

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

The site inspection identified an abandoned UST to the south of the main hospital building (refer to Figure 2). A small self-bunded diesel cube (500L) was observed on the eastern side of the main hospital building positioned next to an external (transportable) generator and a small capacity incinerator was observed on the eastern side of the main hospital building. A review of the DP 2018 report indicated several potentially contaminating activities may have occurred on the site and wider hospital property including: placement of fill; use of hazardous materials in previous and existing structures; contaminants associated with building maintenance (e.g. pesticides); the UST and related infrastructure; spillage of hospital wastes; placement of wastes and/or incinerator ash; and naturally occurring elements in the soils and rock underlying the site (e.g. heavy metals).

> *Are any results above the SAC?*

Yes. One soil sample reported an elevated TRH (F2) concentration above the human health and ecological SAC, seven soil samples reported elevated TRH (F3) concentrations above the ecological SAC and one groundwater sample reported an elevated copper concentration above the ecological SAC for freshwater.

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

JKE are of the opinion that potential human health risks associated with the elevated concentration of TRH (F2) in soil are moderate in the context of the proposed development and there is potential for residual contamination to be present in the vicinity of the existing UST and any buried infrastructure. However, ecological risks associated with the elevated concentrations of TRH (F2) and (F3) in soil at the site are low. Areas beneath the existing buildings and structures have not been included in the assessment.

Is remediation required?

If the presence of the TRH (F2) exceedance (above the human health SAC) at BH23 is confirmed then some localised \ remediation will be required. Some additional sampling in the vicinity of BH23 should confirm the extent of the area that requires remediation. Further investigation of the UST tank pit and associated buried infrastructure is also required following removal. Remediation of the UST and any associated infrastructure (i.e. underground pipe work, vent pipes etc) should be undertaken via removal in accordance with the Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation (2008)[22], AS4976–2008: Removal and disposal of underground petroleum storage tanks[23]; Guidelines for implementing the POEO (Underground Petroleum Storage Systems) Regulation 2008[24]; and UPSS Technical Note: Decommissioning, abandonment and removal of underground petroleum storage systems[25].

Is the site characterisation sufficient to provide adequate confidence in the above decisions?

The characterisation is considered to be sufficient to provide adequate confidence that further investigation and remediation is required.

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

Remediation of the TRH (F2) exceedance at BH23, and the UST and any associated infrastructure, in addition to inspection and additional sampling of the ground surface beneath buildings and structures subsequent to

[22] *Protection of the Environment Operations (POEO) (Underground Petroleum Storage Systems) Regulation 2008* (NSW). (referred to as UPSS Regulation 2008)

[23] Standards Australia, (2008). *The Removal and Disposal of Underground Petroleum Storage Tanks.* (referred to as AS4976-2008)

[24] NSW Department of Environment and Climate Change NSW (DECC), (2009). *Guidelines for the Implementation of the Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2008.* (referred to as UPSS Guidelines 2009)

[25] Department of Environment, Climate Change and Water (DECCW) NSW, UPSS Technical Note: Decommissioning, abandonment and removal of underground petroleum storage systems 2010. (Referred to as UPSS TN: Decommissioning, abandonment and removal).

demolition, followed by a validation assessment is considered likely to render the site suitable for the proposed development.

10.3 Data Gaps

An assessment of data gaps is provided in the following table:

Table 10-1: Data Gap Assessment

Data Gap	Assessment
Areas beneath the existing buildings and structure on the site have not been assessed.	Sampling beneath the existing buildings and structures at the site was not undertaken due to accessibility and the preliminary nature of the assessment. Recommendations are included in the report to address this data gap.
The extent of any associated underground pipework and any residual contamination associated with the USTs (tank pit backfill soils and or water) has not been fully assessed	Sampling was not undertaken in the tank pit area due to the nature of the assessment. Residual contamination is likely to be localised to the tank pit soils/waters and any soils/waters around underground pipework or associated infrastructure. Recommendations are included in the report to address this data gap.

The investigation was limited due to access restrictions imposed by the existing buildings and structures. The above data gaps can be addressed as an additional (data gap) investigation prior to remediation of the site.

11 CONCLUSIONS AND RECOMMENDATIONS

The assessment included a site inspection, review of previous reports, soil sampling from 30 borehole location and groundwater sampling from three monitoring wells. The site inspection identified an abandoned UST, a self bunded above ground diesel fuel tank and a small incinerator. Review of existing report indicated several potentially contaminating activities may have occurred on the site including: placement of fill; use of hazardous materials; contaminants associated with building maintenance (e.g. pesticides); UST and related infrastructure; spillage/placement of wastes and/or incinerator ash; and naturally occurring elements in the soils and rock underlying the site (e.g. heavy metals). TRH was identified in fill above the human health and ecological SAC. Copper was identified in groundwater above the ecological SAC.

Based on the data from the assessment, JKE are of the opinion that potential risks associated with widespread subsurface contamination at the site is low, however localised risks associated with the elevated TRH (F2) in soil and residual contamination associated with the UST and any associated infrastructure should be further assessed and remediated accordingly.

JKE consider that the site can be made suitable for the proposed development provided that the following recommendations are implemented to address the data gaps and to better characterise the risks:

1. When the site becomes fully accessible (i.e. after demolition), undertake inspection and additional sampling in the footprints of the buildings and structures, and around the UST. The additional sampling should include as a minimum:
    a. Inspection of the building footprints following demolition for any visible or olfactory indicators of contamination (e.g. odours, staining or fill inclusions). Soil sampling for the CoPC should also be undertaken in the building footprints to close out this data gap and confirm the waste classification; and
    b. Additional soil sampling in the UST area (tank pit soils and soils around any buried pipework/infrastructure). Additional sampling and analysis should be undertaken at a minimum of four locations (one on each side) around the UST and at least one sample per 5 lineal metres of buried fuel line/infrastructure if encountered, to assess for any residual soil contamination;
    c. Additional sampling in the vicinity of BH23 to confirm the presence /extent of TRH in the surface soil.
2. Development and implementation of a Remediation Action Plan (RAP). The RAP will describe a holistic approach to the management and remediation of the UST and associated infrastructure; and
3. A RAP will be a trigger for the requirement for a validation assessment to be undertaken.

Recommendation 1 can be addressed in the RAP as a data gap investigation prior to remediation.

At this stage, JKE consider that there is no requirement to report any site contamination to the NSW EPA under the NSW EPA Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997 (2015)[26].

[26] NSW EPA, (2015). *Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997* (referred to as Duty to Report Contamination)

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

12 LIMITATIONS

The report limitations are outlined below:

- JKE 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 JKE proposal; and terms of contract between JKE 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, JKE has not undertaken any verification process, except where specifically stated in the report;
- JKE 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;
- JKE 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;
- JKE 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. JKE 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.

Important Information About This Report

These notes have been prepared by JKE 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 JKE 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.

JKE/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 JKE 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

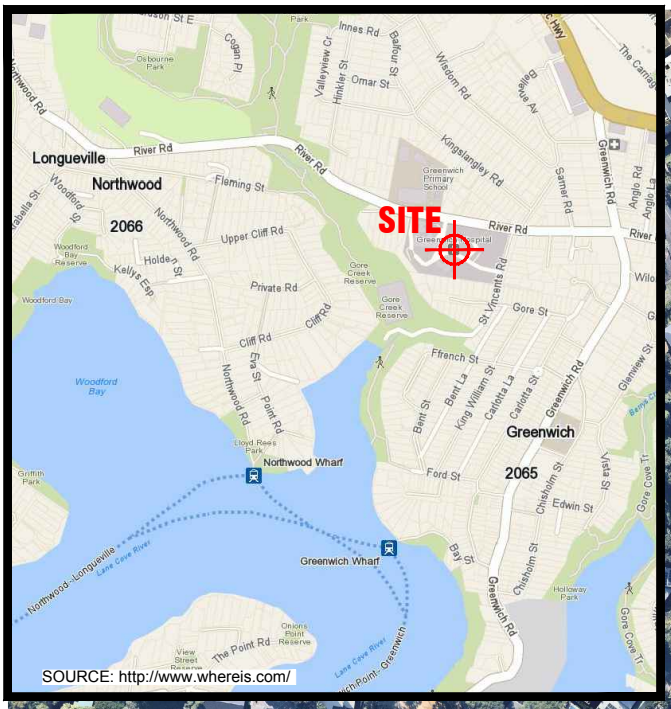
Borehole and test pit logs are prepared by environmental scientists, engineers or geologists based upon interpretation of field conditions and laboratory evaluation of field samples. Logs are normally provided in our reports and these should not be re-drawn for inclusion in site remediation or other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

Appendix A: Report Figures



AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM, 01 JUL 2019.

0 30 60 90 120 150

SCALE 1:3000 @A4 METRES

This plan should be read in conjunction with the Environmental report.

Title: **SITE LOCATION PLAN**

Location: 97-115 RIVER ROAD
GREENWICH, NSW

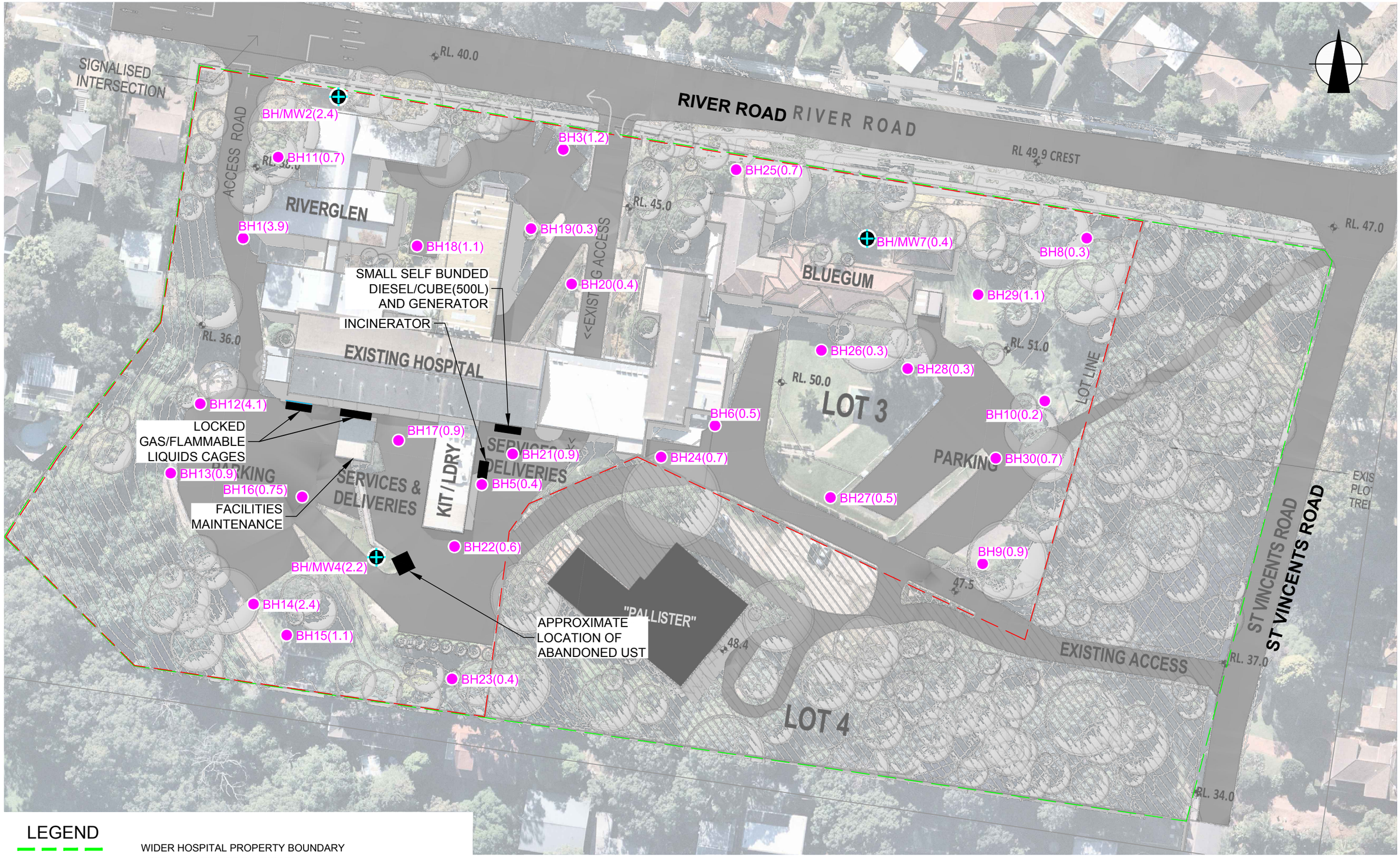
Report No: E32507BT

Figure No: 1

JKEnvironments

PLOT DATE: 27/08/2019 3:09:46 PM DWG FILE: S:\5 E\ES\5C EIS JOBS\32000\SE32507BT GREENWICH\CAD\E32507BT.DWG

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LEGEND

WIDER HOSPITAL PROPERTY BOUNDARY

APPROXIMATE SITE BOUNDARY

BH(Fill Depth) — BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m)

BH/MW(Fill Depth) — BOREHOLE AND GROUND WATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m)

AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM, 12 MAY 2019.

SCALE 0 8 16 24 32 40 METRES 1:800 @A3

This plan should be read in conjunction with the Environmental report.

Title: **SAMPLE LOCATION PLAN**

Location: 97-115 RIVER ROAD GREENWICH, NSW

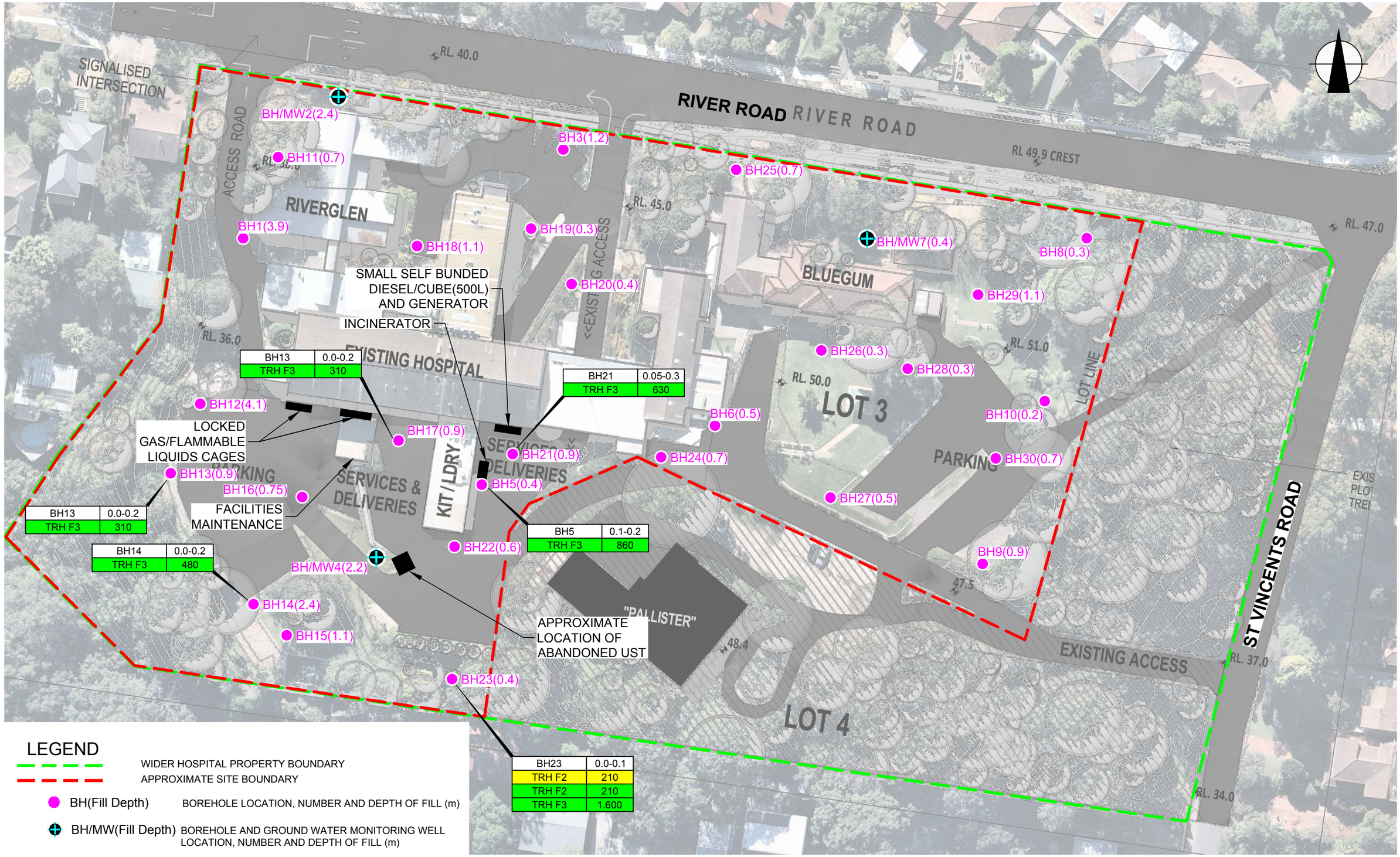
Report No: E32507BT

Figure No: 2

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LEGEND

- WIDER HOSPITAL PROPERTY BOUNDARY
- APPROXIMATE SITE BOUNDARY
- BH(Fill Depth) — BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m)
- BH/MW(Fill Depth) — BOREHOLE AND GROUND WATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m)
- SOIL CONTAMINATION ABOVE SAC FOR HUMAN HEALTH RISK (mg/kg)
- SOIL CONTAMINATION ABOVE SAC FOR ECOLOGICAL RISK (mg/kg)
- GROUND WATER CONTA,MINATION ABOVE SAC FOR ECOLOGICAL RISK MG/L

AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM, 12 MAY 2019.

0 8 16 24 32 40
SCALE 1:800 @A3 METRES

This plan should be read in conjunction with the Environmental report.

Title: **CONTAMINATION LOCATION PLAN**

Location: 97-115 RIVER ROAD GREENWICH, NSW

Report No: E32507BT

Figure No: 3

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PLOT DATE: 28/08/2019 8:03:32 AM DWG FILE: S:\5 EIS\5C EIS JOBS\32000'S\E32507BT GREENWICH\CAD\E32507BT.DWG

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Appendix B: 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
ANZG	Australian and New Zealand Guidelines
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 Agency
VOCs:	Volatile Organic Compounds
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 high 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.

TABLE A

SOIL LABORATORY RESULTS COMPARED TO NEPM 2013.

HIL-A: 'Residential with garden/accessible soils; children's day care centers; preschools; and primary schools'

All data in mg/kg unless stated otherwise			HEAVY METALS								PAHs		ORGANOCHLORINE PESTICIDES (OCPs)							OP PESTICIDES (OPPs)	TOTAL VOCs	TOTAL PCBs	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	Chlorpyrifos			
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	0.1	0.1	0.1	0.2	0.1	100
Site Assessment Criteria (SAC)			100	20	100	6000	300	40	400	7400	300	3	10	270	300	6	50	240	6	160	0.2*	1	Detected/Not Detected
Sample Reference	**Sample Depth**	**Sample Description**																					
BH1	0.2-0.3	Fill: silty sandy gravel	<4	<0.4	14	17	22	<0.1	24	34	0.71	<0.5	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	NA	<0.1	Not Detected
BH1	0.2-0.3	Laboratory duplicate	<4	<0.4	13	22	8	<0.1	41	26	0.1	<0.5	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	NA	<0.1	NA
BH1	0.2-0.3	Laboratory triplicate	<4	<0.4	15	24	16	<0.1	40	29	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH2	0.0-0.1	Fill: silty sand	<4	<0.4	11	21	160	0	5	120	1.5	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	NA
BH2	2.5-2.7	Sandstone	<4	<0.4	45	10	30	<0.1	4	150	24	2.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH3	0.1-0.2	Fill: silty gravelly sand	<4	<0.4	45	46	4	<0.1	37	26	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	Not Detected
BH4	0.1-0.2	Fill: silty gravelly sand	<4	<0.4	92	30	4	<0.1	76	41	0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	Not Detected
BH4	0.5-0.7	Fill: silty sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.1	NA	NA
BH4	0.5-0.7	Laboratory duplicate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA
BH4	1.9-2.0	Fill: silty sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA
BH4	2.4-2.5	Clayey sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA
BH5	0.1-0.2	Fill: silty gravelly sand	<4	<0.4	59	19	6	<0.1	59	33	0.4	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	Not Detected
BH5	0.7-0.8	Clayey sand	<4	<0.4	7	<1	5	<0.1	<1	<1	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH6	0.1-0.2	Fill: silty gravelly sand	<4	<0.4	17	58	2	<0.1	110	36	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	Not Detected
BH6	0.6-0.7	Sandy clay	<4	<0.4	10	<1	4	<0.1	3	3	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH7	0.0-0.1	Fill: silty sand	5	<0.4	23	13	24	<0.1	13	43	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	NA
BH8	0.0-0.1	Fill: silty sand	<4	<0.4	11	17	95	0	3	89	4.1	0.6	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	NA
BH8	0.3-0.4	Sandstone	<4	<0.4	9	5	15	0	2	17	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH9	0.1-0.2	Fill: silty sandy gravel	<4	<0.4	37	15	8	<0.1	38	26	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	Not Detected
BH10	0.0-0.1	Fill: silty sand	<4	<0.4	7	7	26	<0.1	2	28	0.2	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	Not Detected
BH11	0.0-0.2	Fill: silty sand	<4	<0.4	5	11	30	<0.1	3	36	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	Not Detected
BH11	0.0-0.2	Laboratory duplicate	<4	<0.4	6	10	32	<0.1	3	37	1.6	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	NA
BH12	0.3-0.5	Fill: silty sand	<4	<0.4	15	18	34	<0.1	9	43	4	0.6	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	Not Detected
BH13	0.0-0.2	Fill: silty sand	<4	<0.4	24	47	84	<0.1	19	120	1.4	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	NA
BH14	0.05-0.25	Fill: silty sand	<4	<0.4	23	51	5	<0.1	47	37	1.2	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	Not Detected
BH14	1.0-1.2	Fill: clayey sand	6	<0.4	14	23	110	0	7	120	5.4	0.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH15	0.0-0.3	Fill: silty sand	<4	<0.4	5	6	54	<0.1	2	35	2.7	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	Not Detected
BH16	0.0-0.15	Fill: silty clayey sand	<4	<0.4	8	31	17	<0.1	18	55	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	Not Detected
BH16	0.15-0.3	Fill: silty clayey sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA
BH17	0.05-0.25	Fill: sandy gravel	<4	<0.4	88	38	5	<0.1	55	34	0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	Not Detected
BH17	0.7-0.75	Fill: silty sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA
BH17	0.75-0.85	Fill: sandy clay	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA
BH18	0.05-0.25	Fill: sandy gravel	<4	<0.4	76	50	5	<0.1	61	43	0.4	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	Not Detected
BH19	0.0-0.1	Fill: silty sand	17	<0.4	27	100	32	0	9	100	0.72	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	Not Detected
BH20	0.0-0.2	Fill: silty sand	<4	<0.4	10	16	47	<0.1	4	63	0.2	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	Not Detected
BH21	0.05-0.3	Fill: silty sand	<4	<0.4	7	27	9	<0.1	23	23	0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	Not Detected
BH21	0.05-0.3	Laboratory duplicate	<4	<0.4	8	36	12	<0.1	27	25	0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	NA
BH21	0.6-0.9	Fill: silty sand	<4	<0.4	6	12	75	<0.1	2	110	0.4	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA
BH21	0.9-1.1	Fill: clayey sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA
BH22	0.05-0.2	Fill: sandy gravel	<4	<0.4	70	22	4	0	69	38	0.2	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	Not Detected
BH23	0.0-0.1	Fill: silty sand	<4	<0.4	12	25	120	<0.1	6	110	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	Not Detected
BH23	0.3-0.4	Fill: silty clay	<4	<0.4	17	5	28	<0.1	9	19	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH24	0.0-0.3	Fill: silty sand	<4	<0.4	15	25	54	<0.1	25	150	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	Not Detected
BH25	0.0-0.2	Fill: silty sand	<4	<0.4	11	14	37	<0.1	5	60	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	Not Detected
BH26	0.0-0.1	Fill: silty sand	4	<0.4	15	10	34	<0.1	5	34	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	Not Detected
BH27	0.0-0.2	Fill: silty sand	<4	<0.4	9	12	44	0	7	39	0.3	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	Not Detected
BH28	0.0-0.2	Fill: silty sand	4	<0.4	15	11	41	<0.1	3	40	0.84	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	Not Detected
BH29	0.0-0.2	Fill: silty sand	<4	<0.4	6	5	13	<0.1	3	21	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	Not Detected
BH30	0.05-0.15	Fill: sandy gravel	<4	<0.4	82	28	5	<0.1	78	44	0.2	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	Not Detected
BH30	0.05-0.15	Laboratory duplicate	<4	<0.4	70	22	4	<0.1	69	39	0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	NA
Total Number of Samples			42	42	42	42	42	42	42	42	41	41	34	34	34	34	34	34	34	34	9	34	26
Maximum Value			17	<PQL	92	100	160	0.2	110	150	24	2.5	<PQL	<PQL	<PQL	0.2	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	NC

Concentration above the SAC **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-A/B:LOW/HIGH DENSITY RESIDENTIAL**							
Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**								
BH1	0.2-0.3	Fill: silty sandy gravel	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH1	0.2-0.3	Laboratory duplicate	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH1	0.2-0.3	Laboratory triplicate	0m to <1m	Sand	NA	NA	NA	NA	NA	NA	NA	0
BH2	0.0-0.1	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH2	2.5-2.7	Sandstone	2m to <4m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH3	0.1-0.2	Fill: silty gravelly sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH4	0.1-0.2	Fill: silty gravelly sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH5	0.1-0.2	Fill: silty gravelly sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH5	0.7-0.8	Clayey sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH6	0.1-0.2	Fill: silty gravelly sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH6	0.6-0.7	Sandy clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH7	0.0-0.1	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH8	0.0-0.1	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH8	0.3-0.4	Sandstone	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH9	0.1-0.2	Fill: silty sandy gravel	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH10	0.0-0.1	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH11	0.0-0.2	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH11	0.0-0.2	Laboratory duplicate	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH12	0.3-0.5	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH13	0.0-0.2	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH14	0.05-0.25	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH14	1.0-1.2	Fill: clayey sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH15	0.0-0.3	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH16	0.0-0.15	Fill: silty clayey sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH17	0.05-0.25	Fill: sandy gravel	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH18	0.05-0.25	Fill: sandy gravel	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH19	0.0-0.1	Fill: silty sand	0m to <1m	Sand	<25	100	<0.2	<0.5	<1	<3	<1	0
BH20	0.0-0.2	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH21	0.05-0.3	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH21	0.05-0.3	Laboratory duplicate	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH21	0.6-0.9	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH22	0.05-0.2	Fill: sandy gravel	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH23	0.0-0.1	Fill: silty sand	0m to <1m	Sand	<25	210	<0.2	<0.5	<1	<3	<1	0
BH23	0.3-0.4	Fill: silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH24	0.0-0.3	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH25	0.0-0.2	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH26	0.0-0.1	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH27	0.0-0.2	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH28	0.0-0.2	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH29	0.0-0.2	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH30	0.05-0.15	Fill: sandy gravel	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH30	0.05-0.15	Laboratory duplicate	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
Total Number of Samples					41	41	41	41	41	41	41	42
Maximum Value					<PQL	210	<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-A/B:LOW/HIGH DENSITY RESIDENTIAL**						
Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**							
BH1	0.2-0.3	Fill: silty sandy gravel	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH1	0.2-0.3	Laboratory duplicate	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH1	0.2-0.3	Laboratory triplicate	0m to <1m	Sand	NA	NA	NA	NA	NA	NA	NA
BH2	0.0-0.1	Fill: silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH2	2.5-2.7	Sandstone	2m to <4m	Sand	110	440	0.5	310	NL	95	NL
BH3	0.1-0.2	Fill: silty gravelly sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH4	0.1-0.2	Fill: silty gravelly sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH5	0.1-0.2	Fill: silty gravelly sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH5	0.7-0.8	Clayey sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH6	0.1-0.2	Fill: silty gravelly sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH6	0.6-0.7	Sandy clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH7	0.0-0.1	Fill: silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH8	0.0-0.1	Fill: silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH8	0.3-0.4	Sandstone	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH9	0.1-0.2	Fill: silty sandy gravel	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH10	0.0-0.1	Fill: silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH11	0.0-0.2	Fill: silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH11	0.0-0.2	Laboratory duplicate	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH12	0.3-0.5	Fill: silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH13	0.0-0.2	Fill: silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH14	0.05-0.25	Fill: silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH14	1.0-1.2	Fill: clayey sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH15	0.0-0.3	Fill: silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH16	0.0-0.15	Fill: silty clayey sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH17	0.05-0.25	Fill: sandy gravel	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH18	0.05-0.25	Fill: sandy gravel	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH19	0.0-0.1	Fill: silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH20	0.0-0.2	Fill: silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH21	0.05-0.3	Fill: silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH21	0.05-0.3	Laboratory duplicate	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH21	0.6-0.9	Fill: silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH22	0.05-0.2	Fill: sandy gravel	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH23	0.0-0.1	Fill: silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH23	0.3-0.4	Fill: silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH24	0.0-0.3	Fill: silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH25	0.0-0.2	Fill: silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH26	0.0-0.1	Fill: silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH27	0.0-0.2	Fill: silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH28	0.0-0.2	Fill: silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH29	0.0-0.2	Fill: silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH30	0.05-0.15	Fill: sandy gravel	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH30	0.05-0.15	Laboratory duplicate	0m to <1m	Sand	45	110	0.5	160	55	40	3

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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				URBAN RESIDENTIAL AND PUBLIC OPEN SPACE																		
							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	1	0.05
Ambient Background Concentration (ABC)				-	-	-	NSL	13	28	163	5	122	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL
Sample Reference	**Sample Depth**	**Sample Description**	**Soil Texture**																			
BH1	0.2-0.3	Fill: silty sandy gravel	Coarse	8.3	22.7	8.7	<4	14	17	22	24	34	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	0.1
BH1	0.2-0.3	Laboratory duplicate	Coarse	8.3	22.7	8.7	<4	13	22	8	41	26	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH1	0.2-0.3	Laboratory triplicate	Coarse	8.3	22.7	8.7	<4	15	24	16	40	29	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH2	0.0-0.1	Fill: silty sand	Coarse	8.3	22.7	8.7	<4	11	21	160	5	120	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	0.2
BH2	2.5-2.7	Sandstone	Coarse	8.3	22.7	8.7	<4	45	10	30	4	150	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	1.8
BH3	0.1-0.2	Fill: silty gravelly sand	Coarse	8.3	22.7	8.7	<4	45	46	4	37	26	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH4	0.1-0.2	Fill: silty gravelly sand	Coarse	8.3	22.7	8.7	<4	92	30	4	76	41	<1	<0.1	<25	<50	120	180	<0.2	<0.5	<1	<3	<0.05
BH5	0.1-0.2	Fill: silty gravelly sand	Coarse	8.3	22.7	8.7	<4	59	19	6	59	33	<1	<0.1	<25	<50	860	310	<0.2	<0.5	<1	<3	0.1
BH5	0.7-0.8	Clayey sand	Coarse	8.3	22.7	8.7	<4	7	<1	5	<1	<1	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH6	0.1-0.2	Fill: silty gravelly sand	Coarse	8.3	22.7	8.7	<4	17	58	2	110	36	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH6	0.6-0.7	Sandy clay	Coarse	8.3	22.7	8.7	<4	10	<1	4	3	3	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH7	0.0-0.1	Fill: silty sand	Coarse	8.3	22.7	8.7	5	23	13	24	13	43	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH8	0.0-0.1	Fill: silty sand	Coarse	8.3	22.7	8.7	<4	11	17	95	3	89	<1	<0.1	<25	<50	200	150	<0.2	<0.5	<1	<3	0.4
BH8	0.3-0.4	Sandstone	Coarse	8.3	22.7	8.7	<4	9	5	15	2	17	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH9	0.1-0.2	Fill: silty sandy gravel	Coarse	8.3	22.7	8.7	<4	37	15	8	38	26	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH10	0.0-0.1	Fill: silty sand	Coarse	8.3	22.7	8.7	<4	7	7	26	2	28	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH11	0.0-0.2	Fill: silty sand	Coarse	8.3	22.7	8.7	<4	5	11	30	3	36	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH11	0.0-0.2	Laboratory duplicate	Coarse	8.3	22.7	8.7	<4	6	10	32	3	37	<1	<0.1	<25	<50	110	<100	<0.2	<0.5	<1	<3	0.1
BH12	0.3-0.5	Fill: silty sand	Coarse	8.3	22.7	8.7	<4	15	18	34	9	43	<1	<0.1	<25	<50	270	270	<0.2	<0.5	<1	<3	0.4
BH13	0.0-0.2	Fill: silty sand	Coarse	8.3	22.7	8.7	<4	24	47	84	19	120	<1	<0.1	<25	<50	310	240	<0.2	<0.5	<1	<3	0.2
BH14	0.05-0.25	Fill: silty sand	Coarse	8.3	22.7	8.7	<4	23	51	5	47	37	<1	<0.1	<25	<50	480	370	<0.2	<0.5	<1	<3	0.2
BH14	1.0-1.2	Fill: clayey sand	Coarse	8.3	22.7	8.7	6	14	23	110	7	120	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	0.4
BH15	0.0-0.3	Fill: silty sand	Coarse	8.3	22.7	8.7	<4	5	6	54	2	35	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	0.2
BH16	0.0-0.15	Fill: silty clayey sand	Coarse	8.3	22.7	8.7	<4	8	31	17	18	55	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH17	0.05-0.25	Fill: sandy gravel	Coarse	8.3	22.7	8.7	<4	88	38	5	55	34	<1	<0.1	<25	<50	310	470	<0.2	<0.5	<1	<3	<0.05
BH18	0.05-0.25	Fill: sandy gravel	Coarse	8.3	22.7	8.7	<4	76	50	5	61	43	<1	<0.1	<25	<50	200	250	<0.2	<0.5	<1	<3	0.05
BH19	0.0-0.1	Fill: silty sand	Coarse	8.3	22.7	8.7	17	27	100	32	9	100	<1	<0.1	<25	100	340	240	<0.2	<0.5	<1	<3	0.09
BH20	0.0-0.2	Fill: silty sand	Coarse	8.3	22.7	8.7	<4	10	16	47	4	63	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	0.05
BH21	0.05-0.3	Fill: silty sand	Coarse	8.3	22.7	8.7	<4	7	27	9	23	23	<1	<0.1	<25	<50	610	850	<0.2	<0.5	<1	<3	<0.05
BH21	0.05-0.3	Laboratory duplicate	Coarse	8.3	22.7	8.7	<4	8	36	12	27	25	<1	<0.1	<25	<50	690	1000	<0.2	<0.5	<1	<3	<0.05
BH21	0.6-0.9	Fill: silty sand	Coarse	8.3	22.7	8.7	<4	6	12	75	2	110	<1	NA	<25	<50	150	<100	<0.2	<0.5	<1	<3	0.09
BH22	0.05-0.2	Fill: sandy gravel	Coarse	8.3	22.7	8.7	<4	70	22	4	69	38	<1	<0.1	<25	<50	130	<100	<0.2	<0.5	<1	<3	<0.05
BH23	0.0-0.1	Fill: silty sand	Coarse	8.3	22.7	8.7	<4	12	25	120	6	110	<1	<0.1	<25	210	1600	610	<0.2	<0.5	<1	<3	<0.05
BH23	0.3-0.4	Fill: silty clay	Coarse	8.3	22.7	8.7	<4	17	5	28	9	19	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH24	0.0-0.3	Fill: silty sand	Coarse	8.3	22.7	8.7	<4	15	25	54	25	150	<1	<0.1	<25	<50	180	150	<0.2	<0.5	<1	<3	<0.05
BH25	0.0-0.2	Fill: silty sand	Coarse	8.3	22.7	8.7	<4	11	14	37	5	60	<1	<0.1	<25	<50	170	180	<0.2	<0.5	<1	<3	<0.05
BH26	0.0-0.1	Fill: silty sand	Coarse	8.3	22.7	8.7	4	15	10	34	5	34	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH27	0.0-0.2	Fill: silty sand	Coarse	8.3	22.7	8.7	<4	9	12	44	7	39	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	0.07
BH28	0.0-0.2	Fill: silty sand	Coarse	8.3	22.7	8.7	4	15	11	41	3	40	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	0.1
BH29	0.0-0.2	Fill: silty sand	Coarse	8.3	22.7	8.7	<4	6	5	13	3	21	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH30	0.05-0.15	Fill: sandy gravel	Coarse	8.3	22.7	8.7	<4	82	28	5	78	44	<1	<0.1	<25	<50	<100	120	<0.2	<0.5	<1	<3	<0.05
BH30	0.05-0.15	Laboratory duplicate	Coarse	8.3	22.7	8.7	<4	70	22	4	69	39	<1	<0.1	<25	<50	110	140	<0.2	<0.5	<1	<3	<0.05
Total Number of Samples							42	42	42	42	42	42	41	34	41	41	41	41	41	41	41	41	41
Maximum Value							17	92	100	160	110	150	<PQL	<PQL	<PQL	210	1600	1000	<PQL	<PQL	<PQL	<PQL	1.8

Concentration above the SAC

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

				pH	CEC ($cmol_c/kg$)	Clay Content (% clay)	AGED HEAVY METALS-EILs						EILs		ESLs							
							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	1	0.05
Ambient Background Concentration (ABC)				-	-	-	NSL	13	28	163	5	122	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL
Sample Reference	**Sample Depth**	**Sample Description**	**Soil Texture**																			
BH1	0.2-0.3	Fill: silty sandy gravel	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH1	0.2-0.3	Laboratory duplicate	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH1	0.2-0.3	Laboratory triplicate	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	--	--	--	--	--	--	--	--	--	--	--
BH2	0.0-0.1	Fill: silty sand	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH2	2.5-2.7	Sandstone	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	--	180	120	300	2800	50	85	70	105	20
BH3	0.1-0.2	Fill: silty gravelly sand	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH4	0.1-0.2	Fill: silty gravelly sand	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH5	0.1-0.2	Fill: silty gravelly sand	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH5	0.7-0.8	Clayey sand	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	--	180	120	300	2800	50	85	70	105	20
BH6	0.1-0.2	Fill: silty gravelly sand	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH6	0.6-0.7	Sandy clay	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	--	180	120	300	2800	50	85	70	105	20
BH7	0.0-0.1	Fill: silty sand	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH8	0.0-0.1	Fill: silty sand	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH8	0.3-0.4	Sandstone	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	--	180	120	300	2800	50	85	70	105	20
BH9	0.1-0.2	Fill: silty sandy gravel	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH10	0.0-0.1	Fill: silty sand	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH11	0.0-0.2	Fill: silty sand	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH11	0.0-0.2	Laboratory duplicate	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH12	0.3-0.5	Fill: silty sand	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH13	0.0-0.2	Fill: silty sand	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH14	0.05-0.25	Fill: silty sand	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH14	1.0-1.2	Fill: clayey sand	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	--	180	120	300	2800	50	85	70	105	20
BH15	0.0-0.3	Fill: silty sand	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH16	0.0-0.15	Fill: silty clayey sand	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH17	0.05-0.25	Fill: sandy gravel	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH18	0.05-0.25	Fill: sandy gravel	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH19	0.0-0.1	Fill: silty sand	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH20	0.0-0.2	Fill: silty sand	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH21	0.05-0.3	Fill: silty sand	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH21	0.05-0.3	Laboratory duplicate	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH21	0.6-0.9	Fill: silty sand	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	--	180	120	300	2800	50	85	70	105	20
BH22	0.05-0.2	Fill: sandy gravel	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH23	0.0-0.1	Fill: silty sand	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH23	0.3-0.4	Fill: silty clay	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	--	180	120	300	2800	50	85	70	105	20
BH24	0.0-0.3	Fill: silty sand	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH25	0.0-0.2	Fill: silty sand	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH26	0.0-0.1	Fill: silty sand	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH27	0.0-0.2	Fill: silty sand	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH28	0.0-0.2	Fill: silty sand	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH29	0.0-0.2	Fill: silty sand	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH30	0.05-0.15	Fill: sandy gravel	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH30	0.05-0.15	Laboratory duplicate	Coarse	8.3	22.7	8.7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20

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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	Total VOCs*	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	0.2	25	50	100	100	50	0.2	0.5	1	1	100
General Solid Waste CT1			100	20	100	NSL	100	4	40	NSL	200	0.8	60	4	250	<50	<50	4	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	7.2	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	16	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	28.8	2600		NSL		40,000	72	2,073	4,320	7,200	-
Sample Reference	**Sample Depth**	**Sample Description**																										
BH1	0.2-0.3	Fill: silty sandy gravel	<4	<0.4	14	17	22	<0.1	24	34	0.71	0.1	<0.1	<0.1	<0.1	0.2	<0.1	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
BH1	0.2-0.3	Laboratory duplicate	<4	<0.4	13	22	8	<0.1	**41**	26	0.1	<0.05	<0.1	<0.1	<0.1	0.2	<0.1	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	NA
BH1	0.2-0.3	Laboratory triplicate	<4	<0.4	15	24	16	<0.1	40	29	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH2	0.0-0.1	Fill: silty sand	<4	<0.4	11	21	**160**	0.1	5	120	1.5	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	NA
BH2	2.5-2.7	Sandstone	<4	<0.4	45	10	30	<0.1	4	150	24	**1.8**	NA	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	NA
BH3	0.1-0.2	Fill: silty gravelly sand	<4	<0.4	45	46	4	<0.1	37	26	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
BH4	0.1-0.2	Fill: silty gravelly sand	<4	<0.4	92	30	4	<0.1	**76**	41	0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<25	<50	<100	140	140	<0.2	<0.5	<1	<3	Not Detected
BH4	0.5-0.7	Fill: silty sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH4	0.5-0.7	Laboratory duplicate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH4	1.9-2.0	Fill: silty sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH4	2.4-2.5	Clayey sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH5	0.1-0.2	Fill: silty gravelly sand	<4	<0.4	59	19	6	<0.1	**59**	33	0.4	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<25	<50	310	670	980	<0.2	<0.5	<1	<3	Not Detected
BH5	0.7-0.8	Clayey sand	<4	<0.4	7	<1	5	<0.1	<1	<1	<0.05	<0.05	NA	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	NA
BH6	0.1-0.2	Fill: silty gravelly sand	<4	<0.4	17	58	2	<0.1	**110**	36	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
BH6	0.6-0.7	Sandy clay	<4	<0.4	10	<1	4	<0.1	3	3	<0.05	<0.05	NA	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	NA
BH7	0.0-0.1	Fill: silty sand	5	<0.4	23	13	24	<0.1	13	43	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	NA
BH8	0.0-0.1	Fill: silty sand	<4	<0.4	11	17	95	0.2	3	89	4.1	0.4	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<25	<50	<100	180	180	<0.2	<0.5	<1	<3	NA
BH8	0.3-0.4	Sandstone	<4	<0.4	9	5	15	0.1	2	17	<0.05	<0.05	NA	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	NA
BH9	0.1-0.2	Fill: silty sandy gravel	<4	<0.4	37	15	8	<0.1	38	26	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
BH10	0.0-0.1	Fill: silty sand	<4	<0.4	7	7	26	<0.1	2	28	0.2	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
BH11	0.0-0.2	Fill: silty sand	<4	<0.4	5	11	30	<0.1	3	36	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
BH11	0.0-0.2	Laboratory duplicate	<4	<0.4	6	10	32	<0.1	3	37	1.6	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	NA
BH12	0.3-0.5	Fill: silty sand	<4	<0.4	15	18	34	<0.1	9	43	4	0.4	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<25	<50	120	240	360	<0.2	<0.5	<1	<3	Not Detected
BH13	0.0-0.2	Fill: silty sand	<4	<0.4	24	47	84	<0.1	19	120	1.4	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<25	<50	140	260	400	<0.2	<0.5	<1	<3	NA
BH14	0.05-0.25	Fill: silty sand	<4	<0.4	23	51	5	<0.1	**47**	37	1.2	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<25	<50	210	390	600	<0.2	<0.5	<1	<3	Not Detected
BH14	1.0-1.2	Fill: clayey sand	6	<0.4	14	23	**110**	0.2	7	120	5.4	0.4	NA	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	NA
BH15	0.0-0.3	Fill: silty sand	<4	<0.4	5	6	54	<0.1	2	35	2.7	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
BH16	0.0-0.15	Fill: silty clayey sand	<4	<0.4	8	31	17	<0.1	18	55	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
BH16	0.15-0.3	Fill: silty clayey sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH17	0.05-0.25	Fill: sandy gravel	<4	<0.4	88	38	5	<0.1	**55**	34	0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<25	<50	<100	380	380	<0.2	<0.5	<1	<3	Not Detected
BH17	0.7-0.75	Fill: silty sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH17	0.75-0.85	Fill: sandy clay	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH18	0.05-0.25	Fill: sandy gravel	<4	<0.4	76	50	5	<0.1	**61**	43	0.4	0.05	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<25	<50	<100	200	200	<0.2	<0.5	<1	<3	Not Detected
BH19	0.0-0.1	Fill: silty sand	17	<0.4	27	100	32	0.2	9	100	0.72	0.09	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<25	98	170	270	538	<0.2	<0.5	<1	<3	Not Detected
BH20	0.0-0.2	Fill: silty sand	<4	<0.4	10	16	47	<0.1	4	63	0.2	0.05	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
BH21	0.05-0.3	Fill: silty sand	<4	<0.4	7	27	9	<0.1	23	23	0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<25	<50	220	650	870	<0.2	<0.5	<1	<3	Not Detected
BH21	0.05-0.3	Laboratory duplicate	<4	<0.4	8	36	12	<0.1	27	25	0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<25	<50	250	710	960	<0.2	<0.5	<1	<3	NA
BH21	0.6-0.9	Fill: silty sand	<4	<0.4	6	12	75	<0.1	2	110	0.4	0.09	NA	NA	NA	NA	NA	<0.2	<25	<50	<100	170	170	<0.2	<0.5	<1	<3	NA
BH21	0.9-1.1	Fill: clayey sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH22	0.05-0.2	Fill: sandy gravel	<4	<0.4	70	22	4	0.1	**69**	38	0.2	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
BH23	0.0-0.1	Fill: silty sand	<4	<0.4	12	25	**120**	<0.1	6	110	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<25	180	1000	900	2080	<0.2	<0.5	<1	<3	Not Detected
BH23	0.3-0.4	Fill: silty clay	<4	<0.4	17	5	28	<0.1	9	19	<0.05	<0.05	NA	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	NA
BH24	0.0-0.3	Fill: silty sand	<4	<0.4	15	25	54	<0.1	25	150	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<25	<50	<100	140	140	<0.2	<0.5	<1	<3	Not Detected
BH25	0.0-0.2	Fill: silty sand	<4	<0.4	11	14	37	<0.1	5	60	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<25	<50	<100	180	180	<0.2	<0.5	<1	<3	Not Detected
BH26	0.0-0.1	Fill: silty sand	4	<0.4	15	10	34	<0.1	5	34	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
BH27	0.0-0.2	Fill: silty sand	<4	<0.4	9	12	44	0.1	7	39	0.3	0.07	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
BH28	0.0-0.2	Fill: silty sand	4	<0.4	15	11	41	<0.1	3	40	0.84	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
BH29	0.0-0.2	Fill: silty sand	<4	<0.4	6	5	13	<0.1	3	21	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
BH30	0.05-0.15	Fill: sandy gravel	<4	<0.4	82	28	5	<0.1	**78**	44	0.2	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
BH30	0.05-0.15	Laboratory duplicate	<4	<0.4	70	22	4	<0.1	**69**	39	0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<25	<50	<100	100	100	<0.2	<0.5	<1	<3	NA
Total Number of samples			42	42	42	42	42	42	42	42	41	41	34	34	34	34	34	9	41	41	41	41	41	41	41	41	41	26
Maximum Value			17	<PQL	92	100	160	0.2	110	150	24	1.8	<PQL	<PQL	<PQL	0.2	<PQL	<PQL	<PQL	180	1000	900	2080	<PQL	<PQL	<PQL	<PQL	NC

*The VOC vinyl chloride has the lowest classification criteria for waste, therefore it has been adopted it as the criteria for total VOCs

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

			Lead	Nickel
PQL - Envirolab Services			0.03	0.02
TCLP1 - General Solid Waste			5	2
TCLP2 - Restricted Solid Waste			20	8
TCLP3 - Hazardous Waste			>20	>8
Sample Reference	**Sample Depth**	**Sample Description**		
BH2	0.0-0.1	Fill: silty sand	0.03	NA
BH4	0.1-0.2	Fill: silty gravelly sand	NA	0.06
BH6	0.1-0.2	Fill: silty gravelly sand	NA	0.1
BH18	0.05-0.25	Fill: sandy gravel	NA	0.02
BH22	0.05-0.2	Fill: sandy gravel	NA	0.04
BH23	0.0-0.1	Fill: silty sand	<0.03	NA
BH30	0.05-0.15	Fill: sandy gravel	NA	0.1
BH30	0.05-0.15	Laboratory duplicate	NA	0.09
Total Number of samples			2	6
Maximum Value			0.03	0.1

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

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TABLE F
SOIL LABORATORY RESULTS COMPARED TO MANAGEMENT LIMITS
All data in mg/kg unless stated otherwise

			C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)
PQL - Envirolab Services			25	50	100	100
NEPM 2013 Land Use Category			**RESIDENTIAL, PARKLAND & PUBLIC OPEN SPACE**			
Sample Reference	**Sample Depth**	**Soil Texture**				
BH1	0.2-0.3	Coarse	<25	<50	<100	<100
BH1	0.2-0.3	Coarse	<25	<50	<100	<100
BH1	0.2-0.3	Coarse	NA	NA	NA	NA
BH2	0.0-0.1	Coarse	<25	<50	<100	<100
BH2	2.5-2.7	Coarse	<25	<50	<100	<100
BH3	0.1-0.2	Coarse	<25	<50	<100	<100
BH4	0.1-0.2	Coarse	<25	<50	120	180
BH5	0.1-0.2	Coarse	<25	<50	860	310
BH5	0.7-0.8	Coarse	<25	<50	<100	<100
BH6	0.1-0.2	Coarse	<25	<50	<100	<100
BH6	0.6-0.7	Coarse	<25	<50	<100	<100
BH7	0.0-0.1	Coarse	<25	<50	<100	<100
BH8	0.0-0.1	Coarse	<25	<50	200	150
BH8	0.3-0.4	Coarse	<25	<50	<100	<100
BH9	0.1-0.2	Coarse	<25	<50	<100	<100
BH10	0.0-0.1	Coarse	<25	<50	<100	<100
BH11	0.0-0.2	Coarse	<25	<50	<100	<100
BH11	0.0-0.2	Coarse	<25	<50	110	<100
BH12	0.3-0.5	Coarse	<25	<50	270	270
BH13	0.0-0.2	Coarse	<25	<50	310	240
BH14	0.05-0.25	Coarse	<25	<50	480	370
BH14	1.0-1.2	Coarse	<25	<50	<100	<100
BH15	0.0-0.3	Coarse	<25	<50	<100	<100
BH16	0.0-0.15	Coarse	<25	<50	<100	<100
BH17	0.05-0.25	Coarse	<25	<50	310	470
BH18	0.05-0.25	Coarse	<25	<50	200	250
BH19	0.0-0.1	Coarse	<25	100	340	240
BH20	0.0-0.2	Coarse	<25	<50	<100	<100
BH21	0.05-0.3	Coarse	<25	<50	610	850
BH21	0.05-0.3	Coarse	<25	<50	690	1000
BH21	0.6-0.9	Coarse	<25	<50	150	<100
BH22	0.05-0.2	Coarse	<25	<50	130	<100
BH23	0.0-0.1	Coarse	<25	210	1600	610
BH23	0.3-0.4	Coarse	<25	<50	<100	<100
BH24	0.0-0.3	Coarse	<25	<50	180	150
BH25	0.0-0.2	Coarse	<25	<50	170	180
BH26	0.0-0.1	Coarse	<25	<50	<100	<100
BH27	0.0-0.2	Coarse	<25	<50	<100	<100
BH28	0.0-0.2	Coarse	<25	<50	<100	<100
BH29	0.0-0.2	Coarse	<25	<50	<100	<100
BH30	0.05-0.15	Coarse	<25	<50	<100	120
BH30	0.05-0.15	Coarse	<25	<50	110	140
Total Number of Samples			41	41	41	41
Maximum Value			<PQL	210	1600	1000
Concentration above the SAC			**VALUE**			

MANAGEMENT LIMIT ASSESSMENT CRITERIA

			C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)
PQL - Envirolab Services			25	50	100	100
NEPM 2013 Land Use Category			**RESIDENTIAL, PARKLAND & PUBLIC OPEN SPACE**			
Sample Reference	**Sample Depth**	**Soil Texture**				
BH1	0.2-0.3	Coarse	700	1000	2500	10000
BH1	0.2-0.3	Coarse	700	1000	2500	10000
BH1	0.2-0.3	Coarse	--	--	--	--
BH2	0.0-0.1	Coarse	700	1000	2500	10000
BH2	2.5-2.7	Coarse	700	1000	2500	10000
BH3	0.1-0.2	Coarse	700	1000	2500	10000
BH4	0.1-0.2	Coarse	700	1000	2500	10000
BH5	0.1-0.2	Coarse	700	1000	2500	10000
BH5	0.7-0.8	Coarse	700	1000	2500	10000
BH6	0.1-0.2	Coarse	700	1000	2500	10000
BH6	0.6-0.7	Coarse	700	1000	2500	10000
BH7	0.0-0.1	Coarse	700	1000	2500	10000
BH8	0.0-0.1	Coarse	700	1000	2500	10000
BH8	0.3-0.4	Coarse	700	1000	2500	10000
BH9	0.1-0.2	Coarse	700	1000	2500	10000
BH10	0.0-0.1	Coarse	700	1000	2500	10000
BH11	0.0-0.2	Coarse	700	1000	2500	10000
BH11	0.0-0.2	Coarse	700	1000	2500	10000
BH12	0.3-0.5	Coarse	700	1000	2500	10000
BH13	0.0-0.2	Coarse	700	1000	2500	10000
BH14	0.05-0.25	Coarse	700	1000	2500	10000
BH14	1.0-1.2	Coarse	700	1000	2500	10000
BH15	0.0-0.3	Coarse	700	1000	2500	10000
BH16	0.0-0.15	Coarse	700	1000	2500	10000
BH17	0.05-0.25	Coarse	700	1000	2500	10000
BH18	0.05-0.25	Coarse	700	1000	2500	10000
BH19	0.0-0.1	Coarse	700	1000	2500	10000
BH20	0.0-0.2	Coarse	700	1000	2500	10000
BH21	0.05-0.3	Coarse	700	1000	2500	10000
BH21	0.05-0.3	Coarse	700	1000	2500	10000
BH21	0.6-0.9	Coarse	700	1000	2500	10000
BH22	0.05-0.2	Coarse	700	1000	2500	10000
BH23	0.0-0.1	Coarse	700	1000	2500	10000
BH23	0.3-0.4	Coarse	700	1000	2500	10000
BH24	0.0-0.3	Coarse	700	1000	2500	10000
BH25	0.0-0.2	Coarse	700	1000	2500	10000
BH26	0.0-0.1	Coarse	700	1000	2500	10000
BH27	0.0-0.2	Coarse	700	1000	2500	10000
BH28	0.0-0.2	Coarse	700	1000	2500	10000
BH29	0.0-0.2	Coarse	700	1000	2500	10000
BH30	0.05-0.15	Coarse	700	1000	2500	10000
BH30	0.05-0.15	Coarse	700	1000	2500	10000

