REPORT TO

ALLEN JACK + COTTIER

ON

DETAILED SITE INVESTIGATION

FOR

PROPOSED STAGE 1 WORKS AREA

AT

LORETO NORMANHURST GIRLS SCHOOL, 91-93 PENNANT HILLS ROAD, NORMANHURST, NSW

Date: 24 May 2019

Ref: E31772KLrpt5

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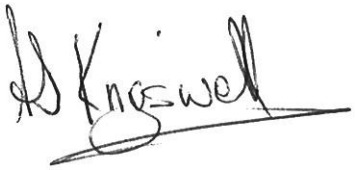

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Executive Summary

Allen Jack + Cottier ('the client') commissioned Environmental Investigation Services (EIS)[1] to undertake a Detailed Site Investigation (DSI) for the proposed Stage 1 Works at Loreto Normanhurst Girls School, 91-93 Pennant Hills Road, Normanhurst, 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 Stage 1 Works development area only which occupies part of the eastern section and the central section of the property, as shown on Figure 2. For the purpose of this report, the assessment area has been referred to as 'the site', whilst the whole property has been referred to as 'the 'school'.

EIS undertook a Preliminary Site Investigation (EIS Ref: E31772KLrpt, dated 24 October 2018[2]) at the site that was limited to the proposed development areas that occupied the north-eastern section of the school and are known as the Boarding House and Early Learning Centre. A summary of this information has been included in Section 2.

From the information provided by the client, EIS understands the Stage 1 Works area will be undertaken in three sections. These are as follows:

- Stage 1A – Includes the construction of a new boarding house located on the eastern boundary of the school. It is proposed that the new building will comprise four levels including two partial basement levels. The building will be cut into the existing batters to the north and east elevations to create the two partial basement levels for car parking and common areas;
- Stage 1B – Includes the landscaping renovation of the Mary Ward Wing located in the centre of the northern section of the school. It is proposed that part of the existing building will be demolished and the area be developed as a landscape feature; and
- Stage 1C – Includes the garden plaza development located immediately to the east of the Mary Ward Wing. It is proposed the existing tennis courts will be demolished and the area will be developed as a garden plaza with a combination of landscaped garden beds and paved footpaths.

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 historical records;
- Assess the current site conditions and use(s) via a site walkover inspection;
- Identify potential contamination sources/areas of environmental concern (AEC) and contaminants of potential concern (CoPC);
- Assess the soil and groundwater contamination conditions via implementation of a sampling and analysis program;
- Prepare a conceptual site model (CSM);
- Assess the potential risks posed by contamination to the receptors identified in the CSM (Tier 1 assessment);
- 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.

The scope of work included the following:

- Review of site information, including background and site history information obtained for the EIS 2018 PSI;
- 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.

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

[2] Titled: "Report to Allen Jack & Cottier Architects on Preliminary Site Investigation at Loreto Normanhurst Master Plan

The soil laboratory results showed elevations of carcinogenic PAHs and total PAHs above the human-health based SAC in the fill material. Elevated concentrations of TRH (C_{16}-C_{34}) (F3), benzo(a)pyrene (B(a)P) and zinc were encountered above the ecological based SAC. Minor elevations of some metals in groundwater were identified above the ecological SAC, however these were considered to be consistent with regional/background groundwater conditions. One fibre cement fragment (FCF) collected from the surface of the site (AMF1) was found to contain chrysotile asbestos.

Based on the Tier 1 risk assessment, the concentrations of carcinogenic PAHs and total PAHs above the human-health based SAC are considered to pose a low to negligible risk to existing site users. Potential ecological related risks exist in relation to TRH (F3), B(a)P and zinc within the fill soil are considered low.

Based on the findings of the assessment, EIS are of the opinion that the site can be made suitable for the proposed development described in Section 1.1. A remediation action plan (RAP) will be required to outline the remediation necessary to make the site suitable for the proposed development. The RAP will outline the methodology for remediation of the contaminated fill soil and validation of the excavation on the completion of remedial works.

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

Table of Contents

1 INTRODUCTION 1

1.1 Proposed Development Details 1
1.2 Aims and Objectives 2
1.3 Scope of Work 2

2 SITE INFORMATION 3

2.1 Background 3
2.2 Site Identification 4
2.3 Site Location and Regional Setting 4
2.4 Topography 4
2.5 Site Inspection 4
2.6 Surrounding Land Use 6
2.7 Underground Services 6
2.8 Section 10.7 Planning Certificate 6

3 GEOLOGY AND HYDROGEOLOGY 7

3.1 Regional Geology 7
3.2 Acid Sulfate Soil (ASS) Risk and Planning 7
3.3 Hydrogeology 7
3.4 Receiving Water Bodies 8

4 SITE HISTORY INFORMATION 9

4.1 Review of Historical Aerial Photographs 9
4.2 Review of Historical Land Title Records 9
4.3 Review of Council Records 10
4.4 SafeWork NSW Records 10
4.5 NSW EPA Records 10
4.6 Historical Business Directory and Additional Lotsearch Information 11
4.7 Summary of Site History Information 11
4.8 Integrity of Site History Information 12

5 CONCEPTUAL SITE MODEL 13

5.1 Potential Contamination Sources/AEC and CoPC 13
5.2 Mechanism for Contamination, Affected Media, Receptors and Exposure Pathways 13

6 SAMPLING, ANALYSIS AND QUALITY PLAN 15

6.1 Data Quality Objectives (DQO) 15
6.2 Soil Sampling Plan and Methodology 17
6.3 Groundwater Sampling Plan and Methodology 19
6.4 Analytical Schedule 20

7 SITE ASSESSMENT CRITERIA (SAC) 22

7.1 Soil 22
7.2 Groundwater 23

8 RESULTS 25

8.1 SUMMARY OF DATA (QA/QC) EVALUATION 25
8.2 SUBSURFACE CONDITIONS 25
8.3 FIELD SCREENING 25
8.4 SOIL LABORATORY RESULTS 26
8.5 GROUNDWATER LABORATORY RESULTS 27

9 DISCUSSION AND CONCLUSIONS 28

9.1 TIER 1 RISK ASSESSMENT AND REVIEW OF CSM 28
9.2 DECISION STATEMENTS 29
9.3 DATA GAPS 30

10 CONCLUSIONS AND RECOMMENDATIONS 31

11 LIMITATIONS 32

List of Tables

Table 2-1: Site Identification	4
Table 4-1: Summary of Historical Aerial Photographs	9
Table 4-2: Summary of SafeWork NSW Records	10
Table 4-3: Summary of Historical Land Uses	11
Table 5-1: Potential (and/or known) Contamination Sources/AEC and Contaminants of Potential Concern	13
Table 5-2: CSM	13
Table 6-1: Soil Sampling Plan and Methodology	17
Table 6-3: Groundwater Sampling Plan and Methodology	19
Table 6-4: Analytical Schedule	20
Table 6-5: Laboratory Details	21
Table 7-1: Details for Asbestos SAC	22
Table 8-1: Summary of Subsurface Conditions	25
Table 8-2: Summary of Field Screening	25
Table 8-3: Summary of Soil Laboratory Results – Human Health and Environmental (Ecological)	26
Table 8-7: Summary of Groundwater Laboratory Results – Human Health and Environmental (Ecological)	27

Attachments

Appendix A: Report Figures
Appendix B: Laboratory Summary Tables
Appendix C: Site Information and Site History
Appendix D: Borehole Logs
Appendix E: Laboratory Report/s & COC Documents
Appendix F: Report Explanatory Notes
Appendix G: Data (QA/QC) Evaluation
Appendix H: Field Work Documents
Appendix I: Calculation Sheets
Appendix J: Guidelines and Reference Documents

Abbreviations

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

Allen Jack + Cottier ('the client') commissioned Environmental Investigation Services (EIS)[3] to undertake a Detailed Site Investigation (DSI) for the proposed Stage 1 Works at Loreto Normanhurst Girls School, 91-93 Pennant Hills Road, Normanhurst, 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 Stage 1 Works development area only which occupies part of the eastern section and the central section of the property, as shown on Figure 2. For the purpose of this report, the assessment area has been referred to as 'the site', whilst the whole property has been referred to as 'the 'school'.

EIS undertook a Preliminary Site Investigation (EIS Ref: E31772KLrpt, dated 24 October 2018[4]) at the site that was limited to the proposed development areas that occupied the north-eastern section of the property and are known as the Boarding House and Early Learning Centre. A summary of this information has been included in Section 2.

EIS are currently in a transitional phase of re-branding and will commence trading as JK Environments in 2019. 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

From the information provided by the client, EIS understands the Stage 1 Works area will be undertaken in three sections. These are as follows:

- Stage 1A – Includes the construction of a new boarding house located on the eastern boundary of the school. It is proposed that the new building will comprise four levels including two partial basement levels. The building will be cut into the existing batters to the north and east elevations to create the two partial basement levels for car parking and common areas;
- Stage 1B – Includes the landscaping renovation of the Mary Ward Wing located in the centre of the northern section of the school. It is proposed that part of the existing building will be demolished and the area be developed as a landscape feature; and
- Stage 1C – Includes the garden plaza development located immediately to the east of the Mary Ward Wing. It is proposed the existing tennis courts will be demolished and the area will be developed as a garden plaza with a combination of landscaped garden beds and paved footpaths.

EIS understand that the Stage 1 development site includes part of Lot 3 in DP1217496, part of Lots 16, 20, 21 and 22 in DP6612, part of Lot 1 in DP809066 and covers an area of approximately 13,200m^2.

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

[4] Titled: "Report to Allen Jack & Cottier Architects on Preliminary Site Investigation at Loreto Normanhurst Master Plan

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 historical records;
- Assess the current site conditions and use(s) via a site walkover inspection;
- Identify potential contamination sources/areas of environmental concern (AEC) and contaminants of potential concern (CoPC);
- Assess the soil and groundwater contamination conditions via implementation of a sampling and analysis program;
- Prepare a conceptual site model (CSM);
- Assess the potential risks posed by contamination to the receptors identified in the CSM (Tier 1 assessment);
- 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 an EIS proposal (Ref: EP49119PL) of 18 March 2019 and written acceptance from the client of 20 March 2019. The scope of work included the following:

- Review of site information, including background and site history information obtained for the EIS 2018 PSI;
- 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)[5], other guidelines made under or with regards to the Contaminated Land Management Act (1997)[6] and State Environmental Planning Policy No.55 – Remediation of Land (1998)[7]. A list of reference documents/guidelines is included in the appendices.

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

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

[7] *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 (EIS 2018)

EIS has previously undertaken a preliminary site investigation (PSI)[8] in 2018. The PSI was limited to the proposed development areas located in the north-eastern section of the school, known as the Boarding House and Early Learning Centre, as shown on Figure 2. The proposed Boarding House area is located in the Stage 1 Works area and the relevant data, collected from the previous investigation, will be reviewed as part of this assessment.

The findings of the EIS 2018 Report are outlined below:

- The site history assessment identified imported fill material, use of pesticides and hazardous building materials as areas of environmental concern (AEC);
- Soil sampling was undertaken from six locations within the Boarding House area (Site 1A) and extended to a maximum depth of 14.0m;
- Fill material was encountered at the surface or beneath the pavement in all boreholes and extended to depths of between 0.1m to 2.4m. The fill material typically consisted of silty sandy clay with inclusions of ironstone gravel, ash and roots;
- Natural silty clay was encountered in BH2 to BH6 and extended to depths of between 0.6m to 4.8m;
- Elevated concentrations of carcinogenic PAHs, above the human-health based Site Assessment Criteria (SAC), were encountered in the fill sample collected from BH2 (0.04-0.2); and
- The investigation identified the following data gaps:
  - The number of sampling points across did not meet the minimum density recommended in the NSW EPA Sampling Design Guidelines (1995); and
  - Groundwater sampling was not undertaken.

The 2018 PSI Report concluded that some of the AEC identified in the CSM may pose a risk to the site receptors. The report made the following recommendations:

- Additional soil sampling in the vicinity of BH2 should be undertaken to better characterise the extent of the site contamination. This should include further soil sampling of the fill and underlying natural soil; and
- Groundwater sampling and analysis from the existing groundwater wells installed for the geotechnical investigation should be undertaken to address the data gaps.

[8] *"Report to TTW on Preliminary Site Investigation (PSI) for Proposed New School Buildings at Loreto Normanhurst Girls School, 91-93 Pennant Hills Road, Normanhurst, NSW"* (EIS Ref: E31772KLrpt, dated 24 October 2018, referred to as EIS 2018 PSI

2.2 Site Identification

Table 2-1: Site Identification

Current Site Owner:	Trustees of the Loreto Property Association
Site Address:	91-93 Pennant Hills Road, Normanhurst, NSW
Lot & Deposited Plan:	Part of Lot 3 in DP1217496 Part of Lots 16, 20, 21 and 22 in DP6612 Part of Lot 1 in DP809066
Current Land Use:	School
Proposed Land Use:	School
Local Government Authority:	Hornsby Shire Council
Current Zoning:	R2 – Low Density Residential
Site Area (m^2):	13,200m^2
Geographical Location (decimal degrees) (approx.):	Latitude: -33.726726 Longitude: 151.098743
Site Location Plan:	Figure 1
Sample Location Plan:	Figure 2
Contamination Data Plan:	Figure 3

2.3 Site Location and Regional Setting

The site is located in a predominantly residential area of Normanhurst. The site is bounded by Pennant Hills Road to the north, Mount Pleasant Avenue to the east and south and Osborn Road to the west.

2.4 Topography

The regional topography is characterised by an east facing hillside that falls towards Mount Pleasant Avenue. The site is located towards the mid-slope of the hillside and has a gentle slope towards the east and north-east at approximately 2° to 3°. Parts of the site appear to have been levelled to account for the slope and accommodate the existing development.

2.5 Site Inspection

A walkover inspection of the site was undertaken by EIS on 27 March 2019. The inspection was limited to accessible areas of the site grounds and immediate surrounds. An internal inspection of buildings was not undertaken. 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 majority of the Stage 1 Works area was occupied by school buildings, paved driveways and footpaths, landscaped areas and a tennis court. The wider site was occupied by school associated buildings including covered outdoor learning areas (COLAs). The southern section of the school was occupied by a recreational area that included car parking, playing fields and bushland. The boarding houses located at the north-east section of the school appeared to have been former residential buildings converted for school use.

2.5.2 Buildings, Structures and Roads

The north-eastern section of the school consisted of the main boarding house and the central section contained classrooms, amenities and administration offices. The buildings were mostly of brick construction with potential asbestos containing fibre cement sheeting noted on the external areas of the buildings. All buildings and structures appeared in good condition.

2.5.3 Boundary Conditions, Soil Stability and Erosion

The school was bounded by metal security fencing along most boundaries with the exception to the east of the boarding house which was bounded by a small brick retaining wall. There were no visible signs of erosion or soil instability along the school boundaries.

2.5.4 Visible or Olfactory Indicators of Contamination

A fibre cement fragment (FCF) was encountered on the ground surface within the Stage 1 Works adjacent the Loreto Community House. The fragment was sampled as identified as AMF1 in this report.

2.5.5 Presence of Drums/Chemicals, Waste and Fill Material

The maintenance yard located in the northern area of the school housed minor quantities of various chemicals and fuel for general maintenance of the school grounds. The yard appeared properly contained and the chemicals stored correctly with no direct pathway to reach bare soil or grass.

The playing fields and tennis courts located centrally in the school ground appeared to have been historically cut and filled to achieve existing levels.

2.5.6 Drainage and Services

Stormwater pits were located across the low-level areas of the school and were assumed to be connected to the local stormwater system. The surface run-off was assumed to follow the general gradient of the site towards the south and east.

2.5.7 Sensitive Environments

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

2.5.8 Landscaped Areas and Visible Signs of Plant Stress

Various raised garden beds, grassed areas and ground-level garden beds were identified across the school grounds. The vegetation present included large (>10m) native trees, exotic and native grasses and exotic shrubs. No visible signs of plant stress or dieback was noted during the site inspection.

2.6 Surrounding Land Use

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

- North – Cumberland Highway and Normanhurst Public School;
- South – Mount Pleasant Avenue and an aged care facility;
- East – Mount Pleasant Avenue and residential properties;
- West – Osborn Road and residential properties.

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

2.7 Underground Services

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

2.8 Section 10.7 Planning Certificate

The s10.7 (2 and 5) planning certificates obtained for the EIS 2018 PSI were reviewed for the assessment. Copies of the certificates are attached in the appendices. A summary of the relevant information is outlined below:

- The site is not located in an area of ecological significance;
- The site is not deemed to be: significantly contaminated; subject to a management order; subject of an approved voluntary management proposal; or subject to an on-going management order under the provisions of the CLM Act 1997;
- The site is not the subject of a Site Audit Statement (SAS);
- The site is not located within an acid sulfate soil (ASS) risk area; and
- The site is not located in a heritage conservation area.

3 GEOLOGY AND HYDROGEOLOGY

3.1 Regional Geology

Regional geological information presented in the Lotsearch report (attached in the appendices) indicated that the site is underlain by Ashfield Shale of the Wianamatta Group, which typically consists of black to dark grey shale and laminite.

3.2 Acid Sulfate Soil (ASS) Risk and Planning

A review of the acid sulfate soil (ASS) risk map prepared by Department of Land and Water Conservation (1997)[9] indicated that the site is not located within a risk area.

ASS information presented in the Lotsearch report (attached in the appendices) indicated that a Class 5 area is located directly to the south of the site. EIS do not consider this to pose a risk of ASS during the proposed development works.

3.3 Hydrogeology

Hydrogeological information presented in the Lotsearch report (attached in the appendices) indicated that the regional aquifer on-site and in the areas immediately surrounding the site includes porous, extensive aquifers of low to moderate productivity. There were a total of 10 registered bores within the report buffer of 2,000m. In summary:

- The nearest registered bore was located approximately 234m from the site. This was utilised for recreational purposes. The next closest bore was located 1,414m west of the site and was utilised for monitoring purposes;
- The majority of the bores were registered for monitoring purposes;
- There was one bore within the report buffer registered for domestic use. This bore was located 1,977m east of the site and is not considered to be a potential receptor; and
- The drillers log information from the closest registered bores typically identified fill and/or clay soil to depths of 1.55m-11.0m, underlain by sandstone bedrock. Standing water levels (SWLs) in the bores ranged from 1.84mBGL to 78.5mBGL.

The information reviewed for this assessment indicated that the subsurface conditions at the site are likely to consist 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. Use of groundwater is not proposed as part of the development.

Considering the local topography and surrounding land features, EIS would generally expect groundwater to flow towards the south and east.

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

3.4 Receiving Water Bodies

Surface water bodies were not identified in the immediate vicinity of the site. The closest surface water body is Coups Creek located approximately 354m to the east of the site. Due to the distance from the site, this creek is not considered to be a potential receptor.

4 SITE HISTORY INFORMATION

4.1 Review of Historical Aerial Photographs

Historical aerial photographs were included in the Lotsearch report obtained for the EIS 2018 PSI (attached in the appendices). EIS has reviewed the photographs and summarised relevant information in the following table:

Table 4-1: Summary of Historical Aerial Photographs

Year	Details
1943	The southern section of the school appeared to be vacant and grassed with a large area covered with trees and vegetation. The north-eastern section of the school appeared to be used as the school with some small residential properties along the eastern boundary and the main school building visible in the north-west corner. The surrounds appeared similar to the school and were most likely used for residential and agricultural purposes.
1956	The school appeared generally similar to the 1943 photograph. More residential properties were visible in the surrounding areas.
1961	The school and surrounds appeared generally similar to the 1956 photograph.
1965	The school appeared generally similar to the 1961 photograph. The immediate surrounds now appeared to be all residential with the open agricultural areas no longer visible.
1970	The central section of the school appeared to have been excavated in some areas, potentially to clear the area for a new playing field. The buildings in the north of the school appeared unchanged.
1982	The central section of the school now appeared to be mostly grassed and cleared of any trees. The remaining areas of the school appeared generally similar to the 1970 photograph.
1991	The school and surrounds appeared generally similar to the 1982 photograph.
2003	The school and surrounds appeared generally similar 1991 photograph.
2009	The western boundary of the school appeared to have been converted into a car park. Additional buildings were visible in the central section of the school, immediately north of the grassed area.
2016	The school and surrounds appeared similar to the present day.

4.2 Review of Historical Land Title Records

Historical land title records obtained for the EIS 2018 PSI were reviewed for the assessment. The record search was undertaken by Advance Legal Searchers Pty Ltd. Copies of the title records are attached in the appendices.

The historical land title records did not identify any particular land uses which could have resulted in significant contamination. The school has been owned by the Loreto Property Association since 1933.

4.3 Review of Council Records

Council records reviewed for the EIS 2018 PSI were sourced under an informal access to information request and were reviewed for the assessment. From the council records viewed as part of this investigation, EIS did not identify any historical on-site activites that would have resulted in significant contamination at the site.

4.4 SafeWork NSW Records

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

Table 4-2: Summary of SafeWork NSW Records

Date	Record Number	License Details
Renewal 17/06/2000	35/034456	Depot 1 – Above Ground Tank for storage of 1,500L of Sodium Hypochlorite Depot 2 – Above Ground Tank for storage of 218L Carbon Dioxide Depot 3 – Roofed storage of 80L petrol Depot 4 – Roofed storage of 60L diesel fuel Depot 5 – Roofed storage of 50Kg Ammonium Nitrate Depot 6 – Roofed storage of total 50L of various pesticides and insecticides
Renewal 17/06/2004	35/034456	As above.

4.5 NSW EPA Records

The Lotsearch report (attached in the appendices) included information from the NSW EPA databases for the following:

- Records maintained in relation to contaminated land under Section 58 of the CLM Act 1997;
- Records of sites notified in accordance with the Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997 (2015)[10]; and
- Licensed activities under the Protection of the Environment Operations Act (1997)[11].

The search included the site area and surrounding areas in the report buffer of 1,000m. The search indicated the following:

- There were no records for the site or any properties in the report buffer under Section 58 of the CLM Act 1997;
- The site has not been notified with regards to the Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997. There were no notified properties in the report buffer;
- There was one activity currently licensed under the POEO Act 1997 that related to the school. This was the North Connex Project that appeared to impact the north section of the school. Another licensed activity was associated with a corridor for Sydney Trains located approximately 370m to the north of the school. These activities are unlikely to pose a contamination risk to the school; and

[10] 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)

[11] Protection of the Environment Operations Act 1997 (NSW) (referred to as POEO Act 1997)

- There were three records associated with delicensed activities under the POEO Act 1997 related to the school. These were all associated with the application of herbicides to waterways throughout NSW. These are unlikely to pose a contamination risk to the school.

4.6 Historical Business Directory and Additional Lotsearch Information

Historical business records for the site and surrounding areas in the report buffer were included in the Lotsearch report (attached in the appendices). The records indicated the following:

- There was one motor mechanics business registered within the report buffer during the 1960s. This business was located over 400m down-gradient of the site; and
- There were two dry cleaner businesses registered within the report buffer during the 1950s to the 1980's. These businesses were located over 300m down-gradient of the site.

The motor mechanic business identified in the historical business directory are considered unlikely to be a contamination risk due to the location down-gradient of the site.

The dry cleaner businesses identified are considered unlikely to pose a contamination risk to the site due to their location down-gradient and their distance from the site.

EIS are of the opinion that the historical businesses in the report buffer are unlikely to represent potential off-site sources of site contamination.

In addition to the above, EIS have reviewed additional information contained within the Lotsearch report and note the following:

- There were no local or state heritage items at the site or in the immediate surrounds; and
- There were no significant ecological constraints at the site or in the immediate surrounds.

4.7 Summary of Site History Information

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 EIS.

Table 4-3: Summary of Historical Land Uses

Year(s)	Potential Land Use / Activities
Pre-1933	The majority of the school was vacant grassed land in the south section with residential properties in the northern section of the site. The site was owned by various individuals with professions unlikely to be associated with on-site activities.
1933	The site was purchased by The Loreto Property Association.
1933-2018	The site has been operational as Loreto Normanhurst School since 1933 with construction and various additions to the school buildings during this time.

4.8 Integrity of Site History Information

The majority of the site history information was obtained from government organisations as outlined in the relevant sections of this report. The veracity of the information from these sources is considered to be relatively high. A certain degree of information loss can be expected given the lack of specific land use details over time. EIS have relied upon the Lotsearch report and have not independently verified any information contained within. However, it is noted that the Lotsearch report is generated based on databases maintained by various government agencies and is expected to be reliable.

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 site history information. Reference should also be made to the figures attached in the appendices.

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

5.1 Potential Contamination Sources/AEC and CoPC

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

Table 5-1: Potential (and/or known) Contamination Sources/AEC and Contaminants of Potential Concern

Source / AEC	CoPC
Fill material – Based on data obtained from the 2018 PSI, fill material is known to be present at the site within the proposed boarding house area (Site 1A). Elevated concentrations of PAHs were encountered within the fill material in this area. Other areas of the site appeared to have been historically filled to achieve existing levels.	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.
Use of pesticides – Pesticides may have been used beneath the buildings and/or around the site.	Heavy metals and OCPs
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

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.

	The mechanisms for contamination from off-site sources could have occurred via 'top down' impacts and spills, or sub-surface release. Impacts to the site could occur via the migration of contaminated groundwater.
Affected media	Soil/soil vapour and groundwater have been identified as potentially affected media. The potential for groundwater impacts is considered to be relatively low. However, groundwater would need to be considered in the event significant contamination was identified in soil.
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. Ecological receptors include terrestrial organisms and plants within unpaved areas.
Potential exposure pathways	Potential exposure pathways relevant to the human receptors include ingestion, dermal absorption and inhalation of dust (all contaminants) and vapours (volatile TRH, naphthalene and BTEX). The potential for exposure would typically be associated with the construction and excavation works, and 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.
Potential exposure mechanisms	The following have been identified as potential exposure mechanisms for site contamination: • Vapour intrusion into the proposed basement and/or building (either from soil contamination or volatilisation of contaminants from groundwater); • Contact (dermal, ingestion or inhalation) with exposed soils in landscaped areas and/or unpaved areas; and • Migration of groundwater off-site into areas where groundwater is being utilised for recreational purposes.

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.

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:

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

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;
- 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;

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

- Laboratory analysis of soils, fibre cement 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 27 March 2019 and 4 April 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 footprint 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.

Where appropriate, data are assessed against valid statistical parameters to characterise the data population. This may include calculation and application of mean values and/or 95% upper confidence limit (UCL) values for the data set, with regards to the NEPM (2013) framework and other relevant guidelines made under the CLM Act 1997. UCLs are considered acceptable where the UCL is below the SAC, the standard deviation of the data is less than 50% of the SAC and none of the individual concentrations are more than 250% of the SAC.

6.1.5.2 Field and Laboratory QA/QC

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

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

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

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 was considered adequate in the absence of any existing sub-surface data for the site. Samples for other contaminants were collected from 23 locations as shown on the attached Figure 2. Based on the site area (13,200m^2), this number of locations corresponded to a sampling density of approximately one sample per 574m^2. The sampling plan was not designed to meet 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
	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. Additional sampling locations were placed in the vicinity of BH2, to target where elevated concentrations of PAHs were encountered during the EIS 2018 PSI. This was undertaken in an attempt to better characterise the extent of contamination in this area.
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 were collected using a drill rig equipped with a 150mm spiral flight auger. 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. BH110 was drilled using a hand auger due to the presence of a potential service in the vicinity.
Sample Collection and Field QA/QC	Soil samples were obtained on 27 and 28 March 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 EIS. 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. The bulk sample intervals are shown on the attached borehole logs; • Each 10L sample was weighed using an electronic scale;

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

Aspect	Input
	• 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. A calibration/check of the accuracy of the scale used for weighing the fibre cement fragments was undertaken using a set of calibration weights. Calibration/check records are maintained on file by EIS. The scale used to weigh the 10L samples was not calibrated, however this is not considered significant as this method of providing a weight for the bulk sample is considered to be considerably more accurate than applying a nominal soil density conversion.
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 EIS 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	A groundwater monitoring well was installed in BH111 (MW111). The wells were positioned to gain a snap-shot of the groundwater conditions. Considering the topography and the location of the nearest down-gradient water body, MW111 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.
Monitoring Well Installation Procedure	The monitoring well construction details are documented on the appropriate borehole logs attached in the appendices. The monitoring well was installed to a depth of approximately 5.7m below ground level. The well was generally constructed as follows: • 50mm diameter Class 18 PVC (machine slotted screen) was installed in the lower section of the well to intersect groundwater; • 50mm diameter Class 18 PVC casing was installed in the upper section of the well (screw fixed); • A 2mm sand filter pack was used around the screen section for groundwater infiltration; • A hydrated bentonite seal/plug was used on top of the sand pack to seal the well; and

	• A gatic cover was installed at the surface with a concrete plug to limit the inflow of surface water.
Monitoring Well Development	The monitoring well was developed on 28 March 2019 using a submersible electrical pump in accordance with the SSP. The monitoring well was effectively dry at the time of development. The field monitoring records and calibration data are attached in the appendices.
Groundwater Sampling	The monitoring wells were allowed to recharge for approximately five to seven days after development. Groundwater samples were obtained on 4 April 2019. Prior to sampling, the monitoring wells were checked for the presence of Light Non-Aqueous Phase Liquids (LNAPLs) using an inter-phase probe electronic dip meter. The monitoring well head space was checked for VOCs using a calibrated PID unit. Due to the small volume of groundwater available, the samples were obtained using a disposable plastic bailer. 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 not considered to have been achieved. Groundwater samples were obtained directly from the disposable bailer and placed in the sample containers. Duplicate samples were not obtained due to the small volume of groundwater encountered. Groundwater removed from the wells during development and sampling was transported to EIS in jerry cans and stored in holding drums prior to collection by a licensed waste water contractor for off-site disposal. The field monitoring record and calibration data are attached in the appendices.
Decontaminant and Sample Preservation	The decontamination procedure adopted during sampling is outlined in the SSP attached in the appendices. The samples were preserved with reference to the analytical requirements and placed in an insulated container with ice in accordance with the SSP. On completion of the fieldwork, the samples were temporarily stored in a fridge at the EIS office, before being delivered in the insulated sample container to a NATA registered laboratory for analysis under standard COC procedures.

6.4 Analytical Schedule

The analytical schedule is outlined in the following table:

Table 6-3: Analytical Schedule

Analyte/CoPC	Fill Samples	Natural Soil Samples	Fibre Cement Material Samples	Groundwater Samples
Heavy Metals	31	17	-	1
TRH/BTEX	31	17	-	1
PAHs	31	17	-	1
OCPs/OPPs	31	-	-	-

Analyte/CoPC	Fill Samples	Natural Soil Samples	Fibre Cement Material Samples	Groundwater Samples
PCBs	31	-	-	-
Asbestos	29	-	1	-
VOCs	-	-	-	1
pH/CEC/Clay Content (%)	1	1	-	-
pH/EC/hardness			-	1

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 blanks, trip spikes and field rinsate samples)	Envirolab Services Pty Ltd NSW, NATA Accreditation Number – 2901 (ISO/IEC 17025 compliance)	19989, 200697, 200697-A, 214605, 214605-A & 215092
Inter-laboratory duplicates	Envirolab Services Pty Ltd VIC, NATA Accreditation Number – 2901 (ISO/IEC 17025 compliance)	14768 & 16446

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 the soil type and the most conservative 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; and
- 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): $\textbf{\% w/w asbestos in soil} = \frac{\textbf{\% asbestos content x bonded ACM (kg)}}{\text{Soil volume (L) x soil density (kg/L)}}$ However, as most of the soil sampled was cohesive the actual soil volume in the 10L bucket varied considerably due to the presence of voids. Therefore, each bucket sample was weighed using electronic scales and the above equation was adjusted as follows: $\textbf{\% w/w asbestos in soil} = \frac{\textbf{\% asbestos content x bonded ACM (kg)}}{\text{Soil weight (kg)}}$

[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. The criteria for benzo(a)pyrene has been increased from the value presented in NEPM (2013) based on the information presented in the CRC Care Technical Report No. 39 – Risk-based management and guidance for benzo(a)pyrene (2017)[16];
- ESLs were calculated based on the soil type. EILs for selected metals were calculated using average site specific soil parameters for pH, cation exchange capacity and clay content. These parameters were obtained from analysis of the two main soil types on site as clay and sand. The relevant data was averaged and applied to each soil type. 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.

7.2 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)[18]. Environmental values for this assessment include 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;
- The Australian Drinking Water Guidelines (2011)[19] were adopted as screening criteria for consumption of groundwater; and

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

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

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

- The guidelines for recreational water quality (primary and secondary contact) presented in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2018)[20] were adopted as screening criteria to assess potential human-health risks in the nearest receiving water body as it is used for recreational purposes and to assess risks associated with incidental contact with groundwater in the proposed basement.

7.2.2 Environment (Ecological - aquatic ecosystems)

- Groundwater Investigation Levels (GILs) for 95% trigger values for protection of freshwater species presented in ANZG 2018. The 99% trigger values were adopted where required to account for bioaccumulation. Low and moderate reliability trigger values were also adopted for some contaminants where high-reliability trigger values don't exist.

[20] ANZG (2018), *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.* (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, EIS are of the opinion that the data are adequately precise, accurate, representative, comparable and complete to serve as a basis for interpretation to achieve the investigation objectives.

8.2 Subsurface Conditions

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

Table 8-1: Summary of Subsurface Conditions

Profile	Description
Pavement	Asphaltic Concrete (AC)/Concrete pavement was encountered at the surface in BH104, BH105, BH106, BH108, BH109, BH111, BH114, BH115, BH116 and BH117 and extended to depths of between 0.03m to 0.16m.
Fill	Fill was encountered at the surface or beneath the pavement in all boreholes and extended to depths of approximately 0.1m to 1.7m. BH105, BH106 and BH110 were terminated in the fill at a maximum depth of approximately 0.6m. The fill typically comprised silty clay, silty sandy clay, gravelly sand, silty sandy clay, silty gravelly sand and sandy gravel with inclusions of ash, slag, ironstone gravels, igneous gravels, sandstone gravels and building rubble (concrete and asphalt).
Natural Soil	Natural silty clay was encountered beneath the fill in all boreholes, excluding boreholes BH103, BH105, BH106 and BH110, and extended to depths of between 0.7m and 2.7m.
Bedrock	Weathered siltstone bedrock was encountered beneath the natural soil or directly beneath the fill in boreholes BH102, BH103, BH104, BH109, BH111 and BH116 and extended to the termination depths of between 1.0m to 6.0m.
Groundwater	Groundwater seepage was not encountered in the boreholes during drilling. All boreholes remained dry on completion of drilling and a short time after. Groundwater was not encountered during development in MW111. Only a small volume of groundwater was encountered during sampling 7 days after installation.

8.3 Field Screening

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

Table 8-2: Summary of Field Screening

Aspect	Details
PID Screening of Soil Samples for VOCs	PID soil sample headspace readings are presented in attached report tables and the COC documents attached in the appendices. The results ranged from 0.1ppm to 122.6ppm equivalent isobutylene. These results indicate PID detectable VOCs. Samples with elevated PID readings were analysed for TRH and BTEX.
Bulk Screening for Asbestos	The bulk field screening results are summarised in the attached report tables. All other results were below the SAC.

Aspect	Details
Groundwater Depth & Flow	Groundwater seepage was not encountered in the boreholes during drilling and a short time after. SWLs measured in the monitoring well installed at the site was measured at 5.12m.
Groundwater Field Parameters	Due to the small volume of groundwater encountered, only one set of field measurements were recorded during sampling, these were as follows: - pH was recorded at 6.19; - EC was recorded at 2,234µS/cm; - Eh was recorded at 212.9mV; and - DO was recorded at 5.4ppm.
LNAPLs petroleum hydrocarbons	Phase separated product (i.e. LNAPL) were not detected using the interphase probe during groundwater sampling.

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 human-health based SAC. One elevated concentration of zinc was encountered in the fill in BH116 (0.7-0.95). All remaining heavy metal results were below the ecological SAC.
TRH	All TRH results were below the human-health based SAC. Elevated concentrations of TRH (C16-C34) (F3) were encountered in fill samples BH2 (0.04-0.2), BH105 (0.2-0.4) and BH106 (0.03-0.15) above the ecological based SAC.
BTEX	All BTEX results were below the SAC.
PAHs	Elevated concentrations of carcinogenic PAHs were encountered in fill samples BH2 (0.04-0.2), BH105 (0.2-0.4), BH106 (0.03-0.15) and DUPRK2 above the human-health based SAC. One elevated concentration of total PAHs was encountered in the fill sample BH2 (0.04-0.2) above the human-health based SAC. One elevated concentration of B(a)P above the ecological based SAC was encountered in the fill sample BH2 (0.04-0.2).
OCPs and OPPs	All OCP and OPP results were below the SAC. All pesticide concentrations were below the laboratory PQLs.
PCBs	All PCB results were below the SAC. All PCB concentrations were below the laboratory PQLs.

Asbestos	All asbestos results were below the SAC (i.e. asbestos was absent in the samples analysed for the investigation). All asbestos quantification (AF/FA) results were below the SAC. One fibre cement fragment (FCF) was sampled and analysed (sample AMF1) and was found to contain Chrysotile asbestos fibres.

8.4.2 Statistical Analysis

Statistical calculations were undertaken on the data sets that contained concentrations above the HIL-A criteria (i.e. Carcinogenic PAHs and Total PAHs) using ProUCL (Version 5.1) are attached in the appendices. In summary:

- The standard deviation exceeded the data assessment criteria for Carcinogenic PAHs;
- The 95% UCL value for Carcinogenic PAHs was above the SAC; and
- The 99% UCL values for Total PAHs was above the SAC.

Only the Total PAH 95% UCL data met all of the statistical parameters specified in Section **Error! Reference ource not found.**

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 below:

Table 8-4: Summary of Groundwater Laboratory Results – Human Health and Environmental (Ecological)

Analyte	Results Compared to SAC
Heavy Metals	Elevated concentrations of copper and zinc were encountered above the ecological based SAC in MW111 at concentrations of 2mg/kg and 52mg/kg respectively. All heavy metals results were below the SAC.
TRH	All TRH results were below the SAC.
BTEX	All BTEX results were below the SAC.
Other VOCs	All VOC results were below the SAC.
PAHs	All PAH results were below the SAC.
Other Parameters	The results for pH, EC and hardness are summarised below: • pH was recorded at 6.19; and • EC was recorded at 2,234µS/cm.

9 DISCUSSION AND CONCLUSIONS

9.1 Tier 1 Risk Assessment and Review of CSM

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

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

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

9.1.1 Soil / Fill Material

Carcinogenic PAHs were encountered above the human-health based SAC in the fill material in BH2 (0.04-0.2), BH105 (0.2-0.4), BH106 (0.03-0.15) and DUPRK2 with concentrations of 73mg/kg, 6.3mg/kg, 6.4mg/kg and 8.8mg/kg respectively (SAC 3mg/kg). Total PAHs above the human-health based SAC were encountered in the fill material in BH2 (0.04-0.2) with a concentration of 640mg/kg (SAC 300mg/kg). The contaminated fill was identified to the west of the proposed boarding house. The contamination poses a risk to site users and workers via inhalation and ingestion of impacted fill material. The boreholes where contaminated fill was encountered met with refusal in the fill material and the underlying natural soil was not sampled. However, it is considered likely that the contamination is related to the presence of ash and slag inclusions within the fill material and therefore confined vertically to the fill material in this area.

TRH (C_{16}-C_{34}) (F3) was encountered above the ecological based SAC in the fill material in BH2 (0.04-0.2), BH105 (0.2-0.4) and BH106 (0.03-0.15) with concentrations of 1,700mg/kg (SAC 1,300mg/kg), 410mg/kg and 770mg/kg (SAC 300mg.kg) respectively. Benzo(a)pyrene and zinc were encountered above the ecological based SAC in the fill material in BH2 (0.04-0.2) and BH116 (0.7-0.95) respectively. The contaminated fill was identified to the west of the proposed boarding house. The contamination was considered likely to be associated with the inclusions of ash and slag encountered within the fill material in the vicinity of BH2, BH105 and BH106. Therefore, it is considered likely the PAH and TRH contamination is confined vertically to the fill material in this area.

One fibre cement fragment (FCF) was collected from the surface of the site (AMF1) and was found to contain chrysotile asbestos fibres. The material was in reasonable condition and was considered as non-friable. The presence of asbestos containing FCF on the surface of the site poses a risk to human receptors through potential disturbance and inhalation of airborne fibres.

From the current proposed Stage 1 Works development plans, EIS understand that the construction of a new boarding house in the vicinity of BH2, BH105 and BH106 , includes two basement levels that will be cut into the existing hill slope in the north-east corner. It is understood that the new boarding house will cover this area in its entirety. In this instance, the contamination pathway for ecological receptors would be removed and there would be no complete SPR linkage. In the event that this fill material is to be included in gardens

or landscaped areas as part of the proposed development, consideration of these exceedances may be warranted.

EIS consider the elevated concentrations of carcinogenic PAHs and TRH (C_{16}-C_{34}) (F3) in the vicinity of BH2, BH105 and BH016 do not pose a risk to existing site users as this area is currently paved. The existing pavement is part of the service road and consequently there is no potential for direct contact (i.e. there is no complete SPR linkage).

9.1.2 Groundwater

Elevated copper and zinc concentrations above the ecological SAC were encountered in the groundwater sample from MW111. The copper concentration was only marginally above the SAC. EIS consider the elevated results are likely to be indicative of regional groundwater background concentrations rather than on on-site contamination source. Based on the low concentrations of metals reported and the distance from the site, EIS consider this represents a low risk to ecological receptors in the nearest receiving water body of Coups Creek.

9.2 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?*

Yes. Although the site history information did not identify any activities on the site or any off-site land uses that may have resulted in contamination of the site, some cutting and filling of the site may have taken place to achieve the current site levels. A FCF containing asbestos (AMF1) was identified at the surface of the site.

> *Are any results above the SAC?*

Yes. Carcinogenic PAHs were encountered above the human-health based SAC in the fill material in BH2 (0.04-0.2), BH105 (0.2-0.4), BH106 (0.03-0.15) and duplicate sample DUPRK2.

Elevated concentrations of TRH (C_{16}-C_{34}) (F3) were encountered above the ecological based SAC in the fill material in BH2 (0.04-0.2), BH105 (0.2-0.4) and BH106 (0.03-0.15). Benzo(a)pyrene and zinc were encountered above the ecological based SAC in the fill material in BH2 (0.04-0.2) and BH116 (0.7-0.95) respectively.

The fibre cement fragment (FCF) collected from the surface of the site (AMF1) was found to contain chrysotile asbestos.

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

Yes. The elevated concentrations of carcinogenic PAHs above the human-health based SAC could pose a risk to future site users and workers during the proposed development through inhalation of contaminated dust and direct contact with the contaminated fill material.

Is remediation required?

Yes, a Remediation Action Plan (RAP) will be required for remedial actions relating the contaminated fill material in the vicinity of BH2, BH105 and BH106.

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

Yes. However additional sampling and/or laboratory analysis in the vicinity of BH2, BH105 and BH106 may be required during bulk earthworks to properly assign a waste classification to the fill soil which is to be disposed of off-site.

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

EIS are of the opinion the site can be made suitable for the proposed development subject to preparation of a RAP, remediation and validation.

9.3 Data Gaps

Additional sampling conducted around BH2 did not properly characterise the horizontal extent of the contamination within the fill material. However, as the proposed development in this area (the boarding house) involves bulk excavation of soil for the construction of two basement levels that will be cut into the existing hillside, it is assumed the material will be removed from site. Therefore this will be confirmed via remediation and validation process outlined in the RAP.

10 CONCLUSIONS AND RECOMMENDATIONS

The Detailed Site Investigation (DSI) was conducted via sampling of the soil and groundwater on site to obtain data on the potential for soil and groundwater contamination at the site. The soil laboratory results showed elevations of carcinogenic PAHs and total PAHs above the human-health based SAC in the fill material. Elevated concentrations of TRH (C_{16}-C_{34}) (F3), benzo(a)pyrene and zinc were encountered above the ecological based SAC. Minor elevations of some metals in groundwater were identified above the ecological SAC, however these were considered to be consistent with regional/background groundwater conditions. One fibre cement fragment (FCF) collected from the surface of the site (AMF1) was found to contain chrysotile asbestos.

Based on the Tier 1 risk assessment, the concentrations of carcinogenic PAHs and total PAHs above the human-health based SAC are considered to pose a low to negligible risk to existing site users. Potential ecological related risks exist in relation to TRH (F3), B(a)P and zinc within the fill soil are considered low.

Based on the findings of the assessment, EIS are of the opinion that the site can be made suitable for the proposed development described in Section 1.1. A remediation action plan (RAP) will be required to outline the remediation necessary to make the site suitable for the proposed development. The RAP will outline the methodology for remediation of the contaminated fill soil and validation of the excavation on the completion of remedial works.

There is considered to be a moderate potential for contamination-related unexpected finds to occur at the site during the proposed development works. Unexpected finds would typically be able to be identified by visual or olfactory indicators and could include:

- Waste materials in fill, including building and demolition waste;
- Fibre cement fragments (e.g. ACM);
- Stained fill/soil;
- Odorous soils (e.g. hydrocarbon odours); and/or
- Ash, slag and/or coal wash.

The following should be implemented in the event of an unexpected find:

- All work in the immediate vicinity should cease and temporary barricades should be erected to isolate the area;
- A suitably qualified contaminated land consultant[21] should be engaged to inspect the find and provide advice on the appropriate course of action; and
- Any actions should be implemented and validated to demonstrate that there are no unacceptable risks to the receptors.

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

[21] EIS recommend that the consultancy engaged for the work be a member of the Australian Contaminated Land Consultants Associated (ACLCA), and/or the individual undertaking the works be certified under one of the NSW EPA endorsed certified practitioner schemes

11 LIMITATIONS

The report limitations are outlined below:

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

Important Information About This Report

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

The Report is based on a Unique Set of Project Specific Factors

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

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

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

Changes in Subsurface Conditions

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

This Report is based on Professional Interpretations of Factual Data

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

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

Assessment Limitations

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

Misinterpretation of Site Assessments by Design Professionals

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

Logs Should not be Separated from the Assessment Report

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

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

Read Responsibility Clauses Closely

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

Appendix A: Report Figures

AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM, 29 DEC 2018.