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TABLE G
SOIL LABORATORY RESULTS COMPARED T0 DIRECT CONTACT CRITERIA
All data in mg/kg unless stated otherwise

Analyte		C_6-C_{10}	>C_{10}-C_{16}	>C_{16}-C_{34}	>C_{34}-C_{40}	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	PID
PQL - Envirolab Services		25	50	100	100	0.2	0.5	1	1	1	
CRC 2011 -Direct contact Criteria		82,000	62,000	85,000	120,000	1,100	120,000	85,000	130,000	29,000	
Site Use		**Intrusive Maintenance Worker - DIRECT SOIL CONTACT**									
Sample Reference	**Sample Depth**										
BH1	0.2-0.3	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH1	0.2-0.3	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH1	0.2-0.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	0
BH2	0.0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH2	2.5-2.7	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH3	0.1-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH4	0.1-0.2	<25	<50	120	180	<0.2	<0.5	<1	<3	<1	0
BH5	0.1-0.2	<25	<50	860	310	<0.2	<0.5	<1	<3	<1	0
BH5	0.7-0.8	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH6	0.1-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH6	0.6-0.7	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH7	0.0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH8	0.0-0.1	<25	<50	200	150	<0.2	<0.5	<1	<3	<1	0
BH8	0.3-0.4	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH9	0.1-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH10	0.0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH11	0.0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH11	0.0-0.2	<25	<50	110	<100	<0.2	<0.5	<1	<3	<1	0
BH12	0.3-0.5	<25	<50	270	270	<0.2	<0.5	<1	<3	<1	0
BH13	0.0-0.2	<25	<50	310	240	<0.2	<0.5	<1	<3	<1	0
BH14	0.05-0.25	<25	<50	480	370	<0.2	<0.5	<1	<3	<1	0
BH14	1.0-1.2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH15	0.0-0.3	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH16	0.0-0.15	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH17	0.05-0.25	<25	<50	310	470	<0.2	<0.5	<1	<3	<1	0
BH18	0.05-0.25	<25	<50	200	250	<0.2	<0.5	<1	<3	<1	0
BH19	0.0-0.1	<25	100	340	240	<0.2	<0.5	<1	<3	<1	0
BH20	0.0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH21	0.05-0.3	<25	<50	610	850	<0.2	<0.5	<1	<3	<1	0
BH21	0.05-0.3	<25	<50	690	1000	<0.2	<0.5	<1	<3	<1	0
BH21	0.6-0.9	<25	<50	150	<100	<0.2	<0.5	<1	<3	<1	0
BH22	0.05-0.2	<25	<50	130	<100	<0.2	<0.5	<1	<3	<1	0
BH23	0.0-0.1	<25	210	1600	610	<0.2	<0.5	<1	<3	<1	0
BH23	0.3-0.4	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH24	0.0-0.3	<25	<50	180	150	<0.2	<0.5	<1	<3	<1	0
BH25	0.0-0.2	<25	<50	170	180	<0.2	<0.5	<1	<3	<1	0
BH26	0.0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH27	0.0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH28	0.0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH29	0.0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH30	0.05-0.15	<25	<50	<100	120	<0.2	<0.5	<1	<3	<1	0
BH30	0.05-0.15	<25	<50	110	140	<0.2	<0.5	<1	<3	<1	0
Total Number of Samples		41	41	41	41	41	41	41	41	41	42
Maximum Value		<PQL	210	1600	1000	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL

Concentration above the SAC **VALUE**

TABLE H
ASBESTOS QUANTIFICATION - FIELD OBSERVATIONS AND LABORATORY RESULTS
HSL-A: Residential with garden/accessible soils; children's day care centers; preschools; and primary schools

						FIELD DATA									LABORATORY DATA											
Date Sampled	Sample reference	Sample Depth	Visible ACM in top 100mm	Approx. Volume of Soil (L)	Soil Mass (g)	Mass ACM (g)	Mass Asbestos in ACM (g)	[Asbestos from ACM in soil] (%w/w)	Mass ACM <7mm (g)	Mass Asbestos in ACM <7mm (g)	[Asbestos from ACM <7mm in soil] (%w/w)	Mass FA (g)	Mass Asbestos in FA (g)	[Asbestos from FA in soil] (%w/w)	Lab Report Number	Sample refeference	Sample Depth	Sample Mass (g)	Asbestos ID in soil (AS4964) >0.1g/kg	Trace Analysis	Total Asbestos (g/kg)	Asbestos ID in soil <0.1g/kg	ACM >7mm Estimation (g)	FA and AF Estimation (g)	ACM >7mm Estimation %(w/w)	FA and AF Estimation %(w/w)
SAC			**No**					**0.01**			**0.001**			**0.001**											**0.01**	**0.001**
22/07/2019	BH1	0.2-0.3	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
22/07/2019	BH1	0.5-0.7	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
22/07/2019	BH1	0.75-0.95	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
22/07/2019	BH1	1.6-1.8	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
22/07/2019	BH1	2.8-3.0	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23/07/2019	BH2	0.0-0.1	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	222520	BH2	0.0-0.1	538.87	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
23/07/2019	BH2	0.6-0.7	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23/07/2019	BH2	1.0-1.1	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23/07/2019	BH3	0.1-0.2	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23/07/2019	BH3	0.3-0.5	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23/07/2019	BH3	0.5-0.6	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23/07/2019	BH4	0.1-0.2	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23/07/2019	BH4	0.2-0.3	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23/07/2019	BH4	0.5-0.7	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23/07/2019	BH4	1.3-1.4	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23/07/2019	BH4	1.9-2.0	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23/07/2019	BH5	0.1-0.2	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23/07/2019	BH5	0.2-0.3	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23/07/2019	BH6	0.1-0.2	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23/07/2019	BH6	0.3-0.4	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23/07/2019	BH7	0.0-0.1	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	222520	BH7	0.0-0.1	413.74	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
24/07/2019	BH8	0.0-0.1	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	222520	BH8	0.0-0.1	381.85	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
24/07/2019	BH9	0.1-0.2	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/07/2019	BH9	0.4-0.6	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/07/2019	BH9	0.6-0.9	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/07/2019	BH10	0.0-0.1	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH11	0.0-0.2	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH11	0.2-0.4	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH11	0.4-0.6	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH12	0.3-0.5	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH12	1.0-1.2	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH12	2.0-2.2	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH12	2.5-2.7	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH12	2.8-3.1	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH12	3.8-4.0	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH13	0.0-0.2	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	222520	BH13	0.0-0.2	661.1	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
25/07/2019	BH13	0.3-0.5	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH14	0.05-0.25	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH14	0.4-.6	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH14	0.65-0.8	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH14	1.0-1.2	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH14	1.4-1.6	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH14	2.3-2.4	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH15	0.0-0.3	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH15	0.4-0.5	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH15	0.5-0.7	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH15	0.9-1.1	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/07/2019	BH16	0.0-0.15	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/07/2019	BH16	0.15-0.3	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/07/2019	BH16	0.3-0.5	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/07/2019	BH17	0.05-0.25	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/07/2019	BH17	0.25-0.45	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/07/2019	BH17	0.7-0.75	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/07/2019	BH17	0.75-0.85	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH18	0.05-0.25	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH18	0.25-0.4	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH18	0.4-0.6	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH18	0.6-0.8	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH18	0.9-1.1	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH19	0.0-0.1	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH19	0.1-0.2	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/07/2019	BH20	0.0-0.2	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH21	0.05-0.3	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH21	0.3-0.6	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH21	0.6-0.9	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH22	0.05-0.2	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH22	0.3-0.5	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH23	0.0-0.1	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/07/2019	BH23	0.3-0.4	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/07/2019	BH24	0.0-0.3	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/07/2019	BH24	0.3-0.5	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/07/2019	BH24	0.5-0.7	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/07/2019	BH25	0.0-0.2	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/07/2019	BH26	0.0-0.1	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/07/2019	BH26	0.1-0.3	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/07/2019	BH27	0.0-0.2	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/07/2019	BH27	0.25-0.45	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/07/2019	BH28	0.0-0.2	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/07/2019	BH28	0.2-0.3	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/07/2019	BH29	0.0-0.2	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/07/2019	BH29	0.3-0.4	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/07/2019	BH29	0.5-0.7	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/07/2019	BH29	0.8-0.9	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/07/2019	BH29	0.9-1.1	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/07/2019	BH30	0.05-0.15	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/07/2019	BH30	0.15-0.3	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/07/2019	BH30	0.3-0.45	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/07/2019	BH30	0.45-0.6	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/07/2019	BH30	0.6-0.7	No	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Concentration above the SAC **VALUE**

TABLE I
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-A/B: LOW/HIGH DENSITY RESIDENTIAL**							
Sample Reference	**Water Depth**	**Depth Category**	**Soil Category**								
MW7	6.35	4m to <8m	Sand	19	300	<1	4	<1	15	<1	24.1
Total Number of Samples				1	1	1	1	1	1	1	1
Maximum Value				19	300	<PQL	4	<PQL	15	<PQL	24.1

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-A/B: LOW/HIGH DENSITY RESIDENTIAL**						
Sample Reference	**Water Depth**	**Depth Category**	**Soil Category**							
MW7	6.35	4m to <8m	Sand	1000	1000	800	NL	NL	NL	NL

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TABLE J

SUMMARY OF GROUNDAWATER LABORATORY RESULTS COMPARED TO ECOLOGICAL GILs SAC

All results in µg/L unless stated otherwise.

	PQL Envirolab Services	ANZG 2018 Fresh Waters	SAMPLES MW7 1/08/2019
Inorganic Compounds and Parameters			
pH	0.1	6.5 - 8.5	6.7
Electrical Conductivity (µS/cm)	1	NSL	270
Metals and Metalloids			
Arsenic (As III)	1	24	<1
Cadmium	0.1	0.2	<0.1
Chromium (VI)	1	1	<1
Copper	1	1.4	**2**
Lead	1	3.4	<1
Total Mercury (inorganic)	0.05	0.06	<0.05
Nickel	1	11	2
Zinc	1	8	4
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)			
Benzene	1	950	<1
Toluene	1	180	4
Ethylbenzene	1	80	<1
m+p-xylene	2	75	8
o-xylene	1	350	7
Total xylenes	2	NSL	15
Volatile Organic Compounds (VOCs), including chlorinated VOCs			
Dichlorodifluoromethane	10	NSL	<10
Chloromethane	10	NSL	<10
Vinyl Chloride	10	100	<10
Bromomethane	10	NSL	<10
Chloroethane	10	NSL	<10
Trichlorofluoromethane	10	NSL	<10
1,1-Dichloroethene	1	700	<1
Trans-1,2-dichloroethene	1	NSL	<1
1,1-dichloroethane	1	90	<1
Cis-1,2-dichloroethene	1	NSL	<1
Bromochloromethane	1	NSL	<1
Chloroform	1	370	18
2,2-dichloropropane	1	NSL	<1
1,2-dichloroethane	1	1900	<1
1,1,1-trichloroethane	1	270	<1
1,1-dichloropropene	1	NSL	<1
Cyclohexane	1	NSL	<1
Carbon tetrachloride	1	240	<1
Benzene	1	see BTEX	<1
Dibromomethane	1	NSL	<1
1,2-dichloropropane	1	900	<1
Trichloroethene	1	NSL	<1
Bromodichloromethane	1	NSL	14
trans-1,3-dichloropropene	1	NSL	<1
cis-1,3-dichloropropene	1	NSL	<1
1,1,2-trichloroethane	1	6500	<1
Toluene	1	see BTEX	4
1,3-dichloropropane	1	1100	<1
Dibromochloromethane	1	NSL	6
1,2-dibromoethane	1	NSL	<1
Tetrachloroethene	1	70	<1
1,1,1,2-tetrachloroethane	1	NSL	<1
Chlorobenzene	1	55	<1
Ethylbenzene	1	see BTEX	<1
Bromoform	1	NSL	<1
m+p-xylene	2	see BTEX	8
Styrene	1	NSL	<1
1,1,2,2-tetrachloroethane	1	400	<1
o-xylene	1	see BTEX	7
1,2,3-trichloropropane	1	NSL	<1
Isopropylbenzene	1	30	<1
Bromobenzene	1	NSL	<1
n-propyl benzene	1	NSL	<1
2-chlorotoluene	1	NSL	<1
4-chlorotoluene	1	NSL	<1
1,3,5-trimethyl benzene	1	NSL	3
Tert-butyl benzene	1	NSL	<1
1,2,4-trimethyl benzene	1	NSL	9
1,3-dichlorobenzene	1	260	<1
Sec-butyl benzene	1	NSL	<1
1,4-dichlorobenzene	1	60	<1
4-isopropyl toluene	1	NSL	1
1,2-dichlorobenzene	1	160	<1
n-butyl benzene	1	NSL	<1
1,2-dibromo-3-chloropropane	1	NSL	<1
1,2,4-trichlorobenzene	1	85	<1
Hexachlorobutadiene	1	NSL	<1
1,2,3-trichlorobenzene	1	3	<1
Polycyclic Aromatic Hydrocarbons (PAHs)			
Naphthalene	0.2	16	<0.2
Acenaphthylene	0.1	NSL	<0.1
Acenaphthene	0.1	NSL	<0.1
Fluorene	0.1	NSL	<0.1
Phenanthrene	0.1	0.6	<0.1
Anthracene	**0.1**	0.01	<0.1
Fluoranthene	0.1	1	<0.1
Pyrene	0.1	NSL	<0.1
Benzo(a)anthracene	0.1	NSL	<0.1
Chrysene	0.1	NSL	<0.1
Benzo(b,j+k)fluoranthene	0.2	NSL	<0.2
Benzo(a)pyrene	0.1	0.1	<0.1
Indeno(1,2,3-c,d)pyrene	0.1	NSL	<0.1
Dibenzo(a,h)anthracene	0.1	NSL	<0.1
Benzo(g,h,i)perylene	0.1	NSL	<0.1

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

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TABLE K

SUMMARY OF GROUNDAWATER LABORATORY RESULTS COMPARED TO HUMAN CONTACT GILs

All results in µg/L unless stated otherwise.

	PQL Envirolab Services	ANZG 2000 Recreational	NHMRC ADWG 2011	SAMPLES MW7 1/08/2019
Inorganic Compounds and Parameters				
pH	0.1	6.5 - 8.5	6.5 - 8.5	6.7
Electrical Conductivity (µS/cm)	1	NSL	NSL	270
Metals and Metalloids				
Arsenic (As III)	1	50	10	<1
Cadmium	0.1	5	2	<0.1
Chromium (total)	1	50	50	<1
Copper	1	1000	2000	2
Lead	1	50	10	<1
Total Mercury (inorganic)	0.05	1	1	<0.05
Nickel	1	100	20	2
Zinc	1	5000	3000	4
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)				
Benzene	1	10	1	<1
Toluene	1	NSL	800	4
Ethylbenzene	1	NSL	300	<1
m+p-xylene	2	NSL	NSL	8
o-xylene	1	NSL	NSL	7
Total xylenes	2	NSL	600	15
Volatile Organic Compounds (VOCs), including chlorinated VOCs				
Dichlorodifluoromethane	10	NSL	NSL	<10
Chloromethane	10	NSL	NSL	<10
Vinyl Chloride	10	NSL	0.3	<10
Bromomethane	10	NSL	NSL	<10
Chloroethane	10	NSL	NSL	<10
Trichlorofluoromethane	10	NSL	NSL	<10
1,1-Dichloroethene	**1**	0.3	30	<1
Trans-1,2-dichloroethene	1	NSL	NSL	<1
1,1-dichloroethane	1	NSL	NSL	<1
Cis-1,2-dichloroethene	1	NSL	NSL	<1
Bromochloromethane	1	NSL	250	<1
Chloroform	1	NSL		18
2,2-dichloropropane	1	NSL	NSL	<1
1,2-dichloroethane	1	10	3	<1
1,1,1-trichloroethane	1	NSL	NSL	<1
1,1-dichloropropene	1	NSL	NSL	<1
Cyclohexane	1	NSL	NSL	<1
Carbon tetrachloride	1	3	NSL	<1
Benzene	1	NSL	see BTEX	<1
Dibromomethane	1	NSL	NSL	<1
1,2-dichloropropane	1	NSL	NSL	<1
Trichloroethene	1	30	NSL	<1
Bromodichloromethane	1	NSL	NSL	14
trans-1,3-dichloropropene	1	NSL	NSL	<1
cis-1,3-dichloropropene	1	NSL	NSL	<1
1,1,2-trichloroethane	1	NSL	NSL	<1
Toluene	1	NSL	see BTEX	4
1,3-dichloropropane	1	NSL	NSL	<1
Dibromochloromethane	1	NSL	NSL	6
1,2-dibromoethane	1	NSL	NSL	<1
Tetrachloroethene	1	10	NSL	<1
1,1,1,2-tetrachloroethane	1	NSL	NSL	<1
Chlorobenzene	1	NSL	300	<1
Ethylbenzene	1	NSL	see BTEX	<1
Bromoform	1	NSL	NSL	<1
m+p-xylene	2	NSL	see BTEX	8
Styrene	1	NSL	NSL	<1
1,1,2,2-tetrachloroethane	1	NSL	NSL	<1
o-xylene	1	NSL	see BTEX	7
1,2,3-trichloropropane	1	NSL	NSL	<1
Isopropylbenzene	1	NSL	NSL	<1
Bromobenzene	1	NSL	NSL	<1
n-propyl benzene	1	NSL	NSL	<1
2-chlorotoluene	1	NSL	NSL	<1
4-chlorotoluene	1	NSL	NSL	<1
1,3,5-trimethyl benzene	1	NSL	NSL	3
Tert-butyl benzene	1	NSL	NSL	<1
1,2,4-trimethyl benzene	1	NSL	NSL	9
1,3-dichlorobenzene	1	NSL	300	<1
Sec-butyl benzene	1	NSL	NSL	<1
1,4-dichlorobenzene	1	NSL	40	<1
4-isopropyl toluene	1	NSL	NSL	1
1,2-dichlorobenzene	1	NSL	1500	<1
n-butyl benzene	1	NSL	NSL	<1
1,2-dibromo-3-chloropropane	1	NSL	NSL	<1
1,2,4-trichlorobenzene	1	NSL	NSL	<1
Hexachlorobutadiene	1	NSL	NSL	<1
1,2,3-trichlorobenzene	1	NSL	NSL	<1
Polycyclic Aromatic Hydrocarbons (PAHs)				
Naphthalene	0.2	NSL	NSL	<0.2
Acenaphthylene	0.1	NSL	NSL	<0.1
Acenaphthene	0.1	NSL	NSL	<0.1
Fluorene	0.1	NSL	NSL	<0.1
Phenanthrene	0.1	NSL	NSL	<0.1
Anthracene	0.1	NSL	NSL	<0.1
Fluoranthene	0.1	NSL	NSL	<0.1
Pyrene	0.1	NSL	NSL	<0.1
Benzo(a)anthracene	0.1	NSL	NSL	<0.1
Chrysene	0.1	NSL	NSL	<0.1
Benzo(b,j+k)fluoranthene	0.2	NSL	NSL	<0.2
Benzo(a)pyrene	**0.1**	0.01	0.01	<0.1
Indeno(1,2,3-c,d)pyrene	0.1	NSL	NSL	<0.1
Dibenzo(a,h)anthracene	0.1	NSL	NSL	<0.1
Benzo(g,h,i)perylene	0.1	NSL	NSL	<0.1

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

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

SAMPLE	ANALYSIS	Envirolab PQL	INITIAL	REPEAT	MEAN	RPD %
Sample Ref = BH1 (0.2-0.3)	Arsenic	4	<4	<4	NC	NC
Dup Ref = DUPKT1	Cadmium	0.4	<0.4	<0.4	NC	NC
	Chromium	1	14	12	13.0	15
Envirolab Report: 222520	Copper	1	22	32	27.0	37
	Lead	1	22	17	19.5	26
	Mercury	0.1	<0.1	<0.1	NC	NC
	Nickel	1	41	46	43.5	11
	Zinc	1	34	33	33.5	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	0.2	<0.1	0.1	120
	Pyrene	0.1	0.2	0.1	0.2	67
	Benzo(a)anthracene	0.1	<0.1	<0.1	NC	NC
	Chrysene	0.1	0.2	<0.1	0.1	120
	Benzo(b,j+k)fluoranthene	0.2	<0.2	<0.2	NC	NC
	Benzo(a)pyrene	0.05	0.1	0.05	0.1	67
	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 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

RPD Results Above the Acceptance Criteria VALUE

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

SAMPLE	ANALYSIS	Envirolab PQL	INITIAL	REPEAT	MEAN	RPD %
Sample Ref = BH26 (0.0-0.1)	Arsenic	4	4	<4	3.0	67
Dup Ref = DUPMP1	Cadmium	0.4	<0.4	<0.4	NC	NC
	Chromium	1	15	12	13.5	22
Envirolab Report: 222520	Copper	1	10	10	10.0	0
	Lead	1	34	32	33.0	6
	Mercury	0.1	<0.1	<0.1	NC	NC
	Nickel	1	5	4	4.5	22
	Zinc	1	34	34	34.0	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	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
	TRH C6-C10 (F1)	25	<25	<25	NC	NC
	TRH >C10-C16 (F2)	50	<50	<50	NC	NC
	TRH >C16-C34 (F3)	100	<100	180	115.0	113
	TRH >C34-C40 (F4)	100	<100	110	80.0	75
	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

RPD Results Above the Acceptance Criteria VALUE

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TABLE M-1
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 = BH10 (0.0-0.1)	Arsenic	4	4	<4	4	3.0	67
Dup Ref = DUPKT2	Cadmium	0.4	0.4	<0.4	<0.4	NC	NC
	Chromium	1	1	7	13	10.0	60
Envirolab Report: 222520	Copper	1	1	7	16	11.5	78
Envirolab VIC Report: 17565	Lead	1	1	26	88	57.0	109
	Mercury	0.1	0.1	<0.1	0.2	0.1	120
	Nickel	1	1	2	2	2.0	0
	Zinc	1	1	28	78	53.0	94
	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	0.3	0.2	143
	Anthracene	0.1	0.1	<0.1	<0.1	NC	NC
	Fluoranthene	0.1	0.1	0.1	0.8	0.5	156
	Pyrene	0.1	0.1	0.1	0.8	0.5	156
	Benzo(a)anthracene	0.1	0.1	<0.1	0.4	0.2	156
	Chrysene	0.1	0.1	<0.1	0.4	0.2	156
	Benzo(b,j+k)fluoranthene	0.2	0.2	<0.2	0.8	0.5	156
	Benzo(a)pyrene	0.05	0.05	<0.05	0.45	0.2	179
	Indeno(123-cd)pyrene	0.1	0.1	<0.1	0.3	0.2	143
	Dibenzo(ah)anthracene	0.1	0.1	<0.1	0.1	0.1	67
	Benzo(ghi)perylene	0.1	0.1	<0.1	0.3	0.2	143
	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	160	105.0	105
	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

RPD Results Above the Acceptance Criteria VALUE

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TABLE M-2
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 = BH24 (0.0-0.3)	Arsenic	4	4	<4	<4	NC	NC
Dup Ref = DUPMP2	Cadmium	0.4	0.4	<0.4	<0.4	NC	NC
	Chromium	1	1	15	16	15.5	6
Envirolab Report: 222520	Copper	1	1	25	27	26.0	8
Envirolab VIC Report: 17565	Lead	1	1	54	57	55.5	5
	Mercury	0.1	0.1	<0.1	<0.1	NC	NC
	Nickel	1	1	25	29	27.0	15
	Zinc	1	1	150	150	150.0	0
	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	NC	NC
	Pyrene	0.1	0.1	<0.1	<0.1	NC	NC
	Benzo(a)anthracene	0.1	0.1	<0.1	<0.1	NC	NC
	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	<0.05	NC	NC
	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	NC	NC
	TRH C6-C10 (F1)	25	25	<25	<25	NC	NC
	TRH >C10-C16 (F2)	50	50	<50	<100	NC	NC
	TRH >C16-C34 (F3)	100	100	180	<100	115.0	113
	TRH >C34-C40 (F4)	100	100	150	<100	100.0	100
	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

RPD Results Above the Acceptance Criteria VALUE

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TABLE N

SUMMARY OF FIELD QA/QC RESULTS

ANALYSIS	Envirolab PQL		TB1[S]	TS[S]
			22/07/2019	1/08/2019
	mg/kg	µg/L	mg/kg	% Recovery
Benzene	0.2	0.2	<0.2	131%
Toluene	0.5	0.5	<0.5	120%
Ethylbenzene	1	1	<1	120%
m+p-xylene	2	2	<2	116%
o-xylene	1	1	<1	118%

Explanation:

[W] Sample type (water)

[S] Sample type (sand)

BTEX concentrations in trip spikes are presented as % recovery

Values above PQLs/Acceptance criteria **VALUE**

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Appendix C: Proposed Development Plans

GREENWICH HOSPITAL REDEVELOPMENT

FOR APPROVAL DRAWINGS

GREENWICH HOSPITAL, RIVER ROAD, GREENWICH

VIEW FROM WESTERN END OF RIVER ROAD LOOKING AT WESTERN END OF THE NORTHERN SENIORS LIVING BUILDING



DRAWING LIST		
DWG NO.	SHEET NAME	CURRENT REVISION
S.00	COVER	7
S.01	EXISTING SITE PLAN	5
S.02	SITE PLAN - OVERALL	5
S.03	SITE ELEVATION & SECTIONS	5
S.04	SITE SECTIONS	5
S.04a	SITE SECTIONS	5
S.04b	SITE SECTIONS	5
S.05	3D VIEWS - SITE	5
S.10	EXISTING TREES	5
S.11	STAGING DIAGRAMS 1	5
S.12	STAGING DIAGRAMS 2	5
S.13	LOCALITY / ANALYSIS	6
S.20	AREA SUMMARY	5
S.30	SHADOWING - SUMMER - 9am EXISTING	5
S.31	SHADOWING - SUMMER - 9am PROPOSED	5
S.32	SHADOWING - SUMMER - 12pm EXISTING	5
S.33	SHADOWING - SUMMER - 12pm PROPOSED	5
S.34	SHADOWING - SUMMER - 3pm EXISTING	5
S.35	SHADOWING - SUMMER - 3pm PROPOSED	5
S.36	SHADOWING - SPRING (EQUINOX) - 9am EXISTING	5
S.37	SHADOWING - SPRING (EQUINOX) - 9am PROPOSED	5
S.38	SHADOWING - SPRING (EQUINOX) - 12pm EXISTING	5

DRAWING LIST		
DWG NO.	SHEET NAME	CURRENT REVISION
S.39	SHADOWING - SPRING (EQUINOX) - 12pm PROPOSED	5
S.40	SHADOWING - SPRING (EQUINOX) - 3pm EXISTING	5
S.41	SHADOWING - SPRING (EQUINOX) - 3pm PROPOSED	5
S.42	SHADOWING - WINTER - 9am EXISTING	5
S.43	SHADOWING - WINTER - 9am PROPOSED	5
S.44	SHADOWING - WINTER - 12pm EXISTING	5
S.45	SHADOWING - WINTER - 12pm PROPOSED	5
S.46	SHADOWING - WINTER - 3pm EXISTING	5
S.47	SHADOWING - WINTER - 3pm PROPOSED	5
S.48	MID WINTER SHADOWS AT SOUTHERN BOUNDARY - MORNING	5
S.49	MID-WINTER SHADOWS AT SOUTHERN BOUNDARY - AFTERNOON	5
S.50	OVERALL FLOOR PLAN - SITE LEVEL 1	1
S.51	OVERALL FLOOR PLAN - SITE LEVEL 2	1
S.52	OVERALL FLOOR PLAN - SITE LEVEL 3	1
S.53	OVERALL FLOOR PLAN - SITE LEVEL 4	1
S.54	OVERALL FLOOR PLAN - SITE LEVEL 5	1
S.55	OVERALL FLOOR PLAN - SITE LEVEL 6	1
S.56	OVERALL FLOOR PLAN - SITE LEVEL 7	1
S.57	OVERALL FLOOR PLAN - SITE LEVEL 8	1
S.58	OVERALL FLOOR PLAN - SITE LEVEL 9 & ABOVE	1

SITE AREA SUMMARY	
SITE AREA	33,763m²
TOTAL GFA HEALTH	**14,500m²**
HOSPITAL	12,750m²
PALLISTER	1,050m²
RESPITE	700m²
TOTAL GFA SENIORS LIVING	**13,000m²**
VILLAS	-
SENIORS LIVING	13,000m²
GFA TOTAL	**27,500m²**
FSR	0.81
DEEP SOIL PLANTING AREA	13,800m² (41%)

CAR PARK SUMMARY			
SET DOWN	10	**GENERAL VISITOR**	11
ACCESS ROAD PARKING	10		
WITHIN INTEGRATED BASEMENT:			
HOSPITAL	209	**SENIORS LIVING**	89
		SITE TOTAL : 329 CAR PARKS	

ACCOMMODATION SUMMARY	
SENIORS LIVING	89 TWO-BEDROOM SENIORS LIVING DWELLINGS
HOSPITAL	150 COMBINED HOSPITAL / RESIDENTIAL CARE BEDS

NB: S.06 (PHOTO MONTAGE VIEWS - CONTEXT), S.H01 - S.H08 (HOSPITAL PLANS AND 3D VIEWS), S.V.01 - S.V.04 (SENIORS LIVING - ST VINCENTS ROAD VILLAS) & SL.01 - SL.04 (SENIORS LIVING APARTMENTS) REMOVED FROM SET.
S.04a & S.04b (SITE SECTIONS), AND S.50 - S.58 (OVERALL FLOOR PLANS) HAVE BEEN ADDED TO THE SET.

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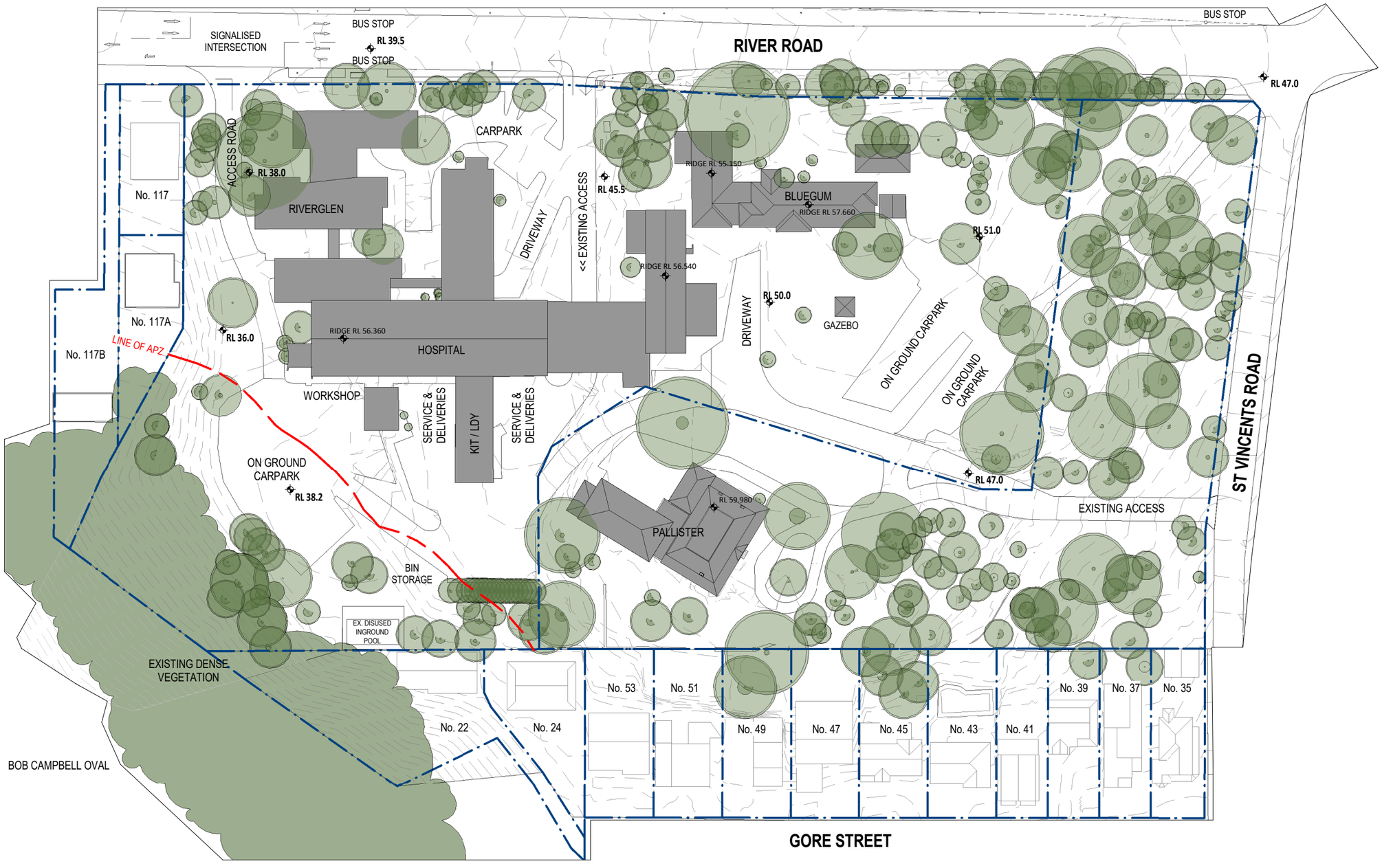
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6	30.08.2019	ISSUE FOR DPE	JC
5	28.08.2019	UPDATE	ML
4	19/08/2019	CONSULTANT ISSUE	JC
3	28/06/2019	PRELIMINARY ISSUE	CM
2	27/06/2019	PRELIMINARY ISSUE	CM
1	26/06/2019	PRELIMINARY ISSUE	CM

bickertonmasters.com.au
bm@bickertonmasters.com.au
Brisbane 07 3257 3622
Sydney 02 9261 8333

CLIENT: HammondCare Champion Life
PROJECT: GREENWICH HOSPITAL CONCEPT PLAN

DRAWING TITLE: COVER
DATE: AUGUST 2019
DRAWN: BF
PROJ ARCH:
SCALE:
PROJ: 1213
DRAWING: S.00
REVISION: P7

6/09/2019 2:37:27 PM



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REV	DATE	DETAILS	INITIALS
5	30.08.2019	ISSUE FOR DPE	JC
4	19/08/2019	CONSULTANT ISSUE	JC
3	28/06/2019	PRELIMINARY ISSUE	CM
2	27/06/2019	PRELIMINARY ISSUE	CM
1	26/06/2019	PRELIMINARY ISSUE	CM
B	12/07/2018	REVISED APARTMENT BLDG ISSUE	BF
A	16/03/2018	CONCEPT PLAN ISSUE	ML

NORTH

bickertonmasters.com.au
bm@bickertonmasters.com.au
Brisbane 07 3257 3622
Sydney 02 9261 8333

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DRAWING TITLE: EXISTING SITE PLAN

DATE:	DRAWN:	PROJ ARCH:	SCALE:
AUGUST 2019	ML, JC	BF	1 : 500 @ A1
	PROJ: 1213	DRAWING: S.01	REVISION: P5

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REV	DATE	DETAILS	INITIALS
5	30.08.2019	ISSUE FOR DPE	JC
4	19/08/2019	CONSULTANT ISSUE	JC
3	28/06/2019	PRELIMINARY ISSUE	CM
2	27/06/2019	PRELIMINARY ISSUE	CM
1	26/06/2019	PRELIMINARY ISSUE	CM
B	12/07/2018	REVISED APARTMENT BLDG ISSUE	BF
A	16/03/2018	CONCEPT PLAN ISSUE	ML

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bm@bickertonmasters.com.au
Brisbane 07 3257 3622
Sydney 02 9261 8333

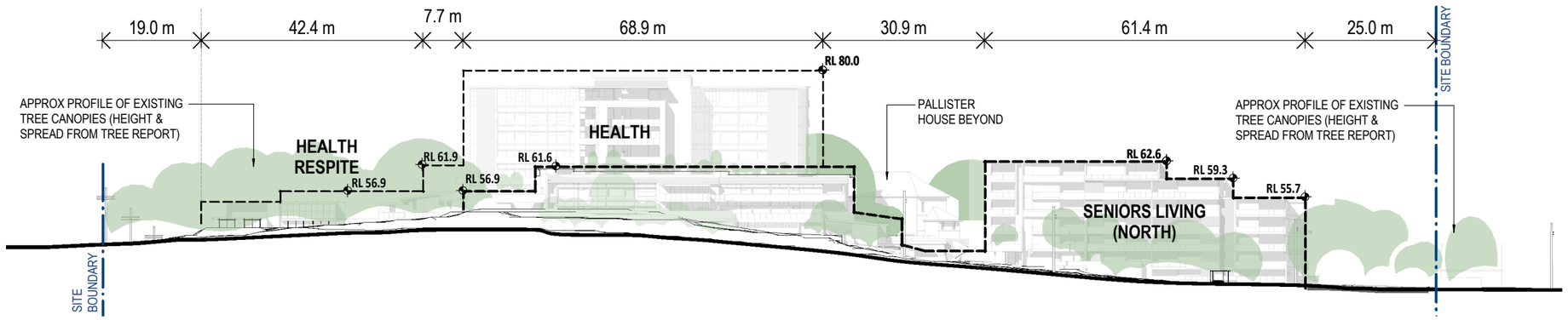
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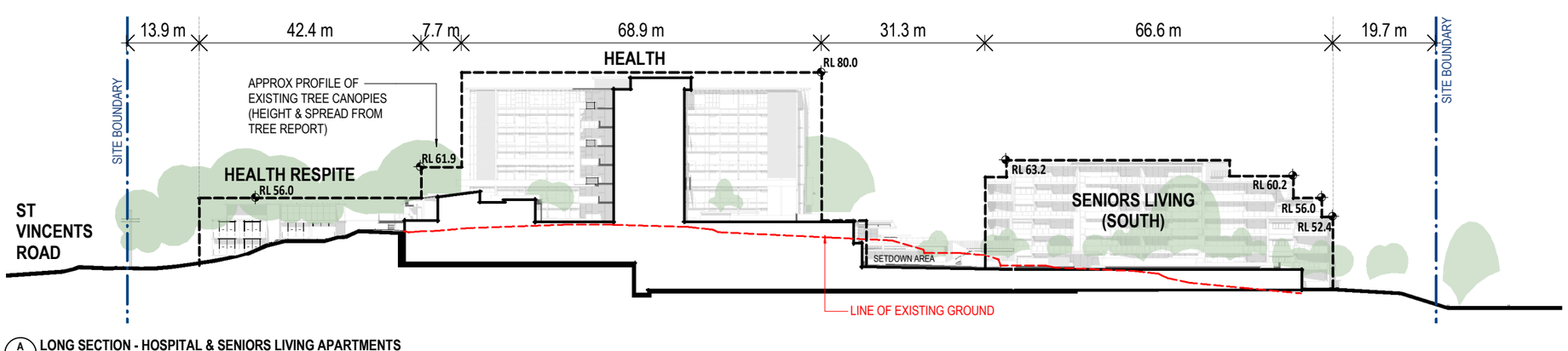
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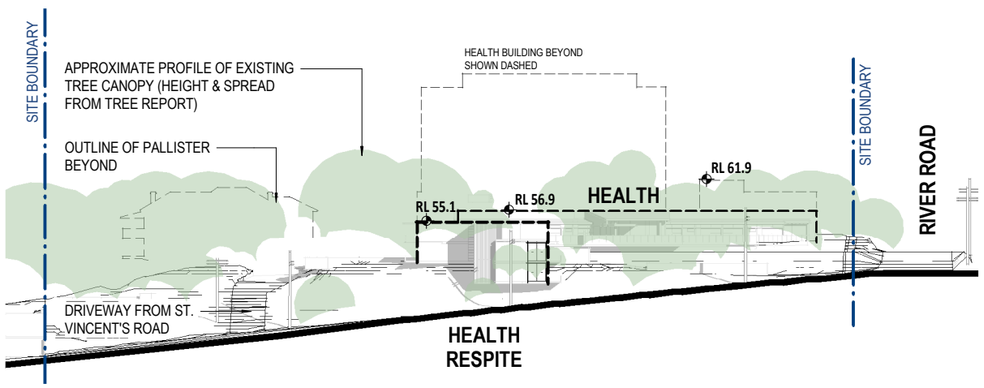
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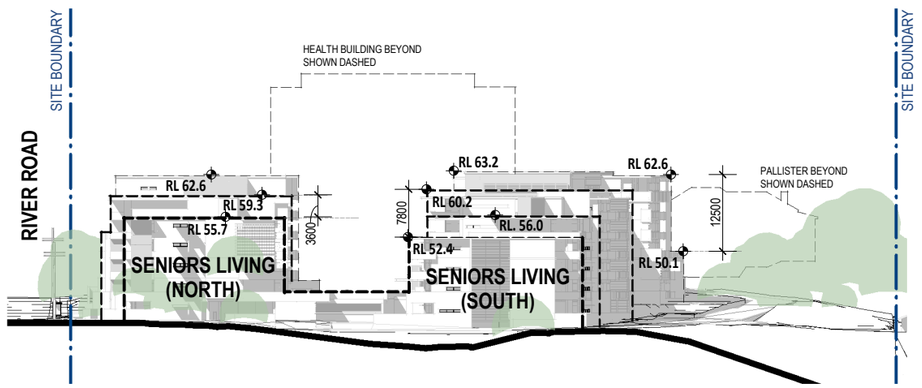
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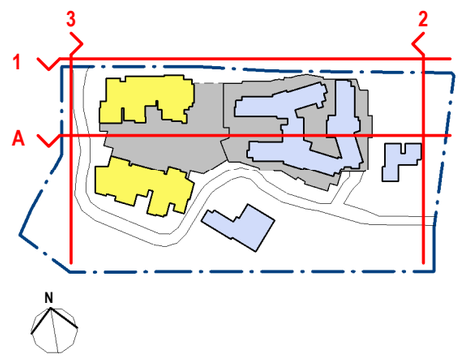
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2 **STREET ELEVATION - ST VINCENTS ROAD**
1 : 500



4 **SITE ELEVATION - WEST ELEVATION**
1 : 500



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REV	DATE	DETAILS	INITIALS
5	30.08.2019	ISSUE FOR DPE	JC
4	19/08/2019	CONSULTANT ISSUE	JC
3	28/06/2019	PRELIMINARY ISSUE	CM
2	27/06/2019	PRELIMINARY ISSUE	CM
1	26/06/2019	PRELIMINARY ISSUE	CM
A	16/03/2018	CONCEPT PLAN ISSUE	ML

bickertonmasters.com.au
bm@bickertonmasters.com.au
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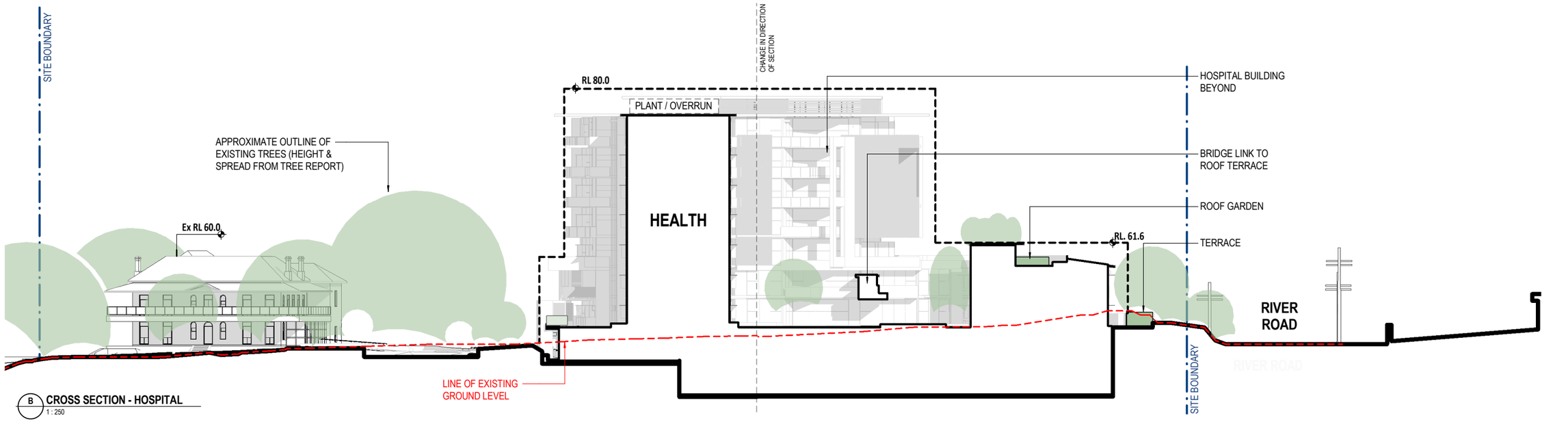
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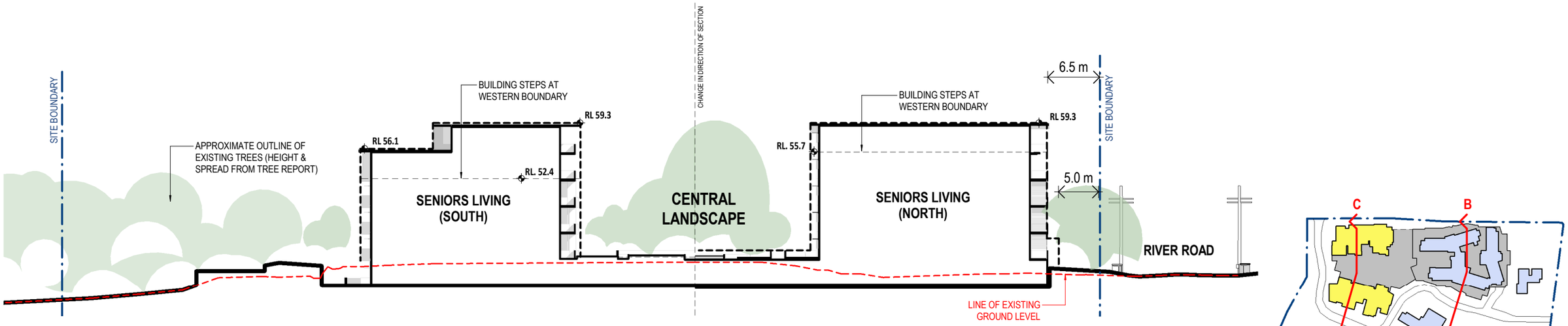
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6/09/2019 2:42:19 PM



B CROSS SECTION - HOSPITAL
1 : 250



C CROSS SECTION - SENIORS LIVING APARTMENTS
1 : 250

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1:250 @ A1, 1:500 @ A3 0 2 5 10 20 30m

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bm@bickertonmasters.com.au
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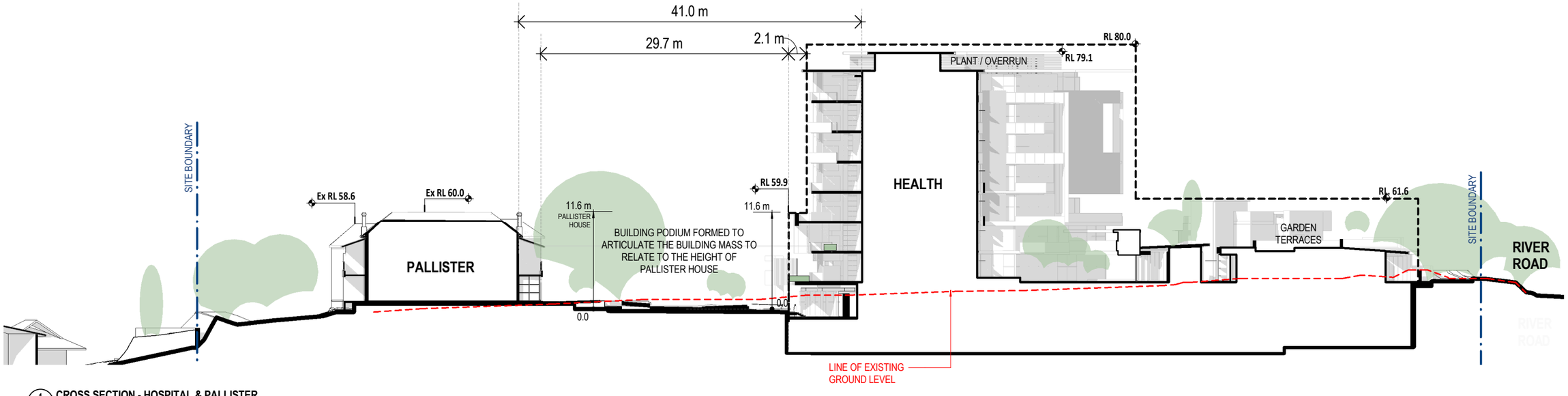
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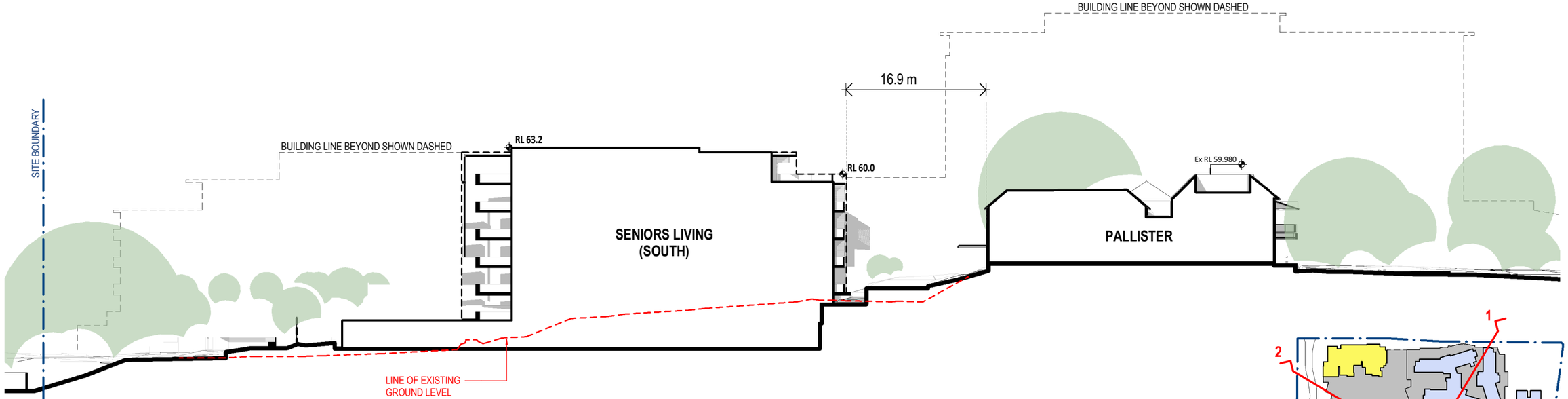
DRAWING TITLE: SITE SECTIONS

DATE:	DRAWN:	PROJ ARCH:	SCALE:
AUGUST 2019	ML, JC	BF	As indicated @ A1
	PROJ: 1213	DRAWING: S.04	REVISION: P5

6/09/2019 2:42:31 PM



1 **CROSS SECTION - HOSPITAL & PALLISTER**
1 : 250



2 **CROSS SECTION 2 - HOSPITAL & PALLISTER**
1 : 250

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1:250 @ A1, 1:500 @ A3 0 2 5 10 20 30m

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REV	DATE	DETAILS	INITIALS
5	30.08.2019	ISSUE FOR DPE	JC
4	19/08/2019	CONSULTANT ISSUE	JC
3	28/06/2019	PRELIMINARY ISSUE	CM
2	27/06/2019	PRELIMINARY ISSUE	CM
1	26/06/2019	PRELIMINARY ISSUE	CM

bickertonmasters.com.au
bm@bickertonmasters.com.au
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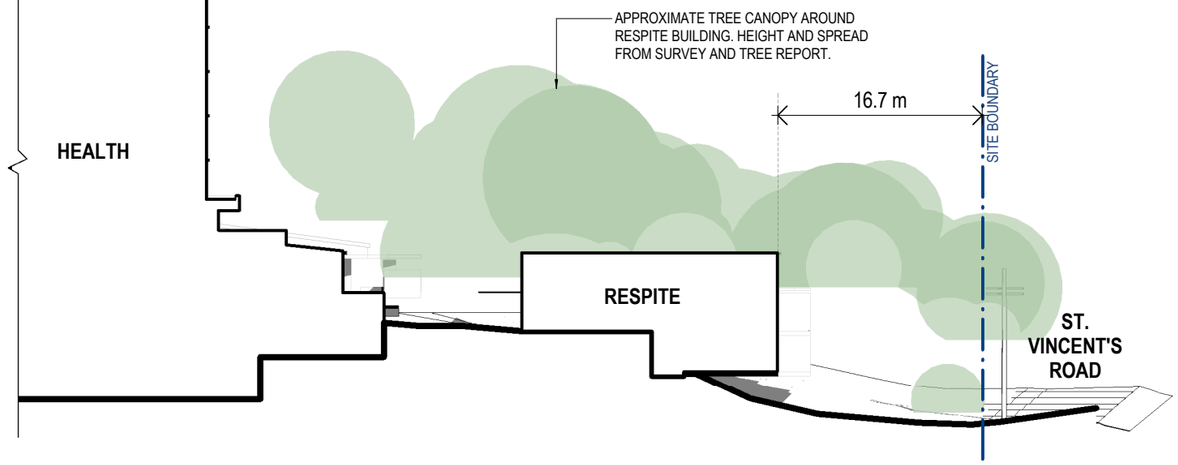
DRAWING TITLE: SITE SECTIONS

DATE: AUGUST 2019
DRAWN: ML, JC
PROJ ARCH: BF
SCALE: As indicated @ A1
PROJ: 1213
DRAWING: S.04a
REVISION: P5

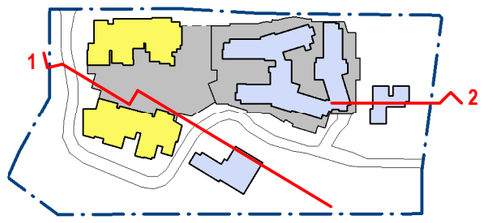
6/09/2019 2:42:37 PM



1 **CROSS SECTION 3 - HOSPITAL & PALLISTER**
1 : 250



2 **SECTION - RESPITE BUILDING**
1 : 250



N

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1:250 @ A1, 1:500 @ A3 0 2 5 10 20 30m

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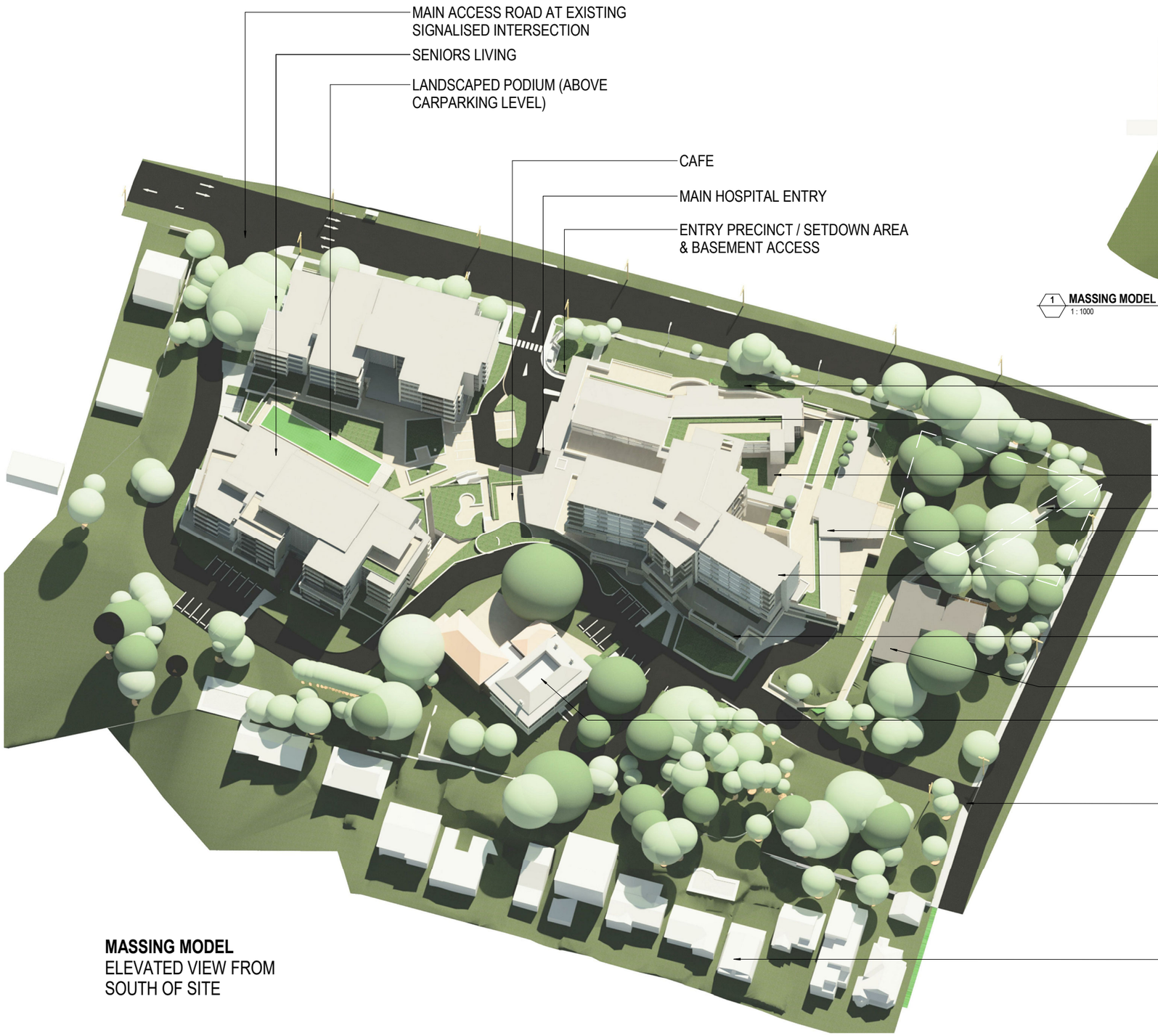
CLIENT: HammondCare Champion Life

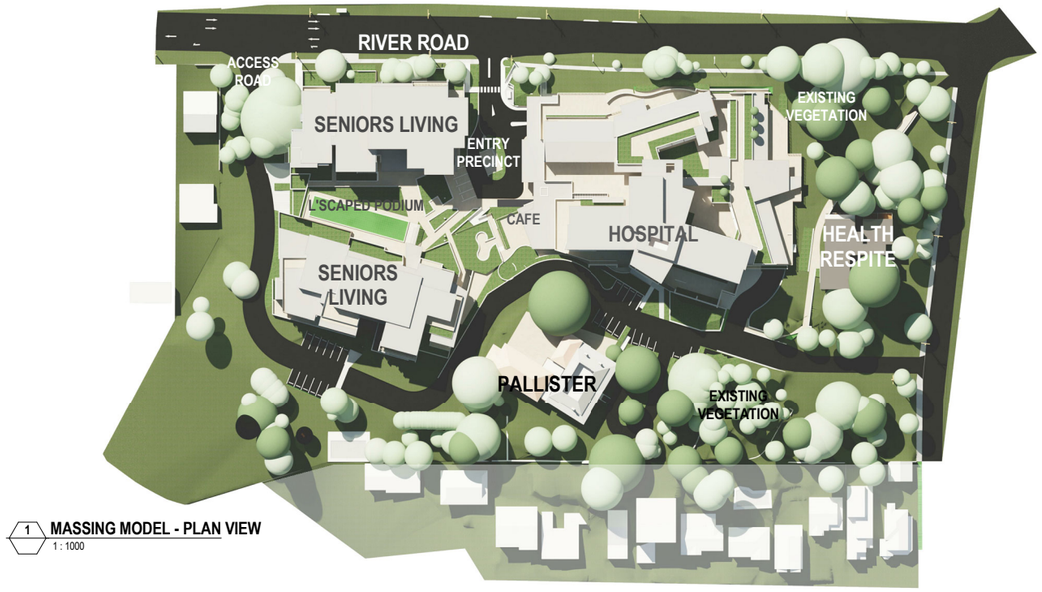
PROJECT: GREENWICH HOSPITAL CONCEPT PLAN

DRAWING TITLE: SITE SECTIONS

DATE:	DRAWN:	PROJ ARCH:	SCALE:
AUGUST 2019	ML, JC	BF	As indicated @ A1
	PROJ: 1213	DRAWING: S.04b	REVISION: P5

6/09/2019 2:42:45 PM





1 MASSING MODEL - PLAN VIEW
1 : 1000

MASSING MODEL
ELEVATED VIEW FROM SOUTH OF SITE

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1:1000 @ A1, 1:2000 @ A3 | 0 | 10 | 30 | 100m

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A	16/03/2018	CONCEPT PLAN ISSUE	ML

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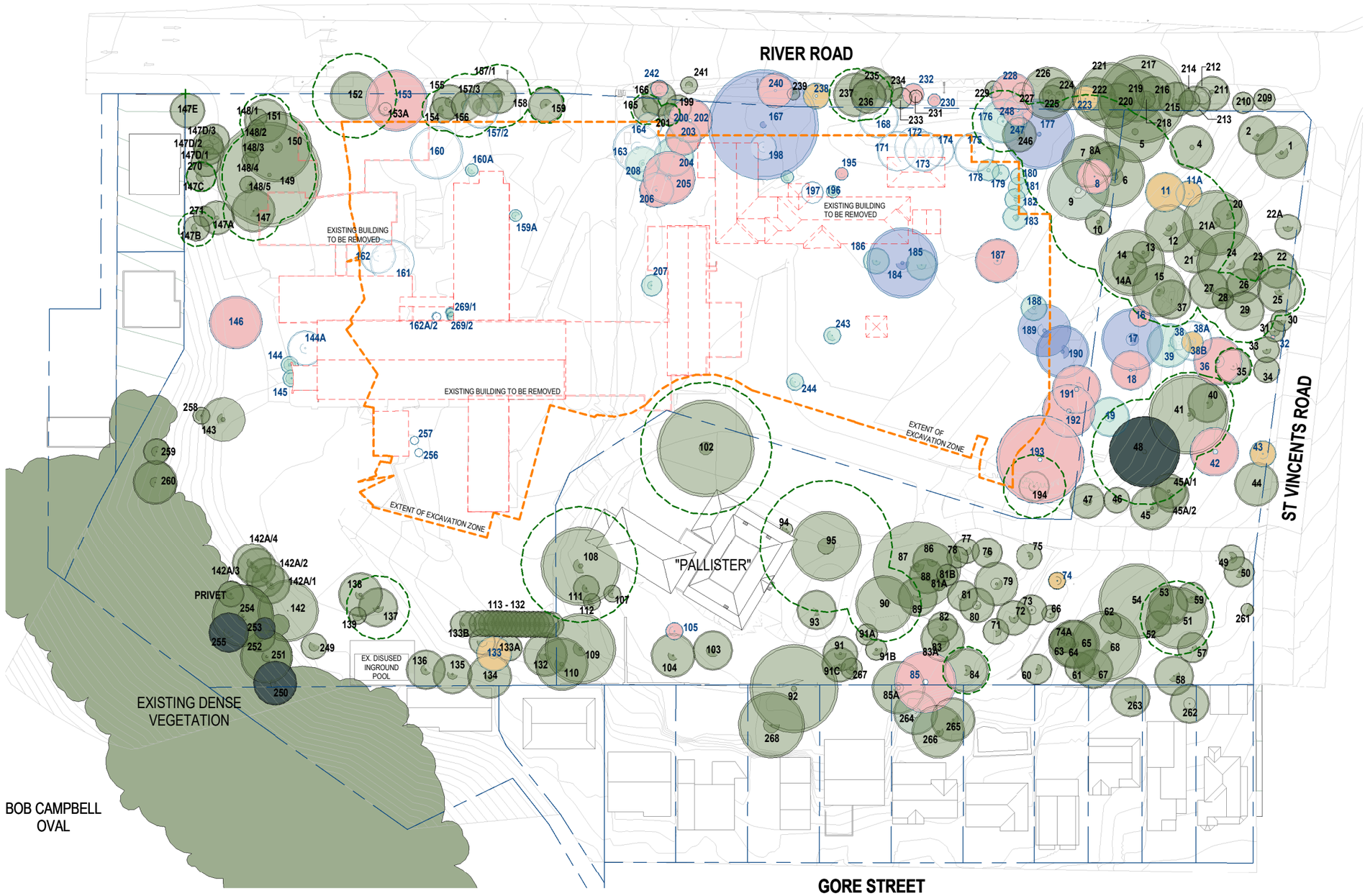
CLIENT: HammondCare Champion Life

PROJECT: GREENWICH HOSPITAL CONCEPT PLAN

DRAWING TITLE: 3D VIEWS - SITE

DATE: AUGUST 2019 | DRAWN: CM | PROJ ARCH: BF | SCALE: 1 : 1000 @ A1
PROJ: 1213 | DRAWING: S.05 | REVISION: P5

6/09/2019 2:42:47 PM



TREE REMOVAL LEGEND

TOTAL TREES DOCUMENTED IN ARBORIST REPORT & GRAPHICALLY SHOWN ON SURVEY DRAWING = 297

EXISTING & TO BE RETAINED/PROTECTED
REVISED SCHEME - 211 TREES TO REMAIN
ORIGINAL SUBMISSION - 125 TREES TO REMAIN

EXISTING & TO BE RETAINED/PROTECTED (HABITAT TREE)
4 TREES (NOTE: INCLUDED WITHIN 211 TREES TO BE RETAINED)

HIGH SIGNIFICANCE TREES TO BE REMOVED
REVISED SCHEME - 10 REMOVED
ORIGINAL SUBMISSION - 14 REMOVED

MEDIUM SIGNIFICANCE TREES TO BE REMOVED
REVISED SCHEME - 24 REMOVED
ORIGINAL SUBMISSION - 57 REMOVED

LOW SIGNIFICANCE TO BE REMOVED
REVISED SCHEME - 21 REMOVED
ORIGINAL SUBMISSION = 33 REMOVED

INAPPROPRIATE/ FUNGI/ SELF-SOWN/ EXEMPT TREES TO BE REMOVED
REVISED SCHEME - 23 REMOVED
ORIGINAL SUBMISSION - 10 REMOVED

OVERMATURE/DECAY/BORER TREES TO BE REMOVED
REVISED SCHEME - 8 REMOVED
ORIGINAL SUBMISSION - 6 REMOVED

TREE PROTECTION ZONE (TPZ)

NOTE:
DRAWING TO BE READ IN CONJUNCTION WITH ARBORIST REPORT PREPARED BY "REDGUM HORTICULTURAL" FOR TREE SPECIES AND OTHER DETAILS

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1:500 @ A1, 1:1000 @ A3 — 0 5 10 20 30 50m

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1	26/06/2019	PRELIMINARY ISSUE	CM
A	16/03/2018	CONCEPT PLAN ISSUE	ML

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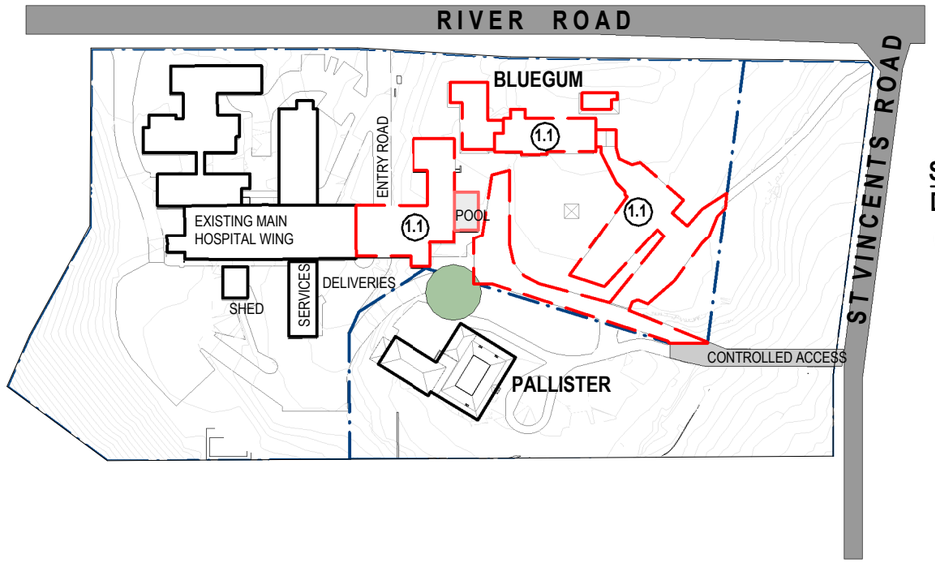
PROJECT: GREENWICH HOSPITAL CONCEPT PLAN

DRAWING TITLE: EXISTING TREES

DATE: AUGUST 2019 | DRAWN: EC | PROJ ARCH: BF | SCALE: 1 : 500 @ A1
PROJ: 1213 | DRAWING: S.10 | REVISION: P5

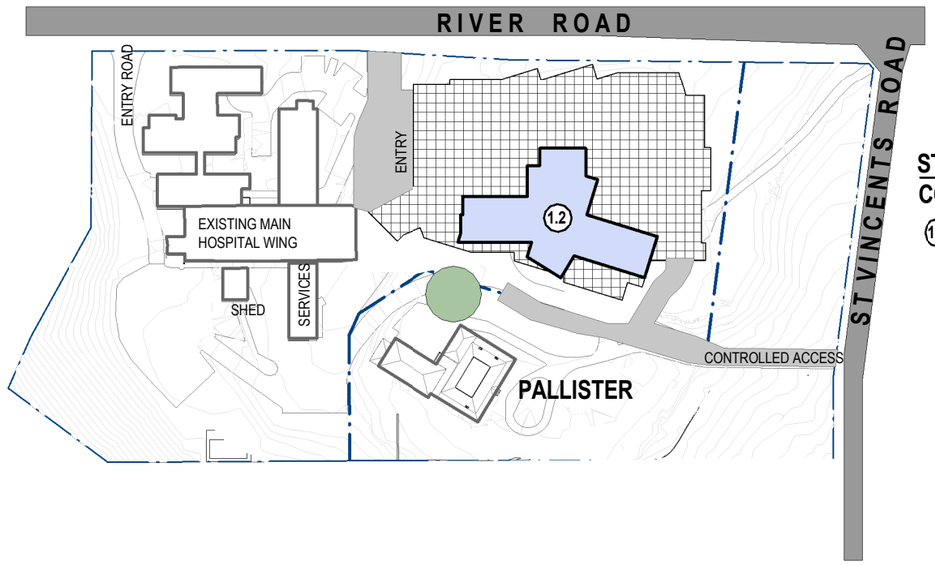
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STAGE 1



STAGE 1.1
DEMOLITION

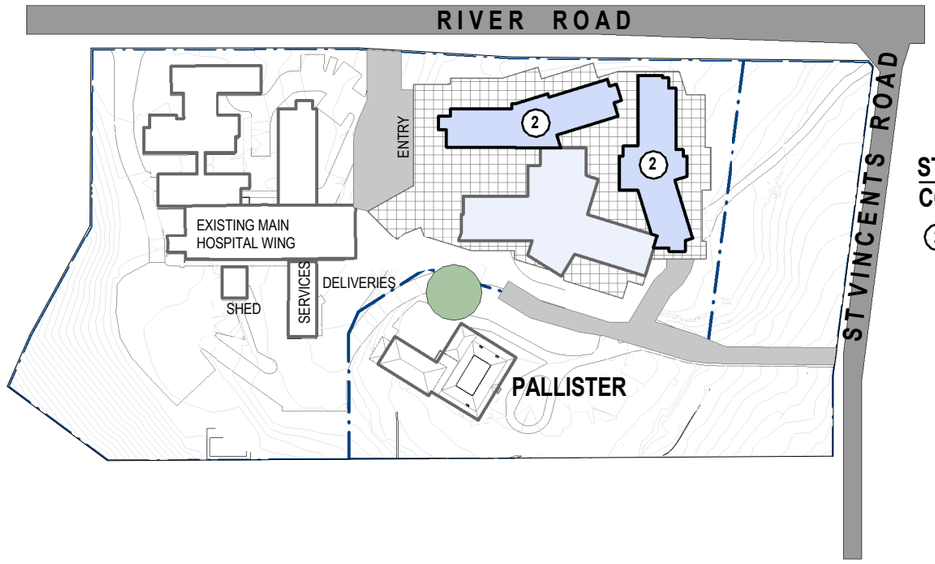
(1.1) DEMOLITION OF BLUEGUM, EASTERN WING OF HOSPITAL AND ASSOCIATED CAR PARK.



STAGE 1.2
CONSTRUCTION

(1.2) CONSTRUCT HOSPITAL PODIUM & TOWER

STAGE 2



STAGE 2
CONSTRUCTION

(2) CONSTRUCTION OF REMAINDER OF HOSPITAL

1:1000 @ A1, 1:2000 @ A3 — 0 — 10 — 30 — 100m

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A	16/03/2018	CONCEPT PLAN ISSUE	ML

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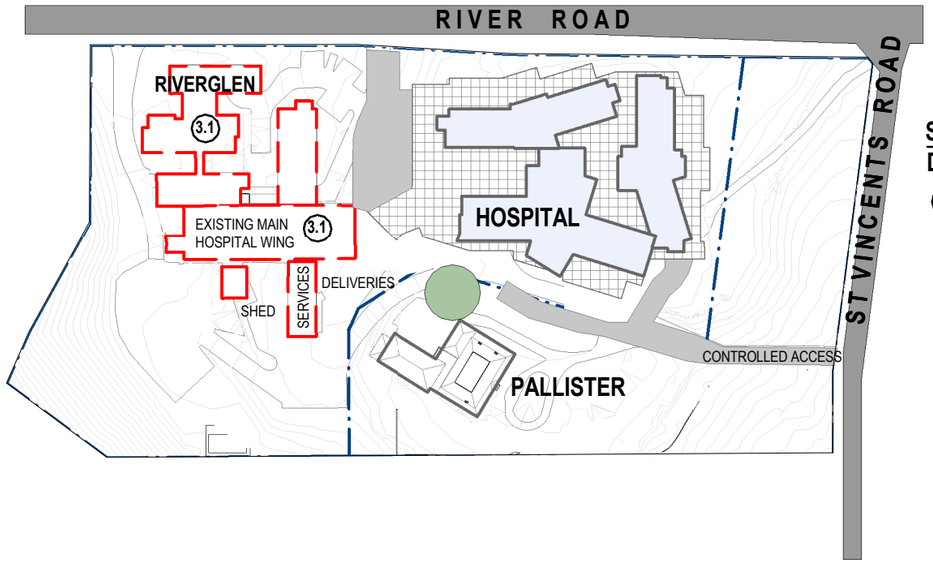
PROJECT: GREENWICH HOSPITAL CONCEPT PLAN

DRAWING TITLE: STAGING DIAGRAMS 1

DATE:	DRAWN:	PROJ ARCH:	SCALE:
AUGUST 2019	CM, JC	BF	1 : 1000 @ A1
	PROJ: 1213	DRAWING: S.11	REVISION: P5

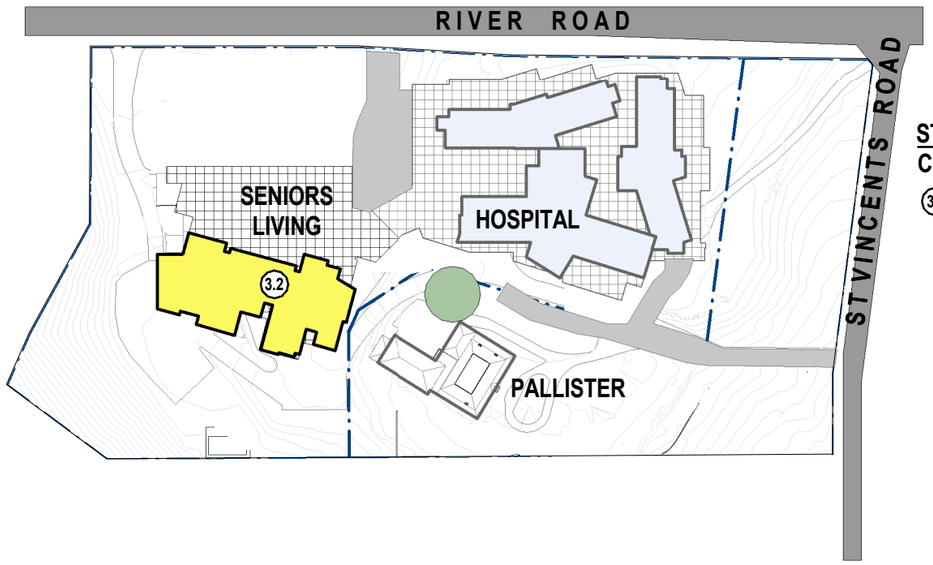
6/09/2019 2:42:55 PM

STAGE 3



STAGE 3.1
DEMOLITION

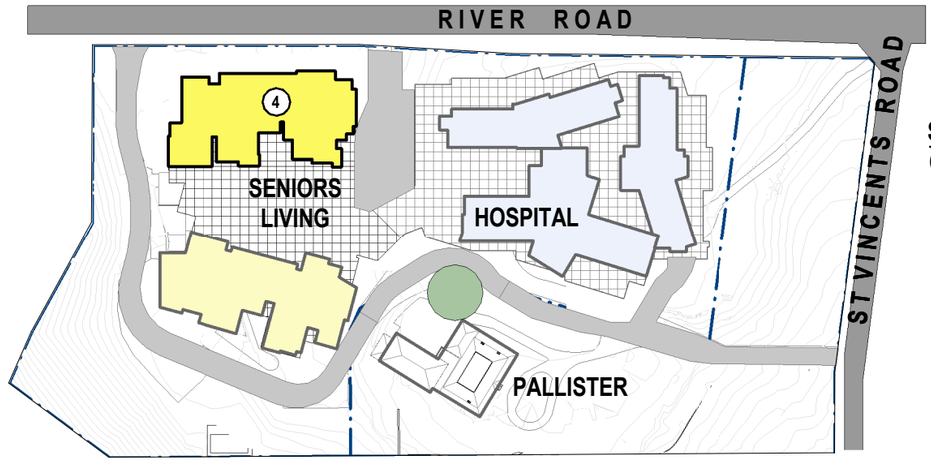
(3.1) DEMOLISH REMAINDER OF EXISTING HOSPITAL AND RIVERGLEN



STAGE 3.2
CONSTRUCTION

(3.2) CONSTRUCT SOUTH-WEST SENIORS LIVING APARTMENTS AND REMAINDER OF INTERNAL ROAD.

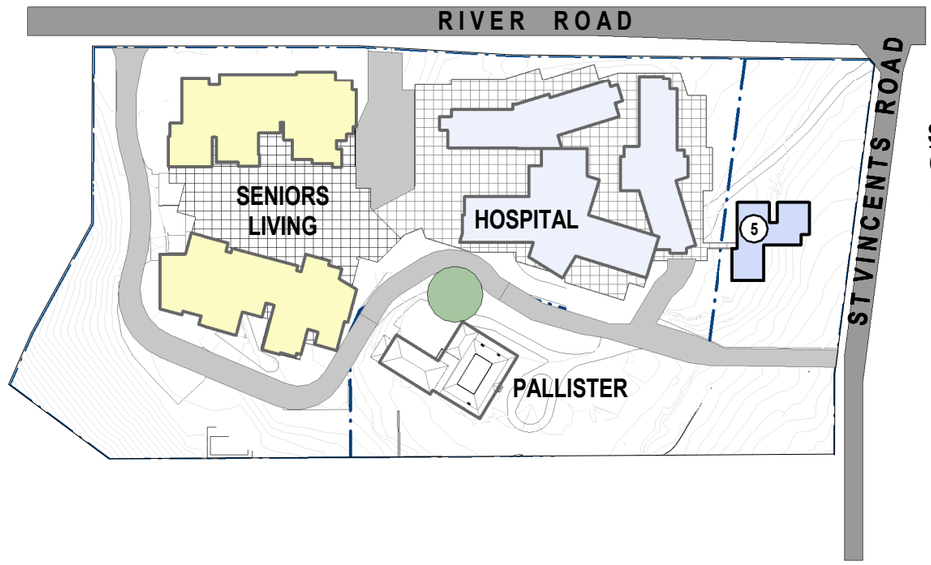
STAGE 4



STAGE 4
CONSTRUCTION

(4) CONSTRUCT NORTHERN SENIORS LIVING BUILDING

STAGE 5



STAGE 5
CONSTRUCTION

(5) CONSTRUCT RESPITE BUILDING

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1:1000 @ A1, 1:2000 @ A3 — 0 — 10 — 30 — 100m

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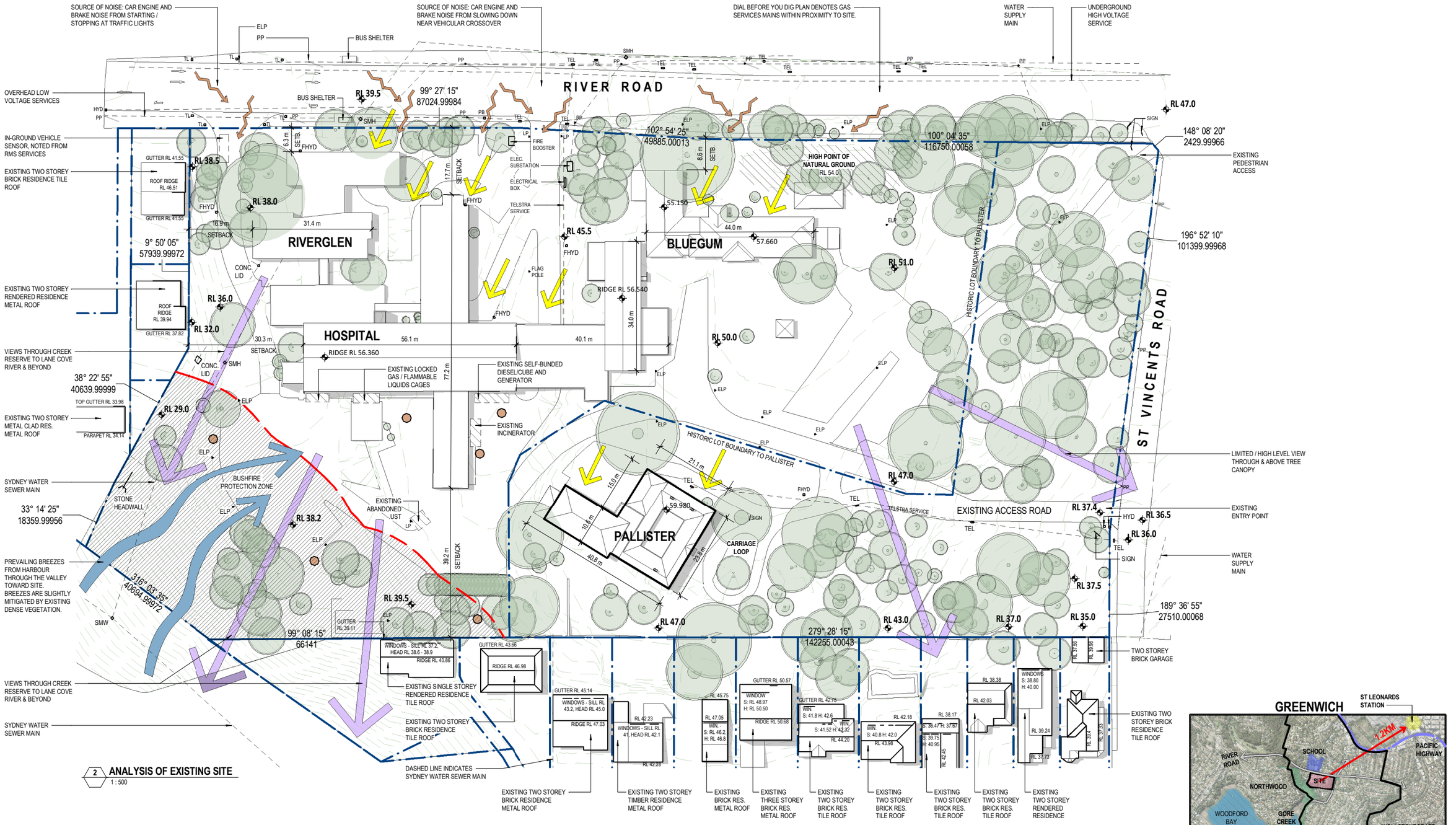
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DRAWING TITLE: STAGING DIAGRAMS 2

DATE:	DRAWN:	PROJ ARCH:	SCALE:
AUGUST 2019	CM, JC	BF	1 : 1000 @ A1
	PROJ: 1213	DRAWING: S.12	REVISION: P5

6/09/2019 2:43:01 PM



2 ANALYSIS OF EXISTING SITE
1 : 500

1 LOCALITY PLAN
1 : 20000
1:10,000 @ A1, 1:20,000 @ A3 — 0m 100m 300m 500m

SITE ANALYSIS LEGEND

- BOREHOLE WITH SOIL CONTAMINATION ABOVE SITE ASSESSMENT CRITERIA FOR ECOLOGICAL RISK - REFER TO DETAILED SITE INVESTIGATION BY JK ENVIRONMENTS
- ITEM NOTED ON DECONTAMINATION REPORT
- SOURCE OF NOISE
- PREVAILING BREEZE
- BEST SOLAR ASPECT
- VIEWS

ABBREVIATIONS

ELP	ELECTRIC LIGHT POLE
FHYD	FIRE HYDRANT
HYD	HYDRANT
LP	LIGHT POLE
PP	POWER POLE
SMW	SEWER MANHOLE
TEL	TELSTRA SERVICE
TL	TRAFFIC LIGHT
UST	UNDERGROUND STORAGE TANK

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AUGUST 2019

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DRAWING TITLE: LOCALITY / ANALYSIS

DATE:	DRAWN:	PROJ ARCH:	SCALE:
AUGUST 2019	JC	BF	As indicated @ A1
	PROJ: 1213	DRAWING: S.13	REVISION: P6

6/09/2019 2:43:03 PM

AREAS & COUNTS: SITE SUMMARY

DEVELOPMENT SUMMARY
APPROXIMATE AREA SUMMARY

SITE AREA: 33,763m²

GFA TOTAL (ROUNDED):
14,500m² HOSPITAL (INC. RESPITE + PALLISTER)
13,000m² SENIORS LIVING
27,500m²

APPROX. FSR 27,500 / 33,763 = **0.81**

DEEP SOIL PLANTING APPROX **12,000m² or 35%**

ACCOMMODATION

COMBINED HOSPITAL / RC BED:	150
SENIORS LIVING :	89

CARPARK COUNTS

SENIORS LIVING (RES):	89
GENERAL VISITOR (EXT)	11
SETDOWN CAR PARKING	10
HOSPITAL STAFF (INT):	209
ACCESS ROAD CAR PARKING	10
SITE TOTAL:	**329**

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1	26/06/2019	PRELIMINARY ISSUE	CM
C	18/12/2018	REVISED GFA CALCULATION	CM
B	12/07/2018	REVISED APARTMENT BLDG ISSUE	BF

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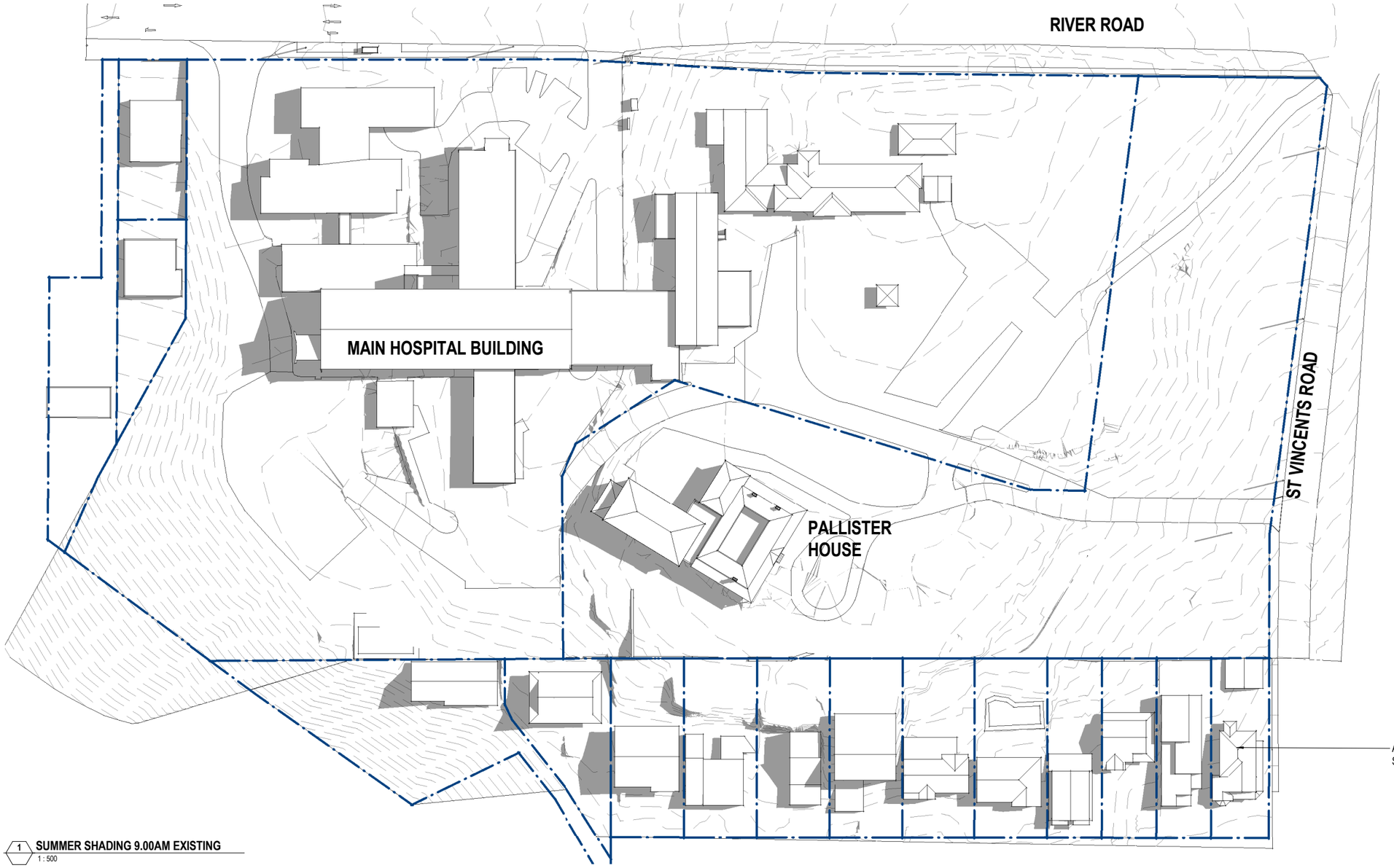
CLIENT: HammondCare Champion Life

PROJECT: GREENWICH HOSPITAL CONCEPT PLAN

DRAWING TITLE: AREA SUMMARY

DATE:	DRAWN:	PROJ ARCH:	SCALE:
AUGUST 2019	CM, JC	BF	
	PROJ: 1213	DRAWING: S.20	REVISION: P5

6/09/2019 2:43:04 PM



1 **SUMMER SHADING 9.00AM EXISTING**
1 : 500

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1:500 @ A1, 1:1000 @ A3 0 5 10 20 50 50m

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3	28/06/2019	PRELIMINARY ISSUE	CM
2	27/06/2019	PRELIMINARY ISSUE	CM
1	26/06/2019	PRELIMINARY ISSUE	CM
B	12/07/2018	REVISED APARTMENT BLDG ISSUE	BF
A	16/03/2018	CONCEPT PLAN ISSUE	ML

NORTH

bickertonmasters.com.au
bm@bickertonmasters.com.au
Brisbane 07 3257 3622
Sydney 02 9261 8333

CLIENT: HammondCare Champion Life

PROJECT: GREENWICH HOSPITAL CONCEPT PLAN

DRAWING TITLE: SHADOWING - SUMMER - 9am EXISTING

DATE:	DRAWN:	PROJ ARCH:	SCALE:
AUGUST 2019	EC	BF	1 : 500 @ A1
	PROJ: 1213	DRAWING: S.30	REVISION: P5

6/09/2019 2:43:07 PM



1 SUMMER SHADING 9.00AM PROPOSED
1 : 500

SHADOW DIAGRAMS

ADDITIONAL SHADOW CAUSED BY PROPOSED SCHEME

FOR APPROVAL
AUGUST 2019

1:500 @ A1, 1:1000 @ A3 — 0 5 10 20 30 50m

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5	30.08.2019	ISSUE FOR DPE	JC
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A	12/07/2018	REVISED APARTMENT BLDG ISSUE	BF

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bm@bickertonmasters.com.au
Brisbane 07 3257 3622
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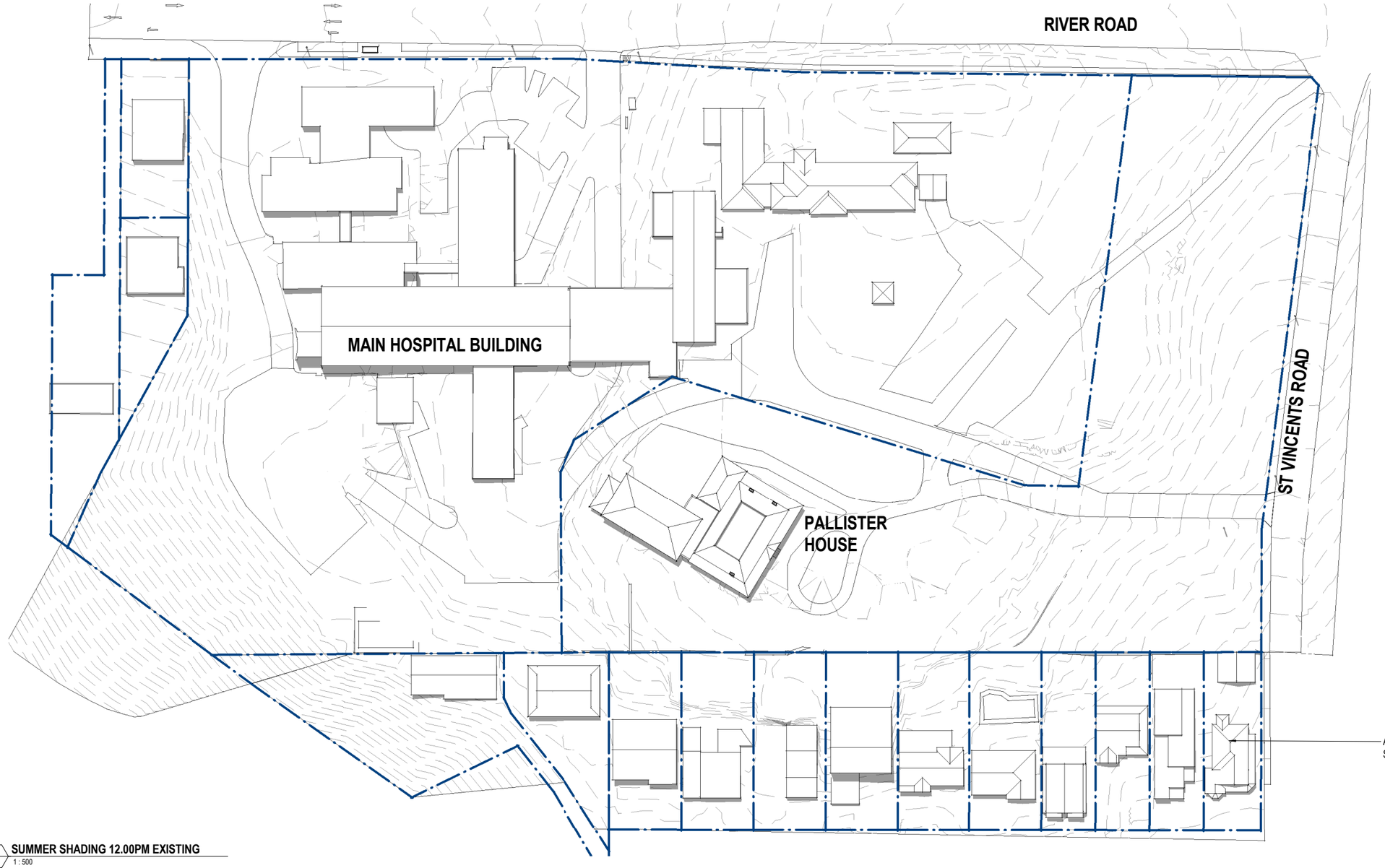
CLIENT: HammondCare Champion Life

PROJECT: GREENWICH HOSPITAL CONCEPT PLAN

DRAWING TITLE: SHADOWING - SUMMER - 9am PROPOSED

DATE:	DRAWN:	PROJ ARCH:	SCALE:
AUGUST 2019	EC	BF	As indicated @ A1
	PROJ: 1213	DRAWING: S.31	REVISION: P5

6/09/2019 2:44:49 PM



1 **SUMMER SHADING 12.00PM EXISTING**
1 : 500

FOR APPROVAL
AUGUST 2019

1:500 @ A1, 1:1000 @ A3 0 5 10 20 30 50m

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2	27/06/2019	PRELIMINARY ISSUE	CM
1	26/06/2019	PRELIMINARY ISSUE	CM
A	12/07/2018	REVISED APARTMENT BLDG ISSUE	BF

NORTH

bickertonmasters.com.au
bm@bickertonmasters.com.au
Brisbane 07 3257 3622
Sydney 02 9261 8333

CLIENT: HammondCare Champion Life

PROJECT: GREENWICH HOSPITAL CONCEPT PLAN

DRAWING TITLE: SHADOWING - SUMMER - 12pm EXISTING

DATE:	DRAWN:	PROJ ARCH:	SCALE:
AUGUST 2019	EC	BF	1 : 500 @ A1
	PROJ: 1213	DRAWING: S.32	REVISION: P5

6/09/2019 2:44:53 PM



1 SUMMER SHADING 12.00PM PROPOSED
1 : 500

SHADOW DIAGRAMS

ADDITIONAL SHADOW CAUSED BY PROPOSED SCHEME

FOR APPROVAL
AUGUST 2019

1:500 @ A1, 1:1000 @ A3 — 0 5 10 20 30 50m

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1	26/06/2019	PRELIMINARY ISSUE	CM
A	12/07/2018	REVISED APARTMENT BLDG ISSUE	BF

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bickertonmasters.com.au
bm@bickertonmasters.com.au
Brisbane 07 3257 3622
Sydney 02 9261 8333

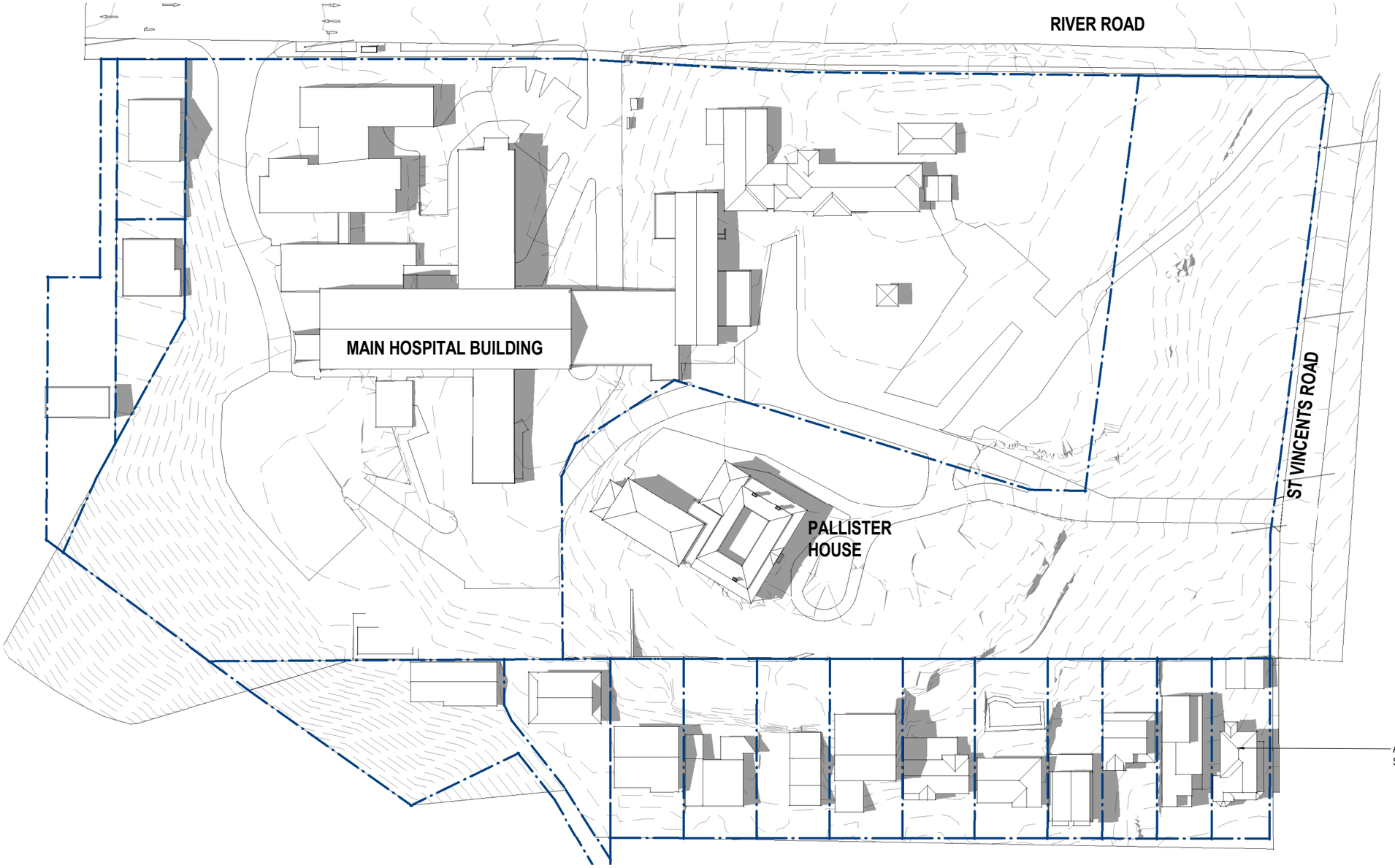
CLIENT: HammondCare Champion Life

PROJECT: GREENWICH HOSPITAL CONCEPT PLAN

DRAWING TITLE: SHADOWING - SUMMER - 12pm PROPOSED

DATE:	DRAWN:	PROJ ARCH:	SCALE:
AUGUST 2019	EC	BF	As indicated @ A1
	PROJ: 1213	DRAWING: S.33	REVISION: P5

6/09/2019 2:46:32 PM



1 **SUMMER SHADING 3.00PM EXISTING**
1 : 500

1:500 @ A1, 1:1000 @ A3 0 5 10 20 30 50m

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2	27/06/2019	PRELIMINARY ISSUE	CM
1	26/06/2019	PRELIMINARY ISSUE	CM
A	12/07/2018	REVISED APARTMENT BLDG ISSUE	BF

NORTH

bickertonmasters.com.au
bm@bickertonmasters.com.au
Brisbane 07 3257 3622
Sydney 02 9261 8333

CLIENT: HammondCare Champion Life

PROJECT: GREENWICH HOSPITAL CONCEPT PLAN

FOR APPROVAL
AUGUST 2019

DRAWING TITLE: SHADOWING - SUMMER - 3pm EXISTING

DATE:	DRAWN:	PROJ ARCH:	SCALE:
AUGUST 2019	EC	BF	1 : 500 @ A1
	PROJ: 1213	DRAWING: S.34	REVISION: P5

6/09/2019 2:46:36 PM



1 SUMMER SHADING 3.00PM PROPOSED
1 : 500

SHADOW DIAGRAMS

ADDITIONAL SHADOW CAUSED BY PROPOSED SCHEME

FOR APPROVAL
AUGUST 2019

1:500 @ A1, 1:1000 @ A3 — 0 5 10 20 30 50m

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1	26/06/2019	PRELIMINARY ISSUE	CM
A	12/07/2018	REVISED APARTMENT BLDG ISSUE	BF

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bickertonmasters.com.au
bm@bickertonmasters.com.au
Brisbane 07 3257 3622
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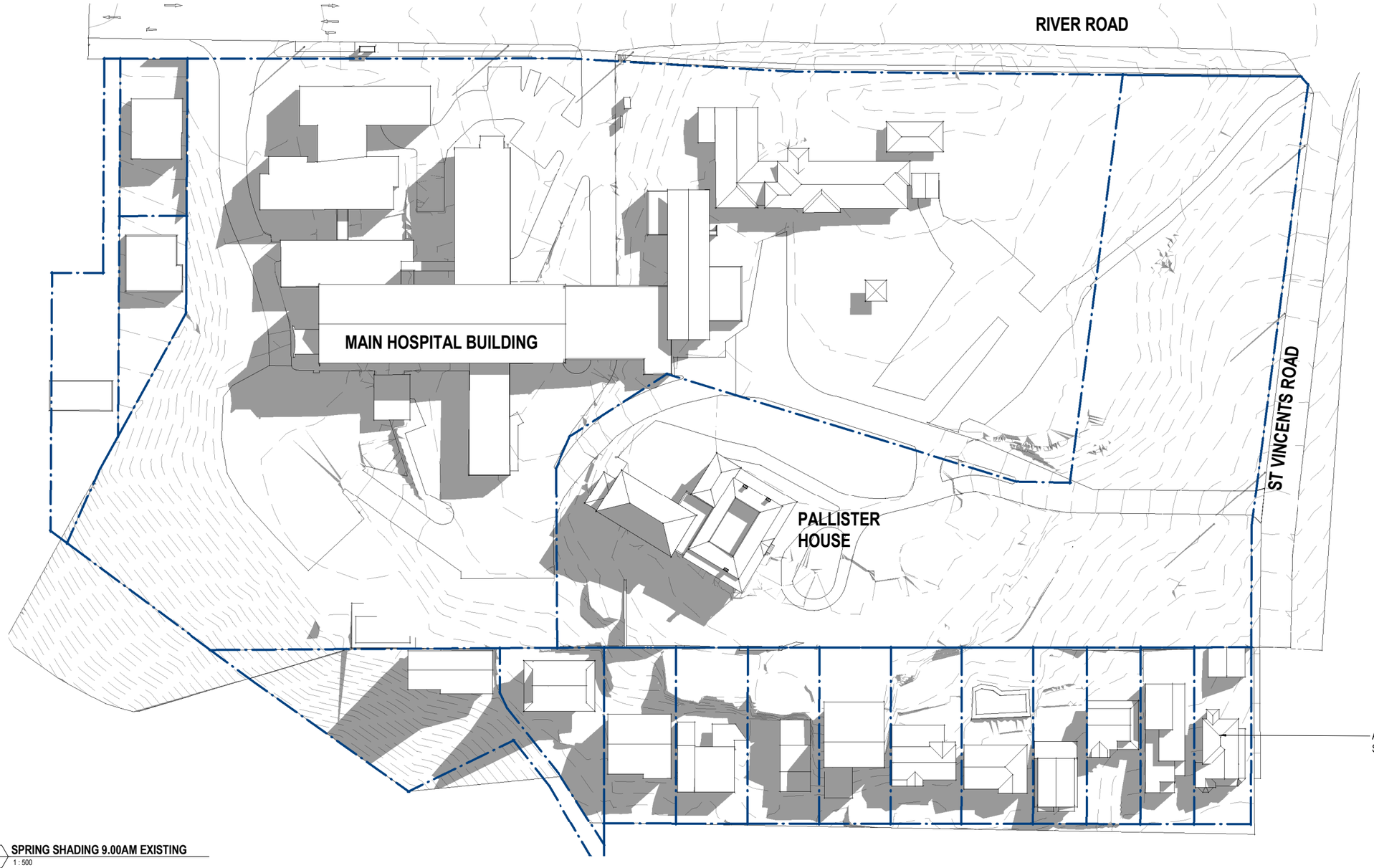
CLIENT: HammondCare Champion Life

PROJECT: GREENWICH HOSPITAL
CONCEPT PLAN

DRAWING TITLE: SHADOWING - SUMMER - 3pm PROPOSED

DATE:	DRAWN:	PROJ ARCH:	SCALE:
AUGUST 2019	EC	BF	As indicated @ A1
	PROJ: 1213	DRAWING: S.35	REVISION: P5

6/09/2019 2:48:17 PM



1 **SPRING SHADING 9.00AM EXISTING**
1 : 500

1:500 @ A1, 1:1000 @ A3 0 5 10 20 50 50m

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1	26/06/2019	PRELIMINARY ISSUE	CM
B	12/07/2018	REVISED APARTMENT BLDG ISSUE	BF
A	16/03/2018	CONCEPT PLAN ISSUE	ML