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

Title: **SITE LOCATION PLAN**

Location: LORETO NORMANHURST, 91-93 PENNANT HILLS ROAD NORMANHURST, NSW

Report No: E31772KL

Figure No: 1

JKEnvironments

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LEGEND

- APPROXIMATE SITE BOUNDARY
- BH (Fill Depth) — BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m)
- APPROXIMATE OUTLINE OF PROPOSED BUILDING

0 12.5 25 37.5 50 62.5

SCALE 1:1250 @A3 METRES

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

Title: **SAMPLE LOCATION PLAN**

Location: LORETO NORMANHURST, 91-93 PENNANT HILLS ROAD NORMANHURST, NSW

Report No: E31772KL

Figure No: 2

JKEnvironments

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

BH116	0.7-0.95
ZINC	590

BH106	0.02-0.15
CARCINOGENIC PAHs	6.4
TRH(C_{16}-C_{34})	410

BH2	0.04-0.2
CARCINOGENIC PAHs	73
TOTAL PAHs	640
TRH(C_{16}-C_{34})	1,700
B(a)P	50

BH105	0.2-0.4
CARCINOGENIC PAHs	6.3
TRH(C_{16}-C_{34})	410

BH117(0.7)
BH116(1.7)
BH113(0.5)
BH115(1.0)
BH112(0.5)
BH114(0.2)
BH111(1.0)-MW111
BH108(0.4)
BH109(0.3)
BH110(>0.5)
BH3(0.2)
BH6(0.35)
BH107(0.5)
BH106(0.4)
BH2(1.2)
BH105(>0.6)
BH104(0.8)
BH5(0.2)
BH102(0.2)
BH103(0.1)
BH1(0.2)
BH4(0.0)
BH101(0.3)

OSBORN ROAD

MOUNT PLEASANT AVENUE

LEGEND

APPROXIMATE SITE BOUNDARY

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

APPROXIMATE OUTLINE OF PROPOSED BUILDING

SAMPLE ID	DEPTH (metres)
CHEMICAL	CONCENTRATION

SOIL CONTAMINATION ABOVE SAC FOR HUMAN HEALTH RISK (mg/kg)

SOIL CONTAMINATION ABOVE SAC FOR ENVIRONMENTAL RISK (mg/kg)

0 12.5 25 37.5 50 62.5

SCALE 1:1250 @A3 METRES

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

Title: **CONTAMINATION DATA PLAN**

Location: LORETO NORMANHURST, 91-93 PENNANT HILLS ROAD NORMANHURST, NSW

Report No: E31772KL

Figure No: 3

JKEnvironments

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Appendix B: Laboratory Summary Tables

JKEnvironments

ABBREVIATIONS AND EXPLANATIONS

Abbreviations used in the Tables:

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

Table Specific Explanations:

HIL Tables:

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

EIL/ESL Table:

- ABC Values for selected metals have been adopted from the published background concentrations presented in Olszowy et. al., (1995), Trace Element Concentrations in Soils from Rural and Urban New South Wales (the 25th percentile values for old suburbs with 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 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	-	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	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	1	Detected/Not Detected
Sample Reference	**Sample Depth**	**Sample Description**																				
BH1	0.0-0.1	Fill: Silty clay	<4	<0.4	12	19	24	0.2	8	34	1.6	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH1	0.8-1.0	Siltsone	6	<0.4	8	28	33	0.1	5	22	0.06	0.06	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH2	0.04-0.2	Fill: Silty sand	<4	<0.4	18	53	21	<0.1	25	49	640	73	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH3	0.0-0.1	Fill: Silty sand	<4	<0.4	25	51	9	<0.1	110	55	0.2	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	Not Detected
BH3	0.5-0.6	Silty clay	<4	<0.4	9	15	27	<0.1	1	3	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH4	0.0-0.1	Silty clay	5	<0.4	15	33	23	<0.1	6	26	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH5	0.0-0.1	Fill: Silty clay	6	<0.4	14	22	27	<0.1	6	24	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH5	0.5-0.6	Silty clay	6	<0.4	14	20	16	<0.1	3	18	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH6	0.0-0.1	Fill: Silty clay	7	<0.4	8	16	57	<0.1	4	54	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH7	0.0-0.1	Fill: Silty clay	6	<0.4	16	19	26	0.5	4	22	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH8	0-0.1	Fill: Sandy silty clay	<4	<0.4	46	17	17	<0.1	32	41	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH8	0.7-0.95	Silty clay	<4	<0.4	9	29	13	<0.1	<1	5	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH9	0.5-0.95	Fill: Silty clay	7	<0.4	8	14	11	0.1	7	26	0.07	0.07	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH9	3.10-3.15	Silty clay	20	<0.4	14	6	21	<0.1	<1	1	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH10	0-0.1	Fill: Silty clay	7	<0.4	12	14	52	<0.1	5	72	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
DUP1	-	Fill: Silty clay	6	<0.4	9	11	43	<0.1	4	64	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
DUP2	-	Fill: Silty clay	<4	<0.4	45	16	17	<0.1	36	38	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH101	0-0.1	Fill: Silty clay	4	<0.4	11	23	19	<0.1	8	100	5	0.6	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH101	0-0.1	Lab replicate	6	<0.4	10	23	19	<0.1	7	40	2.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH101	0.6-0.8	Silty clay	<4	<0.4	9	8	17	<0.1	<1	2	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH102	0-0.2	Fill: Silty clay	4	<0.4	9	15	15	<0.1	6	31	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH103	0-0.1	Fill: Gravelly sand	<4	<0.4	8	29	17	0.1	5	30	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH103	0.2-0.3	Siltstone	<4	<0.4	9	42	16	0.1	6	32	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH104	0.4-0.6	Fill: Silty sandy clay	<4	<0.4	7	30	19	<0.1	3	12	26	2.7	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH104	0.8-0.9	Silty clay	5	<0.4	4	21	28	<0.1	1	4	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH105	0.2-0.4	Fill: Gravelly sand	<4	<0.4	12	67	14	<0.1	12	60	60	6.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH106	0.03-0.15	Fill: Silty gravelly sand	<4	<0.4	38	86	14	<0.1	40	55	63	6.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH107	0-0.1	Fill: Silty clay	8	<0.4	17	29	150	<0.1	11	150	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH107	0.5-0.8	Silty clay	6	<0.4	14	10	15	<0.1	2	5	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH108	0.05-0.2	Fill: Silty clay	<4	<0.4	20	58	8	<0.1	82	41	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH108	0.05-0.2	Lab replicate	<4	<0.4	20	57	9	<0.1	79	41	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH109	0.05-0.15	Fill: Sandy gravel	<4	<0.4	77	34	11	<0.1	69	47	4.2	0.6	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH109	0.5-0.7	Silty clay	4	<0.4	12	16	21	<0.1	1	5	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH110	0-0.1	Fill: Silty sandy clay	<4	<0.4	15	19	34	<0.1	10	33	0.2	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH111	0.6-0.95	Fill: Silty clay	20	<0.4	17	21	83	<0.1	6	66	1.7	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH111	1.5-1.95	Silty clay	5	<0.4	12	13	20	<0.1	<1	2	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH112	0-0.1	Fill: Silty clay	4	<0.4	19	32	41	<0.1	6	53	0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH113	0-0.1	Fill: Silty clay	7	<0.4	38	36	97	0.1	28	91	1.8	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH113	0.5-0.8	Silty clay	<4	<0.4	5	19	17	<0.1	<1	2	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH114	0.12-0.2	Fill: Sandy gravel	6	<0.4	17	28	75	<0.1	11	52	0.3	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH115	0.04-0.2	Fill: Silty clay	5	<0.4	8	28	120	<0.1	3	29	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH115	1.0-1.2	Silty clay	6	<0.4	16	17	26	<0.1	1	7	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH115	1.0-1.2	Lab replicate	5	<0.4	16	14	21	<0.1	<1	3	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH116	0.7-0.95	Fill: Silty clay	5	1	20	35	250	0.3	14	590	6.8	0.9	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH116	1.8-1.95	Siltstone	<4	<0.4	7	59	18	<0.1	12	42	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH117	0.2-0.4	Fill: Silty clay	<4	<0.4	12	20	22	<0.1	3	9	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH117	1.0-1.2	Silty clay	4	<0.4	5	20	26	<0.1	<1	5	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DUPRK1	-	Fill: Sandy gravel	<4	<0.4	64	30	10	<0.1	55	46	7	0.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DUPRK2	-	Fill: Gravelly sand	<4	<0.4	40	110	15	<0.1	41	42	80	8.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AMF1	surface	Material	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Detected
Total Number of Samples			49	49	49	49	49	49	49	49	49	49	31	31	31	31	31	31	31	31	31	30
Maximum Value			20	1	77	110	250	0.5	110	590	640	73	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	NC
Statistical Analysis on Fill Samples																						
Number of Fill Samples			NC	NC	NC	NC	NC	NC	NC	NC	29	29	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Mean Value			NC	NC	NC	NC	NC	NC	NC	NC	51.1	9.17	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Standard Deviation			NC	NC	NC	NC	NC	NC	NC	NC	158.4	22.6	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
% UCL			NC	NC	NC	NC	NC	NC	NC	NC	99	95	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
UCL Value			NC	NC	NC	NC	NC	NC	NC	NC	445	40.62	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Concentration above the SAC **VALUE**

Standard deviation exceeds data assessment criteria VALUE

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	0.0-0.1	Fill: Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH1	0.8-1.0	Siltsone	0m to < 1m	Silt	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH2	0.04-0.2	Fill: Silty sand	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH3	0.0-0.1	Fill: Silty sand	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH3	0.5-0.6	Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH4	0.0-0.1	Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH5	0.0-0.1	Fill: Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH5	0.5-0.6	Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH6	0.0-0.1	Fill: Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH7	0.0-0.1	Fill: Silty clay	0m to < 1m	Clay	<25	110	<0.2	0.6	<1	<1	<1	0
BH8	0-0.1	Fill: Sandy silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH8	0.7-0.95	Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH9	0.5-0.95	Fill: Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH9	3.10-3.15	Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH10	0-0.1	Fill: Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
DUP1	-	Fill: Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	-
DUP2	-	Fill: Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	-
BH101	0-0.1	Fill: Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH101	0-0.1	Lab replicate	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH101	0.6-0.8	Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH102	0-0.2	Fill: Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH103	0-0.1	Fill: Gravelly sand	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH103	0.2-0.3	Siltstone	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH104	0.4-0.6	Fill: Silty sandy clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH104	0.8-0.9	Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH105	0.2-0.4	Fill: Gravelly sand	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0.1
BH106	0.03-0.15	Fill: Silty gravelly sand	0m to < 1m	Sand	<25	60	<0.2	<0.5	<1	<1	<1	0.1
BH107	0-0.1	Fill: Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	1.9
BH107	0.5-0.8	Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	122.6
BH108	0.05-0.2	Fill: Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH108	0.05-0.2	Lab replicate	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH109	0.05-0.15	Fill: Sandy gravel	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.9
BH109	0.5-0.7	Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0.2
BH110	0-0.1	Fill: Silty sandy clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH111	0.6-0.95	Fill: Silty clay	0m to < 1m	Clay	<25	120	<0.2	<0.5	<1	<1	<1	19.1
BH111	1.5-1.95	Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH112	0-0.1	Fill: Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH113	0-0.1	Fill: Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH113	0.5-0.8	Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	13.7
BH114	0.12-0.2	Fill: Sandy gravel	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH115	0.04-0.2	Fill: Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH115	1.0-1.2	Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH115	1.0-1.2	Lab replicate	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH116	0.7-0.95	Fill: Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH116	1.8-1.95	Siltstone	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH117	0.2-0.4	Fill: Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH117	1.0-1.2	Silty clay	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
DUPRK1	-	Fill: Sandy gravel	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	-
DUPRK2	-	Fill: Gravelly sand	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	-
Total Number of Samples					49	49	49	49	49	49	49	45
Maximum Value					<PQL	120	<PQL	0.6	<PQL	<PQL	<PQL	122.6

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	0.0-0.1	Fill: Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH1	0.8-1.0	Siltsone	0m to < 1m	Silt	40	230	0.6	390	NL	95	4
BH2	0.04-0.2	Fill: Silty sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3
BH3	0.0-0.1	Fill: Silty sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3
BH3	0.5-0.6	Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH4	0.0-0.1	Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH5	0.0-0.1	Fill: Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH5	0.5-0.6	Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH6	0.0-0.1	Fill: Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH7	0.0-0.1	Fill: Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH8	0-0.1	Fill: Sandy silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH8	0.7-0.95	Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH9	0.5-0.95	Fill: Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH9	3.10-3.15	Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH10	0-0.1	Fill: Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
DUP1	-	Fill: Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
DUP2	-	Fill: Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH101	0-0.1	Fill: Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH101	0-0.1	Lab replicate	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH101	0.6-0.8	Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH102	0-0.2	Fill: Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH103	0-0.1	Fill: Gravelly sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3
BH103	0.2-0.3	Siltstone	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH104	0.4-0.6	Fill: Silty sandy clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH104	0.8-0.9	Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH105	0.2-0.4	Fill: Gravelly sand	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH106	0.03-0.15	Fill: Silty gravelly sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3
BH107	0-0.1	Fill: Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH107	0.5-0.8	Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH108	0.05-0.2	Fill: Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH108	0.05-0.2	Lab replicate	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH109	0.05-0.15	Fill: Sandy gravel	0m to < 1m	Sand	45	110	0.5	160	55	40	3
BH109	0.5-0.7	Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH110	0-0.1	Fill: Silty sandy clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH111	0.6-0.95	Fill: Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH111	1.5-1.95	Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH112	0-0.1	Fill: Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH113	0-0.1	Fill: Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH113	0.5-0.8	Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH114	0.12-0.2	Fill: Sandy gravel	0m to < 1m	Sand	45	110	0.5	160	55	40	3
BH115	0.04-0.2	Fill: Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH115	1.0-1.2	Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH115	1.0-1.2	Lab replicate	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH116	0.7-0.95	Fill: Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH116	1.8-1.95	Siltstone	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH117	0.2-0.4	Fill: Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH117	1.0-1.2	Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
DUPRK1	-	Fill: Sandy gravel	0m to < 1m	Sand	45	110	0.5	160	55	40	3
DUPRK2	-	Fill: Gravelly sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3

JKEnvironments

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	3	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	0.0-0.1	Fill: Silty clay	Fine	5.76	7.1	35.3	<4	12	19	24	8	34	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	0.2
BH1	0.8-1.0	Siltsone	Fine	5.76	7.1	35.3	6	8	28	33	5	22	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	0.06
BH2	0.04-0.2	Fill: Silty sand	Fine	9.2	26	7	<4	18	53	21	25	49	<1	<0.1	<25	<50	1780	720	<0.2	<0.5	<1	<3	91
BH3	0.0-0.1	Fill: Silty sandy clay	Fine	5.76	7.1	35.3	<4	25	51	9	110	55	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH3	0.5-0.6	Silty clay	Fine	5.76	7.1	35.3	<4	9	15	27	1	3	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH4	0.0-0.1	Silty clay	Fine	5.76	7.1	35.3	5	15	33	23	6	26	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH5	0.0-0.1	Fill: Silty clay	Fine	5.76	7.1	35.3	6	14	22	27	6	24	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH5	0.5-0.6	Silty clay	Fine	5.76	7.1	35.3	6	14	20	16	3	18	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH6	0.0-0.1	Fill: Silty clay	Fine	5.76	7.1	35.3	7	8	16	57	4	54	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH7	0.0-0.1	Fill: Silty clay	Fine	5.76	7.1	35.3	6	16	19	26	4	22	<1	<0.1	<25	110	170	<100	<0.2	0.6	<1	<3	<0.05
BH8	0-0.1	Fill: Sandy silty clay	Fine	5.76	7.1	35.3	<4	46	17	17	32	41	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH8	0.7-0.95	Silty clay	Fine	5.76	7.1	35.3	<4	9	29	13	<1	5	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH9	0.5-0.95	Fill: Silty clay	Fine	5.76	7.1	35.3	7	8	14	11	7	26	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	0.07
BH9	3.10-3.15	Silty clay	Fine	5.76	7.1	35.3	20	14	6	21	<1	1	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH10	0-0.1	Fill: Silty clay	Fine	5.76	7.1	35.3	7	12	14	52	5	72	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
DUP1	-	Fill: Silty clay	Fine	5.76	7.1	35.3	6	9	11	43	4	64	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
DUP2	-	Fill: Silty clay	Fine	5.76	7.1	35.3	<4	45	16	17	36	38	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH101	0-0.1	Fill: Silty clay	Fine	5.76	7.1	35.3	4	11	23	19	8	100	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	0.4
BH101	0-0.1	Lab replicate	Fine	5.76	7.1	35.3	6	10	23	19	7	40	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	0.1
BH101	0.6-0.8	Silty clay	Fine	5.76	7.1	35.3	<4	9	8	17	<1	2	<0.1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH102	0-0.2	Fill: Silty clay	Fine	5.76	7.1	35.3	4	9	15	15	6	31	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH103	0-0.1	Fill: Gravelly sand	Coarse	9.2	26	7	<4	8	29	17	5	30	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH103	0.2-0.3	Siltstone	Fine	5.76	7.1	35.3	<4	9	42	16	6	32	<0.1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH104	0.4-0.6	Fill: Silty sandy clay	Fine	5.76	7.1	35.3	<4	7	30	19	3	12	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	1.7
BH104	0.8-0.9	Silty clay	Fine	5.76	7.1	35.3	5	4	21	28	1	4	<0.1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH105	0.2-0.4	Fill: Gravelly sand	Coarse	9.2	26	7	<4	12	67	14	12	60	<0.1	<0.1	<25	<50	410	300	<0.2	<0.5	<1	<3	4.1
BH106	0.03-0.15	Fill: Silty gravelly sand	Coarse	9.2	26	7	<4	38	86	14	40	55	<0.1	<0.1	<25	60	770	710	<0.2	<0.5	<1	<3	4.2
BH107	0-0.1	Fill: Silty clay	Fine	5.76	7.1	35.3	8	17	29	150	11	150	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH107	0.5-0.8	Silty clay	Fine	5.76	7.1	35.3	6	14	10	15	2	5	<0.1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH108	0.05-0.2	Fill: Silty clay	Fine	5.76	7.1	35.3	<4	20	58	8	82	41	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH108	0.05-0.2	Lab replicate	Fine	5.76	7.1	35.3	<4	20	57	9	79	41	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH109	0.05-0.15	Fill: Sandy gravel	Coarse	9.2	26	7	<4	77	34	11	69	47	<0.1	<0.1	<25	<50	130	170	<0.2	<0.5	<1	<3	0.4
BH109	0.5-0.7	Silty clay	Fine	5.76	7.1	35.3	4	12	16	21	1	5	<0.1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH110	0-0.1	Fill: Silty sandy clay	Fine	5.76	7.1	35.3	<4	15	19	34	10	33	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	0.06
BH111	0.6-0.95	Fill: Silty clay	Fine	5.76	7.1	35.3	20	17	21	83	6	66	<0.1	<0.1	<25	120	<100	<100	<0.2	<0.5	<1	<3	0.2
BH111	1.5-1.95	Silty clay	Fine	5.76	7.1	35.3	5	12	13	20	<1	2	<0.1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH112	0-0.1	Fill: Silty clay	Fine	5.76	7.1	35.3	4	19	32	41	6	53	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	0.05
BH113	0-0.1	Fill: Silty clay	Fine	5.76	7.1	35.3	7	38	36	97	28	91	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	0.2
BH113	0.5-0.8	Silty clay	Fine	5.76	7.1	35.3	<4	5	19	17	<1	2	<0.1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH114	0.12-0.2	Fill: Sandy gravel	Coarse	9.2	26	7	6	17	28	75	11	52	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	0.07
BH115	0.04-0.2	Fill: Silty clay	Fine	5.76	7.1	35.3	5	8	28	120	3	29	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH115	1.0-1.2	Silty clay	Fine	5.76	7.1	35.3	6	16	17	26	1	7	<0.1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH115	1.0-1.2	Lab replicate	Fine	5.76	7.1	35.3	5	16	14	21	<1	3	<0.1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH116	0.7-0.95	Fill: Silty clay	Fine	5.76	7.1	35.3	5	20	35	250	14	590	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	0.62
BH116	1.8-1.95	Siltstone	Fine	5.76	7.1	35.3	<4	7	59	18	12	42	<0.1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH117	0.2-0.4	Fill: Silty clay	Fine	5.76	7.1	35.3	<4	12	20	22	3	9	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH117	1.0-1.2	Silty clay	Fine	5.76	7.1	35.3	4	5	20	26	<1	5	<0.1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
DUPRK1	-	Fill: Sandy gravel	Coarse	9.2	26	7	<4	64	30	10	55	46	<0.1	NA	<25	<50	180	200	<0.2	<0.5	<1	<3	0.56
DUPRK2	-	Fill: Gravelly sand	Coarse	9.2	26	7	<4	40	110	15	41	42	<0.1	NA	<25	<50	180	200	<0.2	<0.5	<1	<3	5.2
Total Number of Samples				49	49	49	49	49	49	49	49	49	49	31	49	49	49	49	49	49	49	49	49
Maximum Value				9.2	26	35.3	20	77	110	250	110	590	<PQL	<PQL	<PQL	120	1700	720	<PQL	0.6	<PQL	<PQL	50

Concentration above the SAC — VALUE

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

EIL AND ESL ASSESSMENT CRITERIA

Land Use Category				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	3	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	0.0-0.1	Fill: Silty clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	180	180	120	1300	5600	60	105	125	45	20
BH1	0.8-1.0	Siltsone	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	--	180	120	1300	5600	60	105	125	45	20
BH2	0.04-0.2	Fill: Silty sand	Fine	9.2	26	7	100	413	248	1263	355	1082	170	180	180	120	1300	5600	60	105	125	45	20
BH3	0.0-0.1	Fill: Silty sandy clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	180	180	120	1300	5600	60	105	125	45	20
BH3	0.5-0.6	Silty clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	--	180	120	1300	5600	60	105	125	45	20
BH4	0.0-0.1	Silty clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	180	180	120	1300	5600	60	105	125	45	20
BH5	0.0-0.1	Fill: Silty clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	180	180	120	1300	5600	60	105	125	45	20
BH5	0.5-0.6	Silty clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	--	180	120	1300	5600	60	105	125	45	20
BH6	0.0-0.1	Fill: Silty clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	180	180	120	1300	5600	60	105	125	45	20
BH7	0.0-0.1	Fill: Silty clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	180	180	120	1300	5600	60	105	125	45	20
BH8	0-0.1	Fill: Sandy silty clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	180	180	120	1300	5600	60	105	125	45	20
BH8	0.7-0.95	Silty clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	--	180	120	1300	5600	60	105	125	45	20
BH9	0.5-0.95	Fill: Silty clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	180	180	120	1300	5600	60	105	125	45	20
BH9	3.10-3.15	Silty clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	--	180	120	1300	5600	60	105	125	45	20
BH10	0-0.1	Fill: Silty clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	180	180	120	1300	5600	60	105	125	45	20
DUP1	-	Fill: Silty clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	180	180	120	1300	5600	60	105	125	45	20
DUP2	-	Fill: Silty clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	180	180	120	1300	5600	60	105	125	45	20
BH101	0-0.1	Fill: Silty clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	180	180	120	1300	5600	60	105	125	45	20
BH101	0-0.1	Lab replicate	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	180	180	120	1300	5600	60	105	125	45	20
BH101	0.6-0.8	Silty clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	--	180	120	1300	5600	60	105	125	45	20
BH102	0-0.2	Fill: Silty clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	180	180	120	1300	5600	60	105	125	45	20
BH103	0-0.1	Fill: Gravelly sand	Coarse	9.2	26	7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH103	0.2-0.3	Siltstone	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	--	180	120	1300	5600	60	105	125	45	20
BH104	0.4-0.6	Fill: Silty sandy clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	180	180	120	1300	5600	60	105	125	45	20
BH104	0.8-0.9	Silty clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	--	180	120	1300	5600	60	105	125	45	20
BH105	0.2-0.4	Fill: Gravelly sand	Coarse	9.2	26	7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH106	0.03-0.15	Fill: Silty gravelly sand	Coarse	9.2	26	7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH107	0-0.1	Fill: Silty clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	180	180	120	1300	5600	60	105	125	45	20
BH107	0.5-0.8	Silty clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	--	180	120	1300	5600	60	105	125	45	20
BH108	0.05-0.2	Fill: Silty clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	180	180	120	1300	5600	60	105	125	45	20
BH108	0.05-0.2	Lab replicate	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	180	180	120	1300	5600	60	105	125	45	20
BH109	0.05-0.15	Fill: Sandy gravel	Coarse	9.2	26	7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH109	0.5-0.7	Silty clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	--	180	120	1300	5600	60	105	125	45	20
BH110	0-0.1	Fill: Silty sandy clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	180	180	120	1300	5600	60	105	125	45	20
BH111	0.6-0.95	Fill: Silty clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	180	180	120	1300	5600	60	105	125	45	20
BH111	1.5-1.95	Silty clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	--	180	120	1300	5600	60	105	125	45	20
BH112	0-0.1	Fill: Silty clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	180	180	120	1300	5600	60	105	125	45	20
BH113	0-0.1	Fill: Silty clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	180	180	120	1300	5600	60	105	125	45	20
BH113	0.5-0.8	Silty clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	--	180	120	1300	5600	60	105	125	45	20
BH114	0.12-0.2	Fill: Sandy gravel	Coarse	9.2	26	7	100	413	248	1263	355	1082	170	180	180	120	300	2800	50	85	70	105	20
BH115	0.04-0.2	Fill: Silty clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	180	180	120	1300	5600	60	105	125	45	20
BH115	1.0-1.2	Silty clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	--	180	120	1300	5600	60	105	125	45	20
BH115	1.0-1.2	Lab replicate	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	--	180	120	1300	5600	60	105	125	45	20
BH116	0.7-0.95	Fill: Silty clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	180	180	120	1300	5600	60	105	125	45	20
BH116	1.8-1.95	Siltstone	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	--	180	120	1300	5600	60	105	125	45	20
BH117	0.2-0.4	Fill: Silty clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	180	180	120	1300	5600	60	105	125	45	20
BH117	1.0-1.2	Silty clay	Fine	5.76	7.1	35.3	100	413	218	1263	175	392	170	--	180	120	1300	5600	60	105	125	45	20
DUPRK1	-	Fill: Sandy gravel	Coarse	9.2	26	7	100	413	248	1263	355	1082	170	--	180	120	300	2800	50	85	70	105	20
DUPRK2	-	Fill: Gravelly sand	Coarse	9.2	26	7	100	413	248	1263	355	1082	170	--	180	120	300	2800	50	85	70	105	20

TABLE D
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 reference	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		**0.01**	**0.001**
27/03/2019	BH101	0-0.3	No	10	8,600	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	214605-A	BH101	0-0.3	534.47	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
27/03/2019	BH102	0-0.2	No	10	8,600	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	214605-A	BH102	0-0.2	453.94	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
27/03/2019	BH103	0-0.1	No	10	12,400	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	214605-A	BH103	0-0.1	758.54	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
27/03/2019	BH104	0.03-0.4	No	10	10,100	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	214605-A	BH104	0.03-0.4	763.45	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
27/03/2019	BH104	0.4-0.8	No	10	10,000	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	214605-A	BH104	0.4-0.8	509.28	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
27/03/2019	BH105	0.05-0.2	No	10	9,700	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	214605-A	BH105	0.05-0.2	726.94	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
27/03/2019	BH105	0.2-0.6	No	10	10,300	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	214605-A	BH105	0.2-0.6	600.84	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
27/03/2019	BH106	0.03-0.4	No	10	12,400	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	214605-A	BH106	0.03-0.4	780.67	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
27/03/2019	BH107	0-0.5	No	10	9,800	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	214605-A	BH107	0-0.5	429.63	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
27/03/2019	BH108	0.05-0.2	No	10	12,300	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	214605-A	BH108	0.05-0.2	784.28	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
27/03/2019	BH109	0.05-0.3	No	5	4,700	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	214605-A	BH109	0.05-0.3	684.56	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
27/03/2019	BH110	0-0.5	No	10	11,000	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	214605-A	BH110	0-0.5	639.32	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
27/03/2019	BH111	0.16-0.6	No	10	9,600	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	214605-A	BH111	0.16-0.6	711.12	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
27/03/2019	BH111	0.6-1.0	No	10	4,000	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	214605-A	BH111	0.6-1.0	329.33	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
27/03/2019	BH112	0-0.5	No	10	10,000	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	214605-A	BH112	0-0.5	503.23	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
27/03/2019	BH113	0-0.45	No	10	10,000	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	214605-A	BH113	0-0.45	460.24	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
27/03/2019	BH114	0.12-0.2	No	4	2,000	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	214605-A	BH114	0.12-0.2	480.4	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
27/03/2019	BH115	0.09-1.0	No	10	10,300	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	214605-A	BH115	0.09-1.0	561.15	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
27/03/2019	BH116	0.05-0.7	No	10	10,000	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	214605-A	BH116	0.05-0.7	906.93	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
27/03/2019	BH116	0.7-1.7	No	10	10,100	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	214605-A	BH116	0.7-1.7	630.74	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
27/03/2019	BH117	0.2-0.7	No	10	10,000	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	214605-A	BH117	0.2-0.7	552.09	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

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

				C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	
PQL - Envirolab Services				10	50	1	1	1	3	1	PID
NEPM 2013 - Land Use Category				HSL-A/B: LOW/HIGH DENSITY RESIDENTIAL							
Sample Reference	**Water Depth**	**Depth Category**	**Soil Category**								
MW111	5.12	4m to <8m	Clay	<10	<50	<1	<1	<1	<3	<1	-
Total Number of Samples				1	1	1	1	1	1	1	0
Maximum Value				<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL

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

TABLE F

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	MW111
Inorganic Compounds and Parameters			
pH	0.1	6.5 - 8.5	6.2
Electrical Conductivity (µS/cm)	1	NSL	2234
Hardness ($mgCaCO_3/L$)	3	NSL	210
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	9
Zinc	1	8	52
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)			
Benzene	1	950	<1
Toluene	1	180	<1
Ethylbenzene	1	80	<1
m+p-xylene	2	75	<2
o-xylene	1	350	<1
Total xylenes	2	NSL	<2
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	<1
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	<1
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	<1
1,3-dichloropropane	1	1100	<1
Dibromochloromethane	1	NSL	<1
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	<2
Styrene	1	NSL	<1
1,1,2,2-tetrachloroethane	1	400	<1
o-xylene	1	see BTEX	<1
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	<1
Tert-butyl benzene	1	NSL	<1
1,2,4-trimethyl benzene	1	NSL	<1
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**

TABLE G

SUMMARY OF GROUNDAWATER LABORATORY RESULTS COMPARED TO HUMAN CONTACT GILs

All results in µg/L unless stated otherwise.

	PQL Envirolab Services	ANZG 2018 Recreational	MW111
Inorganic Compounds and Parameters			
pH	0.1	6.5 - 8.5	6.2
Electrical Conductivity (µS/cm)	1	NSL	2234
Hardness (mgCaCo3/L)	3	500	210
Metals and Metalloids			
Arsenic (As III)	1	50	<1
Cadmium	0.1	5	<0.1
Chromium (total)	1	50	1
Copper	1	1000	2
Lead	1	50	<1
Total Mercury (inorganic)	0.05	1	<0.05
Nickel	1	100	9
Zinc	1	5000	52
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)			
Benzene	1	10	<1
Toluene	1	NSL	<1
Ethylbenzene	1	NSL	<1
m+p-xylene	2	NSL	<2
o-xylene	1	NSL	<1
Total xylenes	2	NSL	<2
Volatile Organic Compounds (VOCs), including chlorinated VOCs			
Dichlorodifluoromethane	10	NSL	<10
Chloromethane	10	NSL	<10
Vinyl Chloride	10	NSL	<10
Bromomethane	10	NSL	<10
Chloroethane	10	NSL	<10
Trichlorofluoromethane	10	NSL	<10
1,1-Dichloroethene	**1**	0.3	<1
Trans-1,2-dichloroethene	1	NSL	<1
1,1-dichloroethane	1	NSL	<1
Cis-1,2-dichloroethene	1	NSL	<1
Bromochloromethane	1	NSL	<1
Chloroform	1	NSL	<1
2,2-dichloropropane	1	NSL	<1
1,2-dichloroethane	1	10	<1
1,1,1-trichloroethane	1	NSL	<1
1,1-dichloropropene	1	NSL	<1
Cyclohexane	1	NSL	<1
Carbon tetrachloride	1	3	<1
Benzene	1	NSL	<1
Dibromomethane	1	NSL	<1
1,2-dichloropropane	1	NSL	<1
Trichloroethene	1	30	<1
Bromodichloromethane	1	NSL	<1
trans-1,3-dichloropropene	1	NSL	<1
cis-1,3-dichloropropene	1	NSL	<1
1,1,2-trichloroethane	1	NSL	<1
Toluene	1	NSL	<1
1,3-dichloropropane	1	NSL	<1
Dibromochloromethane	1	NSL	<1
1,2-dibromoethane	1	NSL	<1
Tetrachloroethene	1	10	<1
1,1,1,2-tetrachloroethane	1	NSL	<1
Chlorobenzene	1	NSL	<1
Ethylbenzene	1	NSL	<1
Bromoform	1	NSL	<1
m+p-xylene	2	NSL	<2
Styrene	1	NSL	<1
1,1,2,2-tetrachloroethane	1	NSL	<1
o-xylene	1	NSL	<1
1,2,3-trichloropropane	1	NSL	<1
Isopropylbenzene	1	NSL	<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	<1
Tert-butyl benzene	1	NSL	<1
1,2,4-trimethyl benzene	1	NSL	<1
1,3-dichlorobenzene	1	NSL	<1
Sec-butyl benzene	1	NSL	<1
1,4-dichlorobenzene	1	NSL	<1
4-isopropyl toluene	1	NSL	<1
1,2-dichlorobenzene	1	NSL	<1
n-butyl benzene	1	NSL	<1
1,2-dibromo-3-chloropropane	1	NSL	<1
1,2,4-trichlorobenzene	1	NSL	<1
Hexachlorobutadiene	1	NSL	<1
1,2,3-trichlorobenzene	1	NSL	<1
Polycyclic Aromatic Hydrocarbons (PAHs)			
Naphthalene	0.2	NSL	<0.2
Acenaphthylene	0.1	NSL	<0.1
Acenaphthene	0.1	NSL	<0.1
Fluorene	0.1	NSL	<0.1
Phenanthrene	0.1	NSL	<0.1
Anthracene	0.1	NSL	<0.1
Fluoranthene	0.1	NSL	<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**	0.01	<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**

TABLE H
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 = BH10 (0-0.1)	Arsenic	4	7	6	6.5	15
Dup Ref = DUP1	Cadmium	0.4	<0.4	<0.4	NC	NC
	Chromium	1	12	9	10.5	29
Envirolab Report: 200697	Copper	1	14	11	12.5	24
	Lead	1	52	43	47.5	19
	Mercury	0.1	<0.1	<0.1	NC	NC
	Nickel	1	5	4	4.5	22
	Zinc	1	72	64	68.0	12
	Naphthalene	0.1	<0.1	<0.1	NC	NC
	Acenaphthylene	0.1	<0.1	<0.1	NC	NC
	Acenaphthene	0.1	<0.1	<0.1	NC	NC
	Fluorene	0.1	<0.1	<0.1	NC	NC
	Phenanthrene	0.1	<0.1	<0.1	NC	NC
	Anthracene	0.1	<0.1	<0.1	NC	NC
	Fluoranthene	0.1	<0.1	<0.1	NC	NC
	Pyrene	0.1	<0.1	<0.1	NC	NC
	Benzo(a)anthracene	0.1	<0.1	<0.1	NC	NC
	Chrysene	0.1	<0.1	<0.1	NC	NC
	Benzo(b,j+k)fluoranthene	0.2	<0.2	<0.2	NC	NC
	Benzo(a)pyrene	0.05	<0.05	<0.05	NC	NC
	Indeno(123-cd)pyrene	0.1	<0.1	<0.1	NC	NC
	Dibenzo(ah)anthracene	0.1	<0.1	<0.1	NC	NC
	Benzo(ghi)perylene	0.1	<0.1	<0.1	NC	NC
	Total OCPs	0.1	<0.1	<0.1	NC	NC
	Total OPPs	0.1	<0.1	<0.1	NC	NC
	Total PCBs	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

Explanation:

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

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

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

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

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

RPD Results Above the Acceptance Criteria VALUE

TABLE I
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 = BH109 (0.05-0.15)	Arsenic	4	<4	<4	NC	NC
Dup Ref = DUPRK1	Cadmium	0.4	<0.4	<0.4	NC	NC
	Chromium	1	77	64	70.5	18
Envirolab Report: 214605	Copper	1	34	30	32.0	13
	Lead	1	11	10	10.5	10
	Mercury	0.1	<0.1	<0.1	NC	NC
	Nickel	1	69	55	62.0	23
	Zinc	1	47	46	46.5	2
	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	0.3	0.6	0.5	67
	Anthracene	0.1	<0.1	0.1	0.1	67
	Fluoranthene	0.1	0.6	1.3	1.0	74
	Pyrene	0.1	0.8	1.4	1.1	55
	Benzo(a)anthracene	0.1	0.3	0.5	0.4	50
	Chrysene	0.1	0.4	0.8	0.6	67
	Benzo(b,j+k)fluoranthene	0.2	0.7	1	0.9	35
	Benzo(a)pyrene	0.05	0.4	0.56	0.5	33
	Indeno(123-cd)pyrene	0.1	0.2	0.3	0.3	40
	Dibenzo(ah)anthracene	0.1	<0.1	<0.1	NC	NC
	Benzo(ghi)perylene	0.1	0.3	0.5	0.4	50
	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	130	180	155.0	32
	TRH >C_{34}-C_{40} (F4)	100	170	200	185.0	16
	Benzene	0.2	<0.2	<0.2	NC	NC
	Toluene	0.5	<0.5	<0.5	NC	NC
	Ethylbenzene	1	<1	<1	NC	NC
	m+p-xylene	2	<2	<2	NC	NC
	o-xylene	1	<1	<1	NC	NC

Explanation:

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

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

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

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

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

RPD Results Above the Acceptance Criteria VALUE

TABLE J
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 = BH8 (0-0.1)	Arsenic	4	4	<4	<4	NC	NC
Dup Ref = DUP2	Cadmium	0.4	0.4	<0.4	<0.4	NC	NC
	Chromium	1	1	46	45	45.5	2
Envirolab Report: 200697	Copper	1	1	17	16	16.5	6
Envirolab VIC Report: 14768	Lead	1	1	17	17	17.0	0
	Mercury	0.1	0.1	<0.1	<0.1	NC	NC
	Nickel	1	1	32	36	34.0	12
	Zinc	1	1	41	38	39.5	8
	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
	Total OCPs	0.1	0.1	<0.1	<0.1	NC	NC
	Total OPPs	0.1	0.1	<0.1	<0.1	NC	NC
	Total PCBs	0.1	0.1	<0.1	<0.1	NC	NC
	TRH C6-C10 (F1)	25	25	<25	<25	NC	NC
	TRH >C10-C16 (F2)	50	50	<50	<50	NC	NC
	TRH >C16-C34 (F3)	100	100	<100	<100	NC	NC
	TRH >C34-C40 (F4)	100	100	<100	<100	NC	NC
	Benzene	0.2	0.2	<0.2	<0.2	NC	NC
	Toluene	0.5	0.5	<0.5	<0.5	NC	NC
	Ethylbenzene	1	1	<1	<1	NC	NC
	m+p-xylene	2	2	<2	<2	NC	NC
	o-xylene	1	1	<1	<1	NC	NC

Explanation:

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

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

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

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

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

RPD Results Above the Acceptance Criteria VALUE

JKEnvironments

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

SAMPLE	ANALYSIS	Envirolab PQL	Envirolab VIC PQL	INITIAL	REPEAT	MEAN	RPD %
Sample Ref = BH105 (0.2-0.4)	Arsenic	4	4	<4	<4	NC	NC
Dup Ref = DUPRK2	Cadmium	0.4	0.4	<0.4	<0.4	NC	NC
	Chromium	1	1	12	40	26.0	108
Envirolab Report: 214605	Copper	1	1	67	110	88.5	49
Envirolab VIC Report: 16446	Lead	1	1	14	15	14.5	7
	Mercury	0.1	0.1	<0.1	<0.1	NC	NC
	Nickel	1	1	12	41	26.5	109
	Zinc	1	1	60	42	51.0	35
	Naphthalene	0.1	1	<0.1	<1	NC	NC
	Acenaphthylene	0.1	1	<0.1	<1	NC	NC
	Acenaphthene	0.1	1	0.2	<1	0.4	86
	Fluorene	0.1	1	0.2	<1	0.4	86
	Phenanthrene	0.1	0.1	5.4	7.7	6.6	35
	Anthracene	0.1	0.1	1.1	1.6	1.4	37
	Fluoranthene	0.1	0.1	13	17	15.0	27
	Pyrene	0.1	0.1	12	14	13.0	15
	Benzo(a)anthracene	0.1	0.1	4.1	5.6	4.9	31
	Chrysene	0.1	0.1	5.6	5.8	5.7	4
	Benzo(b,j+k)fluoranthene	0.2	0.2	8	10	9.0	22
	Benzo(a)pyrene	0.05	0.05	4.1	5.2	4.7	24
	Indeno(123-cd)pyrene	0.1	0.1	2.7	4.5	3.6	50
	Dibenzo(ah)anthracene	0.1	0.1	0.6	1.5	1.1	86
	Benzo(ghi)perylene	0.1	0.1	3.7	5.8	4.8	44
	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	410	350	380.0	16
	TRH >C34-C40 (F4)	100	100	300	420	360.0	33
	Benzene	0.2	0.2	<0.2	<0.2	NC	NC
	Toluene	0.5	0.5	<0.5	<0.5	NC	NC
	Ethylbenzene	1	1	<1	<1	NC	NC
	m+p-xylene	2	2	<2	<2	NC	NC
	o-xylene	1	1	<1	<1	NC	NC

Explanation:

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

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

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

RPD Results Above the Acceptance Criteria VALUE

TABLE L
SUMMARY OF FIELD QA/QC RESULTS

ANALYSIS	Envirolab PQL	TB1[S]
		31/08/2018
	mg/kg	mg/kg
Benzene	0.2	<0.2
Toluene	0.5	<0.5
Ethylbenzene	1	<1
m+p-xylene	2	<2
o-xylene	1	<1

Explanation:
[S] Sample type (sand)

Values above PQLs/Acceptance criteria **VALUE**

TABLE M

SUMMARY OF FIELD QA/QC RESULTS

ANALYSIS	Envirolab PQL		TB1[S]	FRAM1[S]
			27/03/2019	27/03/2019
	mg/kg	µg/L	mg/kg	µg/L
TRH C6-C10 (F1)	25	10	<25	NA
Benzene	0.2	1	<0.2	<1
Toluene	0.5	1	<0.5	<1
Ethylbenzene	1	1	<1	<1
m+p-xylene	2	2	<2	<2
o-xylene	1	1	<1	<1

Explanation:

[W] Sample type (water)

[S] Sample type (sand)

BTEX concentrations in trip spikes are presented as % recovery

Values above PQLs/Acceptance criteria **VALUE**

Appendix C: Site Information and Site History

Proposed Development Plans

DRAWING LIST

A0000	COVER SHEET	NTS	4
A0001	EXISTING SITE PLAN	1:1000 @ A1	4
A0002	PROPOSED BUILDING ENVELOPE SITE PLAN	1:1000 @ A1	4
A0003	STAGE 1 WORKS	1:500 @ A1	3
A0004	INDICATIVE EXTENT OF FUTURE ENVELOPES	1:500 @ A1	3
A0005	SITE ELEVATIONS	1:500 @ A1	4
A0006	SITE ELEVATIONS	1:500 @ A1	4
A0007	SITE SECTIONS	1:500 @ A1	4
A0008	SITE SECTIONS	1:500 @ A1	4
A0009	OVERALL 3D VIEW - EXISTING	NTS	4
A0010	OVERALL 3D VIEW - STAGE 1 ENVELOPES	NTS	4
A0011	OVERALL 3D VIEW - FUTURE PROJECTS	NTS	3
A0012	SHADOW DIAGRAMS - WINTER SOLSTICE 9am - 11am	1:2000 @ A1	3
A0013	SHADOW DIAGRAMS - WINTER SOLSTICE 12pm - 2pm	1:2000 @ A1	2
A0014	SHADOW DIAGRAMS - WINTER SOLSTICE 3pm	1:2000 @ A1	2
A0015	SHADOW DIAGRAMS - SUMMER SOLSTICE 9am - 11am	1:2000 @ A1	3
A0016	SHADOW DIAGRAMS - SUMMER SOLSTICE 12pm - 2pm	1:2000 @ A1	2
A0017	SHADOW DIAGRAMS - SUMMER SOLSTICE 3pm	1:2000 @ A1	2
A0018	SHADOW DIAGRAMS - EQUINOX 9am - 11am	1:2000 @ A1	3
A0019	SHADOW DIAGRAMS - EQUINOX 12pm - 2pm	1:2000 @ A1	2
A0020	SHADOW DIAGRAMS - EQUINOX 3pm	1:2000 @ A1	2
A0021	VIEW IMPACT ANALYSIS	NTS	1

LORETO NORMANHURST
CONCEPT PROPOSAL
91-93 PENNANT HILLS ROAD
NORMANHURST. NSW 2076

Revisions

No.	Date	Description	Ver	App'd
1	30.11.2018	DRAFT MASTERPLAN ISSUE		
2	10.12.2018	ISSUED FOR COORDINATION		
3	18.12.2018	CONCEPT PROPOSAL		
4	10.01.2019	CONCEPT PROPOSAL - SUBMISSION		

Key

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Project
LORETO NORMANHURST
CONCEPT PROPOSAL
91-93 PENNANT HILLS ROAD
NORMANHURST. NSW 2076
Proj. No. 18008

Drawing Title
COVER SHEET
Sheet Status
NOT FOR CONSTRUCTION

Scale
NTS

Drawing No.
A0000

Issue
4

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PLOTTED & CHECKED BY: Author
REF: C:\Users\arbuckle\Documents\18008_MasterPlan_Arbuckle.rvt

Revisions			
No.	Date	Description	Ver App'd
1	30.11.2018	DRAFT MASTERPLAN ISSUE	
2	10.12.2018	ISSUED FOR COORDINATION	
3	18.12.2018	CONCEPT PROPOSAL	
4	10.01.2019	CONCEPT PROPOSAL - SUBMISSION	

Key

N

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Project
LORETO NORMANHURST
CONCEPT PROPOSAL
91-93 PENNANT HILLS ROAD
NORMANHURST. NSW 2076
Proj. No. 18008

Drawing Title
EXISTING SITE PLAN
Sheet Status
NOT FOR CONSTRUCTION

Scale
1:1000 @ A1
Drawing No.
A0001
Issue
4

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REF: C:\Users\virtualsite\Documents\18008_MasterPlan_afforddable.rvt
PLOTTED & CHECKED BY: Author
PLOT DATE & TIME: 10/01/2019 4:05:04 PM

KEY

1	NEW BOARDING HOUSE	5	MARY WARD BUILDING UPGRADE	9	MOUNT PLEASANT PAVILION
2	SENIOR SCHOOL UPGRADE	6	GYMNASIUM	10	BUSH CHAPEL
3	FUTURE SCHOOL USE	7	GONZAGA BARRY CENTRE EXTENSION	11	ELC SUBJECT OF HORNSBY SHIRE COUNCIL DEVELOPMENT APPLICATION
4	JUNIOR SCHOOL UPGRADE	8	ALL WEATHER PLAYING FIELD AND UNDERGROUND CARPARK	12	PEDESTRIAN BRIDGE LINK FROM LRC TO MARY WARD WING

Revisions

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Key

N

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Project
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CONCEPT PROPOSAL
91-93 PENNANT HILLS ROAD
NORMANHURST. NSW 2076
Proj. No. 18008

Drawing Title
PROPOSED BUILDING ENVELOPE SITE PLAN
Sheet Status
NOT FOR CONSTRUCTION

Scale
1:1000 @ A1
Drawing No.
A0002
Issue
4

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PLOT DATE & TIME: 10/01/2019 4:05:06 PM
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REF: C:\Users\ahurstable\Documents\18008_MasterPlan_ahurstable.rvt

INDICATES EXTENT OF STAGE 1 DA SCOPE

PROPOSED STAGING WORKS WITHIN STAGE 1 DA

Revisions

No.	Date	Description	Ver	App'd
1	10.12.2018	ISSUED FOR COORDINATION		
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Project
LORETO NORMANHURST
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91-93 PENNANT HILLS ROAD
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Proj. No. 18008

Drawing Title
STAGE 1 WORKS

Sheet Status
NOT FOR CONSTRUCTION

Scale
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Drawing No.
A0003

Issue
3

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INDICATES EXTENT OF FUTURE WORKS ENVELOPE SCOPES

INDICATES EXTENT OF FUTURE PROPOSED ENVELOPES

GENERAL LANDSCAPE WORKS THROUGHOUT ENTIRE CAMPUS

NOTE: FINAL EXTENTS OF WORKS MAY NOMINALLY CHANGE

KEY

1	NEW BOARDING HOUSE	5	MARY WARD BUILDING UPGRADE	9	MOUNT PLEASANT PAVILION
2	SENIOR SCHOOL UPGRADE	6	GYMNASIUM	10	BUSH CHAPEL
3	FUTURE SCHOOL USE	7	GONZAGA BARRY CENTRE EXTENSION	11	ELC SUBJECT OF HORNSBY SHIRE COUNCIL DEVELOPMENT APPLICATION
4	JUNIOR SCHOOL UPGRADE	8	ALL WEATHER PLAYING FIELD AND UNDERGROUND CARPARK	12	PEDESTRIAN BRIDGE LINK FROM LRC TO MARY WARD WING

Revisions

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Project

LORETO NORMANHURST
CONCEPT PROPOSAL

91-93 PENNANT HILLS ROAD
NORMANHURST. NSW 2076

Proj. No. 18008

Drawing Title

INDICATIVE EXTENT OF FUTURE ENVELOPES

Sheet Status

NOT FOR CONSTRUCTION

Scale: 1:500 @ A1

Drawing No.: A0004

Issue: 3

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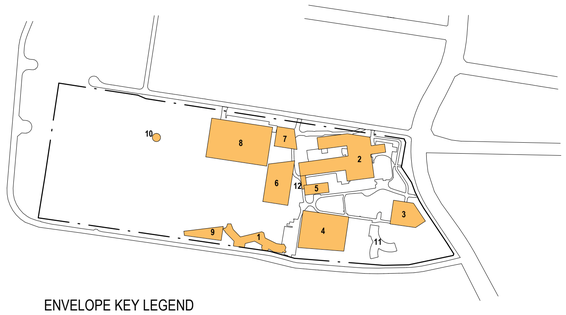
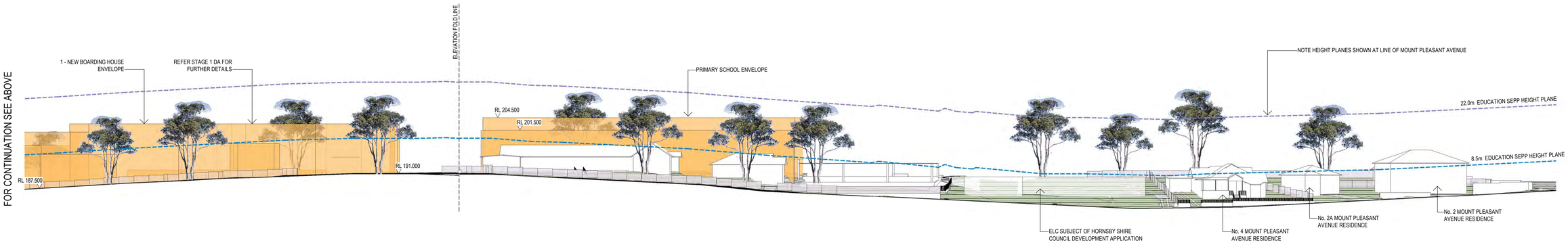