NORTH

FOR APPROVAL
AUGUST 2019

bickertonmasters.com.au
bm@bickertonmasters.com.au
Brisbane 07 3257 3622
Sydney 02 9261 8333

CLIENT: HammondCare Champion Life

PROJECT: GREENWICH HOSPITAL CONCEPT PLAN

DRAWING TITLE: SHADOWING - SPRING (EQUINOX) - 9am EXISTING

DATE:	DRAWN:	PROJ ARCH:	SCALE:
AUGUST 2019	EC	BF	1 : 500 @ A1
	PROJ: 1213	DRAWING: S.36	REVISION: P5

6/09/2019 2:48:21 PM



1 SPRING SHADING 9.00AM PROPOSED
1 : 500

SHADOW DIAGRAMS

ADDITIONAL SHADOW CAUSED BY PROPOSED SCHEME

FOR APPROVAL
AUGUST 2019

1:500 @ A1, 1:1000 @ A3 — 0 5 10 20 50 50m

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2	27/06/2019	PRELIMINARY ISSUE	CM
1	26/06/2019	PRELIMINARY ISSUE	CM
A	12/07/2018	REVISED APARTMENT BLDG ISSUE	BF

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bickertonmasters.com.au
bm@bickertonmasters.com.au
Brisbane 07 3257 3622
Sydney 02 9261 8333

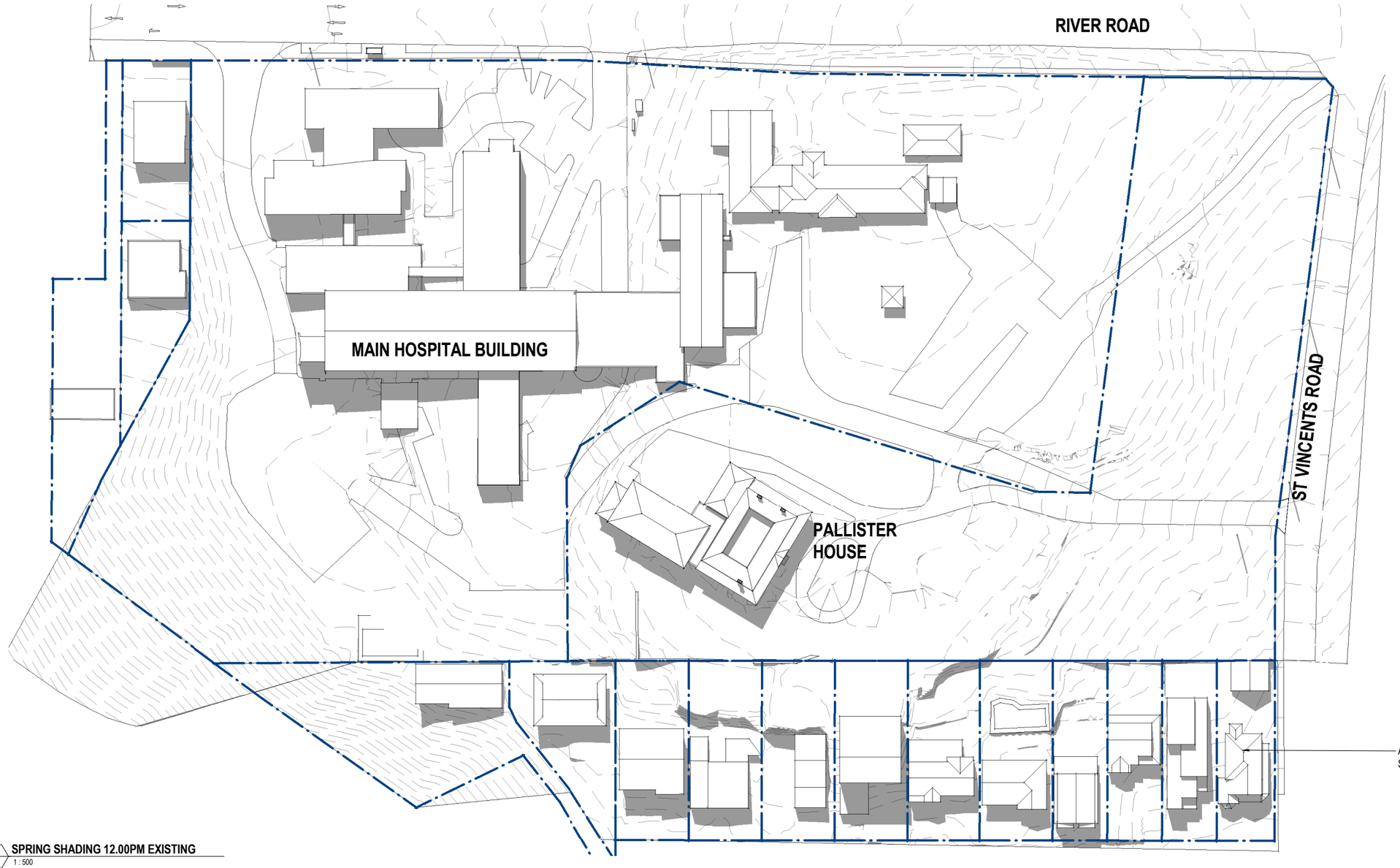
CLIENT: HammondCare Champion Life

PROJECT: GREENWICH HOSPITAL CONCEPT PLAN

DRAWING TITLE: SHADOWING - SPRING (EQUINOX) - 9am PROPOSED

DATE:	DRAWN:	PROJ ARCH:	SCALE:
AUGUST 2019	EC	BF	As indicated @ A1
	PROJ: 1213	DRAWING: S.37	REVISION: P5

6/09/2019 2:50:04 PM



1 **SPRING SHADING 12.00PM EXISTING**
1 : 500

1:500 @ A1, 1:1000 @ A3 0 5 10 20 30 50m

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1	26/06/2019	PRELIMINARY ISSUE	CM
A	12/07/2018	REVISED APARTMENT BLDG ISSUE	BF

NORTH

bickertonmasters.com.au
bm@bickertonmasters.com.au
Brisbane 07 3257 3622
Sydney 02 9261 8333

CLIENT: HammondCare Champion Life

PROJECT: GREENWICH HOSPITAL CONCEPT PLAN

DRAWING TITLE: SHADOWING - SPRING (EQUINOX) - 12pm EXISTING

DATE:	DRAWN:	PROJ ARCH:	SCALE:
AUGUST 2019	EC	BF	1 : 500 @ A1
	PROJ: 1213	DRAWING: S.38	REVISION: P5

FOR APPROVAL
AUGUST 2019

6/09/2019 2:50:08 PM



1 **SPRING SHADING 12.00PM PROPOSED**
1 : 500

SHADOW DIAGRAMS

ADDITIONAL SHADOW CAUSED BY PROPOSED SCHEME

FOR APPROVAL

AUGUST 2019

1:500 @ A1, 1:1000 @ A3 0 5 10 20 40 50m

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A	12/07/2018	REVISED APARTMENT BLDG ISSUE	BF

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bm@bickertonmasters.com.au
Brisbane 07 3257 3622
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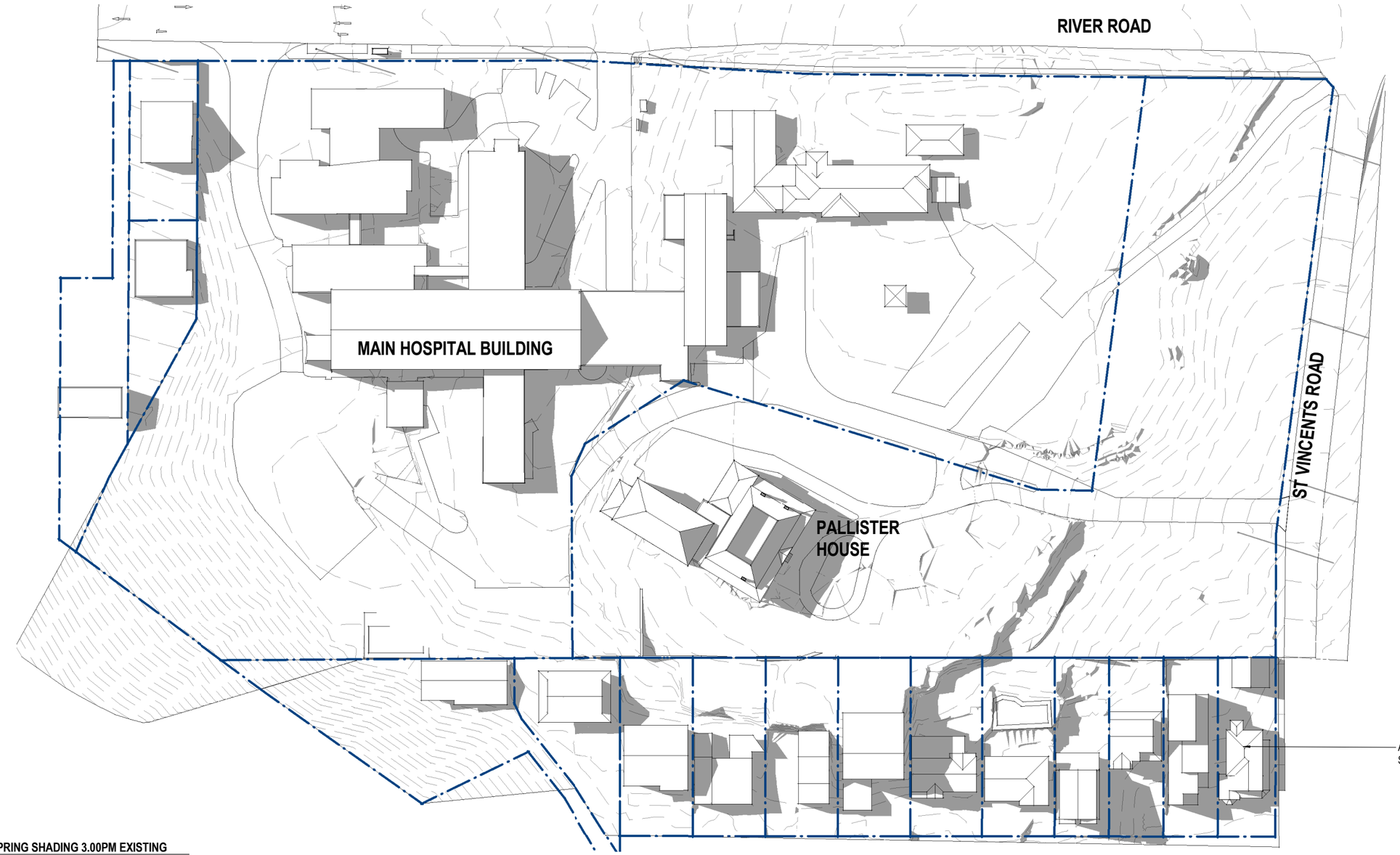
CLIENT: HammondCare Champion Life

PROJECT: GREENWICH HOSPITAL CONCEPT PLAN

DRAWING TITLE: SHADOWING - SPRING (EQUINOX) - 12pm PROPOSED

DATE:	DRAWN:	PROJ ARCH:	SCALE:
AUGUST 2019	EC	BF	As indicated @ A1
	PROJ: 1213	DRAWING: S.39	REVISION: P5

6/09/2019 2:51:50 PM



1 SPRING SHADING 3.00PM EXISTING
1 : 500

1:500 @ A1, 1:1000 @ A3 0 5 10 20 50 50m

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1	26/06/2019	PRELIMINARY ISSUE	CM
A	12/07/2018	REVISED APARTMENT BLDG ISSUE	BF

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FOR APPROVAL
AUGUST 2019

bickertonmasters.com.au
bm@bickertonmasters.com.au
Brisbane 07 3257 3622
Sydney 02 9261 8333

CLIENT: HammondCare Champion Life

PROJECT: GREENWICH HOSPITAL CONCEPT PLAN

DRAWING TITLE: SHADOWING - SPRING (EQUINOX) - 3pm EXISTING

DATE:	DRAWN:	PROJ ARCH:	SCALE:
AUGUST 2019	EC	BF	1 : 500 @ A1
	PROJ: 1213	DRAWING: S.40	REVISION: P5

6/09/2019 2:51:53 PM



1 SPRING SHADING 3.00PM PROPOSED
1 : 500

SHADOW DIAGRAMS

ADDITIONAL SHADOW CAUSED BY PROPOSED SCHEME

FOR APPROVAL

AUGUST 2019

1:500 @ A1, 1:1000 @ A3 — 0 5 10 20 30 50m

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1	26/06/2019	PRELIMINARY ISSUE	CM
A	12/07/2018	REVISED APARTMENT BLDG ISSUE	BF

NORTH

bickertonmasters.com.au
bm@bickertonmasters.com.au
Brisbane 07 3257 3622
Sydney 02 9261 8333

CLIENT: HammondCare Champion Life

PROJECT: GREENWICH HOSPITAL CONCEPT PLAN

DRAWING TITLE: SHADOWING - SPRING (EQUINOX) - 3pm PROPOSED

DATE:	DRAWN:	PROJ ARCH:	SCALE:
AUGUST 2019	EC	BF	As indicated @ A1
	PROJ:	DRAWING:	REVISION:
	1213	S.41	P5

6/09/2019 2:52:11 PM



1 **EXISTING SITE CONDITION - WINTER SHADING 9.00AM**
1 : 500

1:500 @ A1, 1:1000 @ A3 0 5 10 20 30 50m

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1	26/06/2019	PRELIMINARY ISSUE	CM
B	12/07/2018	REVISED APARTMENT BLDG ISSUE	BF
A	16/03/2018	CONCEPT PLAN ISSUE	ML

NORTH

bickertonmasters.com.au
bm@bickertonmasters.com.au
Brisbane 07 3257 3622
Sydney 02 9261 8333

CLIENT: HammondCare Champion Life

PROJECT: GREENWICH HOSPITAL CONCEPT PLAN

DRAWING TITLE: SHADOWING - WINTER - 9am EXISTING

DATE:	DRAWN:	PROJ ARCH:	SCALE:
AUGUST 2019	EC	BF	1 : 500 @ A1
	PROJ:	DRAWING:	REVISION:
	1213	S.42	P5

FOR APPROVAL
AUGUST 2019

6/09/2019 2:52:15 PM



1 **WINTER SHADING 9.00AM PROPOSED**
1 : 500

SHADOW DIAGRAMS

ADDITIONAL SHADOW CAUSED BY PROPOSED SCHEME

FOR APPROVAL
AUGUST 2019

1:500 @ A1, 1:1000 @ A3 0 5 10 20 30 50m

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REV	DATE	DETAILS	INITIALS
5	30.08.2019	ISSUE FOR DPE	JC
4	19/08/2019	CONSULTANT ISSUE	JC
3	28/06/2019	PRELIMINARY ISSUE	CM
2	27/06/2019	PRELIMINARY ISSUE	CM
1	26/06/2019	PRELIMINARY ISSUE	CM
B	14/01/2019	SHADOW ANALYSIS	CM
A	12/07/2018	REVISED APARTMENT BLDG ISSUE	BF

NORTH

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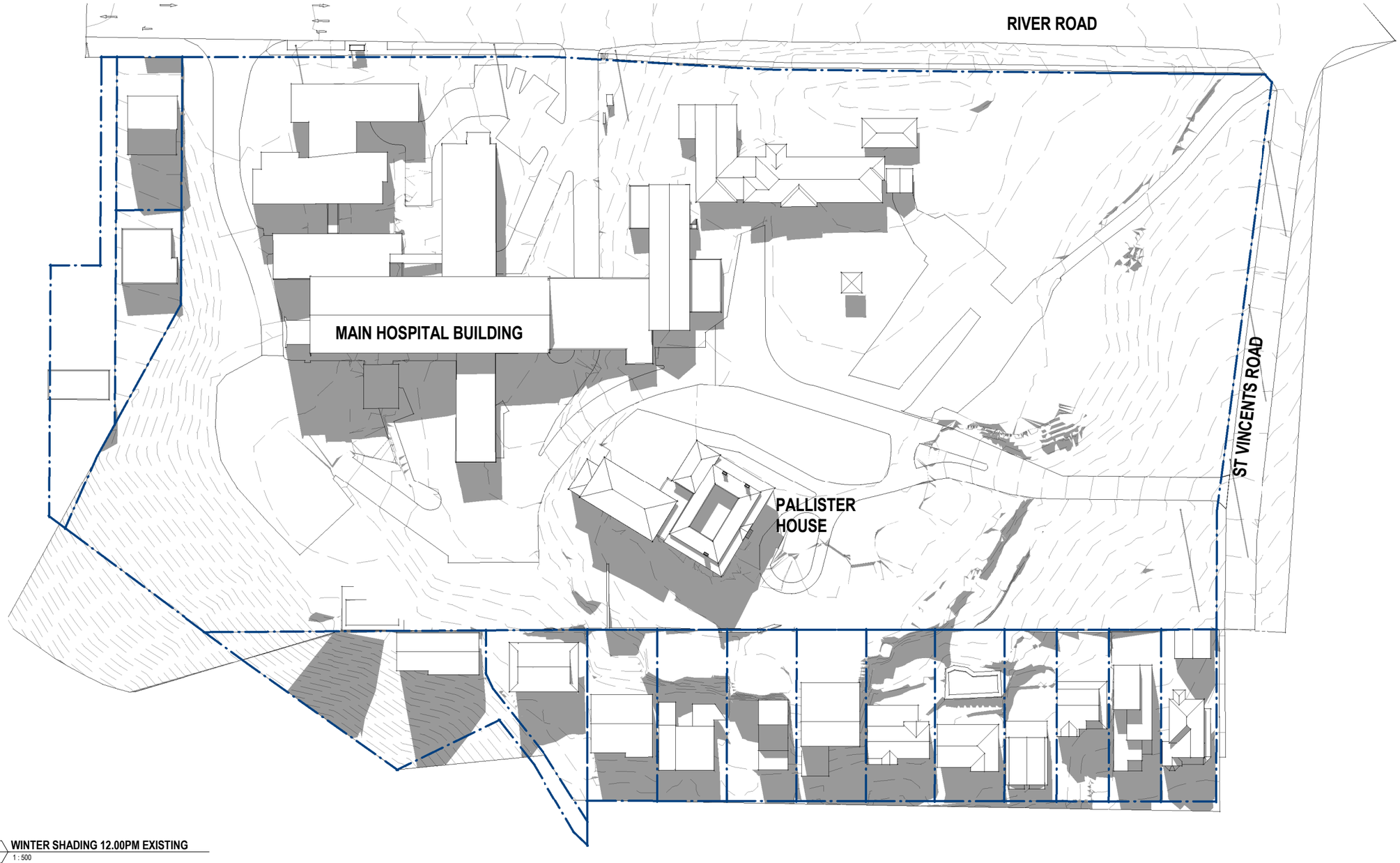
CLIENT: HammondCare Champion Life

PROJECT: GREENWICH HOSPITAL CONCEPT PLAN

DRAWING TITLE: SHADOWING - WINTER - 9am PROPOSED

DATE:	DRAWN:	PROJ ARCH:	SCALE:
AUGUST 2019	EC	BF	As indicated @ A1
	PROJ:	DRAWING:	REVISION:
	1213	S.43	P5

6/09/2019 2:54:05 PM



1 WINTER SHADING 12.00PM EXISTING
1 : 500

1:500 @ A1, 1:1000 @ A3 0 5 10 20 30 50m

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1	26/06/2019	PRELIMINARY ISSUE	CM
A	12/07/2018	REVISED APARTMENT BLDG ISSUE	BF

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bickertonmasters.com.au
bm@bickertonmasters.com.au
Brisbane 07 3257 3622
Sydney 02 9261 8333

CLIENT: HammondCare Champion Life

PROJECT: GREENWICH HOSPITAL CONCEPT PLAN

DRAWING TITLE: SHADOWING - WINTER - 12pm EXISTING

DATE:	DRAWN:	PROJ ARCH:	SCALE:
AUGUST 2019	EC	BF	1 : 500 @ A1
	PROJ: 1213	DRAWING: S.44	REVISION: P5

FOR APPROVAL
AUGUST 2019

6/09/2019 2:54:10 PM



1 WINTER SHADING 12.00PM PROPOSED
1 : 500

SHADOW DIAGRAMS

ADDITIONAL SHADOW CAUSED BY PROPOSED SCHEME

FOR APPROVAL

AUGUST 2019

1:500 @ A1, 1:1000 @ A3 — 0 5 10 20 30 50m

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1	26/06/2019	PRELIMINARY ISSUE	CM
B	14/01/2019	SHADOW ANALYSIS	CM
A	12/07/2018	REVISED APARTMENT BLDG ISSUE	BF

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bickertonmasters.com.au
bm@bickertonmasters.com.au
Brisbane 07 3257 3622
Sydney 02 9261 8333

CLIENT: HammondCare Champion Life

PROJECT: GREENWICH HOSPITAL CONCEPT PLAN

DRAWING TITLE: SHADOWING - WINTER - 12pm PROPOSED

DATE:	DRAWN:	PROJ ARCH:	SCALE:
AUGUST 2019	EC	BF	As indicated @ A1
	PROJ:	DRAWING:	REVISION:
	1213	S.45	P5

6/09/2019 2:55:54 PM



1 **WINTER SHADING 3.00PM EXISTING**
1 : 500

1:500 @ A1, 1:1000 @ A3 0 5 10 20 30 50m

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1	26/06/2019	PRELIMINARY ISSUE	CM
A	12/07/2018	REVISED APARTMENT BLDG ISSUE	BF

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bickertonmasters.com.au
bm@bickertonmasters.com.au
Brisbane 07 3257 3622
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CLIENT: HammondCare Champion Life

PROJECT: GREENWICH HOSPITAL CONCEPT PLAN

FOR APPROVAL
AUGUST 2019

DRAWING TITLE: SHADOWING - WINTER - 3pm EXISTING

DATE:	DRAWN:	PROJ ARCH:	SCALE:
AUGUST 2019	EC	BF	1 : 500 @ A1
	PROJ: 1213	DRAWING: S.46	REVISION: P5

6/09/2019 2:55:58 PM



1 **WINTER SHADING 3.00PM PROPOSED**
1 : 500

SHADOW DIAGRAMS

ADDITIONAL SHADOW CAUSED BY PROPOSED SCHEME

FOR APPROVAL
AUGUST 2019

1:500 @ A1, 1:1000 @ A3 — 0 5 10 20 50 50m

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bickertonmasters.com.au
bm@bickertonmasters.com.au
Brisbane 07 3257 3622
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CLIENT: HammondCare Champion Life

PROJECT: GREENWICH HOSPITAL CONCEPT PLAN

DRAWING TITLE: SHADOWING - WINTER - 3pm PROPOSED

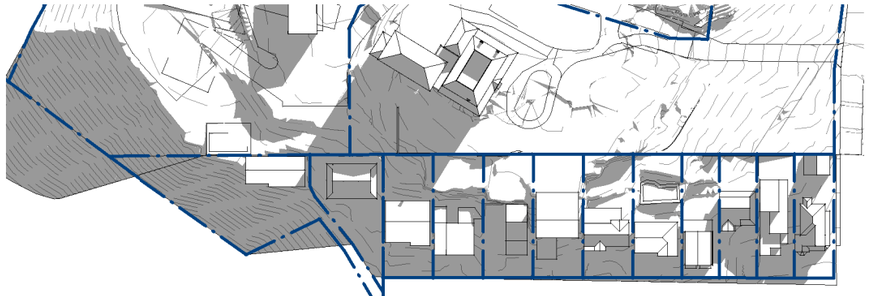
DATE: AUGUST 2019 | DRAWN: EC | PROJ ARCH: BF | SCALE: As indicated @ A1
PROJ: 1213 | DRAWING: S.47 | REVISION: P5

6/09/2019 2:57:58 PM

EXISTING

PROPOSED

9:00am

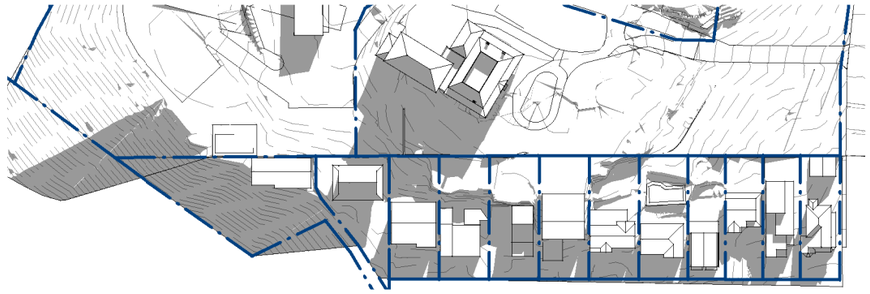


1 EXISTING SITE CONDITION - WINTER SHADING - Study 9.00AM
1 : 1000

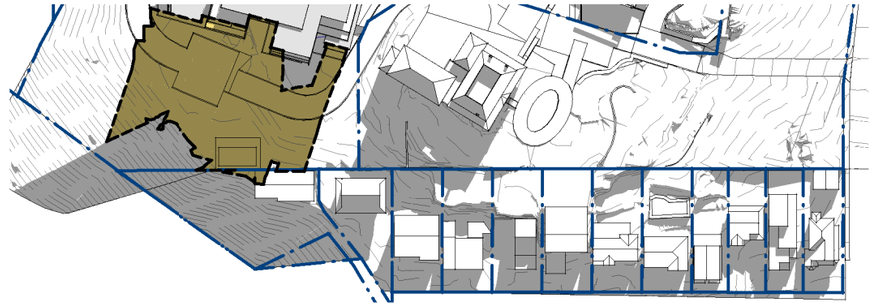


5 PROPOSED SITE CONDITION - WINTER SHADING - Study 9.00AM
1 : 1000

10:00am

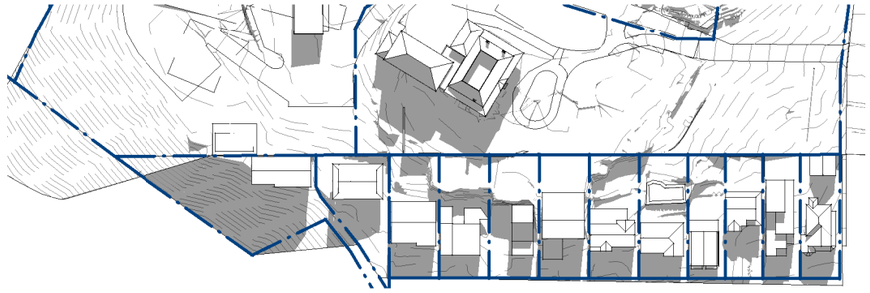


2 EXISTING SITE CONDITION - WINTER SHADING - Study 10.00AM
1 : 1000

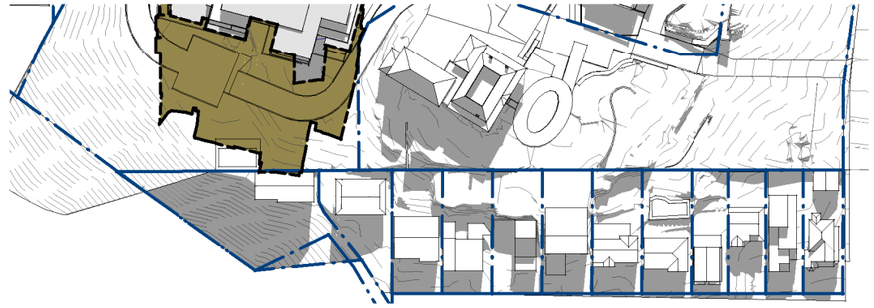


6 PROPOSED SITE CONDITION - WINTER SHADING - Study 10.00AM
1 : 1000

11:00am

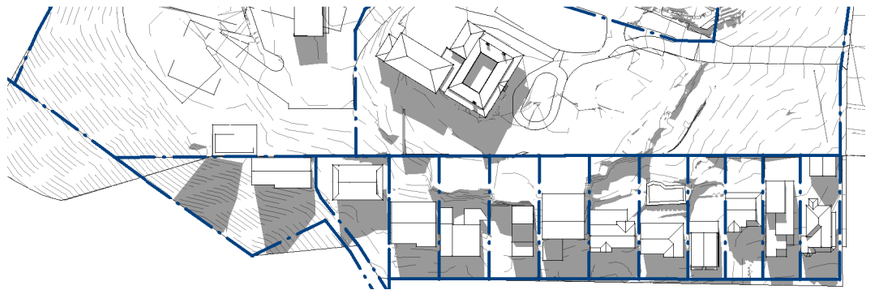


3 EXISTING SITE CONDITION - WINTER SHADING - Study 11.00AM
1 : 1000

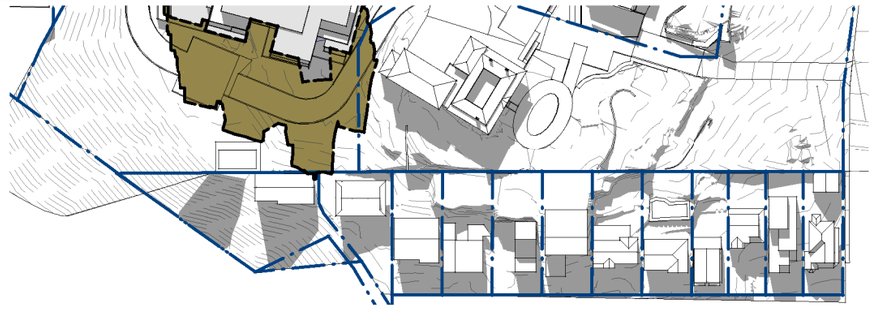


7 PROPOSED SITE CONDITION - WINTER SHADING - Study 11.00AM
1 : 1000

12:00pm



4 EXISTING SITE CONDITION - WINTER SHADING - Study 12.00PM
1 : 1000



8 PROPOSED SITE CONDITION - WINTER SHADING - Study 12.00PM
1 : 1000

SHADOW DIAGRAMS

ADDITIONAL SHADOW CAUSED BY PROPOSED SCHEME

FOR APPROVAL
AUGUST 2019

1:1000 @ A1, 1:2000 @ A3 | 0 | 10 | 30 | 100m

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B	14/01/2019	SHADOW ANALYSIS	CM
A	12/07/2018	REVISED APARTMENT BLDG ISSUE	BF

NORTH

bickertonmasters.com.au
bm@bickertonmasters.com.au
Brisbane 07 3257 3622
Sydney 02 9261 8333

CLIENT: HammondCare Champion Life

PROJECT: GREENWICH HOSPITAL CONCEPT PLAN

DRAWING TITLE: MID WINTER SHADOWS AT SOUTHERN BOUNDARY - MORNING

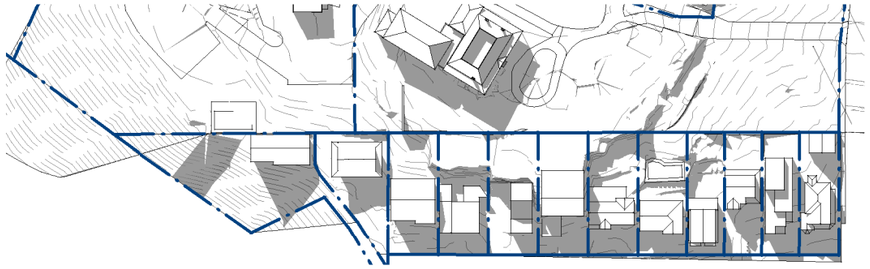
DATE:	DRAWN:	PROJ ARCH:	SCALE:
AUGUST 2019	EC	BF	1 : 1000 @ A1
	PROJ: 1213	DRAWING: S.48	REVISION: P5

6/09/2019 2:58:26 PM

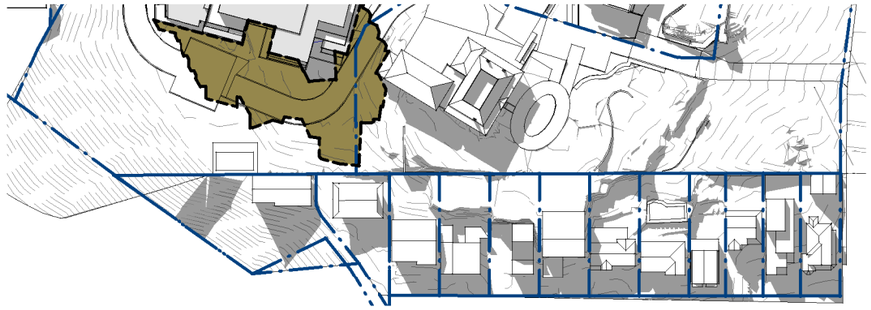
EXISTING

PROPOSED

1:00pm

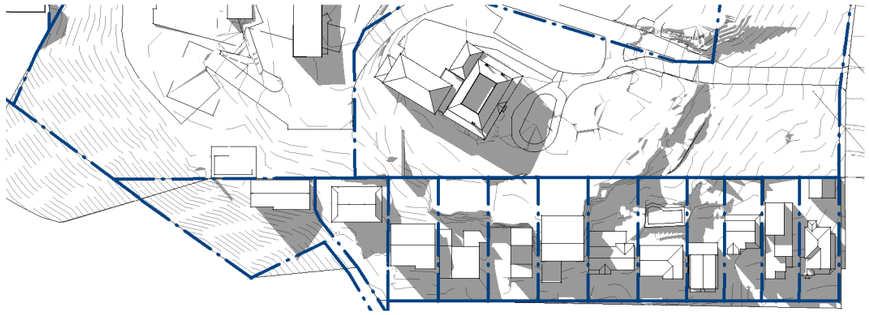


1 EXISTING SITE CONDITION - WINTER SHADING - Study 1.00PM
1 : 1000

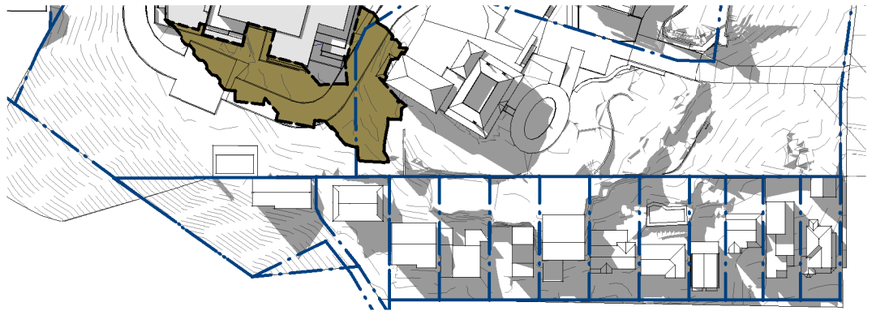


4 PROPOSED SITE CONDITION - WINTER SHADING - Study 1.00PM
1 : 1000

2:00pm

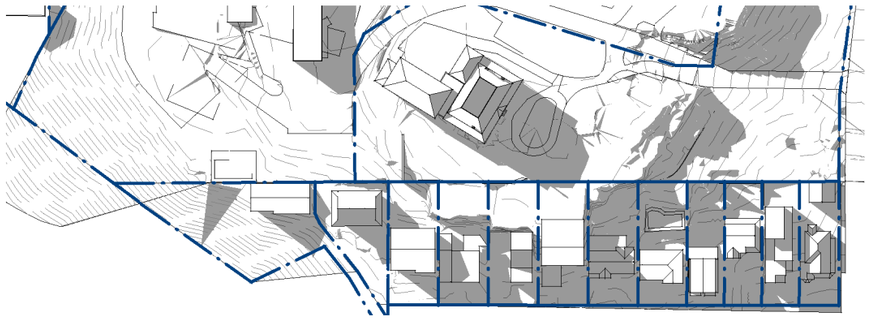


2 EXISTING SITE CONDITION - WINTER SHADING - Study 2.00PM
1 : 1000

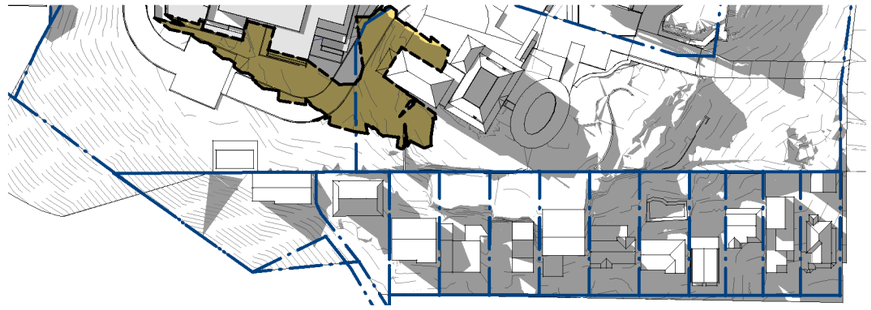


5 PROPOSED SITE CONDITION - WINTER SHADING - Study 2.00PM
1 : 1000

3:00pm



3 EXISTING SITE CONDITION - WINTER SHADING - Study 3.00PM
1 : 1000



6 PROPOSED SITE CONDITION - WINTER SHADING - Study 3.00PM
1 : 1000

SHADOW DIAGRAMS

ADDITIONAL SHADOW CAUSED BY PROPOSED SCHEME

FOR APPROVAL
AUGUST 2019

1:1000 @ A1, 1:2000 @ A3 — 0 — 10 — 30 — 100m

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A	12/07/2018	REVISED APARTMENT BLDG ISSUE	BF

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bickertonmasters.com.au
bm@bickertonmasters.com.au
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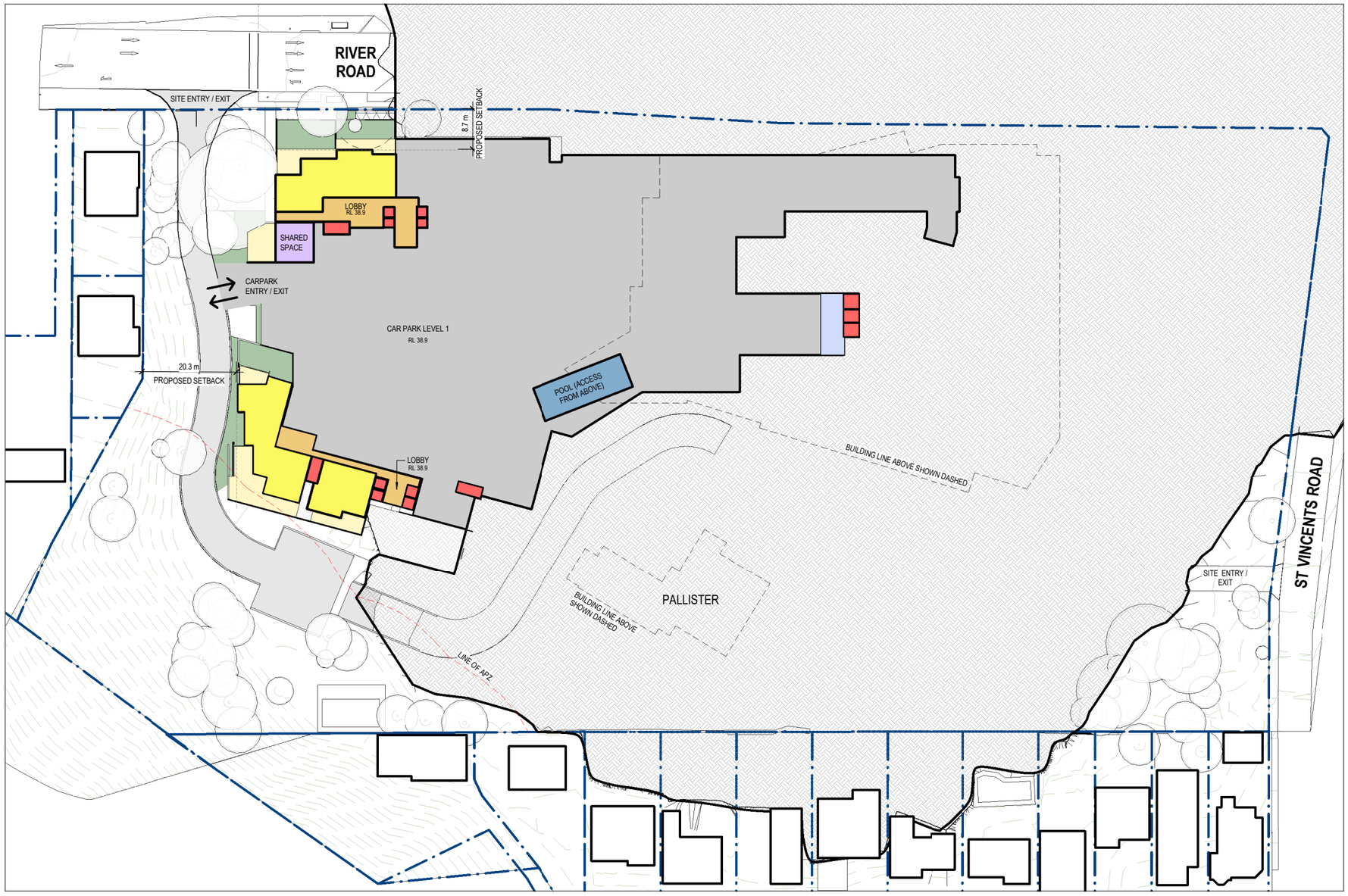
CLIENT: HammondCare Champion Life

PROJECT: GREENWICH HOSPITAL CONCEPT PLAN

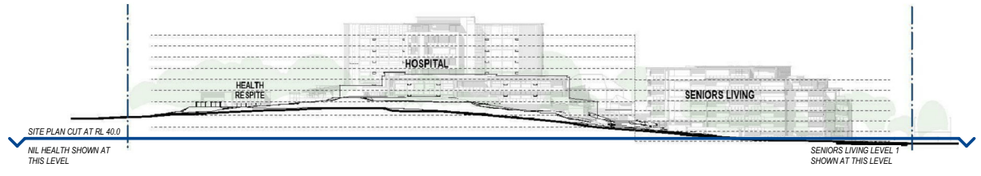
DRAWING TITLE: MID-WINTER SHADOWS AT SOUTHERN BOUNDARY - AFTERNOON

DATE:	DRAWN:	PROJ ARCH:	SCALE:
AUGUST 2019	EC	BF	1 : 1000 @ A1
	PROJ: 1213	DRAWING: S.49	REVISION: P5

6/09/2019 2:58:36 PM



1 **SITE LEVEL 1**
1 : 500



FOR APPROVAL
AUGUST 2019

1:500 @ A1, 1:1000 @ A3 0 5 10 20 50 50m

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REV	DATE	DETAILS	INITIALS
1	30.08.2019	ISSUE FOR DPE	JC

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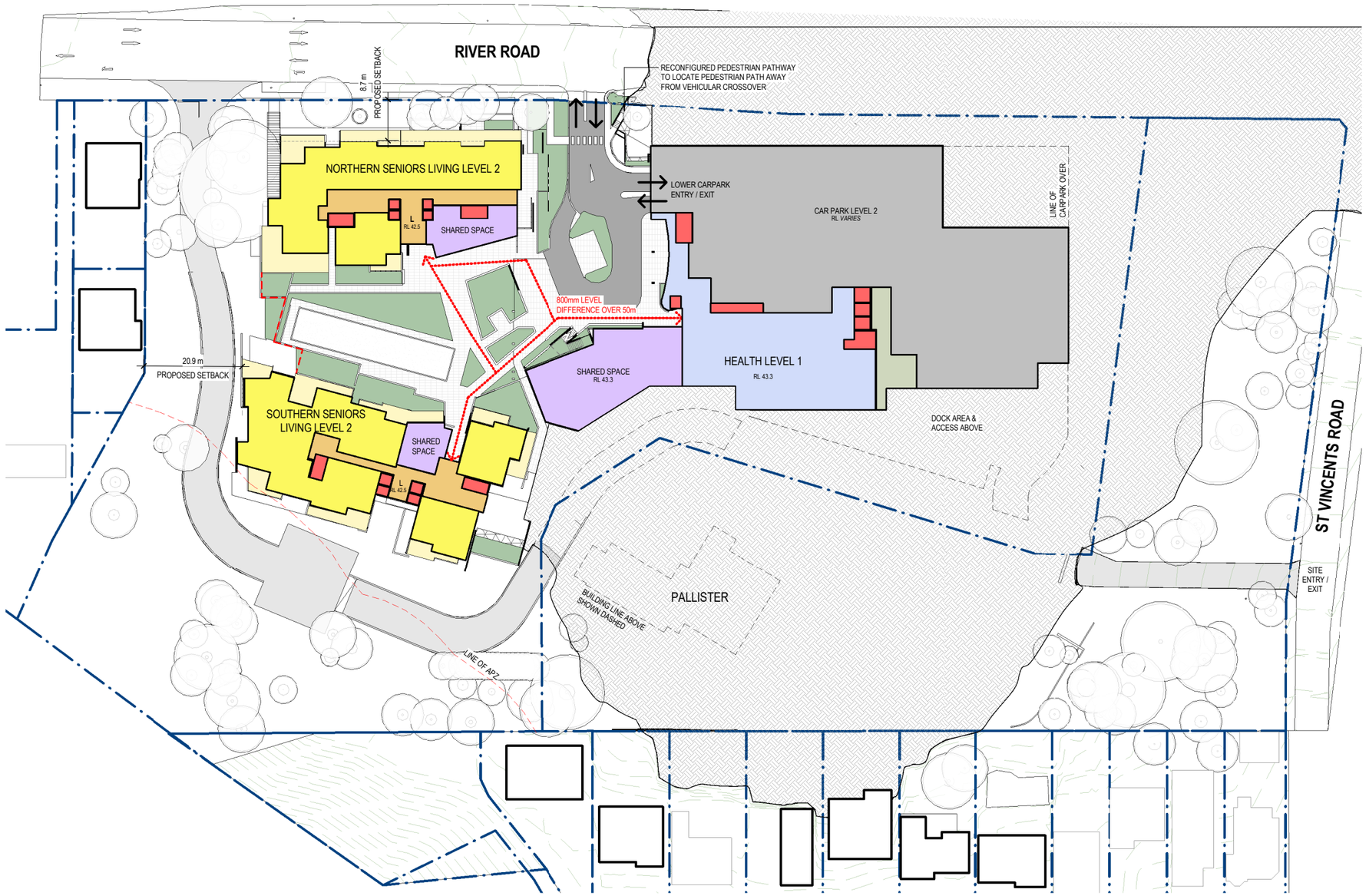
CLIENT: HammondCare Champion Life

PROJECT: GREENWICH HOSPITAL CONCEPT PLAN

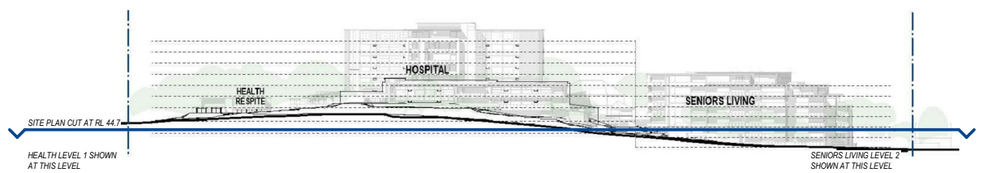
DRAWING TITLE: OVERALL FLOOR PLAN - SITE LEVEL 1

DATE:	DRAWN:	PROJ ARCH:	SCALE:
AUGUST 2019	JC	BF	As indicated @ A1
	PROJ: 1213	DRAWING: S.50	REVISION: P1

6/09/2019 2:58:40 PM



1 **SITE LEVEL 2**
1 : 500



FOR APPROVAL
AUGUST 2019

1:500 @ A1, 1:1000 @ A3 0 5 10 20 50 50m

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REV	DATE	DETAILS	INITIALS
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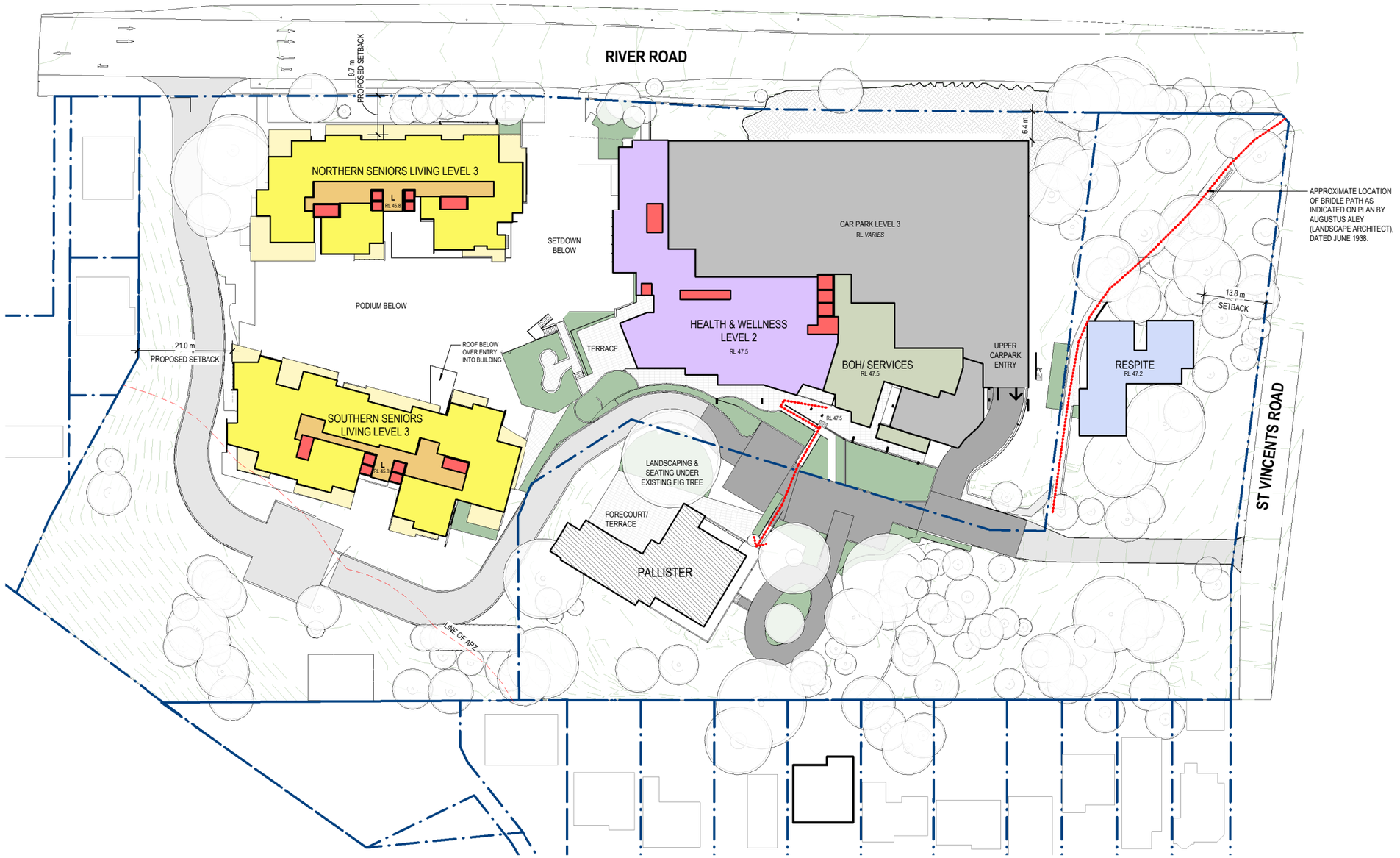
CLIENT: HammondCare Champion Life

PROJECT: GREENWICH HOSPITAL
CONCEPT PLAN

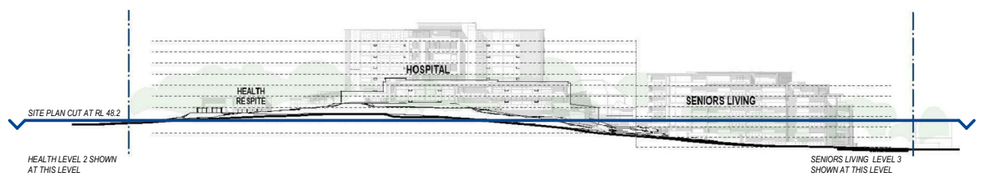
DRAWING TITLE: OVERALL FLOOR PLAN - SITE LEVEL 2

DATE:	DRAWN:	PROJ ARCH:	SCALE:
AUGUST 2019	JC	BF	As indicated @ A1
	PROJ: 1213	DRAWING: S.51	REVISION: P1

6/09/2019 2:58:44 PM



1 **SITE LEVEL 3**
1 : 500



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1:500 @ A1, 1:1000 @ A3 0 5 10 20 30 50m

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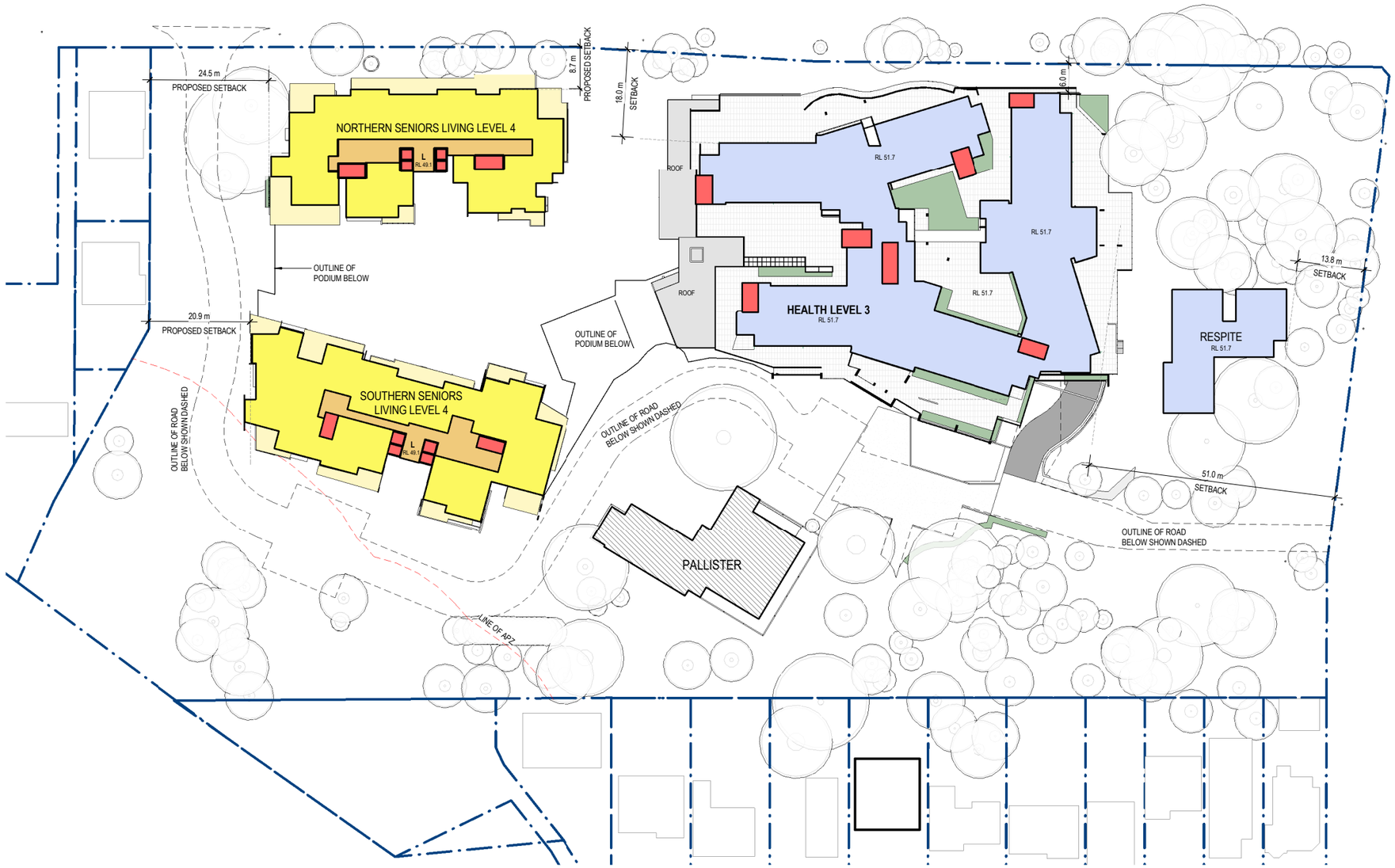
CLIENT: HammondCare Champion Life