ENVELOPE KEY LEGEND

2 SITE ELEVATION - MOUNT PLEASANT AVENUE
1 : 500



1 SITE ELEVATION - MOUNT PLEASANT AVENUE
1 : 500

Revisions				
No.	Date	Description	Ver	App'd
1	30.11.2018	DRAFT MASTERPLAN ISSUE		
2	10.12.2018	ISSUED FOR COORDINATION		
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CONCEPT PROPOSAL
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NORMANHURST. NSW 2076
Proj. No. 18008

Drawing Title
SITE ELEVATIONS
Sheet Status
NOT FOR CONSTRUCTION

Scale
1:500 @ A1
Drawing No.
A0005
Issue
4

0 5 10 20 40 m

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PLOTTED & CHECKED BY: Author
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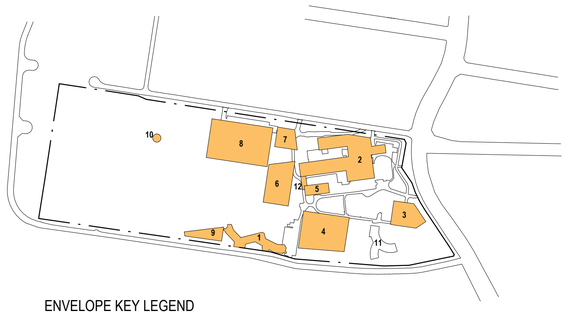
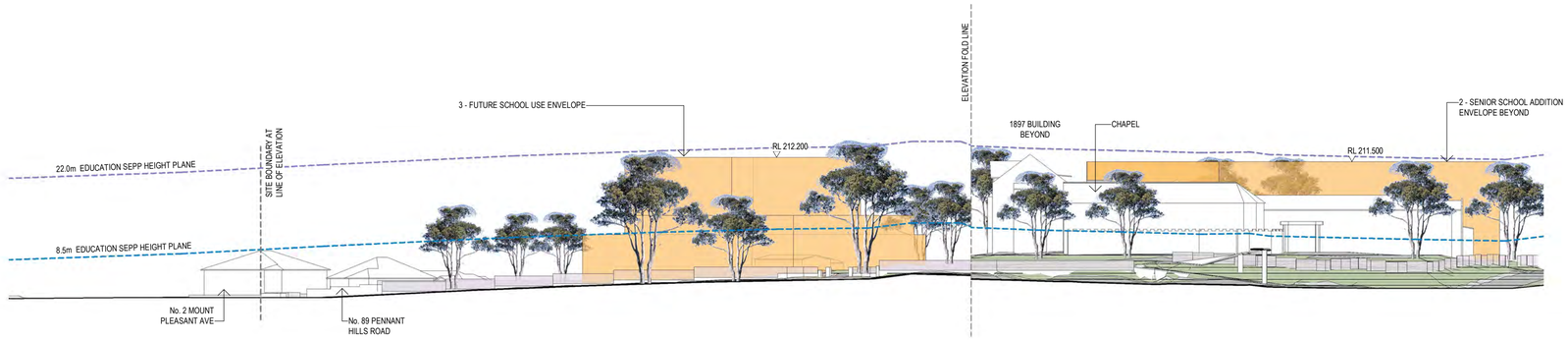
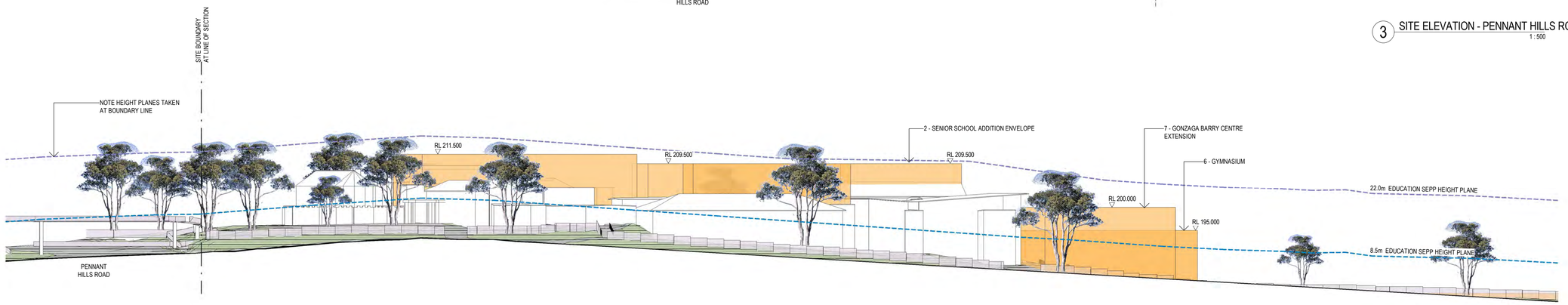


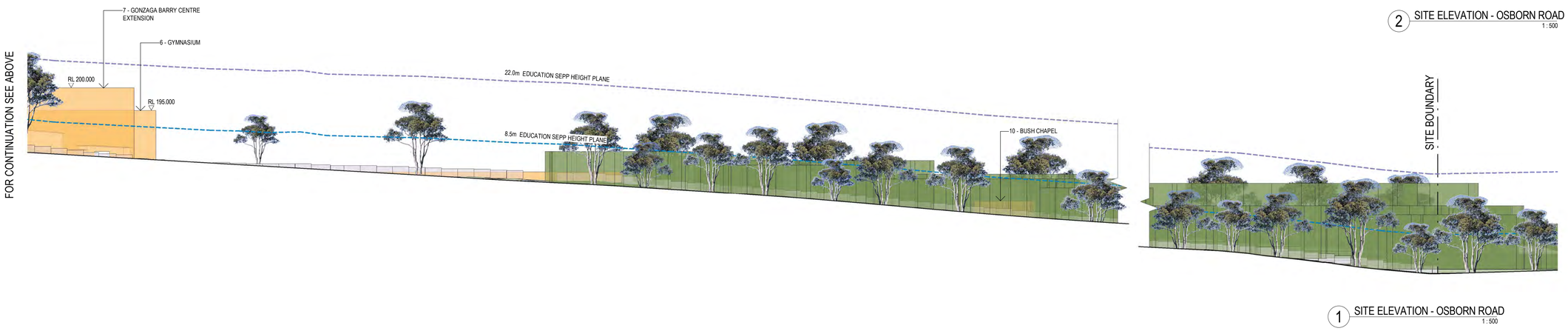
ENVELOPE KEY LEGEND



3 SITE ELEVATION - PENNANT HILLS ROAD
1 : 500



2 SITE ELEVATION - OSBORN ROAD
1 : 500



1 SITE ELEVATION - OSBORN ROAD
1 : 500

Revisions

No.	Date	Description	Ver	App'd
1	30.11.2018	DRAFT MASTERPLAN ISSUE		
2	10.12.2018	ISSUED FOR COORDINATION		
3	18.12.2018	CONCEPT PROPOSAL		
4	10.01.2019	CONCEPT PROPOSAL - SUBMISSION		

Key

Client
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Project
LORETO NORMANHURST
CONCEPT PROPOSAL
91-93 PENNANT HILLS ROAD
NORMANHURST, NSW 2076
Proj. No. 18008

Drawing Title
SITE ELEVATIONS

Sheet Status
NOT FOR CONSTRUCTION

Scale
1:500 @ A1

Drawing No.
A0006

Issue
4

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REF: C:\Users\ahurst\adeDocuments\18008_MasterPlan_ahurst.rvt
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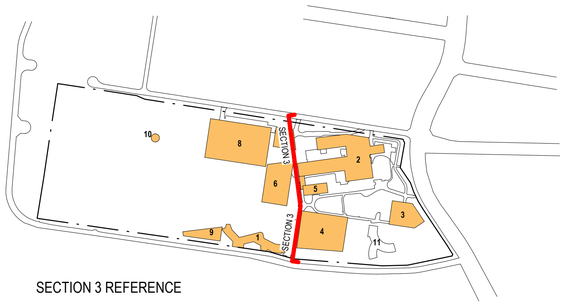
PLOT DATE & TIME: 10/01/2019 4:05:30 PM



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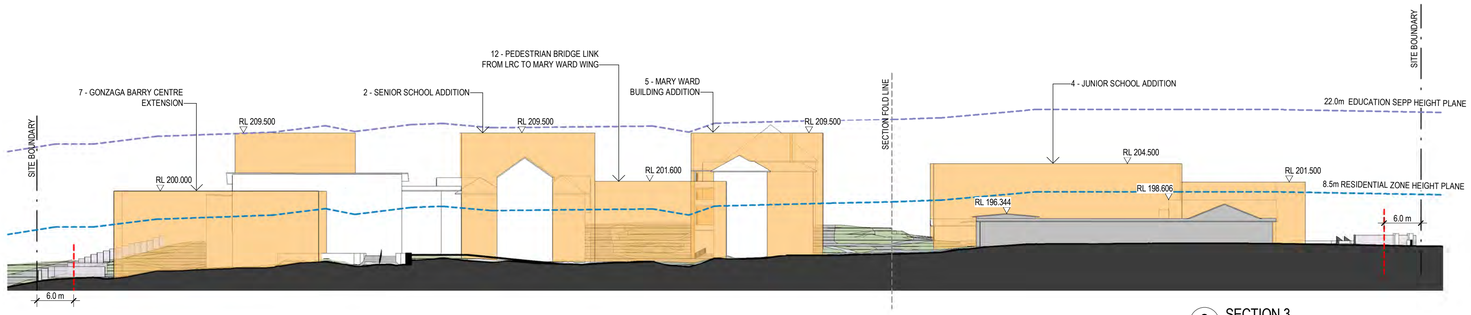

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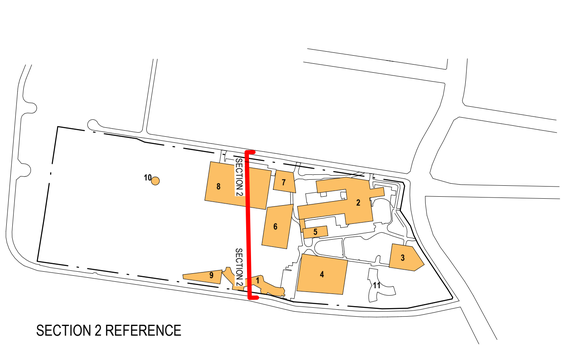

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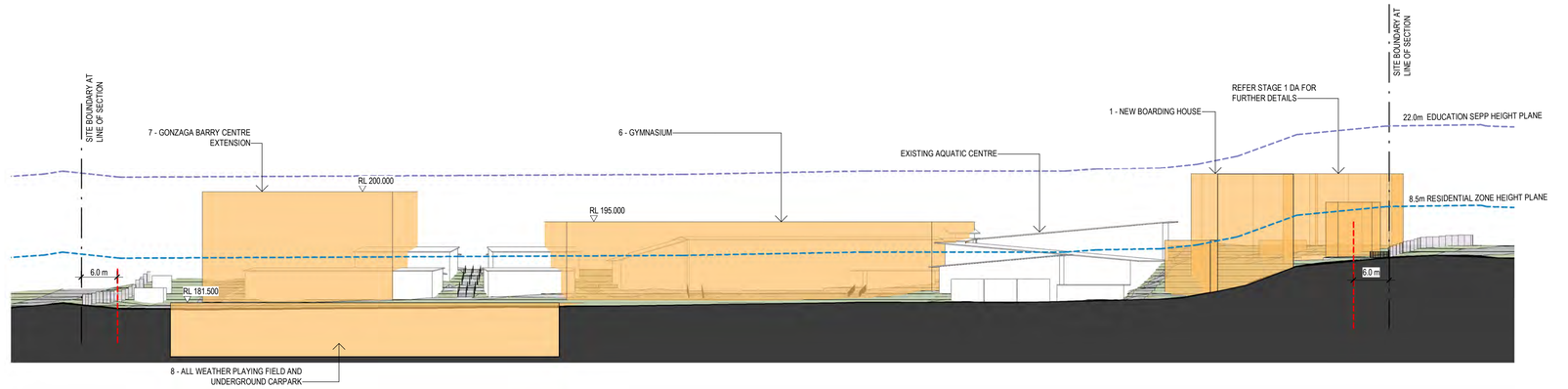

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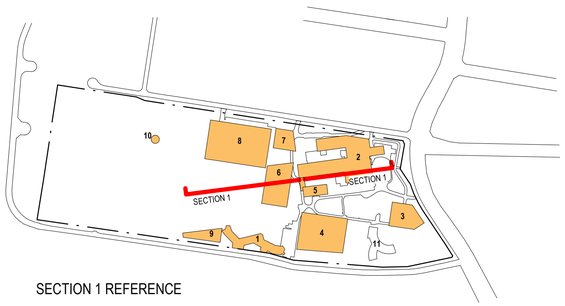

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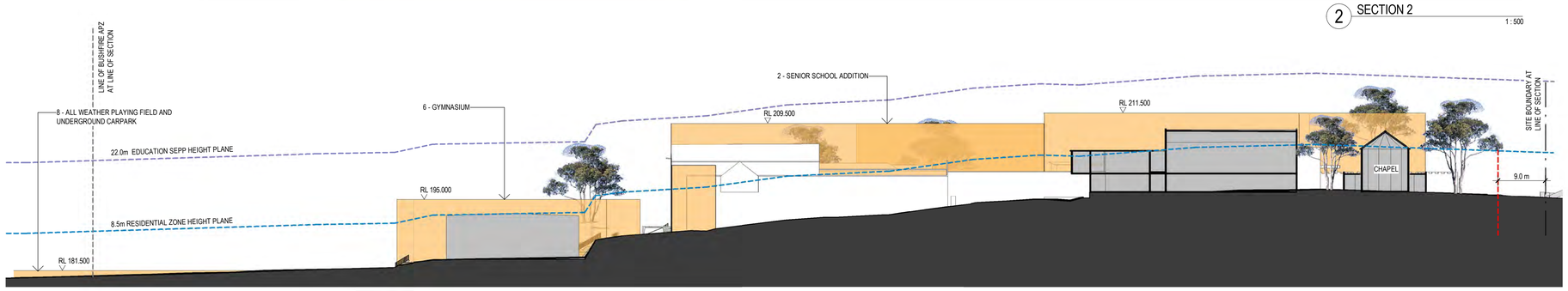

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Revisions			
No.	Date	Description	Ver App'd
1	30.11.2018	DRAFT MASTERPLAN ISSUE	
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Key

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Project
LORETO NORMANHURST
CONCEPT PROPOSAL
91-93 PENNANT HILLS ROAD
NORMANHURST. NSW 2076
Proj. No. 18008

Drawing Title
SITE SECTIONS
Sheet Status
NOT FOR CONSTRUCTION

Scale
1:500 @ A1
Drawing No.
A0007
Issue
4

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PLOTTED & CHECKED BY: Author
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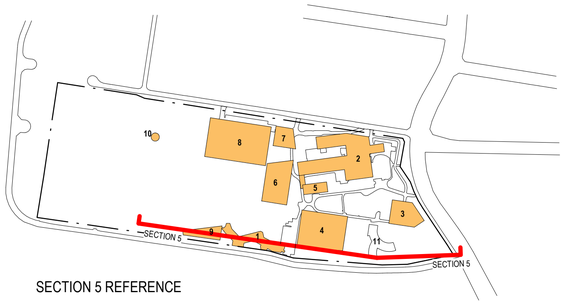

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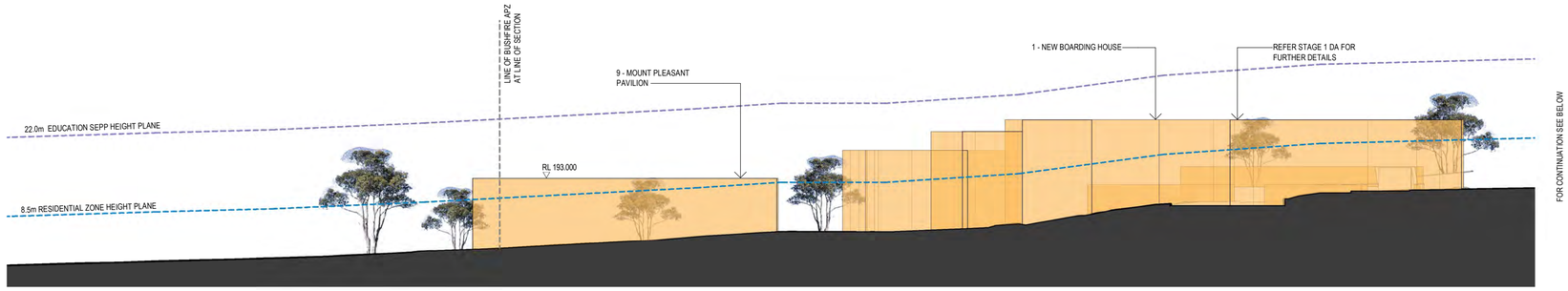

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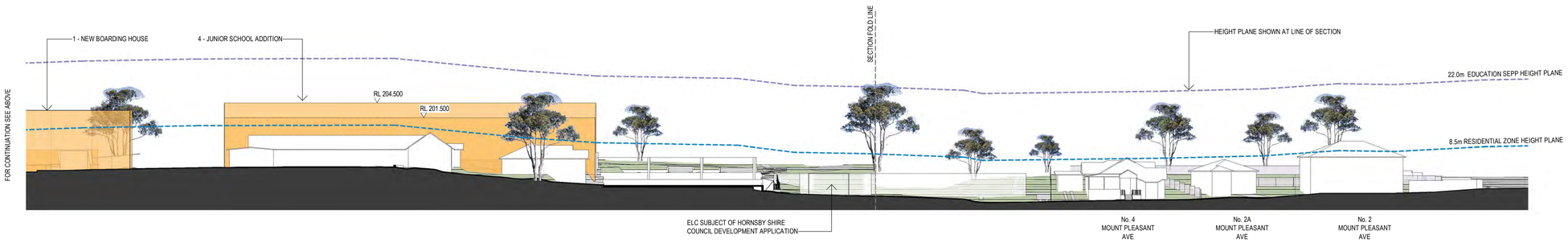

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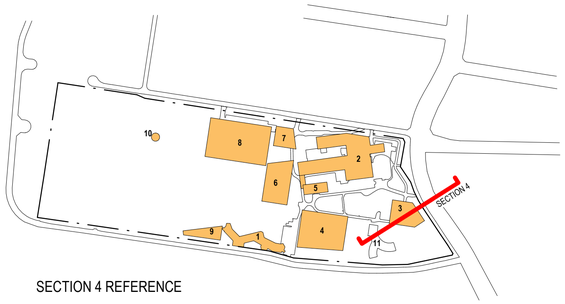

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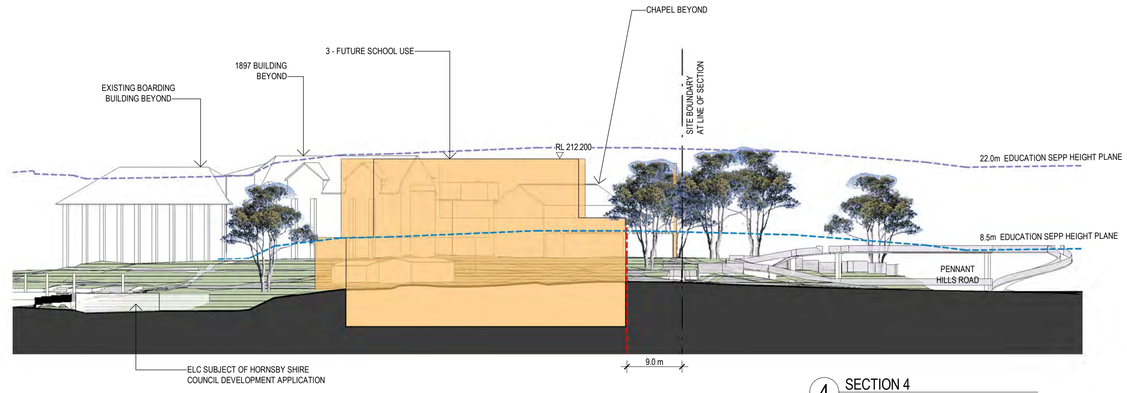

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Revisions				
No.	Date	Description	Ver	App'd
1	30.11.2018	DRAFT MASTERPLAN ISSUE		
2	10.12.2018	ISSUED FOR COORDINATION		
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Key

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Project
LORETO NORMANHURST
CONCEPT PROPOSAL
91-93 PENNANT HILLS ROAD
NORMANHURST. NSW 2076
Proj. No. 18008

Drawing Title
SITE SECTIONS

Sheet Status
NOT FOR CONSTRUCTION

Scale
1:500 @ A1

Drawing No.
A0008

Issue
4

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Revisions				
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2	10.12.2018	ISSUED FOR COORDINATION		
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Key

N

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Project

LORETO NORMANHURST
CONCEPT PROPOSAL

91-93 PENNANT HILLS ROAD
NORMANHURST, NSW 2076

Proj. No. 18008

Drawing Title

OVERALL 3D VIEW - EXISTING

Sheet Status

NOT FOR CONSTRUCTION

Scale	Drawing No.	Issue
NTS	A0009	4

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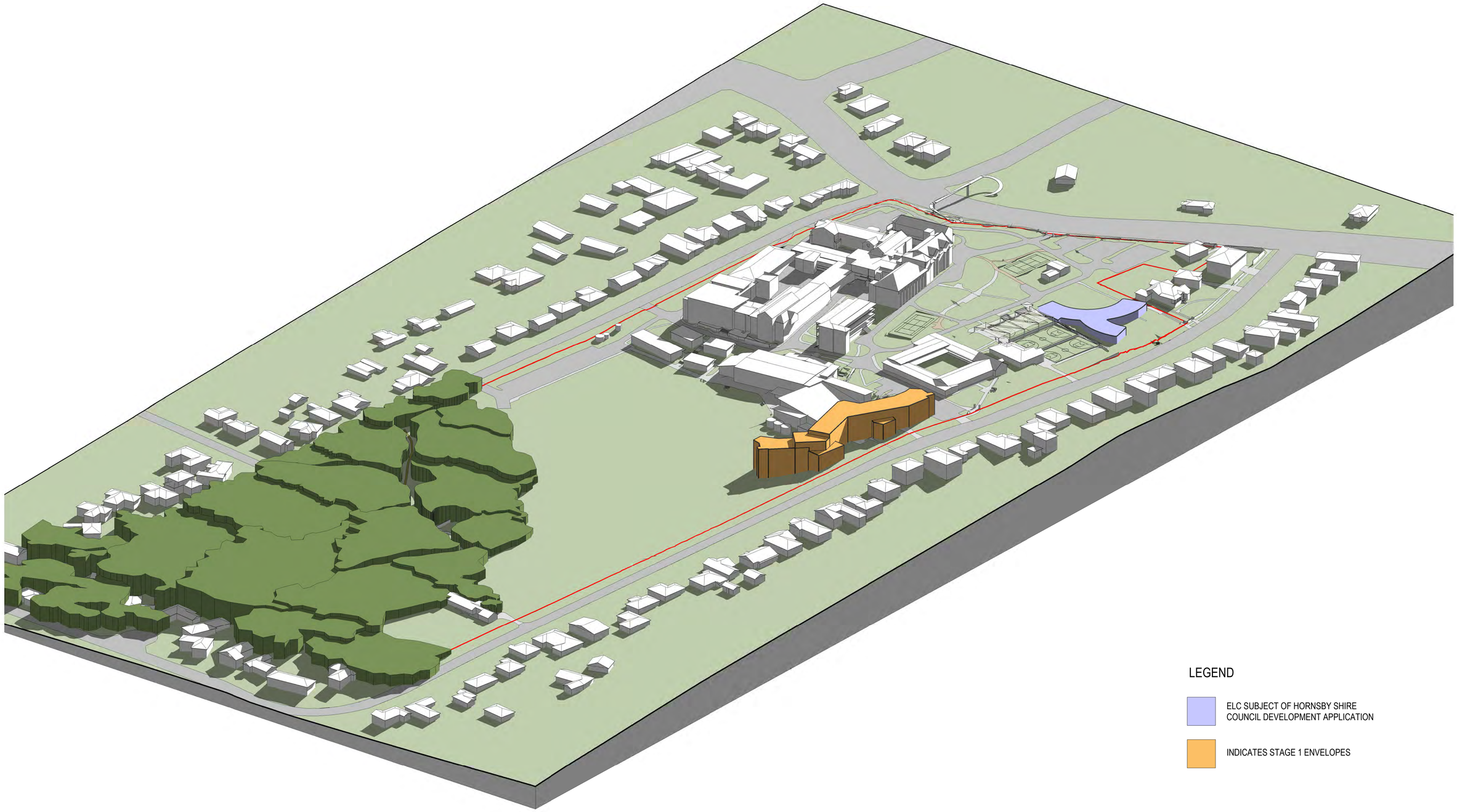

LEGEND

ELC SUBJECT OF HORNSBY SHIRE COUNCIL DEVELOPMENT APPLICATION

INDICATES STAGE 1 ENVELOPES

Revisions

No.	Date	Description	Ver	App'd
1	30.11.2018	DRAFT MASTERPLAN ISSUE		
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Key

N

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Project
LORETO NORMANHURST
CONCEPT PROPOSAL
91-93 PENNANT HILLS ROAD
NORMANHURST. NSW 2076
Proj. No. 18008

Drawing Title
OVERALL 3D VIEW - STAGE 1 ENVELOPES
Sheet Status
NOT FOR CONSTRUCTION

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Drawing No.: A0010
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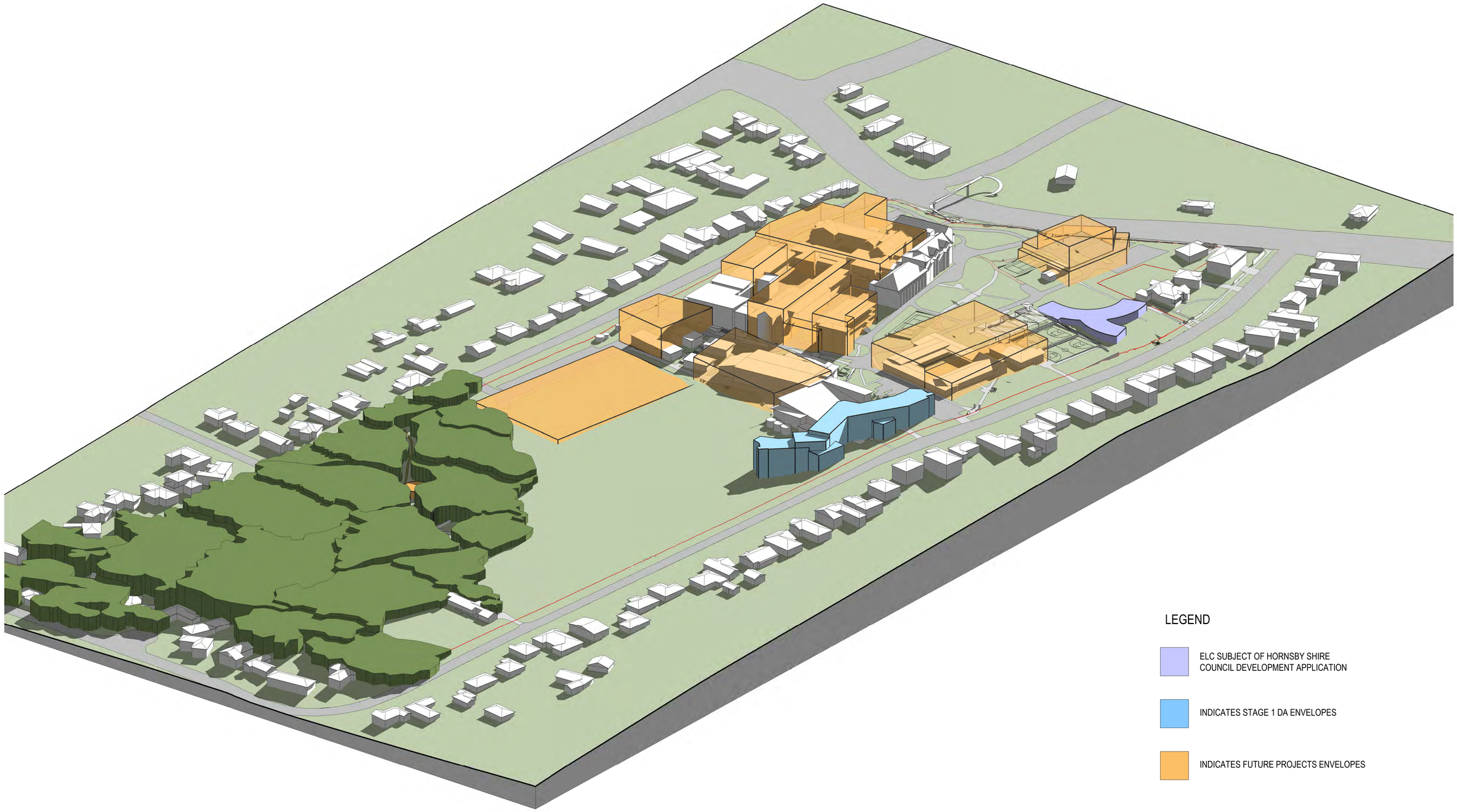

LEGEND

ELC SUBJECT OF HORNSBY SHIRE COUNCIL DEVELOPMENT APPLICATION

INDICATES STAGE 1 DA ENVELOPES

INDICATES FUTURE PROJECTS ENVELOPES

Revisions

No.	Date	Description	Ver	App'd
1	10.12.2018	ISSUED FOR COORDINATION		
2	18.12.2018	CONCEPT PROPOSAL		
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Key

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Project
LORETO NORMANHURST
CONCEPT PROPOSAL
91-93 PENNANT HILLS ROAD
NORMANHURST. NSW 2076
Proj. No. 18008

Drawing Title
OVERALL 3D VIEW - FUTURE PROJECTS
Sheet Status
NOT FOR CONSTRUCTION

Scale
NTS

Drawing No.
A0011

Issue
3

PLOT DATE & TIME: 10/01/2019 4:05:51 PM
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6 EXISTING SHADOW DIAGRAMS - 9am WINTER SOLSTICE
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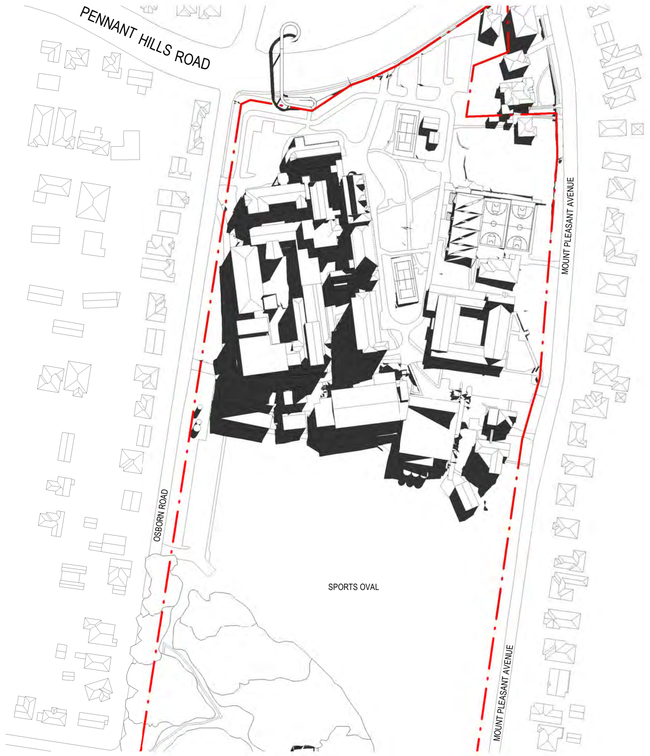
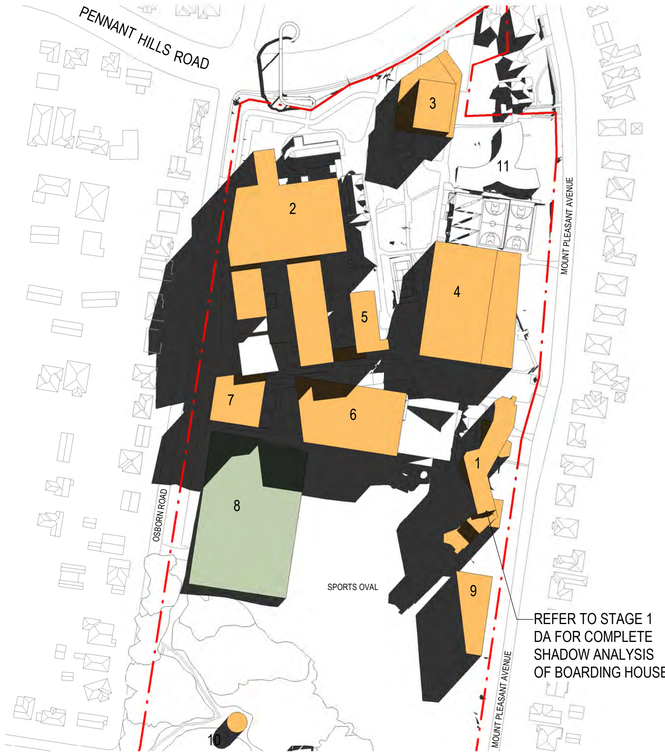


4 EXISTING SHADOW DIAGRAMS - 10am WINTER SOLSTICE
1 : 2000

2 EXISTING SHADOW DIAGRAMS - 11am WINTER SOLSTICE
1 : 2000



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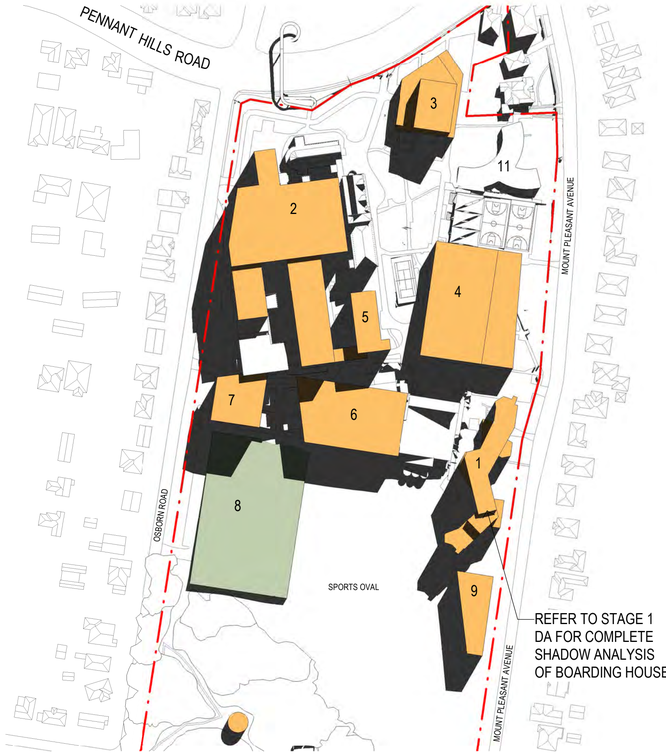

3 PROPOSED SHADOW DIAGRAMS - 10am WINTER SOLSTICE
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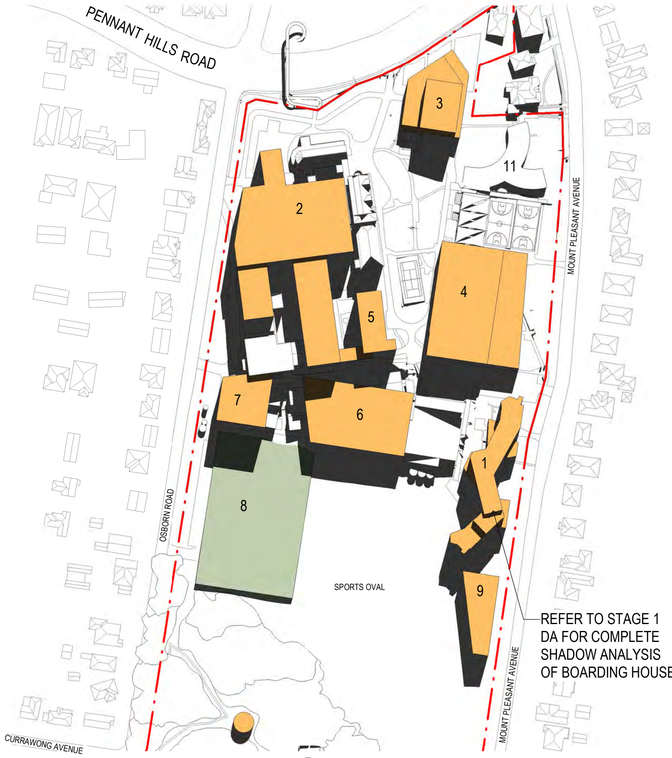

1 PROPOSED SHADOW DIAGRAMS - 11am WINTER SOLSTICE
1 : 2000

NOTE: MAXIMUM OVERSHADOWING CAST BY PROPOSED DEVELOPMENT ENVELOPES

Revisions

No.	Date	Description	Ver	App'd
1	10.12.2018	ISSUED FOR COORDINATION		
2	18.12.2018	CONCEPT PROPOSAL		
3	10.01.2019	CONCEPT PROPOSAL - SUBMISSION		

Key

N

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Project
LORETO NORMANHURST
CONCEPT PROPOSAL
91-93 PENNANT HILLS ROAD
NORMANHURST, NSW 2076
Proj. No. 18008

Drawing Title
SHADOW DIAGRAMS - WINTER SOLSTICE 9am - 11am
Sheet Status
NOT FOR CONSTRUCTION

Scale
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Drawing No.
A0012
Issue
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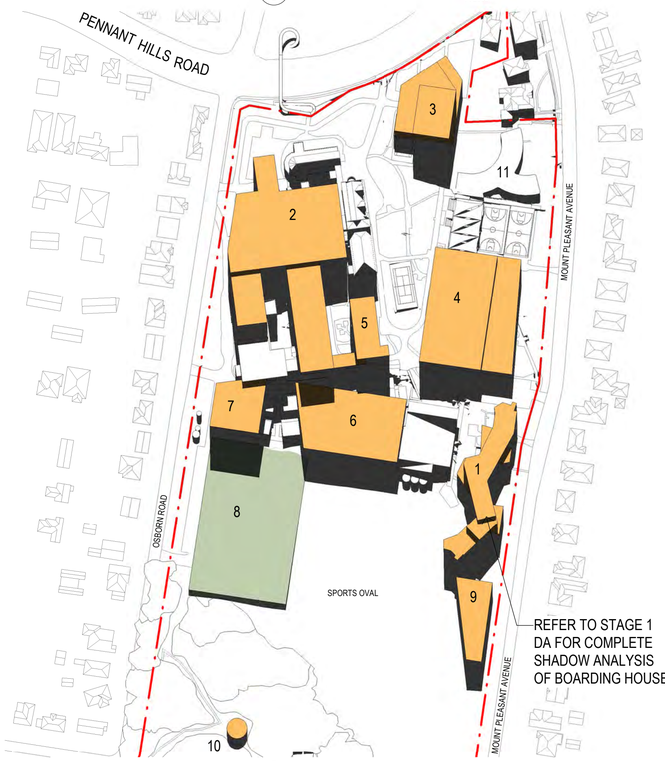
6 EXISTING SHADOW DIAGRAMS - 12pm WINTER SOLSTICE
1 : 2000

4 EXISTING SHADOW DIAGRAMS - 1pm WINTER SOLSTICE
1 : 2000

2 EXISTING SHADOW DIAGRAMS - 2pm WINTER SOLSTICE
1 : 2000



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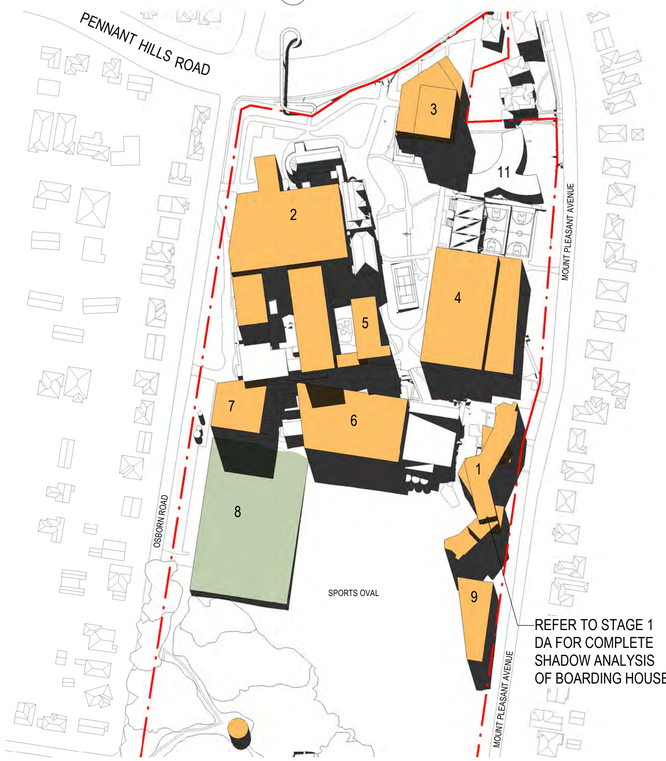

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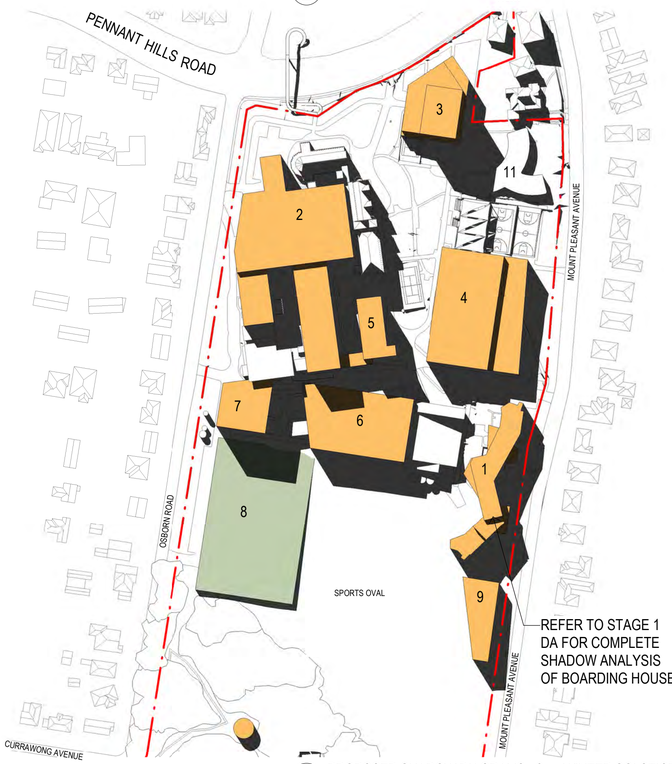

1 PROPOSED SHADOW DIAGRAMS - 2pm WINTER SOLSTICE
1 : 2000

NOTE: MAXIMUM OVERSHADOWING CAST BY PROPOSED DEVELOPMENT ENVELOPES

Revisions

No.	Date	Description	Ver	App'd
1	18.12.2018	CONCEPT PROPOSAL		
2	10.01.2019	CONCEPT PROPOSAL - SUBMISSION		

Key

N

Client
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Project
LORETO NORMANHURST
CONCEPT PROPOSAL
91-93 PENNANT HILLS ROAD
NORMANHURST, NSW 2076
Proj. No. 18008

Drawing Title
SHADOW DIAGRAMS - WINTER SOLSTICE 12pm - 2pm
Sheet Status
NOT FOR CONSTRUCTION

Scale
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Drawing No.
A0013
Issue
2

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PLOT DATE & TIME: 10/01/2019 4:06:06 PM
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REF: C:\Users\ahunstable\Documents\18008_MasterPlan_ahunstable.rvt

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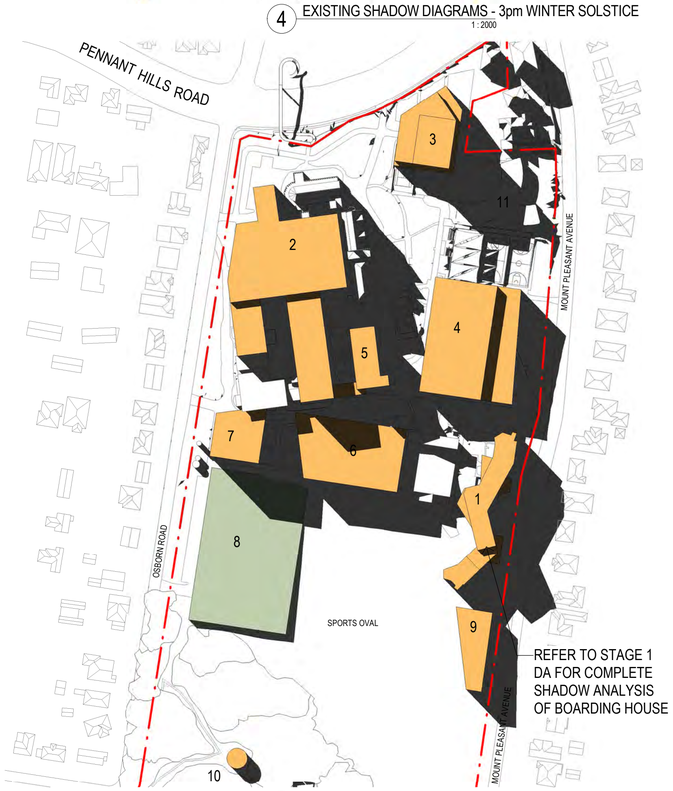

2 PROPOSED SHADOW DIAGRAMS - 3pm WINTER SOLSTICE
1 : 2000

NOTE: MAXIMUM OVERSHADOWING CAST BY PROPOSED DEVELOPMENT ENVELOPES

Revisions

No.	Date	Description	Ver	App'd
1	18.12.2018	CONCEPT PROPOSAL		
2	10.01.2019	CONCEPT PROPOSAL - SUBMISSION		

Key

N

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Project
LORETO NORMANHURST
CONCEPT PROPOSAL
91-93 PENNANT HILLS ROAD
NORMANHURST, NSW 2076
Proj. No. 18008

Drawing Title
SHADOW DIAGRAMS - WINTER SOLSTICE 3pm

Sheet Status
NOT FOR CONSTRUCTION

Scale
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Drawing No.
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Issue
2

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PLOT DATE & TIME: 10/01/2019 4:06:09 PM
PLOTTED & CHECKED BY: Author
REF: C:\Users\shaunsable\Documents\18008_MasterPlan_shsatable.rvt

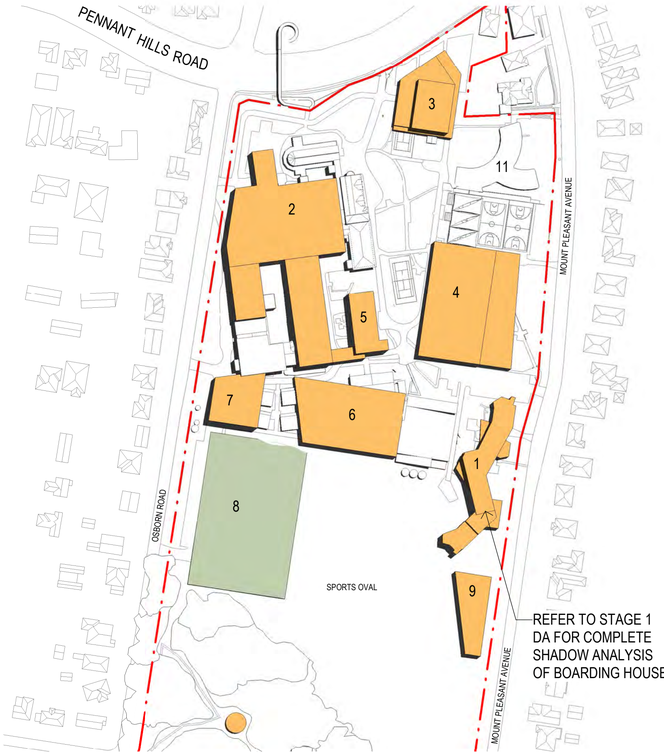
6 EXISTING SHADOW DIAGRAMS - 9am SUMMER SOLSTICE
1 : 2000

4 EXISTING SHADOW DIAGRAMS - 10am SUMMER SOLSTICE
1 : 2000

2 EXISTING SHADOW DIAGRAMS - 11am SUMMER SOLSTICE
1 : 2000

5 PROPOSED SHADOW DIAGRAMS - 9am SUMMER SOLSTICE
1 : 2000

3 PROPOSED SHADOW DIAGRAMS - 10am SUMMER SOLSTICE
1 : 2000



1 PROPOSED SHADOW DIAGRAMS - 11am SUMMER SOLSTICE
1 : 2000

NOTE: MAXIMUM OVERSHADOWING CAST BY PROPOSED DEVELOPMENT ENVELOPES

Revisions

No.	Date	Description	Ver	App'd
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3	10.01.2019	CONCEPT PROPOSAL - SUBMISSION		

Key

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Project
LORETO NORMANHURST
CONCEPT PROPOSAL
91-93 PENNANT HILLS ROAD
NORMANHURST. NSW 2076
Proj. No. 18008

Drawing Title
SHADOW DIAGRAMS - SUMMER SOLSTICE 9am - 11am
Sheet Status
NOT FOR CONSTRUCTION

Scale
1:2000 @ A1
Drawing No.
A0015
Issue
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REF: C:\Users\ahuddale\Documents\18008_MasterPlan_ahuddale.rvt
PLOTTED & CHECKED BY: Author
PLOT DATE & TIME: 10/01/2019 4:08:17 PM

4 EXISTING SHADOW DIAGRAMS - 12pm SUMMER SOLSTICE
1 : 2000

5 EXISTING SHADOW DIAGRAMS - 1pm SUMMER SOLSTICE
1 : 2000

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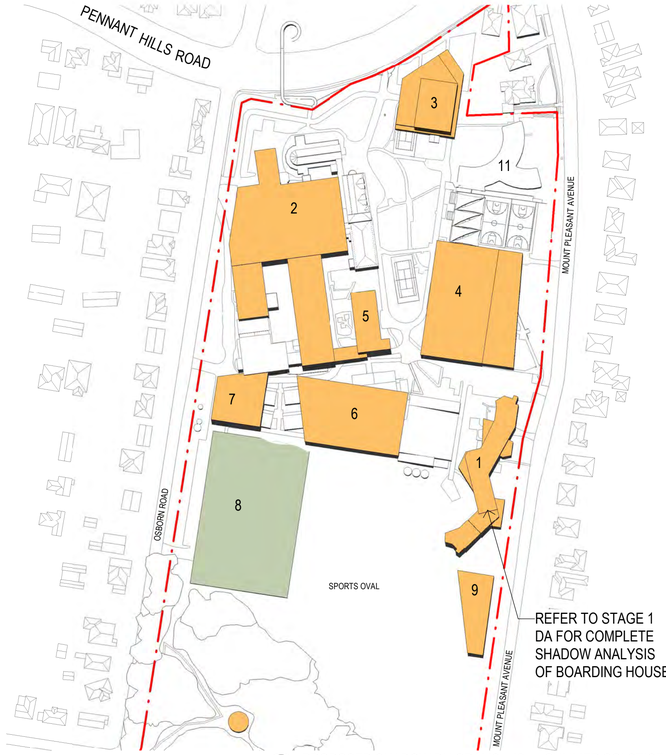
1 : 2000



3 PROPOSED SHADOW DIAGRAMS - 12pm SUMMER SOLSTICE
1 : 2000

2 PROPOSED SHADOW DIAGRAMS - 1pm SUMMER SOLSTICE
1 : 2000

1 PROPOSED SHADOW DIAGRAMS - 2pm SUMMER SOLSTICE
1 : 2000

NOTE: MAXIMUM OVERSHADOWING CAST BY PROPOSED DEVELOPMENT ENVELOPES

Revisions

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NORMANHURST. NSW 2076
Proj. No. 18008

Drawing Title
SHADOW DIAGRAMS - SUMMER SOLSTICE 12pm - 2pm
Sheet Status
NOT FOR CONSTRUCTION

Scale
1:2000 @ A1
Drawing No.
A0016
Issue
2

0 20 40 80 160 m

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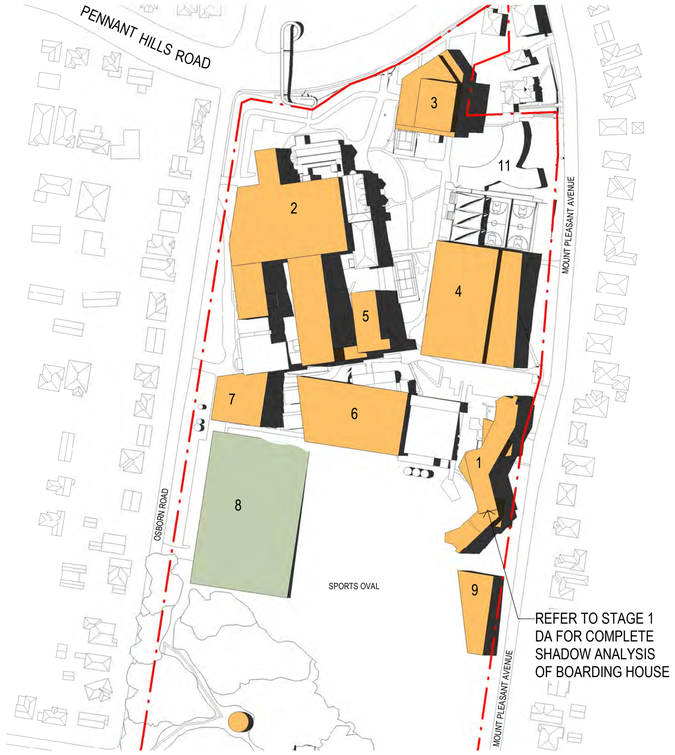
PLOT DATE & TIME: 10/01/2019 4:08:25 PM

2 EXISTING SHADOW DIAGRAMS - 3pm SUMMER SOLSTICE
1 : 2000



1 PROPOSED SHADOW DIAGRAMS - 3pm SUMMER SOLSTICE
1 : 2000

NOTE: MAXIMUM OVERSHADOWING CAST BY PROPOSED DEVELOPMENT ENVELOPES

Revisions

No.	Date	Description	Ver	App'd
1	18.12.2018	CONCEPT PROPOSAL		
2	10.01.2019	CONCEPT PROPOSAL - SUBMISSION		

Key

N

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Project
LORETO NORMANHURST
CONCEPT PROPOSAL
91-93 PENNANT HILLS ROAD
NORMANHURST. NSW 2076
Proj. No. 18008

Drawing Title
SHADOW DIAGRAMS - SUMMER SOLSTICE 3pm

Sheet Status
NOT FOR CONSTRUCTION

Scale
1:2000 @ A1

Drawing No.
A0017

Issue
2

0 20 40 80 160 m

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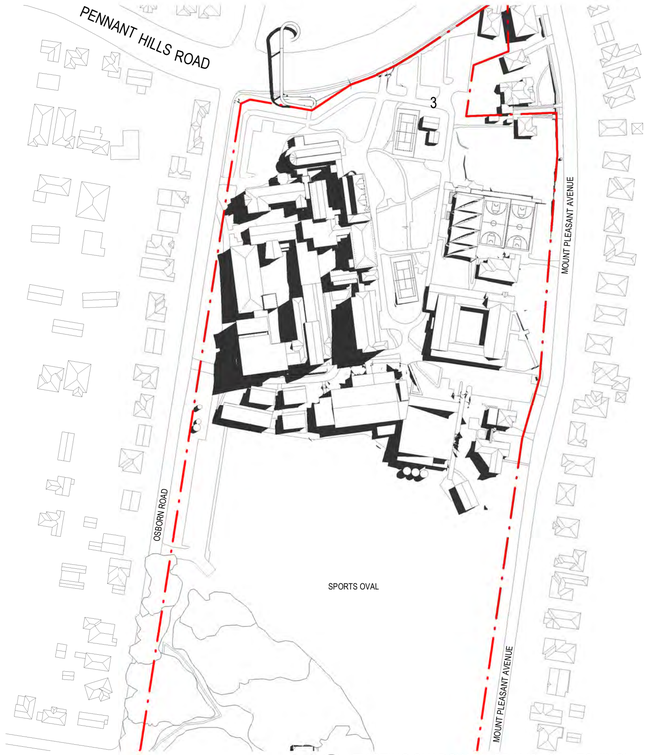
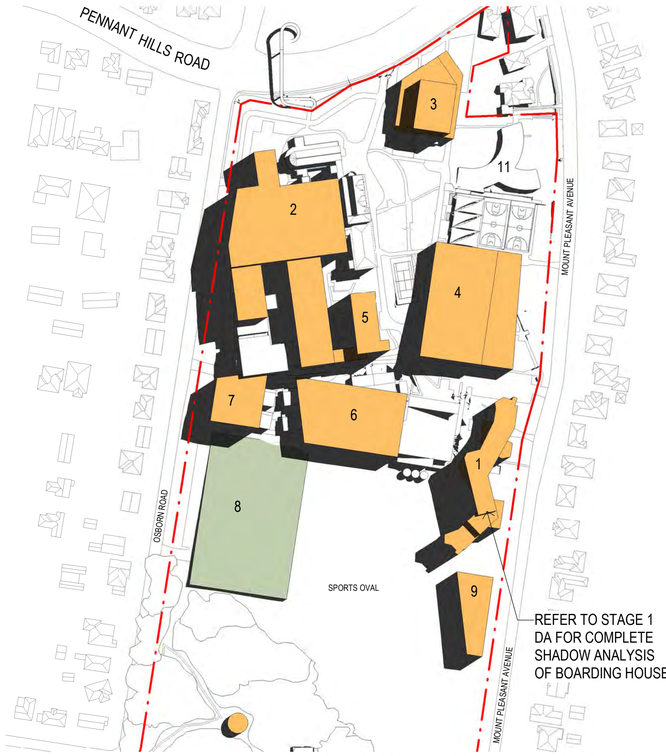
PLOT DATE & TIME: 10/01/2019 4:06:28 PM



6 EXISTING SHADOW DIAGRAMS - 9am EQUINOX
1 : 2000

4 EXISTING SHADOW DIAGRAMS - 10am EQUINOX
1 : 2000

2 EXISTING SHADOW DIAGRAMS - 11am EQUINOX
1 : 2000



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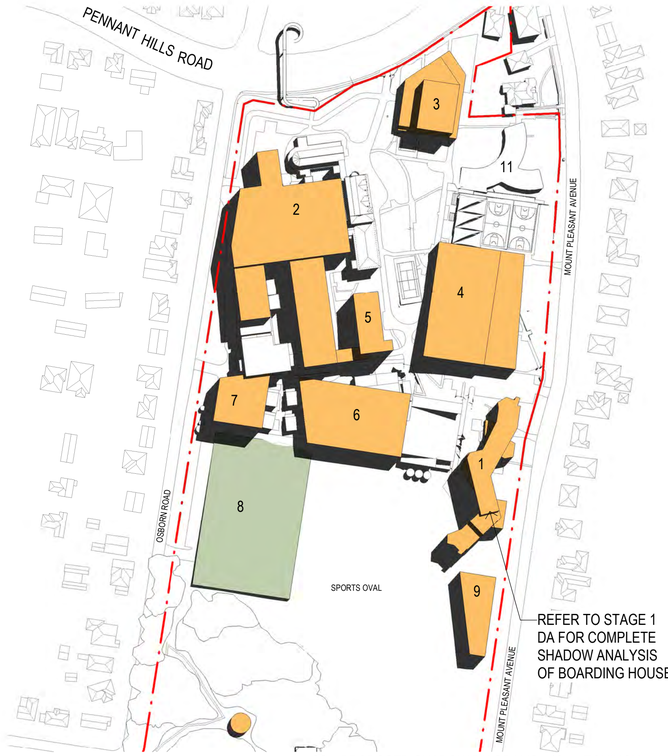

3 PROPOSED SHADOW DIAGRAMS - 10am EQUINOX
1 : 2000

1 PROPOSED SHADOW DIAGRAMS - 11am EQUINOX
1 : 2000

NOTE: MAXIMUM OVERSHADOWING CAST BY PROPOSED DEVELOPMENT ENVELOPES

Revisions

No.	Date	Description	Ver	App'd
1	10.12.2018	ISSUED FOR COORDINATION		
2	18.12.2018	CONCEPT PROPOSAL		
3	10.01.2019	CONCEPT PROPOSAL - SUBMISSION		

Key

N

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Project
LORETO NORMANHURST
CONCEPT PROPOSAL
91-93 PENNANT HILLS ROAD
NORMANHURST. NSW 2076
Proj. No. 18008

Drawing Title
SHADOW DIAGRAMS - EQUINOX 9am - 11am

Sheet Status
NOT FOR CONSTRUCTION

Scale
1:2000 @ A1

Drawing No.
A0018

Issue
3

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REF: C:\Users\ahuda\Documents\18008_MasterPlan_ahuda\ble.rvt
PLOTTED & CHECKED BY: Author
PLOT DATE & TIME: 10/01/2019 4:06:35 PM

6 EXISTING SHADOW DIAGRAMS - 12pm EQUINOX
1 : 2000

4 EXISTING SHADOW DIAGRAMS - 1pm EQUINOX
1 : 2000

2 EXISTING SHADOW DIAGRAMS - 2pm EQUINOX
1 : 2000

5 PROPOSED SHADOW DIAGRAMS - 12pm EQUINOX
1 : 2000

3 PROPOSED SHADOW DIAGRAMS - 1pm EQUINOX
1 : 2000

1 PROPOSED SHADOW DIAGRAMS - 2pm EQUINOX
1 : 2000

NOTE: MAXIMUM OVERSHADOWING CAST BY PROPOSED DEVELOPMENT ENVELOPES

Revisions

No.	Date	Description	Ver	App'd
1	18.12.2018	CONCEPT PROPOSAL		
2	10.01.2019	CONCEPT PROPOSAL - SUBMISSION		

Key

N

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Project
LORETO NORMANHURST
CONCEPT PROPOSAL
91-93 PENNANT HILLS ROAD
NORMANHURST. NSW 2076
Proj. No. 18008

Drawing Title
SHADOW DIAGRAMS - EQUINOX 12pm - 2pm

Sheet Status
NOT FOR CONSTRUCTION

Scale
1:2000 @ A1

Drawing No.
A0019

Issue
2

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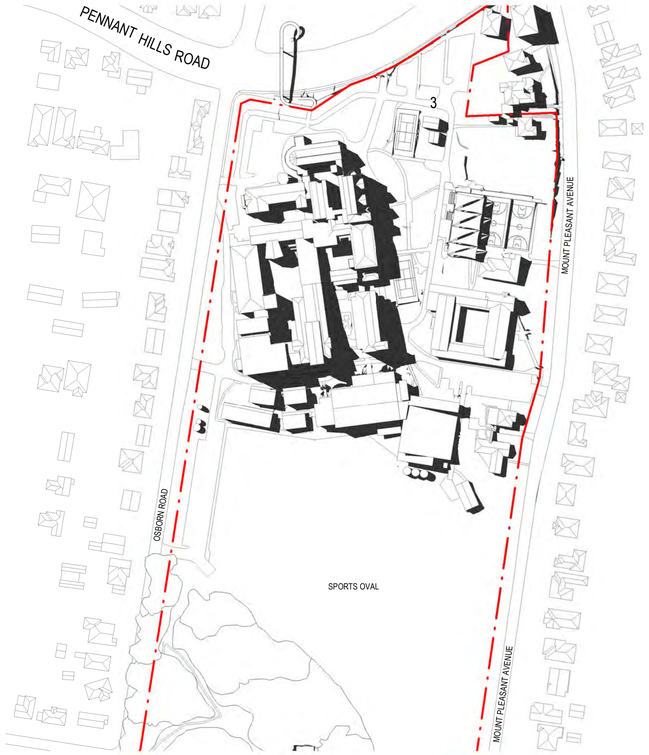

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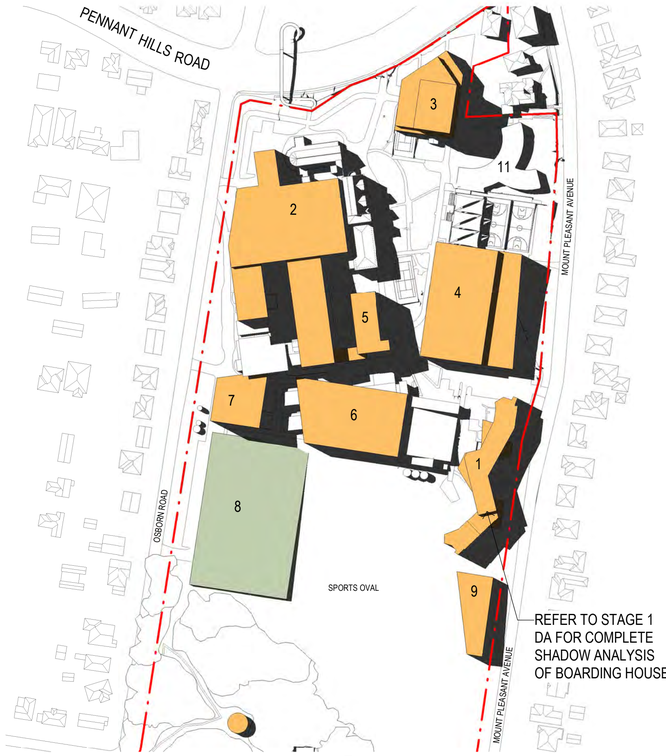

1 PROPOSED SHADOW DIAGRAMS - 3pm EQUINOX
1 : 2000

NOTE: MAXIMUM OVERSHADOWING CAST BY PROPOSED DEVELOPMENT ENVELOPES

Revisions

No.	Date	Description	Ver	App'd
1	18.12.2018	CONCEPT PROPOSAL		
2	10.01.2019	CONCEPT PROPOSAL - SUBMISSION		

Key

N

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Project
LORETO NORMANHURST
CONCEPT PROPOSAL
91-93 PENNANT HILLS ROAD
NORMANHURST. NSW 2076
Proj. No. 18008

Drawing Title
SHADOW DIAGRAMS - EQUINOX 3pm

Sheet Status
NOT FOR CONSTRUCTION

Scale
1:2000 @ A1

Drawing No.
A0020

Issue
2

0 20 40 80 160 m

REF: C:\Users\ahuda\Documents\18008_MasterPlan_ahuda\de.rvt
PLOTTED & CHECKED BY: Author
PLOT DATE & TIME: 10/01/2019 4:09:46 PM

EXISTING VIEW FROM 96 PENNANT HILLS ROAD LOOKING TOWARDS
LORETO NORMANHURST CAMPUS

EXISTING VIEW FROM 83 PENNANT HILLS ROAD
LOOKING TOWARDS LORETO NORMANHURST CAMPUS

EXISTING VIEW TOWARDS No. 4 MOUNT PLEASANT AVENUE

PROPOSED VIEW FROM 96 PENNANT HILLS ROAD LOOKING TOWARDS LORETO
NORMANHURST CAMPUS WITH ENVELOPE 3 SHOWN BEYOND TREES

PROPOSED VIEW FROM 82 PENNANT HILLS ROAD
LOOKING TOWARDS LORETO NORMANHURST
CAMPUS WITH ENVELOPE 3 SHOWN BEYOND TREES

PROPOSED VIEW TOWARDS No. 4 MOUNT PLEASANT AVENUE WITH
ENVELOPE 3 SHOWN BEYOND

Revisions

No.	Date	Description	Ver	App'd
1	10.01.2019	CONCEPT PROPOSAL - SUBMISSION		

Key

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Project
LORETO NORMANHURST
CONCEPT PROPOSAL
91-93 PENNANT HILLS ROAD
NORMANHURST. NSW 2076
Proj. No. 18008

Drawing Title
VIEW IMPACT ANALYSIS

Sheet Status
NOT FOR CONSTRUCTION

Scale
NTS

Drawing No.
A0021

Issue
1

PLOT DATE & TIME: 10/01/2019 4:08:47 PM
PLOTTED & CHECKED BY: Author
REF: C:\Users\ahuxtable\Documents\18008_MasterPlan_ahuxtable.rvt

Lotsearch Environmental Risk and Planning Report

LOTSEARCH

LOTSEARCH ENVIRO PROFESSIONAL

Date: 24 Aug 2018 18:20:36

Reference: LS004062

Address: 91-93 Pennant Hills Road, Normanhurst, NSW 2076

Table of Contents

Location Confidences 2
Dataset Listings 3
Site Location Aerial 6
Contaminated Land & Waste Management Facilities 7
EPA PFAS Investigation Program 9
EPA Other Sites with Contamination Issues 10
EPA Current Licensed Activities 11
EPA Delicensed & Former Licensed Activities 13
UPSS Sensitive Zones 15
Historical Business Activities 16
Historical Aerial Imagery & Maps 30
Topographic Features 45
Elevation Contours 52
Hydrogeology & Groundwater 53
Geology 58
Naturally Occurring Asbestos Potential 60
Soils 61
Acid Sulfate Soils 65
Dryland Salinity 69
Mining Subsidence Districts 70
State Environmental Planning 71
Local Environmental Planning 73
Heritage 78
Natural Hazards 82
Ecological Constraints 84
Terms & Conditions 94

Location Confidences

Where Lotsearch has had to georeference features from supplied addresses, a location confidence has been assigned to the data record. This indicates a confidence to the positional accuracy of the feature. Where applicable, a confidence is given under the field heading “LocConf” or “Location Confidence”.

Location Confidence	Description
Premise Match	Georeferenced to the site location / premise or part of site
Area Match	Georeferenced with the confidence of the general/approximate area
Road Match	Georeferenced to the road or rail
Road Intersection	Georeferenced to the road intersection
Buffered Point	Feature is a buffered point
Network of Features	Georeferenced to a network of features

Dataset Listing

Datasets contained within this report, detailing their source and data currency:

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features Onsite	No. Features within 100m	No. Features within Buffer
Cadastre Boundaries	Dept. Finance, Services & Innovation	24/08/2018	24/08/2018	Daily	-	-	-	-
Topographic Data	Dept. Finance, Services & Innovation	17/07/2018	17/07/2018	As required	-	-	-	-
List of NSW contaminated sites notified to EPA	Environment Protection Authority	07/08/2018	02/08/2018	Monthly	1000	0	0	0
Contaminated Land Records of Notice	Environment Protection Authority	01/08/2018	01/08/2018	Monthly	1000	0	0	0
Former Gasworks	Environment Protection Authority	01/08/2018	11/10/2017	Monthly	1000	0	0	0
National Waste Management Site Database	Geoscience Australia	07/08/2018	07/03/2017	Quarterly	1000	0	0	0
EPA PFAS Investigation Program	Environment Protection Authority	07/08/2018	07/08/2018	Monthly	2000	0	0	0
EPA Other Sites with Contamination Issues	Environment Protection Authority	11/01/2018	11/01/2018	As required	1000	0	0	0
Licensed Activities under the POEO Act 1997	Environment Protection Authority	02/08/2018	02/08/2018	Monthly	1000	1	1	2
Delicensed POEO Activities still Regulated by the EPA	Environment Protection Authority	02/08/2018	02/08/2018	Monthly	1000	0	1	1
Former POEO Licensed Activities now revoked or surrendered	Environment Protection Authority	02/08/2018	02/08/2018	Monthly	1000	3	3	4
UPSS Environmentally Sensitive Zones	Environment Protection Authority	14/04/2015	12/01/2010	As required	1000	0	0	1
UBD Business to Business Directory 1991 (Premise & Intersection Matches)	Hardie Grant			Not required	150	0	0	0
UBD Business to Business Directory 1991 (Road & Area Matches)	Hardie Grant			Not required	150	-	0	0
UBD Business to Business Directory 1986 (Premise & Intersection Matches)	Hardie Grant			Not required	150	0	0	0
UBD Business to Business Directory 1986 (Road & Area Matches)	Hardie Grant			Not required	150	-	0	0
UBD Business Directory 1982 (Premise & Intersection Matches)	Hardie Grant			Not required	150	0	0	0
UBD Business Directory 1982 (Road & Area Matches)	Hardie Grant			Not required	150	-	0	0
UBD Business Directory 1978 (Premise & Intersection Matches)	Hardie Grant			Not required	150	0	0	0
UBD Business Directory 1978 (Road & Area Matches)	Hardie Grant			Not required	150	-	0	0
UBD Business Directory 1975 (Premise & Intersection Matches)	Hardie Grant			Not required	150	0	0	0
UBD Business Directory 1975 (Road & Area Matches)	Hardie Grant			Not required	150	-	0	0
UBD Business Directory 1970 (Premise & Intersection Matches)	Hardie Grant			Not required	150	0	1	1
UBD Business Directory 1970 (Road & Area Matches)	Hardie Grant			Not required	150	-	0	0
UBD Business Directory 1965 (Premise & Intersection Matches)	Hardie Grant			Not required	150	0	2	2
UBD Business Directory 1965 (Road & Area Matches)	Hardie Grant			Not required	150	-	0	0
UBD Business Directory 1961 (Premise & Intersection Matches)	Hardie Grant			Not required	150	0	2	2
UBD Business Directory 1961 (Road & Area Matches)	Hardie Grant			Not required	150	-	0	0
UBD Business Directory 1950 (Premise & Intersection Matches)	Hardie Grant			Not required	150	0	2	2
UBD Business Directory 1950 (Road & Area Matches)	Hardie Grant			Not required	150	-	0	0

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features Onsite	No. Features within 100m	No. Features within Buffer
UBD Business Directory Drycleaners & Motor Garages/Service Stations (Premise & Intersection Matches)	Hardie Grant			Not required	500	0	0	5
UBD Business Directory Drycleaners & Motor Garages/Service Stations (Road & Area Matches)	Hardie Grant			Not required	500	-	0	0
Points of Interest	Dept. Finance, Services & Innovation	17/07/2018	17/07/2018	Quarterly	1000	1	3	41
Tanks (Areas)	Dept. Finance, Services & Innovation	17/07/2018	17/07/2018	Quarterly	1000	0	0	0
Tanks (Points)	Dept. Finance, Services & Innovation	17/07/2018	17/07/2018	Quarterly	1000	0	0	0
Major Easements	Dept. Finance, Services & Innovation	17/07/2018	17/07/2018	As required	1000	0	7	63
State Forest	Dept. Finance, Services & Innovation	18/01/2018	18/01/2018	As required	1000	0	0	0
NSW National Parks and Wildlife Service Reserves	NSW Office of Environment & Heritage	18/01/2018	30/09/2017	Annually	1000	0	0	0
Hydrogeology Map of Australia	Commonwealth of Australia (Geoscience Australia)	08/10/2014	17/03/2000	As required	1000	1	1	1
Botany Groundwater Management Zones	NSW Department of Primary Industries	15/03/2018	01/10/2005	As required	1000	0	0	0
Groundwater Boreholes	NSW Dept. of Primary Industries - Water NSW; Commonwealth of Australia (Bureau of Meteorology)	24/07/2018	23/07/2018	Annually	2000	0	0	10
Geological Units 1:100,000	NSW Dept. of Industry, Resources & Energy	20/08/2014		None planned	1000	1	-	2
Geological Structures 1:100,000	NSW Dept. of Industry, Resources & Energy	20/08/2014		None planned	1000	0	-	0
Naturally Occurring Asbestos Potential	NSW Dept. of Industry, Resources & Energy	04/12/2015	24/09/2015	Unknown	1000	0	0	0
Soil Landscapes	NSW Office of Environment & Heritage	12/08/2014		None planned	1000	2	-	5
Atlas of Australian Soils	CSIRO	19/05/2017	17/02/2011	As required	1000	1	1	1
Standard Local Environmental Plan Acid Sulfate Soils	NSW Planning and Environment	07/10/2016	07/10/2016	As required	500	1	-	-
Atlas of Australian Acid Sulfate Soils	CSIRO	19/01/2017	21/02/2013	As required	1000	1	1	1
Dryland Salinity - National Assessment	National Land and Water Resources Audit	18/07/2014	12/05/2013	None planned	1000	0	0	0
Dryland Salinity Potential of Western Sydney	NSW Office of Environment & Heritage	12/05/2017	01/01/2002	None planned	1000	-	-	-
Mining Subsidence Districts	Dept. Finance, Services & Innovation	13/07/2017	01/07/2017	As required	1000	0	0	0
SEPP 14 - Coastal Wetlands	NSW Planning and Environment	17/12/2015	24/10/2008	Annually	1000	0	0	0
SEPP 26 - Littoral Rainforest	NSW Planning and Environment	17/12/2015	05/02/1988	Annually	1000	0	0	0
SEPP 71 - Coastal Protection	NSW Planning and Environment	17/12/2015	01/08/2003	Annually	1000	0	0	0
SEPP Major Developments 2005	NSW Planning and Environment	09/03/2013	25/05/2005	Under Review	1000	0	1	1
SEPP Strategic Land Use Areas	NSW Planning and Environment	01/08/2017	28/01/2014	Annually	1000	0	0	0
LEP - Land Zoning	NSW Planning and Environment	23/07/2018	29/06/2018	Quarterly	1000	1	8	71
LEP - Minimum Subdivision Lot Size	NSW Planning and Environment	23/07/2018	13/07/2018	Quarterly	0	1	-	-
LEP - Height of Building	NSW Planning and Environment	09/08/2018	22/06/2018	Quarterly	0	1	-	-
LEP - Floor Space Ratio	NSW Planning and Environment	23/07/2018	06/07/2018	Quarterly	0	0	-	-
LEP - Land Application	NSW Planning and Environment	23/07/2018	29/06/2018	Quarterly	0	1	-	-
LEP - Land Reservation Acquisition	NSW Planning and Environment	23/07/2018	13/07/2018	Quarterly	0	0	-	-
State Heritage Items	NSW Office of Environment & Heritage	04/04/2018	30/09/2016	Quarterly	1000	0	0	1

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features Onsite	No. Features within 100m	No. Features within Buffer
Local Heritage Items	NSW Planning and Environment	04/04/2018	23/03/2018	Quarterly	1000	2	3	40
Bush Fire Prone Land	NSW Rural Fire Service	08/08/2018	31/07/2018	Quarterly	1000	2	2	3
Remnant Vegetation of the Cumberland Plain	NSW Office of Environment & Heritage	07/10/2014	04/08/2011	Unknown	1000	4	4	9
RAMSAR Wetlands	Commonwealth of Australia Department of the Environment	08/10/2014	24/06/2011	As required	1000	0	0	0
Groundwater Dependent Ecosystems	Bureau of Meteorology	14/08/2017	15/05/2017	Unknown	1000	0	0	2
Inflow Dependent Ecosystems Likelihood	Bureau of Meteorology	14/08/2017	15/05/2017	Unknown	1000	0	0	2
NSW BioNet Species Sightings	NSW Office of Environment & Heritage	20/08/2018	20/08/2018	Daily	10000	-	-	-

Aerial Imagery 2017

91-93 Pennant Hills Road, Normanhurst, NSW 2076

Scale:
0 50 100 200
Meters

Data Source Aerial Imagery: © 2018 Google Inc, used with permission. Google and the Google logo are registered trademarks of Google Inc.

Coordinate System:
GDA 1994 MGA Zone 56

Date: 24 August 2018

Contaminated Land & Waste Management Facilities

91-93 Pennant Hills Road, Normanhurst, NSW 2076

List of NSW contaminated sites notified to EPA

Records from the NSW EPA Contaminated Land list within the dataset buffer:

Map Id	Site	Address	Suburb	Activity	Management Class	Status	Location Confidence	Dist (m)	Direction
N/A	No records in buffer								

The values within the EPA site management class in the table above, are given more detailed explanations in the table below:

EPA site management class	Explanation
Contamination being managed via the planning process (EP&A Act)	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. The contamination of this site is managed by the consent authority under the Environmental Planning and Assessment Act 1979 (EP&A Act) planning approval process, with EPA involvement as necessary to ensure significant contamination is adequately addressed. The consent authority is typically a local council or the Department of Planning and Environment.
Contamination currently regulated under CLM Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the Contaminated Land Management Act 1997 (CLM Act). Management of the contamination is regulated by the EPA under the CLM Act. Regulatory notices are available on the EPA's Contaminated Land Public Record of Notices.
Contamination currently regulated under POEO Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. Management of the contamination is regulated under the Protection of the Environment Operations Act 1997 (POEO Act). The EPA's regulatory actions under the POEO Act are available on the POEO public register.
Contamination formerly regulated under the CLM Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation under the Contaminated Land Management Act 1997 (CLM Act). The contamination was addressed under the CLM Act.
Contamination formerly regulated under the POEO Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed under the Protection of the Environment Operations Act 1997 (POEO Act).
Contamination was addressed via the planning process (EP&A Act)	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed by the appropriate consent authority via the planning process under the Environmental Planning and Assessment Act 1979 (EP&A Act).
Ongoing maintenance required to manage residual contamination (CLM Act)	The EPA has determined that ongoing maintenance, under the Contaminated Land Management Act 1997 (CLM Act), is required to manage the residual contamination. Regulatory notices under the CLM Act are available on the EPA's Contaminated Land Public Record of Notices.
Regulation being finalised	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the Contaminated Land Management Act 1997. A regulatory approach is being finalised.
Regulation under the CLM Act not required	The EPA has completed an assessment of the contamination and decided that regulation under the Contaminated Land Management Act 1997 is not required.
Under assessment	The contamination is being assessed by the EPA to determine whether regulation is required. The EPA may require further information to complete the assessment. For example, the completion of management actions regulated under the planning process or Protection of the Environment Operations Act 1997. Alternatively, the EPA may require information via a notice issued under s77 of the Contaminated Land Management Act 1997 or issue a Preliminary Investigation Order.

NSW EPA Contaminated Land List Data Source: Environment Protection Authority

Contaminated Land & Waste Management Facilities

91-93 Pennant Hills Road, Normanhurst, NSW 2076

Contaminated Land: Records of Notice

Record of Notices within the dataset buffer:

Map Id	Name	Address	Suburb	Notices	Area No	Location Confidence	Distance	Direction
N/A	No records in buffer							

Contaminated Land Records of Notice Data Source: Environment Protection Authority

Former Gasworks

Former Gasworks within the dataset buffer:

Map Id	Location	Council	Further Info	Location Confidence	Distance	Direction
N/A	No records in buffer					

Former Gasworks Data Source: Environment Protection Authority

National Waste Management Site Database

Sites on the National Waste Management Site Database within the dataset buffer:

Site Id	Owner	Name	Address	Suburb	Class	Landfill	Reprocess	Transfer	Comments	Loc Conf	Dist (m)	Direction
N/A	No records in buffer											

Waste Management Facilities Data Source: Geoscience Australia

EPA PFAS Investigation Program

91-93 Pennant Hills Road, Normanhurst, NSW 2076

EPA PFAS Investigation Program

Sites that are part of the EPA PFAS investigation program, within the dataset buffer:

Id	Site	Address	Location Confidence	Distance	Direction
N/A	No records in buffer				

EPA PFAS Investigation Program: Environment Protection Authority

EPA Other Sites with Contamination Issues

91-93 Pennant Hills Road, Normanhurst, NSW 2076

EPA Other Sites with Contamination Issues

This dataset contains other sites identified on the EPA website as having contamination issues. This dataset currently includes:

- James Hardie asbestos manufacturing and waste disposal sites
- Radiological investigation sites in Hunter's Hill

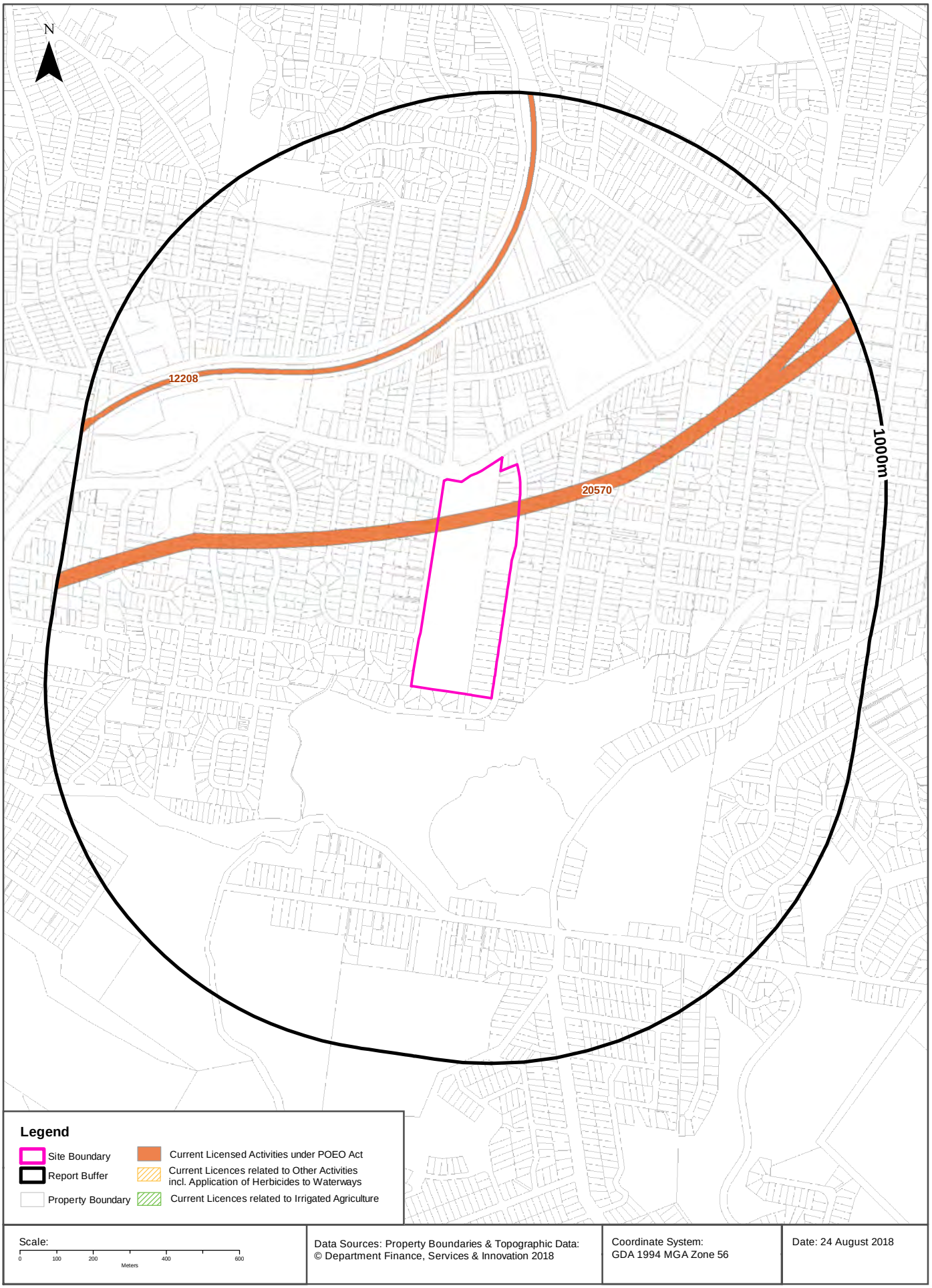
Sites within the dataset buffer:

Site Id	Site Name	Site Address	Dataset	Comments	Location Confidence	Distance	Direction
N/A	No records in buffer						

EPA Other Sites with Contamination Issues: Environment Protection Authority

Current EPA Licensed Activities

91-93 Pennant Hills Road, Normanhurst, NSW 2076



EPA Activities

91-93 Pennant Hills Road, Normanhurst, NSW 2076

Licensed Activities under the POEO Act 1997

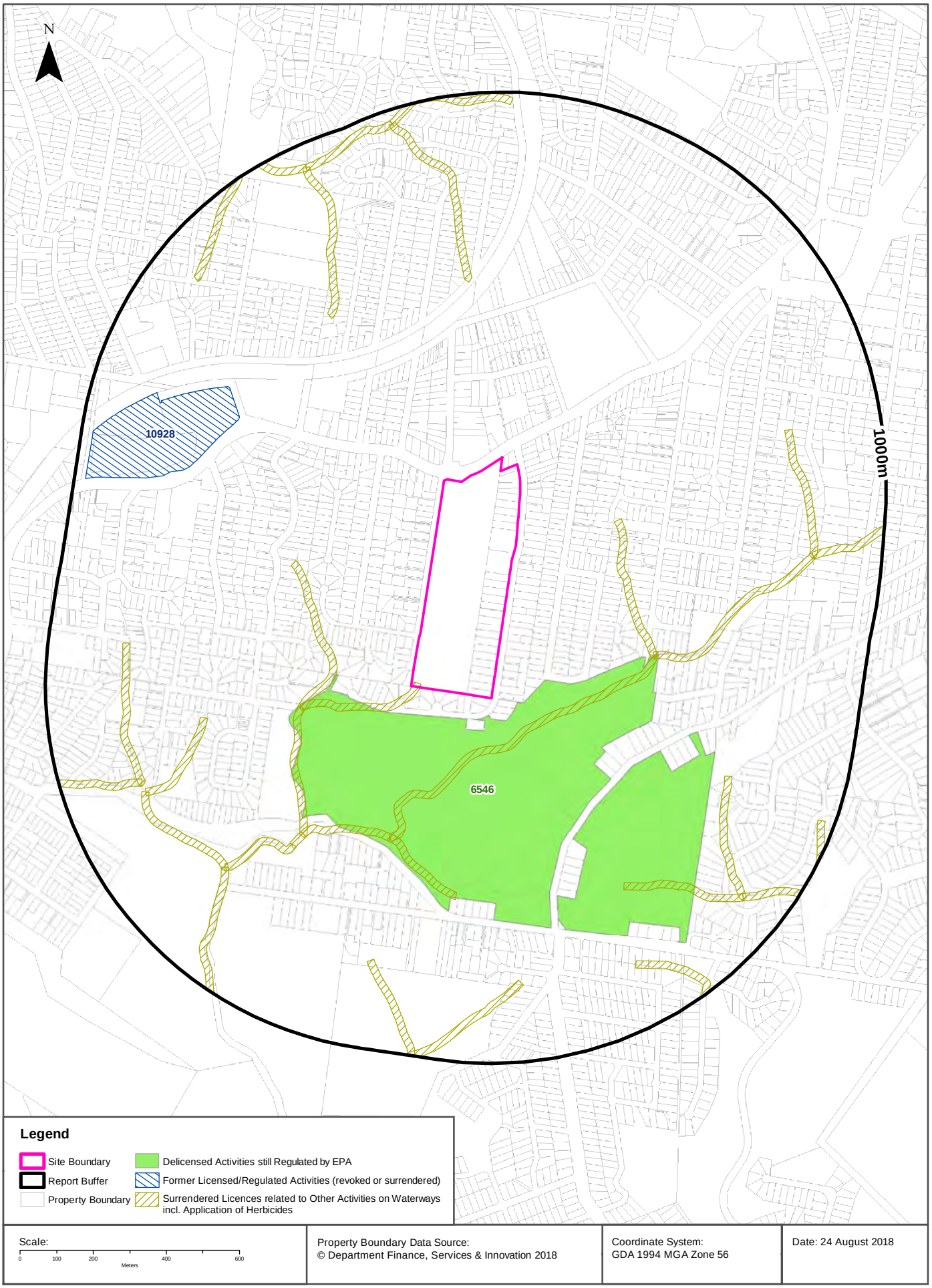
Licensed activities under the Protection of the Environment Operations Act 1997, within the dataset buffer:

EPL	Organisation	Name	Address	Suburb	Activity	Loc Conf	Distance	Direction
20570	LENDLEASE ENGINEERING PTY LIMITED	NorthConnex Project	BETWEEN WINDSOR ROAD, BAULKHAM HILLS and M2 MOTORWAY, PENNANT HILLS AND M1 MOTORWAY., WAHROONGA, NSW 2076	WAHROONGA	Road construction	Road Match	0m	Onsite
12208	SYDNEY TRAINS		PO BOX K349, HAYMARKET, NSW 1238		Railway systems activities	Road Match	371m	North

POEO Licence Data Source: Environment Protection Authority

Delicensed & Former Licensed EPA Activities

91-93 Pennant Hills Road, Normanhurst, NSW 2076



EPA Activities

91-93 Pennant Hills Road, Normanhurst, NSW 2076

Delicensed Activities still regulated by the EPA

Delicensed activities still regulated by the EPA, within the dataset buffer:

Licence No	Organisation	Name	Address	Suburb	Activity	Loc Conf	Distance	Direction
6546	ADVENTIST HEALTHCARE LIMITED	SYDNEY ADVENTIST HOSPITAL	185 FOX VALLEY ROAD	WAHROONGA	Hazardous, Industrial or Group A Waste Generation or Storage	Premise Match	47m	South

Delicensed Activities Data Source: Environment Protection Authority

Former Licensed Activities under the POEO Act 1997, now revoked or surrendered

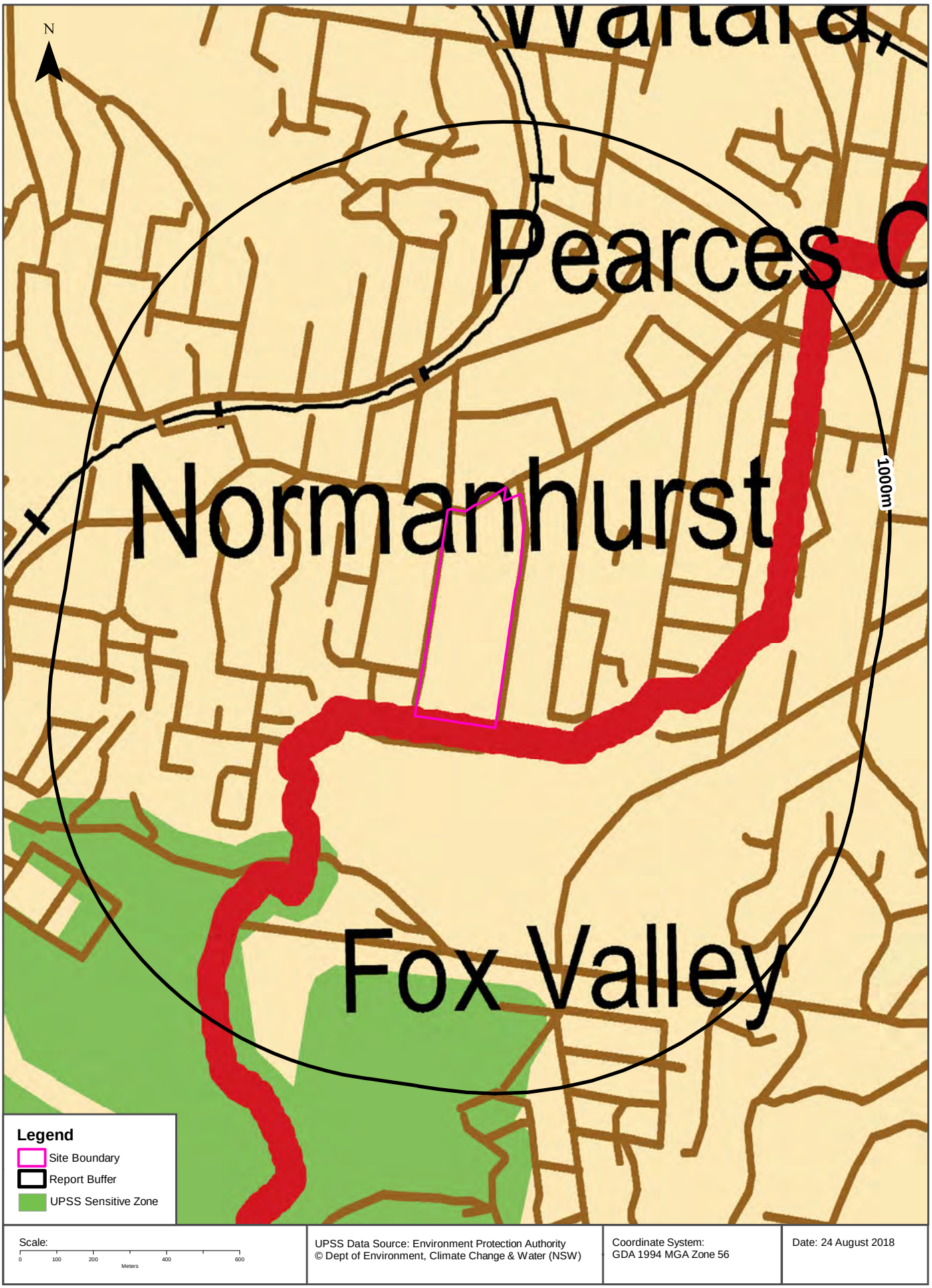
Former Licensed activities under the Protection of the Environment Operations Act 1997, now revoked or surrendered, within the dataset buffer:

Licence No	Organisation	Location	Status	Issued Date	Activity	Loc Conf	Distance	Direction
4653	LUHRMANN ENVIRONMENT MANAGEMENT PTY LTD	WATERWAYS THROUGHOUT NSW	Surrendered		Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	0m	Onsite
4838	Robert Orchard	Various Waterways throughout New South Wales - SYDNEY NSW 2000	Surrendered		Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	0m	Onsite
6630	SYDNEY WEED & PEST MANAGEMENT PTY LTD	WATERWAYS THROUGHOUT NSW - PROSPECT, NSW, 2148	Surrendered		Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	0m	Onsite
10928	HORNSBY SHIRE COUNCIL	Cnr Dartford and Pennant Hills Roads, THORNLEIGH, NSW 2120	Surrendered	05/09/2000	Waste disposal by application to land	Premise Match	586m	North West

Former Licensed Activities Data Source: Environment Protection Authority

UPSS Sensitive Zones

91-93 Pennant Hills Road, Normanhurst, NSW 2076



Historical Business Directories

91-93 Pennant Hills Road, Normanhurst, NSW 2076

1991 Business to Business Directory Records Premise or Road Intersection Matches

Records from the 1991 UBD Business to Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Feature Point	Direction
N/A	No records in buffer				

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1991 Business to Business Directory Records Road or Area Matches

Records from the 1991 UBD Business to Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
N/A	No records in buffer			

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

Historical Business Directories

91-93 Pennant Hills Road, Normanhurst, NSW 2076

1986 Business to Business Directory Records Premise or Road Intersection Matches

Records from the 1986 UBD Business to Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Feature Point	Direction
N/A	No records in buffer				