PROJECT: GREENWICH HOSPITAL
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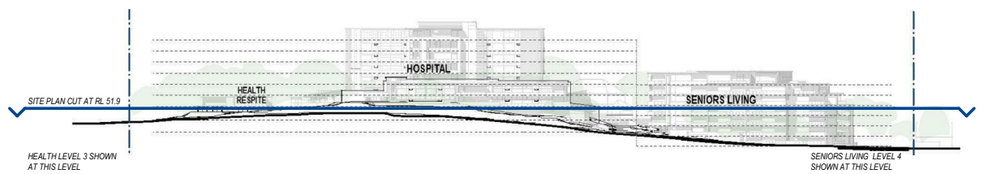
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DATE:	DRAWN:	PROJ ARCH:	SCALE:
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1 **SITE LEVEL 4**
1 : 500



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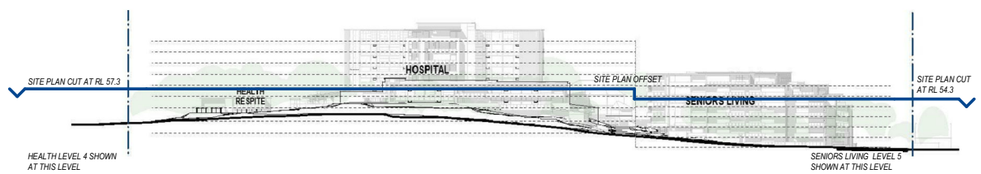
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OVERALL FLOOR PLAN - SITE LEVEL 4

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1 SITE LEVEL 5
1 : 500



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1:500 @ A1, 1:1000 @ A3 0 5 10 20 30 50m

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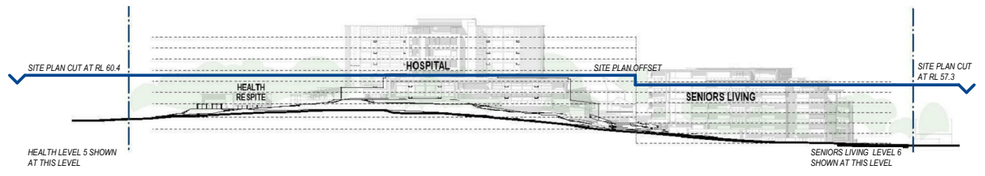
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OVERALL FLOOR PLAN - SITE LEVEL 5

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AUGUST 2019	JC	BF	As indicated @ A1
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1 **SITE LEVEL 6**
1 : 500



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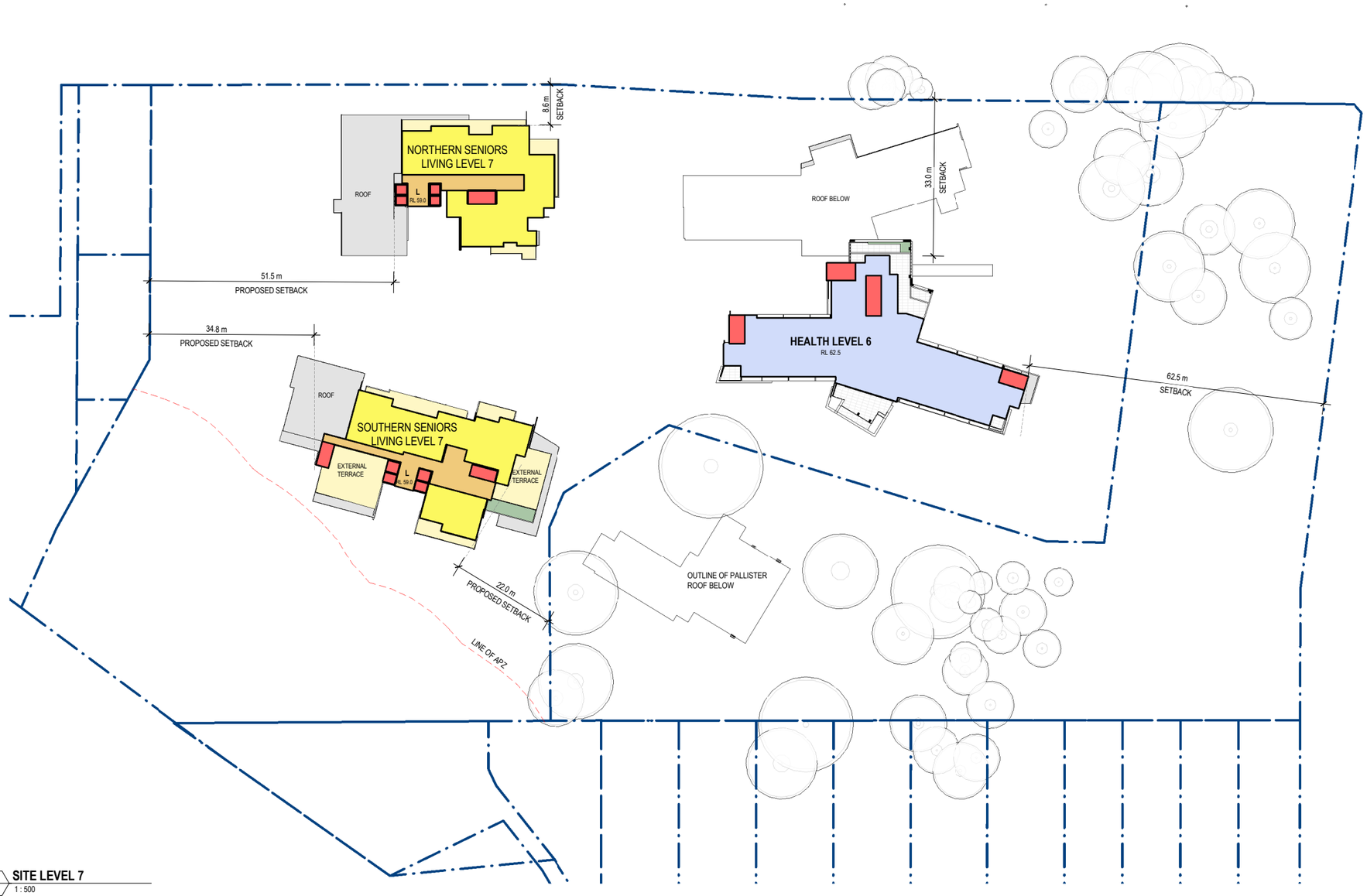
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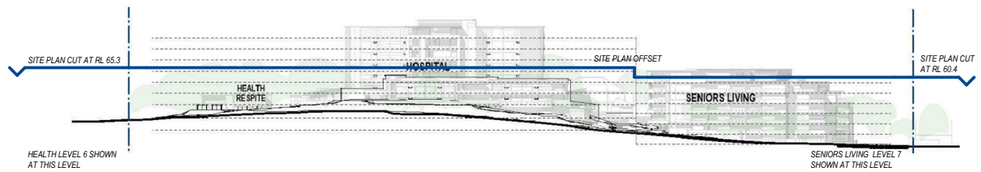
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1 **SITE LEVEL 7**
1 : 500



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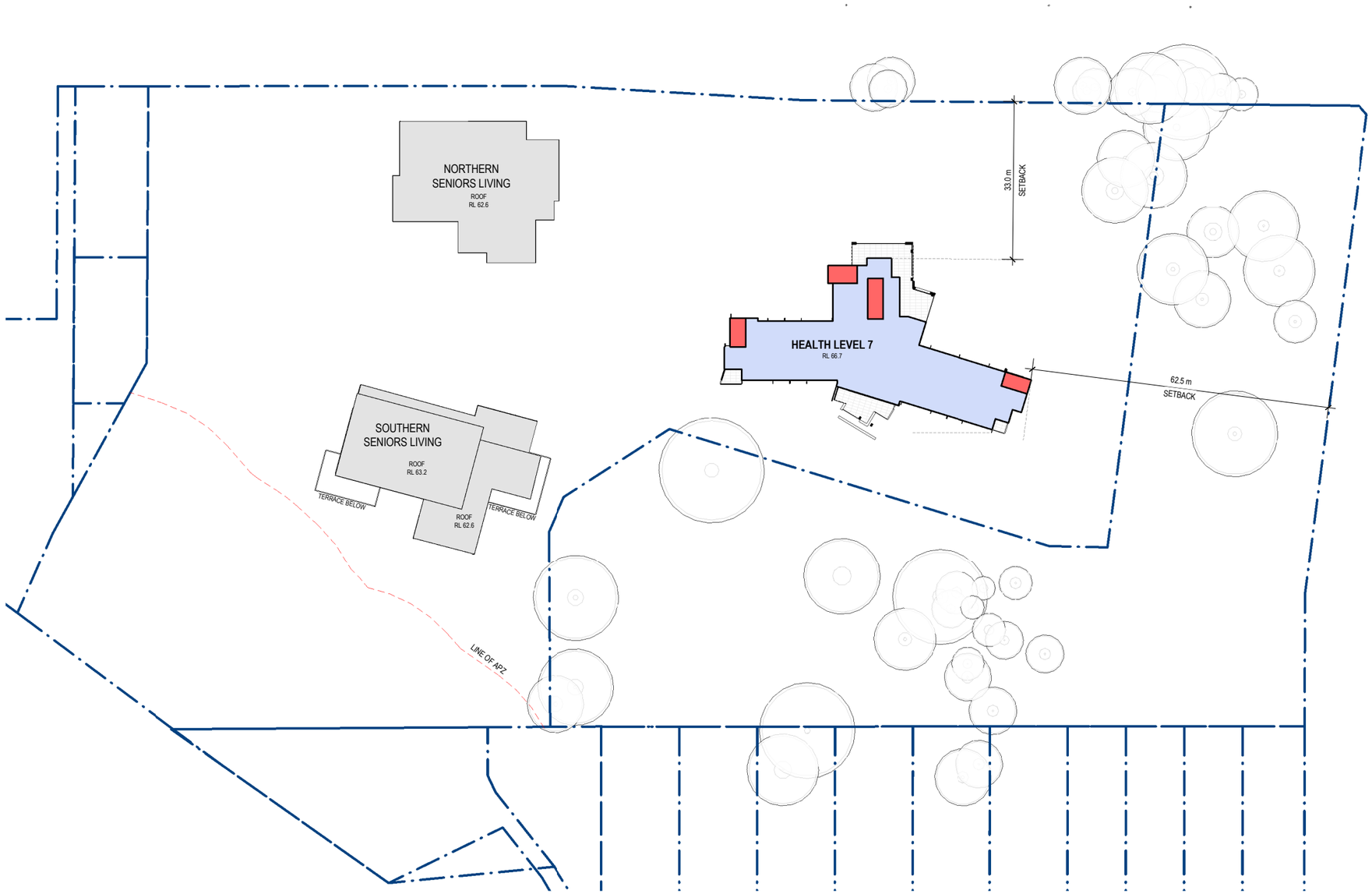
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1 **SITE LEVEL 8**
1 : 500



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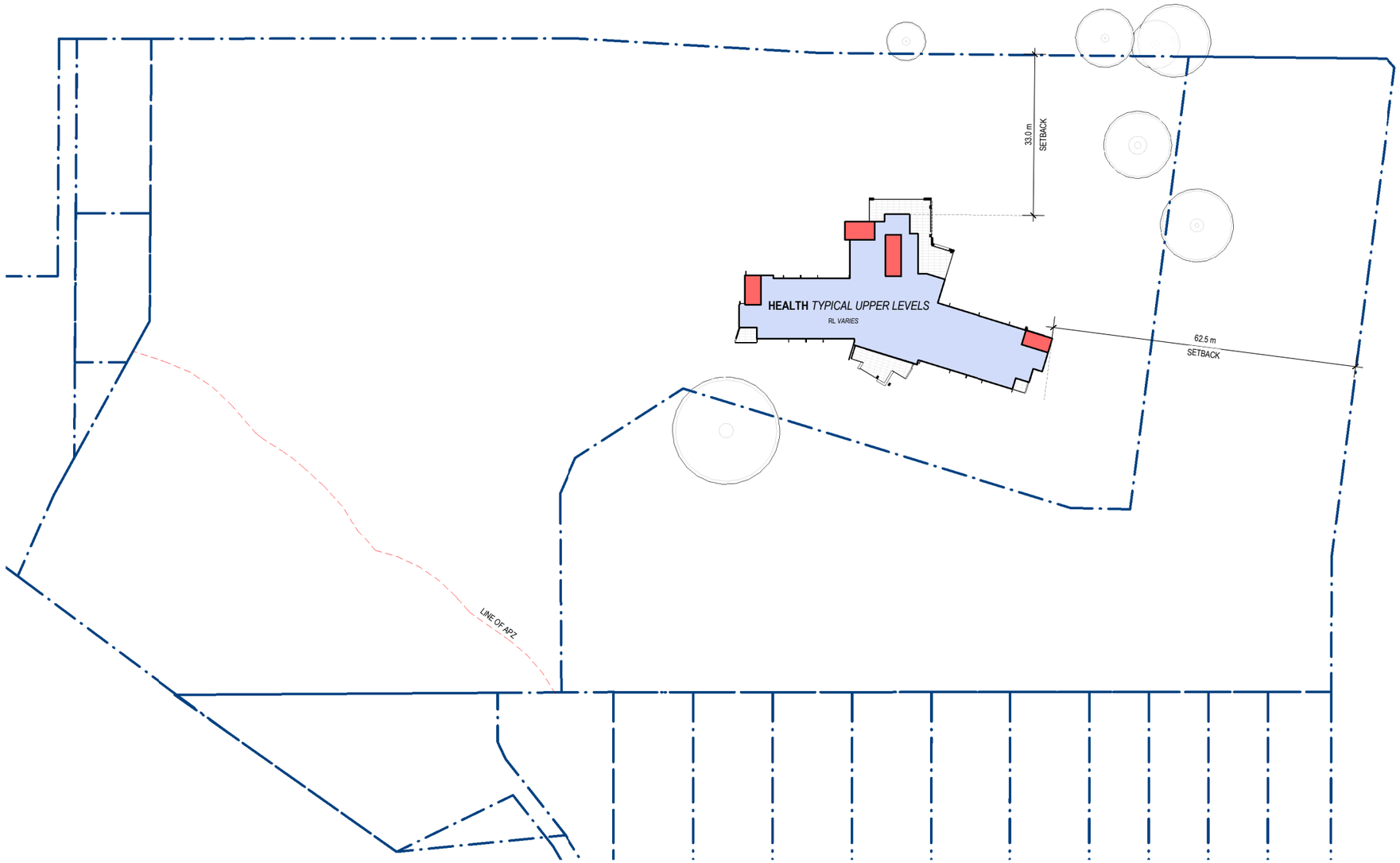
CLIENT: HammondCare Champion Life

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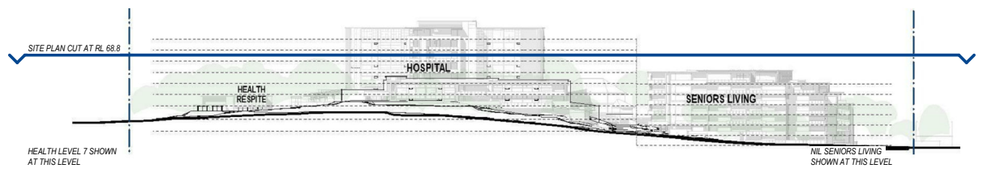
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	PROJ:	**DRAWING:**	**REVISION:**
	1213	S.57	P1

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1 TYPICAL SITE LEVELS - LEVEL 9 AND ABOVE
1 : 500



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Appendix D: Site Photos

Project Ref: E32507BT Greenwich
Site Address: 97-115 River Road, Greenwich, NSW
Selected Site Photos Dated: 22 July 2019



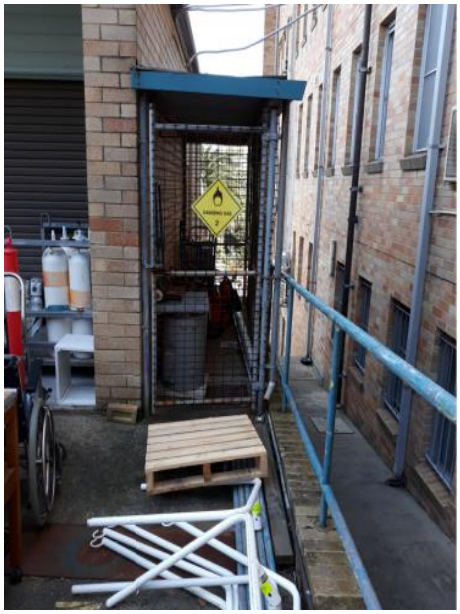
Photograph 1: Taken showing the gatic cover and fill point of the abandoned UST to the south of the main hospital building (refer to Figure 2)



Photograph 2: The self-bunded diesel fuel cube 500L capacity located on the south-east of the main hospital building)refer to Figure 2).



Photograph 3: The small incinerator located on the east side of the main hospital building (refer to Figure 2).



Photograph 4: Showing one of the flammable liquid locked stores. The one shown in the photograph is located to the north of the facilities maintenance building (refer to Figure 2).



Photograph 5: Showing one of the locked gas cages. The cage shown in the photograph is located on the south-west corner of the main hospital building (refer to Figure 2).

Appendix E: Borehole Logs

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BOREHOLE LOG

Borehole No. 1

Client: HAMMOND CARE

Project: PROPOSED HOSPITAL REDEVELOPMENT

Location: 97-115 RIVER ROAD, GREENWICH, NSW

Job No.: 32507R **Method:** SPIRAL AUGER **R.L. Surface:** 37.3 m

Date: 22/7/19 **Datum:** AHD

Plant Type: JK205 **Logged/Checked By:** S.M./P.R.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF CORING										CONCRETE: 170mm.t				8mm DIA. REINFORCEMENT, 12mm & 35mm BOTTOM COVER
						37			-	FILL: Silty sandy gravel, fine to medium grained, igneous, angular, dark grey, fine to coarse grained sand.	M D			
					N = 11 4,7,4					FILL: Clayey sand, medium to coarse grained, yellow brown and orange brown, with sub-angular fine to medium grained sandstone gravel.	w>PL		490 390 360	60mm VOID UNDERNEATH SLAB APPEARS MODERATELY COMPACTED
							1			FILL: Silty clay, medium to high plasticity, light grey mottled brown and dark grey, trace of ash, slag, and angular fine to medium grained igneous gravel.				
						36				FILL: Silty clay, medium plasticity, light grey, with angular medium to coarse grained ironstone gravel.			250 270 190	APPEARS MODERATELY COMPACTED
					N = 8 3,4,4		2							
						35								
ON COMPLETION					N = 2 1,1,1		3						200 180 140	
						34				FILL: Sand, medium to coarse grained, light grey and brown.	M W			
							4		-	SANDSTONE: fine to medium grained, light grey.	DW SW	L M - H		HAWKESBURY SANDSTONE LOW TO MODERATE 'TC' BIT RESISTANCE
						33				REFER TO CORED BOREHOLE LOG				HIGH RESISTANCE
							5							
						32								
							6							
						31								

JK 9.02.4 LIB:GLB Log JK AUGERHOLE - MASTER 32507R GREENWICH.GPJ <<DrawingFile>> 30/08/2019 10:46 10.01.00.01 Datgel Lab and In Situ Tool - DGD | Lib: JK 9.02.4 2019-05-31 Prj: JK 9.01.0 2018-03-20

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CORED BOREHOLE LOG

Borehole No. 1

Client: HAMMOND CARE

Project: PROPOSED HOSPITAL REDEVELOPMENT

Location: 97-115 RIVER ROAD, GREENWICH, NSW

Job No.: 32507R | **Core Size:** NMLC | **R.L. Surface:** 37.3 m

Date: 22/7/19 | **Inclination:** VERTICAL | **Datum:** AHD

Plant Type: JK205 | **Bearing:** N/A | **Logged/Checked By:** S.M./P.R.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	DEFECT DETAILS: SPACING (mm) (600, 200, 60, 20)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
					START CORING AT 4.24m						
50% RETURN		33	5		SANDSTONE: fine to medium grained, light grey, with shale clasts, bedded at 0-10°.	SW	M				Hawkesbury Sandstone
		32					M - H			(5.15m) J, 15°, P, S, Cn (5.27m) Be, 5°, P, S, Cn	
0% RETURN		31	6							(5.55m) XWS, 0°, 4 mm.t	
			7		as above, but bedded at 0-20°.						
		30			END OF BOREHOLE AT 7.29 m						
		29	8								
		28	9								
		27	10								

JK 9.02.4 LIB:GLB Log JK CORED BOREHOLE - MASTER 32507R GREENWICH.GPJ <<DrawingFile>> 30/08/2019 10:46 10.01.00.01 Datgel Lab and In Situ Tool - DGD | Lib: JK 9.02.4 2019-05-31 Prj: JK 9.01.0 2018-03-20

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FRACTURES NOT MARKED ARE CONSIDERED TO BE DRILLING AND HANDLING BREAKS

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BOREHOLE LOG

Borehole No. 2

1 / 1

Client: HAMMOND CARE

Project: PROPOSED HOSPITAL REDEVELOPMENT

Location: 97-115 RIVER ROAD, GREENWICH, NSW

Job No.: 32507R **Method:** SPIRAL AUGER **R.L. Surface:** 39 m

Date: 23/7/19 **Datum:** AHD

Plant Type: JK205 **Logged/Checked By:** S.M./P.R.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION										FILL: Silty sand, fine to medium grained, dark brown, with root fibres.	M			GRASS COVER APPEARS WELL COMPACTED
					N = 21 2,12,9					FILL: Silty sand, medium to coarse grained, brown, with clay fines an sub-angular medium to coarse grained sandstone gravel, trace of ash.				
						38	1			FILL: Silty sandy clay, low to medium plasticity, brown mottled orange brown, medium to coarse grained sand, with sub-angular medium to coarse grained ironstone and sandstone gravel, trace of slag and ash.				APPEARS MODERATELY COMPACTED
					N = 4 2,2,2									
						37	2							
									-	SANDSTONE: fine to medium grained, light grey.	SW	M - H		HAWKESBURY SANDSTONE HIGH 'TC' BIT RESISTANCE WITH VERY LOW RESISTANCE BANDS
						36	3				DW	VL		
										as above, but yellow brown.	SW	M		
											DW	VL		
										as above, but orange brown.				
						35	4			as above, but light grey.	SW	M		MODERATE RESISTANCE WITH VERY LOW RESISTANCE BANDS
											DW	VL		
											SW	M		
						34	5							GROUNDWATER MONITORING WELL INSTALLED TO 2.3m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 0.4m TO 2.3m. CASING 0.11m TO 0.4m. 2mm SAND FILTER PACK 0.4m TO 2.3m. BENTONITE SEAL 0.11m TO 0.4m. BACKFILLED WITH SAND TO THE SURFACE. COMPLETED WITH A CONCRETED GATIC COVER.
						33	6							
										END OF BOREHOLE AT 6.30 m				

JK 9.02.4 LIB:GLB Log JK AUGERHOLE - MASTER 32507R GREENWICH.GPJ <<DrawingFile>> 30/08/2019 10:46 10.01.00.01 Datgel Lab and In Situ Tool - DGD | Lib: JK 9.02.4 2019-05-31 Prj: JK 9.01.0 2018-03-20

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BOREHOLE LOG

Borehole No. 3

Client: HAMMOND CARE

Project: PROPOSED HOSPITAL REDEVELOPMENT

Location: 97-115 RIVER ROAD, GREENWICH, NSW

Job No.: 32507R **Method:** SPIRAL AUGER **R.L. Surface:** 42.8 m

Date: 23/7/19 **Datum:** AHD

Plant Type: JK205 **Logged/Checked By:** S.M./P.R.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF CORING									-	ASPHALTIC CONCRETE: 45mm.t	D			APPEARS MODERATELY COMPACTED
					N = 11 8,4,7	42	1			FILL: Silty gravelly sand, medium to coarse grained, dark grey, angular medium to coarse grained igneous gravel. FILL: Sand, medium to coarse grained, light grey, with dark grey silty clay nodules, trace of ash.				
									-	FILL: Silty sand, medium to coarse grained, brown and light grey, with sub-angular medium to coarse grained sandstone gravel, trace of clay fines, slag and ash. FILL: Clayey sand, medium to coarse grained, light brown. SANDSTONE: fine to medium grained, light grey. REFER TO CORED BOREHOLE LOG	SW	M - H		HAWKESBURY SANDSTONE HIGH 'TC' BIT RESISTANCE
						41	2							
						40	3							
						39	4							
						38	5							
						37	6							
						36								

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CORED BOREHOLE LOG

Borehole No. 3

Client: HAMMOND CARE

Project: PROPOSED HOSPITAL REDEVELOPMENT

Location: 97-115 RIVER ROAD, GREENWICH, NSW

Job No.: 32507R | **Core Size:** NMLC | **R.L. Surface:** 42.8 m

Date: 23/7/19 | **Inclination:** VERTICAL | **Datum:** AHD

Plant Type: JK205 | **Bearing:** N/A | **Logged/Checked By:** S.M./P.R.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ VL -0.1, L -0.3, M -1, H -3, VH -10, EH	DEFECT DETAILS SPACING (mm) DESCRIPTION Type, orientation, defect shape and roughness, defect coatings and seams, openness and thickness Specific / General	Formation
					START CORING AT 1.22m					
ON COMPLETION		41	2		SANDSTONE: fine to medium grained, dark red brown, light grey and orange brown, bedded at 0-20°.	MW	H L		(1.87m) XWS, 20°, 3 mm.t (2.13m) XWS, 10°, 8 mm.t (2.21m) XWS, 10°, 15 mm.t	Hawkesbury Sandstone
					NO CORE 0.42m					
	100% RETURN	40	3		SANDSTONE: fine to medium grained, light grey and dark red brown, bedded at 0-10°.	MW	L M		(2.65m) XWS, 0°, 25 mm.t (2.92m) Cb, 0°, 5mm.t (3.14m) XWS, 0°, 3-8mm.t (3.21m) Be, 0°, P, S, Cb Sn (3.22m) J, 30°, P, S, Cb Sn, 5 mm.t (3.67m) Be, 0°, P, S, Cb Sn, 5 mm.t (3.84m) XWS, 0°, 75 mm.t	Hawkesbury Sandstone
		39	4							
		38	5		as above, but light grey and orange brown.	SW	H			
		37	6							
		36	7		as above, but light grey, red brown and yellow brown, with slump bedding structure.				(6.57m) XWS, 0°, 65 mm.t	
		35			END OF BOREHOLE AT 7.20 m					

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BOREHOLE LOG

Borehole No. 4

Client: HAMMOND CARE

Project: PROPOSED HOSPITAL REDEVELOPMENT

Location: 97-115 RIVER ROAD, GREENWICH, NSW

Job No.: 32507R **Method:** SPIRAL AUGER **R.L. Surface:** 41.5 m

Date: 23/7/19 **Datum:** AHD

Plant Type: JK205 **Logged/Checked By:** S.M./P.R.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF CORING										ASPHALTIC CONCRETE:				
									-	FILL: Silty gravelly sand, medium to coarse grained, dark grey, angular fine to coarse grained igneous gravel.	M W			APPEARS POORLY COMPACTED
					N = 3 4,2,1	41				FILL: Silty sand, medium to coarse grained, brown and dark yellow brown, with sub-angular medium to coarse grained sandstone gravel.	M			
							1			as above, but orange brown and yellow brown.				
					N = 4 3,2,2	40								
							2			as above, but brown, with clay fines.				
									SC	Clayey SAND: fine to medium grained, red brown and orange brown.	M	(L)		RESIDUAL
						39			-	SANDSTONE: fine to medium grained, light grey.	DW	VL - L		HAWKESBURY SANDSTONE LOW 'TC' BIT RESISTANCE
							3			REFER TO CORED BOREHOLE LOG				GROUNDWATER MONITORING WELL INSTALLED TO 2.2m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 0.1m TO 2.2m. 2mm SAND FILTER PACK 0.3m TO 2.2m. BENTONITE SEAL 0.1m TO 0.3m. BACKFILLED WITH SAND TO THE SURFACE. COMPLETED WITH A CONCRETED GATIC COVER.
						38								
							4							
						37								
							5							
						36								
							6							
						35								

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CORED BOREHOLE LOG

Borehole No. 4 **2 / 2**

Client: HAMMOND CARE

Project: PROPOSED HOSPITAL REDEVELOPMENT

Location: 97-115 RIVER ROAD, GREENWICH, NSW

Job No.: 32507R **Core Size:** NMLC **R.L. Surface:** 41.5 m

Date: 23/7/19 **Inclination:** VERTICAL **Datum:** AHD

Plant Type: JK205 **Bearing:** N/A **Logged/Checked By:** S.M./P.R.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ VL 0.1 L 0.3 M 1 H 3 VH 10 EH	DEFECT DETAILS SPACING (mm) 600 200 60 20 DESCRIPTION Type, orientation, defect shape and roughness, defect coatings and seams, openness and thickness Specific / General	Formation
		39	3		START CORING AT 3.03m					
ON COMPLETION 0% RETURN		38	4		SANDSTONE: fine to medium grained, light grey and orange brown, bedded at 0-10°.	DW	L		(3.11m) XWS, 0°, 5mm.t, HP: 150, 330, 410 kPa	Hawkesbury Sandstone
					Extremely Weathered sandstone: sandy CLAY: low to medium plasticity, light grey mottled orange brown, fine to medium grained sand.	XW	Hd			
		37	5		SANDSTONE: fine to medium grained, light grey, yellow brown and red brown, bedded at 0-20°.	SW	M		(4.36m) Be, 0°, P, S, Cn	
		36	6				M - H		(5.66m) CS, 0°, 3 mm.t	
		35	7		as above, but light grey and yellow brown, with slump bedding structure.		H			
		34	8		END OF BOREHOLE AT 7.25 m					
		33								

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BOREHOLE LOG

Borehole No. 5

1 / 1

Client: HAMMOND CARE

Project: PROPOSED HOSPITAL REDEVELOPMENT

Location: 97-115 RIVER ROAD, GREENWICH, NSW

Job No.: 32507R **Method:** SPIRAL AUGER **R.L. Surface:** 44.5 m

Date: 23/7/19 **Datum:** AHD

Plant Type: JK205 **Logged/Checked By:** S.M./P.R.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION									-	ASPHALTIC CONCRETE: 65mm.t				
									-	FILL: Silty gravelly sand, medium to coarse grained igneous, angular, dark grey, medium to coarse grained sand.	D			
						44			CL-CI	FILL: Sand, medium to coarse grained, orange brown, with clay fines, and sub-angular medium to coarse grained sandstone gravel.	w<PL	Hd	460 600 570	RESIDUAL
					N = 14 5,5,9		1		-	Sandy CLAY: low to medium plasticity, orange brown and yellow brown, fine to medium grained.	DW	L		HAWKESBURY SANDSTONE
						43				as above, but light grey, with low strength iron indurated bands.	SW	M		LOW 'TC' BIT RESISTANCE
										SANDSTONE: fine to medium grained, light grey and orange brown.				HIGH RESISTANCE
							2				DW	VL		VERY LOW RESISTANCE
										as above, but red brown and light grey.	SW	M		HIGH RESISTANCE
						42				END OF BOREHOLE AT 2.30 m				
							3							
						41								
							4							
						40								
							5							
						39								
							6							
						38								

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BOREHOLE LOG

Borehole No. 6

Client: HAMMOND CARE

Project: PROPOSED HOSPITAL REDEVELOPMENT

Location: 97-115 RIVER ROAD, GREENWICH, NSW

Job No.: 32507R **Method:** SPIRAL AUGER **R.L. Surface:** 49.5 m

Date: 23/7/19 **Datum:** AHD

Plant Type: JK205 **Logged/Checked By:** S.M./P.R.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF CORING									-	ASPHALTIC CONCRETE: 60mm.t FILL: Silty gravelly sand, medium to coarse grained, dark grey, sub-angular medium to coarse grained igneous gravel.	D			
					N=SPT 2/ 20mm REFUSAL	49			CI-CH	FILL: Clayey sand, medium to coarse grained, with sub-angular medium to coarse grained sandstone gravel.	w<PL	(VSt)		RESIDUAL
							1		-	Sandy CLAY: low plasticity, light grey, fine to medium grained, with low strength iron indurated bands.	SW	L		HAWKESBURY SANDSTONE
										SANDSTONE: fine to medium grained, light grey.		M - H		LOW 'TC' BIT RESISTANCE
						48				REFER TO CORED BOREHOLE LOG				HIGH RESISTANCE
							2							
						47								
							3							
						46								
							4							
						45								
							5							
						44								
							6							
						43								

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CORED BOREHOLE LOG

Borehole No. 6

Client: HAMMOND CARE

Project: PROPOSED HOSPITAL REDEVELOPMENT

Location: 97-115 RIVER ROAD, GREENWICH, NSW

Job No.: 32507R | **Core Size:** NMLC | **R.L. Surface:** 49.5 m

Date: 23/7/19 | **Inclination:** VERTICAL | **Datum:** AHD

Plant Type: JK205 | **Bearing:** N/A | **Logged/Checked By:** S.M./P.R.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ VL -0.1, L -0.3, M -1, H -3, VH -10, EH	DEFECT DETAILS SPACING (mm) 600, 200, 60, 20	DEFECT DETAILS DESCRIPTION Type, orientation, defect shape and roughness, defect coatings and seams, openness and thickness Specific / General	Formation
					START CORING AT 1.24m						
ON COMPLETION 100% RETURN		48 47 46 45 44 43 42	1 2 3 4 5 6 7		SANDSTONE: fine to medium grained, light grey and orange brown, bedded at 0-20°. as above, but orange brown and grey. as above, but light grey. END OF BOREHOLE AT 7.26 m	SW FR	H M H M			(1.68m) XWS, 0°, 3 mm.t (3.52m) Be, 0°, P, S, Fe Sn (4.39m) Be, 0°, P, S, Cn (5.36m) XWS, 0°, 25 mm.t (5.45m) XWS, 0°, 70 mm.t	Hawkesbury Sandstone

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BOREHOLE LOG

Borehole No. 7

Client: HAMMOND CARE

Project: PROPOSED HOSPITAL REDEVELOPMENT

Location: 97-115 RIVER ROAD, GREENWICH, NSW

Job No.: 32507R **Method:** SPIRAL AUGER **R.L. Surface:** 52 m

Date: 23/7/19 **Datum:** AHD

Plant Type: JK205 **Logged/Checked By:** S.M./P.R.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF CORING										FILL: Silty sand, fine to medium grained, dark brown, with root fibres.	D			
									-	SANDSTONE: fine to medium grained, yellow brown and brown, with extremely weathered bands.	DW	L		HAWKESBURY SANDSTONE LOW 'TC' BIT RESISTANCE
						51	1					VL		VERY LOW RESISTANCE
												L		LOW RESISTANCE
						50	2			as above, but red brown and light grey.	SW	M		MODERATE RESISTANCE
										as above, but light grey.				
										REFER TO CORED BOREHOLE LOG				
						49	3							
						48	4							
						47	5							
						46	6							

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Log No. **BH11** **1/1**

Client: HAMMONDCARE

Project: PROPOSED HOSPITAL REDEVELOPMENT

Location: 97-115 RIVER ROAD, GREENWICH, NSW

Job No.: E32507BT **Method:** SPIRAL AUGER/PUSHTUBE **R.L. Surface:** 38.5m

Date: 25/7/19 **Datum:** AHD

Plant Type: EZIPROBE **Logged/Checked by:** M.M.P./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION							0			FILL: Silty sand, fine to medium grained, dark brown, trace of root fibres.	D			GRASS COVER
										FILL: Sandy clay, low to medium plasticity, light grey and red brown, trace of ironstone, sandstone and igneous gravel and ash.	w<PL			
							0.5			FILL: Silty sand, fine to medium grained, light brown, trace of ironstone, igneous and sandstone gravel, ash and slag.	D			
										END OF BOREHOLE AT 0.7m				REFUSAL
							1							
							1.5							
							2							
							2.5							
							3							
							3.5							

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Log No. **BH12** **1/2**

Client: HAMMONDCARE

Project: PROPOSED HOSPITAL REDEVELOPMENT

Location: 97-115 RIVER ROAD, GREENWICH, NSW

Job No.: E32507BT **Method:** SPIRAL AUGER/PUSHTUBE **R.L. Surface:** 37.0m

Date: 25/7/19 **Datum:** AHD

Plant Type: EZIPROBE **Logged/Checked by:** M.M.P./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION							0			MULCH: 300mm.t.				MULCH COVER
							0.5			FILL: Silty sand, fine to medium grained, light brown, trace of blue metal, igneous, ironstone and sandstone gravel and ash.	D			
							1			FILL: Sandy clay, low to medium plasticity, dark brown, trace of igneous and sandstone gravel and ash.	w<PL			
							1.5							
							2			FILL: Sandy clay, low to medium plasticity, yellow brown and brown, trace of sandstone, igneous and ironstone gravel, ash and slag.	w<PL			
							2.5			FILL: Silty clay, low to medium plasticity, light grey, trace of igneous gravel.	w<PL			
							3			FILL: Sand, fine to medium grained, yellow brown, trace of sandstone gravel.	D			
							3.5							

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Log No. **BH12** **2/2**

Client: HAMMONDCARE

Project: PROPOSED HOSPITAL REDEVELOPMENT

Location: 97-115 RIVER ROAD, GREENWICH, NSW

Job No.: E32507BT **Method:** SPIRAL AUGER/PUSHTUBE **R.L. Surface:** 37.0m

Date: 25/7/19 **Datum:** AHD

Plant Type: EZIPROBE **Logged/Checked by:** M.M.P./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
										FILL: Sand, fine to medium grained, yellow brown, trace of sandstone gravel.	D			
	■									FILL: Silty sand, fine to medium grained, brown, trace of sandstone and quartz gravel.	M			
							4			END OF BOREHOLE AT 4.1m				REFUSAL
							4.5							
							5							
							5.5							
							6							
							6.5							
							7							

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Log No. **BH13** **1/1**

Client: HAMMONDCARE

Project: PROPOSED HOSPITAL REDEVELOPMENT

Location: 97-115 RIVER ROAD, GREENWICH, NSW

Job No.: E32507BT **Method:** SPIRAL AUGER/PUSHTUBE **R.L. Surface:** 37.0m

Date: 25/7/19 **Datum:** AHD

Plant Type: EZIPROBE **Logged/Checked by:** M.M.P./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION							0			FILL: Silty sand, fine to medium grained, dark brown, trace of ironstone and sandstone gravel, brick, terracotta pipe and concrete fragments.	D			
							0.5			FILL: Silty clayey sand, fine to medium grained, brown and red brown, trace of ironstone, igneous and sandstone gravel, brick, concrete and terracotta fragments.	D			
							1			END OF BOREHOLE AT 0.9m				REFUSAL
							1.5							
							2							
							2.5							
							3							
							3.5							

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Log No. **BH14** **1/1**

Client: HAMMONDCARE

Project: PROPOSED HOSPITAL REDEVELOPMENT

Location: 97-115 RIVER ROAD, GREENWICH, NSW

Job No.: E32507BT **Method:** SPIRAL AUGER/PUSHTUBE **R.L. Surface:** 38.0m

Date: 25/7/19 **Datum:** AHD

Plant Type: EZIPROBE **Logged/Checked by:** M.M.P./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION							0			ASPHALTIC CONCRETE: 50mm.t.				
										FILL: Silty sand, fine to medium grained, dark brown, trace of blue metal gravel.	D			
							0.5			FILL: Sandy clay, low to medium plasticity, light grey and light red brown, trace of ironstone gravel.	w<PL			
										FILL: Sandy clay, low to medium plasticity, dark brown and yellow brown, trace of ironstone, igneous and sandstone gravel and brick fragments.	w<PL			
							1			FILL: Clayey sand, fine to medium grained, yellow brown, trace of ironstone gravel and brick fragments.	D			
							1.5			FILL: Silty sandy clay, low to medium plasticity, yellow brown mottled grey, trace of ironstone gravel.	w<PL			
							2							
										FILL: Silty sand, fine to medium grained, dark brown, trace of sandstone gravel.	D			
							2.5			END OF BOREHOLE AT 2.4m				REFUSAL
							3							
							3.5							

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Log No. **BH15** **1/1**

Client: HAMMONDCARE

Project: PROPOSED HOSPITAL REDEVELOPMENT

Location: 97-115 RIVER ROAD, GREENWICH, NSW

Job No.: E32507BT **Method:** SPIRAL AUGER/PUSHTUBE **R.L. Surface:** 37.5m

Date: 25/7/19 **Datum:** AHD

Plant Type: EZIPROBE **Logged/Checked by:** M.M.P./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION							0			FILL: Silty sand, fine to medium grained, brown, trace of root fibres, ironstone and igneous gravel.	D			GRASS COVER
							0.5			FILL: Silty clay, low to medium plasticity, grey and red brown, trace of ironstone gravel.	w<PL			
										FILL: Clayey sand, fine to medium grained, yellow brown and brown, trace of ironstone, igneous and sandstone gravel and ash.	D			
							1			FILL: Clayey sand, fine to medium grained, brown, trace of sandstone gravel.	D			
										END OF BOREHOLE AT 1.1m				REFUSAL ON INFERRED SANDSTONE BEDROCK
							1.5							
							2							
							2.5							
							3							
							3.5							

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Log No. **BH16** **1/1**

Client: HAMMONDCARE

Project: PROPOSED HOSPITAL REDEVELOPMENT

Location: 97-115 RIVER ROAD, GREENWICH, NSW

Job No.: E32507BT **Method:** SPIRAL AUGER/PUSHTUBE **R.L. Surface:** 38.5m

Date: 25/7/19 **Datum:** AHD

Plant Type: EZIPROBE **Logged/Checked by:** M.M.P./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION							0			ASPHALTIC COVER: 50mm.t.				
										FILL: Silty clayey sand, fine to medium grained, dark grey, trace of blue metal gravel.	D			
										FILL: Silty clayey sand, fine to medium grained, grey, trace of ironstone and igneous gravel.	D			
							0.5			FILL: Silty sandy clay, low to medium plasticity, grey mottled orange brown, trace of ironstone gravel.	w<PL			
										FILL: Sandstone, medium to coarse grained, light grey and brown.	D			REFUSAL
										END OF BOREHOLE AT 0.75m				
							1							
							1.5							
							2							
							2.5							
							3							
							3.5							

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Log No. **BH17** **1/1**

Client: HAMMONDCARE

Project: PROPOSED HOSPITAL REDEVELOPMENT

Location: 97-115 RIVER ROAD, GREENWICH, NSW

Job No.: E32507BT **Method:** SPIRAL AUGER/PUSHTUBE **R.L. Surface:** 41.5m

Date: 25/7/19 **Datum:** AHD

Plant Type: EZIPROBE **Logged/Checked by:** M.M.P./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION							0			ASPHALTIC COVER: 50mm.t.				
										FILL: Sandy gravel, medium to coarse grained, dark grey, fine to medium grained, blue metal gravel.	D			ROADBASE
										FILL: Silty sand, fine to medium grained, brown, trace of ironstone, igneous and sandstone gravel and ash.	D			
							0.5							
										FILL: Sandy clay, low to medium plasticity, grey, trace of sandstone gravel.	w≈PL D			
							1			FILL: Silty sand, fine to medium grained, dark brown, trace of ironstone, igneous and sandstone gravel and ash.				REFUSAL ON INFERRED ROCK
										END OF BOREHOLE AT 0.9m				
							1.5							
							2							
							2.5							
							3							
							3.5							

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Log No. **BH18** **1/1**

Client: HAMMONDCARE

Project: PROPOSED HOSPITAL REDEVELOPMENT

Location: 97-115 RIVER ROAD, GREENWICH, NSW

Job No.: E32507BT **Method:** SPIRAL AUGER/PUSHTUBE **R.L. Surface:** 41.0m

Date: 25/7/19 **Datum:** AHD

Plant Type: EZIPROBE **Logged/Checked by:** M.M.P./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION							0			ASPHALTIC CONCRETE: 50mm.t.				
										FILL: Sandy gravel, medium to coarse grained, dark grey, blue metal gravel.	D			
										FILL: Silty sand, fine to medium grained, light brown and orange brown, trace of ironstone and sandstone gravel.	D			
							0.5			FILL: Sand, fine to medium grained, yellow brown.	D			
										FILL: Silty sand, medium to coarse grained, orange brown, trace of ironstone gravel.				
							1			FILL: Silty sand, fine to medium grained, brown, trace of ironstone and igneous gravel.	W			
										END OF BOREHOLE AT 1.1m				REFUSAL
							1.5							
							2							
							2.5							
							3							
							3.5							

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Log No. **BH19** **1/1**

Client: HAMMONDCARE

Project: PROPOSED HOSPITAL REDEVELOPMENT

Location: 97-115 RIVER ROAD, GREENWICH, NSW

Job No.: E32507BT **Method:** HAND AUGER **R.L. Surface:** 43.0m

Date: 25/7/19 **Datum:** AHD

Plant Type: N/A **Logged/Checked by:** M.M.P./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■		■				0			FILL: Silty sand, fine to medium grained, dark brown, trace of mulch.	D			MULCH COVER
	■		■							FILL: Silty sand, fine to medium grained, dark brown, trace of blue metal gravel.	D			
										END OF BOREHOLE AT 0.3m				HAND AUGER REFUSAL
							0.5							
							1							
							1.5							
							2							
							2.5							
							3							
							3.5							

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Log No. **BH20** **1/1**

Client: HAMMONDCARE

Project: PROPOSED HOSPITAL REDEVELOPMENT

Location: 97-115 RIVER ROAD, GREENWICH, NSW

Job No.: E32507BT **Method:** HAND AUGER **R.L. Surface:** 45.5m

Date: 24/7/19 **Datum:** AHD

Plant Type: N/A **Logged/Checked by:** M.M.P./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION	■		■				0			FILL: Silty sand, fine to medium grained, dark brown, trace of ironstone, igneous and sandstone gravel, concrete fragments and mulch.	D			
										END OF BOREHOLE AT 0.4m				HAND AUGER REFUSAL ON INFERRED BURRIED SLAB
							0.5							
							1							
							1.5							
							2							
							2.5							
							3							
							3.5							

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Log No. **BH21** 1/1

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Client: HAMMONDCARE

Project: PROPOSED HOSPITAL REDEVELOPMENT

Location: 97-115 RIVER ROAD, GREENWICH, NSW

Job No.: E32507BT **Method:** SPIRAL AUGER/PUSHTUBE **R.L. Surface:** 44.5m

Date: 25/7/19 **Datum:** AHD

Plant Type: EZIPROBE **Logged/Checked by:** M.M.P./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION							0			ASPHALTIC COVER: 50mm.t.				
										FILL: Silty sand, fine to medium grained, dark grey, with fine to medium grained blue metal gravel.	D			
							0.5			FILL: Silty sand, fine to medium grained, grey, with fine to medium grained blue metal gravel, trace of ironstone, igneous and sandstone gravel.	D			
										FILL: Clayey sand, fine to medium grained, dark brown, trace of ironstone and sandstone gravel and ash.	D			
							1		CL-CI	Sandy CLAY: low to medium plasticity, yellow brown, fine to medium grained, trace of ironstone gravel.	w<PL			
							1.5			END OF BOREHOLE AT 1.4m				
							2							
							2.5							
							3							
							3.5							

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Log No. **BH22** **1/1**

Client: HAMMONDCARE

Project: PROPOSED HOSPITAL REDEVELOPMENT

Location: 97-115 RIVER ROAD, GREENWICH, NSW

Job No.: E32507BT **Method:** SPIRAL AUGER/PUSHTUBE **R.L. Surface:** 43.0m

Date: 25/7/19 **Datum:** AHD

Plant Type: EZIPROBE **Logged/Checked by:** M.M.P./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION							0			ASPHALTIC COVER: 50mm.t.				
	■		■						-	FILL: Sandy gravel, medium to coarse grained, dark grey, blue metal gravel, fine to medium grained.	D			ROADBASE
	■		■				0.5			FILL: Silty sand, fine to medium grained, brown, trace of ironstone, igneous and sandstone gravel and ash.	D			
	■								SP	SAND: fine to medium grained, yellow brown, trace of ironstone gravel.	D			
									CL-CI	Sandy CLAY: low to medium plasticity, grey, fine to medium grained.	w≈PL			
							1			END OF BOREHOLE AT 0.9m				REFUSAL
							1.5							
							2							
							2.5							
							3							
							3.5							

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Log No. **BH23** **1/1**

Client: HAMMONDCARE

Project: PROPOSED HOSPITAL REDEVELOPMENT

Location: 97-115 RIVER ROAD, GREENWICH, NSW

Job No.: E32507BT **Method:** HAND AUGER **R.L. Surface:** 40.5m

Date: 25/7/19 **Datum:** AHD

Plant Type: N/A **Logged/Checked by:** M.M.P./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION	■		■				0			FILL: Silty sand, fine to medium grained, dark brown, trace of organic material, mulch, igneous gravel and ash.	D			
	■									FILL: Silty clay, low to medium plasticity, red brown mottled grey, trace of ironstone gravel.	w<PL			
							0.5			END OF BOREHOLE AT 0.4m				HAND AUGER REFUSAL
							1							
							1.5							
							2							
							2.5							
							3							
							3.5							

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Log No. **BH24** **1/1**

Client: HAMMONDCARE

Project: PROPOSED HOSPITAL REDEVELOPMENT

Location: 97-115 RIVER ROAD, GREENWICH, NSW

Job No.: E32507BT **Method:** HAND AUGER **R.L. Surface:** 48.8m

Date: 24/7/19 **Datum:** AHD

Plant Type: N/A **Logged/Checked by:** M.M.P./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION	■		■				0			FILL: Silty sand, fine to medium grained, dark brown, trace of root fibres and mulch.	D			MULCH COVER
	■		■							FILL: Silty sand, fine to medium grained, dark brown and yellow brown, trace of ironstone and igneous gravel and root fibres.	D			
	■		■				0.5			FILL: Silty sand, fine to medium grained, yellow brown and dark brown, trace of ironstone gravel.	D			
										END OF BOREHOLE AT 0.7m				HAND AUGER REFUSAL ON INFERRED SANDSTONE BEDROCK
							1							
							1.5							
							2							
							2.5							
							3							
							3.5							

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Log No. **BH25** **1/1**

Client: HAMMONDCARE

Project: PROPOSED HOSPITAL REDEVELOPMENT

Location: 97-115 RIVER ROAD, GREENWICH, NSW

Job No.: E32507BT **Method:** HAND AUGER **R.L. Surface:** 48.5m

Date: 24/7/19 **Datum:** AHD

Plant Type: N/A **Logged/Checked by:** M.M.P./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION	■		■				0			FILL: Silty sand, fine to medium grained, dark brown, trace of ironstone, igneous and sandstone gravel and root fibres.	D			GRASS COVER
							0.5			END OF BOREHOLE AT 0.4m				HAND AUGER REFUSAL ON INFERRED SANDSTONE BEDROCK
							1							
							1.5							
							2							
							2.5							
							3							
							3.5							

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Log No. **BH26** **1/1**

Client: HAMMONDCARE

Project: PROPOSED HOSPITAL REDEVELOPMENT

Location: 97-115 RIVER ROAD, GREENWICH, NSW

Job No.: E32507BT **Method:** SPIRAL AUGER/PUSHTUBE **R.L. Surface:** 50.7m

Date: 24/7/19 **Datum:** AHD

Plant Type: EZIPROBE **Logged/Checked by:** M.M.P./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION							0			FILL: Silty sand, fine to medium grained, dark brown, trace of root fibres.	D			GRASS COVER
										FILL: Clayey sand, fine to medium grained, dark yellow brown, trace of ironstone, igneous and sandstone gravel and root fibres.	D			
									CL-CI	Sandy CLAY: low to medium plasticity, yellow brown, trace of ironstone gravel.	w<PL			
							0.5			Sandy CLAY: low to medium plasticity, red brown and light grey, trace of ironstone gravel.	w<PL			
							1							
										END OF BOREHOLE AT 1.2m				
							1.5							
							2							
							2.5							
							3							
							3.5							

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Log No. **BH27** 1/1

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Client: HAMMONDCARE

Project: PROPOSED HOSPITAL REDEVELOPMENT

Location: 97-115 RIVER ROAD, GREENWICH, NSW

Job No.: E32507BT **Method:** SPIRAL AUGER/PUSHTUBE **R.L. Surface:** 49.7m

Date: 24/7/19 **Datum:** AHD

Plant Type: EZIPROBE **Logged/Checked by:** M.M.P./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION							0			FILL: Silty sand, fine to medium grained, dark brown, trace of root fibres and sandstone gravel.	D			GRASS COVER
										FILL: Sandy clay, low to medium plasticity, dark grey, fine to medium grained, trace of ironstone and sandstone gravel and root fibres.	w<PL			
							0.5		CL-CI	Sandy CLAY: low to medium plasticity, yellow brown, fine to medium grained sand.	w<PL			
										Sandy CLAY: low to medium plasticity, yellow brown and grey, fine to medium grained sand, trace of ironstone gravel.	w<PL			
							1			END OF BOREHOLE AT 0.9m				REFUSAL ON IRONSTONE GRAVEL
							1.5							
							2							
							2.5							
							3							
							3.5							

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Log No. **BH28** **1/1**

Client: HAMMONDCARE

Project: PROPOSED HOSPITAL REDEVELOPMENT

Location: 97-115 RIVER ROAD, GREENWICH, NSW

Job No.: E32507BT **Method:** SPIRAL AUGER/PUSHTUBE **R.L. Surface:** 40.8m

Date: 24/7/19 **Datum:** AHD

Plant Type: EZIPROBE **Logged/Checked by:** M.M.P./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION							0			FILL: Silty sand, fine to medium grained, dark brown, trace of ironstone gravel and root fibres.	D			GRASS COVER
										FILL: Silty sand, fine to medium grained, light yellow brown, trace of ironstone and igneous gravel, ash and root fibres.	D			
									SC		D			
							0.5		CL-CI	Clayey SAND: fine to medium grained, yellow brown.	w<PL			
										Sandy CLAY: low to medium plasticity, fine to medium grained, yellow brown, with ironstone gravel.				REFUSAL ON IRONSTONE GRAVEL
										END OF BOREHOLE AT 0.6m				
							1							
							1.5							
							2							
							2.5							
							3							
							3.5							

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Log No. **BH29** 1/1

Environmental logs are not to be used for geotechnical purposes

Client: HAMMONDCARE

Project: PROPOSED HOSPITAL REDEVELOPMENT

Location: 97-115 RIVER ROAD, GREENWICH, NSW

Job No.: E32507BT **Method:** SPIRAL AUGER/PUSHTUBE **R.L. Surface:** 52.0m

Date: 24/7/19 **Datum:** AHD

Plant Type: EZIPROBE **Logged/Checked by:** M.M.P./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION							0			FILL: Silty sand, fine to medium grained, dark brown, trace of root fibres.	D			GRASS COVER
										FILL: Silty sand, fine to medium grained, light brown, trace of ironstone, sandstone, igneous and blue metal gravel.	D			
							0.5			FILL: Sandy gravel, fine to medium grained, dark brown, blue metal gravel and fine to medium grained sand.	D			
										FILL: Sand, fine to medium grained, yellow brown.	D			
							1			FILL: Clayey sand, fine to medium grained, dark grey, trace of ironstone gravel.	D			
									CL-CI	Sandy CLAY: low to medium plasticity, yellow brown, trace of ironstone gravel.	w<PL			
							1.5			END OF BOREHOLE AT 1.5m				
							2							
							2.5							
							3							
							3.5							

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Log No. **BH30** 1/1

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Client: HAMMONDCARE

Project: PROPOSED HOSPITAL REDEVELOPMENT

Location: 97-115 RIVER ROAD, GREENWICH, NSW

Job No.: E32507BT **Method:** SPIRAL AUGER/PUSHTUBE **R.L. Surface:** 49.5m

Date: 24/7/19 **Datum:** AHD

Plant Type: EZIPROBE **Logged/Checked by:** M.M.P./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION	■		■				0			ASPHALTIC COVER: 50mm.t.				
	■									FILL: Sandy gravel, medium to coarse grained, dark grey, trace of metal fragments and ironstone gravel.	D			
	■									FILL: Silty sand, fine to medium grained, dark grey, with ash, trace of rounded igneous and sandstone gravel and slag.	D			
	■						0.5			FILL: Silty sand, fine to medium grained, light brown, trace of ironstone, sandstone and igneous gravel.	D			
	■									FILL: Sand, fine to medium grained, yellow brown.	D			POSSIBLY NATURAL
							1			FILL: Sand, fine to medium grained, yellow brown, trace of ironstone gravel.				REFUSAL
										END OF BOREHOLE AT 0.7m				
							1.5							
							2							
							2.5							
							3							
							3.5							

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ENVIRONMENTAL LOGS EXPLANATION NOTES

INTRODUCTION

These notes have been provided to amplify the environmental report in regard to classification methods, field procedures and certain matters relating to the logging of soil and rock. Not all notes are necessarily relevant to all reports.