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1986 Business to Business Directory Records Road or Area Matches

Records from the 1986 UBD Business to Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
N/A	No records in buffer			

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

Historical Business Directories

91-93 Pennant Hills Road, Normanhurst, NSW 2076

1982 Business Directory Records
Premise or Road Intersection Matches

Records from the 1982 UBD Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Feature Point	Direction
N/A	No records in buffer				

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1982 Business Directory Records
Road or Area Matches

Records from the 1982 UBD Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
N/A	No records in buffer			

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

Historical Business Directories

91-93 Pennant Hills Road, Normanhurst, NSW 2076

1978 Business Directory Records
Premise or Road Intersection Matches

Records from the 1978 UBD Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Feature Point	Direction
N/A	No records in buffer				

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1978 Business Directory Records
Road or Area Matches

Records from the 1978 UBD Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
N/A	No records in buffer			

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

Historical Business Directories

91-93 Pennant Hills Road, Normanhurst, NSW 2076

1975 Business Directory Records
Premise or Road Intersection Matches

Records from the 1975 UBD Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Feature Point	Direction
N/A	No records in buffer				

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1975 Business Directory Records
Road or Area Matches

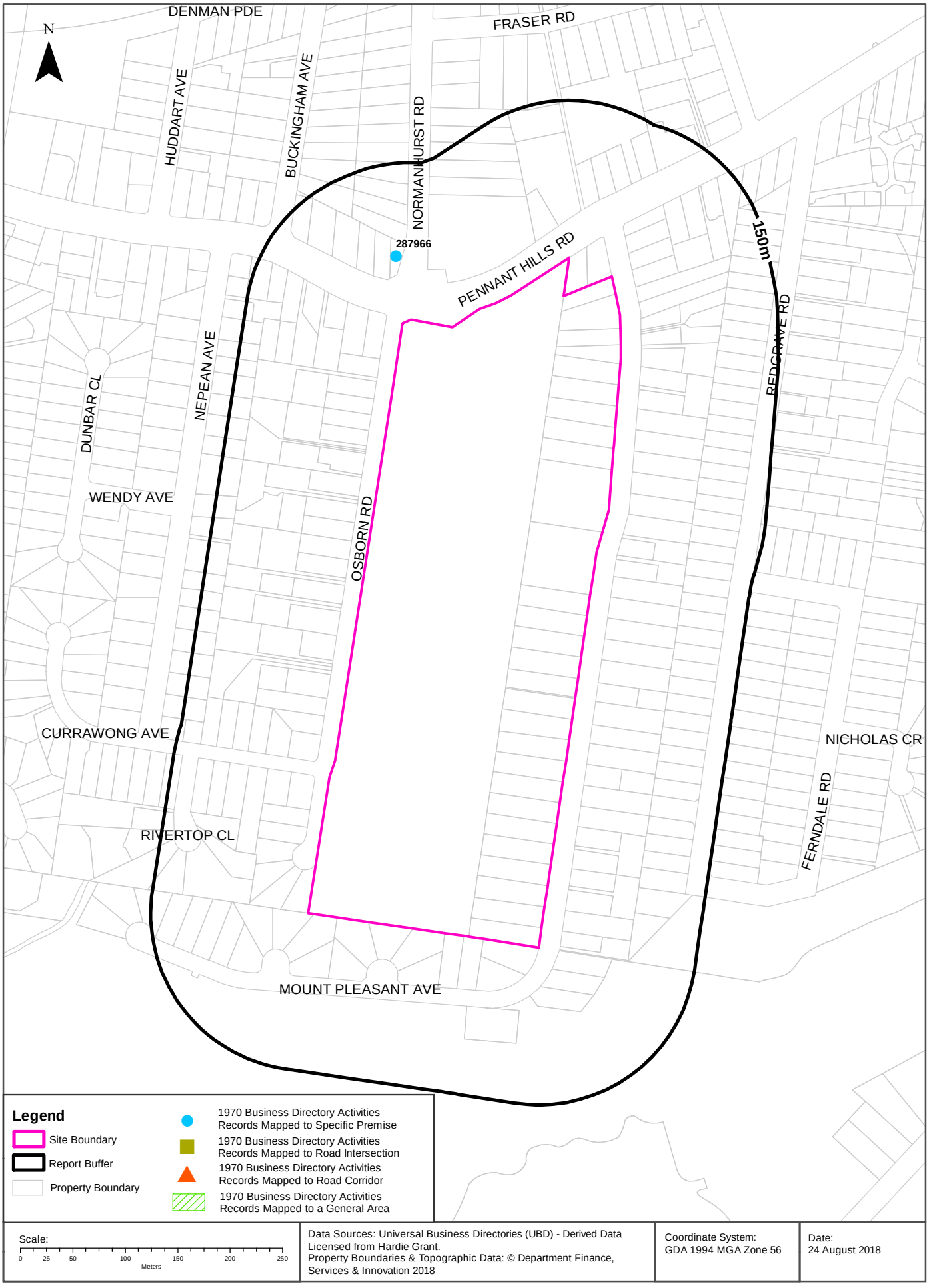
Records from the 1975 UBD Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
N/A	No records in buffer			

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1970 Historical Business Directory Records

91-93 Pennant Hills Road, Normanhurst, NSW 2076



Historical Business Directories

91-93 Pennant Hills Road, Normanhurst, NSW 2076

1970 Business Directory Records
Premise or Road Intersection Matches

Records from the 1970 UBD Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Feature Point	Direction
DELICATESSENS (D080)	Spark,A.L., 100 Pennant Hills Rd., Normanhurst	287966	Premise Match	62m	North

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1970 Business Directory Records
Road or Area Matches

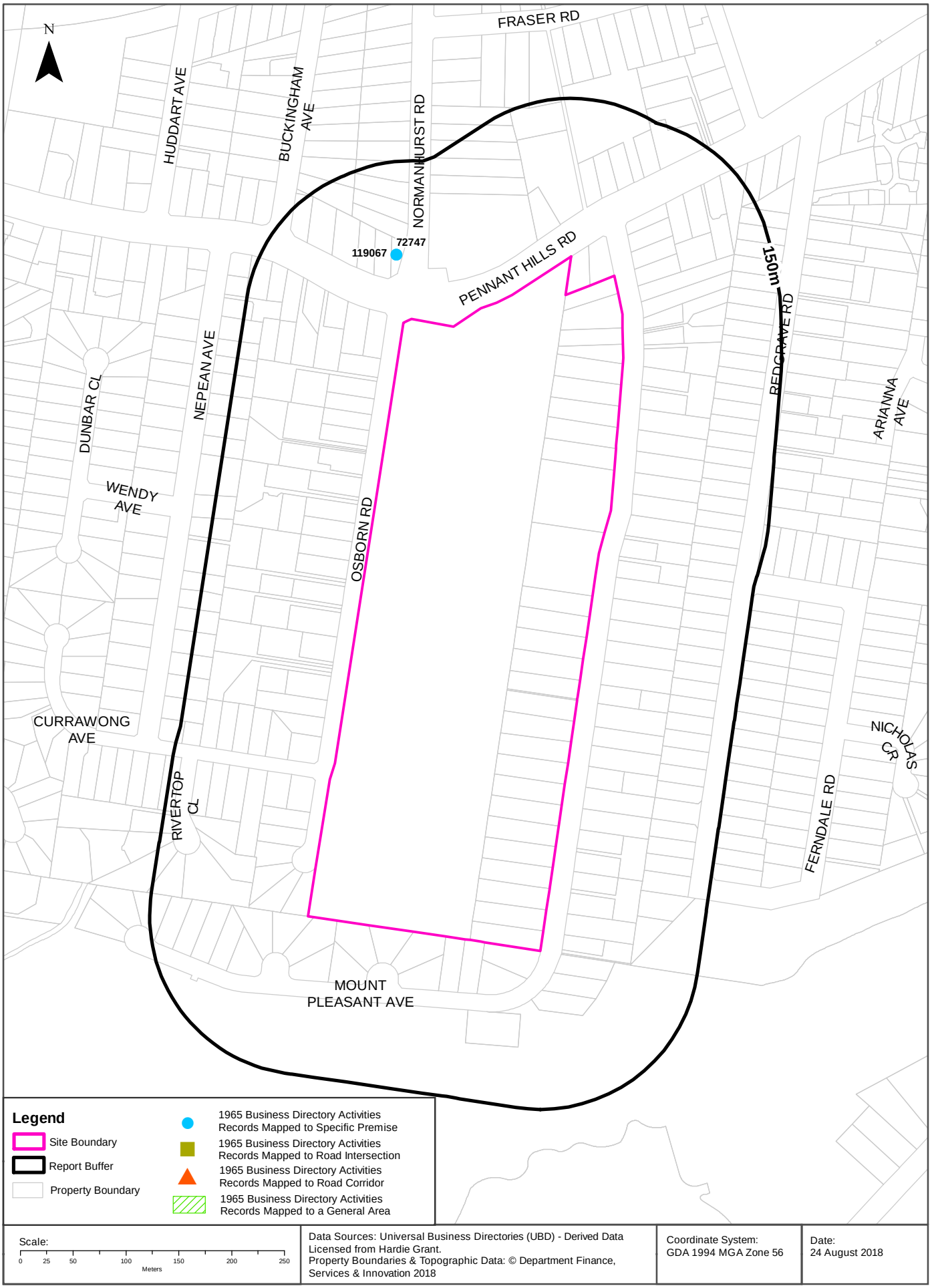
Records from the 1970 UBD Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
N/A	No records in buffer			

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1965 Historical Business Directory Records

91-93 Pennant Hills Road, Normanhurst, NSW 2076



Historical Business Directories

91-93 Pennant Hills Road, Normanhurst, NSW 2076

1965 Business Directory Records
Premise or Road Intersection Matches

Records from the 1965 UBD Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Feature Point	Direction
DELICATESSENS	Spark, A. L., 100 Pennant Hills Rd., Normanhurst	72747	Premise Match	62m	North
Mixed Businesses	Woodage, L. A. , 100 Pennant Hills Rd., Normanhurst	119067	Premise Match	62m	North

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1965 Business Directory Records
Road or Area Matches

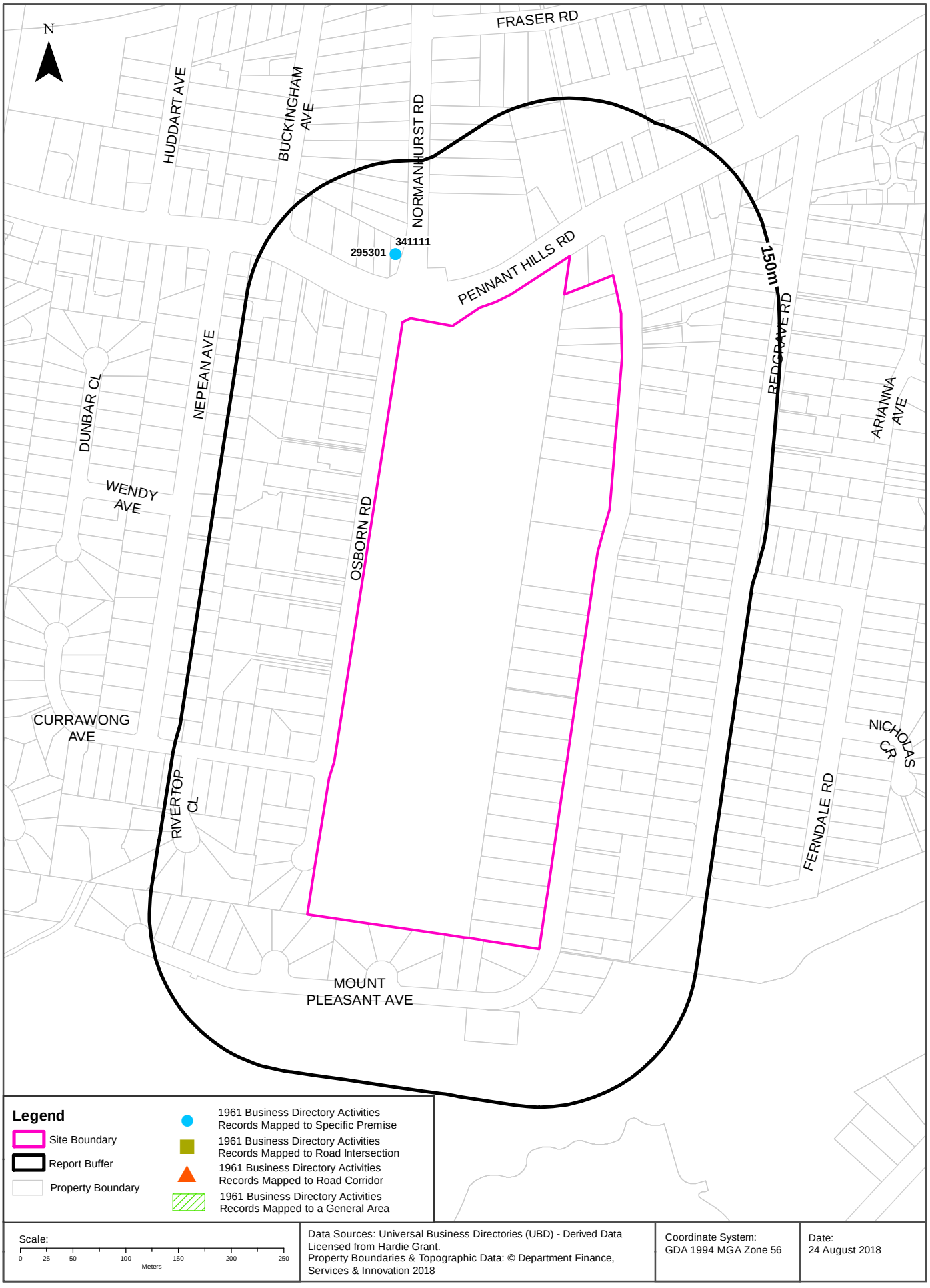
Records from the 1965 UBD Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
N/A	No records in buffer			

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1961 Historical Business Directory Records

91-93 Pennant Hills Road, Normanhurst, NSW 2076



Historical Business Directories

91-93 Pennant Hills Road, Normanhurst, NSW 2076

1961 Business Directory Records
Premise or Road Intersection Matches

Records from the 1961 UBD Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Feature Point	Direction
MIXED BUSINESS	Hamilton, J. I., 100 Pennant Hills Rd., Normanhurst	341111	Premise Match	62m	North
DELICATESSENS	Spark, A. L., 100 Pennant Hills Rd., Normanhurst	295301	Premise Match	62m	North

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1961 Business Directory Records
Road or Area Matches

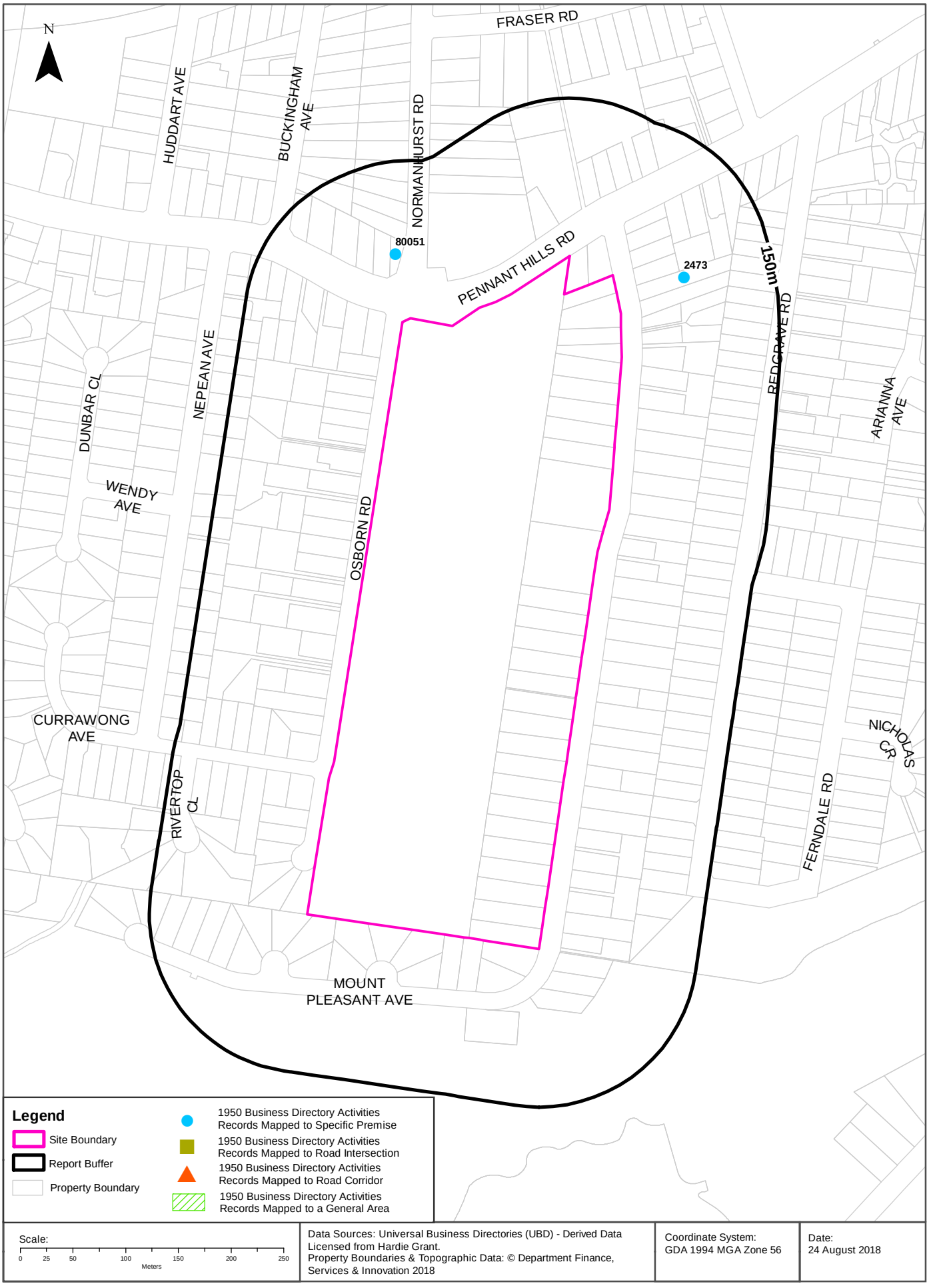
Records from the 1961 UBD Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
N/A	No records in buffer			

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1950 Historical Business Directory Records

91-93 Pennant Hills Road, Normanhurst, NSW 2076



Historical Business Directories

91-93 Pennant Hills Road, Normanhurst, NSW 2076

1950 Business Directory Records
Premise or Road Intersection Matches

Records from the 1950 UBD Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Feature Point	Direction
MIXED BUSINESSES & GENERAL STORES	Grattan, C., 100 Pennant Hills Rd., Normanhurst	80051	Premise Match	62m	North
ARCHITECTS	Vine Hall, J., 9 Mount Pleasant Ave., Normanhurst	2473	Premise Match	66m	North East

1950 Business Directory Records
Road or Area Matches

Records from the 1950 UBD Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
N/A	No records in buffer			

Historical Business Directories

91-93 Pennant Hills Road, Normanhurst, NSW 2076

Dry Cleaners, Motor Garages & Service Stations Premise or Road Intersection Matches

Dry Cleaners, Motor Garages & Service Stations from UBD Business Directories, mapped to a premise or road intersection, within the dataset buffer:

Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Feature Point	Direction
DRY CLEANERS, PRESSERS & DYERS	Hornsby Dry Cleaners, 50 Denman Pde., Normanhurst	35291	1950	Premise Match	341m	North
DRY CLEANERS & PRESSERS.	Normanhurst Dry Cleaners, 54 Denman Pde., Normanhurst.	25458	1986	Premise Match	342m	North
DRY CLEANERS & PRESSERS. (D8500)	Normanhurst Dry Cleaners, 54 Denman Pde., Normanhurst. 2076.	23991	1982	Premise Match	342m	North
DRY CLEANERS, PRESSERS&/OR DYERS.	Country Club, 54 Denman Pde., Normanhurst	23983	1975	Premise Match	356m	North
Motor Service Stations - Petrol, Oil, Etc.	Total Service Station, Cnr. Campbell St. & Pennant Hills Rd. Normanhurst	125970	1965	Road Intersection	414m	North West

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

Dry Cleaners, Motor Garages & Service Stations Road or Area Matches

Dry Cleaners, Motor Garages & Service Stations from UBD Business Directories, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Road Corridor or Area
N/A	No records in buffer				

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

Aerial Imagery 2016

91-93 Pennant Hills Road, Normanhurst, NSW 2076

Scale: 0 50 100 200 Meters	Data Sources: Aerial Imagery © Department Finance, Services & Innovation	Coordinate System: GDA 1994 MGA Zone 56	Date: 24 August 2018

Aerial Imagery 2009

91-93 Pennant Hills Road, Normanhurst, NSW 2076

Scale:
0 50 100 200
Meters

Data Source Aerial Imagery: © 2018 Google Inc, used with permission. Google and the Google logo are registered trademarks of Google Inc.

Coordinate System:
GDA 1994 MGA Zone 56

Date: 24 August 2018

Aerial Imagery 2003

91-93 Pennant Hills Road, Normanhurst, NSW 2076

Scale: 0 50 100 200 Meters	Data Source Aerial Imagery: © 2018 Google Inc, used with permission. Google and the Google logo are registered trademarks of Google Inc.	Coordinate System: GDA 1994 MGA Zone 56	Date: 24 August 2018

Aerial Imagery 1991

91-93 Pennant Hills Road, Normanhurst, NSW 2076

Aerial Imagery 1982

91-93 Pennant Hills Road, Normanhurst, NSW 2076

Aerial Imagery 1970

91-93 Pennant Hills Road, Normanhurst, NSW 2076

Scale:	Data Sources: Aerial Imagery © Department Finance, Services & Innovation	Coordinate System: GDA 1994 MGA Zone 56	Date: 24 August 2018

0 25 50 100 150 200
Meters

Aerial Imagery 1965

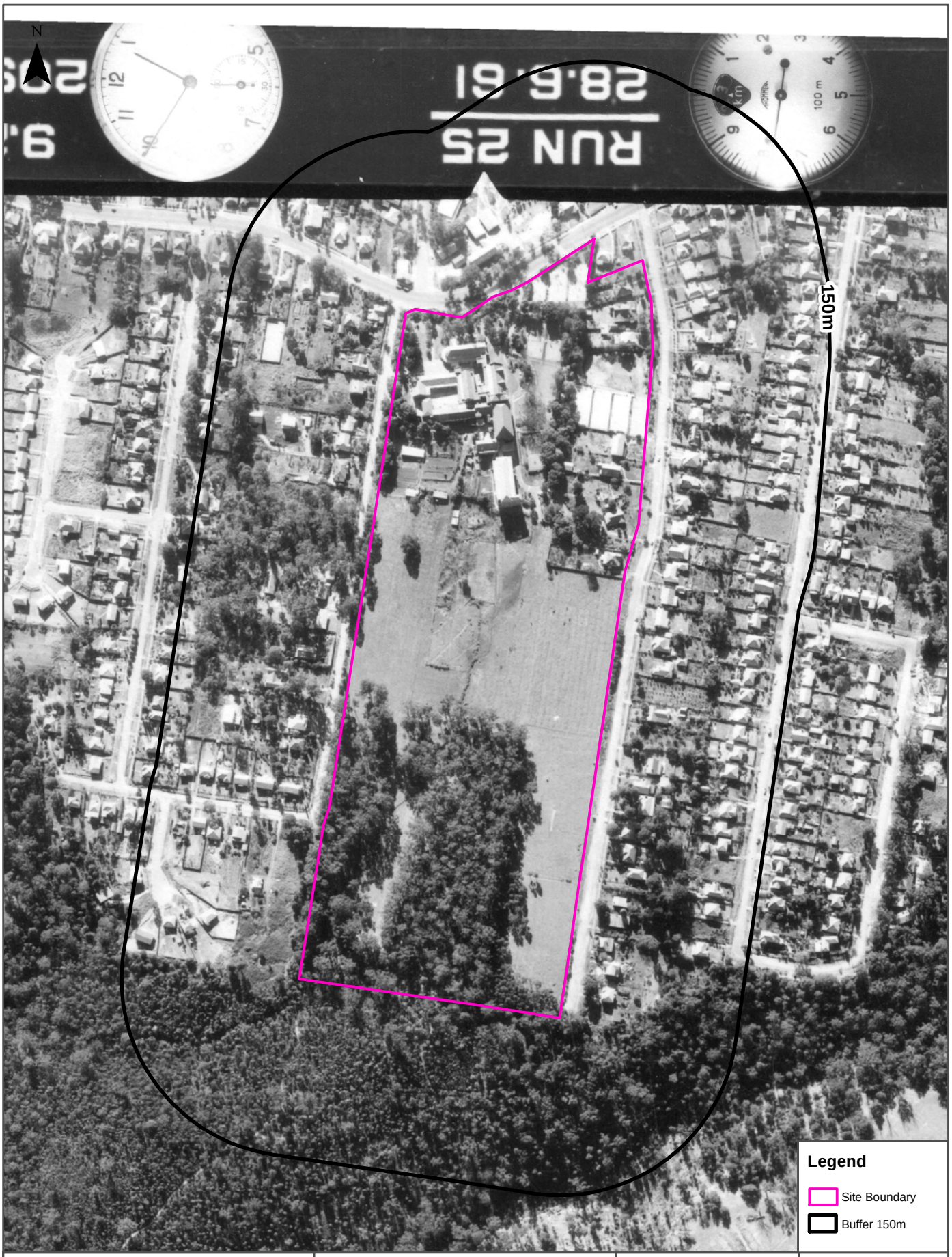
91-93 Pennant Hills Road, Normanhurst, NSW 2076

Aerial Imagery 1961

91-93 Pennant Hills Road, Normanhurst, NSW 2076

Aerial Imagery 1961

91-93 Pennant Hills Road, Normanhurst, NSW 2076

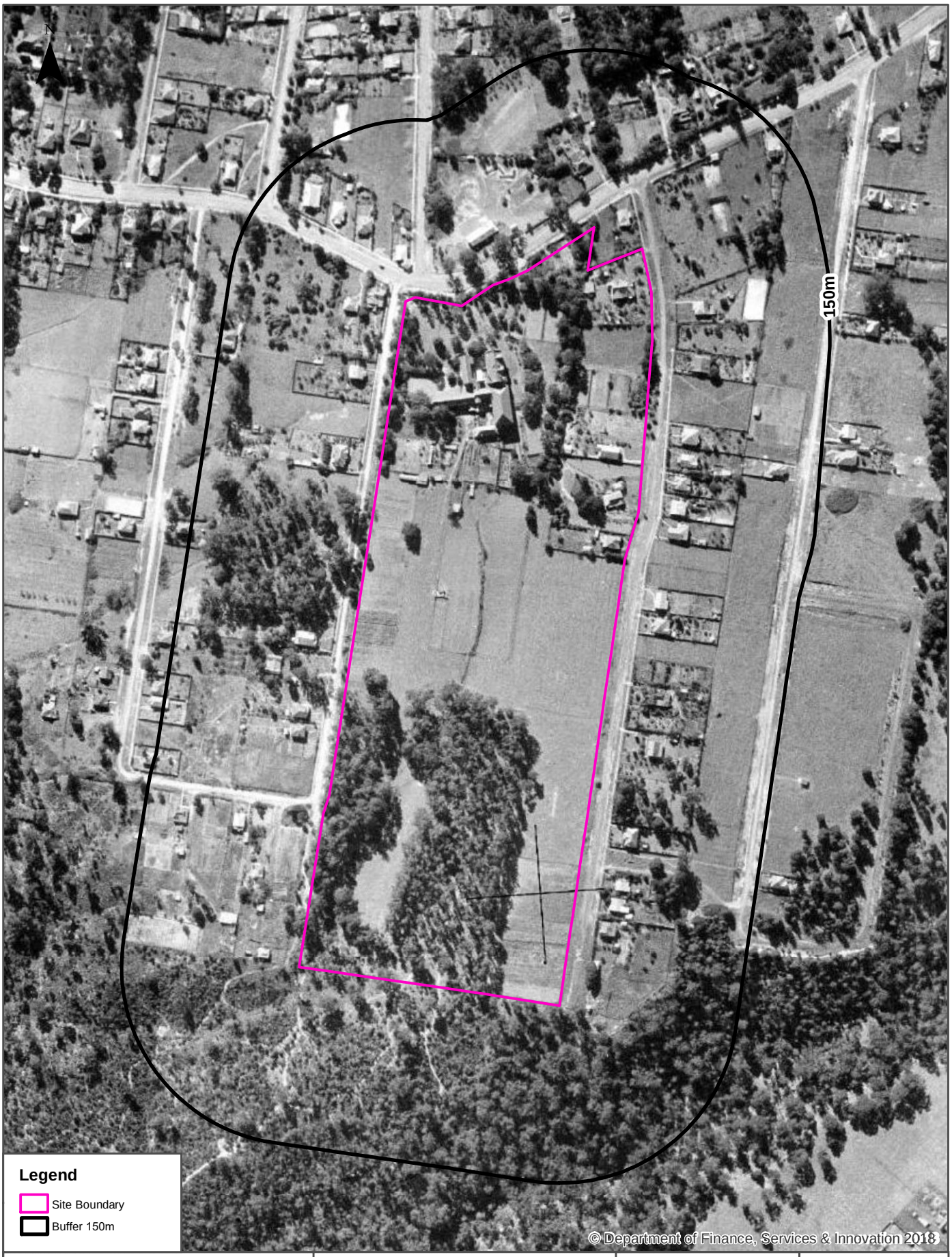


Aerial Imagery 1956

91-93 Pennant Hills Road, Normanhurst, NSW 2076

Aerial Imagery 1943

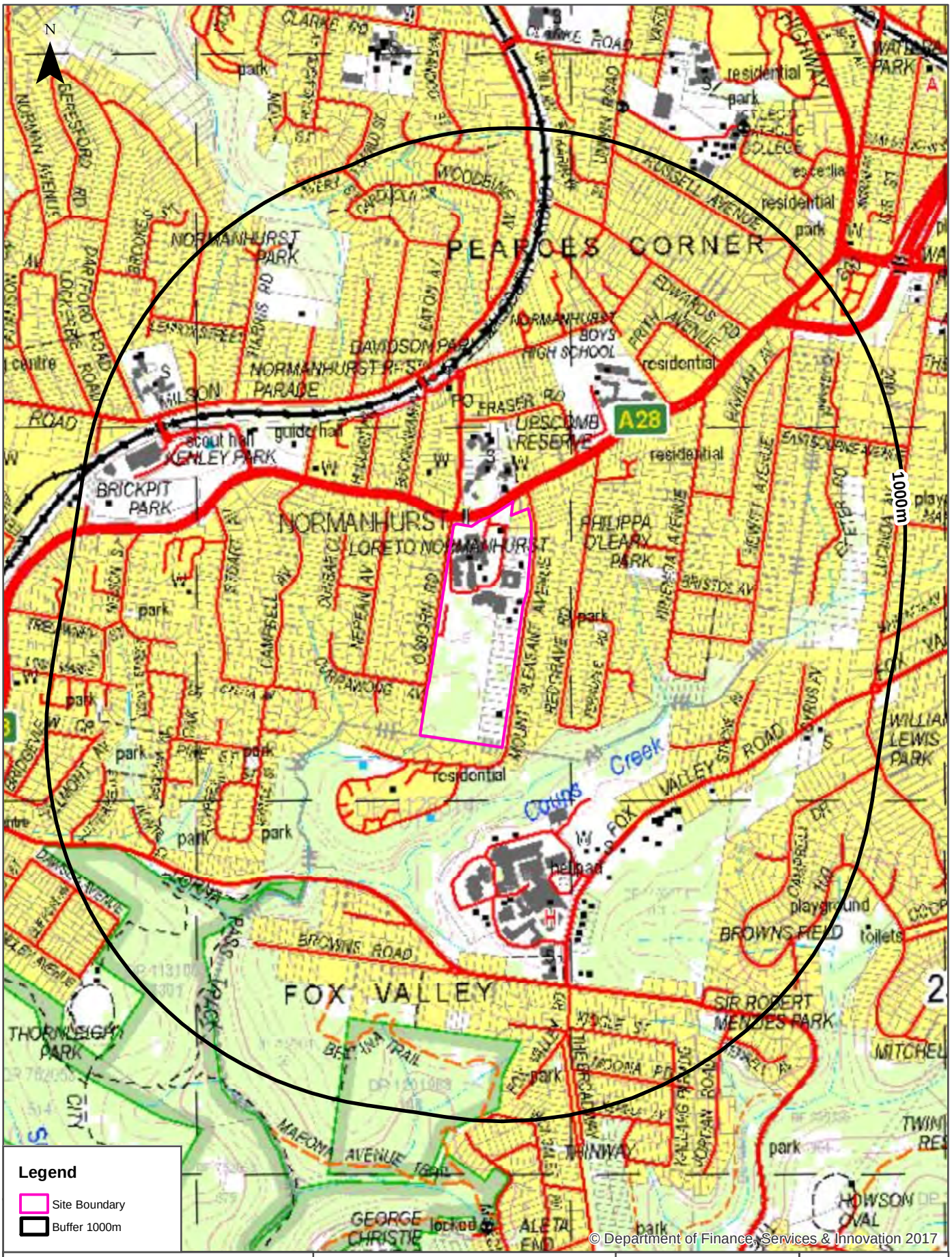
91-93 Pennant Hills Road, Normanhurst, NSW 2076



Scale: 0 25 50 100 150 200 Meters	Data Sources: Aerial Imagery © Department Finance, Services & Innovation	Coordinate System: GDA 1994 MGA Zone 56	Date: 24 August 2018

Topographic Map 2015

91-93 Pennant Hills Road, Normanhurst, NSW 2076



Scale: 0 100 200 400 600 Meters	Data Sources: Topographic Map Data © NSW Land and Property Information	Coordinate System: GDA 1994 MGA Zone 56	Date: 24 August 2018

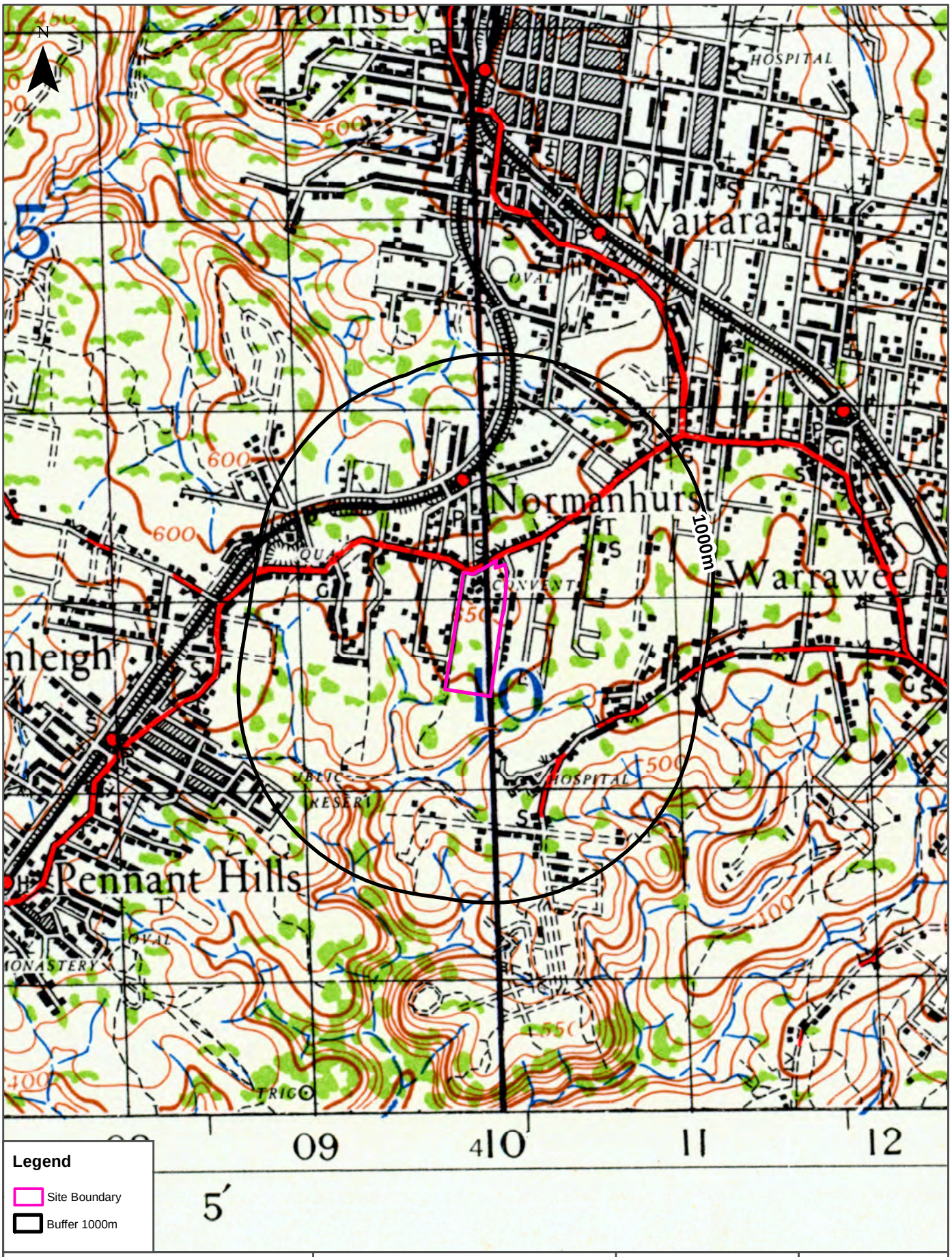
Historical Map 1975

91-93 Pennant Hills Road, Normanhurst, NSW 2076

Scale: 0 200 400 800 Meters	Data Sources: Sheet 9130, Sydney (Edition 1) NATMAP 1:100,000 Topographic Maps Geoscience Australia	Coordinate System: GDA 1994 MGA Zone 56	Date: 24 August 2018

Historical Map c.1942

91-93 Pennant Hills Road, Normanhurst, NSW 2076



Scale: 0 200 400 800 1,200 Meters

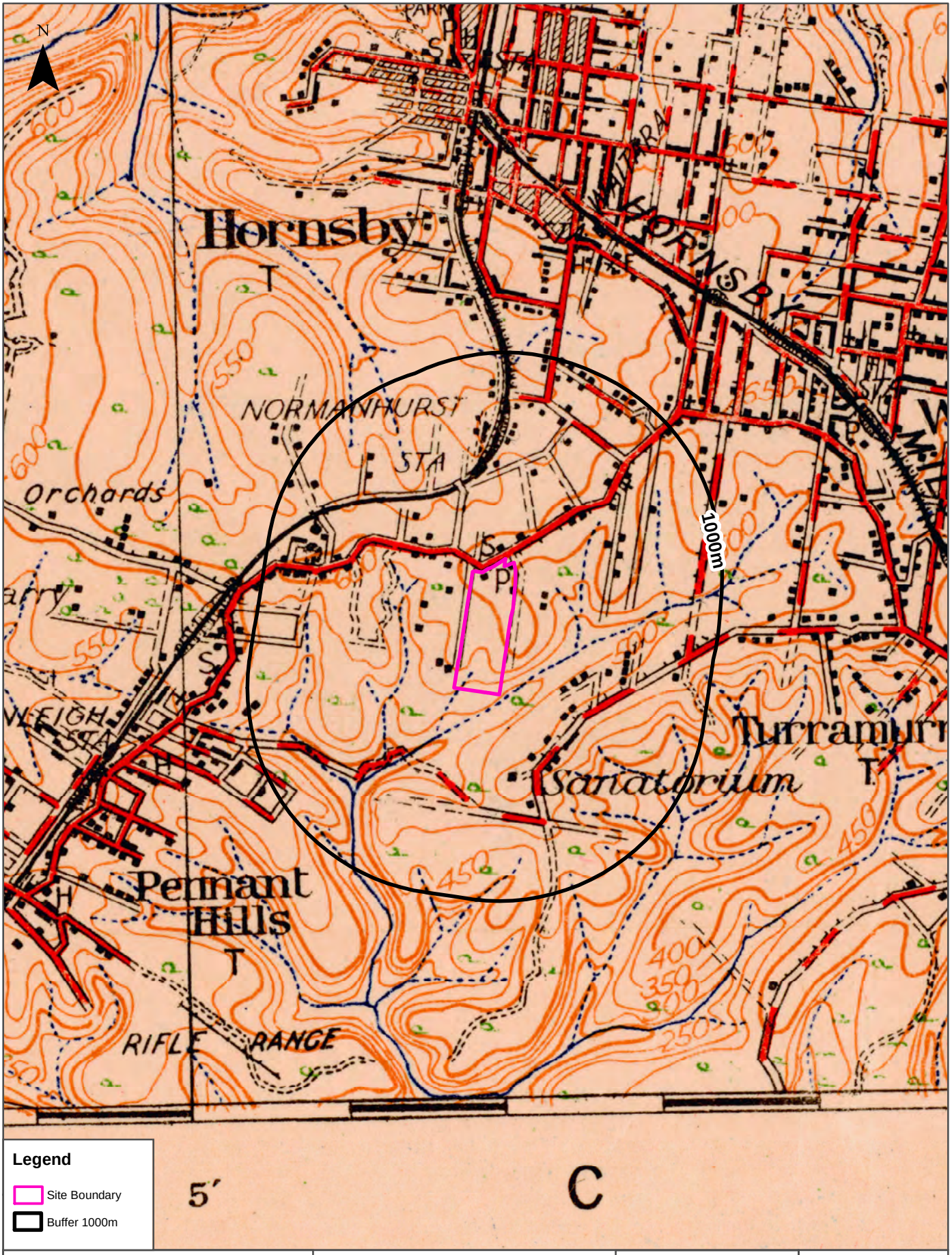
Data Sources: Australia 1:63360 Sheet 417
Broken Bay, New South Wales
Prepared by Commonwealth Section Imperial General Staff

Coordinate System:
GDA 1994 MGA Zone 56

Date: 24 August 2018

Historical Map c.1920

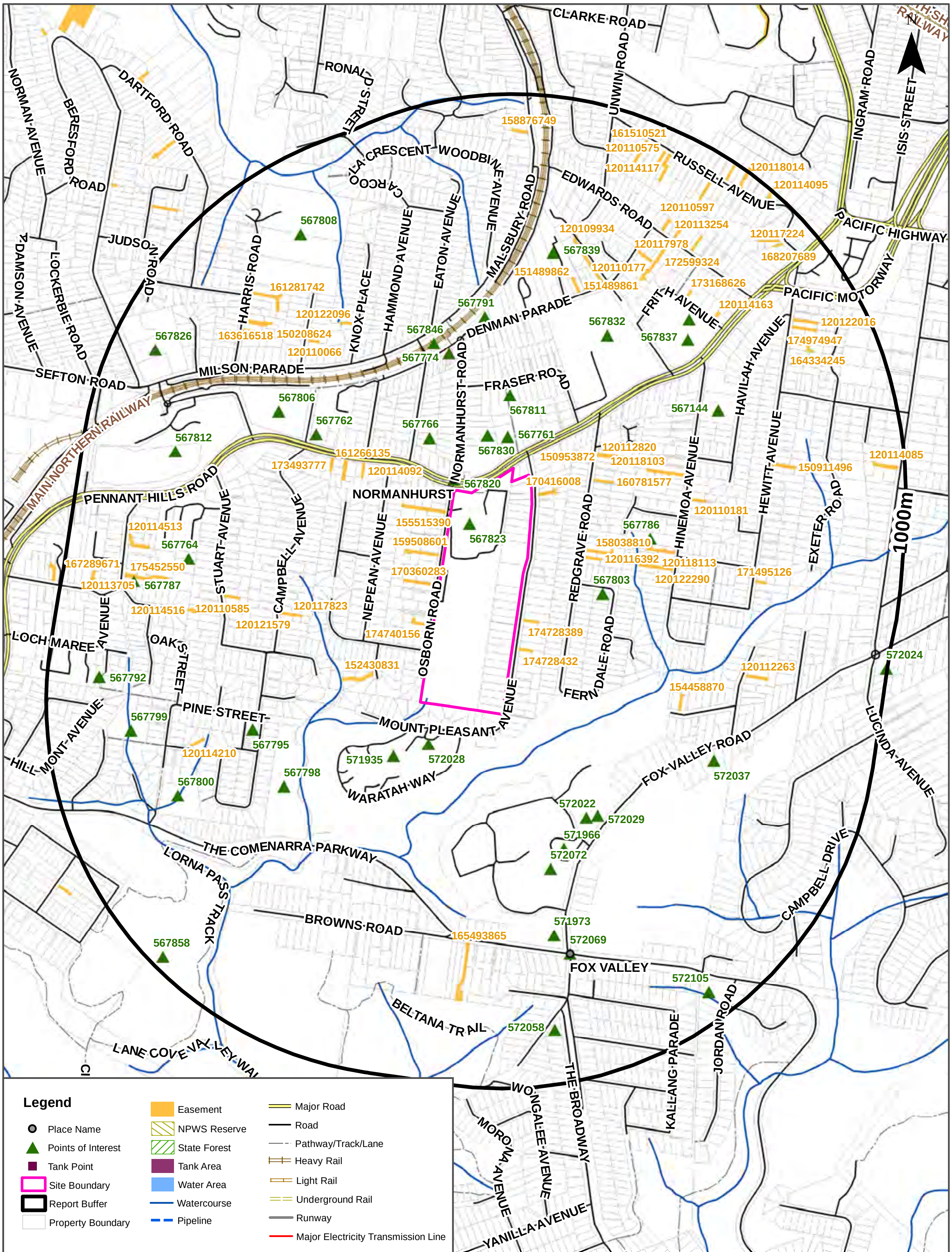
91-93 Pennant Hills Road, Normanhurst, NSW 2076



Scale: 0 200 400 800 1,200 Meters	Data Sources: Australia 1:63360 Sheet 417 Broken Bay, New South Wales Prepared by Commonwealth Section Imperial General Staff	Coordinate System: GDA 1994 MGA Zone 56	Date: 24 August 2018

Topographic Features

91-93 Pennant Hills Road, Normanhurst, NSW 2076



Scale: 0 100 200 400 600 Meters	Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018	Coordinate System: GDA 1994 MGA Zone 56	Date: 24 August 2018

Topographic Features

91-93 Pennant Hills Road, Normanhurst, NSW 2076

Points of Interest

What Points of Interest exist within the dataset buffer?

Map Id	Feature Type	Label	Distance	Direction
567823	High School	LORETO NORMANHURST	0m	Onsite
567820	Suburb	NORMANHURST	28m	North
567761	Place Of Worship	MORMON CHURCH	85m	North
572028	Community Home	ELIZABETH LODGE HOSTEL	108m	South
567830	Primary School	NORMANHURST PUBLIC SCHOOL	111m	North
567766	Place Of Worship	UNITING CHURCH	157m	North
571935	Community Facility	ESTHER SOMERVILLE	161m	South West
567811	Park	LIPSCOMB RESERVE	196m	North
567803	Park	Park	218m	East
567786	Park	PHILIPPA O'LEARY PARK	323m	East
567774	Post Office	NORMANHURST POST OFFICE	351m	North
572022	Place Of Worship	SEVENTH DAY ADVENTIST CHURCH	355m	South East
572029	Primary School	WAHROONGA ADVENTIST SCHOOL 181 FOX VALLEY RD	371m	South East
571966	Helipad	Helipad	395m	South
567846	Railway Station	NORMANHURST RAILWAY STATION	395m	North
567762	Place Of Worship	ANGLICAN CHURCH	399m	North West
567791	Park	DAVIDSON PARK	411m	North
567832	High School	NORMANHURST BOYS HIGH SCHOOL	427m	North East
567798	Park	Park	429m	South West
572072	General Hospital	SYDNEY ADVENTIST PRIVATE HOSPITAL	433m	South
567795	Park	Park	454m	South West
567806	Park	KENLEY PARK	515m	North West
567144	Nursing Home	GREENWOOD AGED CARE	535m	North East
567837	Retirement Village	BOWDEN BRAE VILLAGE	558m	North East
572037	Child Care Centre	FOX VALLEY PRE-SCHOOL	578m	South East
567839	Retirement Village	BRAMBLEWOOD RETIREMENT VILLAGE	585m	North
567149	Nursing Home	UNITING BOWDEN BRAE NORMANHURST	596m	North East
571973	Combined Primary-Secondary School	WAHROONGA ADVENTIST SCHOOL	607m	South
572069	Locality	FOX VALLEY	665m	South
567764	Place Of Worship	CATHOLIC CHURCH	673m	West

Map Id	Feature Type	Label	Distance	Direction
567800	Park	Park	694m	South West
567812	Park	BRICKPIT PARK	752m	North West
567799	Park	Park	777m	West
567808	Park	NORMANHURST PARK	800m	North West
567787	Park	Park	809m	West
572058	Park	Park	854m	South
567792	Park	Park	861m	West
567826	Primary School	NORMANHURST WEST PUBLIC SCHOOL	884m	North West
572105	Park	SIR ROBERT MENZIES PARK	924m	South East
567858	Park	Park	968m	South West
572024	Park	WILLIAM LEWIS PARK	998m	East

Topographic Features

91-93 Pennant Hills Road, Normanhurst, NSW 2076

Tanks (Areas)

What are the Tank Areas located within the dataset buffer?
Note. The large majority of tank features provided by LPI are derived from aerial imagery & are therefore primarily above ground tanks.

Map Id	Tank Type	Status	Name	Feature Currency	Distance	Direction
	No records in buffer					

Tanks (Points)

What are the Tank Points located within the dataset buffer?
Note. The large majority of tank features provided by LPI are derived from aerial imagery & are therefore primarily above ground tanks.

Map Id	Tank Type	Status	Name	Feature Currency	Distance	Direction
	No records in buffer					

Major Easements

What Major Easements exist within the dataset buffer?
Note. Easements provided by LPI are not at the detail of local governments. They are limited to major easements such as Right of Carriageway, Electrical Lines (66kVa etc.), Easement to drain water & Significant subterranean pipelines (gas, water etc.).

Map Id	Easement Class	Easement Type	Easement Width	Distance	Direction
155515390	Primary	Right of way	6.095m	16m	North West
159508601	Primary	Right of way	variable	16m	North West
170360283	Primary	Right of way	3.66m	16m	West
174740156	Primary	Right of way	3.5m & var	16m	South West
174728389	Primary	Right of way	3.5m	20m	South East
174728432	Primary	Right of way	4m	20m	South East
170416008	Primary	Right of way	Var	20m	North East
152430831	Primary	Right of way		137m	South West
120116392	Primary	Undefined		147m	East
158038810	Primary	Right of way	1.7m and VAR	148m	East
160781577	Primary	Right of way	4	168m	North East
120112820	Primary	Undefined		191m	North East
150953872	Primary	Right of way	4 WIDE	192m	North East

Map Id	Easement Class	Easement Type	Easement Width	Distance	Direction
120114092	Primary	Undefined		248m	North West
161266135	Primary	Right of way	6.095	295m	North West
120122290	Primary	Undefined		298m	East
120118103	Primary	Undefined		313m	North East
120118113	Primary	Undefined		317m	East
173493777	Primary	Right of way		332m	North West
120117823	Primary	Undefined		351m	West
120121579	Primary	Undefined		373m	West
120110181	Primary	Undefined		419m	North East
154458870	Primary	Right of way	variable	464m	South East
151489862	Primary	Right of way	2.865m & var	501m	North
151489861	Primary	Right of way	1.135m & var	503m	North
120122096	Primary	Undefined		518m	North West
120110585	Primary	Undefined		523m	West
120110066	Primary	Undefined		538m	North West
120109934	Primary	Undefined		548m	North
120114516	Primary	Undefined		568m	West
120114210	Primary	Undefined		586m	South West
172599324	Primary	Right of way	3.5m, 4m & VAR	601m	North East
171495126	Primary	Right of way	3.5 Wide & Vari	615m	East
165493865	Primary	Right of way	4m & Variable	620m	South
120112263	Primary	Undefined		630m	East
173168626	Primary	Right of way	3.5	631m	North East
150208624	Primary	Right of way	4,5,var	634m	North West
150911496	Primary	Right of way	4 WIDE	648m	North East
120114163	Primary	Undefined		648m	North East
120110177	Primary	Undefined		657m	North East
163616518	Primary	Right of way	3.655m & var	661m	North West
161281742	Primary	Right of way	VAR	672m	North West
175452550	Primary	Right of way	4.57 & Variable	720m	West
120117978	Primary	Undefined		741m	North East
174056262	Primary	Right of way	3.6m	743m	North East
120113254	Primary	Right of way		746m	North East
120114513	Primary	Undefined		783m	West
164334245	Primary	Right of way	3.655m and var	783m	North East
120113705	Primary	Undefined		803m	West
174974947	Primary	Right of way	3.5m	807m	North East

Map Id	Easement Class	Easement Type	Easement Width	Distance	Direction
120122016	Primary	Undefined		819m	North East
120114117	Primary	Undefined		860m	North East
120110597	Primary	Undefined		867m	North East
161510521	Primary	Right of way		868m	North
120117224	Primary	Undefined		874m	North East
120110575	Primary	Undefined		892m	North
168207689	Primary	Right of way	3metres wide	895m	North East
158876749	Primary	Right of way		897m	North
167289671	Primary	Right of way	4m & Var	912m	West
120114085	Primary	Undefined		914m	East
120121543	Primary	Undefined		950m	North East
120118014	Primary	Undefined		953m	North East
120114095	Primary	Undefined		968m	North East

Topographic Features

91-93 Pennant Hills Road, Normanhurst, NSW 2076

State Forest

What State Forest exist within the dataset buffer?

State Forest Number	State Forest Name	Distance	Direction
N/A	No records in buffer		

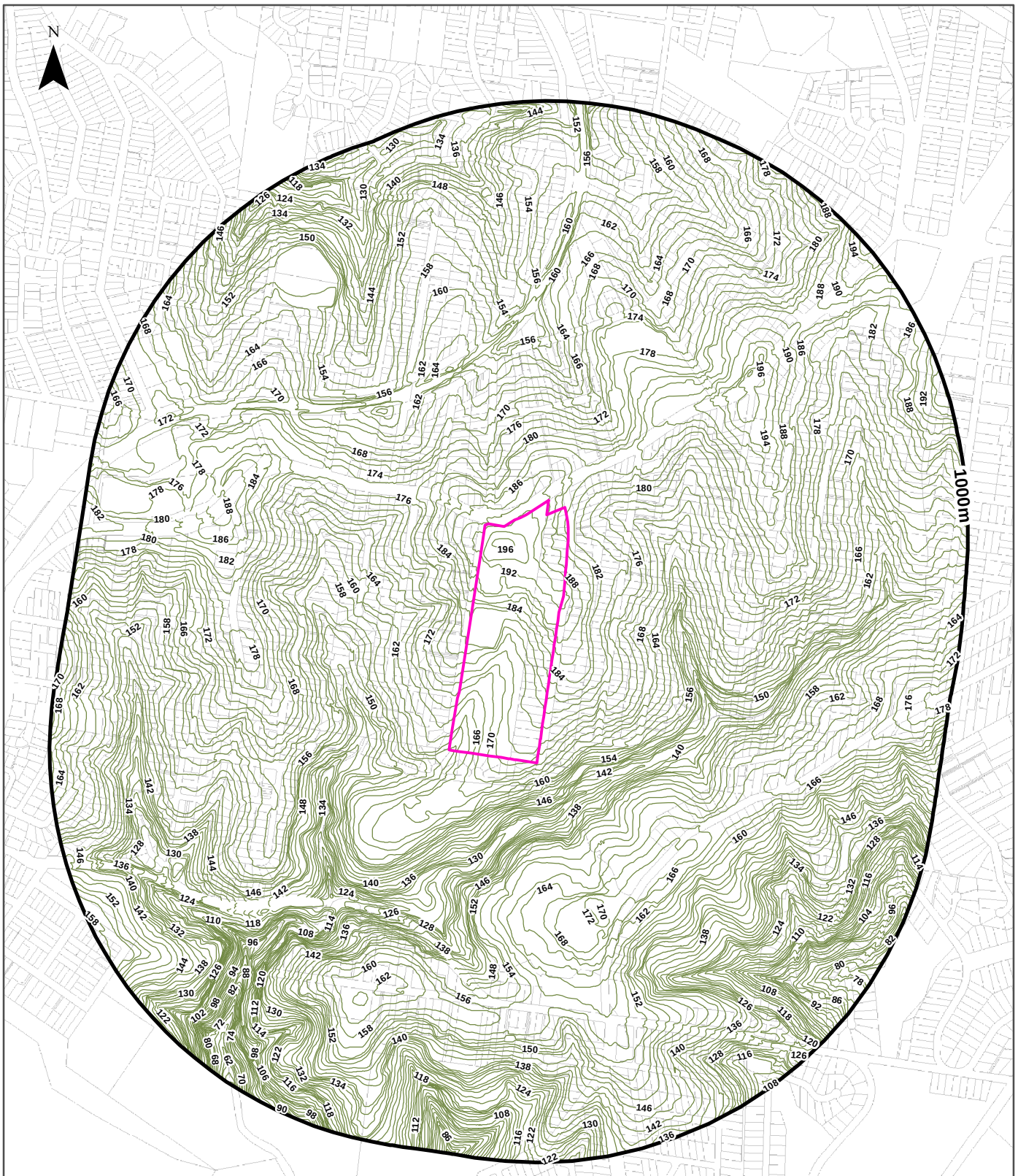
National Parks and Wildlife Service Reserves

What NPWS Reserves exist within the dataset buffer?

Reserve Number	Reserve Type	Reserve Name	Gazetted Date	Distance	Direction
N/A	No records in buffer				

Elevation Contours (m AHD)

91-93 Pennant Hills Road, Normanhurst, NSW 2076



Legend

- Elevation Contour (m AHD)
- Site Boundary
- Report Buffer
- Property Boundary

Accuracy & Currency: This contour data can be up to 0.4 of the contour interval out in height and must therefore not be used for any design or engineering works, but only as a general guide to topography. Gaps may occur along contour lines due to vertical topography, obscured topography in the source photography such as buildings, dense vegetation or dead ground, or the fact that original buildings have been replaced in the intervening thirty years since the original contour capture.

Scale: 0 100 200 400 Meters	Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018	Coordinate System: GDA 1994 MGA Zone 56	Date: 24 August 2018

Hydrogeology & Groundwater

91-93 Pennant Hills Road, Normanhurst, NSW 2076

Hydrogeology

Description of aquifers on-site:

Description
Porous, extensive aquifers of low to moderate productivity

Description of aquifers within the dataset buffer:

Description
Porous, extensive aquifers of low to moderate productivity

Hydrogeology Map of Australia : Commonwealth of Australia (Geoscience Australia)

Botany Groundwater Management Zones

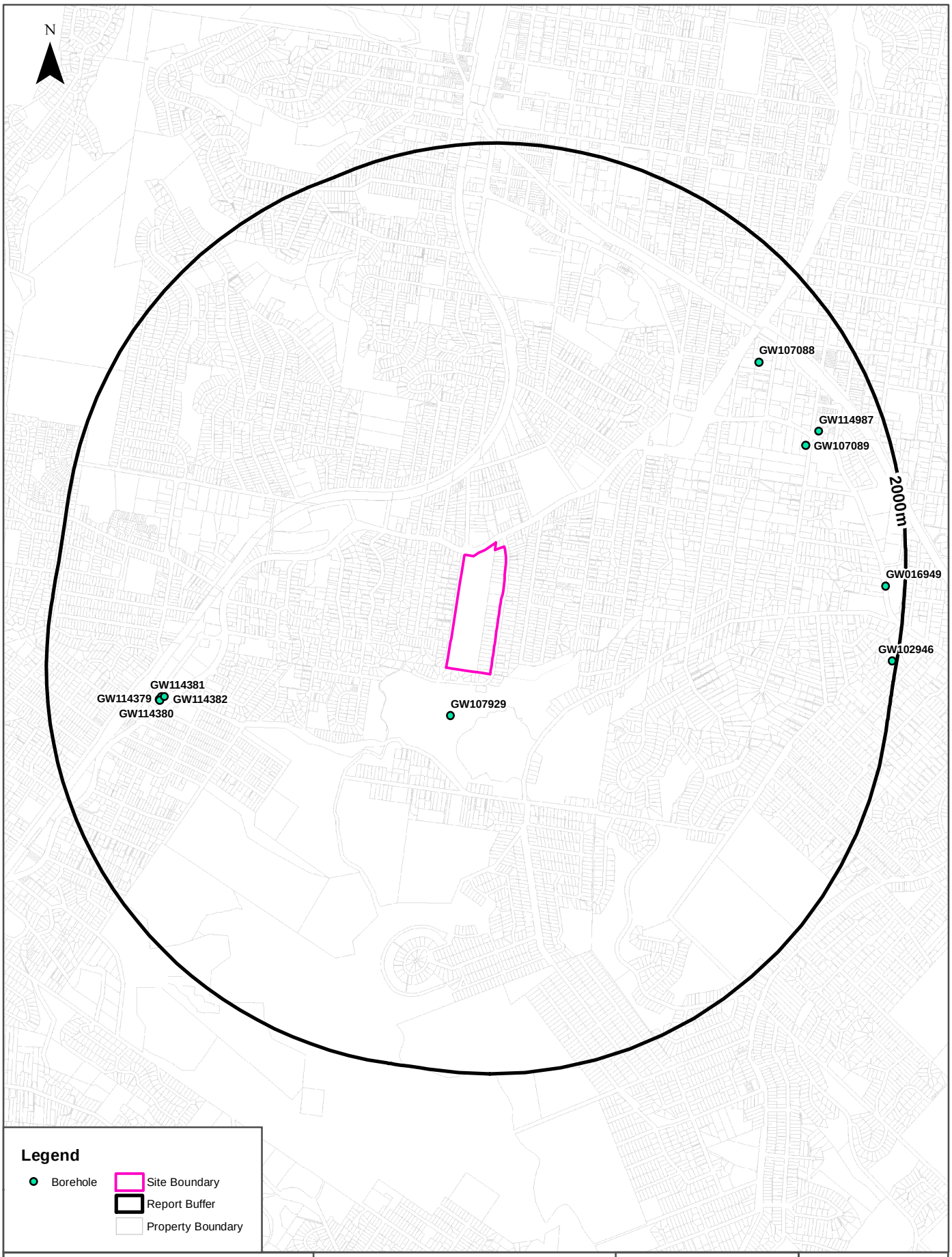
Groundwater management zones relating to the Botany Sand Beds aquifer within the dataset buffer:

Management Zone No.	Restriction	Distance	Direction
N/A	No records in buffer		

Botany Groundwater Management Zones Data Source : NSW Department of Primary Industries

Groundwater Boreholes

91-93 Pennant Hills Road, Normanhurst, NSW 2076



Hydrogeology & Groundwater

91-93 Pennant Hills Road, Normanhurst, NSW 2076

Groundwater Boreholes

Boreholes within the dataset buffer:

GW No.	Licence No	Work Type	Owner Type	Authorised Purpose	Intended Purpose	Name	Complete Date	Final Depth (m)	Drilled Depth (m)	Salinity (mg/L)	SWL (m)	Yield (L/s)	Elev (AHD)	Dist	Dir
GW107929	10BL164420, 10BL165856, 10WA109473	Bore		Recreation (groundwater), Test Bore	Recreation (groundwater)		18/03/2005	180.00	180.00	1800	58.00	0.100		234m	South
GW114382	10BL604932	Bore	Private	Monitoring Bore	Monitoring Bore	BP - Thornleig	28/07/2011	7.00	7.00		1.84			1414m	West
GW114381	10BL604932	Bore	Private	Monitoring Bore	Monitoring Bore	BP - Thornleig	28/07/2011	8.00	8.00		2.43			1430m	West
GW114380	10BL604932	Bore	Private	Monitoring Bore	Monitoring Bore	BP - Thornleig	28/07/2011	8.00	8.00		2.90			1441m	West
GW114379	10BL604932	Bore	Private	Monitoring Bore	Monitoring Bore	BP - Thornleig	28/07/2011	8.00	8.00		2.43			1442m	West
GW107088	10BL164779, 10BL165192, 10WA109443	Bore		Recreation (groundwater), Test Bore	Recreation (groundwater)		11/01/2005	162.00	162.00	670	78.50	1.000		1574m	North East
GW107089	10BL164780, 10BL165191, 10WA109445	Bore		Recreation (groundwater), Test Bore	Recreation (groundwater)		13/01/2005	216.00	216.00	470	65.00	0.100		1591m	North East
GW114987	10BL604934			Monitoring Bore	Monitoring Bore		17/08/2011	10.00	10.00		1.87			1677m	North East
GW016949	10BL008051	Well	Private	Recreation (groundwater)	Irrigation		01/01/1958	11.70	11.70	Very Poor				1906m	East
GW102946	10BL159554, 10WA108455	Bore		Domestic, Stock	Domestic, Stock		15/03/2000	186.50	186.50	843				1977m	East

Hydrogeology & Groundwater

91-93 Pennant Hills Road, Normanhurst, NSW 2076

Driller's Logs

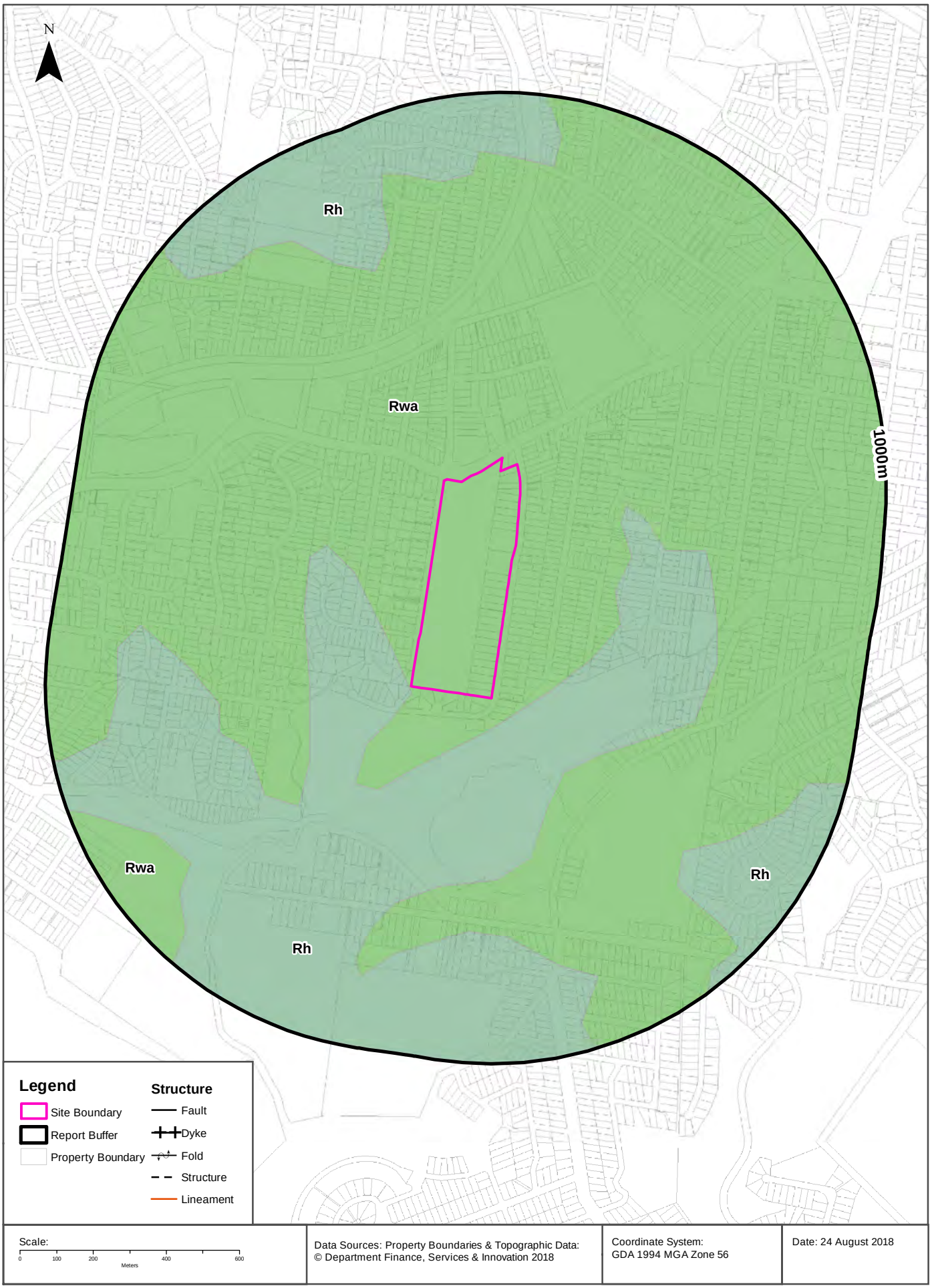
Drill log data relevant to the boreholes within the dataset buffer:

Groundwater No	Drillers Log	Distance	Direction
GW107929	0.00m-16.00m SANDSTONE L./B 16.00m-17.00m SANDSTONE,FRACTURED, SOFT 17.00m-35.00m SANDSTONE GREY 35.00m-35.50m SHALE 35.50m-73.00m SANDSTONE GREY 73.00m-74.50m SANDSTONE FINE QUARTZ 74.50m-83.00m SANDSTONE GREY 83.00m-88.00m SANDSTONE D/G 88.00m-92.00m SANDSTONE GREY 92.00m-92.50m SANDSTONE F/Q 92.50m-117.00m SANDSTONE D/G 117.00m-117.20m SANDSTONE FRACTURED 117.20m-124.00m SANDSTONE GREY 124.00m-124.50m SANDSTONE F/Q 124.50m-133.00m SANDSTONE GREY 133.00m-135.00m SANDSTONE / QUARTZ 135.00m-153.00m SANDSTONE GREY 153.00m-156.50m SANDSTOHNE FINE QUARTZ 156.50m-180.00m SANDSTONE GREY	234m	South
GW114382	0.00m-0.14m CONCRETE 0.14m-0.20m GRAVELLY SAND,MINOR SILT,GREY BROWN 0.20m-0.60m SILTY SAND,MINOR CLAY 0.60m-1.55m SILTY SAND,FINE SAND,ORANGE,GREY,BROWN 1.55m-7.00m SANDSTONE,WEATHERED,ORANGE GREY	1414m	West
GW114381	0.00m-0.15m CONCRETE 0.15m-0.25m SANDY GRAVEL,MINOR SILT GREY BROWN 0.25m-2.70m SILTY CLAY,MINOR SANDSTONE GRAVEL 2.70m-8.00m SANDSTONE,HIGLY TO M/WEATHERED	1430m	West
GW114380	0.00m-0.23m CONCRETE 0.23m-0.50m SANDY GRAVEL 0.50m-0.80m SANDY SILTY GRAVELLY CLAY 0.80m-2.30m SILTY SANDSTONE GRAVEL 2.30m-8.00m SANDSTONE,WEATHERED ORANGE RED BROWN	1441m	West
GW114379	0.00m-0.15m CONCRETE 0.15m-1.03m SILTY CLAY MINOR GRAVEL 1.03m-2.40m SANDY SILTY CLAY,GRAVEL ORANGEY BROWN 2.40m-8.00m SANDSTONE,WEATHERED	1442m	West
GW107088	0.00m-5.50m CLAY BROWN 5.50m-11.00m CLAY WHITE 11.00m-40.00m SANDSTONE L/GREY 40.00m-43.00m SANDSTONE,SHALE BEDDING 43.00m-47.50m SANDSTONE GREY 47.50m-48.30m SANDSTONE QUARTZ 48.30m-61.00m SANDSTONE GREY 61.00m-63.50m SANDSTONE,D/GREY 63.50m-67.50m SANDSTONE GREY 67.50m-68.00m SANDSTONE,FINE QUARTZ 68.00m-113.00m SANDSTONE GREY 113.00m-113.50m SANDSTONE,QUARTZ 113.50m-145.00m SANDSTONE GREY 145.00m-147.00m SANDSTONE QUARTZ 147.00m-153.00m SANDSTONE GREY 153.00m-154.00m SANDSTONE FINE QUARTZ 154.00m-157.00m SANDSTONE GREY 157.00m-157.20m SANDSTONE FRACTURED 157.20m-162.00m SANDSTONE GREY	1574m	North East

Groundwater No	Drillers Log	Distance	Direction
GW107089	0.00m-1.00m FILL 1.00m-5.00m CLAY BROWN 5.00m-21.00m SHALE 21.00m-57.00m SANDSTONE GREY 57.00m-58.00m SANDSTONE F/QUARTZ 58.00m-71.00m SANDSTONE GREY 71.00m-72.00m SANDSTONE ,SHALE BEDDING 72.00m-74.00m SHALE HARD 74.00m-121.50m SANDSTONE GREY 121.50m-123.50m SANDSTONE F/QUARTZ 123.50m-125.00m SANDSTONE GREY 125.00m-126.00m SANDSTONE QUARTZ 126.00m-175.00m SANDSTONE GREY 175.00m-175.30m SANDSTONE, QUARTZ 175.30m-181.00m SANDSTONE GREY 181.00m-181.50m SANDSTONE QUARTZ 181.50m-191.00m SANDSTONE GREY 191.00m-192.00m SANDSTONE QUARTZ 192.00m-200.00m SANDSTONE GREY 200.00m-201.50m SANDSTONE F/QUARTZ 201.50m-216.00m SANDSTONE GREY	1591m	North East
GW016949	0.00m-1.21m Topsoil 1.21m-2.13m Clay 2.13m-11.73m Shale	1906m	East
GW102946	0.00m-7.00m FILL 7.00m-10.00m WEATHERED SHALE 10.00m-13.00m WEATHERED SANDSTONE 13.00m-38.00m SANDSTONE M.G. 38.00m-40.00m SANDSTONE QUARTZ 40.00m-67.00m SANDSTONE M.G. 67.00m-69.50m HARD SHALE 69.50m-82.00m SANDSTONE M.G. 82.00m-84.50m SANDSTONE AND SHALE 84.50m-92.00m SANDSTONE M.G. 92.00m-95.00m SHALE AND SANDSTONE 95.00m-95.50m QUARTZ 95.50m-98.00m SANDSTONE M.G. 98.00m-113.50m SANDSTONE M.G. 113.50m-115.00m SANDSTONE AND QUARTZ 115.00m-154.00m SANDSTONE M.G. 154.00m-157.00m SANDSTONE AND QUARTZ 157.00m-160.50m SANDSTONE M.G. 160.50m-163.00m SANDSTONE AND QUARTZ 163.00m-165.00m SANDSTONE M.G. 165.00m-167.00m SANDSTONE AND QUARTZ 167.00m-169.00m SANDSTONE M.G. 169.00m-171.00m SANDSTONE QUARTZ 171.00m-172.50m SANDSTONE M.G. 172.50m-173.00m HARD SHALE 173.00m-178.00m SANDSTONE F/G 178.00m-179.00m SANDSTONE AND QUARTZ 179.00m-186.50m HARD SHALE	1977m	East

Geology 1:100,000

91-93 Pennant Hills Road, Normanhurst, NSW 2076



Geology

91-93 Pennant Hills Road, Normanhurst, NSW 2076

Geological Units

What are the Geological Units onsite?

Symbol	Description	Unit Name	Group	Sub Group	Age	Dom Lith	Map Sheet	Dataset
Rwa	Black to dark grey shale and laminate	Ashfield Shale	Wianamatta Group		Triassic		Sydney	1:100,000

What are the Geological Units within the dataset buffer?

Symbol	Description	Unit Name	Group	Sub Group	Age	Dom Lith	Map Sheet	Dataset
Rh	Medium to coarse grained quartz sandstone, very minor shale and laminate lenses				Triassic		Sydney	1:100,000
Rwa	Black to dark grey shale and laminate	Ashfield Shale	Wianamatta Group		Triassic		Sydney	1:100,000

Geological Structures

What are the Geological Structures onsite?

Feature	Name	Description	Map Sheet	Dataset
No features				1:100,000

What are the Geological Structures within the dataset buffer?

Feature	Name	Description	Map Sheet	Dataset
No features				1:100,000

Geological Data Source : NSW Department of Industry, Resources & Energy

Naturally Occurring Asbestos Potential

91-93 Pennant Hills Road, Normanhurst, NSW 2076

Naturally Occurring Asbestos Potential

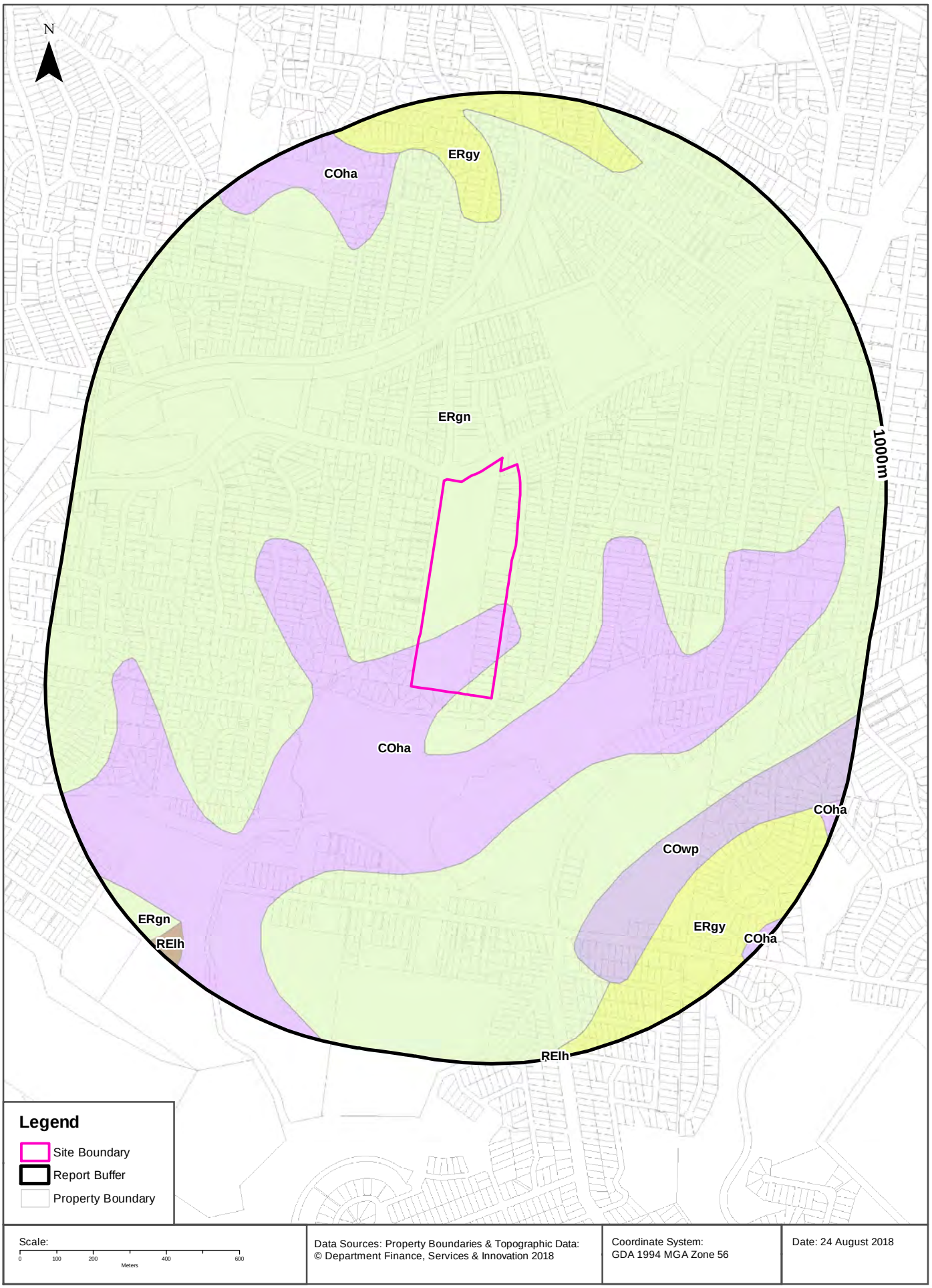
Naturally Occurring Asbestos Potential within the dataset buffer:

Potential	Sym	Strat Name	Group	Formation	Scale	Min Age	Max Age	Rock Type	Dom Lith	Description	Dist	Dir
No records in buffer												

Mining Subsidence District Data Source: © State of New South Wales through NSW Department of Industry, Resources & Energy

Soil Landscapes

91-93 Pennant Hills Road, Normanhurst, NSW 2076



Soils

91-93 Pennant Hills Road, Normanhurst, NSW 2076

Soil Landscapes

What are the onsite Soil Landscapes?

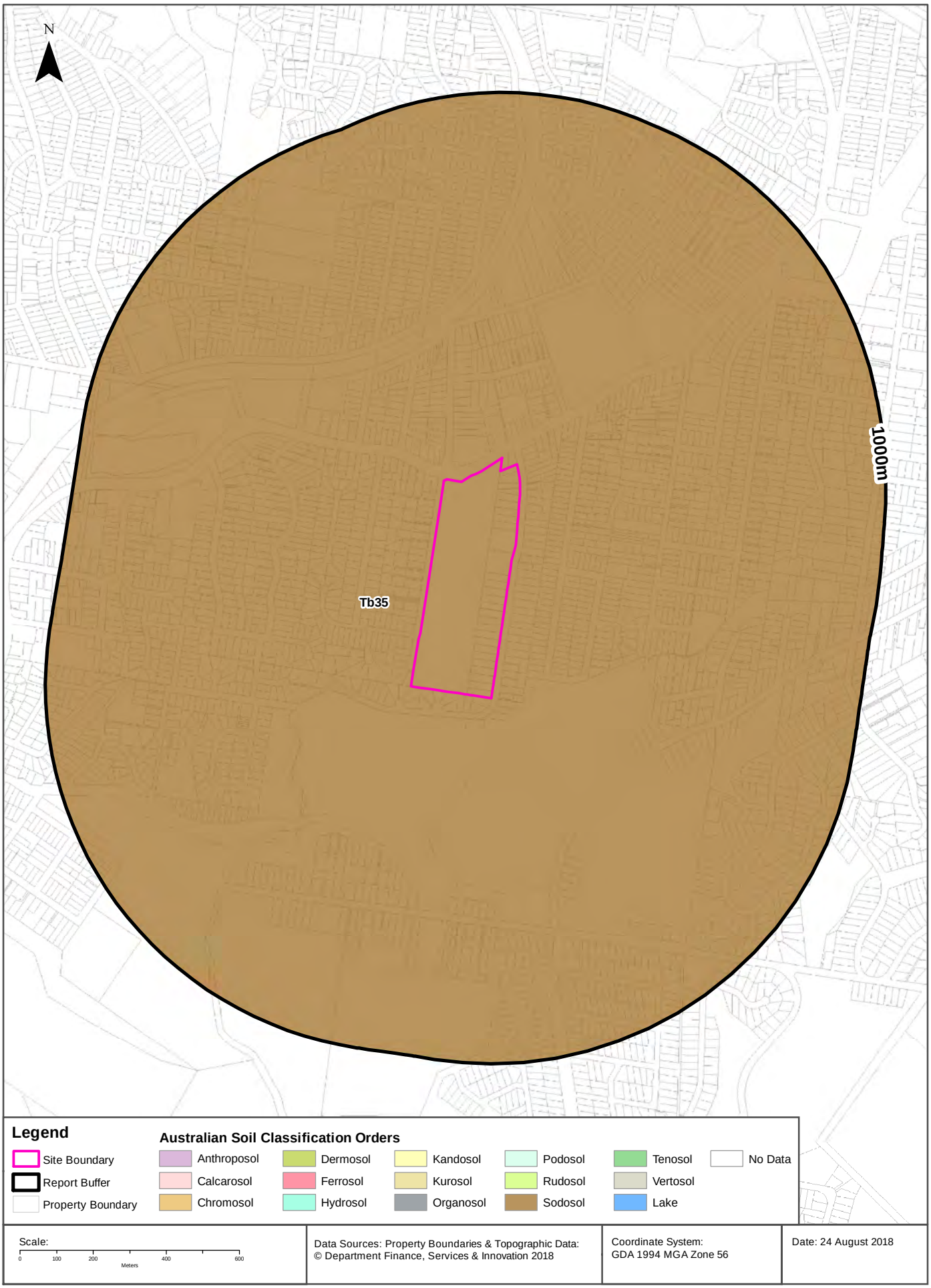
Soil Code	Name	Group	Process	Map Sheet	Scale
COha	HAWKESBURY		COLLUVIAL	Sydney	1:100,000
ERgn	GLENORIE		EROSIONAL	Sydney	1:100,000

What are the Soil Landscapes within the dataset buffer?

Soil Code	Name	Group	Process	Map Sheet	Scale
COha	HAWKESBURY		COLLUVIAL	Sydney	1:100,000
COwp	WEST PENNANT HILLS		COLLUVIAL	Sydney	1:100,000
ERgn	GLENORIE		EROSIONAL	Sydney	1:100,000
ERgy	GYMEA		EROSIONAL	Sydney	1:100,000
RElh	LUCAS HEIGHTS		RESIDUAL	Sydney	1:100,000

Atlas of Australian Soils

91-93 Pennant Hills Road, Normanhurst, NSW 2076



Soils

91-93 Pennant Hills Road, Normanhurst, NSW 2076

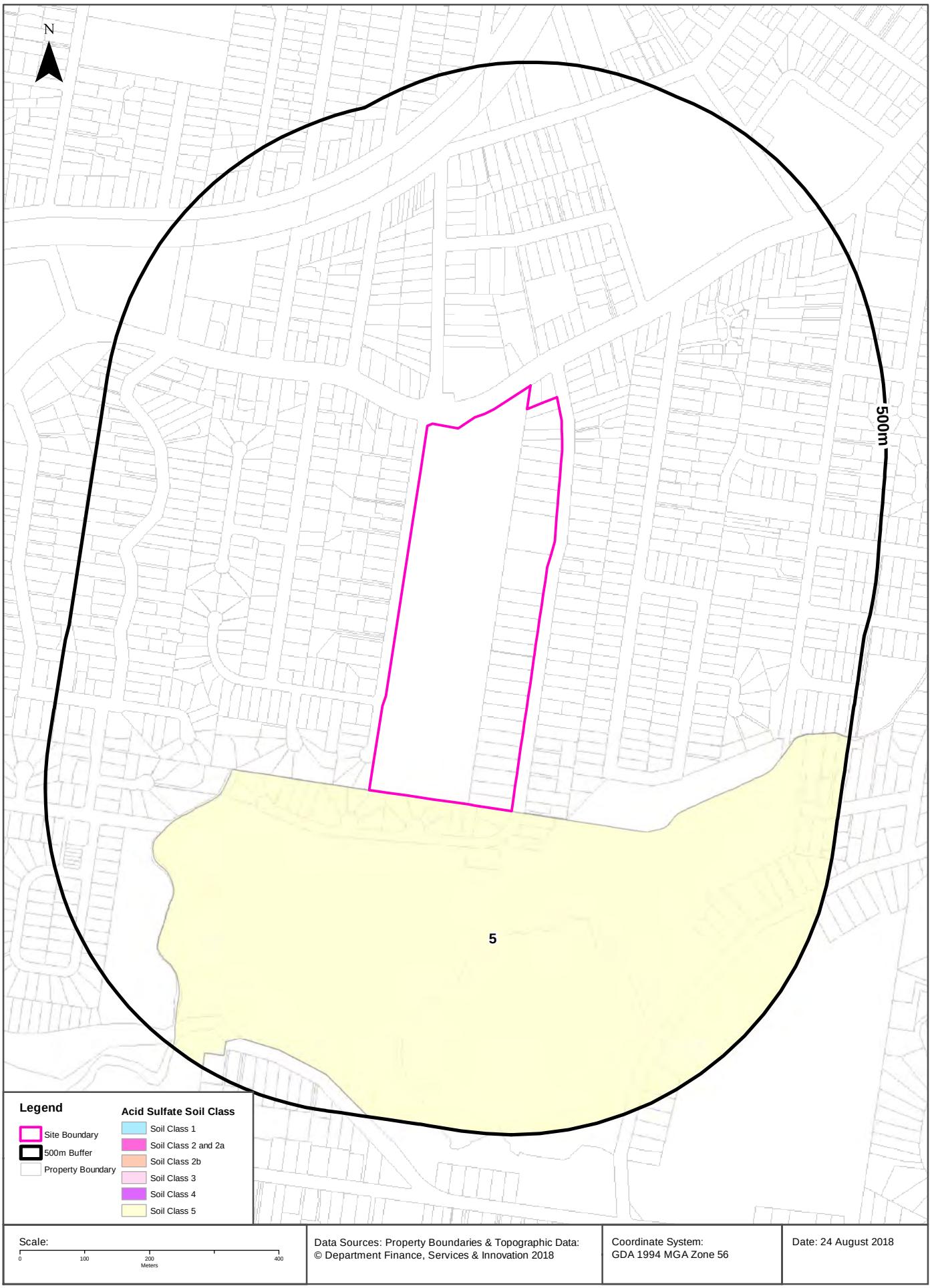
Atlas of Australian Soils

Soil mapping units and Australian Soil Classification orders within the dataset buffer:

Map Unit Code	Soil Order	Map Unit Description	Distance
Tb35	Sodosol	Dissected plateau remnants--flat to undulating ridge tops with moderate to steep side slopes: chief soils are hard acidic yellow and yellow mottled soils (Dy3.41), (Dy2.21), and (Dy2.41) and hard acidic red soils (Dr2.21); many shallow profiles occur and profile thickness varies considerably over short distances. Associated are: (Gn3.54), (Gn3.14), and possibly other (Gn3) soils; (Db1.2) soils on some ridges; (Dy5.81) soils in areas transitional to unit Mb2; soils common to unit Mb2; and eroded lateritic remnants. Small areas of other soils are likely. Flat ferruginous shale or sandstone fragments are common on and/or in and/or below the soils of this unit.	0m

Acid Sulfate Soils

91-93 Pennant Hills Road, Normanhurst, NSW 2076



Acid Sulfate Soils

91-93 Pennant Hills Road, Normanhurst, NSW 2076

Standard Local Environmental Plan Acid Sulfate Soils

What is the on-site Acid Sulfate Soil Plan Class that presents the largest environmental risk?

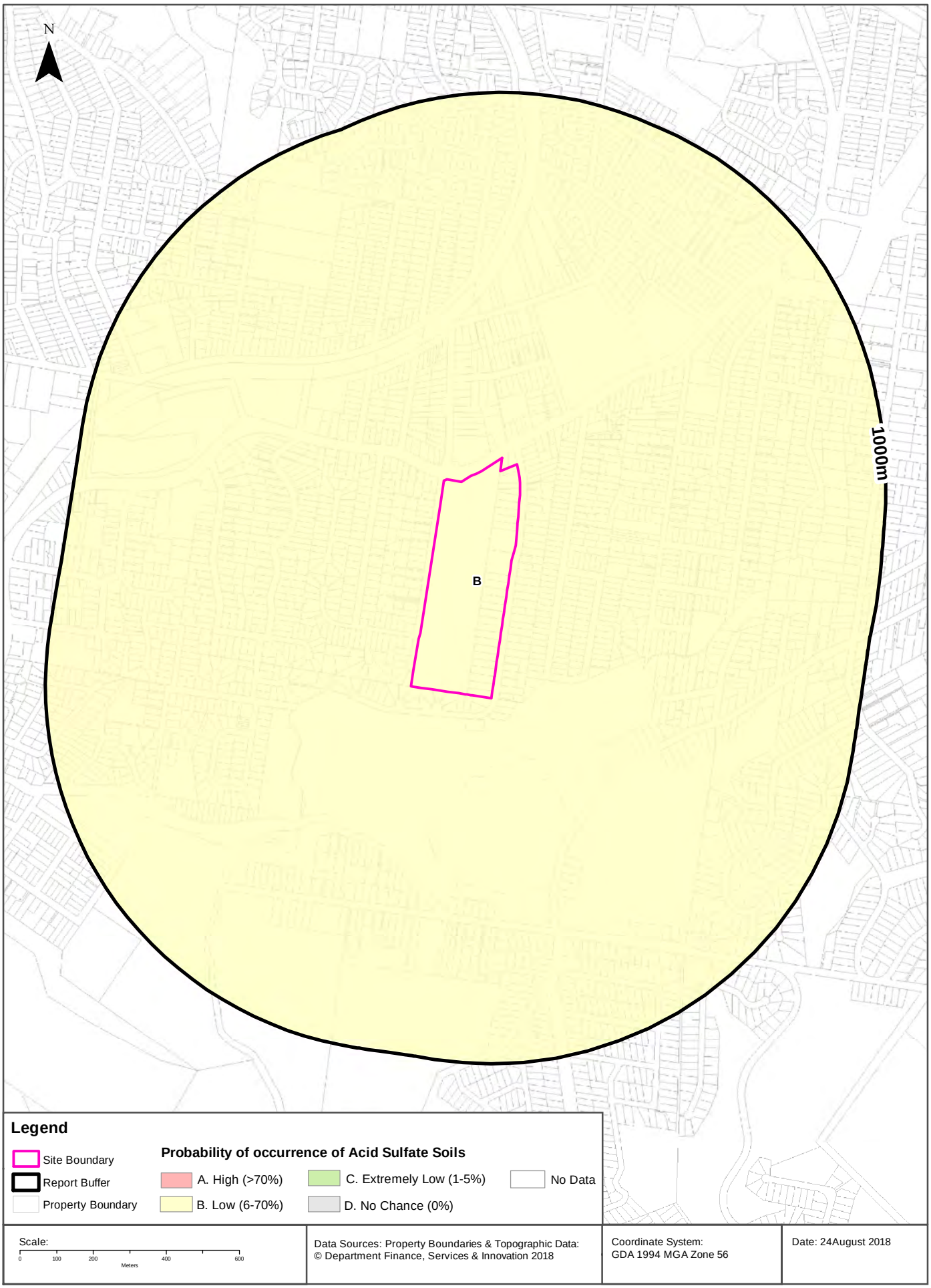
Soil Class	Description	LEP
5	Works within 500 metres of adjacent Class 1, 2, 3, or 4 land that is below 5 metres AHD and by which the watertable is likely to be lowered below 1 metre AHD on adjacent Class 1, 2, 3 or 4 land, present an environmental risk	Ku-ring-gai Local Environmental Plan 2015

If the on-site Soil Class is 5, what other soil classes exist within 500m?

Soil Class	Description	LEP	Distance	Direction
None				

Atlas of Australian Acid Sulfate Soils

91-93 Pennant Hills Road, Normanhurst, NSW 2076



Acid Sulfate Soils

91-93 Pennant Hills Road, Normanhurst, NSW 2076

Atlas of Australian Acid Sulfate Soils

Atlas of Australian Acid Sulfate Soil categories within the dataset buffer:

Class	Description	Distance
B	Low Probability of occurrence. 6-70% chance of occurrence.	0m

Dryland Salinity

91-93 Pennant Hills Road, Normanhurst, NSW 2076

Dryland Salinity - National Assessment

Is there Dryland Salinity - National Assessment data onsite?

No

Is there Dryland Salinity - National Assessment data within the dataset buffer?

No

What Dryland Salinity assessments are given?

Assessment 2000	Assessment 2020	Assessment 2050	Distance	Direction
N/A	N/A	N/A	N/A	N/A

Dryland Salinity Data Source : National Land and Water Resources Audit
The Commonwealth and all suppliers of source data used to derive the maps of "Australia, Forecast Areas Containing Land of High Hazard or Risk of Dryland Salinity from 2000 to 2050" do not warrant the accuracy or completeness of information in this product. Any person using or relying upon such information does so on the basis that the Commonwealth and data suppliers shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information. Any persons using this information do so at their own risk.
In many cases where a high risk is indicated, less than 100% of the area will have a high hazard or risk.

Dryland Salinity Potential of Western Sydney

Dryland Salinity Potential of Western Sydney within the dataset buffer?