Where geotechnical borehole logs are utilised for environmental purpose, reference should also be made to the explanatory notes included in the geotechnical report. Environmental logs are not suitable for geotechnical purposes.

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

DESCRIPTION AND CLASSIFICATION METHODS

The methods of description and classification of soils and rocks used in this report are based on Australian Standard 1726:2017 *'Geotechnical Site Investigations'*. In general, descriptions cover the following properties – soil or rock type, colour, structure, strength or density, and inclusions. Identification and classification of soil and rock involves judgement and the Company infers accuracy only to the extent that is common in current geoenvironmental practice.

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

Soil Classification	Particle Size
Clay	< 0.002mm
Silt	0.002 to 0.075mm
Sand	0.075 to 2.36mm
Gravel	2.36 to 63mm
Cobbles	63 to 200mm
Boulders	> 200mm

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

Relative Density	SPT 'N' Value (blows/300mm)
Very loose (VL)	< 4
Loose (L)	4 to 10
Medium dense (MD)	10 to 30
Dense (D)	30 to 50
Very Dense (VD)	> 50

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

Classification	Unconfined Compressive Strength (kPa)	Indicative Undrained Shear Strength (kPa)
Very Soft (VS)	≤ 25	≤ 12
Soft (S)	> 25 and ≤ 50	> 12 and ≤ 25
Firm (F)	> 50 and ≤ 100	> 25 and ≤ 50
Stiff (St)	> 100 and ≤ 200	> 50 and ≤ 100
Very Stiff (VSt)	> 200 and ≤ 400	> 100 and ≤ 200
Hard (Hd)	> 400	> 200
Friable (Fr)	Strength not attainable – soil crumbles	

Rock types are classified by their geological names, together with descriptive terms regarding weathering, strength, defects, etc. Where relevant, further information regarding rock classification is given in the text of the report. In the Sydney Basin, 'shale' is used to describe fissile mudstone, with a weakness parallel to bedding. Rocks with alternating inter-laminations of different grain size (eg. siltstone/claystone and siltstone/fine grained sandstone) are referred to as 'laminite'.

INVESTIGATION METHODS

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

Test Pits: These are normally excavated with a backhoe or a tracked excavator, allowing close examination of the insitu soils and 'weaker' bedrock if it is safe to descend into the pit. The depth of penetration is limited to about 3m for a backhoe and up to 6m for a large excavator. Limitations of test pits are the problems associated with disturbance and difficulty of reinstatement and the consequent effects on close-by structures. Care must be taken if construction is to be carried out near test pit locations to either properly recompact the backfill during construction or to design and construct the

structure so as not to be adversely affected by poorly compacted backfill at the test pit location.

Hand Auger Drilling: A borehole of 50mm to 100mm diameter is advanced by manually operated equipment. Refusal of the hand auger can occur on a variety of materials such as obstructions within any fill, tree roots, hard clay, gravel or ironstone, cobbles and boulders, and does not necessarily indicate rock level.

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

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

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

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

Continuous Core Drilling: A continuous core sample is obtained using a diamond tipped core barrel. Provided full core recovery is achieved (which is not always possible in very low strength rocks and granular soils), this technique provides a very reliable (but relatively expensive) method of investigation. In rocks, NMLC or HQ triple tube core barrels, which give a core of about 50mm and 61mm diameter, respectively, is usually used with water flush. The length of core recovered is compared to the length drilled and any length not recovered is shown as NO CORE. The location of NO CORE recovery is determined on site by the supervising engineer; where the location is uncertain, the loss is placed at the bottom of the drill run.

Standard Penetration Tests: Standard Penetration Tests (SPT) are used mainly in non-cohesive soils, but can also be used in cohesive soils, as a means of indicating density or strength and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289.6.3.1–2004 (R2016) *'Methods of Testing Soils for Engineering Purposes, Soil Strength and Consolidation Tests – Determination of the Penetration Resistance of a Soil – Standard Penetration Test (SPT)'*.

The test is carried out in a borehole by driving a 50mm diameter split sample tube with a tapered shoe, under the impact of a 63.5kg hammer with a free fall of 760mm. It is normal for the tube to be driven in three successive 150mm increments and the 'N' value is taken as the number of blows for the last 300mm. In dense sands, very hard clays or weak rock, the full 450mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form:

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

  N = 13
  4, 6, 7

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

  N > 30
  15, 30/40mm

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

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

LOGS

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

The terms and symbols used in preparation of the logs are defined in the following pages.

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

GROUNDWATER

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

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

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

FILL

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

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

LABORATORY TESTING

Laboratory testing has not been undertaken to confirm the soil classification and rock strengths indicated on the environmental logs unless noted in the report.

SYMBOL LEGENDS

SOIL


FILL


TOPSOIL


CLAY (CL, CI, CH)


SILT (ML, MH)


SAND (SP, SW)


GRAVEL (GP, GW)


SANDY CLAY (CL, CI, CH)


SILTY CLAY (CL, CI, CH)


CLAYEY SAND (SC)


SILTY SAND (SM)


GRAVELLY CLAY (CL, CI, CH)


CLAYEY GRAVEL (GC)


SANDY SILT (ML, MH)


PEAT AND HIGHLY ORGANIC SOILS (Pt)

ROCK


CONGLOMERATE


SANDSTONE


SHALE/MUDSTONE


SILTSTONE


CLAYSTONE


COAL


LAMINITE


LIMESTONE


PHYLLITE, SCHIST


TUFF


GRANITE, GABBRO


DOLERITE, DIORITE


BASALT, ANDESITE


QUARTZITE

OTHER MATERIALS


BRICKS OR PAVERS


CONCRETE


ASPHALTIC CONCRETE

CLASSIFICATION OF COARSE AND FINE GRAINED SOILS

Major Divisions		Group Symbol	Typical Names	Field Classification of Sand and Gravel	Laboratory Classification	
Coarse grained soil (more than 65% of soil excluding oversize fraction is greater than 0.075mm)	GRAVEL (more than half of coarse fraction is larger than 2.36mm	GW	Gravel and gravel-sand mixtures, little or no fines	Wide range in grain size and substantial amounts of all intermediate sizes, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	$C_u > 4$ $1 < C_c < 3$
		GP	Gravel and gravel-sand mixtures, little or no fines, uniform gravels	Predominantly one size or range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	Fails to comply with above
		GM	Gravel-silt mixtures and gravel-sand-silt mixtures	'Dirty' materials with excess of non-plastic fines, zero to medium dry strength	≥ 12% fines, fines are silty	Fines behave as silt
		GC	Gravel-clay mixtures and gravel-sand-clay mixtures	'Dirty' materials with excess of plastic fines, medium to high dry strength	≥ 12% fines, fines are clayey	Fines behave as clay
	SAND (more than half of coarse fraction is smaller than 2.36mm)	SW	Sand and gravel-sand mixtures, little or no fines	Wide range in grain size and substantial amounts of all intermediate sizes, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	$C_u > 6$ $1 < C_c < 3$
		SP	Sand and gravel-sand mixtures, little or no fines	Predominantly one size or range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	Fails to comply with above
		SM	Sand-silt mixtures	'Dirty' materials with excess of non-plastic fines, zero to medium dry strength	≥ 12% fines, fines are silty	N/A
		SC	Sand-clay mixtures	'Dirty' materials with excess of plastic fines, medium to high dry strength	≥ 12% fines, fines are clayey	

Major Divisions		Group Symbol	Typical Names	Field Classification of Silt and Clay			Laboratory Classification
				Dry Strength	Dilatancy	Toughness	% < 0.075mm
Fine grained soils (more than 35% of soil excluding oversize fraction is less than 0.075mm)	SILT and CLAY (low to medium plasticity)	ML	Inorganic silt and very fine sand, rock flour, silty or clayey fine sand or silt with low plasticity	None to low	Slow to rapid	Low	Below A line
		CL, CI	Inorganic clay of low to medium plasticity, gravelly clay, sandy clay	Medium to high	None to slow	Medium	Above A line
		OL	Organic silt	Low to medium	Slow	Low	Below A line
	SILT and CLAY (high plasticity)	MH	Inorganic silt	Low to medium	None to slow	Low to medium	Below A line
		CH	Inorganic clay of high plasticity	High to very high	None	High	Above A line
		OH	Organic clay of medium to high plasticity, organic silt	Medium to high	None to very slow	Low to medium	Below A line
	Highly organic soil	Pt	Peat, highly organic soil	–	–	–	–

Laboratory Classification Criteria

A well graded coarse grained soil is one for which the coefficient of uniformity $Cu > 4$ and the coefficient of curvature $1 < C_c < 3$. Otherwise, the soil is poorly graded. These coefficients are given by:

$$C_U = \frac{D_{60}}{D_{10}} \qquad and \qquad C_C = \frac{(D_{30})^2}{D_{10}\, D_{60}}$$

Where D_{10}, D_{30} and D_{60} are those grain sizes for which 10%, 30% and 60% of the soil grains, respectively, are smaller.

NOTES:

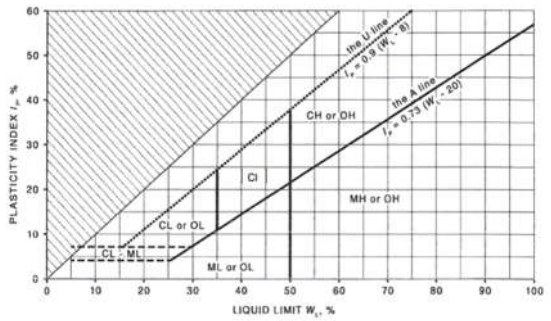
1 For a coarse grained soil with a fines content between 5% and 12%, the soil is given a dual classification comprising the two group symbols separated by a dash; for example, for a poorly graded gravel with between 5% and 12% silt fines, the classification is GP-GM.

2 Where the grading is determined from laboratory tests, it is defined by coefficients of curvature (C_c) and uniformity (C_u) derived from the particle size distribution curve.

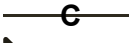
3 Clay soils with liquid limits > 35% and ≤ 50% may be classified as being of medium plasticity.

4 The U line on the Modified Casagrande Chart is an approximate upper bound for most natural soils.

Modified Casagrande Chart for Classifying Silts and Clays according to their Behaviour



LOG SYMBOLS

Log Column	Symbol	Definition
Groundwater Record		Standing water level. Time delay following completion of drilling/excavation may be shown.
		Extent of borehole/test pit collapse shortly after drilling/excavation.
		Groundwater seepage into borehole or test pit noted during drilling or excavation.
Samples	ES	Sample taken over depth indicated, for environmental analysis.
	U50	Undisturbed 50mm diameter tube sample taken over depth indicated.
	DB	Bulk disturbed sample taken over depth indicated.
	DS	Small disturbed bag sample taken over depth indicated.
	ASB	Soil sample taken over depth indicated, for asbestos analysis.
	ASS	Soil sample taken over depth indicated, for acid sulfate soil analysis.
	SAL	Soil sample taken over depth indicated, for salinity analysis.
Field Tests	N = 17 4, 7, 10	Standard Penetration Test (SPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration. 'Refusal' refers to apparent hammer refusal within the corresponding 150mm depth increment.
	N_c = 5 7 3R	Solid Cone Penetration Test (SCPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration for 60° solid cone driven by SPT hammer. 'R' refers to apparent hammer refusal within the corresponding 150mm depth increment.
	VNS = 25 PID = 100	Vane shear reading in kPa of undrained shear strength. Photoionisation detector reading in ppm (soil sample headspace test).
Moisture Condition (Fine Grained Soils)	$w > PL$ $w \approx PL$ $w < PL$ $w \approx LL$ $w > LL$	Moisture content estimated to be greater than plastic limit. Moisture content estimated to be approximately equal to plastic limit. Moisture content estimated to be less than plastic limit. Moisture content estimated to be near liquid limit. Moisture content estimated to be wet of liquid limit.
(Coarse Grained Soils)	D M W	DRY – runs freely through fingers. MOIST – does not run freely but no free water visible on soil surface. WET – free water visible on soil surface.
Strength (Consistency) Cohesive Soils	VS S F St VSt Hd Fr ( )	VERY SOFT – unconfined compressive strength ≤ 25kPa. SOFT – unconfined compressive strength > 25kPa and ≤ 50kPa. FIRM – unconfined compressive strength > 50kPa and ≤ 100kPa. STIFF – unconfined compressive strength > 100kPa and ≤ 200kPa. VERY STIFF – unconfined compressive strength > 200kPa and ≤ 400kPa. HARD – unconfined compressive strength > 400kPa. FRIABLE – strength not attainable, soil crumbles. Bracketed symbol indicates estimated consistency based on tactile examination or other assessment.
Density Index/ Relative Density (Cohesionless Soils)	VL L MD D VD ( )	**Density Index (I_D) Range (%)** / **SPT 'N' Value Range (Blows/300mm)** VERY LOOSE ≤ 15 / 0 – 4 LOOSE > 15 and ≤ 35 / 4 – 10 MEDIUM DENSE > 35 and ≤ 65 / 10 – 30 DENSE > 65 and ≤ 85 / 30 – 50 VERY DENSE > 85 / > 50 Bracketed symbol indicates estimated density based on ease of drilling or other assessment.
Hand Penetrometer Readings	300 250	Measures reading in kPa of unconfined compressive strength. Numbers indicate individual test results on representative undisturbed material unless noted otherwise.

Log Column	Symbol	Definition
Remarks	'V' bit	Hardened steel 'V' shaped bit.
	'TC' bit	Twin pronged tungsten carbide bit.
	T_{60}	Penetration of auger string in mm under static load of rig applied by drill head hydraulics without rotation of augers.
	Soil Origin	The geological origin of the soil can generally be described as: RESIDUAL – soil formed directly from insitu weathering of the underlying rock. No visible structure or fabric of the parent rock. EXTREMELY WEATHERED – soil formed directly from insitu weathering of the underlying rock. Material is of soil strength but retains the structure and/or fabric of the parent rock. ALLUVIAL – soil deposited by creeks and rivers. ESTUARINE – soil deposited in coastal estuaries, including sediments caused by inflowing creeks and rivers, and tidal currents. MARINE – soil deposited in a marine environment. AEOLIAN – soil carried and deposited by wind. COLLUVIAL – soil and rock debris transported downslope by gravity, with or without the assistance of flowing water. Colluvium is usually a thick deposit formed from a landslide. The description 'slopewash' is used for thinner surficial deposits. LITTORAL – beach deposited soil.

Classification of Material Weathering

Term		Abbreviation		Definition
Residual Soil		RS		Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible, but the soil has not been significantly transported.
Extremely Weathered		XW		Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible.
Highly Weathered	Distinctly Weathered (Note 1)	HW	DW	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores.
Moderately Weathered		MW		The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable, but shows little or no change of strength from fresh rock.
Slightly Weathered		SW		Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.
Fresh		FR		Rock shows no sign of decomposition of individual minerals or colour changes.

NOTE 1: The term 'Distinctly Weathered' is used where it is not practicable to distinguish between 'Highly Weathered' and 'Moderately Weathered' rock. 'Distinctly Weathered' is defined as follows: *'Rock strength usually changed by weathering. The rock may be highly discoloured, usually by iron staining. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores'*. There is some change in rock strength.

Rock Material Strength Classification

Term	Abbreviation	Uniaxial Compressive Strength (MPa)	Guide to Strength	
			Point Load Strength Index $Is_{(50)}$ (MPa)	Field Assessment
Very Low Strength	VL	0.6 to 2	0.03 to 0.1	Material crumbles under firm blows with sharp end of pick; can be peeled with knife; too hard to cut a triaxial sample by hand. Pieces up to 30mm thick can be broken by finger pressure.
Low Strength	L	2 to 6	0.1 to 0.3	Easily scored with a knife; indentations 1mm to 3mm show in the specimen with firm blows of the pick point; has dull sound under hammer. A piece of core 150mm long by 50mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.
Medium Strength	M	6 to 20	0.3 to 1	Scored with a knife; a piece of core 150mm long by 50mm diameter can be broken by hand with difficulty.
High Strength	H	20 to 60	1 to 3	A piece of core 150mm long by 50mm diameter cannot be broken by hand but can be broken by a pick with a single firm blow; rock rings under hammer.
Very High Strength	VH	60 to 200	3 to 10	Hand specimen breaks with pick after more than one blow; rock rings under hammer.
Extremely High Strength	EH	> 200	> 10	Specimen requires many blows with geological pick to break through intact material; rock rings under hammer.

Appendix F: Laboratory Reports & COC Documents

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

CERTIFICATE OF ANALYSIS 222520

Client Details

Client	Environmental Investigation Services
Attention	Katrina Taylor
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E323507BT, Greenwich**
Number of Samples	111 Soil
Date samples received	26/07/2019
Date completed instructions received	26/07/2019

Analysis Details

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

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

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

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

Report Details

Date results requested by	02/08/2019
Date of Issue	01/08/2019

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Asbestos Approved By
Analysed by Asbestos Approved Identifier: Lucy Zhu, Aida Marner
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Loren Bardwell, Senior Chemist
Lucy Zhu, Senior Asbestos Analyst
Steven Luong, Organics Supervisor

Authorised By

Nancy Zhang, Laboratory Manager

VOCs in soil						
Our Reference		222520-18	222520-20	222520-21	222520-60	222520-64
Your Reference	UNITS	BH4	BH4	BH4	BH16	BH17
Depth		0.5-0.7	1.9-2.0	2.4-2.5	0.15-0.3	0.7-0.75
Date Sampled		23/07/2019	23/07/2019	23/07/2019	24/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019
Dichlorodifluoromethane	mg/kg	<1	<1	<1	<1	<1
Chloromethane	mg/kg	<1	<1	<1	<1	<1
Vinyl Chloride	mg/kg	<1	<1	<1	<1	<1
Bromomethane	mg/kg	<1	<1	<1	<1	<1
Chloroethane	mg/kg	<1	<1	<1	<1	<1
Trichlorofluoromethane	mg/kg	<1	<1	<1	<1	<1
1,1-Dichloroethene	mg/kg	<1	<1	<1	<1	<1
trans-1,2-dichloroethene	mg/kg	<1	<1	<1	<1	<1
1,1-dichloroethane	mg/kg	<1	<1	<1	<1	<1
cis-1,2-dichloroethene	mg/kg	<1	<1	<1	<1	<1
bromochloromethane	mg/kg	<1	<1	<1	<1	<1
chloroform	mg/kg	<1	<1	<1	<1	<1
2,2-dichloropropane	mg/kg	<1	<1	<1	<1	<1
1,2-dichloroethane	mg/kg	<1	<1	<1	<1	<1
1,1,1-trichloroethane	mg/kg	<1	<1	<1	<1	<1
1,1-dichloropropene	mg/kg	<1	<1	<1	<1	<1
Cyclohexane	mg/kg	<1	<1	<1	<1	<1
carbon tetrachloride	mg/kg	<1	<1	<1	<1	<1
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
dibromomethane	mg/kg	<1	<1	<1	<1	<1
1,2-dichloropropane	mg/kg	<1	<1	<1	<1	<1
trichloroethene	mg/kg	<1	<1	<1	<1	<1
bromodichloromethane	mg/kg	<1	<1	<1	<1	<1
trans-1,3-dichloropropene	mg/kg	<1	<1	<1	<1	<1
cis-1,3-dichloropropene	mg/kg	<1	<1	<1	<1	<1
1,1,2-trichloroethane	mg/kg	<1	<1	<1	<1	<1
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,3-dichloropropane	mg/kg	<1	<1	<1	<1	<1
dibromochloromethane	mg/kg	<1	<1	<1	<1	<1
1,2-dibromoethane	mg/kg	<1	<1	<1	<1	<1
tetrachloroethene	mg/kg	<1	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	mg/kg	<1	<1	<1	<1	<1
chlorobenzene	mg/kg	<1	<1	<1	<1	<1

VOCs in soil						
Our Reference		222520-18	222520-20	222520-21	222520-60	222520-64
Your Reference	UNITS	BH4	BH4	BH4	BH16	BH17
Depth		0.5-0.7	1.9-2.0	2.4-2.5	0.15-0.3	0.7-0.75
Date Sampled		23/07/2019	23/07/2019	23/07/2019	24/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
bromoform	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
styrene	mg/kg	<1	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	mg/kg	<1	<1	<1	<1	<1
o-Xylene	mg/kg	<1	<1	<1	<1	<1
1,2,3-trichloropropane	mg/kg	<1	<1	<1	<1	<1
isopropylbenzene	mg/kg	<1	<1	<1	<1	<1
bromobenzene	mg/kg	<1	<1	<1	<1	<1
n-propyl benzene	mg/kg	<1	<1	<1	<1	<1
2-chlorotoluene	mg/kg	<1	<1	<1	<1	<1
4-chlorotoluene	mg/kg	<1	<1	<1	<1	<1
1,3,5-trimethyl benzene	mg/kg	<1	<1	<1	<1	<1
tert-butyl benzene	mg/kg	<1	<1	<1	<1	<1
1,2,4-trimethyl benzene	mg/kg	<1	<1	<1	<1	<1
1,3-dichlorobenzene	mg/kg	<1	<1	<1	<1	<1
sec-butyl benzene	mg/kg	<1	<1	<1	<1	<1
1,4-dichlorobenzene	mg/kg	<1	<1	<1	<1	<1
4-isopropyl toluene	mg/kg	<1	<1	<1	<1	<1
1,2-dichlorobenzene	mg/kg	<1	<1	<1	<1	<1
n-butyl benzene	mg/kg	<1	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	mg/kg	<1	<1	<1	<1	<1
1,2,4-trichlorobenzene	mg/kg	<1	<1	<1	<1	<1
hexachlorobutadiene	mg/kg	<1	<1	<1	<1	<1
1,2,3-trichlorobenzene	mg/kg	<1	<1	<1	<1	<1
Surrogate Dibromofluorometha	%	103	103	105	102	101
Surrogate aaa-Trifluorotoluene	%	95	80	90	96	98
Surrogate Toluene-d_8	%	98	100	98	99	99
Surrogate 4-Bromofluorobenzene	%	100	103	100	99	96

VOCs in soil				
Our Reference		222520-65	222520-76	222520-77
Your Reference	UNITS	BH17	BH21	BH21
Depth		0.75-0.85	0.6-0.9	0.9-1.1
Date Sampled		24/07/2019	25/07/2019	25/07/2019
Type of sample		Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	30/07/2019	30/07/2019	30/07/2019
Dichlorodifluoromethane	mg/kg	<1	<1	<1
Chloromethane	mg/kg	<1	<1	<1
Vinyl Chloride	mg/kg	<1	<1	<1
Bromomethane	mg/kg	<1	<1	<1
Chloroethane	mg/kg	<1	<1	<1
Trichlorofluoromethane	mg/kg	<1	<1	<1
1,1-Dichloroethene	mg/kg	<1	<1	<1
trans-1,2-dichloroethene	mg/kg	<1	<1	<1
1,1-dichloroethane	mg/kg	<1	<1	<1
cis-1,2-dichloroethene	mg/kg	<1	<1	<1
bromochloromethane	mg/kg	<1	<1	<1
chloroform	mg/kg	<1	<1	<1
2,2-dichloropropane	mg/kg	<1	<1	<1
1,2-dichloroethane	mg/kg	<1	<1	<1
1,1,1-trichloroethane	mg/kg	<1	<1	<1
1,1-dichloropropene	mg/kg	<1	<1	<1
Cyclohexane	mg/kg	<1	<1	<1
carbon tetrachloride	mg/kg	<1	<1	<1
Benzene	mg/kg	<0.2	<0.2	<0.2
dibromomethane	mg/kg	<1	<1	<1
1,2-dichloropropane	mg/kg	<1	<1	<1
trichloroethene	mg/kg	<1	<1	<1
bromodichloromethane	mg/kg	<1	<1	<1
trans-1,3-dichloropropene	mg/kg	<1	<1	<1
cis-1,3-dichloropropene	mg/kg	<1	<1	<1
1,1,2-trichloroethane	mg/kg	<1	<1	<1
Toluene	mg/kg	<0.5	<0.5	<0.5
1,3-dichloropropane	mg/kg	<1	<1	<1
dibromochloromethane	mg/kg	<1	<1	<1
1,2-dibromoethane	mg/kg	<1	<1	<1
tetrachloroethene	mg/kg	<1	<1	<1
1,1,1,2-tetrachloroethane	mg/kg	<1	<1	<1
chlorobenzene	mg/kg	<1	<1	<1

VOCs in soil				
Our Reference		222520-65	222520-76	222520-77
Your Reference	UNITS	BH17	BH21	BH21
Depth		0.75-0.85	0.6-0.9	0.9-1.1
Date Sampled		24/07/2019	25/07/2019	25/07/2019
Type of sample		Soil	Soil	Soil
Ethylbenzene	mg/kg	<1	<1	<1
bromoform	mg/kg	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2
styrene	mg/kg	<1	<1	<1
1,1,2,2-tetrachloroethane	mg/kg	<1	<1	<1
o-Xylene	mg/kg	<1	<1	<1
1,2,3-trichloropropane	mg/kg	<1	<1	<1
isopropylbenzene	mg/kg	<1	<1	<1
bromobenzene	mg/kg	<1	<1	<1
n-propyl benzene	mg/kg	<1	<1	<1
2-chlorotoluene	mg/kg	<1	<1	<1
4-chlorotoluene	mg/kg	<1	<1	<1
1,3,5-trimethyl benzene	mg/kg	<1	<1	<1
tert-butyl benzene	mg/kg	<1	<1	<1
1,2,4-trimethyl benzene	mg/kg	<1	<1	<1
1,3-dichlorobenzene	mg/kg	<1	<1	<1
sec-butyl benzene	mg/kg	<1	<1	<1
1,4-dichlorobenzene	mg/kg	<1	<1	<1
4-isopropyl toluene	mg/kg	<1	<1	<1
1,2-dichlorobenzene	mg/kg	<1	<1	<1
n-butyl benzene	mg/kg	<1	<1	<1
1,2-dibromo-3-chloropropane	mg/kg	<1	<1	<1
1,2,4-trichlorobenzene	mg/kg	<1	<1	<1
hexachlorobutadiene	mg/kg	<1	<1	<1
1,2,3-trichlorobenzene	mg/kg	<1	<1	<1
Surrogate Dibromofluorometha	%	104	104	102
Surrogate aaa-Trifluorotoluene	%	95	101	91
Surrogate Toluene-d_8	%	100	100	100
Surrogate 4-Bromofluorobenzene	%	100	96	98

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		222520-1	222520-8	222520-12	222520-16	222520-22
Your Reference	UNITS	BH1	BH2	BH3	BH4	BH5
Depth		0.2-0.3	0.0-0.1	0.1-0.2	0.1-0.2	0.1-0.2
Date Sampled		22/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	73	60	83	83	78

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		222520-25	222520-28	222520-30	222520-32	222520-36
Your Reference	UNITS	BH6	BH7	BH8	BH9	BH10
Depth		0.1-0.2	0.0-0.1	0.0-0.1	0.1-0.2	0.0-0.1
Date Sampled		22/07/2019	25/07/2019	24/07/2019	24/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	78	77	77	81	79

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		222520-38	222520-41	222520-47	222520-49	222520-55
Your Reference	UNITS	BH11	BH12	BH13	BH14	BH15
Depth		0.0-0.2	0.3-0.5	0.0-0.2	0.05-0.25	0.0-0.3
Date Sampled		25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	82	72	79	86	83

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		222520-59	222520-62	222520-66	222520-71	222520-73
Your Reference	UNITS	BH16	BH17	BH18	BH19	BH20
Depth		0.0-0.15	0.05-0.25	0.05-0.25	0.0-0.1	0.0-0.2
Date Sampled		24/07/2019	24/07/2019	25/07/2019	25/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	78	78	72	79	80

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		222520-74	222520-78	222520-81	222520-83	222520-86
Your Reference	UNITS	BH21	BH22	BH23	BH24	BH25
Depth		0.05-0.3	0.05-0.2	0.0-0.1	0.0-0.3	0.0-0.2
Date Sampled		25/07/2019	25/07/2019	25/07/2019	24/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	78	88	82	67	79

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		222520-87	222520-90	222520-93	222520-96	222520-102
Your Reference	UNITS	BH26	BH27	BH28	BH29	BH30
Depth		0.0-0.1	0.0-0.2	0.0-0.2	0.0-0.2	0.05-0.15
Date Sampled		24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	105	78	81	85	87

vTRH(C6-C10)/BTEXN in Soil				
Our Reference		222520-107	222520-108	222520-110
Your Reference	UNITS	DUPKT1	DUMP1	TB1
Depth		-	-	-
Date Sampled		22/07/2019	24/07/2019	22/07/2019
Type of sample		Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	30/07/2019	30/07/2019	30/07/2019
TRH C_6 - C_9	mg/kg	<25	<25	[NA]
TRH C_6 - C_{10}	mg/kg	<25	<25	[NA]
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	[NA]
Benzene	mg/kg	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1
naphthalene	mg/kg	<1	<1	[NA]
Total +ve Xylenes	mg/kg	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	79	82	83

svTRH (C10-C40) in Soil						
Our Reference		222520-1	222520-8	222520-12	222520-16	222520-22
Your Reference	UNITS	BH1	BH2	BH3	BH4	BH5
Depth		0.2-0.3	0.0-0.1	0.1-0.2	0.1-0.2	0.1-0.2
Date Sampled		22/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	310
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	140	670
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	120	860
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	180	310
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	300	1,200
Surrogate o-Terphenyl	%	87	90	90	90	93

svTRH (C10-C40) in Soil						
Our Reference		222520-25	222520-28	222520-30	222520-32	222520-36
Your Reference	UNITS	BH6	BH7	BH8	BH9	BH10
Depth		0.1-0.2	0.0-0.1	0.0-0.1	0.1-0.2	0.0-0.1
Date Sampled		22/07/2019	25/07/2019	24/07/2019	24/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	29/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	180	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	200	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	150	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	360	<50	<50
Surrogate o-Terphenyl	%	90	91	94	87	88

svTRH (C10-C40) in Soil						
Our Reference		222520-38	222520-41	222520-47	222520-49	222520-55
Your Reference	UNITS	BH11	BH12	BH13	BH14	BH15
Depth		0.0-0.2	0.3-0.5	0.0-0.2	0.05-0.25	0.0-0.3
Date Sampled		25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	120	140	210	<100
TRH C_{29} - C_{36}	mg/kg	<100	240	260	390	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	270	310	480	<100
TRH >C_{34} -C_{40}	mg/kg	<100	270	240	370	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	540	540	850	<50
Surrogate o-Terphenyl	%	90	91	94	95	88

svTRH (C10-C40) in Soil						
Our Reference		222520-59	222520-62	222520-66	222520-71	222520-73
Your Reference	UNITS	BH16	BH17	BH18	BH19	BH20
Depth		0.0-0.15	0.05-0.25	0.05-0.25	0.0-0.1	0.0-0.2
Date Sampled		24/07/2019	24/07/2019	25/07/2019	25/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	98	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	170	<100
TRH C_{29} - C_{36}	mg/kg	<100	380	200	270	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	100	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	100	<50
TRH >C_{16} -C_{34}	mg/kg	<100	310	200	340	<100
TRH >C_{34} -C_{40}	mg/kg	<100	470	250	240	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	780	450	680	<50
Surrogate o-Terphenyl	%	90	83	89	94	88

svTRH (C10-C40) in Soil						
Our Reference		222520-74	222520-78	222520-81	222520-83	222520-86
Your Reference	UNITS	BH21	BH22	BH23	BH24	BH25
Depth		0.05-0.3	0.05-0.2	0.0-0.1	0.0-0.3	0.0-0.2
Date Sampled		25/07/2019	25/07/2019	25/07/2019	24/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019
TRH C_{10} - C_{14}	mg/kg	<50	<50	180	<50	<50
TRH C_{15} - C_{28}	mg/kg	220	<100	1,000	<100	<100
TRH C_{29} - C_{36}	mg/kg	650	<100	900	140	180
TRH >C_{10} -C_{16}	mg/kg	<50	<50	210	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	210	<50	<50
TRH >C_{16} -C_{34}	mg/kg	610	130	1,600	180	170
TRH >C_{34} -C_{40}	mg/kg	850	<100	610	150	180
Total +ve TRH (>C10-C40)	mg/kg	1,500	130	2,400	330	350
Surrogate o-Terphenyl	%	99	91	126	91	89

svTRH (C10-C40) in Soil						
Our Reference		222520-87	222520-90	222520-93	222520-96	222520-102
Your Reference	UNITS	BH26	BH27	BH28	BH29	BH30
Depth		0.0-0.1	0.0-0.2	0.0-0.2	0.0-0.2	0.05-0.15
Date Sampled		24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	120
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	120
Surrogate o-Terphenyl	%	87	89	84	85	85

svTRH (C10-C40) in Soil			
Our Reference		222520-107	222520-108
Your Reference	UNITS	DUPKT1	DUMP1
Depth		-	-
Date Sampled		22/07/2019	24/07/2019
Type of sample		Soil	Soil
Date extracted	-	29/07/2019	29/07/2019
Date analysed	-	30/07/2019	30/07/2019
TRH C_{10} - C_{14}	mg/kg	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	180
TRH >C_{10} -C_{16}	mg/kg	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	180
TRH >C_{34} -C_{40}	mg/kg	<100	110
Total +ve TRH (>C10-C40)	mg/kg	<50	300
Surrogate o-Terphenyl	%	84	86

PAHs in Soil						
Our Reference		222520-1	222520-8	222520-12	222520-16	222520-22
Your Reference	UNITS	BH1	BH2	BH3	BH4	BH5
Depth		0.2-0.3	0.0-0.1	0.1-0.2	0.1-0.2	0.1-0.2
Date Sampled		22/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	0.1	0.2
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.2	0.3	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.2	0.3	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.2	0.2	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	0.3	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.1	0.2	<0.05	<0.05	0.1
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	0.71	1.5	<0.05	0.1	0.4
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	89	93	88	89	96

PAHs in Soil						
Our Reference		222520-25	222520-28	222520-30	222520-32	222520-36
Your Reference	UNITS	BH6	BH7	BH8	BH9	BH10
Depth		0.1-0.2	0.0-0.1	0.0-0.1	0.1-0.2	0.0-0.1
Date Sampled		22/07/2019	25/07/2019	24/07/2019	24/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	0.8	<0.1	0.1
Pyrene	mg/kg	<0.1	<0.1	0.8	<0.1	0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	0.3	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	0.5	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	0.7	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	0.4	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	0.3	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	4.1	<0.05	0.2
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	0.6	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	92	83	95	89	88

PAHs in Soil						
Our Reference		222520-38	222520-41	222520-47	222520-49	222520-55
Your Reference	UNITS	BH11	BH12	BH13	BH14	BH15
Depth		0.0-0.2	0.3-0.5	0.0-0.2	0.05-0.25	0.0-0.3
Date Sampled		25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	0.2	<0.1	0.2	0.2
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	0.6	0.2	<0.1	0.5
Pyrene	mg/kg	<0.1	0.8	0.3	0.2	0.5
Benzo(a)anthracene	mg/kg	<0.1	0.3	0.2	0.2	0.2
Chrysene	mg/kg	<0.1	0.4	0.2	0.5	0.3
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	0.6	0.3	<0.2	0.4
Benzo(a)pyrene	mg/kg	<0.05	0.4	0.2	0.2	0.2
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.3	<0.1	<0.1	0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	0.4	0.1	<0.1	0.2
Total +ve PAH's	mg/kg	<0.05	4.0	1.4	1.2	2.7
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	0.6	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	0.6	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	94	83	95	90	90

PAHs in Soil						
Our Reference		222520-59	222520-62	222520-66	222520-71	222520-73
Your Reference	UNITS	BH16	BH17	BH18	BH19	BH20
Depth		0.0-0.15	0.05-0.25	0.05-0.25	0.0-0.1	0.0-0.2
Date Sampled		24/07/2019	24/07/2019	25/07/2019	25/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	0.1	0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	0.1	0.1
Pyrene	mg/kg	<0.1	<0.1	0.1	0.1	0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	0.1	0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	0.05	0.09	0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	0.1	0.4	0.72	0.2
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	91	91	88	93	92

PAHs in Soil						
Our Reference		222520-74	222520-78	222520-81	222520-83	222520-86
Your Reference	UNITS	BH21	BH22	BH23	BH24	BH25
Depth		0.05-0.3	0.05-0.2	0.0-0.1	0.0-0.3	0.0-0.2
Date Sampled		25/07/2019	25/07/2019	25/07/2019	24/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	0.2	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	0.1	0.2	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	91	89	94	91	92

PAHs in Soil						
Our Reference		222520-87	222520-90	222520-93	222520-96	222520-102
Your Reference	UNITS	BH26	BH27	BH28	BH29	BH30
Depth		0.0-0.1	0.0-0.2	0.0-0.2	0.0-0.2	0.05-0.15
Date Sampled		24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	0.1	0.2	<0.1	<0.1
Pyrene	mg/kg	<0.1	0.1	0.2	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	0.07	0.1	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	0.3	0.84	<0.05	0.2
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	92	91	91	85	92

PAHs in Soil			
Our Reference		222520-107	222520-108
Your Reference	UNITS	DUPKT1	DUMP1
Depth		-	-
Date Sampled		22/07/2019	24/07/2019
Type of sample		Soil	Soil
Date extracted	-	29/07/2019	29/07/2019
Date analysed	-	29/07/2019	29/07/2019
Naphthalene	mg/kg	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1
Pyrene	mg/kg	0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1
Total +ve PAH's	mg/kg	0.2	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	87	93

Organochlorine Pesticides in soil						
Our Reference		222520-1	222520-8	222520-12	222520-16	222520-22
Your Reference	UNITS	BH1	BH2	BH3	BH4	BH5
Depth		0.2-0.3	0.0-0.1	0.1-0.2	0.1-0.2	0.1-0.2
Date Sampled		22/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	30/07/2019
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	103	101	104	102	103

Organochlorine Pesticides in soil						
Our Reference		222520-25	222520-28	222520-30	222520-32	222520-36
Your Reference	UNITS	BH6	BH7	BH8	BH9	BH10
Depth		0.1-0.2	0.0-0.1	0.0-0.1	0.1-0.2	0.0-0.1
Date Sampled		22/07/2019	25/07/2019	24/07/2019	24/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	101	101	100	98	97

Organochlorine Pesticides in soil						
Our Reference		222520-38	222520-41	222520-47	222520-49	222520-55
Your Reference	UNITS	BH11	BH12	BH13	BH14	BH15
Depth		0.0-0.2	0.3-0.5	0.0-0.2	0.05-0.25	0.0-0.3
Date Sampled		25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	97	99	106	103	100

Organochlorine Pesticides in soil						
Our Reference		222520-59	222520-62	222520-66	222520-71	222520-73
Your Reference	UNITS	BH16	BH17	BH18	BH19	BH20
Depth		0.0-0.15	0.05-0.25	0.05-0.25	0.0-0.1	0.0-0.2
Date Sampled		24/07/2019	24/07/2019	25/07/2019	25/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	100	98	100	101	95

Organochlorine Pesticides in soil						
Our Reference		222520-74	222520-78	222520-81	222520-83	222520-86
Your Reference	UNITS	BH21	BH22	BH23	BH24	BH25
Depth		0.05-0.3	0.05-0.2	0.0-0.1	0.0-0.3	0.0-0.2
Date Sampled		25/07/2019	25/07/2019	25/07/2019	24/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	97	101	111	94	95

Organochlorine Pesticides in soil						
Our Reference		222520-87	222520-90	222520-93	222520-96	222520-102
Your Reference	UNITS	BH26	BH27	BH28	BH29	BH30
Depth		0.0-0.1	0.0-0.2	0.0-0.2	0.0-0.2	0.05-0.15
Date Sampled		24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	95	92	96	97	98

Organophosphorus Pesticides						
Our Reference		222520-1	222520-8	222520-12	222520-16	222520-22
Your Reference	UNITS	BH1	BH2	BH3	BH4	BH5
Depth		0.2-0.3	0.0-0.1	0.1-0.2	0.1-0.2	0.1-0.2
Date Sampled		22/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	30/07/2019
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	103	101	104	102	103

Organophosphorus Pesticides						
Our Reference		222520-25	222520-28	222520-30	222520-32	222520-36
Your Reference	UNITS	BH6	BH7	BH8	BH9	BH10
Depth		0.1-0.2	0.0-0.1	0.0-0.1	0.1-0.2	0.0-0.1
Date Sampled		22/07/2019	25/07/2019	24/07/2019	24/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	101	101	100	98	97

Organophosphorus Pesticides						
Our Reference		222520-38	222520-41	222520-47	222520-49	222520-55
Your Reference	UNITS	BH11	BH12	BH13	BH14	BH15
Depth		0.0-0.2	0.3-0.5	0.0-0.2	0.05-0.25	0.0-0.3
Date Sampled		25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	97	99	106	103	100

Organophosphorus Pesticides						
Our Reference		222520-59	222520-62	222520-66	222520-71	222520-73
Your Reference	UNITS	BH16	BH17	BH18	BH19	BH20
Depth		0.0-0.15	0.05-0.25	0.05-0.25	0.0-0.1	0.0-0.2
Date Sampled		24/07/2019	24/07/2019	25/07/2019	25/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	100	98	100	101	95

Organophosphorus Pesticides						
Our Reference		222520-74	222520-78	222520-81	222520-83	222520-86
Your Reference	UNITS	BH21	BH22	BH23	BH24	BH25
Depth		0.05-0.3	0.05-0.2	0.0-0.1	0.0-0.3	0.0-0.2
Date Sampled		25/07/2019	25/07/2019	25/07/2019	24/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	97	101	111	94	95

Organophosphorus Pesticides						
Our Reference		222520-87	222520-90	222520-93	222520-96	222520-102
Your Reference	UNITS	BH26	BH27	BH28	BH29	BH30
Depth		0.0-0.1	0.0-0.2	0.0-0.2	0.0-0.2	0.05-0.15
Date Sampled		24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	95	92	96	97	98

PCBs in Soil						
Our Reference		222520-1	222520-8	222520-12	222520-16	222520-22
Your Reference	UNITS	BH1	BH2	BH3	BH4	BH5
Depth		0.2-0.3	0.0-0.1	0.1-0.2	0.1-0.2	0.1-0.2
Date Sampled		22/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	30/07/2019
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	103	101	104	102	103

PCBs in Soil						
Our Reference		222520-25	222520-28	222520-30	222520-32	222520-36
Your Reference	UNITS	BH6	BH7	BH8	BH9	BH10
Depth		0.1-0.2	0.0-0.1	0.0-0.1	0.1-0.2	0.0-0.1
Date Sampled		22/07/2019	25/07/2019	24/07/2019	24/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	101	101	100	98	97

PCBs in Soil						
Our Reference		222520-38	222520-41	222520-47	222520-49	222520-55
Your Reference	UNITS	BH11	BH12	BH13	BH14	BH15
Depth		0.0-0.2	0.3-0.5	0.0-0.2	0.05-0.25	0.0-0.3
Date Sampled		25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	97	99	106	103	100

PCBs in Soil						
Our Reference		222520-59	222520-62	222520-66	222520-71	222520-73
Your Reference	UNITS	BH16	BH17	BH18	BH19	BH20
Depth		0.0-0.15	0.05-0.25	0.05-0.25	0.0-0.1	0.0-0.2
Date Sampled		24/07/2019	24/07/2019	25/07/2019	25/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	100	98	100	101	95

PCBs in Soil						
Our Reference		222520-74	222520-78	222520-81	222520-83	222520-86
Your Reference	UNITS	BH21	BH22	BH23	BH24	BH25
Depth		0.05-0.3	0.05-0.2	0.0-0.1	0.0-0.3	0.0-0.2
Date Sampled		25/07/2019	25/07/2019	25/07/2019	24/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	97	101	111	94	95

PCBs in Soil						
Our Reference		222520-87	222520-90	222520-93	222520-96	222520-102
Your Reference	UNITS	BH26	BH27	BH28	BH29	BH30
Depth		0.0-0.1	0.0-0.2	0.0-0.2	0.0-0.2	0.05-0.15
Date Sampled		24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	95	92	96	97	98

Acid Extractable metals in soil						
Our Reference		222520-1	222520-8	222520-12	222520-16	222520-22
Your Reference	UNITS	BH1	BH2	BH3	BH4	BH5
Depth		0.2-0.3	0.0-0.1	0.1-0.2	0.1-0.2	0.1-0.2
Date Sampled		22/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	14	11	45	92	59
Copper	mg/kg	17	21	46	30	19
Lead	mg/kg	22	160	4	4	6
Mercury	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	24	5	37	76	59
Zinc	mg/kg	34	120	26	41	33

Acid Extractable metals in soil						
Our Reference		222520-25	222520-28	222520-30	222520-32	222520-36
Your Reference	UNITS	BH6	BH7	BH8	BH9	BH10
Depth		0.1-0.2	0.0-0.1	0.0-0.1	0.1-0.2	0.0-0.1
Date Sampled		22/07/2019	25/07/2019	24/07/2019	24/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Arsenic	mg/kg	<4	5	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	17	23	11	37	7
Copper	mg/kg	58	13	17	15	7
Lead	mg/kg	2	24	95	8	26
Mercury	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Nickel	mg/kg	110	13	3	38	2
Zinc	mg/kg	36	43	89	26	28

Acid Extractable metals in soil						
Our Reference		222520-38	222520-41	222520-47	222520-49	222520-55
Your Reference	UNITS	BH11	BH12	BH13	BH14	BH15
Depth		0.0-0.2	0.3-0.5	0.0-0.2	0.05-0.25	0.0-0.3
Date Sampled		25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	5	15	24	23	5
Copper	mg/kg	11	18	47	51	6
Lead	mg/kg	30	34	84	5	54
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	3	9	19	47	2
Zinc	mg/kg	36	43	120	37	35

Acid Extractable metals in soil						
Our Reference		222520-59	222520-62	222520-66	222520-71	222520-73
Your Reference	UNITS	BH16	BH17	BH18	BH19	BH20
Depth		0.0-0.15	0.05-0.25	0.05-0.25	0.0-0.1	0.0-0.2
Date Sampled		24/07/2019	24/07/2019	25/07/2019	25/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Arsenic	mg/kg	<4	<4	<4	17	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	8	88	76	27	10
Copper	mg/kg	31	38	50	100	16
Lead	mg/kg	17	5	5	32	47
Mercury	mg/kg	<0.1	<0.1	<0.1	0.2	<0.1
Nickel	mg/kg	18	55	61	9	4
Zinc	mg/kg	55	34	43	100	63

Acid Extractable metals in soil						
Our Reference		222520-74	222520-78	222520-81	222520-83	222520-86
Your Reference	UNITS	BH21	BH22	BH23	BH24	BH25
Depth		0.05-0.3	0.05-0.2	0.0-0.1	0.0-0.3	0.0-0.2
Date Sampled		25/07/2019	25/07/2019	25/07/2019	24/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	7	70	12	15	11
Copper	mg/kg	27	22	25	25	14
Lead	mg/kg	9	4	120	54	37
Mercury	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	23	69	6	25	5
Zinc	mg/kg	23	38	110	150	60

Acid Extractable metals in soil						
Our Reference		222520-87	222520-90	222520-93	222520-96	222520-102
Your Reference	UNITS	BH26	BH27	BH28	BH29	BH30
Depth		0.0-0.1	0.0-0.2	0.0-0.2	0.0-0.2	0.05-0.15
Date Sampled		24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Arsenic	mg/kg	4	<4	4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	15	9	15	6	82
Copper	mg/kg	10	12	11	5	28
Lead	mg/kg	34	44	41	13	5
Mercury	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	5	7	3	3	78
Zinc	mg/kg	34	39	40	21	44

Acid Extractable metals in soil				
Our Reference		222520-107	222520-108	222520-112
Your Reference	UNITS	DUPKT1	DUMP1	BH1 - [TRIPLICATE]
Depth		-	-	0.2-0.3
Date Sampled		22/07/2019	24/07/2019	22/07/2019
Type of sample		Soil	Soil	Soil
Date prepared	-	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	29/07/2019	29/07/2019	29/07/2019
Arsenic	mg/kg	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4
Chromium	mg/kg	12	12	15
Copper	mg/kg	32	10	24
Lead	mg/kg	17	32	16
Mercury	mg/kg	<0.1	<0.1	<0.1
Nickel	mg/kg	46	4	40
Zinc	mg/kg	33	34	29

Moisture						
Our Reference		222520-1	222520-8	222520-12	222520-16	222520-22
Your Reference	UNITS	BH1	BH2	BH3	BH4	BH5
Depth		0.2-0.3	0.0-0.1	0.1-0.2	0.1-0.2	0.1-0.2
Date Sampled		22/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019
Moisture	%	11	18	4.1	4.9	3.4

Moisture						
Our Reference		222520-25	222520-28	222520-30	222520-32	222520-36
Your Reference	UNITS	BH6	BH7	BH8	BH9	BH10
Depth		0.1-0.2	0.0-0.1	0.0-0.1	0.1-0.2	0.0-0.1
Date Sampled		22/07/2019	25/07/2019	24/07/2019	24/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019
Moisture	%	8.8	16	22	16	12

Moisture						
Our Reference		222520-38	222520-41	222520-47	222520-49	222520-55
Your Reference	UNITS	BH11	BH12	BH13	BH14	BH15
Depth		0.0-0.2	0.3-0.5	0.0-0.2	0.05-0.25	0.0-0.3
Date Sampled		25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019
Moisture	%	12	11	10	3.1	7.5

Moisture						
Our Reference		222520-59	222520-62	222520-66	222520-71	222520-73
Your Reference	UNITS	BH16	BH17	BH18	BH19	BH20
Depth		0.0-0.15	0.05-0.25	0.05-0.25	0.0-0.1	0.0-0.2
Date Sampled		24/07/2019	24/07/2019	25/07/2019	25/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019
Moisture	%	7.3	2.9	6.0	25	13

Moisture						
Our Reference		222520-74	222520-78	222520-81	222520-83	222520-86
Your Reference	UNITS	BH21	BH22	BH23	BH24	BH25
Depth		0.05-0.3	0.05-0.2	0.0-0.1	0.0-0.3	0.0-0.2
Date Sampled		25/07/2019	25/07/2019	25/07/2019	24/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019
Moisture	%	3.2	4.2	24	17	8.5

Moisture						
Our Reference		222520-87	222520-90	222520-93	222520-96	222520-102
Your Reference	UNITS	BH26	BH27	BH28	BH29	BH30
Depth		0.0-0.1	0.0-0.2	0.0-0.2	0.0-0.2	0.05-0.15
Date Sampled		24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019
Date analysed	-	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019
Moisture	%	18	15	15	9.3	6.1

Moisture			
Our Reference		222520-107	222520-108
Your Reference	UNITS	DUPKT1	DUMP1
Depth		-	-
Date Sampled		22/07/2019	24/07/2019
Type of sample		Soil	Soil
Date prepared	-	29/07/2019	29/07/2019
Date analysed	-	30/07/2019	30/07/2019
Moisture	%	8.8	17

Asbestos ID - soils						
Our Reference		222520-1	222520-12	222520-16	222520-22	222520-25
Your Reference	UNITS	BH1	BH3	BH4	BH5	BH6
Depth		0.2-0.3	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2
Date Sampled		22/07/2019	23/07/2019	23/07/2019	23/07/2019	22/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019
Sample mass tested	g	Approx. 40g	Approx. 55g	Approx. 45g	Approx. 50g	Approx. 35g
Sample Description	-	Brown coarse-grained soil & rocks	Grey coarse-grained soil & rocks	Grey coarse-grained soil & rocks	Grey coarse-grained soil & rocks	Grey coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils						
Our Reference		222520-32	222520-36	222520-38	222520-41	222520-49
Your Reference	UNITS	BH9	BH10	BH11	BH12	BH14
Depth		0.1-0.2	0.0-0.1	0.0-0.2	0.3-0.5	0.05-0.25
Date Sampled		24/07/2019	24/07/2019	25/07/2019	25/07/2019	25/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019
Sample mass tested	g	Approx. 35g	Approx. 40g	Approx. 35g	Approx. 35g	Approx. 50g
Sample Description	-	Grey fine- grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Black bituminous soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils						
Our Reference		222520-55	222520-59	222520-62	222520-66	222520-71
Your Reference	UNITS	BH15	BH16	BH17	BH18	BH19
Depth		0.0-0.3	0.0-0.15	0.05-0.25	0.05-0.25	0.0-0.1
Date Sampled		25/07/2019	24/07/2019	24/07/2019	25/07/2019	25/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019
Sample mass tested	g	Approx. 40g	Approx. 45g	Approx. 40g	Approx. 45g	Approx. 25g
Sample Description	-	Brown coarse-grained soil & rocks	Grey coarse-grained soil & rocks	Grey coarse-grained soil & rocks	Grey coarse-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils						
Our Reference		222520-73	222520-74	222520-78	222520-81	222520-83
Your Reference	UNITS	BH20	BH21	BH22	BH23	BH24
Depth		0.0-0.2	0.05-0.3	0.05-0.2	0.0-0.1	0.0-0.3
Date Sampled		24/07/2019	25/07/2019	25/07/2019	25/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019
Sample mass tested	g	Approx. 35g	Approx. 40g	Approx. 50g	Approx. 30g	Approx. 35g
Sample Description	-	Brown fine-grained soil & rocks	Black bituminous soil & rocks	Grey coarse-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils						
Our Reference		222520-86	222520-87	222520-90	222520-93	222520-96
Your Reference	UNITS	BH25	BH26	BH27	BH28	BH29
Depth		0.0-0.2	0.0-0.1	0.0-0.2	0.0-0.2	0.0-0.2
Date Sampled		24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019
Sample mass tested	g	Approx. 40g	Approx. 35g	Approx. 25g	Approx. 35g	Approx. 50g
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils		
Our Reference		222520-102
Your Reference	UNITS	BH30
Depth		0.05-0.15
Date Sampled		24/07/2019
Type of sample		Soil
Date analysed	-	30/07/2019
Sample mass tested	g	Approx. 40g
Sample Description	-	Grey coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected

Asbestos ID - soils NEPM - ASB-001					
Our Reference		222520-8	222520-28	222520-30	222520-47
Your Reference	UNITS	BH2	BH7	BH8	BH13
Depth		0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.2
Date Sampled		23/07/2019	25/07/2019	24/07/2019	25/07/2019
Type of sample		Soil	Soil	Soil	Soil
Date analysed	-	30/07/2019	30/07/2019	30/07/2019	30/07/2019
Sample mass tested	g	538.87	413.74	381.85	661.1
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos[#1]	g/kg	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–
FA and AF Estimation*	g	–	–	–	–
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. **NOTE** #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) **NOTE** #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.