Feature Id	Classification	Description	Distance	Direction
N/A	Outside Data Coverage			

Dryland Salinity Potential of Western Sydney Data Source : NSW Office of Environment and Heritage

Mining Subsidence Districts

91-93 Pennant Hills Road, Normanhurst, NSW 2076

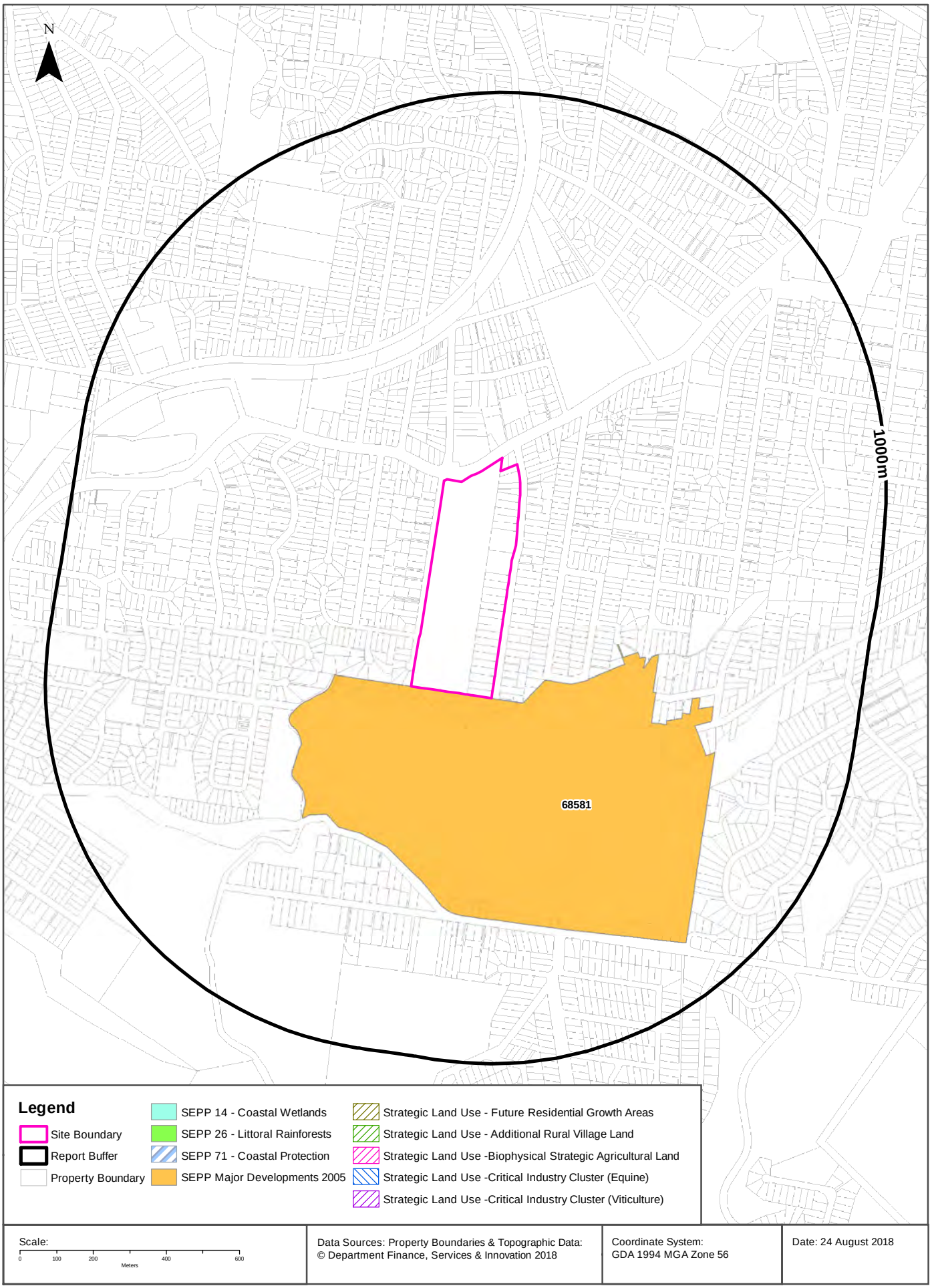
Mining Subsidence Districts

Mining Subsidence Districts within the dataset buffer:

District	Distance	Direction
There are no Mining Subsidence Districts within the report buffer		

State Environmental Planning Policy

91-93 Pennant Hills Road, Normanhurst, NSW 2076



Environmental Zoning

91-93 Pennant Hills Road, Normanhurst, NSW 2076

State Environmental Planning Policy Protected Areas

Are there any State Environmental Planning Policy Protected Areas onsite or within the dataset buffer?

Dataset	Onsite	Within Site Buffer	Distance
SEPP14 - Coastal Wetlands	No	No	N/A
SEPP26 - Littoral Rainforests	No	No	N/A
SEPP71 - Coastal Protection Zone	No	No	N/A

SEPP Protected Areas Data Source: NSW Department of Planning & Environment

State Environmental Planning Policy Major Developments (2005)

State Environmental Planning Policy Major Developments within the dataset buffer:

Map Id	Feature	Effective Date	Distance	Direction
68581	Wahroonga Estate	18/12/2009	0m	South

SEPP Major Development Data Source: NSW Department of Planning & Environment

State Environmental Planning Policy Strategic Land Use Areas

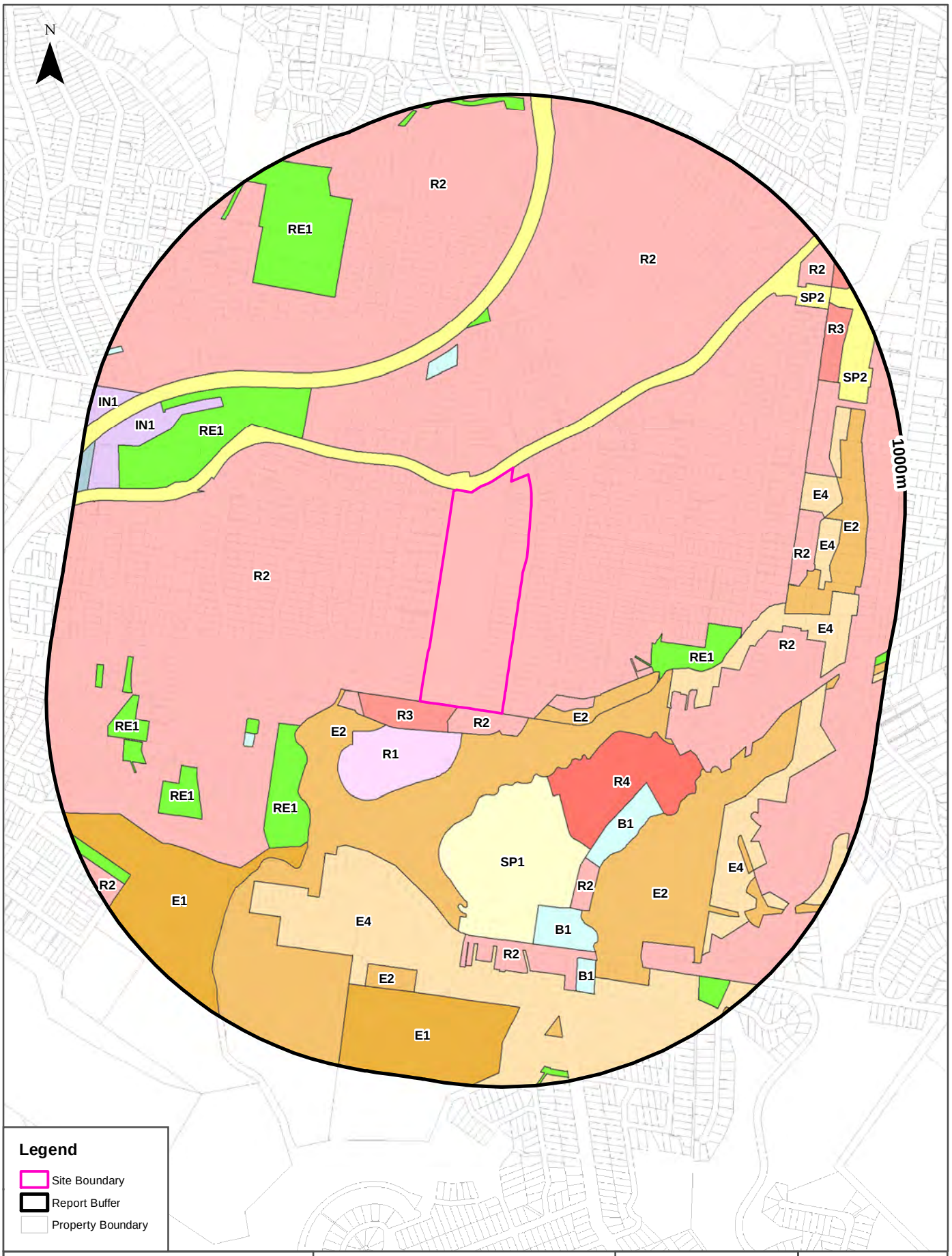
State Environmental Planning Policy Strategic Land Use Areas onsite or within the dataset buffer:

Strategic Land Use	SEPPNo	Effective Date	Amendment	Amendment Year	Distance	Direction
No records within buffer						

SEPP Strategic Land Use Data Source: NSW Department of Planning & Environment

LEP Planning Zones

91-93 Pennant Hills Road, Normanhurst, NSW 2076



Local Environmental Plan

91-93 Pennant Hills Road, Normanhurst, NSW 2076

Land Zoning

What Local Environmental Plan Land Zones exist within the dataset buffer?

Zone	Description	Purpose	LEP or SEPP	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
R2	Low Density Residential		Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017		0m	Onsite
R2	Low Density Residential		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		0m	South
R3	Medium Density Residential		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		0m	South West
SP2	Infrastructure	Road	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017		0m	North West
R2	Low Density Residential		Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017		29m	North
E2	Environmental Conservation		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		47m	South
R1	General Residential		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		69m	South West
E2	Environmental Conservation		State Environmental Planning Policy (State Significant Precincts) 2005	05/08/2011	05/08/2011	21/12/2012	State Environmental Planning Policy (Major Development) Amendment (UTS Ku-ring-gai Campus and Wahroonga Estate) 2012	86m	South East
R2	Low Density Residential		State Environmental Planning Policy (State Significant Precincts) 2005	05/08/2011	05/08/2011	30/12/1899	State Environmental Planning Policy (Major Development) Amendment (UTS Ku-ring-gai Campus and Wahroonga Estate) 2012	116m	South East
R2	Low Density Residential		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		155m	South West
SP1	Special Activities	Health Services Facilities	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		187m	South
R4	High Density Residential		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		207m	South East
B1	Neighbourhood Centre		Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017		306m	North
R2	Low Density Residential		State Environmental Planning Policy (State Significant Precincts) 2005	05/08/2011	05/08/2011	30/12/1899	State Environmental Planning Policy (Major Development) Amendment (UTS Ku-ring-gai Campus and Wahroonga Estate) 2012	318m	South East
RE1	Public Recreation		Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017		328m	South West
RE1	Public Recreation		Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017		330m	East
SP2	Infrastructure	Railway	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017		359m	South West

Zone	Description	Purpose	LEP or SEPP	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
RE1	Public Recreation		Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017		394m	North
R2	Low Density Residential		Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017		398m	North West
B1	Neighbourhood Centre		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		409m	South East
E4	Environmental Living		Ku-ring-gai Local Environmental Plan 2015	19/01/2018	19/01/2018	19/01/2018	Amendment No 14	426m	South
RE1	Public Recreation		Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017		429m	North West
E4	Environmental Living		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		434m	East
RE1	Public Recreation		Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017		434m	South West
R2	Low Density Residential		Ku-ring-gai Local Environmental Plan 2015	19/01/2018	19/01/2018	19/01/2018	Amendment No 14	442m	South East
R2	Low Density Residential		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		445m	South
B1	Neighbourhood Centre		Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017		450m	South West
E2	Environmental Conservation		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		477m	South East
E1	National Parks and Nature Reserves		Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017		481m	South West
B1	Neighbourhood Centre		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		521m	South
R2	Low Density Residential		Ku-ring-gai Local Environmental Plan 2015	19/01/2018	19/01/2018	19/01/2018	Amendment No 14	599m	South
RE1	Public Recreation		Hornsby Local Environmental Plan 2013	29/09/2017	29/09/2017	29/09/2017	Amendment No 8	609m	North West
RE1	Public Recreation		Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017		622m	South West
E4	Environmental Living		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		644m	South East
IN1	General Industrial		Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017		658m	North West
B1	Neighbourhood Centre		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		685m	South
E2	Environmental Conservation		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		703m	East
R2	Low Density Residential		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		703m	East
E2	Environmental Conservation		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		713m	South East
E2	Environmental Conservation		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		714m	South
E4	Environmental Living		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		718m	East
RE1	Public Recreation		Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017		726m	West
RE1	Public Recreation		Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017		751m	South West
E4	Environmental Living		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		767m	East
RE1	Public Recreation		Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017		771m	West
E1	National Parks and Nature Reserves		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		773m	South
E4	Environmental Living		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		801m	North East
E2	Environmental Conservation		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		803m	South East
R3	Medium Density Residential		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		816m	North East
E2	Environmental Conservation		Ku-ring-gai Local Environmental Plan 2015	19/01/2018	19/01/2018	19/01/2018	Amendment No 14	822m	South
E2	Environmental Conservation		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		847m	East

Zone	Description	Purpose	LEP or SEPP	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
E4	Environmental Living		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		849m	South East
RE1	Public Recreation		Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017		852m	West
SP2	Infrastructure	Classified Road	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		854m	North East
IN1	General Industrial		Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017		874m	West
RE1	Public Recreation		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		879m	South East
R2	Low Density Residential		Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017		880m	North East
RE1	Public Recreation		Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017		904m	South West
E2	Environmental Conservation		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		940m	South East
E4	Environmental Living		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		950m	South East
RE1	Public Recreation		Ku-ring-gai Local Environmental Plan 2015	19/01/2018	19/01/2018	19/01/2018	Amendment No 14	953m	South
R3	Medium Density Residential		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		955m	North East
RE1	Public Recreation		Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017		956m	North
RE1	Public Recreation		Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017		958m	North
B1	Neighbourhood Centre		Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017		960m	North West
E2	Environmental Conservation		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		968m	East
E4	Environmental Living		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		968m	East
RE1	Public Recreation		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		968m	East
B6	Enterprise Corridor		Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017		969m	West
RE1	Public Recreation		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		995m	South East
E4	Environmental Living		Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018		997m	South East

Local Environmental Plan

91-93 Pennant Hills Road, Normanhurst, NSW 2076

Minimum Subdivision Lot Size

What are the onsite Local Environmental Plan Minimum Subdivision Lot Sizes?

Symbol	Minimum Lot Size	LEP or SEPP	Published Date	Commenced Date	Currency Date	Amendment	Percentage of Site Area
I	500 m²	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017		99.99

Maximum Height of Building

What are the onsite Local Environmental Plan Maximum Height of Buildings?

Symbol	Maximum Height of Building	LEP or SEPP	Published Date	Commenced Date	Currency Date	Amendment	Percentage of Site Area
9	8.50 m	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017		99.9

Floor Space Ratio

What are the onsite Local Environmental Plan Floor Space Ratios?

Symbol	Floor Space Ratio	LEP or SEPP	Published Date	Commenced Date	Currency Date	Amendment	Percentage of Site Area
No Data							

Land Application

What are the onsite Local Environmental Plan Land Applications?

Application Type	LEP or SEPP	Published Date	Commenced Date	Currency Date	Amendment	Percentage of Site Area
Included	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	11/10/2013		100

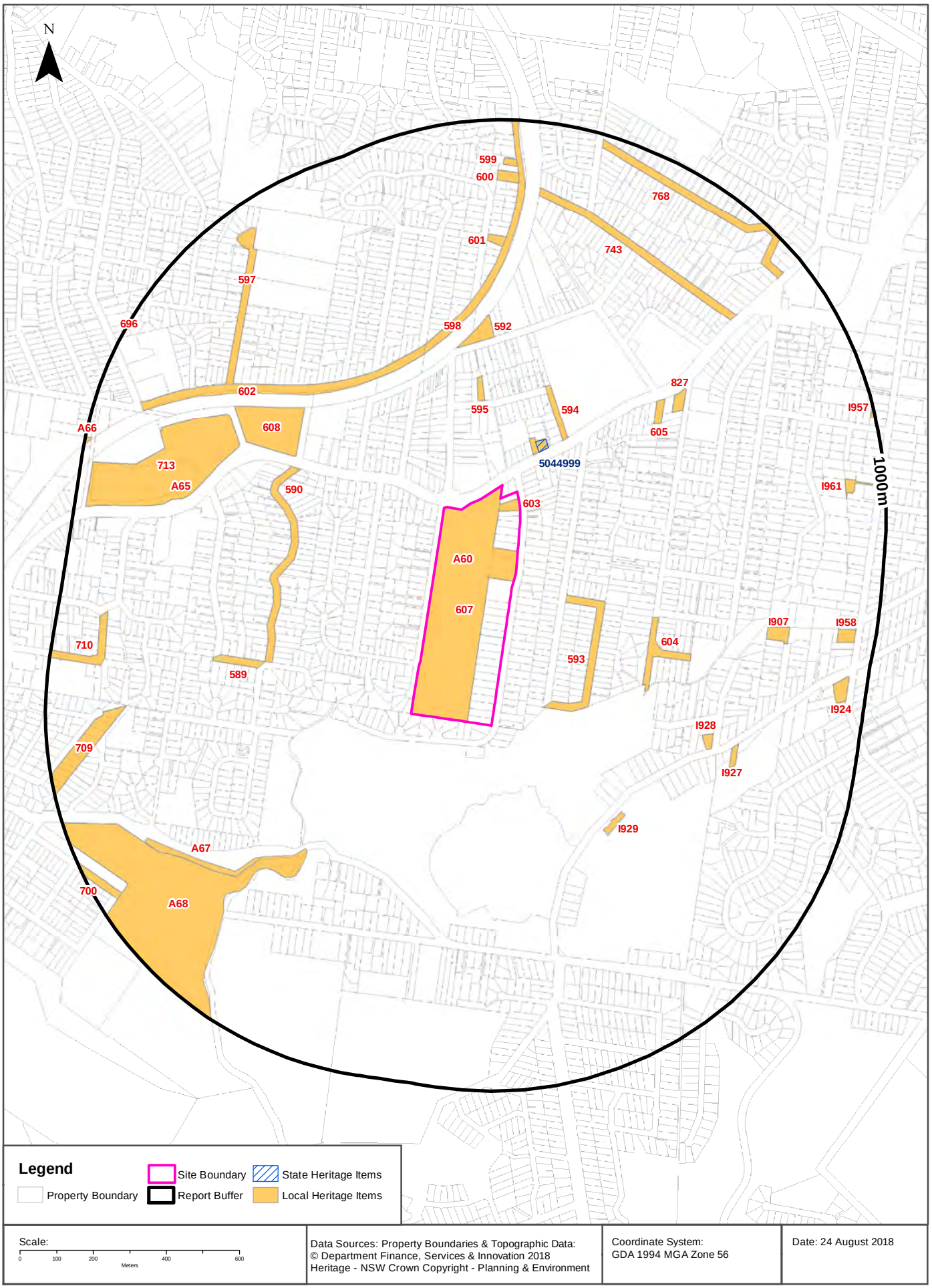
Land Reservation Acquisition

What are the onsite Local Environmental Plan Land Reservation Acquisitions?

Reservation	LEP	Published Date	Commenced Date	Currency Date	Amendment	Comments	Percentage of Site Area
No Data							

Heritage Items

91-93 Pennant Hills Road, Normanhurst, NSW 2076



Heritage

91-93 Pennant Hills Road, Normanhurst, NSW 2076

State Heritage Items

What are the State Heritage Items located within the dataset buffer?

Map Id	Name	Address	LGA	Listing Date	Listing No	Plan No	Distance	Direction
5044999	Gilligaloola	82-84 Pennant Hills Road Normanhurst	Hornsby	02/04/1999	271	664	124m	North East

Local Heritage Items

What are the Local Heritage Items located within the dataset buffer?

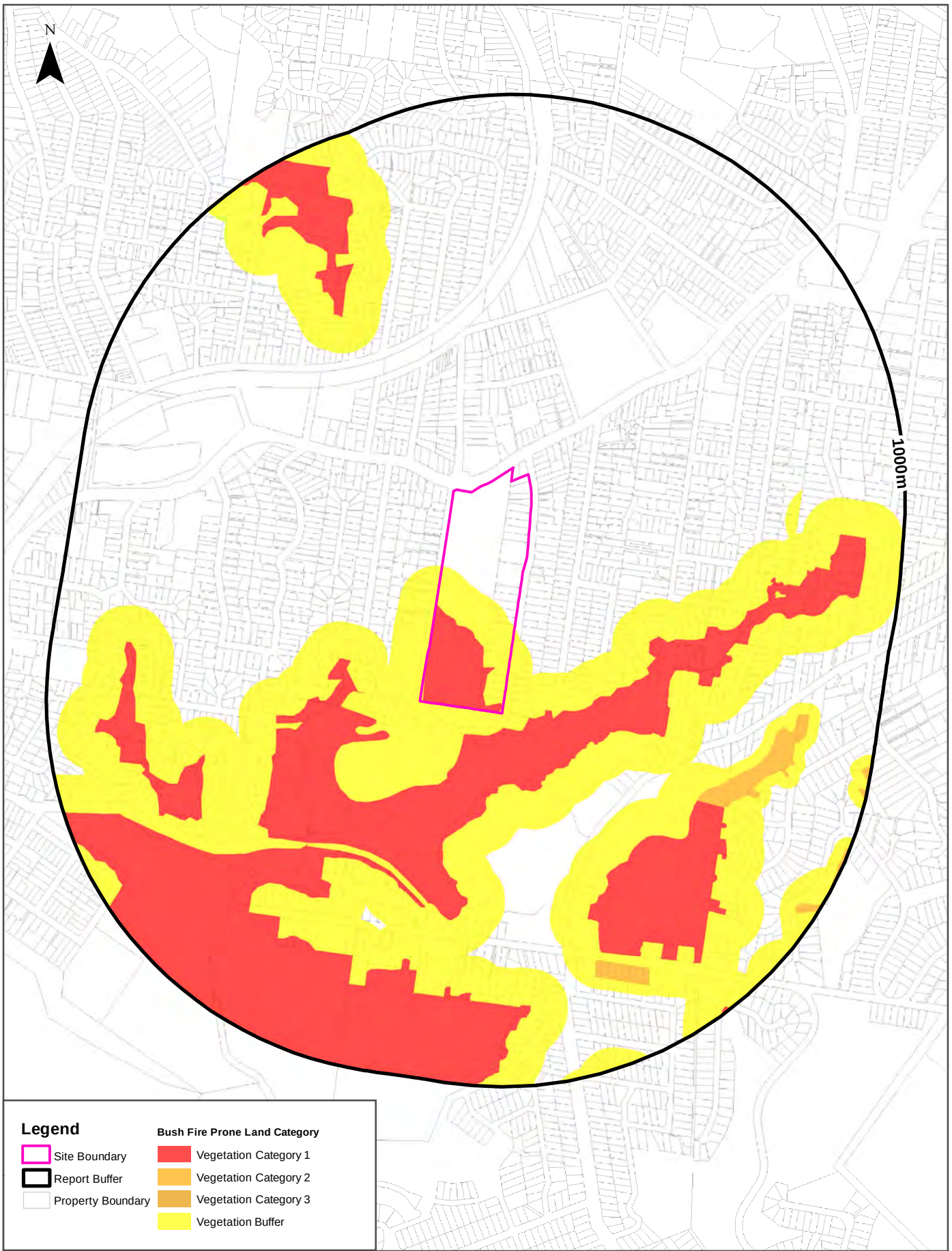
Map Id	Name	Classification	Significance	LEP or Act	Published Date	Commenced Date	Currency Date	Distance	Direction
607	Loretto Convent group,grounds, gates and cemetery	Item - General	Local	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017	0m	Onsite
603	House	Item - General	Local	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017	0m	Onsite
A60	Loretto Convent group,grounds, gates and cemetery	Item - Archaeological	Local	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017	0m	North
606	'Gilligaloola' and garden	Item - General	State	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017	109m	North East
593	Street trees	Item - Landscape	Local	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017	131m	East
594	Street trees	Item - Landscape	Local	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017	185m	North East
595	House	Item - General	Local	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017	238m	North
590	Street trees	Item - Landscape	Local	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017	378m	West
604	Roadside trees and bushland	Item - Landscape	Local	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017	392m	East
592	Davidson Park	Item - Landscape	Local	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017	394m	North
602	Roadside trees and bushland	Item - Landscape	Local	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017	399m	North West
589	Street trees	Item - Landscape	Local	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017	417m	West
605	House	Item - General	Local	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017	417m	North East
598	Street trees	Item - Landscape	Local	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017	417m	North

Map Id	Name	Classification	Significance	LEP or Act	Published Date	Commenced Date	Currency Date	Distance	Direction
I929	Administrative headquarters, Seventh Day Adventist Church	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018	417m	South East
I929	Hospital - Sanitarium	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	21/10/2016	21/10/2016	19/01/2018	417m	South East
608	Kenley Park and Hornsby Shire Historical Society drill hall	Item - General	Local	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017	429m	North West
A68	Pennant Hills Park,Lorna Pass within Thornleigh	Item - Archaeological	Local	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017	468m	South West
827	Chislehurst	Item - General	Local	Hornsby Local Environmental Plan 2013	19/09/2014	19/09/2014	29/09/2017	476m	North East
A67	1830s road remains	Item - Archaeological	Local	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017	562m	South West
I928	Dwelling house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	21/10/2016	21/10/2016	19/01/2018	574m	South East
713	Brickworks wall and bushland	Item - Landscape	Local	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017	586m	North West
601	House	Item - General	Local	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017	651m	North
I927	Dwelling house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018	659m	South East
597	Street trees	Item - Landscape	Local	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017	667m	North West
I907	Dwelling house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018	704m	East
A65	Brickworks wall and bushland	Item - Archaeological	Local	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017	719m	North West
743	Street trees	Item - Landscape	Local	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017	720m	North East
709	Trees	Item - Landscape	Local	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017	778m	West
600	House	Item - General	Local	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017	828m	North
710	Street trees	Item - Landscape	Local	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017	851m	West
599	House	Item - General	Local	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017	874m	North
I961	Dwelling house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	21/10/2016	21/10/2016	19/01/2018	891m	East
I958	Dwelling house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	19/01/2018	896m	East
I924	Dwelling house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	04/12/2015	04/12/2015	19/01/2018	908m	East
768	Street trees	Item - Landscape	Local	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017	914m	North East
700	Sandstone kerb and gutter	Item - Landscape	Local	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017	931m	South West
A66	Remains of maltworks	Item - Archaeological	Local	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017	983m	West

Map Id	Name	Classification	Significance	LEP or Act	Published Date	Commenced Date	Currency Date	Distance	Direction
I957	Dwelling House "Mansfield"	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	21/10/2016	21/10/2016	19/01/2018	986m	North East
696	House	Item - General	Local	Hornsby Local Environmental Plan 2013	27/09/2013	11/10/2013	29/09/2017	997m	North West

Natural Hazards - Bush Fire Prone Land

91-93 Pennant Hills Road, Normanhurst, NSW 2076



Data Sources: Bush Fire Prone Land: © NSW Rural Fire Service 2018. Property Boundaries: © Department Finance, Services & Innovation 2018

Coordinate System: GDA 1994 MGA Zone 56

Date: 24 August 2018

Natural Hazards

91-93 Pennant Hills Road, Normanhurst, NSW 2076

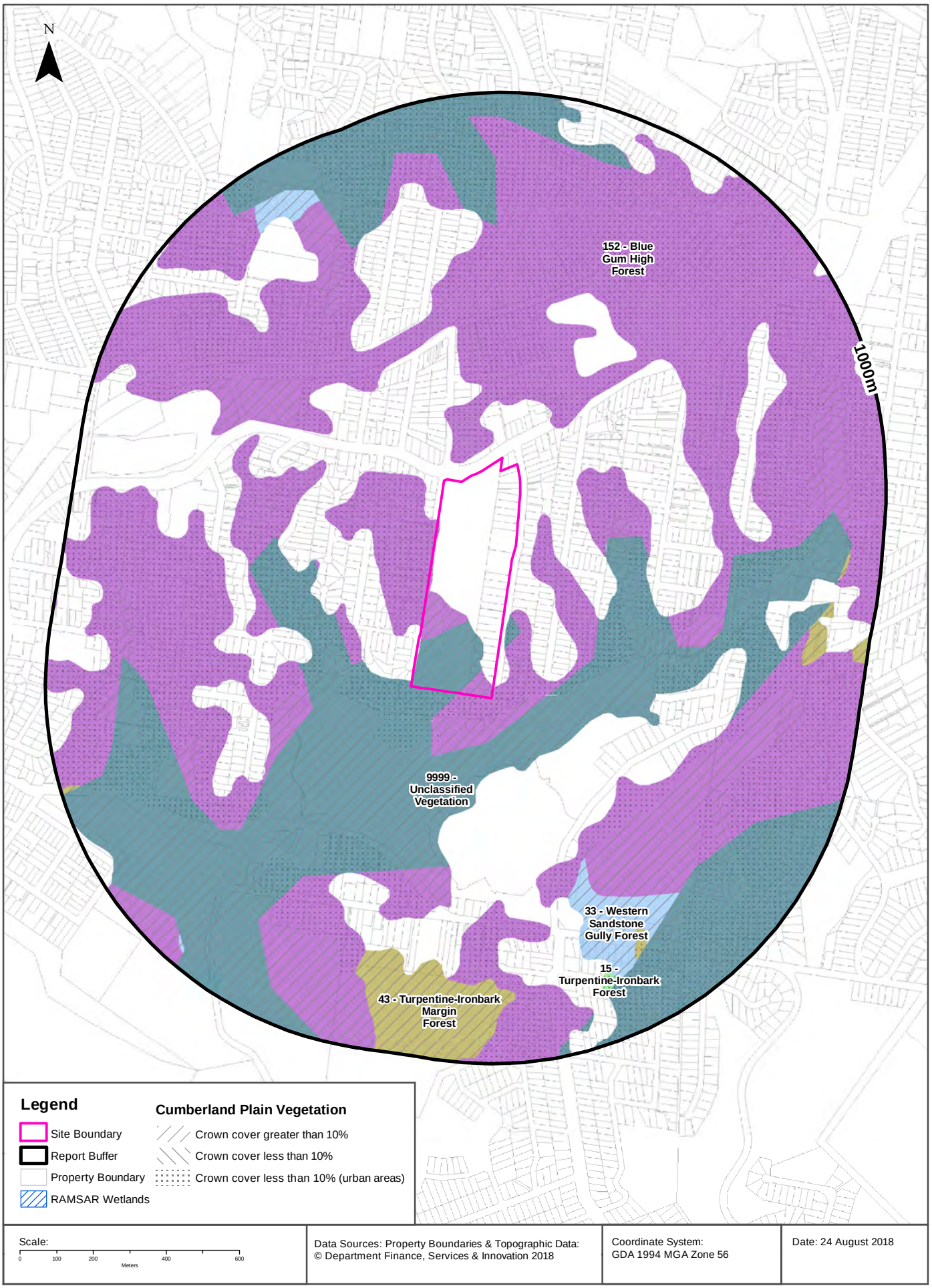
Bush Fire Prone Land

What are the nearest Bush Fire Prone Land Categories that exist within the dataset buffer?

Bush Fire Prone Land Category	Distance	Direction
Vegetation Buffer	0m	Onsite
Vegetation Category 1	0m	Onsite
Vegetation Category 2	570m	South East

Ecological Constraints - Remnant Vegetation of the Cumberland Plain

91-93 Pennant Hills Road, Normanhurst, NSW 2076



Ecological Constraints

91-93 Pennant Hills Road, Normanhurst, NSW 2076

Remnant Vegetation of the Cumberland Plain

What remnant vegetation of the Cumberland Plain exists within the dataset buffer?

Description	Crown Cover	Distance	Direction
152 - Blue Gum High Forest	Crown cover greater than 10%	0m	Onsite
9999 - Unclassified Vegetation	Crown cover greater than 10%	0m	Onsite
152 - Blue Gum High Forest	Crown cover less than 10% (urban areas)	0m	Onsite
9999 - Unclassified Vegetation	Crown cover less than 10% (urban areas)	0m	Onsite
33 - Western Sandstone Gully Forest	Crown cover greater than 10%	504m	South East
43 - Turpentine-Ironbark Margin Forest	Crown cover less than 10% (urban areas)	572m	East
43 - Turpentine-Ironbark Margin Forest	Crown cover greater than 10%	715m	South
15 - Turpentine-Ironbark Forest	Crown cover less than 10% (urban areas)	791m	South
33 - Western Sandstone Gully Forest	Crown cover less than 10% (urban areas)	828m	South East

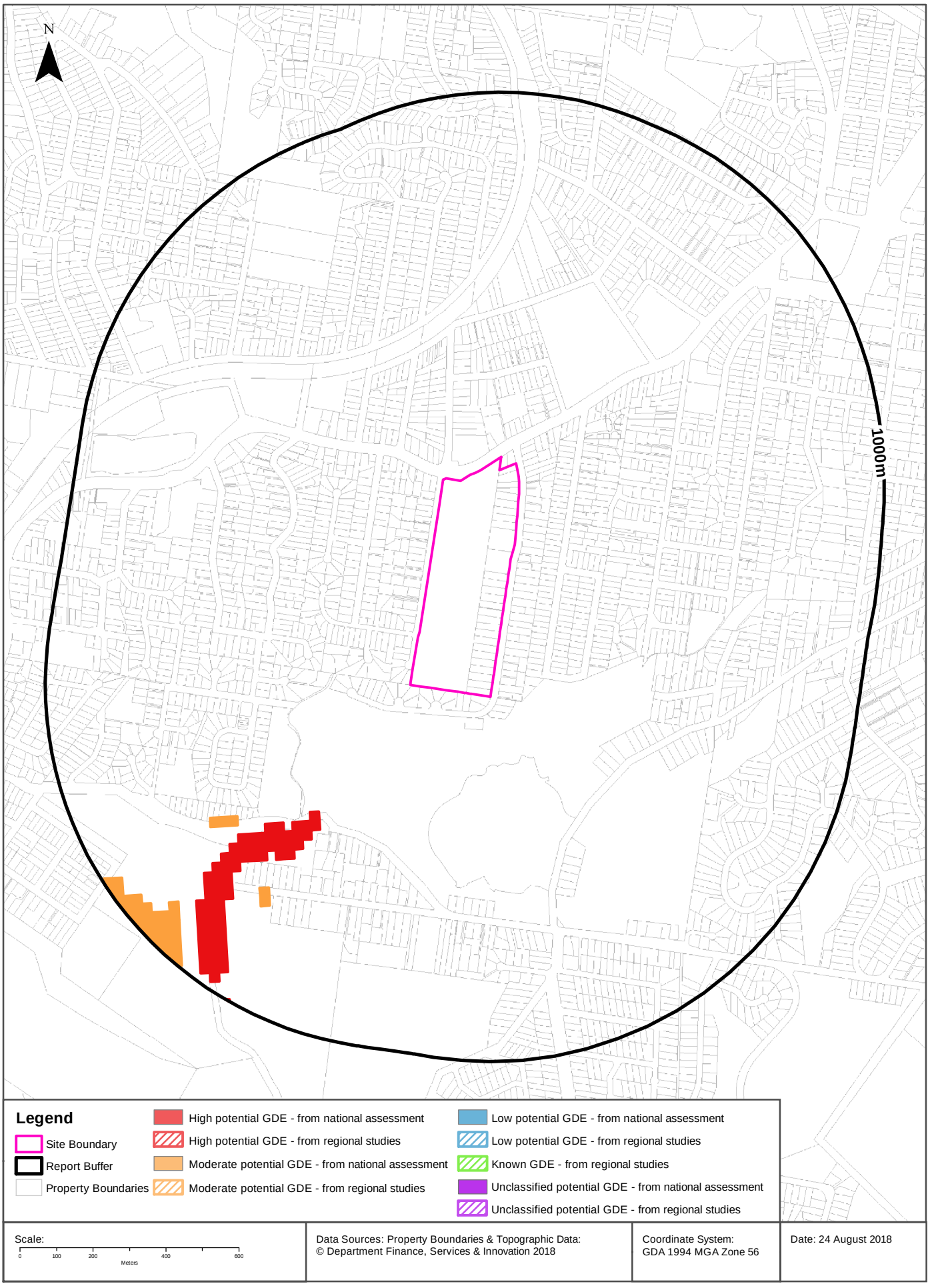
RAMSAR Wetlands

What RAMSAR Wetland areas exist within the dataset buffer?

Map Id	RAMSAR Name	Wetland Name	Designation Date	Source	Distance	Direction
N/A	No records in buffer					

Ecological Constraints - Groundwater Dependent Ecosystems Atlas

91-93 Pennant Hills Road, Normanhurst, NSW 2076



Ecological Constraints

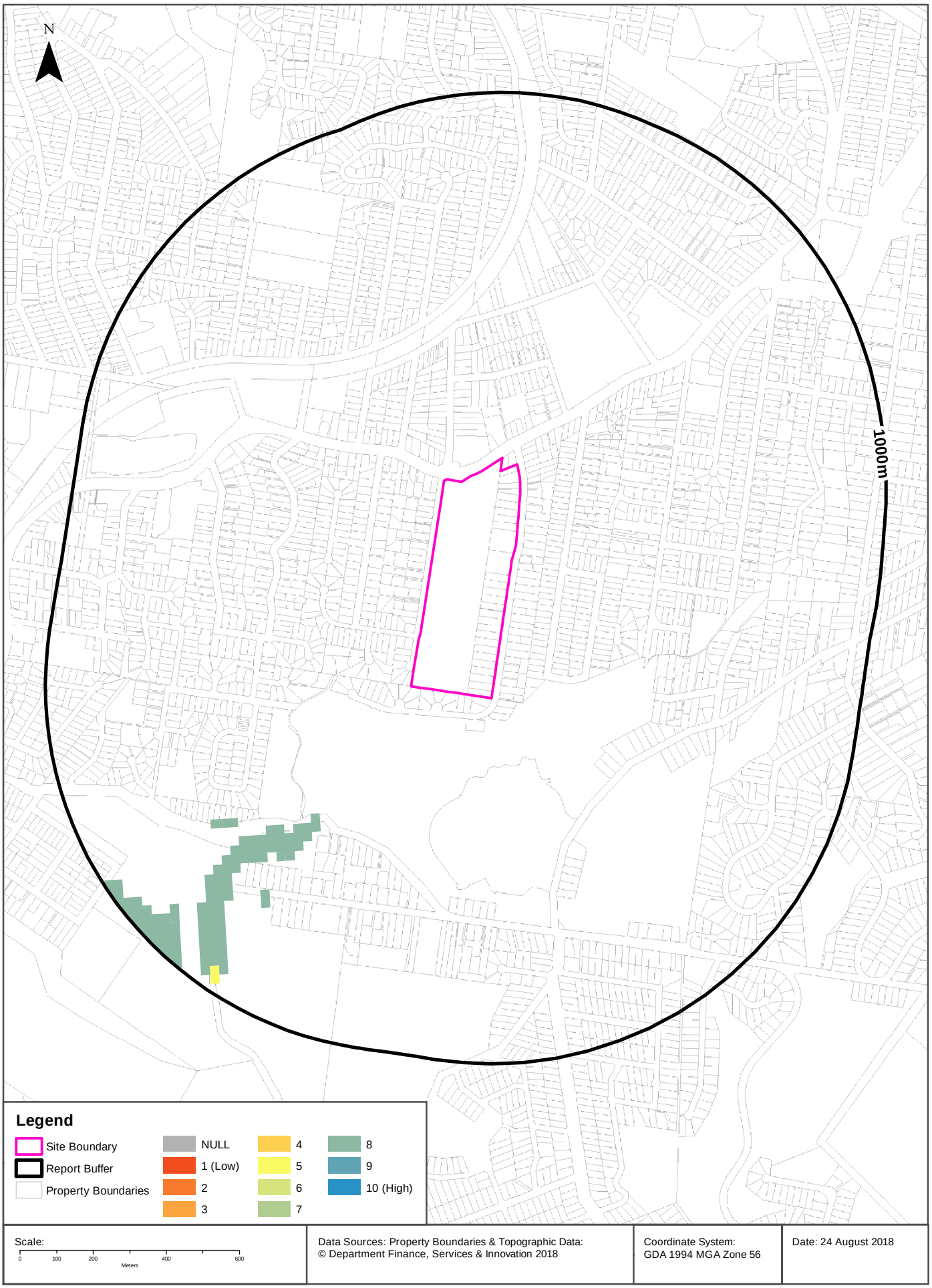
91-93 Pennant Hills Road, Normanhurst, NSW 2076

Groundwater Dependent Ecosystems Atlas

Type	GDE Potential	Geomorphology	Ecosystem Type	Aquifer Geology	Distance
Terrestrial	High potential GDE - from national assessment	Deeply dissected sandstone plateaus.	Vegetation	Consolidated sedimentary	427m
Terrestrial	Moderate potential GDE - from national assessment	Deeply dissected sandstone plateaus.	Vegetation	Consolidated sedimentary	594m

Ecological Constraints - Inflow Dependent Ecosystems Likelihood

91-93 Pennant Hills Road, Normanhurst, NSW 2076



Ecological Constraints

91-93 Pennant Hills Road, Normanhurst, NSW 2076

Inflow Dependent Ecosystems Likelihood

Type	IDE Likelihood	Geomorphology	Ecosystem Type	Aquifer Geology	Distance
Terrestrial	8	Deeply dissected sandstone plateaus.	Vegetation	Consolidated sedimentary	427m
Terrestrial	5	Deeply dissected sandstone plateaus.	Vegetation	Consolidated sedimentary	926m

Ecological Constraints

91-93 Pennant Hills Road, Normanhurst, NSW 2076

NSW BioNet Atlas

Species on the NSW BioNet Atlas that have a NSW or federal conservation status, a NSW sensitivity status, or are listed under a migratory species agreement, and are within 10km of the site?

Data does not include NSW category 1 sensitive species.

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Amphibia	Heleioporus australiacus	Giant Burrowing Frog	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Amphibia	Litoria aurea	Green and Golden Bell Frog	Endangered	Not Sensitive	Vulnerable	
Animalia	Amphibia	Pseudophryne australis	Red-crowned Toadlet	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Anthochaera phrygia	Regent Honeyeater	Critically Endangered	Not Sensitive	Critically Endangered	
Animalia	Aves	Apus pacificus	Fork-tailed Swift	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Ardea ibis	Cattle Egret	Not Listed	Not Sensitive	Not Listed	CAMBA;JAMBA
Animalia	Aves	Artamus cyanopterus cyanopterus	Dusky Woodswallow	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Botaurus poiciloptilus	Australasian Bittern	Endangered	Not Sensitive	Endangered	
Animalia	Aves	Calidris acuminata	Sharp-tailed Sandpiper	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Calidris ferruginea	Curlew Sandpiper	Endangered	Not Sensitive	Critically Endangered	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Callocephalon fimbriatum	Gang-gang Cockatoo	Endangered Population, Vulnerable	Category 3	Not Listed	
Animalia	Aves	Callocephalon fimbriatum	Gang-gang Cockatoo	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Calyptorhynchus lathami	Glossy Black-Cockatoo	Vulnerable	Category 2	Not Listed	
Animalia	Aves	Cecropis daurica	Red-rumped Swallow	Not Listed	Not Sensitive	Not Listed	ROKAMBA
Animalia	Aves	Daphoenositta chrysoptera	Varied Sittella	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Ephippiorhynchus asiaticus	Black-necked Stork	Endangered	Not Sensitive	Not Listed	
Animalia	Aves	Falco hypoleucos	Grey Falcon	Endangered	Category 2	Not Listed	
Animalia	Aves	Glossopsitta pusilla	Little Lorikeet	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Haematopus fuliginosus	Sooty Oystercatcher	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Haematopus longirostris	Pied Oystercatcher	Endangered	Not Sensitive	Not Listed	
Animalia	Aves	Haliaeetus leucogaster	White-bellied Sea-Eagle	Vulnerable	Not Sensitive	Not Listed	CAMBA
Animalia	Aves	Hieraaetus morphnoides	Little Eagle	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Hirundapus caudacutus	White-throated Needletail	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Ixobrychus flavicollis	Black Bittern	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Lathamus discolor	Swift Parrot	Endangered	Category 3	Critically Endangered	
Animalia	Aves	Limicola falcinellus	Broad-billed Sandpiper	Vulnerable	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Lophoictinia isura	Square-tailed Kite	Vulnerable	Category 3	Not Listed	

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Aves	Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Merops ornatus	Rainbow Bee-eater	Not Listed	Not Sensitive	Not Listed	JAMBA
Animalia	Aves	Nettapus coromandelianus	Cotton Pygmy-Goose	Endangered	Not Sensitive	Not Listed	
Animalia	Aves	Ninox connivens	Barking Owl	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Ninox strenua	Powerful Owl	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Numenius minutus	Little Curlew	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Pachycephala olivacea	Olive Whistler	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Pandion cristatus	Eastern Osprey	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Petroica boodang	Scarlet Robin	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Petroica phoenicea	Flame Robin	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Petroica rodinogaster	Pink Robin	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Polytelis swainsonii	Superb Parrot	Vulnerable	Category 3	Vulnerable	
Animalia	Aves	Ptilinopus superbus	Superb Fruit-Dove	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Stagonopleura guttata	Diamond Firetail	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Tyto novaehollandiae	Masked Owl	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Tyto tenebricosa	Sooty Owl	Vulnerable	Category 3	Not Listed	
Animalia	Gastropoda	Pommerhelix duralensis	Dural Woodland Snail	Endangered	Not Sensitive	Endangered	
Animalia	Mammalia	Cercartetus nanus	Eastern Pygmy-possum	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Chalinolobus dwyeri	Large-eared Pied Bat	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Mammalia	Dasyurus maculatus	Spotted-tailed Quoll	Vulnerable	Not Sensitive	Endangered	
Animalia	Mammalia	Falsistrellus tasmaniensis	Eastern False Pipistrelle	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Isoodon obesulus obesulus	Southern Brown Bandicoot (eastern)	Endangered	Not Sensitive	Endangered	
Animalia	Mammalia	Miniopterus australis	Little Bentwing-bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Mormopterus norfolkensis	Eastern Freetail-bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Myotis macropus	Southern Myotis	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Petauroides volans	Greater Glider	Not Listed	Not Sensitive	Vulnerable	
Animalia	Mammalia	Petaurus australis	Yellow-bellied Glider	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Phascolarctos cinereus	Koala	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Mammalia	Pseudomys gracilicaudatus	Eastern Chestnut Mouse	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Pseudomys novaehollandiae	New Holland Mouse	Not Listed	Not Sensitive	Vulnerable	
Animalia	Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Mammalia	Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	Vulnerable	Not Sensitive	Not Listed	

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Mammalia	Scoteanax rueppellii	Greater Broad-nosed Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Reptilia	Dermochelys coriacea	Leatherback Turtle	Endangered	Not Sensitive	Endangered	
Animalia	Reptilia	Myuchelys bellii	Bell's Turtle, Western Sawshelled Turtle	Endangered	Not Sensitive	Vulnerable	
Animalia	Reptilia	Varanus rosenbergi	Rosenberg's Goanna	Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Acacia bynoeana	Bynoe's Wattle	Endangered	Not Sensitive	Vulnerable	
Plantae	Flora	Acacia cluniesrossiae	Kanangra Wattle	Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Acacia gordonii		Endangered	Not Sensitive	Endangered	
Plantae	Flora	Acacia pubescens	Downy Wattle	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Argyrotegium nitidulum	Shining Cudweed	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Callistemon linearifolius	Netted Bottle Brush	Vulnerable	Category 3	Not Listed	
Plantae	Flora	Cryptostylis hunteriana	Leafless Tongue Orchid	Vulnerable	Category 2	Vulnerable	
Plantae	Flora	Darwinia biflora		Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Darwinia peduncularis		Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Deyeuxia appressa		Endangered	Not Sensitive	Endangered	
Plantae	Flora	Epacris purpurascens subsp. purpurascens		Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Epacris purpurascens var. purpurascens		Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Eucalyptus camfieldii	Camfield's Stringybark	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Eucalyptus leucoxylon subsp. pruinosa	Yellow Gum	Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Eucalyptus nicholii	Narrow-leaved Black Peppermint	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Eucalyptus scoparia	Wallangarra White Gum	Endangered	Not Sensitive	Vulnerable	
Plantae	Flora	Galium australe	Tangled Bedstraw	Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Genoplesium baueri	Bauer's Midge Orchid	Endangered	Category 2	Endangered	
Plantae	Flora	Genoplesium plumosum	Tallong Midge Orchid	Critically Endangered	Category 2	Endangered	
Plantae	Flora	Grammitis stenophylla	Narrow-leaf Finger Fern	Endangered	Category 3	Not Listed	
Plantae	Flora	Grevillea caleyi	Caley's Grevillea	Critically Endangered	Category 3	Critically Endangered	
Plantae	Flora	Grevillea hilliana	White Yiel Yiel	Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Grevillea juniperina subsp. juniperina	Juniper-leaved Grevillea	Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Grevillea parviflora subsp. parviflora	Small-flower Grevillea	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Haloragodendron lucasii		Endangered	Not Sensitive	Endangered	
Plantae	Flora	Hibbertia spanantha	Julian's Hibbertia	Critically Endangered	Category 2	Critically Endangered	
Plantae	Flora	Hibbertia superans		Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Isotoma fluviatilis subsp. fluviatilis		Not Listed	Not Sensitive	Extinct	

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Plantae	Flora	Kunzea rupestris		Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Lasiopetalum joyceae		Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Leptospermum deanei		Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Macadamia integrifolia	Macadamia Nut	Not Listed	Not Sensitive	Vulnerable	
Plantae	Flora	Macadamia tetraphylla	Rough-shelled Bush Nut	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Melaleuca biconvexa	Biconvex Paperbark	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Melaleuca deanei	Deane's Paperbark	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Persoonia hirsuta	Hairy Geebung	Endangered	Category 3	Endangered	
Plantae	Flora	Persoonia mollis subsp. maxima		Endangered	Not Sensitive	Endangered	
Plantae	Flora	Persoonia nutans	Nodding Geebung	Endangered	Not Sensitive	Endangered	
Plantae	Flora	Persoonia pauciflora	North Rothbury Persoonia	Critically Endangered	Category 3	Critically Endangered	
Plantae	Flora	Pimelea curviflora subsp. curviflora		Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Pimelea curviflora var. curviflora		Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Pomaderris prunifolia	Plum-leaf Pomaderris	Endangered Population	Not Sensitive	Not Listed	
Plantae	Flora	Prostanthera marifolia	Seaforth Mintbush	Critically Endangered	Category 3	Critically Endangered	
Plantae	Flora	Pterostylis nigricans	Dark Greenhood	Vulnerable	Category 2	Not Listed	
Plantae	Flora	Senecio behrianus		Presumed Extinct	Not Sensitive	Endangered	
Plantae	Flora	Syzygium paniculatum	Magenta Lilly Pilly	Endangered	Not Sensitive	Vulnerable	
Plantae	Flora	Tetratheca glandulosa		Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Tetratheca juncea	Black-eyed Susan	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Wilsonia backhousei	Narrow-leafed Wilsonia	Vulnerable	Not Sensitive	Not Listed	

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Land Title Records

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Email: search@alsearchers.com.au

27th August 2018

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

Attention: Harley Wang,

RE: **91 – 93 Pennant Hills Road,**
Normanhurst
Reference E31772KL

Note 1:	**Lot 1**	**DP 1218765**	(page 1)
Note 2:	**Lot 16**	**DP 6612**	(page 3)

Note 1:

Current Search

Folio Identifier Auto Consol 4570-1 (title attached)
Lot 1 DP 1218765 & Lot B DP 327538 (plan attached)
Dated 24th August 2018
Registered Proprietor:
TRUSTEES OF THE LORETO PROPERTY ASSOCIATION

Title Tree
Lot 1 DP 1218765 & Lot B DP 327538

Folio Identifier Auto Consol 4570-1

Certificate of Title Volume 4570 Folio 1

Certificate of Title Volume 3978 Folio 214

Certificate of Title Volume 1760 Folio 29

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Summary of proprietor(s)
Lot 1 DP 1218765 & Lot B DP 327538

Year	**Proprietor(s)**
	(Lot 1 DP 1218765 & Lot B DP 327538 – A/C 4570-1)
2016 – todate	Trustees of the Loreto Property Association
	(Lot 11 DP 6612 & Lot B DP 327538 – Area 2 Roods 2 ¼ Perches – CTVol 4570 Fol 1)
1986 – 2016	Trustees of the Loreto Property Association
1933 – 1986	The Loreto Property Association
	(Lot 11 DP 6612 – Area 1 Rood 10 ¼ Perches – CTVol 3978 Fol 214)
1927 – 1933	Mary O'Sullivan, spinster & teacher Rose Strange, spinster & teacher Mary Walker, spinster & teacher Marion Ochiltree, spinster & teacher Christina Fagan, spinster & teacher
	(Part Portion 28 Parish South Colah – Area 27 Acres 34 ¾ Perches – CTVol 1760 Fol 29)
1907 – 1927	William Mutch, builder

****

Note 2:

Current Search

Folio Identifier 16/6612 (title attached)
DP 6612 (plan attached)
Dated 24th August 2018
Registered Proprietor:
TRUSTEES OF THE LORETO PROPERTY ASSOCIATION

Title Tree
Lot 16 DP 6612

Folio Identifier 16/6612

Certificate of Title Volume 2340 Folio 153

Certificate of Title Volume 1760 Folio 29

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Summary of proprietor(s)
Lot 16 DP 6612

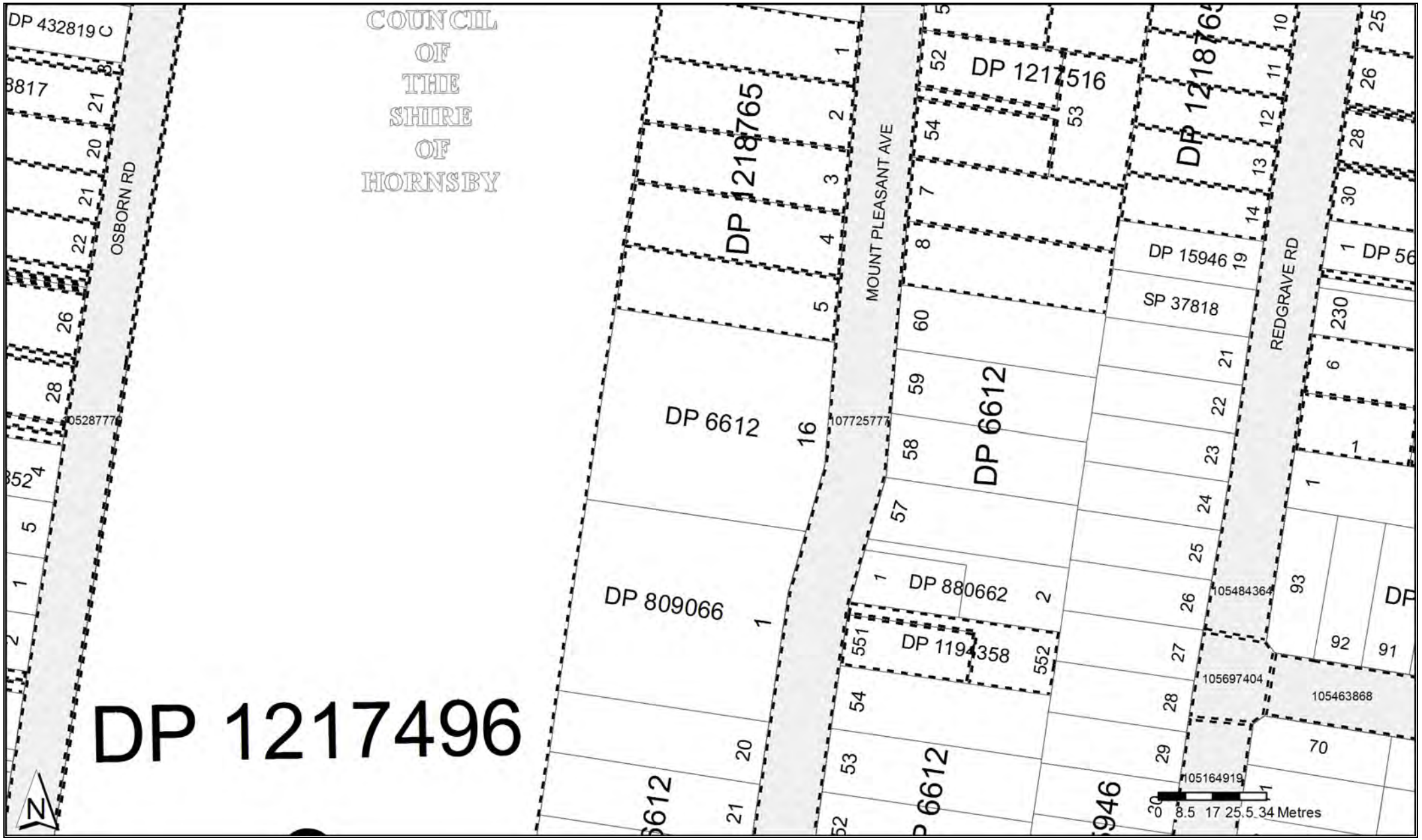
Year	Proprietor(s)
	(Lot 16 DP 6612)
1988 – todate	Trustees of the Loreto Property Association
	(Lot 16 DP 6612 – Area 1 Acre 8 Perches – CTVol 2340 Fol 153)
1986 – 1988	Trustees of the Loreto Property Association
1933 – 1986	The Loreto Property Association
1933 – 1933	Catherine Mary Frizelle Catherine Felkins Annie Fallon Christina Fagan
1920 – 1933	Catherine Mary Frizelle Catherine Felkins Annie Fallon Christina Fagan Barbara Mulhall
1913 – 1920	Arthur James Hethersett Marshall, wool expert
	(Part Portion 28 Parish South Colah – Area 27 Acres 34 ¾ Perches – CTVol 1760 Fol 29)
1907 – 1913	William Mutch, builder

****

Cadastral Records Enquiry Report : Lot 16 DP 6612

Ref : NOUSER

Locality : NORMANHURST
Parish : SOUTH COLAH
LGA : HORNSBY
County : CUMBERLAND



This information is provided as a searching aid only.Whilst every endeavour is made to ensure that current map, plan and titling information is accurately reflected, the Registrar General cannot guarantee the information provided. For ALL ACTIVITY PRIOR TO SEPTEMBER 2002 you must refer to the RGs Charting and Reference Maps

	Status	Surv/Comp	Purpose
DP215946			
Lot(s): 3			
DP1022684	REGISTERED	SURVEY	EASEMENT
DP1048817	REGISTERED	SURVEY	SUBDIVISION
DP1104120	REGISTERED	SURVEY	SUBDIVISION
DP262038			
Lot(s): 8			
DP1104120	REGISTERED	SURVEY	SUBDIVISION
DP519954			
Lot(s): 1			
DP1234655	PRE-ALLOCATED	UNAVAILABLE	SUBDIVISION
DP563529			
Lot(s): 2			
DP1211909	REGISTERED	COMPILATION	ROADS ACT, 1993
DP1048817			
Lot(s): 21			
DP215946	HISTORICAL	SURVEY	SUBDIVISION
DP1104120	REGISTERED	SURVEY	SUBDIVISION
DP1111962			
Lot(s): 1, 2, 6			
DP16368	HISTORICAL	SURVEY	UNRESEARCHED
DP1169079			
Lot(s): 52			
DP28463	HISTORICAL	SURVEY	UNRESEARCHED
DP1194358			
Lot(s): 551, 552			
DP6612	HISTORICAL	COMPILATION	UNRESEARCHED
DP1211909			
Lot(s): 27, 28			
DP863934	HISTORICAL	SURVEY	SUBDIVISION
Lot(s): 29, 30			
DP863933	HISTORICAL	SURVEY	SUBDIVISION
Lot(s): 31			
DP563529	HISTORICAL	SURVEY	SUBDIVISION
NSW GAZ. 18-12-2015 Folio : 4091 ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993 LOTS 48 AND 65 DP1211909			
Lot(s): 25, 26			
DP242447	HISTORICAL	SURVEY	SUBDIVISION
Lot(s): 25			
NSW GAZ. 18-12-2015 Folio : 4091 ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993 LOTS 42 AND 59 DP1211909			
Lot(s): 26			
NSW GAZ. 18-12-2015 Folio : 4091 ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993 LOTS 43 AND 60 DP1211909			
Lot(s): 28			
NSW GAZ. 18-12-2015 Folio : 4091 ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993 LOTS 45 AND 62 DP1211909			
Lot(s): 27			
NSW GAZ. 18-12-2015 Folio : 4091 ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993 LOTS 44 AND 61 DP1211909			
Lot(s): 30			
NSW GAZ. 18-12-2015 Folio : 4091 ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993 LOTS 47 AND 64 DP1211909			

	Status	Surv/Comp	Purpose
Lot(s): 29			
NSW GAZ. 18-12-2015 Folio : 4091 ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993 LOTS 46 AND 63 DP1211909			
DP1217496			
Lot(s): 3			
DP734965	HISTORICAL	SURVEY	OLD SYSTEM CONVERSION
NSW GAZ. 26-08-2016 Folio : 2301 ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993 LOTS 6 AND 9 DP1217496 (STRATUM REQUIRED FOR ROAD PURPOSES) SEE AK780181			
DP1217516			
Lot(s): 52, 53, 54			
DP731152	HISTORICAL	SURVEY	SUBDIVISION
Lot(s): 50, 51			
DP566425	HISTORICAL	SURVEY	SUBDIVISION
Lot(s): 54			
NSW GAZ. 26-08-2016 Folio : 2301 ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993 LOTS 59 AND 64 DP1217516 (STRATUM REQUIRED FOR ROAD PURPOSES) SEE AK780181			
Lot(s): 53			
NSW GAZ. 26-08-2016 Folio : 2301 ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993 LOTS 58 AND 63 DP1217516 (STRATUM REQUIRED FOR ROAD PURPOSES) SEE AK780181			
Lot(s): 52			
NSW GAZ. 26-08-2016 Folio : 2301 ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993 LOTS 57 AND 62 DP1217516 (STRATUM REQUIRED FOR ROAD PURPOSES) SEE AK780181			
Lot(s): 51			
NSW GAZ. 26-08-2016 Folio : 2301 ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993 LOTS 56 AND 61 DP1217516 (STRATUM REQUIRED FOR ROAD PURPOSES) SEE AK780181			
Lot(s): 50			
NSW GAZ. 26-08-2016 Folio : 2301 ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993 LOTS 55 AND 60 DP1217516 (STRATUM REQUIRED FOR ROAD PURPOSES) SEE AK780181			
DP1218765			
Lot(s): 10, 11, 12, 13, 14			
DP15946	HISTORICAL	SURVEY	UNRESEARCHED
Lot(s): 1, 2, 3, 4, 5, 7, 8			
DP6612	HISTORICAL	COMPILATION	UNRESEARCHED
Lot(s): 5			
NSW GAZ. 26-08-2016 Folio : 2301 ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993 LOTS 19 AND 33 DP1218765 (STRATUM REQUIRED FOR ROAD PURPOSES) SEE AK780181			
Lot(s): 4			
NSW GAZ. 26-08-2016 Folio : 2301 ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993 LOTS 18 AND 32 DP1218765 (STRATUM REQUIRED FOR ROAD PURPOSES) SEE AK780181			
Lot(s): 3			
NSW GAZ. 26-08-2016 Folio : 2301 ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993 LOTS 17 AND 31 DP1218765 (STRATUM REQUIRED FOR ROAD PURPOSES) SEE AK780181			
Lot(s): 2			
NSW GAZ. 26-08-2016 Folio : 2301 ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993 LOTS 16 AND 30 DP1218765 (STRATUM REQUIRED FOR ROAD PURPOSES) SEE AK780181			
Lot(s): 1			
NSW GAZ. 26-08-2016 Folio : 2301 ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993 LOTS 15 AND 29 DP1218765 (STRATUM REQUIRED FOR ROAD PURPOSES) SEE AK780181			

	Status	Surv/Comp	Purpose
Lot(s): 8			
NSW GAZ.	26-08-2016		Folio : 2301
ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993 LOTS 22 AND 36 DP1218765 (STRATUM REQUIRED FOR ROAD PURPOSES) SEE AK780181			
Lot(s): 7			
NSW GAZ.	26-08-2016		Folio : 2301
ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993 LOTS 21 AND 35 DP1218765 (STRATUM REQUIRED FOR ROAD PURPOSES) SEE AK780181			
Lot(s): 10			
NSW GAZ.	26-08-2016		Folio : 2301
ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993 LOTS 24 AND 38 DP1218765 (STRATUM REQUIRED FOR ROAD PURPOSES) SEE AK780181			
Lot(s): 11			
NSW GAZ.	26-08-2016		Folio : 2301
ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993 LOTS 25 AND 39 DP1218765 (STRATUM REQUIRED FOR ROAD PURPOSES) SEE AK780181			
Lot(s): 12			
NSW GAZ.	26-08-2016		Folio : 2304
ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993 LOTS 26 AND 40 DP1218765 (STRATUM REQUIRED FOR ROAD PURPOSES) SEE AK780181			
Lot(s): 13			
NSW GAZ.	26-08-2016		Folio : 2301
ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993 LOTS 27 AND 41 DP1218765 (STRATUM REQUIRED FOR ROAD PURPOSES) SEE AK780181			
Lot(s): 14			
NSW GAZ.	26-08-2016		Folio : 2301
ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993 LOTS 28 AND 42 DP1218765 (STRATUM REQUIRED FOR ROAD PURPOSES) SEE AK780181			
DP1218788			
Lot(s): 30			
DP1120186	HISTORICAL	SURVEY	SUBDIVISION
NSW GAZ.	26-08-2016		Folio : 2301
ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993 LOTS 41 AND 52 DP1218788 (STRATUM REQUIRED FOR ROAD PURPOSES) SEE AK780181			
Lot(s): 29, 30			
DP1115010	HISTORICAL	SURVEY	SUBDIVISION
Lot(s): 26, 27			
DP579913	HISTORICAL	COMPILATION	SUBDIVISION
Lot(s): 24, 25			
DP549485	HISTORICAL	SURVEY	SUBDIVISION
Lot(s): 23			
DP414195	HISTORICAL	SURVEY	UNRESEARCHED
NSW GAZ.	26-08-2016		Folio : 2301
ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993 LOTS 34 AND 45 DP1218788 (STRATUM REQUIRED FOR ROAD PURPOSES) SEE AK780181			
Lot(s): 21, 22			
DP365331	HISTORICAL	COMPILATION	UNRESEARCHED
Lot(s): 20			
DP215946	HISTORICAL	SURVEY	SUBDIVISION
NSW GAZ.	26-08-2016		Folio : 2301
ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993 LOTS 31 AND 42 DP1218788 (STRATUM REQUIRED FOR ROAD PURPOSES) SEE AK780181			
Lot(s): 28, 29, 30			
DP201852	HISTORICAL	SURVEY	SUBDIVISION
Lot(s): 29			
NSW GAZ.	26-08-2016		Folio : 2301
ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993 LOTS 40 AND 51 DP1218788 (STRATUM REQUIRED FOR ROAD PURPOSES) SEE AK780181			
Lot(s): 28			
NSW GAZ.	26-08-2016		Folio : 2301
ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993 LOTS 39 AND 50 DP1218788 (STRATUM REQUIRED FOR ROAD PURPOSES) SEE AK780181			

	Status	Surv/Comp	Purpose

Lot(s): 24

NSW GAZ. 26-08-2016 Folio : 2301
ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993
LOTS 35 AND 46 DP1218788 (STRATUM REQUIRED FOR ROAD PURPOSES) SEE AK780181

Lot(s): 25

NSW GAZ. 26-08-2016 Folio : 2301
ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993
LOTS 36 AND 47 DP1218788 (STRATUM REQUIRED FOR ROAD PURPOSES) SEE AK780181

Lot(s): 27

NSW GAZ. 26-08-2016 Folio : 2301
ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993
LOTS 38 AND 49 DP1218788 (STRATUM REQUIRED FOR ROAD PURPOSES) SEE AK780181

Lot(s): 26

NSW GAZ. 26-08-2016 Folio : 2301
ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993
LOTS 37 AND 48 DP1218788 (STRATUM REQUIRED FOR ROAD PURPOSES) SEE AK780181

Lot(s): 22

NSW GAZ. 26-08-2016 Folio : 2301
ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993
LOTS 33 AND 44 DP1218788 (STRATUM REQUIRED FOR ROAD PURPOSES) SEE AK780181

Lot(s): 21

NSW GAZ. 26-08-2016 Folio : 2301
ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993
LOTS 32 AND 43 DP1218788 (STRATUM REQUIRED FOR ROAD PURPOSES) SEE AK780181

Road

Polygon Id(s): 105287779

NSW GAZ. 15-07-2016 Folio : 2001
ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993
LOTS 5-10 DP1217496 (STRATUM LOTS)

PA83350 - LOTS 5 AND 10 DP1217496

NSW GAZ. 09-03-2018 Folio : 1465
ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993
LOTS 4 AND 7 DP1217496 (STRATUM LOTS)

PA83428 - PENDING

Polygon Id(s): 105484364

NSW GAZ. 09-03-2018 Folio : 1465
ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993
LOTS 37 AND 54 DP1211909 (STRATUM LOTS)

Polygon Id(s): 107725777

DP1218765 REGISTERED COMPILATION ROADS ACT, 1993

NSW GAZ. 09-03-2018 Folio : 1465
ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993
LOTS 20 AND 34 DP1218765 (STRATUM LOTS)

Polygon Id(s): 105164919, 105697404, 107725777

EX-SUR 70/11 DP939826

Polygon Id(s): 105164919, 105463868, 105484364, 105697404

EX-SUR 29/10 DP983393

Plan	Surv/Comp	Purpose
DP6612	COMPILATION	UNRESEARCHED
DP15946	SURVEY	UNRESEARCHED
DP28463	SURVEY	UNRESEARCHED
DP201852	SURVEY	SUBDIVISION
DP215946	SURVEY	SUBDIVISION
DP262038	SURVEY	RESUMPTION OR ACQUISITION
DP327538	COMPILATION	UNRESEARCHED
DP432819	COMPILATION	UNRESEARCHED
DP519954	COMPILATION	SUBDIVISION
DP541189	SURVEY	SUBDIVISION
DP563529	SURVEY	SUBDIVISION
DP593033	COMPILATION	SUBDIVISION
DP629202	SURVEY	SUBDIVISION
DP809066	SURVEY	CONSOLIDATION
DP880662	SURVEY	SUBDIVISION
DP1048817	SURVEY	SUBDIVISION
DP1111962	SURVEY	SUBDIVISION
DP1169079	SURVEY	SUBDIVISION
DP1169079	UNRESEARCHED	SUBDIVISION
DP1194358	SURVEY	SUBDIVISION
DP1194358	UNRESEARCHED	SUBDIVISION
SP37818	COMPILATION	STRATA PLAN

6612

DP6612 E

JAD

S. HORNSBY

For check survey see Plan catd. E.S. 12/25

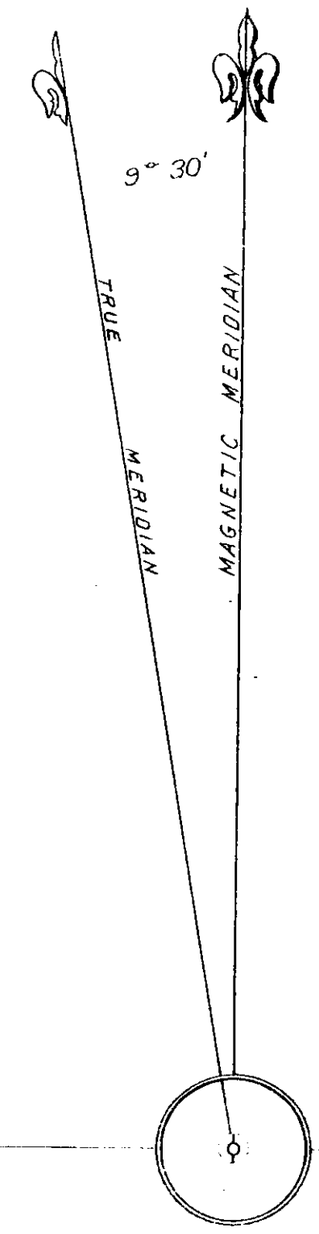
PLAN

Showing Subdivision of land in Appn 14432

HORNSBY SHIRE

Parish of South Colah . County of Cumberland

Scale 80 Ft to an Inch



CONVERSION TABLE ADDED IN REGISTRAR GENERAL'S DEPARTMENT

DP 6612

FEET	INCHES	METRES
2	-	0.61
4	-	1.22
4	6 1/4	1.38
4	6 3/4	1.39
9		2.665
19	4	5.495
21	-	6.4
21	9 3/8	6.64
24	9	7.545
25	3	7.695
26	2	7.975
31	10 1/4	9.71
34	1 3/4	10.41
40	4	12.295
44	1	13.435
52	6	16
57	3	17.45
61	3 1/2	18.68
61	5 1/2	18.73
61	5 3/4	18.74
64	0 1/2	19.52
64	10 3/4	19.78
65	10 1/2	20.08
65	11 3/4	20.11
66	-	20.115
66	1 3/4	20.16
66	7 1/2	20.305
67	11	20.7
68	9	20.955
69	5 1/2	21.17
70	-	21.335
71	1 3/4	21.685
72	-	21.945
75	5	22.985
78	5	23.9
79	6 3/4	24.25
83	5	25.425
91	3	27.815
100	-	30.48
106	7 1/4	32.495
110	-	33.53
127	1 1/4	38.74
175	-	53.34
178	7 1/4	54.44
194	4 1/4	59.24
198	-	60.35
198	5 1/2	60.49
200	-	60.96
202	2 1/4	61.63
205	8 1/4	62.69
206	7	62.97
207	4 1/2	63.21
207	8	63.3
210	0 1/4	64.01
211	-	64.31
212	5 3/4	64.76
214	4 1/4	65.34
214	10	65.48
215	0 1/4	65.54
215	4 1/2	65.65
215	5	65.66
215	8 1/2	65.75
215	10 1/4	65.79
216	0 1/2	65.85
216	4 3/4	65.96
216	5	65.96
216	8 3/4	66.06
216	10 1/2	66.1
217	1	66.17
217	5	66.27
217	6 1/2	66.31
217	8	66.34
217	8 1/2	66.36
217	9 1/4	66.38
217	10	66.4
217	10 1/2	66.41
218	-	66.45

CONVERSION TABLE ADDED IN REGISTRAR GENERAL'S DEPARTMENT

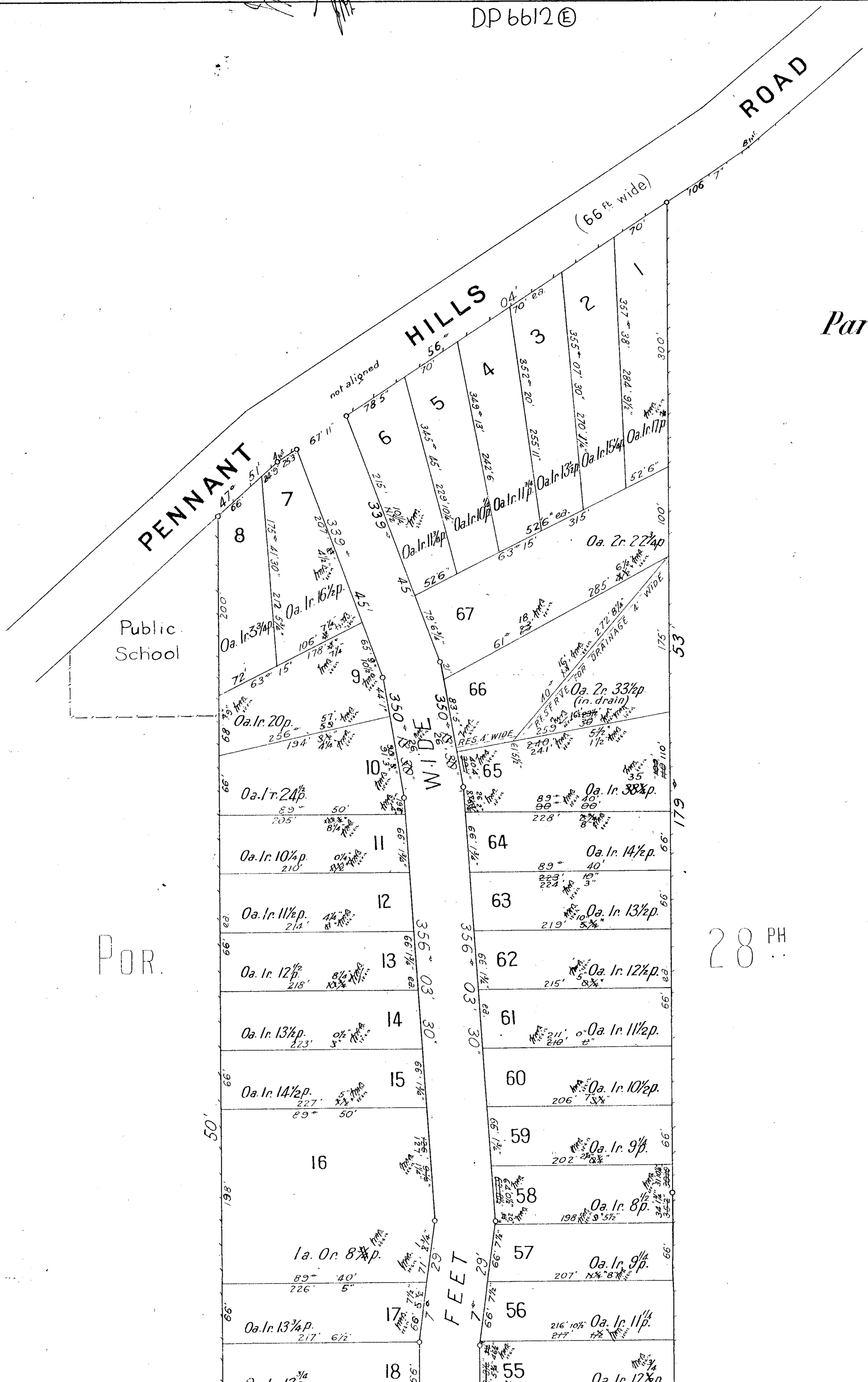
DP 6612 CONTINUED

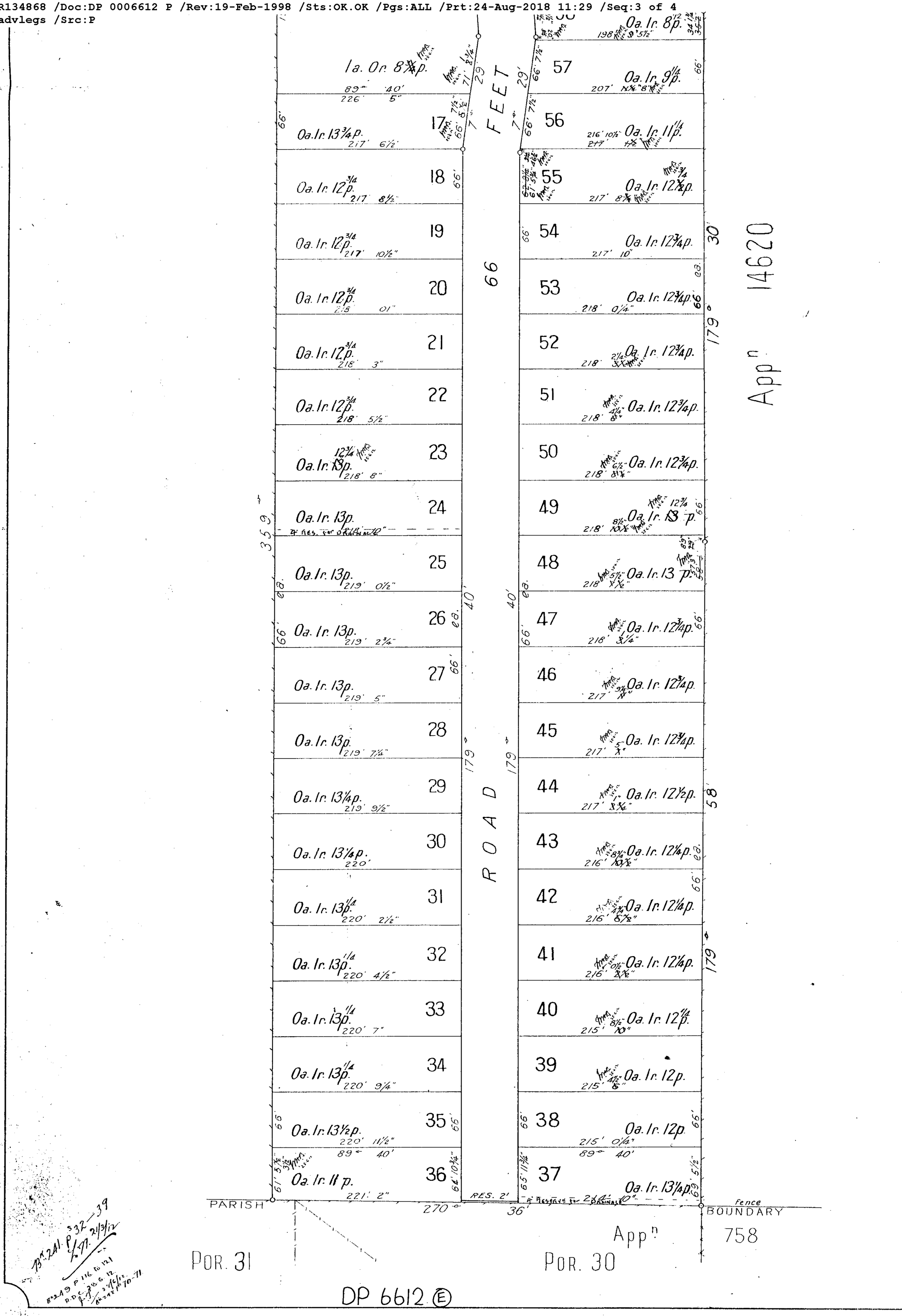
FEET	INCHES	METRES
218	0 1/8	66.45
218	0 1/4	66.45
218	1	66.47
218	1 1/4	66.48
218	2 1/4	66.5
218	3	66.52
218	4 1/4	66.55
218	5 1/2	66.59
218	6 1/2	66.61
218	8	66.65
218	8 1/4	66.66
218	8 1/2	66.66
218	10	66.7
219	0 1/2	66.76
219	2 3/4	66.82
219	5	66.88
219	7 1/4	66.94
219	9 1/2	66.99
219	9 5/8	67
219	10	67.01
220	-	67.06
220	2 1/2	67.12
220	4 1/2	67.17
220	7	67.23
220	8 1/8	67.26
220	9 1/4	67.29
220	11 1/2	67.35
221	2	67.41
223	0 1/2	67.98
224	3	68.35
226	5	69.01
227	5	69.32
228	8	69.7
229	10 1/4	70.06
241	-	73.46
241	1 1/2	73.49
242	6	73.91
255	11	78
259	-	78.94
270	1 1/4	82.33
272	8 1/4	83.12
284	9 1/2	86.8
285	6 1/2	87.03
300	-	91.44
315	-	96.01
2110	-	643.1

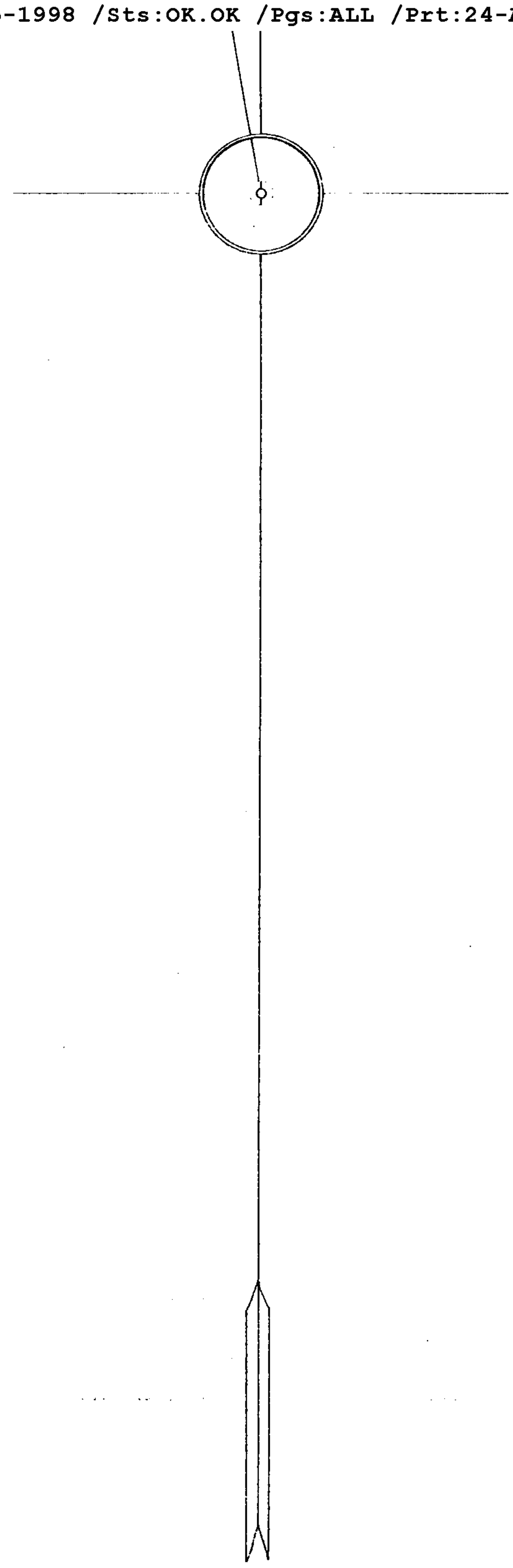
AC	RD	P	SQ M
-	1	3 3/4	1107
-	1	8 1/2	1227
-	1	9 1/4	1246
-	1	10 1/4	1271
-	1	10 1/2	1277
-	1	11	1290
-	1	11 1/4	1296
-	1	11 1/2	1303
-	1	11 3/4	1309
-	1	12	1315
-	1	12 1/4	1322
-	1	12 1/2	1328
-	1	12 3/4	1334
-	1	13	1341
-	1	13 1/4	1347
-	1	13 1/2	1353
-	1	13 3/4	1359
-	1	14 1/2	1378
-	1	15 1/4	1397
-	1	16 1/2	1429
-	1	17	1442
-	1	20	1518
-	1	24 1/2	1631
-	1	35	1897
-	2	22 3/4	2599
-	2	33 1/2	2871
1	-	8	4249

5/ 5. 3. 12

DP 6612 (E)







DP6612 Ⓔ

DECLARATION

I, William Hy Binsted of Hornsby Licensed Surveyor specially licensed under the Real Property Act, do hereby solemnly and sincerely declare that the boundaries and measurements shown on this Plan are correct for the purposes of the said Act and that the said Plan and the survey of the land to which the same relates, have been prepared and made by me or under my immediate supervision and I make this solemn declaration conscientiously believing the same to be true and by virtue of the provisions of the Oaths Act 1900

Subscribed and declared before me at Hornsby
this 28th day of Decr A.D. 1911
Cyprian Armaghan J.P.

W H Binsted,
Licensed Surveyor

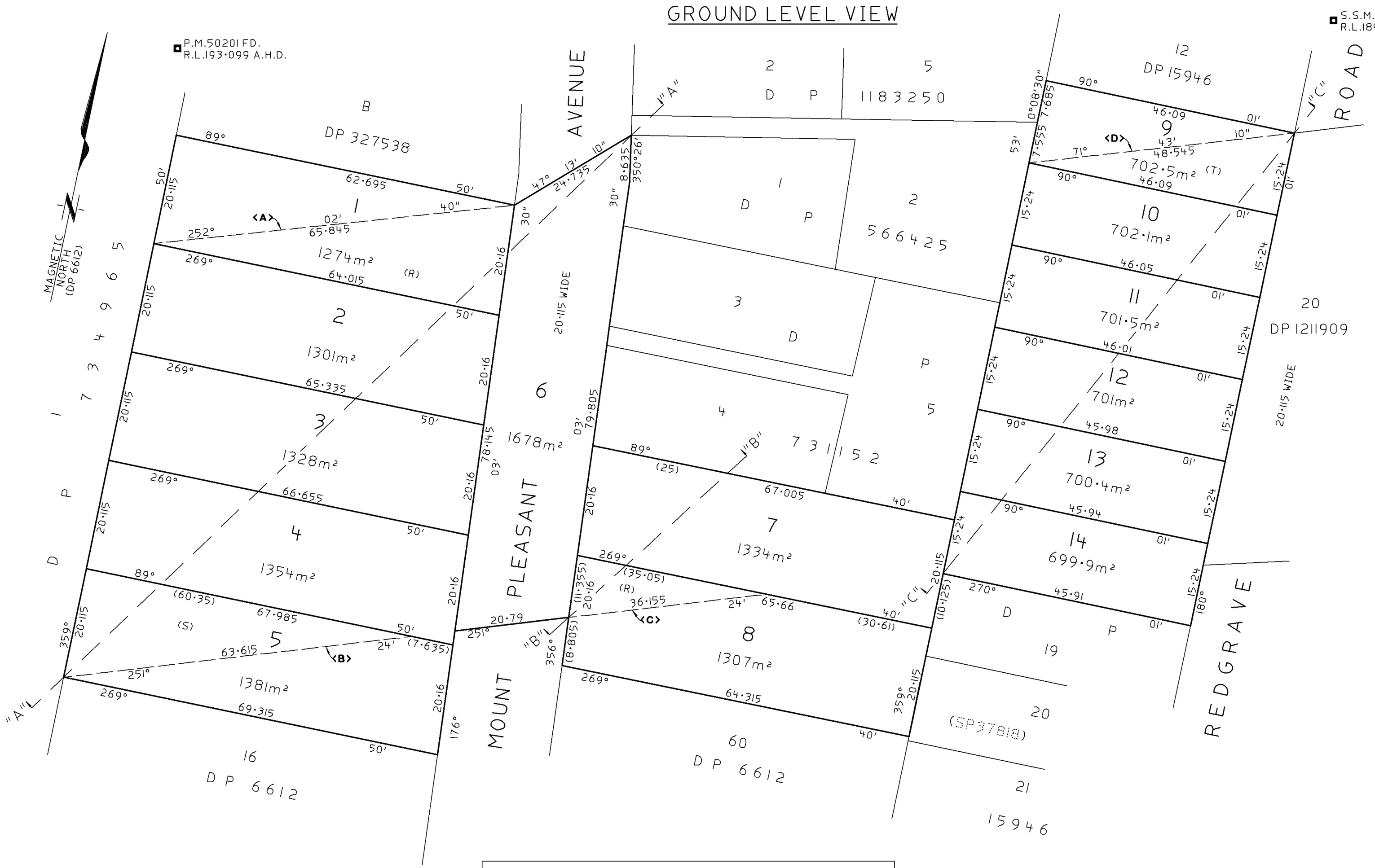
Date of Survey Decr 1911

Assumed Magnetic Variation 9° 30′ E.
Azimuth taken from Survey of Pennant Hills Rd (Line A.B.)

Re-declared this 25th June 1912
before me E M MacDermott J.P.

MAB 8/7/12

GROUND LEVEL VIEW



LOTS 1, 15 & 29
LOT 11 DP 6612
AUTO CONSOL 4570-1

LOTS 2, 16 & 30
LOT 12 DP 6612
AUTO CONSOL 3811-215

LOTS 3, 17 & 31
LOT 13 DP 6612
AUTO CONSOL 3811-215

LOTS 4, 18 & 32
LOT 14 DP 6612
C.T.14/6612

LOTS 5, 19 & 33
LOT 15 DP 6612
C.T.15/6612

LOTS 6, 20 & 34
PRIVATE SUBDIVISION ROAD
C.T.VOL.1760 FOL.29

LOTS 7, 21 & 35
LOT 62 DP 6612
C.T.62/6612

LOTS 8, 22 & 36
LOT 61 DP 6612
C.T.61/6612

LOTS 9, 23 & 37
LOT 13 DP 15946
C.T.13/15946

LOTS 10, 24 & 38
LOT 14 DP 15946
C.T.14/15946

LOTS 11, 25 & 39
LOT 15 DP 15946
C.T.15/15946

LOTS 12, 26 & 40
LOT 16 DP 15946
C.T.16/15946

LOTS 13, 27 & 41
LOT 17 DP 15946
C.T.17/15946

LOTS 14, 28 & 42
LOT 18 DP 15946
C.T.18/15946

LOTS 1 & 8 ARE UNLIMITED IN HEIGHT AND DEPTH EXCEPT FOR THOSE PARTS DESIGNATED (R) WHICH ARE STRATUM UNLIMITED IN HEIGHT LYING ABOVE A HORIZONTAL PLANE AT R.L.162 A.H.D. IDENTIFIED HEREON AND ON SHEET 4 AS BOUNDARIES OF LOTS 15 & 22 BELOW.

LOTS 2, 3, 4 & 6 ARE STRATUM UNLIMITED IN HEIGHT LYING ABOVE A HORIZONTAL PLANE AT R.L.162 A.H.D. IDENTIFIED HEREON AND ON SHEET 4 AS BOUNDARIES OF LOTS 16, 17, 18 & 20 BELOW.

LOTS 7 & 10 TO 14 INCLUSIVE ARE STRATUM UNLIMITED IN HEIGHT LYING ABOVE A HORIZONTAL PLANE AT R.L.163 A.H.D. IDENTIFIED HEREON AND ON SHEET 4 AS BOUNDARIES OF LOTS 21 & 24 TO 28 INCLUSIVE BELOW.

LOT 5 IS UNLIMITED IN HEIGHT AND DEPTH EXCEPT FOR THAT PART DESIGNATED (S) WHICH IS A STRATUM UNLIMITED IN HEIGHT LYING ABOVE A HORIZONTAL PLANE AT R.L.161 A.H.D. IDENTIFIED HEREON AND ON SHEET 4 AS A BOUNDARY OF LOT 19 BELOW.

LOT 9 IS UNLIMITED IN HEIGHT AND DEPTH EXCEPT FOR THAT PART DESIGNATED (T) WHICH IS A STRATUM UNLIMITED IN HEIGHT LYING ABOVE A HORIZONTAL PLANE AT R.L.163 A.H.D. IDENTIFIED HEREON AND ON SHEET 4 AS A BOUNDARY OF LOT 23 BELOW.

<A> BOUNDARY OF LOT 15 BELOW
<B> BOUNDARY OF LOT 19 BELOW
<C> BOUNDARY OF LOT 22 BELOW
<D> BOUNDARY OF LOT 23 BELOW

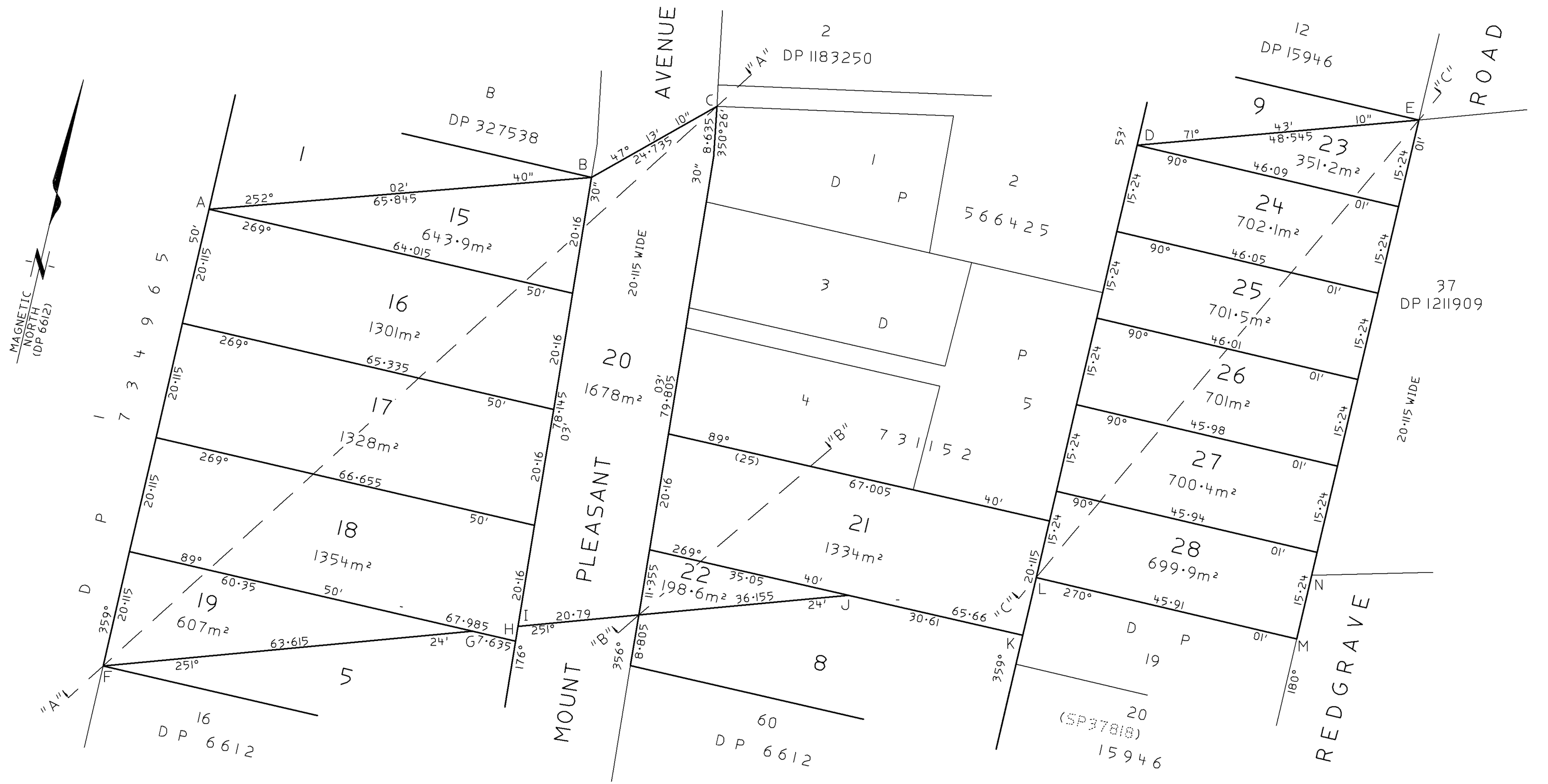
Surveyor : DAVID KENNETH BURKE Date of Survey : N/A Surveyor's Ref : C11132B, CHECKLIST EXEMPTION : 2015M7100(119)RMS	PLAN OF LAND TO BE ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993.	L.G.A. : HORNSBY Locality : NORMANHURST Subdivision No : N/A Lengths are in metres. Reduction Ratio 1:500	Registered 12.04.2016	DP1218765

10 20 30 40 50 60 70 80 90 100 110 120 130 140

FILE : SF 2014/076318

PLAN: 6012 201 SS 4113

STRATUM VIEW AT R.L.161 A.H.D.



LOTS 15 TO 18 INCLUSIVE, 20 & 22 ARE STRATUM LIMITED IN HEIGHT LYING BELOW A HORIZONTAL PLANE AT R.L.162 A.H.D. IDENTIFIED HEREON AND ON SHEET 4 AS BOUNDARIES OF LOTS 1 TO 4 INCLUSIVE, 6 & 8 ABOVE AND LIMITED IN DEPTH LYING ABOVE A HORIZONTAL PLANE AT R.L.122 A.H.D. IDENTIFIED HEREON AND ON SHEET 4 AS BOUNDARIES OF LOTS 29 TO 32 INCLUSIVE, 34 & 36 BELOW.

LOT 19 IS A STRATUM LIMITED IN HEIGHT LYING BELOW A HORIZONTAL PLANE AT R.L.161 A.H.D. IDENTIFIED HEREON AND ON SHEET 4 AS A BOUNDARY OF LOT 5 ABOVE AND LIMITED IN DEPTH LYING ABOVE A HORIZONTAL PLANE AT R.L.121 A.H.D. IDENTIFIED HEREON AND ON SHEET 4 AS A BOUNDARY OF LOT 33 BELOW.