Method ID	Methodology Summary
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: VOCs in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	222520-20
Date extracted	-			29/07/2019	18	29/07/2019	29/07/2019		29/07/2019	29/07/2019
Date analysed	-			30/07/2019	18	30/07/2019	30/07/2019		30/07/2019	30/07/2019
Dichlorodifluoromethane	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
Chloromethane	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
Vinyl Chloride	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
Bromomethane	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
Chloroethane	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
Trichlorofluoromethane	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
1,1-Dichloroethene	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
trans-1,2-dichloroethene	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	mg/kg	1	Org-014	<1	18	<1	<1	0	111	103
cis-1,2-dichloroethene	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
bromochloromethane	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
chloroform	mg/kg	1	Org-014	<1	18	<1	<1	0	106	97
2,2-dichloropropane	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	mg/kg	1	Org-014	<1	18	<1	<1	0	101	93
1,1,1-trichloroethane	mg/kg	1	Org-014	<1	18	<1	<1	0	108	99
1,1-dichloropropene	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
Cyclohexane	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
carbon tetrachloride	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-014	<0.2	18	<0.2	<0.2	0	[NT]	[NT]
dibromomethane	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
trichloroethene	mg/kg	1	Org-014	<1	18	<1	<1	0	107	100
bromodichloromethane	mg/kg	1	Org-014	<1	18	<1	<1	0	107	99
trans-1,3-dichloropropene	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-014	<0.5	18	<0.5	<0.5	0	[NT]	[NT]
1,3-dichloropropane	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
dibromochloromethane	mg/kg	1	Org-014	<1	18	<1	<1	0	106	97
1,2-dibromoethane	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
tetrachloroethene	mg/kg	1	Org-014	<1	18	<1	<1	0	85	79
1,1,1,2-tetrachloroethane	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
chlorobenzene	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
bromoform	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-014	<2	18	<2	<2	0	[NT]	[NT]
styrene	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]

QUALITY CONTROL: VOCs in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	222520-20
o-Xylene	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
1,2,3-trichloropropane	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
isopropylbenzene	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
bromobenzene	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
n-propyl benzene	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
2-chlorotoluene	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
4-chlorotoluene	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
1,3,5-trimethyl benzene	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
tert-butyl benzene	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
1,2,4-trimethyl benzene	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
sec-butyl benzene	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
4-isopropyl toluene	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
n-butyl benzene	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
hexachlorobutadiene	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	mg/kg	1	Org-014	<1	18	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluorometha	%		Org-014	101	18	103	104	1	107	102
Surrogate aaa-Trifluorotoluene	%		Org-014	106	18	95	83	13	105	94
Surrogate Toluene-d_8	%		Org-014	101	18	98	101	3	101	101
Surrogate 4-Bromofluorobenzene	%		Org-014	101	18	100	97	3	96	101

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	222520-8
Date extracted	-			29/07/2019	1	29/07/2019	29/07/2019		29/07/2019	29/07/2019
Date analysed	-			30/07/2019	1	30/07/2019	30/07/2019		30/07/2019	30/07/2019
TRH C_6 - C_9	mg/kg	25	Org-016	<25	1	<25	<25	0	88	79
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	1	<25	<25	0	88	79
Benzene	mg/kg	0.2	Org-016	<0.2	1	<0.2	<0.2	0	104	93
Toluene	mg/kg	0.5	Org-016	<0.5	1	<0.5	<0.5	0	88	79
Ethylbenzene	mg/kg	1	Org-016	<1	1	<1	<1	0	85	75
m+p-xylene	mg/kg	2	Org-016	<2	1	<2	<2	0	82	73
o-Xylene	mg/kg	1	Org-016	<1	1	<1	<1	0	81	72
naphthalene	mg/kg	1	Org-014	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	88	1	73	75	3	90	85

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	222520-78
Date extracted	-			[NT]	38	29/07/2019	29/07/2019		29/07/2019	29/07/2019
Date analysed	-			[NT]	38	30/07/2019	30/07/2019		30/07/2019	30/07/2019
TRH C_6 - C_9	mg/kg	25	Org-016	[NT]	38	<25	<25	0	82	72
TRH C_6 - C_{10}	mg/kg	25	Org-016	[NT]	38	<25	<25	0	82	72
Benzene	mg/kg	0.2	Org-016	[NT]	38	<0.2	<0.2	0	96	86
Toluene	mg/kg	0.5	Org-016	[NT]	38	<0.5	<0.5	0	82	73
Ethylbenzene	mg/kg	1	Org-016	[NT]	38	<1	<1	0	79	69
m+p-xylene	mg/kg	2	Org-016	[NT]	38	<2	<2	0	77	67
o-Xylene	mg/kg	1	Org-016	[NT]	38	<1	<1	0	76	67
naphthalene	mg/kg	1	Org-014	[NT]	38	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	38	82	81	1	88	78

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	74	29/07/2019	29/07/2019		[NT]	[NT]
Date analysed	-			[NT]	74	30/07/2019	30/07/2019		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	[NT]	74	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	[NT]	74	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-016	[NT]	74	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-016	[NT]	74	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-016	[NT]	74	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-016	[NT]	74	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-016	[NT]	74	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-014	[NT]	74	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	74	78	83	6	[NT]	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	102	29/07/2019	29/07/2019		[NT]	[NT]
Date analysed	-			[NT]	102	30/07/2019	30/07/2019		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	[NT]	102	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	[NT]	102	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-016	[NT]	102	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-016	[NT]	102	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-016	[NT]	102	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-016	[NT]	102	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-016	[NT]	102	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-014	[NT]	102	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	102	87	76	13	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	222520-8
Date extracted	-			29/07/2019	1	29/07/2019	29/07/2019		29/07/2019	29/07/2019
Date analysed	-			30/07/2019	1	29/07/2019	29/07/2019		29/07/2019	29/07/2019
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	1	<50	<50	0	95	107
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	1	<100	<100	0	101	126
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	1	<100	<100	0	100	114
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	1	<50	<50	0	95	107
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	1	<100	<100	0	101	126
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	1	<100	<100	0	100	114
Surrogate o-Terphenyl	%		Org-003	86	1	87	87	0	99	112

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	222520-78
Date extracted	-			[NT]	38	29/07/2019	29/07/2019		29/07/2019	29/07/2019
Date analysed	-			[NT]	38	30/07/2019	30/07/2019		30/07/2019	30/07/2019
TRH C_{10} - C_{14}	mg/kg	50	Org-003	[NT]	38	<50	<50	0	86	110
TRH C_{15} - C_{28}	mg/kg	100	Org-003	[NT]	38	<100	<100	0	92	106
TRH C_{29} - C_{36}	mg/kg	100	Org-003	[NT]	38	<100	<100	0	100	#
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	[NT]	38	<50	<50	0	86	110
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	[NT]	38	<100	110	10	92	106
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	[NT]	38	<100	<100	0	100	#
Surrogate o-Terphenyl	%		Org-003	[NT]	38	90	92	2	98	103

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	74	29/07/2019	29/07/2019		[NT]	[NT]
Date analysed	-			[NT]	74	30/07/2019	30/07/2019		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	[NT]	74	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	[NT]	74	220	250	13	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	[NT]	74	650	710	9	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	[NT]	74	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	[NT]	74	610	690	12	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	[NT]	74	850	1000	16	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-003	[NT]	74	99	99	0	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	102	29/07/2019	29/07/2019		[NT]	[NT]
Date analysed	-			[NT]	102	30/07/2019	30/07/2019		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	[NT]	102	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	[NT]	102	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	[NT]	102	<100	100	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	[NT]	102	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	[NT]	102	<100	110	10	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	[NT]	102	120	140	15	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-003	[NT]	102	85	85	0	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	222520-8
Date extracted	-			29/07/2019	1	29/07/2019	29/07/2019		29/07/2019	29/07/2019
Date analysed	-			29/07/2019	1	29/07/2019	29/07/2019		29/07/2019	29/07/2019
Naphthalene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	112	112
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	94	98
Phenanthrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	102	110
Anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	1	0.2	<0.1	67	91	100
Pyrene	mg/kg	0.1	Org-012	<0.1	1	0.2	0.1	67	99	101
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	1	0.2	<0.1	67	140	110
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	1	0.1	<0.05	67	101	94
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	97	1	89	89	0	85	90

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	222520-78
Date extracted	-			[NT]	38	29/07/2019	29/07/2019		29/07/2019	29/07/2019
Date analysed	-			[NT]	38	29/07/2019	29/07/2019		29/07/2019	29/07/2019
Naphthalene	mg/kg	0.1	Org-012	[NT]	38	<0.1	<0.1	0	111	114
Acenaphthylene	mg/kg	0.1	Org-012	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	[NT]	38	<0.1	<0.1	0	103	102
Phenanthrene	mg/kg	0.1	Org-012	[NT]	38	<0.1	0.2	67	105	106
Anthracene	mg/kg	0.1	Org-012	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	[NT]	38	<0.1	0.4	120	98	98
Pyrene	mg/kg	0.1	Org-012	[NT]	38	<0.1	0.3	100	111	106
Benzo(a)anthracene	mg/kg	0.1	Org-012	[NT]	38	<0.1	0.2	67	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	[NT]	38	<0.1	0.2	67	129	114
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	[NT]	38	<0.2	0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	[NT]	38	<0.05	0.1	67	111	96
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	[NT]	38	94	94	0	96	93

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	74	29/07/2019	29/07/2019		[NT]	[NT]
Date analysed	-			[NT]	74	29/07/2019	29/07/2019		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-012	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-012	[NT]	74	0.1	0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-012	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-012	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	[NT]	74	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	[NT]	74	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	[NT]	74	91	95	4	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	102	29/07/2019	29/07/2019		[NT]	[NT]
Date analysed	-			[NT]	102	29/07/2019	29/07/2019		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-012	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-012	[NT]	102	0.2	0.1	67	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-012	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-012	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	[NT]	102	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	[NT]	102	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	[NT]	102	92	97	5	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	222520-8
Date extracted	-			29/07/2019	1	29/07/2019	29/07/2019		29/07/2019	29/07/2019
Date analysed	-			29/07/2019	1	29/07/2019	29/07/2019		29/07/2019	29/07/2019
HCB	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	92	85
gamma-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	95	82
Heptachlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	76	79
delta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	103	99
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	99	85
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	104	96
Dieldrin	mg/kg	0.1	Org-005	<0.1	1	0.2	0.2	0	115	91
Endrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	85	77
pp-DDD	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	71	64
Endosulfan II	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	61	82
Methoxychlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	100	1	103	101	2	99	86

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	222520-78
Date extracted	-			[NT]	38	29/07/2019	29/07/2019		29/07/2019	29/07/2019
Date analysed	-			[NT]	38	29/07/2019	29/07/2019		30/07/2019	30/07/2019
HCB	mg/kg	0.1	Org-005	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	[NT]	38	<0.1	<0.1	0	90	92
gamma-BHC	mg/kg	0.1	Org-005	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	[NT]	38	<0.1	<0.1	0	92	93
Heptachlor	mg/kg	0.1	Org-005	[NT]	38	<0.1	<0.1	0	74	85
delta-BHC	mg/kg	0.1	Org-005	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	[NT]	38	<0.1	<0.1	0	101	101
Heptachlor Epoxide	mg/kg	0.1	Org-005	[NT]	38	<0.1	<0.1	0	100	92
gamma-Chlordane	mg/kg	0.1	Org-005	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	[NT]	38	<0.1	<0.1	0	100	102
Dieldrin	mg/kg	0.1	Org-005	[NT]	38	<0.1	<0.1	0	116	99
Endrin	mg/kg	0.1	Org-005	[NT]	38	<0.1	<0.1	0	86	89
pp-DDD	mg/kg	0.1	Org-005	[NT]	38	<0.1	<0.1	0	72	66
Endosulfan II	mg/kg	0.1	Org-005	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	[NT]	38	<0.1	<0.1	0	62	94
Methoxychlor	mg/kg	0.1	Org-005	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	[NT]	38	97	96	1	98	89

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	74	29/07/2019	29/07/2019		[NT]	[NT]
Date analysed	-			[NT]	74	30/07/2019	30/07/2019		[NT]	[NT]
HCB	mg/kg	0.1	Org-005	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-005	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-005	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-005	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-005	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-005	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-005	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-005	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-005	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	[NT]	74	97	96	1	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	102	29/07/2019	29/07/2019		[NT]	[NT]
Date analysed	-			[NT]	102	30/07/2019	30/07/2019		[NT]	[NT]
HCB	mg/kg	0.1	Org-005	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-005	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-005	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-005	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-005	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-005	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-005	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-005	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-005	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	[NT]	102	98	97	1	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	222520-8
Date extracted	-			29/07/2019	1	29/07/2019	29/07/2019		29/07/2019	29/07/2019
Date analysed	-			29/07/2019	1	29/07/2019	29/07/2019		29/07/2019	29/07/2019
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	101	105
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	98	120
Dimethoate	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	92	81
Fenitrothion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	106	113
Malathion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	100	100
Parathion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	112	114
Ronnel	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	98	104
Surrogate TCMX	%		Org-008	100	1	103	101	2	95	97

QUALITY CONTROL: Organophosphorus Pesticides						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	222520-78
Date extracted	-			[NT]	38	29/07/2019	29/07/2019		29/07/2019	29/07/2019
Date analysed	-			[NT]	38	29/07/2019	29/07/2019		30/07/2019	30/07/2019
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-008	[NT]	38	<0.1	<0.1	0	110	110
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	[NT]	38	<0.1	<0.1	0	106	102
Dimethoate	mg/kg	0.1	Org-008	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	[NT]	38	<0.1	<0.1	0	98	98
Fenitrothion	mg/kg	0.1	Org-008	[NT]	38	<0.1	<0.1	0	118	115
Malathion	mg/kg	0.1	Org-008	[NT]	38	<0.1	<0.1	0	104	109
Parathion	mg/kg	0.1	Org-008	[NT]	38	<0.1	<0.1	0	104	108
Ronnel	mg/kg	0.1	Org-008	[NT]	38	<0.1	<0.1	0	108	101
Surrogate TCMX	%		Org-008	[NT]	38	97	96	1	98	94

QUALITY CONTROL: Organophosphorus Pesticides					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	74	29/07/2019	29/07/2019		[NT]	[NT]
Date analysed	-			[NT]	74	30/07/2019	30/07/2019		[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-008	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-008	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-008	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-008	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-008	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-008	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-008	[NT]	74	97	96	1	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	102	29/07/2019	29/07/2019		[NT]	[NT]
Date analysed	-			[NT]	102	30/07/2019	30/07/2019		[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-008	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-008	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-008	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-008	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-008	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-008	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-008	[NT]	102	98	97	1	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	222520-8
Date extracted	-			29/07/2019	1	29/07/2019	29/07/2019		29/07/2019	29/07/2019
Date analysed	-			29/07/2019	1	29/07/2019	29/07/2019		29/07/2019	29/07/2019
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	106	104
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-006	100	1	103	101	2	95	97

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	222520-78
Date extracted	-			[NT]	38	29/07/2019	29/07/2019		29/07/2019	29/07/2019
Date analysed	-			[NT]	38	29/07/2019	29/07/2019		30/07/2019	30/07/2019
Aroclor 1016	mg/kg	0.1	Org-006	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	[NT]	38	<0.1	<0.1	0	101	100
Aroclor 1260	mg/kg	0.1	Org-006	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-006	[NT]	38	97	96	1	98	94

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	74	29/07/2019	29/07/2019		[NT]	[NT]
Date analysed	-			[NT]	74	30/07/2019	30/07/2019		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-006	[NT]	74	97	96	1	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	102	29/07/2019	29/07/2019		[NT]	[NT]
Date analysed	-			[NT]	102	30/07/2019	30/07/2019		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-006	[NT]	102	98	97	1	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	222520-8
Date prepared	-			29/07/2019	1	29/07/2019	29/07/2019		29/07/2019	29/07/2019
Date analysed	-			29/07/2019	1	29/07/2019	29/07/2019		29/07/2019	29/07/2019
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	106	97
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	107	94
Chromium	mg/kg	1	Metals-020	<1	1	14	13	7	102	92
Copper	mg/kg	1	Metals-020	<1	1	17	22	26	100	99
Lead	mg/kg	1	Metals-020	<1	1	22	8	93	104	79
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	95	97
Nickel	mg/kg	1	Metals-020	<1	1	24	41	52	98	86
Zinc	mg/kg	1	Metals-020	<1	1	34	26	27	103	87

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	222520-78
Date prepared	-			[NT]	38	29/07/2019	29/07/2019		29/07/2019	29/07/2019
Date analysed	-			[NT]	38	29/07/2019	29/07/2019		29/07/2019	29/07/2019
Arsenic	mg/kg	4	Metals-020	[NT]	38	<4	<4	0	100	86
Cadmium	mg/kg	0.4	Metals-020	[NT]	38	<0.4	<0.4	0	105	78
Chromium	mg/kg	1	Metals-020	[NT]	38	5	6	18	99	87
Copper	mg/kg	1	Metals-020	[NT]	38	11	10	10	97	93
Lead	mg/kg	1	Metals-020	[NT]	38	30	32	6	101	75
Mercury	mg/kg	0.1	Metals-021	[NT]	38	<0.1	<0.1	0	96	87
Nickel	mg/kg	1	Metals-020	[NT]	38	3	3	0	94	74
Zinc	mg/kg	1	Metals-020	[NT]	38	36	37	3	99	74

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	62	29/07/2019	29/07/2019		[NT]	[NT]
Date analysed	-			[NT]	62	29/07/2019	29/07/2019		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	62	<4	<4	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	62	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	62	88	77	13	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	62	38	36	5	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	62	5	5	0	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	62	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	62	55	65	17	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	62	34	37	8	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	74	29/07/2019	29/07/2019		[NT]	[NT]
Date analysed	-			[NT]	74	29/07/2019	29/07/2019		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	74	<4	<4	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	74	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	74	7	8	13	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	74	27	36	29	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	74	9	12	29	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	74	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	74	23	27	16	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	74	23	25	8	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	102	29/07/2019	29/07/2019		[NT]	[NT]
Date analysed	-			[NT]	102	29/07/2019	29/07/2019		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	102	<4	<4	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	102	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	102	82	70	16	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	102	28	22	24	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	102	5	4	22	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	102	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	102	78	69	12	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	102	44	39	12	[NT]	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

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

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

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Report Comments

Asbestos: A portion of the supplied samples were sub-sampled for asbestos analysis according to Envirolab procedures.
We cannot guarantee that these sub-samples are indicative of the entire sample.
Envirolab recommends supplying 40-50g of sample in its own container.
Note: Samples requested for asbestos testing were sub-sampled from jars provided by the client.

TRH Soil C10-C40 NEPM - # Percent recovery for the matrix spike is not possible to report as the high concentration of analytes in sample 222520-78 has caused interference.

Asbestos-ID in soil: NEPM
This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013. This is reported outside our scope of NATA accreditation.

Note: All samples analysed as received. However, samples 222520-28 & 30 are below the minimum 500mL sample volume as per National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013.

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 222520-1 for Pb and Ni. Therefore a triplicate result has been issued as laboratory sample number 222520-112.

OP's in Soil - The PQL has been raised due to interferences from analytes (other than those being tested) in sample/s 71.

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

SAMPLE RECEIPT ADVICE

Client Details

Client	Environmental Investigation Services
Attention	Katrina Taylor

Sample Login Details

Your reference	E323507BT, Greenwich
Envirolab Reference	222520
Date Sample Received	26/07/2019
Date Instructions Received	26/07/2019
Date Results Expected to be Reported	02/08/2019

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	111 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	12.7
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

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ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
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Sample ID	VOCs in soil	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticidesin soil	Organophosphorus Pesticides	PCBsin Soil	Acid Extractable metalsin soil	Asbestos ID - soils	Asbestos ID - soils NEPM - ASB-001	On Hold
BH1-0.2-0.3		✓	✓	✓	✓	✓	✓	✓	✓		
BH1-0.5-0.7											✓
BH1-0.75-0.95											✓
BH1-1.6-1.8											✓
BH1-2.8-3.0											✓
BH1-3.2-3.4											✓
BH1-4.0-4.1											✓
BH2-0.0-0.1		✓	✓	✓	✓	✓	✓	✓		✓	
BH2-0.6-0.7											✓
BH2-1.0-1.1											✓
BH2-2.5-2.7											✓
BH3-0.1-0.2		✓	✓	✓	✓	✓	✓	✓	✓		
BH3-0.3-0.5											✓
BH3-0.5-0.6											✓
BH3-1.1-1.2											✓
BH4-0.1-0.2		✓	✓	✓	✓	✓	✓	✓	✓		
BH4-0.2-0.3											✓
BH4-0.5-0.7	✓										
BH4-1.3-1.4											✓
BH4-1.9-2.0	✓										
BH4-2.4-2.5	✓										
BH5-0.1-0.2		✓	✓	✓	✓	✓	✓	✓	✓		
BH5-0.2-0.3											✓
BH5-0.7-0.8											✓
BH6-0.1-0.2		✓	✓	✓	✓	✓	✓	✓	✓		
BH6-0.3-0.4											✓
BH6-0.6-0.7											✓
BH7-0.0-0.1		✓	✓	✓	✓	✓	✓	✓		✓	
BH7-0.5-0.6											✓
BH8-0.0-0.1		✓	✓	✓	✓	✓	✓	✓		✓	
BH8-0.3-0.4											✓
BH9-0.1-0.2		✓	✓	✓	✓	✓	✓	✓	✓		

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Sample ID	VOCs in soil	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticidesin soil	Organophosphorus Pesticides	PCBsin Soil	Acid Extractable metalsin soil	Asbestos ID - soils	Asbestos ID - soils NEPM - ASB-001	On Hold
BH9-0.4-0.6											✓
BH9-0.6-0.9											✓
BH9-1.1-1.2											✓
BH10-0.0-0.1		✓	✓	✓	✓	✓	✓	✓	✓		
BH10-0.1-0.2											✓
BH11-0.0-0.2		✓	✓	✓	✓	✓	✓	✓	✓		
BH11-0.2-0.4											✓
BH11-0.4-0.6											✓
BH12-0.3-0.5		✓	✓	✓	✓	✓	✓	✓	✓		
BH12-1.0-1.2											✓
BH12-2.0-2.2											✓
BH12-2.5-2.7											✓
BH12-2.8-3.1											✓
BH12-3.8-4.0											✓
BH13-0.0-0.2		✓	✓	✓	✓	✓	✓	✓		✓	
BH13-0.3-0.5											✓
BH14-0.05-0.25		✓	✓	✓	✓	✓	✓	✓	✓		
BH14-0.4-0.6											✓
BH14-0.65-0.8											✓
BH14-1.0-1.2											✓
BH14-1.4-1.6											✓
BH14-2.3-2.4											✓
BH15-0.0-0.3		✓	✓	✓	✓	✓	✓	✓	✓		
BH15-0.4-0.5											✓
BH15-0.5-0.7											✓
BH15-0.9-1.1											✓
BH16-0.0-0.15		✓	✓	✓	✓	✓	✓	✓	✓		
BH16-0.15-0.3	✓										
BH16-0.3-0.5											✓
BH17-0.05-0.25		✓	✓	✓	✓	✓	✓	✓	✓		
BH17-0.25-0.45											✓
BH17-0.7-0.75	✓										

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Sample ID	VOCs in soil	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticidesin soil	Organophosphorus Pesticides	PCBsin Soil	Acid Extractable metalsin soil	Asbestos ID - soils	Asbestos ID - soils NEPM - ASB-001	On Hold
BH17-0.75-0.85	✓										
BH18-0.05-0.25		✓	✓	✓	✓	✓	✓	✓	✓		
BH18-0.25-0.4											✓
BH18-0.4-0.6											✓
BH18-0.6-0.8											✓
BH18-0.9-1.1											✓
BH19-0.0-0.1		✓	✓	✓	✓	✓	✓	✓	✓		
BH19-0.1-0.2											✓
BH20-0.0-0.2		✓	✓	✓	✓	✓	✓	✓	✓		
BH21-0.05-0.3		✓	✓	✓	✓	✓	✓	✓	✓		
BH21-0.3-0.6											✓
BH21-0.6-0.9	✓										
BH21-0.9-1.1	✓										
BH22-0.05-0.2		✓	✓	✓	✓	✓	✓	✓	✓		
BH22-0.3-0.5											✓
BH22-0.6-0.8											✓
BH23-0.0-0.1		✓	✓	✓	✓	✓	✓	✓	✓		
BH23-0.3-0.4											✓
BH24-0.0-0.3		✓	✓	✓	✓	✓	✓	✓	✓		
BH24-0.3-0.5											✓
BH24-0.5-0.7											✓
BH25-0.0-0.2		✓	✓	✓	✓	✓	✓	✓	✓		
BH26-0.0-0.1		✓	✓	✓	✓	✓	✓	✓	✓		
BH26-0.1-0.3											✓
BH26-0.3-0.5											✓
BH27-0.0-0.2		✓	✓	✓	✓	✓	✓	✓	✓		
BH27-0.25-0.45											✓
BH27-0.5-0.7											✓
BH28-0.0-0.2		✓	✓	✓	✓	✓	✓	✓	✓		
BH28-0.2-0.3											✓
BH28-0.3-0.5											✓
BH29-0.0-0.2		✓	✓	✓	✓	✓	✓	✓	✓		

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ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
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Sample ID	VOCs in soil	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticidesin soil	Organophosphorus Pesticides	PCBsin Soil	Acid Extractable metalsin soil	Asbestos ID - soils	Asbestos ID - soils NEPM - ASB-001	On Hold
BH29-0.3-0.4											✓
BH29-0.5-0.7											✓
BH29-0.8-0.9											✓
BH29-0.9-1.1											✓
BH29-1.1-0.3											✓
BH30-0.05-0.15		✓	✓	✓	✓	✓	✓	✓	✓		
BH30-0.15-0.3											✓
BH30-0.3-0.45											✓
BH30-0.45-0.6											✓
BH30-0.6-0.7											✓
DUPKT1		✓	✓	✓				✓			
DUMP1		✓	✓	✓				✓			
DUMP3											✓
TB1		✓									
BH5-1.3-1.5											✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.

TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen	EIS Job Number: E323507BT Date Results Required: STANDARD Page: 1 of 4	JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: ktaylor@jkenvironments.com.au

Location:	Greenwich	Sample Preserved in Esky on Ice
Sampler:	SM / MMP	Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 6a	Combo 3	Asbestos (500ml)	VOCs	BTEX
22/07/2019	1	BH1	0.2-0.3	G	0	FILL	X				
	2		0.5-0.7	G	0	FILL					
	3		0.75-0.95	G	0	FILL					
	4		1.6-1.8	G	0	FILL					
	5		2.8-3.0	G	0	FILL					
	6		3.2-3.4	G	0	FILL					
	7		4.0-4.1	G	0	Natural					
23/07/2019	8	BH2	0.0-0.1	G	0	FILL	X		X		
	9		0.6-0.7	G	0	FILL					
	10		1.0-1.1	G	0	FILL					
	11		2.5-2.7	G	0	Natural					
23/07/2019	12	BH3	0.1-0.2	G	0	FILL	X				
	13		0.3-0.5	G	0	FILL					
	14		0.5-0.6	G	0	FILL					
	15		1.1-1.2	G	0	Natural					
23/07/2019	16	BH4	0.1-0.2	G	0	FILL	X				
	17		0.2-0.3	G	0	FILL					
	18		0.5-0.7	G	0	FILL				X	
	19		1.3-1.4	G	0	FILL					
	20		1.9-2.0	G	0	FILL				X	
	21		2.4-2.5	G	0	Natural				X	
23/07/2019	22	BH5	0.1-0.2	G	0	FILL	X				
	23		0.2-0.3	G	0	FILL					
	24		0.7-0.8	G	0	Natural					
22/01/2019	25	BH6	0.1-0.2	G	0	FILL	X				
	26		0.3-0.4	G	0	FILL					
	27		0.6-0.7	G	0	Natural					

ENVIROLAB GROUP

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

Job No: 222520

Date Received: 26/7/19

Time Received: 11:30

Received by:

Temp: Cool/Ambient

Cooling: Ice/Icepack

Security: Intact/Broken/None

Remarks (comments/detection limits required):

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

Relinquished By:	Date:	Time:	Received By:	Date:
			Kevin Ng	26/7/19

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD	EIS Job Number: E323507BT	JKEnvironments
12 ASHLEY STREET		REAR OF 115 WICKS ROAD
CHATSWOOD NSW 2067		MACQUARIE PARK, NSW 2113
P: (02) 99106200	Date Results Required: STANDARD	P: 02-9888 5000 F: 02-9888 5001
F: (02) 99106201		Attention: ktaylor@jkenvironments.com.au
Attention: Aileen	Page: 2 of 4	

Location:	Greenwich	Sample Preserved in Esky on Ice
Sampler:	SM / MMP	Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 6a	Combo 3	Asbestos (500ml)	VOCs	BTEX							
25/07/2019	28	BH7	0.0-0.1	G	0	Fill	X		X									
	29		0.5-0.6	G	0	Natural												
24/07/2019	30	BH8	0.0-0.1	G	0	Fill	X		X									
	31		0.3-0.4	G	0	Natural												
24/07/2019	32	BH9	0.1-0.2	G	0	Fill	X											
	33		0.4-0.6	G	0	Fill												
	34		0.6-0.9	G	0	Fill												
	35		1.1-1.2	G	0	Natural												
24/07/2019	36	BH10	0.0-0.1	G	0	Fill	X											
	37		0.1-0.2	G	0	Natural												
25/07/2019	38	BH11	0.0-0.2	G	0	Fill	X											
	39		0.2-0.4	G	0	Fill												
	40		0.4-0.6	G	0	Fill												
25/07/2019	41	BH12	0.3-0.5	G	0	Fill	X											
	42		1.0-1.2	G	0	Fill												
	43		2.0-2.2	G	0	Fill												
	44		2.5-2.7	G	0	Fill												
	45		2.8-3.1	G	0	Fill												
	46		3.8-4.0	G	0	Fill												
25/07/2019	47	BH13	0.0-0.2	G	0	Fill	X		X									
	48		0.3-0.5	G	0	Fill												
25/07/2019	49	BH14	0.05-0.25	G	0	Fill	X											
	50		0.4-.6	G	0	Fill												
	51		0.65-0.8	G	0	Fill												
	52		1.0-1.2	G	0	Fill												
	53		1.4-1.6	G	0	Fill												
	54		2.3-2.4	G	0	Fill												

Remarks (comments/detection limits required):	Sample Containers: G - 250mg Glass Jar A - Ziplock Asbestos Bag P - Plastic Bag

Relinquished By:	Date:	Time:	Received By:	Date:
			[illegible]	26/7

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen	EIS Job Number: E323507BT Date Results Required: STANDARD Page: 3 of 4	JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: ktaylor@jkenvironments.com.au

Location:	Greenwich	Sample Preserved in Esky on Ice
Sampler:	SM / MMP	Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 6a	Combo 3	Asbestos (500ml)	VOCs	BTEX							
25/07/2019	55	BH15	0.0-0.3	G	0	Fill	X											
	56		0.4-0.5	G	0	Fill												
	57		0.5-0.7	G	0	Fill												
	58		0.9-1.1	G	0	Fill												
24/07/2019	59	BH16	0.0-0.15	G	0	Fill	X											
	60		0.15-0.3	G	0	Fill				X								
	61		0.3-0.5	G	0	Fill												
24/07/2019	62	BH17	0.05-0.25	G	0	Fill	X											
	63		0.25-0.45	G	0	Fill												
	64		0.7-0.75	G	0	Fill				X								
	65		0.75-0.85	G	0	Fill				X								
25/07/2019	66	BH18	0.05-0.25	G	0	Fill	X											
	67		0.25-0.4	G	0	Fill												
	68		0.4-0.6	G	0	Fill												
	69		0.6-0.8	G	0	Fill												
	70		0.9-1.1	G	0	Fill												
25/07/2019	71	BH19	0.0-0.1	G	0	Fill	X											
	72		0.1-0.2	G	0	Fill												
24/07/2019	73	BH20	0.0-0.2	G	0	Fill	X											
25/07/2019	74	BH21	0.05-0.3	G	0	Fill	X											
	75		0.3-0.6	G	0	Fill												
	76		0.6-0.9	G	0	Fill				X								
	77		0.9-1.1	G	0	Natural				X								
25/07/2019	78	BH22	0.05-0.2	G	0	Fill	X											
	79		0.3-0.5	G	0	Fill												
	80		0.6-0.8	G	0	Natural												
25/07/2019	81	BH23	0.0-0.1	G	0	Fill	X											
	82		0.3-0.4	G	0	Fill												

Remarks (comments/detection limits required):	Sample Containers: G - 250mg Glass Jar A - Ziplock Asbestos Bag P - Plastic Bag

Relinquished By:	Date:	Time:	Received By:	Date:
			Kevin Ly	26/7

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD	EIS Job Number: E323507BT	JKEnvironments
12 ASHLEY STREET		REAR OF 115 WICKS ROAD
CHATSWOOD NSW 2067	Date Results Required: STANDARD	MACQUARIE PARK, NSW 2113
P: (02) 99106200		P: 02-9888 5000 F: 02-9888 5001
F: (02) 99106201	Page: 4 of 4	Attention: ktaylor@jkenvironments.com.au
Attention: Aileen		

Location:	Greenwich	Sample Preserved in Esky on Ice
Sampler:	SM / MMP	Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 6a	Combo 3	Asbestos (500ml)	VOCs	BTEX							
24/07/2019	83	BH24	0.0-0.3	G	0	Fill	X											
	84		0.3-0.5	G	0	Fill												
	85		0.5-0.7	G	0	Fill												
24/07/2019	86	BH25	0.0-0.2	G	0	Fill	X											
24/07/2019	87	BH26	0.0-0.1	G	0	Fill	X											
	88		0.1-0.3	G	0	Fill												
	89		0.3-0.5	G	0	Natural												
24/07/2019	90	BH27	0.0-0.2	G	0	Fill	X											
	91		0.25-0.45	G	0	Fill												
	92		0.5-0.7	G	0	Natural												
24/07/2019	93	BH28	0.0-0.2	G	0	Fill	X											
	94		0.2-0.3	G	0	Fill												
	95		0.3-0.5	G	0	Natural												
24/07/2019	96	BH29	0.0-0.2	G	0	Fill	X											
	97		0.3-0.4	G	0	Fill												
	98		0.5-0.7	G	0	Fill												
	99		0.8-0.9	G	0	Fill												
	100		0.9-1.1	G	0	Fill												
	101		1.1-1.3	G	0	Natural												
24/07/2019	102	BH30	0.05-0.15	G	0	Fill	X											
	103		0.15-0.3	G	0	Fill												
	104		0.3-0.45	G	0	Fill												
	105		0.45-0.6	G	0	Fill												
	106		0.6-0.7	G	0	Fill												
22/07/2019	107	DUPKT1	-	G	0	Fill		X										
25/07/2019	~~97~~	DUPKT2	-	G	0	Fill		X										
24/07/2019	108	DUPMP1	-	G	0	Fill		X										
24/07/2019	~~98~~	DUPMP2	-	G	0	Fill		X										
24/07/2019	109	DUPMP3	-	G	0	Fill												
22-25/7/2019	110	TB1	-	G	0	Sand					X							

Remarks (comments/detection limits required):

Please send DUPKT2 and DUPMP2 to Envirolab melbourne

111 BH5 1.3-1.5 (Extra) Kev.

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

Relinquished By:	Date:	Time:	Received By:	Date:
			Kevin Ng	26/7

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

CERTIFICATE OF ANALYSIS 222520-A

Client Details

Client	Environmental Investigation Services
Attention	Katrina Taylor
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E323507BT, Greenwich**
Number of Samples	111 Soil
Date samples received	26/07/2019
Date completed instructions received	02/07/2019

Analysis Details

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

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

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

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

Report Details

Date results requested by	09/08/2019
Date of Issue	09/08/2019

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

Results Approved By
Diego Bigolin, Team Leader, Inorganics
Jaimie Loa-Kum-Cheung, Metals Supervisor
Loren Bardwell, Senior Chemist
Lucy Zhu, Senior Asbestos Analyst
Nick Sarlamis, Inorganics Supervisor
Steven Luong, Organics Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		222520-A-11	222520-A-24	222520-A-27	222520-A-31	222520-A-52
Your Reference	UNITS	BH2	BH5	BH6	BH8	BH14
Depth		2.5-2.7	0.7-0.8	0.6-0.7	0.3-0.4	1.0-1.2
Date Sampled		23/07/2019	23/07/2019	22/07/2019	24/07/2019	25/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/08/2019	05/08/2019	05/08/2019	05/08/2019	05/08/2019
Date analysed	-	06/08/2019	06/08/2019	06/08/2019	06/08/2019	06/08/2019
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	88	90	95	89	88

vTRH(C6-C10)/BTEXN in Soil			
Our Reference		222520-A-76	222520-A-82
Your Reference	UNITS	BH21	BH23
Depth		0.6-0.9	0.3-0.4
Date Sampled		25/07/2019	25/07/2019
Type of sample		Soil	Soil
Date extracted	-	05/08/2019	05/08/2019
Date analysed	-	06/08/2019	06/08/2019
TRH C_6 - C_9	mg/kg	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25
Benzene	mg/kg	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1
m+p-xylene	mg/kg	<2	<2
o-Xylene	mg/kg	<1	<1
naphthalene	mg/kg	<1	<1
Total +ve Xylenes	mg/kg	<3	<3
Surrogate aaa-Trifluorotoluene	%	95	89

svTRH (C10-C40) in Soil						
Our Reference		222520-A-11	222520-A-24	222520-A-27	222520-A-31	222520-A-52
Your Reference	UNITS	BH2	BH5	BH6	BH8	BH14
Depth		2.5-2.7	0.7-0.8	0.6-0.7	0.3-0.4	1.0-1.2
Date Sampled		23/07/2019	23/07/2019	22/07/2019	24/07/2019	25/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/08/2019	05/08/2019	05/08/2019	05/08/2019	05/08/2019
Date analysed	-	06/08/2019	06/08/2019	06/08/2019	06/08/2019	06/08/2019
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	84	86	84	85	84

svTRH (C10-C40) in Soil			
Our Reference		222520-A-76	222520-A-82
Your Reference	UNITS	BH21	BH23
Depth		0.6-0.9	0.3-0.4
Date Sampled		25/07/2019	25/07/2019
Type of sample		Soil	Soil
Date extracted	-	05/08/2019	05/08/2019
Date analysed	-	06/08/2019	06/08/2019
TRH C_{10} - C_{14}	mg/kg	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100
TRH C_{29} - C_{36}	mg/kg	170	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50
TRH >C_{16} -C_{34}	mg/kg	150	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	150	<50
Surrogate o-Terphenyl	%	83	84

sTPH in Soil (C10-C40)-Silica		
Our Reference		222520-A-81
Your Reference	UNITS	BH23
Depth		0.0-0.1
Date Sampled		25/07/2019
Type of sample		Soil
Date extracted	-	05/08/2019
Date analysed	-	07/08/2019
TPH C_{10} - C_{14}	mg/kg	<50
TPH C_{15} - C_{28}	mg/kg	160
TPH C_{29} - C_{36}	mg/kg	300
TPH >C_{10} -C_{16}	mg/kg	<50
TPH >C_{16} -C_{34}	mg/kg	350
TPH >C_{34} -C_{40}	mg/kg	270
Surrogate o-Terphenyl	%	74

PAHs in Soil						
Our Reference		222520-A-11	222520-A-24	222520-A-27	222520-A-31	222520-A-52
Your Reference	UNITS	BH2	BH5	BH6	BH8	BH14
Depth		2.5-2.7	0.7-0.8	0.6-0.7	0.3-0.4	1.0-1.2
Date Sampled		23/07/2019	23/07/2019	22/07/2019	24/07/2019	25/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/08/2019	05/08/2019	05/08/2019	05/08/2019	05/08/2019
Date analysed	-	06/08/2019	06/08/2019	06/08/2019	06/08/2019	06/08/2019
Naphthalene	mg/kg	0.4	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.8	<0.1	<0.1	<0.1	0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.3	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	3.9	<0.1	<0.1	<0.1	0.5
Anthracene	mg/kg	1	<0.1	<0.1	<0.1	0.1
Fluoranthene	mg/kg	4.4	<0.1	<0.1	<0.1	1.2
Pyrene	mg/kg	3.9	<0.1	<0.1	<0.1	1.0
Benzo(a)anthracene	mg/kg	1.7	<0.1	<0.1	<0.1	0.5
Chrysene	mg/kg	1.5	<0.1	<0.1	<0.1	0.4
Benzo(b,j+k)fluoranthene	mg/kg	2.5	<0.2	<0.2	<0.2	0.7
Benzo(a)pyrene	mg/kg	1.8	<0.05	<0.05	<0.05	0.4
Indeno(1,2,3-c,d)pyrene	mg/kg	0.9	<0.1	<0.1	<0.1	0.2
Dibenzo(a,h)anthracene	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	1.1	<0.1	<0.1	<0.1	0.3
Total +ve PAH's	mg/kg	24	<0.05	<0.05	<0.05	5.4
Benzo(a)pyrene TEQ calc (zero)	mg/kg	2.5	<0.5	<0.5	<0.5	0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	2.5	<0.5	<0.5	<0.5	0.6
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	2.5	<0.5	<0.5	<0.5	0.6
Surrogate p-Terphenyl-d14	%	91	92	94	93	95

PAHs in Soil			
Our Reference		222520-A-76	222520-A-82
Your Reference	UNITS	BH21	BH23
Depth		0.6-0.9	0.3-0.4
Date Sampled		25/07/2019	25/07/2019
Type of sample		Soil	Soil
Date extracted	-	05/08/2019	05/08/2019
Date analysed	-	06/08/2019	06/08/2019
Naphthalene	mg/kg	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1
Pyrene	mg/kg	0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.09	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1
Total +ve PAH's	mg/kg	0.4	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	96	99

Acid Extractable metals in soil						
Our Reference		222520-A-11	222520-A-24	222520-A-27	222520-A-31	222520-A-52
Your Reference	UNITS	BH2	BH5	BH6	BH8	BH14
Depth		2.5-2.7	0.7-0.8	0.6-0.7	0.3-0.4	1.0-1.2
Date Sampled		23/07/2019	23/07/2019	22/07/2019	24/07/2019	25/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	05/08/2019	05/08/2019	05/08/2019	05/08/2019	05/08/2019
Date analysed	-	05/08/2019	05/08/2019	05/08/2019	05/08/2019	05/08/2019
Arsenic	mg/kg	<4	<4	<4	<4	6
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	45	7	10	9	14
Copper	mg/kg	10	<1	<1	5	23
Lead	mg/kg	30	5	4	15	110
Mercury	mg/kg	<0.1	<0.1	<0.1	0.1	0.2
Nickel	mg/kg	4	<1	3	2	7
Zinc	mg/kg	150	<1	3	17	120

Acid Extractable metals in soil			
Our Reference		222520-A-76	222520-A-82
Your Reference	UNITS	BH21	BH23
Depth		0.6-0.9	0.3-0.4
Date Sampled		25/07/2019	25/07/2019
Type of sample		Soil	Soil
Date prepared	-	05/08/2019	05/08/2019
Date analysed	-	05/08/2019	05/08/2019
Arsenic	mg/kg	<4	<4
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	6	17
Copper	mg/kg	12	5
Lead	mg/kg	75	28
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	2	9
Zinc	mg/kg	110	19

Moisture						
Our Reference		222520-A-11	222520-A-24	222520-A-27	222520-A-31	222520-A-52
Your Reference	UNITS	BH2	BH5	BH6	BH8	BH14
Depth		2.5-2.7	0.7-0.8	0.6-0.7	0.3-0.4	1.0-1.2
Date Sampled		23/07/2019	23/07/2019	22/07/2019	24/07/2019	25/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	05/08/2019	05/08/2019	05/08/2019	05/08/2019	05/08/2019
Date analysed	-	06/08/2019	06/08/2019	06/08/2019	06/08/2019	06/08/2019
Moisture	%	12	6.1	11	9.5	18

Moisture			
Our Reference		222520-A-76	222520-A-82
Your Reference	UNITS	BH21	BH23
Depth		0.6-0.9	0.3-0.4
Date Sampled		25/07/2019	25/07/2019
Type of sample		Soil	Soil
Date prepared	-	05/08/2019	05/08/2019
Date analysed	-	06/08/2019	06/08/2019
Moisture	%	11	11

Misc Inorg - Soil				
Our Reference		222520-A-25	222520-A-71	222520-A-102
Your Reference	UNITS	BH6	BH19	BH30
Depth		0.1-0.2	0.0-0.1	0.05-0.15
Date Sampled		22/07/2019	25/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil
Date prepared	-	06/08/2019	06/08/2019	06/08/2019
Date analysed	-	06/08/2019	06/08/2019	06/08/2019
pH 1:5 soil:water	pH Units	9.6	6.0	9.3

CEC				
Our Reference		222520-A-25	222520-A-71	222520-A-102
Your Reference	UNITS	BH6	BH19	BH30
Depth		0.1-0.2	0.0-0.1	0.05-0.15
Date Sampled		22/07/2019	25/07/2019	24/07/2019
Type of sample		Soil	Soil	Soil
Date prepared	-	07/08/2019	07/08/2019	07/08/2019
Date analysed	-	07/08/2019	07/08/2019	07/08/2019
Exchangeable Ca	meq/100g	20	14	11
Exchangeable K	meq/100g	0.4	0.3	0.6
Exchangeable Mg	meq/100g	8.6	2.3	8.7
Exchangeable Na	meq/100g	1.8	0.13	0.12
Cation Exchange Capacity	meq/100g	30	17	21

Clay 50-120g				
Our Reference		222520-A-25	222520-A-71	222520-A-77
Your Reference	UNITS	BH6	BH19	BH21
Depth		0.1-0.2	0.0-0.1	0.9-1.1
Date Sampled		22/07/2019	25/07/2019	25/07/2019
Type of sample		Soil	Soil	Soil
Date prepared	-	06/08/2019	06/08/2019	06/08/2019
Date analysed	-	07/08/2019	07/08/2019	07/08/2019
Clay in soils <2µm	% (w/w)	5	9	12

Asbestos ID - soils NEPM - ASB-001		
Our Reference		222520-A-73
Your Reference	UNITS	BH20
Depth		0.0-0.2
Date Sampled		24/07/2019
Type of sample		Soil
Date analysed	-	08/08/2019
Sample mass tested	g	664.5
Sample Description	-	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected
Total Asbestos[#1]	g/kg	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected
ACM >7mm Estimation*	g	–
FA and AF Estimation*	g	–
ACM >7mm Estimation*	%(w/w)	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001

Metals in TCLP USEPA1311						
Our Reference		222520-A-8	222520-A-16	222520-A-25	222520-A-66	222520-A-78
Your Reference	UNITS	BH2	BH4	BH6	BH18	BH22
Depth		0.0-0.1	0.1-0.2	0.1-0.2	0.05-0.25	0.05-0.2
Date Sampled		23/07/2019	23/07/2019	22/07/2019	25/07/2019	25/07/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/08/2019	05/08/2019	05/08/2019	05/08/2019	05/08/2019
Date analysed	-	05/08/2019	05/08/2019	05/08/2019	05/08/2019	05/08/2019
pH of soil for fluid# determ.	pH units	6.9	9.0	9.0	9.4	9.0
pH of soil TCLP (after HCl)	pH units	1.8	1.8	1.8	1.9	1.9
Extraction fluid used	-	1	1	1	1	1
pH of final Leachate	pH units	5.0	5.3	5.0	5.4	5.2
Lead in TCLP	mg/L	0.03	[NA]	[NA]	[NA]	[NA]
Nickel in TCLP	mg/L	[NA]	0.06	0.1	0.02	0.04

Metals in TCLP USEPA1311			
Our Reference		222520-A-81	222520-A-102
Your Reference	UNITS	BH23	BH30
Depth		0.0-0.1	0.05-0.15
Date Sampled		25/07/2019	24/07/2019
Type of sample		Soil	Soil
Date extracted	-	05/08/2019	05/08/2019
Date analysed	-	05/08/2019	05/08/2019
pH of soil for fluid# determ.	pH units	7.8	9.2
pH of soil TCLP (after HCl)	pH units	2.0	1.8
Extraction fluid used	-	1	1
pH of final Leachate	pH units	5.0	5.2
Lead in TCLP	mg/L	<0.03	[NA]
Nickel in TCLP	mg/L	[NA]	0.1

Method ID	Methodology Summary
AS1289.3.6.3	Determination Particle Size Analysis using AS1289.3.6.3 and AS1289.3.6.1 and in house method INORG-107. Clay fraction at <2µm reported.
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. **NOTE** #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) **NOTE** #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
EXTRACT.7	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using in house method INORG-004. Please note that the mass used may be scaled down from the default based on sample mass available.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-009	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-AES analytical finish.
Metals-020	Determination of various metals by ICP-AES.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.

Method ID	Methodology Summary
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			05/08/2019	[NT]	[NT]	[NT]	[NT]	05/08/2019	[NT]
Date analysed	-			06/08/2019	[NT]	[NT]	[NT]	[NT]	06/08/2019	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	96	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	96	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	[NT]	[NT]	110	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	[NT]	[NT]	99	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	91	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	91	[NT]
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	98	[NT]	[NT]	[NT]	[NT]	95	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			05/08/2019	[NT]	[NT]	[NT]	[NT]	05/08/2019	[NT]
Date analysed	-			06/08/2019	[NT]	[NT]	[NT]	[NT]	06/08/2019	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	105	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	104	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	125	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	105	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	104	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	125	[NT]
Surrogate o-Terphenyl	%		Org-003	87	[NT]	[NT]	[NT]	[NT]	107	[NT]

QUALITY CONTROL: sTPH in Soil (C10-C40)-Silica						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			05/08/2019	[NT]	[NT]	[NT]	[NT]	05/08/2019	[NT]
Date analysed	-			07/08/2019	[NT]	[NT]	[NT]	[NT]	07/08/2019	[NT]
TPH C_{10} - C_{14}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	90	[NT]
TPH C_{15} - C_{28}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	103	[NT]
TPH C_{29} - C_{36}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	71	[NT]
TPH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	90	[NT]
TPH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	103	[NT]
TPH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	71	[NT]
Surrogate o-Terphenyl	%		Org-003	75	[NT]	[NT]	[NT]	[NT]	115	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			05/08/2019	[NT]	[NT]	[NT]	[NT]	05/08/2019	[NT]
Date analysed	-			06/08/2019	[NT]	[NT]	[NT]	[NT]	06/08/2019	[NT]
Naphthalene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Phenanthrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	[NT]	[NT]	[NT]	[NT]	125	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	94	[NT]	[NT]	[NT]	[NT]	89	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			05/08/2019	[NT]	[NT]	[NT]	[NT]	05/08/2019	[NT]
Date analysed	-			05/08/2019	[NT]	[NT]	[NT]	[NT]	05/08/2019	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	104	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	104	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			06/08/2019	[NT]	[NT]	[NT]	[NT]	06/08/2019	[NT]
Date analysed	-			06/08/2019	[NT]	[NT]	[NT]	[NT]	06/08/2019	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			07/08/2019	[NT]	[NT]	[NT]	[NT]	07/08/2019	[NT]
Date analysed	-			07/08/2019	[NT]	[NT]	[NT]	[NT]	07/08/2019	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Exchangeable K	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Exchangeable Na	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]

QUALITY CONTROL: Metals in TCLP USEPA1311						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			05/08/2019	102	05/08/2019	05/08/2019		05/08/2019	[NT]
Date analysed	-			05/08/2019	102	05/08/2019	05/08/2019		05/08/2019	[NT]
Lead in TCLP	mg/L	0.03	Metals-020 ICP-AES	<0.03	[NT]	[NT]	[NT]	[NT]	94	[NT]
Nickel in TCLP	mg/L	0.02	Metals-020 ICP-AES	<0.02	102	0.1	0.09	11	97	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

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

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

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Report Comments

Asbestos-ID in soil: NEPM
This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013. This is reported outside our scope of NATA accreditation.

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

SAMPLE RECEIPT ADVICE

Client Details

Client	Environmental Investigation Services
Attention	Katrina Taylor

Sample Login Details

Your reference	E323507BT, Greenwich
Envirolab Reference	222520-A
Date Sample Received	26/07/2019
Date Instructions Received	02/07/2019
Date Results Expected to be Reported	09/08/2019

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	111 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	12.7
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	sTPH in Soil (C10-C40)-Silica	PAHs in Soil	Acid Extractable metalsin soil	Misc Inorg - Soil	CEC	Clay 50-120g	Asbestos ID - soils NEPM - ASB-001	Metals in TCLP USEPA1311	On Hold
BH1-0.2-0.3											✓
BH1-0.5-0.7											✓
BH1-0.75-0.95											✓
BH1-1.6-1.8											✓
BH1-2.8-3.0											✓
BH1-3.2-3.4											✓
BH1-4.0-4.1											✓
BH2-0.0-0.1										✓	
BH2-0.6-0.7											✓
BH2-1.0-1.1											✓
BH2-2.5-2.7	✓	✓		✓	✓						
BH3-0.1-0.2											✓
BH3-0.3-0.5											✓
BH3-0.5-0.6											✓
BH3-1.1-1.2											✓
BH4-0.1-0.2										✓	
BH4-0.2-0.3											✓
BH4-0.5-0.7											✓
BH4-1.3-1.4											✓
BH4-1.9-2.0											✓
BH4-2.4-2.5											✓
BH5-0.1-0.2											✓
BH5-0.2-0.3											✓
BH5-0.7-0.8	✓	✓		✓	✓						
BH6-0.1-0.2						✓	✓	✓		✓	
BH6-0.3-0.4											✓
BH6-0.6-0.7	✓	✓		✓	✓						
BH7-0.0-0.1											✓
BH7-0.5-0.6											✓
BH8-0.0-0.1											✓
BH8-0.3-0.4	✓	✓		✓	✓						
BH9-0.1-0.2											✓

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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	sTPH in Soil (C10-C40)-Silica	PAHs in Soil	Acid Extractable metalsin soil	Misc Inorg - Soil	CEC	Clay 50-120g	Asbestos ID - soils NEPM - ASB-001	Metals in TCLP USEPA1311	On Hold
BH9-0.4-0.6											✓
BH9-0.6-0.9											✓
BH9-1.1-1.2											✓
BH10-0.0-0.1											✓
BH10-0.1-0.2											✓
BH11-0.0-0.2											✓
BH11-0.2-0.4											✓
BH11-0.4-0.6											✓
BH12-0.3-0.5											✓
BH12-1.0-1.2											✓
BH12-2.0-2.2											✓
BH12-2.5-2.7											✓
BH12-2.8-3.1											✓
BH12-3.8-4.0											✓
BH13-0.0-0.2											✓
BH13-0.3-0.5											✓
BH14-0.05-0.25											✓
BH14-0.4-0.6											✓
BH14-0.65-0.8											✓
BH14-1.0-1.2	✓	✓		✓	✓						
BH14-1.4-1.6											✓
BH14-2.3-2.4											✓
BH15-0.0-0.3											✓
BH15-0.4-0.5											✓
BH15-0.5-0.7											✓
BH15-0.9-1.1											✓
BH16-0.0-0.15											✓
BH16-0.15-0.3											✓
BH16-0.3-0.5											✓
BH17-0.05-0.25											✓
BH17-0.25-0.45											✓
BH17-0.7-0.75											✓

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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	sTPH in Soil (C10-C40)-Silica	PAHs in Soil	Acid Extractable metalsin soil	Misc Inorg - Soil	CEC	Clay 50-120g	Asbestos ID - soils NEPM - ASB-001	Metals in TCLP USEPA1311	On Hold
BH17-0.75-0.85											✓
BH18-0.05-0.25										✓	
BH18-0.25-0.4											✓
BH18-0.4-0.6											✓
BH18-0.6-0.8											✓
BH18-0.9-1.1											✓
BH19-0.0-0.1						✓	✓	✓			
BH19-0.1-0.2											✓
BH20-0.0-0.2									✓		
BH21-0.05-0.3											✓
BH21-0.3-0.6											✓
BH21-0.6-0.9	✓	✓		✓	✓						
BH21-0.9-1.1											✓
BH22-0.05-0.2										✓	
BH22-0.3-0.5											✓
BH22-0.6-0.8											✓
BH23-0.0-0.1			✓							✓	
BH23-0.3-0.4	✓	✓		✓	✓						
BH24-0.0-0.3											✓
BH24-0.3-0.5											✓
BH24-0.5-0.7											✓
BH25-0.0-0.2											✓
BH26-0.0-0.1											✓
BH26-0.1-0.3											✓
BH26-0.3-0.5											✓
BH27-0.0-0.2											✓
BH27-0.25-0.45											✓
BH27-0.5-0.7											✓
BH28-0.0-0.2											✓
BH28-0.2-0.3											✓
BH28-0.3-0.5											✓
BH29-0.0-0.2											✓

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

Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	sTPH in Soil (C10-C40)-Silica	PAHs in Soil	Acid Extractable metalsin soil	Misc Inorg - Soil	CEC	Clay 50-120g	Asbestos ID - soils NEPM - ASB-001	Metals in TCLP USEPA1311	On Hold
BH29-0.3-0.4											✓
BH29-0.5-0.7											✓
BH29-0.8-0.9											✓
BH29-0.9-1.1											✓
BH29-1.1-0.3											✓
BH30-0.05-0.15						✓	✓	✓		✓	
BH30-0.15-0.3											✓
BH30-0.3-0.45											✓
BH30-0.45-0.6											✓
BH30-0.6-0.7											✓
DUPKT1											✓
DUMP1											✓
DUMP3											✓
TB1											✓
BH5-1.3-1.5											✓
BH1 - [TRIPLICATE]-0.2-0.3											✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

Jessica Hie

From: Katrina Taylor <KTaylor@jkenvironments.com.au>
Sent: Friday, 2 August 2019 11:18 AM
To: Samplereceipt; Simon Song
Subject: RE: Results for Registration 222520 E323507BT, Greenwich

Morning,

Please schedule the following analysis for samples from the above referenced job on standard turnaround:

pH/CEC/clay content	Asbestos 500ml	TCLP Lead	TCLP Nickel (16)	Combo 3	TRH silica clean up
BH6 (0.1-0.2) (25) BH19 (0.0-0.1) (71) BH30 (0.05-0.15) (102)	BH20 (0.0-0.2) (73)	BH2 (0.0-0.1) (8) BH23 (0.0-0.1) (81)	BH4 (0.1-0.2) BH6 (0.1-0.2) (25) BH18 (0.05-0.25) (66) BH22 (0.05-0.2) (78) BH30 (0.05-0.15) (102)	BH2 (2.5-2.7) (11) BH5 (0.7-0.8) (24) BH6 (0.6-0.7) (27) BH8 (0.3-0.4) (31) BH14 (1.0-1.2) (52) BH21 (0.6-0.9) (76) BH23 (0.3-0.4) (82)	BH23 (0.0-0.1) (81)

222520-A
Due: 9/8/19
Std TAT.

Regards
Katrina Taylor
Senior Environmental Scientist
NSW Licensed Asbestos Assessor

T: +612 9888 5000
E: KTaylor@jkenvironments.com.au
www.jkenvironments.com.au

PO Box 976
NORTH RYDE BC NSW 1670
115 Wicks Road
MACQUARIE PARK NSW 2113

JKEnvironments

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From: Ken Nguyen [mailto:KNguyen@envirolab.com.au]
Sent: Thursday, 1 August 2019 6:57 PM
To: Katrina Taylor <KTaylor@jkenvironments.com.au>
Subject: Results for Registration 222520 E323507BT, Greenwich

Please refer to attached for:
a copy of the Certificate of Analysis
a copy of the COC/paperwork received from you
an Excel or .csv file containing the results
Please note that a hard copy will not be posted.

Enquiries should be made directly to:

customerservice@envirolab.com.au

Regards,

Ken Nguyen | Customer Service / Chemist | Envirolab Services Pty Ltd
(Monday to Friday 1pm to 9pm)

Great Science, Great Service.

12 Ashley Street Chatswood NSW 2067
T 612 9910 6200 **F** 612 9910 6201
E knguyen@envirolab.com.au | **W** www.envirolab.com.au

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Emerging Contaminants ● Forensic

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PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING THIS EMAIL

New sampling bottle provision now available for PFAS and SVOCs in water samples

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

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Envirolab Services Pty Ltd
ABN 37 112 535 645 - 002
25 Research Drive Croydon South VIC 3136
ph 03 9763 2500 fax 03 9763 2633
melbourne@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 17565

Client Details

Client	Environmental Investigation Services
Attention	Katrina Taylor
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E323507BT**
Number of Samples	2 Soil
Date samples received	30/07/2019
Date completed instructions received	30/07/2019

Analysis Details

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

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

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

Report Details

Date results requested by	05/08/2019
Date of Issue	05/08/2019

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Results Approved By
Chris De Luca, Operations Manager

Authorised By



Pamela Adams, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil			
Our Reference		17565-1	17565-2
Your Reference	UNITS	DUPKT2	DUPMP2
Date Sampled		25/07/2019	24/07/2019
Type of sample		Soil	Soil
Date extracted	-	31/07/2019	31/07/2019
Date analysed	-	31/07/2019	31/07/2019
vTRH C_6 - C_9	mg/kg	<25	<25
vTRH C_6 - C_{10}	mg/kg	<25	<25
TRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25
Benzene	mg/kg	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1
m+p-xylene	mg/kg	<2	<2
o-Xylene	mg/kg	<1	<1
Naphthalene	mg/kg	<1	<1
Total +ve Xylenes	mg/kg	<1	<1
Surrogate aaa-Trifluorotoluene	%	96	102

TRH Soil C10-C40 NEPM			
Our Reference	UNITS	17565-1	17565-2
Your Reference		DUPKT2	DUPMP2
Date Sampled		25/07/2019	24/07/2019
Type of sample		Soil	Soil
Date extracted	-	31/07/2019	31/07/2019
Date analysed	-	31/07/2019	31/07/2019
TRH C_{10} - C_{14}	mg/kg	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100
TRH C_{29} - C_{36}	mg/kg	160	<100
Total +ve TRH (C10-C36)	mg/kg	160	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50
TRH >C_{16} -C_{34}	mg/kg	160	100
TRH >C_{34} -C_{40}	mg/kg	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	160	100
Surrogate o-Terphenyl	%	89	87

PAHs in Soil			
Our Reference		17565-1	17565-2
Your Reference	UNITS	DUPKT2	DUPMP2
Date Sampled		25/07/2019	24/07/2019
Type of sample		Soil	Soil
Date extracted	-	31/07/2019	31/07/2019
Date analysed	-	01/08/2019	01/08/2019
Naphthalene	mg/kg	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	0.3	<0.1
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	0.8	<0.1
Pyrene	mg/kg	0.8	<0.1
Benzo(a)anthracene	mg/kg	0.4	<0.1
Chrysene	mg/kg	0.4	<0.1
Benzo(b,j&k)fluoranthene	mg/kg	0.8	<0.2
Benzo(a)pyrene	mg/kg	0.45	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	0.3	<0.1
Dibenzo(a,h)anthracene	mg/kg	0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.3	<0.1
Total +ve PAH's	mg/kg	4.6	<0.05
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	0.7	<0.5
Benzo(a)pyrene TEQ calc (Half)	mg/kg	0.7	<0.5
Benzo(a)pyrene TEQ calc (PQL)	mg/kg	0.7	<0.5
Surrogate p-Terphenyl-d_{14}	%	86	88

Acid Extractable metals in soil			
Our Reference	UNITS	17565-1	17565-2
Your Reference		DUPKT2	DUPMP2
Date Sampled		25/07/2019	24/07/2019
Type of sample		Soil	Soil
Date digested	-	31/07/2019	31/07/2019
Date analysed	-	01/08/2019	01/08/2019
Arsenic	mg/kg	4	<4
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	13	16
Copper	mg/kg	16	27
Lead	mg/kg	88	57
Mercury	mg/kg	0.2	<0.1
Nickel	mg/kg	2	29
Zinc	mg/kg	78	150

Moisture			
Our Reference		17565-1	17565-2
Your Reference	UNITS	DUPKT2	DUPMP2
Date Sampled		25/07/2019	24/07/2019
Type of sample		Soil	Soil
Date prepared	-	31/07/2019	31/07/2019
Date analysed	-	01/08/2019	01/08/2019
Moisture	%	23	15

Method ID	Methodology Summary
Inorg-008	Moisture content determined by heating at 105 deg C for a minimum of 12 hours.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			31/07/2019	[NT]	[NT]	[NT]	[NT]	31/07/2019	[NT]
Date analysed	-			31/07/2019	[NT]	[NT]	[NT]	[NT]	31/07/2019	[NT]
vTRH C_6 - C_9	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	99	[NT]
vTRH C_6 - C_{10}	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	99	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	[NT]	[NT]	103	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	[NT]	[NT]	101	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	98	[NT]
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	101	[NT]	[NT]	[NT]	[NT]	100	[NT]

QUALITY CONTROL: TRH Soil C10-C40 NEPM					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			31/07/2019	[NT]	[NT]	[NT]	[NT]	31/07/2019	[NT]
Date analysed	-			01/08/2019	[NT]	[NT]	[NT]	[NT]	01/08/2019	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	90	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	97	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	80	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	90	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	97	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	80	[NT]
Surrogate o-Terphenyl	%		Org-003	84	[NT]	[NT]	[NT]	[NT]	79	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			31/07/2019	[NT]	[NT]	[NT]	[NT]	31/07/2019	[NT]
Date analysed	-			01/08/2019	[NT]	[NT]	[NT]	[NT]	01/08/2019	[NT]
Naphthalene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Phenanthrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Benzo(b,j&k)fluoranthene	mg/kg	0.2	Org-012	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	[NT]	[NT]	[NT]	[NT]	76	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d_{14}	%		Org-012	94	[NT]	[NT]	[NT]	[NT]	84	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date digested	-			31/07/2019	[NT]	[NT]	[NT]	[NT]	31/07/2019	[NT]
Date analysed	-			01/08/2019	[NT]	[NT]	[NT]	[NT]	01/08/2019	[NT]
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	[NT]	[NT]	101	[NT]
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	[NT]	[NT]	[NT]	[NT]	105	[NT]
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	[NT]	[NT]	127	[NT]
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

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

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

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Envirolab Services Pty Ltd
ABN 37 112 535 645 - 002
25 Research Drive Croydon South VIC 3136
ph 03 9763 2500 fax 03 9763 2633
melbourne@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Environmental Investigation Services
Attention	Katrina Taylor

Sample Login Details

Your reference	E323507BT
Envirolab Reference	17565
Date Sample Received	30/07/2019
Date Instructions Received	30/07/2019
Date Results Expected to be Reported	05/08/2019

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	2 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	9.7
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Pamela Adams	Analisa Mathrick
Phone: 03 9763 2500	**Phone: 03 9763 2500**
Fax: 03 9763 2633	**Fax: 03 9763 2633**
Email: padams@envirolab.com.au	**Email: amathrick@envirolab.com.au**

Analysis Underway, details on the following page:

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Sample ID	vTRH(C6-C10)/BTEXN in Soil	TRH Soil C10-C40 NEPM	PAHs in Soil	Acid Extractable metalsin soil
DUPKT2	✓	✓	✓	✓
DUPMP2	✓	✓	✓	✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen	EIS Job Number: E323507BT Date Results Required: STANDARD Page: 4 of 4	JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: ktaylor@jkenvironments.com.au

Location:	Greenwich	Sample Preserved in Esky on Ice
Sampler:	SM / MMP	Tests Required

	Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 6a	Combo 3	Asbestos (500ml)	VOCs	BTEX
	24/07/2019	83	BH24	0.0-0.3	G	0	Fill	X				
		84		0.3-0.5	G	0	Fill					
		85		0.5-0.7	G	0	Fill					
	24/07/2019	86	BH25	0.0-0.2	G	0	Fill	X				
	24/07/2019	87	BH26	0.0-0.1	G	0	Fill	X				
		88		0.1-0.3	G	0	Fill					
		89		0.3-0.5	G	0	Natural					
	24/07/2019	90	BH27	0.0-0.2	G	0	Fill	X				
		91		0.25-0.45	G	0	Fill					
		92		0.5-0.7	G	0	Natural					
	24/07/2019	93	BH28	0.0-0.2	G	0	Fill	X				
		94		0.2-0.3	G	0	Fill					
		95		0.3-0.5	G	0	Natural					
	24/07/2019	96	BH29	0.0-0.2	G	0	Fill	X				
		97		0.3-0.4	G	0	Fill					
		98		0.5-0.7	G	0	Fill					
		99		0.8-0.9	G	0	Fill					
		100		0.9-1.1	G	0	Fill					
		101		1.1-1.3	G	0	Natural					
	24/07/2019	102	BH30	0.05-0.15	G	0	Fill	X				
		103		0.15-0.3	G	0	Fill					
		104		0.3-0.45	G	0	Fill					
		105		0.45-0.6	G	0	Fill					
		106		0.6-0.7	G	0	Fill					
	22/07/2019	107	DUPKT1	-	G	0	Fill		X			
1	25/07/2019	~~8~~	DUPKT2	-	G	0	Fill		X			
	24/07/2019	108	DUPMP1	-	G	0	Fill		X			
2	24/07/2019	~~9~~	DUPMP2	-	G	0	Fill		X			
	24/07/2019	109	DUPMP3	-	G	0	Fill					
	22-25/7/2019	110	TB1	-	G	0	Sand					X

Envirolab Services
~~25 Research Drive~~
Croydon South VIC 3136
~~Ph: (03) 9763 2500~~

Job No: 17565
Date Received: 29/7/19
Time Received: 13
Received By: GS 9.7
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Remarks (comments/detection limits required):
Please send DUPKT2 and DUPMP2 to Emvirolab melbourne
111 BH5 1.3-1.5 (Extra) Kev.

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

Relinquished By:	Date:	Time:	Received By:	Date:
Tony Doherty, ELS	29/07/2019	11:37	Kevin Ly	26/7

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

CERTIFICATE OF ANALYSIS 223069

Client Details

Client	Environmental Investigation Services
Attention	Katrina Taylor
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E32507BT, Greenwich**
Number of Samples	2 WATER
Date samples received	01/08/2019
Date completed instructions received	01/08/2019

Analysis Details

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

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

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

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

Report Details

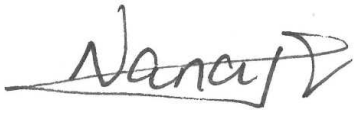
Date results requested by	08/08/2019
Date of Issue	08/08/2019

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Results Approved By
Jaimie Loa-Kum-Cheung, Metals Supervisor
Priya Samarawickrama, Senior Chemist
Steven Luong, Organics Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

VOCs in water		
Our Reference		223069-1
Your Reference	UNITS	MW7
Date Sampled		01/08/2019
Type of sample		WATER
Date extracted	-	05/08/2019
Date analysed	-	06/08/2019
Dichlorodifluoromethane	µg/L	<10
Chloromethane	µg/L	<10
Vinyl Chloride	µg/L	<10
Bromomethane	µg/L	<10
Chloroethane	µg/L	<10
Trichlorofluoromethane	µg/L	<10
1,1-Dichloroethene	µg/L	<1
Trans-1,2-dichloroethene	µg/L	<1
1,1-dichloroethane	µg/L	<1
Cis-1,2-dichloroethene	µg/L	<1
Bromochloromethane	µg/L	<1
Chloroform	µg/L	18
2,2-dichloropropane	µg/L	<1
1,2-dichloroethane	µg/L	<1
1,1,1-trichloroethane	µg/L	<1
1,1-dichloropropene	µg/L	<1
Cyclohexane	µg/L	<1
Carbon tetrachloride	µg/L	<1
Benzene	µg/L	<1
Dibromomethane	µg/L	<1
1,2-dichloropropane	µg/L	<1
Trichloroethene	µg/L	<1
Bromodichloromethane	µg/L	14
trans-1,3-dichloropropene	µg/L	<1
cis-1,3-dichloropropene	µg/L	<1
1,1,2-trichloroethane	µg/L	<1
Toluene	µg/L	4
1,3-dichloropropane	µg/L	<1
Dibromochloromethane	µg/L	6
1,2-dibromoethane	µg/L	<1
Tetrachloroethene	µg/L	<1
1,1,1,2-tetrachloroethane	µg/L	<1
Chlorobenzene	µg/L	<1
Ethylbenzene	µg/L	<1

VOCs in water		
Our Reference		223069-1
Your Reference	UNITS	MW7
Date Sampled		01/08/2019
Type of sample		WATER
Bromoform	µg/L	<1
m+p-xylene	µg/L	8
Styrene	µg/L	<1
1,1,2,2-tetrachloroethane	µg/L	<1
o-xylene	µg/L	7
1,2,3-trichloropropane	µg/L	<1
Isopropylbenzene	µg/L	<1
Bromobenzene	µg/L	<1
n-propyl benzene	µg/L	<1
2-chlorotoluene	µg/L	<1
4-chlorotoluene	µg/L	<1
1,3,5-trimethyl benzene	µg/L	3
Tert-butyl benzene	µg/L	<1
1,2,4-trimethyl benzene	µg/L	9
1,3-dichlorobenzene	µg/L	<1
Sec-butyl benzene	µg/L	<1
1,4-dichlorobenzene	µg/L	<1
4-isopropyl toluene	µg/L	1
1,2-dichlorobenzene	µg/L	<1
n-butyl benzene	µg/L	<1
1,2-dibromo-3-chloropropane	µg/L	<1
1,2,4-trichlorobenzene	µg/L	<1
Hexachlorobutadiene	µg/L	<1
1,2,3-trichlorobenzene	µg/L	<1
Surrogate Dibromofluoromethane	%	99
Surrogate toluene-d8	%	100
Surrogate 4-BFB	%	103

vTRH(C6-C10)/BTEXN in Water			
Our Reference	UNITS	223069-1	223069-2
Your Reference		MW7	TS
Date Sampled		01/08/2019	01/08/2019
Type of sample		WATER	WATER
Date extracted	-	05/08/2019	05/08/2019
Date analysed	-	06/08/2019	06/08/2019
TRH C_6 - C_9	µg/L	<10	[NA]
TRH C_6 - C_{10}	µg/L	38	[NA]
TRH C_6 - C_{10} less BTEX (F1)	µg/L	19	[NA]
Benzene	µg/L	<1	131%
Toluene	µg/L	4	120%
Ethylbenzene	µg/L	<1	120%
m+p-xylene	µg/L	8	116%
o-xylene	µg/L	7	118%
Naphthalene	µg/L	<1	[NA]
Surrogate Dibromofluoromethane	%	99	101
Surrogate toluene-d8	%	100	103
Surrogate 4-BFB	%	103	104

svTRH (C10-C40) in Water		
Our Reference		223069-1
Your Reference	UNITS	MW7
Date Sampled		01/08/2019
Type of sample		WATER
Date extracted	-	05/08/2019
Date analysed	-	06/08/2019
TRH C_{10} - C_{14}	µg/L	240
TRH C_{15} - C_{28}	µg/L	120
TRH C_{29} - C_{36}	µg/L	<100
TRH >C_{10} - C_{16}	µg/L	300
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	300
TRH >C_{16} - C_{34}	µg/L	<100
TRH >C_{34} - C_{40}	µg/L	<100
Surrogate o-Terphenyl	%	85

PAHs in Water - Low Level		
Our Reference		223069-1
Your Reference	UNITS	MW7
Date Sampled		01/08/2019
Type of sample		WATER
Date extracted	-	05/08/2019
Date analysed	-	06/08/2019
Naphthalene	µg/L	<0.2
Acenaphthylene	µg/L	<0.1
Acenaphthene	µg/L	<0.1
Fluorene	µg/L	<0.1
Phenanthrene	µg/L	<0.1
Anthracene	µg/L	<0.1
Fluoranthene	µg/L	<0.1
Pyrene	µg/L	<0.1
Benzo(a)anthracene	µg/L	<0.1
Chrysene	µg/L	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2
Benzo(a)pyrene	µg/L	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5
Total +ve PAH's	µg/L	NIL (+)VE
Surrogate p-Terphenyl-d14	%	98

HM in water - dissolved		
Our Reference	UNITS	223069-1
Your Reference		MW7
Date Sampled		01/08/2019
Type of sample		WATER
Date prepared	-	05/08/2019
Date analysed	-	05/08/2019
Arsenic-Dissolved	µg/L	<1
Cadmium-Dissolved	µg/L	<0.1
Chromium-Dissolved	µg/L	<1
Copper-Dissolved	µg/L	2
Lead-Dissolved	µg/L	<1
Mercury-Dissolved	µg/L	<0.05
Nickel-Dissolved	µg/L	2
Zinc-Dissolved	µg/L	4

Miscellaneous Inorganics		
Our Reference	UNITS	223069-1
Your Reference		MW7
Date Sampled		01/08/2019
Type of sample		WATER
Date prepared	-	02/08/2019
Date analysed	-	02/08/2019
pH	pH Units	6.7
Electrical Conductivity	µS/cm	270

Method ID	Methodology Summary
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25°C in accordance with APHA latest edition 2510 and Rayment & Lyons.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-013	Water samples are analysed directly by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

QUALITY CONTROL: VOCs in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			05/08/2019	[NT]	[NT]	[NT]	[NT]	05/08/2019	[NT]
Date analysed	-			06/08/2019	[NT]	[NT]	[NT]	[NT]	06/08/2019	[NT]
Dichlorodifluoromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromomethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroform	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
2,2-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,1-trichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	84	[NT]
1,1-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Cyclohexane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibromomethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	89	[NT]
Bromodichloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	88	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Toluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	86	[NT]
1,2-dibromoethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromoform	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
m+p-xylene	µg/L	2	Org-013	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Styrene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

QUALITY CONTROL: VOCs in water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
o-xylene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-013	99	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate toluene-d8	%		Org-013	100	[NT]	[NT]	[NT]	[NT]	101	[NT]
Surrogate 4-BFB	%		Org-013	101	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			05/08/2019	[NT]	[NT]	[NT]	[NT]	05/08/2019	[NT]
Date analysed	-			06/08/2019	[NT]	[NT]	[NT]	[NT]	06/08/2019	[NT]
TRH C_6 - C_9	µg/L	10	Org-016	<10	[NT]	[NT]	[NT]	[NT]	88	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-016	<10	[NT]	[NT]	[NT]	[NT]	88	[NT]
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	89	[NT]
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	89	[NT]
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	87	[NT]
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	89	[NT]
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Naphthalene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-016	99	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate toluene-d8	%		Org-016	100	[NT]	[NT]	[NT]	[NT]	101	[NT]
Surrogate 4-BFB	%		Org-016	101	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			05/08/2019	[NT]	[NT]	[NT]	[NT]	05/08/2019	[NT]
Date analysed	-			05/08/2019	[NT]	[NT]	[NT]	[NT]	05/08/2019	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	78	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	73	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	89	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	78	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	73	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	89	[NT]
Surrogate o-Terphenyl	%		Org-003	75	[NT]	[NT]	[NT]	[NT]	80	[NT]

QUALITY CONTROL: PAHs in Water - Low Level						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			05/08/2019	[NT]	[NT]	[NT]	[NT]	05/08/2019	[NT]
Date analysed	-			06/08/2019	[NT]	[NT]	[NT]	[NT]	06/08/2019	[NT]
Naphthalene	µg/L	0.2	Org-012	<0.2	[NT]	[NT]	[NT]	[NT]	90	[NT]
Acenaphthylene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	84	[NT]
Phenanthrene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	76	[NT]
Anthracene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	70	[NT]
Pyrene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	74	[NT]
Benzo(a)anthracene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	70	[NT]
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-012	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	70	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	88	[NT]	[NT]	[NT]	[NT]	81	[NT]

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date prepared	-			05/08/2019	[NT]	[NT]	[NT]	[NT]	05/08/2019	[NT]
Date analysed	-			05/08/2019	[NT]	[NT]	[NT]	[NT]	05/08/2019	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	[NT]	[NT]	96	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			02/08/2019	[NT]	[NT]	[NT]	[NT]	02/08/2019	[NT]
Date analysed	-			02/08/2019	[NT]	[NT]	[NT]	[NT]	02/08/2019	[NT]
pH	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	102	[NT]
Electrical Conductivity	µS/cm	1	Inorg-002	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

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

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

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Report Comments

Dissolved Metals: no filtered, preserved sample was received, therefore the unpreserved sample was filtered through 0.45µm filter at the lab. Note: there is a possibility some elements may be underestimated.

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

SAMPLE RECEIPT ADVICE

Client Details

Client	Environmental Investigation Services
Attention	Katrina Taylor

Sample Login Details

Your reference	E32507BT, Greenwich
Envirolab Reference	223069
Date Sample Received	01/08/2019
Date Instructions Received	01/08/2019
Date Results Expected to be Reported	08/08/2019

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	2 WATER
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	1.2
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

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

Sample ID	VOCs in water	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHs in Water - Low Level	HM in water - dissolved	pH	Electrical Conductivity
MW7	✓	✓	✓	✓	✓	✓	✓
TS		✓					

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen	EIS Job Number: E32507BT Date Results Required: STANDARD Page: 1 of 1	JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: ktaylor@jkenvironments.com.au

Location:	Greenwich					Sample Preserved in Esky on Ice										
Sampler:	MMP					Tests Required										
Date Sampled	Lab Ref:	Sample Number	Sample Containers	PID	Sample Description	Combo 3L	VOCs	pH / EC	BTEX							
01/08/2019	1	MW7	2x G1, 4xV	24.1	Water	X	X	X								
01/08/2019	2	TS	1X V	-	Water				X							

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

Relinquished By:	Date:	Time:	Received By:	Date:
		15:31	R	1/8/19.

ENVIROLAB GROUP

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

Job No: 223069
Date Received: 1/8/2019
Time Received: 15:31
Received by: RZ
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Appendix G: Report Explanatory Notes

Standard Sampling Procedure

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

A. Soil Sampling

- Prepare a borehole/test pit log or made a note of the sample description for stockpiles.
- Layout sampling equipment on clean plastic sheeting to prevent direct contact with ground surface. The work area should be at a distance from the drill rig/excavator such that the machine can operate in a safe manner.
- Ensure all sampling equipment has been decontaminated prior to use.
- Remove any surface debris from the immediate area of the sampling location.
- Collect samples and place in glass jar with a Teflon seal. This should be undertaken as quickly as possible to prevent the loss of any volatiles. If possible, fill the glass jars completely.
- Collect samples for asbestos analysis and place in a zip-lock plastic bag.
- Label the sampling containers with the JKE job number, sample location (eg. BH1), sampling depth interval and date. If more than one sample container is used, this should also be indicated (eg. 2 = Sample jar 1 of 2 jars).
- Photoionisation detector (PID) screening of volatile organic compounds (VOCs) should be undertaken on samples using the soil sample headspace method. Headspace measurements are taken following equilibration of the headspace gasses in partly filled zip-lock plastic bags. PID headspace data is recorded on the borehole/test pit log and the chain of custody forms.
- Record the lithology of the sample and sample depth on the borehole/test pit log generally in accordance with AS1726-2017[27].
- Store the sample in a sample container cooled with ice or chill packs. On completion of the sampling the sample container should be delivered to the lab immediately or stored in the refrigerator prior to delivery to the lab. All samples are preserved in accordance with the standards outlined in the report.
- Check for the presence of groundwater after completion of each borehole using an electronic dip metre or water whistle. Boreholes should be left open until the end of fieldwork where it is safe to do so. All groundwater levels in the boreholes should be rechecked on the completion of the fieldwork.
- Backfill the boreholes/test pits with the excavation cuttings or clean sand prior to leaving the site.

B. Decontamination Procedures for Soil Sampling Equipment

- All sampling equipment should be decontaminated between every sampling location. This excludes single use PVC tubing used for push tubes etc. Equipment and materials required for the decontamination include:
  - Phosphate free detergent (Decon 90);
  - Potable water;
  - Stiff brushes; and
  - Plastic sheets.
- Ensure the decontamination materials are clean prior to proceeding with the decontamination.
- Fill both buckets with clean potable water and add phosphate free detergent to one bucket.
- In the bucket containing the detergent, scrub the sampling equipment until all the material attached to the equipment has been removed.
- Rinse sampling equipment in the bucket containing potable water.

[27] Standards Australia, (2017), *Geotechnical Site Investigations.* (AS1726-2017)

- Place cleaned equipment on clean plastic sheets.

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

C. Groundwater Sampling

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

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

- After monitoring well installation, at least three bore volumes should be pumped from the monitoring wells (well development) to remove any water introduced during the drilling process and/or the water that is disturbed during installation of the monitoring well. This should be completed prior to purging and sampling.
- Groundwater monitoring wells should then be left to recharge for at least three days before purging and sampling. Prior to purging or sampling, the condition of each well should observed and any anomalies recorded on the field data sheets. The following information should be noted: the condition of the well, noting any signs of damage, tampering or complete destruction; the condition and operation of the well lock; the condition of the protective casing and the cement footing (raised or cracked); and, the presence of water between protective casing and well.
- Measure the groundwater level from the collar of the piezometer/monitoring well using an electronic dip meter. The collar level should be taken (if required) during the site visit using a dumpy level and staff.
- Purging and sampling of piezometers/monitoring wells is done on the same site visit when using micro-purge (or other low flow) techniques.
- Layout and organize all equipment associated with groundwater sampling in a location where they will not interfere with the sampling procedure and will not pose a risk of contaminating samples. Equipment generally required includes:
  - Stericup single-use filters (for heavy metals samples);
  - Bucket with volume increments;
  - Sample containers: teflon bottles with 1 ml nitric acid, 75mL glass vials with 1 mL hydrochloric acid, 1 L amber glass bottles;
  - Bucket with volume increments;
  - Flow cell;
  - pH/EC/Eh/Temperature meters;
  - Plastic drums used for transportation of purged water;
  - Esky and ice;
  - Nitrile gloves;
  - Distilled water (for cleaning);
  - Electronic dip meter;
  - Low flow peristaltic pump and associated tubing; and
  - Groundwater sampling forms.
- Ensure all non-disposable sampling equipment is decontaminated or that new disposable equipment is available prior to any work commencing at a new location. The procedure for decontamination of groundwater equipment is outlined at the end of this section.

- Disposable gloves should be used whenever samples are taken to protect the sampler and to assist in avoidance of contamination.
- Groundwater samples are obtained from the monitoring wells using low flow sampling equipment to reduce the disturbance of the water column and loss of volatiles.
- During pumping to purge the well, the pH, temperature, conductivity, dissolved oxygen, redox potential and groundwater levels are monitored (where possible) using calibrated field instruments to assess the development of steady state conditions. Steady state conditions are generally considered to have been achieved when the difference in the pH measurements is less than 0.2 units, the difference in conductivity is less than 10% and whilst the well is no longer in draw-down.
- All measurements are recorded on specific data sheets.
- Once steady state conditions are considered to have been achieved, groundwater samples are obtained directly from the pump tubing and placed in appropriate glass bottles, BTEX vials or plastic bottles.
- All samples are preserved in accordance with water sampling requirements specified by the laboratory and placed in an insulated container with ice. Groundwater samples are preserved by immediate storage in an insulated sample container with ice.
- At the end of each water sampling complete a chain of custody form for samples being sent to the laboratory.

D. <u>Decontamination Procedures for Groundwater Sampling Equipment</u>

- All equipment associated with the groundwater sampling procedure (other than single-use items) are decontaminated between every sampling location.
- The following equipment and materials are required for the decontamination procedure:
  - Phosphate free detergent;
  - Potable water;
  - Distilled water; and
  - Plastic Sheets or bulk bags (plastic bags).
- Fill one bucket with clean potable water and phosphate free detergent, and one bucket with distilled water.
- Flush potable water and detergent through pump head. Wash sampling equipment and pump head using brushes in the bucket containing detergent until all materials attached to the equipment are removed.
- Flush pump head with distilled water.
- Change water and detergent solution after each sampling location.
- Rinse sampling equipment in the bucket containing distilled water.
- Place cleaned equipment on clean plastic sheets.
- If all materials are not removed by this procedure that equipment should not be used until it has been thoroughly cleaned

QA/QC Definitions

The QA/QC terms used in this report are defined below. The definitions are in accordance with US EPA publication SW-846, entitled *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (1994)[28] methods and those described in *Environmental Sampling and Analysis, A Practical Guide,* (1991)[29]. The NEPM (2013) is consistent with these documents.

A. Practical Quantitation Limit (PQL), Limit of Reporting (LOR) & Estimated Quantitation Limit (EQL)

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

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

B. Precision

The degree to which data generated from repeated measurements differ from one another due to random errors. Precision is measured using the standard deviation or Relative Percent Difference (RPD).

C. Accuracy

Accuracy is a measure of the agreement between an experimental result and the true value of the parameter being measured (i.e. the proximity of an averaged result to the true value, where all random errors have been statistically removed). The assessment of accuracy for an analysis can be achieved through the analysis of known reference materials or assessed by the analysis of surrogates, field blanks, trip spikes and matrix spikes. Accuracy is typically reported as percent recovery.

D. Representativeness

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

E. Completeness

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

- Chain-of-custody forms;
- Sample receipt form;
- All sample results reported;

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

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

- All blank data reported;
- All laboratory duplicate and RPDs calculated;
- All surrogate spike data reported;
- All matrix spike and lab control spike (LCS) data reported and RPDs calculated;
- Spike recovery acceptable limits reported; and
- NATA stamp on reports.

F. Comparability

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

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

G. Blanks

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

H. Matrix Spikes

Samples are spiked with laboratory grade standards to detect interactive effects between the sample matrix and the analytes being measured. Matrix Spikes are reported as a percent recovery and are prepared for 1 in every 20 samples. Sample batches that contain less than 20 samples may be reported with a Matrix Spike from another batch. The percent recovery is calculated using the formula below. Acceptable recovery limits are 70% to 130%.

$$\frac{\text{(Spike Sample Result – Sample Result) x 100}}{\text{Concentration of Spike Added}}$$

I. Surrogate Spikes

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

J. Duplicates

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

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

Appendix H: Data (QA/QC) Evaluation

Data (QA/QC) Evaluation

A. INTRODUCTION

This Data (QA/QC) Evaluation forms part of the validation process for the DQOs documented in Section 6.1 of this report. Checks were made to assess the data in terms of precision, accuracy, representativeness, comparability and completeness. These 'PARCC' parameters are referred to collectively as DQIs and are defined in the Report Explanatory Notes attached in the report appendices.

1. Field and Laboratory Considerations

The quality of the analytical data produced for this project has been considered in relation to the following:

- Sample collection, storage, transport and analysis;
- Laboratory PQLs;
- Field QA/QC results; and
- Laboratory QA/QC results.

2. Field QA/QC Samples and Analysis

A summary of the field QA/QC samples collected and analysed for this assessment is provided in the following table:

Sample Type	Sample Identification	Frequency (of Sample Type)	Analysis Performed
Intra-laboratory duplicate (soil)	DUPKT1 (primary sample BH1 0.2-0.3m)	Approximately 6% of primary samples	Heavy metals, TRH/BTEX, PAHs
Intra-laboratory duplicate (soil)	DUPMP1 (primary sample BH26 0.0-0.1m)	As above	As above
Inter-laboratory duplicate (soil)	DUPKT2 (primary sample BH10 0.0-0.1m)	Approximately 6% of primary samples	Heavy metals, TRH/BTEX, PAHs
Inter-laboratory duplicate (soil)	DUPMP2 (primary sample BH24 0.0-0.3m)	As above	As above
Trip blank (soil)	TB1 (22/7/2019)	One for the assessment to demonstrate adequacy of storage and transport methods	BTEX
Trip spike (water)	TS1 (1/8/2019)	One for the assessment to demonstrate adequacy of preservation, storage and transport methods	BTEX

The results for the field QA/QC samples are detailed in the laboratory summary tables (Table L-1 to Table N inclusive) attached to the assessment report and are discussed in the subsequent sections of this Data (QA/QC) Evaluation report.

3. Data Assessment Criteria

JKE adopted the following criteria for assessing the field and laboratory QA/QC analytical results:

Field Duplicates

Acceptable targets for precision of field duplicates in this report will be 30% or less, consistent with NEPM (2013). RPD failures will be considered qualitatively on a case-by-case basis taking into account factors such as the concentrations used to calculate the RPD (i.e. RPD exceedance where concentrations are close to the PQL are typically not as significant as those where concentrations are reported at least five or 10 times the PQL), sample type, collection methods and the specific analyte where the RPD exceedance was reported.

Field Blanks

Acceptable targets for field blank samples in this report will be less than the PQL for organic analytes. Metals will be considered on a case-by-case basis with regards to typical background concentrations in soils and published drinking water guidelines for waters.

Trip Spikes

Acceptable targets for trip spike samples in this report will be 70% to 130%. This is in line with spike recovery limits adopted by the laboratory for organic analysis.

Laboratory QA/QC

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

A summary of the acceptable limits adopted by the primary laboratory (Envirolab) is provided below:

RPDs

- Results that are <5 times the PQL, any RPD is acceptable; and
- Results >5 times the PQL, RPDs between 0-50% are acceptable.

Laboratory Control Samples (LCS) and Matrix Spikes

- 70-130% recovery acceptable for metals and inorganics;
- 60-140% recovery acceptable for organics; and
- 10-140% recovery acceptable for VOCs.

Surrogate Spikes

- 60-140% recovery acceptable for general organics; and
- 10-140% recovery acceptable for VOCs.

Method Blanks

- All results less than PQL.

B. DATA EVALUATION

1. Sample Collection, Storage, Transport and Analysis

Samples were collected by trained field staff in accordance with the JKE SSP. The SSP was developed to be consistent with relevant guidelines, including NEPM (2013) and other guidelines made under the CLM Act 1997.

Appropriate sample preservation, handling and storage procedures were adopted. Laboratory analysis was undertaken within specified holding times generally in accordance with Schedule B(3) of NEPM (2013) and the laboratory NATA accredited methodologies.

JKE note that the temperature on receipt of soil samples was reported to be up to 12.7°C. JKE understand that the temperature is measured at the laboratory using an infrared temperature probe by scanning the outside of the sample container (i.e. one sample jar/container at the time of registering the samples). This procedure is not considered to be robust as there is a potential for the outside of the jar to warm to ambient temperature, or at least to increase from that of the internal contents, relatively quickly. On this basis, JKE are of the opinion that the temperatures reported on the Sample Receipts are unlikely to be reliable or representative of the overall batch. This is further supported by the trip spike recovery results (discussed further below) which reported adequate recovery in the range of 116% to 131%.

Envirolab noted that the asbestos results were reported to be consistent with the recommendations in NEPM (2013), however this level of reporting is outside the scope of their NATA accreditation. In the absence of other available analytical methods for asbestos, this was found to be acceptable for the purpose of this assessment.

Review of the project data also indicated that:

- COC documentation was adequately maintained;
- Sample receipt advice documentation was provided for all sample batches;
- All analytical results were reported; and
- Consistent units were used to report the analysis results.

2. Laboratory PQLs

Appropriate PQLs were adopted for the analysis and all PQLs were below the SAC, with the exception of the anthracene PQL for groundwater analysis which was 10 times greater than the ecological SAC. In light of the PAH concentrations reported for soil and groundwater, JKE are of the opinion that this is not significant, and it does not affect the quality of the dataset as a whole or the outcome of the assessment.

3. Field QA/QC Sample Results

Field Duplicates

The results indicated that field precision was acceptable. RPD non-conformances were reported for some analytes as discussed below:

- Elevated RPDs were reported for copper and for several PAH compounds in DUPKT1/BH1 (0.2-0.3m);
- Elevated RPDs were reported for arsenic and TRH (F3) and TRH (F4) in DUPMP1/BH26 (0.0-0.1m);

- Elevated RPDs were reported for several heavy metals (arsenic, chromium, copper, lead, mercury and zinc), several PAH compounds and TRH (F3) in DUPKT2/BH10 (0.0-0.1m); and
- Elevated RPDs were reported for TRH (F3) and TRH (F4) in DUPMP2/BH24 (0.0-0.3m).

Values outside the acceptable limits have been attributed to sample heterogeneity and the difficulties associated with obtaining homogenous duplicate samples of heterogeneous matrices. There is also a higher risk of RPDs being outside of the acceptable limit when the measured concentrations are close to the PQL of the analytical technique. In this case small differences in the measured concentration s in the primary and duplicate sample can have a disproportionate impact on the RPD. Where applicable, the higher duplicate value has been adopted as a conservative measure (see attached report tables).

Field Blanks

During the investigation, one soil trip blank was placed in the esky during sampling and transported back to the laboratory. The results were all less than the PQLs, therefore cross contamination between samples that may have significance for data validity did not occur.

Trip Spikes

The results ranged from 116% to 131% and indicated that field preservation methods were appropriate.

4. Laboratory QA/QC

The analytical methods implemented by the laboratory were performed in accordance with their NATA accreditation and were consistent with Schedule B(3) of NEPM (2013). The frequency of data reported for the laboratory QA/QC (i.e. duplicates, spikes, blanks, LCS) was considered to be acceptable for the purpose of this assessment.

A review of the laboratory QA/QC data identified the following minor non-conformances:

Laboratory report 222520

- Percent recovery for the matrix spike for TRH C10-C40 was not possible to report as the high concentration of analytes in one sample caused interference;
- The laboratory RPD acceptance criteria was exceeded for one sample for lead and nickel. Therefore a triplicate result was issued; and
- The PQL was raised for OP's in soil due to interferences from analytes (other than those being tested) in one sample.

Laboratory report 223069

- A filtered, preserved sample was not received for the groundwater sample, therefore the unpreserved sample was filtered through a 0.45µm filter at the lab, therefore there is a possibility some elements may be underestimated.

C. DATA QUALITY SUMMARY

JKE 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.

Non-conformances were reported for some field QA/QC samples and laboratory QA/QC analysis. These non-conformances were considered to be sporadic and minor, and were not considered to be indicative of systematic sampling or analytical errors. On this basis, these non-conformances are not considered to materially impact the report findings.

There was only one groundwater monitoring event undertaken for the assessment. On this basis there is some uncertainty around the representativeness of the groundwater data, particularly during different climatic conditions and after wet/dry periods. However, given the low contaminant concentrations reported, the site history and the surrounding land uses, this is not considered to alter the conclusions of the assessment.

Appendix I: Field Work Documents

JKEnvironments

Client:	TSA	**Job No.:**	E32507BT
Project:	Proposed Hospital Redevelopment	**Well No.:**	MW2
Location:	97-115 River Road, GREENWICH, NSW	**Depth (m):**	2.3

WELL FINISH DETAILS

	Gatic Cover ☒	**Standpipe** ☐	**Other (describe)** ☐

WELL DEVELOPMENT DETAILS

Method:	–	**SWL – Before (m):**	Dry
Date:	25/7/19	**Time – Before:**	13.50
Undertaken By:	MMP	**SWL – After (m):**	–
Total Vol. Removed:	–	**Time – After:**	–
PID Reading (ppm):	–		

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	Temp (°C)	DO (mg/L)	EC (µS/m)	pH	Eh (mV)
Well Dry					

Comments:Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

YSI Used:

Tested By:	MMP
Date Tested:	25.7.19
Checked By:	KRS
Date:	26.7.19

Remarks:

- Steady state conditions
- Difference in the pH less than 0.2 units, difference in the conductiveity less than 10% and SWL stable/not in drawdown
- Minimum 3 monitoring well volumes purged, unless well purged until it is effectively dry

JKEnvironments

Client:	TSA	**Job No.:**	E32507BT
Project:	Proposed Hospital Redevelopment	**Well No.:**	MW4
Location:	97-115 River Road, GREENWICH, NSW	**Depth (m):**	2.4

WELL FINISH DETAILS

	Gatic Cover ☒	**Standpipe** ☐	**Other (describe)** ☐

WELL DEVELOPMENT DETAILS

Method:	–	**SWL – Before (m):**	Dry
Date:	25/7/19	**Time – Before:**	13.15
Undertaken By:	MMP	**SWL – After (m):**	–
Total Vol. Removed:	–	**Time – After:**	–
PID Reading (ppm):	–		

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	Temp (°C)	DO (mg/L)	EC (µS/m)	pH	Eh (mV)
Well Dry					

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

YSI Used:

Tested By:	MMP
Date Tested:	25.7.19
Checked By:	KRT
Date:	26.7.19

Remarks:

- Steady state conditions
- Difference in the pH less than 0.2 units, difference in the conductiveity less than 10% and SWL stable/not in drawdown
- Minimum 3 monitoring well volumes purged, unless well purged until it is effectively dry

JKEnvironments

Client:	TSA	**Job No.:**	E32507BT
Project:	Proposed Hospital Redevelopment	**Well No.:**	MW7
Location:	97-115 River Road, GREENWICH, NSW	**Depth (m):**	7.1

WELL FINISH DETAILS

	Gatic Cover ☒	Standpipe ☐	Other (describe) ☐

WELL DEVELOPMENT DETAILS

Method:	–	**SWL – Before (m):**	Well Dry
Date:	25/7/19	**Time – Before:**	13.30
Undertaken By:	MMP	**SWL – After (m):**	–
Total Vol. Removed:	–	**Time – After:**	–
PID Reading (ppm):	–		

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	Temp (°C)	DO (mg/L)	EC (µS/m)	pH	Eh (mV)
Well Dry					

Comments:Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

YSI Used:

Tested By:	25.7.19
Date Tested:	MMP.
Checked By:	~~KBS~~
Date:	26.7.19.

Remarks:

- Steady state conditions
- Difference in the pH less than 0.2 units, difference in the conductiveity less than 10% and SWL stable/not in drawdown
- Minimum 3 monitoring well volumes purged, unless well purged until it is effectively dry

JKEnvironments

Client:	TSA	**Job No.:**	E32507BT
Project:	Proposed Hospital Redevelopment	**Well No.:**	MW2
Location:	97-115 River Road, GREENWICH, NSW	**Depth (m):**	2.3

WELL FINISH

	Gatic Cover		**Standpipe**		**Other (describe)**

WELL PURGE DETAILS:

Method:	–	**SWL – Before:**	Dry
Date:	1/8/19	**Time – Before:**	–
Undertaken By:	MMP	**Total Vol Removed:**	–
Pump Program No:	–	**PID (ppm):**	0

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
Well Dry								

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

Sampling Containers Used: x glass amber, x BTEX vials, x HNO3 plastic, x H2SO4 plastic, x unpreserved plastic

YSI used:

Tested By: ~~Katrina Taylor~~ MMP	**Remarks:**
Date Tested: 1/8/19	- Steady state conditions
Checked By:	- difference in the pH less than 0.2 units, difference in conductivity less than 10% 10% and SWL stable/not in drawdown
Date: 5.8.19	

JKEnvironments

Client:	TSA	**Job No.:**	E32507BT
Project:	Proposed Hospital Redevelopment	**Well No.:**	MW4
Location:	97-115 River Road, GREENWICH, NSW	**Depth (m):**	2.4

WELL FINISH

X	Gatic Cover		Standpipe		Other (describe)

WELL PURGE DETAILS:

Method:	—	**SWL – Before:**	Dry
Date:	1/8/19	**Time – Before:**	—
Undertaken By:	NMP	**Total Vol Removed:**	—
Pump Program No:	—	**PID (ppm):**	0

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
well Dry								

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

Sampling Containers Used: x glass amber, x BTEX vials, x HNO3 plastic, x H2SO4 plastic, x unpreserved plastic

YSI used:

Tested By: ~~Katrina Taylor~~ NMP	**Remarks:**
Date Tested: 1/8/19	- Steady state conditions - difference in the pH less than 0.2 units, difference in conductivity less than 10%
Checked By: [illegible]	10% and SWL stable/not in drawdown
Date: 5.8.19	

JKEnvironments

Client:	TSA	**Job No.:**	E32507BT
Project:	Proposed Hospital Redevelopment	**Well No.:**	MW7
Location:	97-115 River Road, GREENWICH, NSW	**Depth (m):**	7.1

WELL FINISH

X	**Gatic Cover**		**Standpipe**		**Other (describe)**

WELL PURGE DETAILS:

Method:	Peri Pump	**SWL – Before:**	6.35
Date:	1/8/19	**Time – Before:**	0850
Undertaken By:	MMP	**Total Vol Removed:**	3L
Pump Program No:		**PID (ppm):**	241

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
0908	6.5	0.5		17.5	7.7	181.9	6.63	172.7
0920	8.60	1.0		17.7	2.9	275.4	6.89	94
0922	6.75	1.5		18.0	3.2	264.9	6.119	26.8
0924	6.8	2		18.1	3.4	259.9	6.95	33.0
Sampling								

Comments: Odours (YES / (NO)), NAPL/PSH (YES / (NO)), Sheen (YES / (NO)), Steady State Achieved (YES / (NO)

Sampling Containers Used: 1 x glass amber, 4 x BTEX vials, ○ x HNO3 plastic, ○ x H2SO4 plastic, ○ x unpreserved plastic

YSI used: Ran dry

Tested By: ~~Katrina Taylor~~ MMP

Date Tested: 1/8/19

Checked By:

Date: 5.8.19

Remarks:

- Steady state conditions
- difference in the pH less than 0.2 units, difference in conductivity less than 10% 10% and SWL stable/not in drawdown

Appendix J: Guidelines and Reference Documents

Acid Sulfate Soils Management Advisory Committee (ASSMAC), (1998). Acid Sulfate Soils Manual

Australian and New Zealand Environment Conservation Council (ANZECC), (2000). Australian and New Zealand Guidelines for Fresh and Marine Water Quality

Canadian Council of Ministers of the Environment, (1999). Canadian soil quality guidelines for the protection of environmental and human health: Benzo(a)Pyrene (1997)

CRC Care, (2011). Technical Report No. 10 – Health screening levels for hydrocarbons in soil and groundwater Part 1: Technical development document

Contaminated Land Management Act 1997 (NSW)

Department of Land and Water Conservation, (1997). 1:25,000 Acid Sulfate Soil Risk Map Series

Managing Land Contamination, Planning Guidelines SEPP55 – Remediation of Land (1998)

National Health and Medical Research Council (NHMRC), (2018). National Water Quality Management Strategy, Australian Drinking Water Guidelines 2011

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

NSW EPA, (1995). Contaminated Sites Sampling Design Guidelines

NSW EPA, (2014). Waste Classification Guidelines - Part 1: Classifying Waste

NSW EPA, (2015). Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997

NSW EPA, (2017). Guidelines for the NSW Site Auditor Scheme, 3rd Edition

National Environment Protection Council (NEPC), (2013). National Environmental Protection (Assessment of Site Contamination) Measure 1999 as amended (2013)

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

Protection of the Environment Operations Act 1997 (NSW)

State Environmental Planning Policy No.55 – Remediation of Land 1998 (NSW)

World Health Organisation (WHO), (2008). Petroleum Products in Drinking-water, Background document for the development of WHO Guidelines for Drinking Water Quality

Western Australia Department of Health, (2009). Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia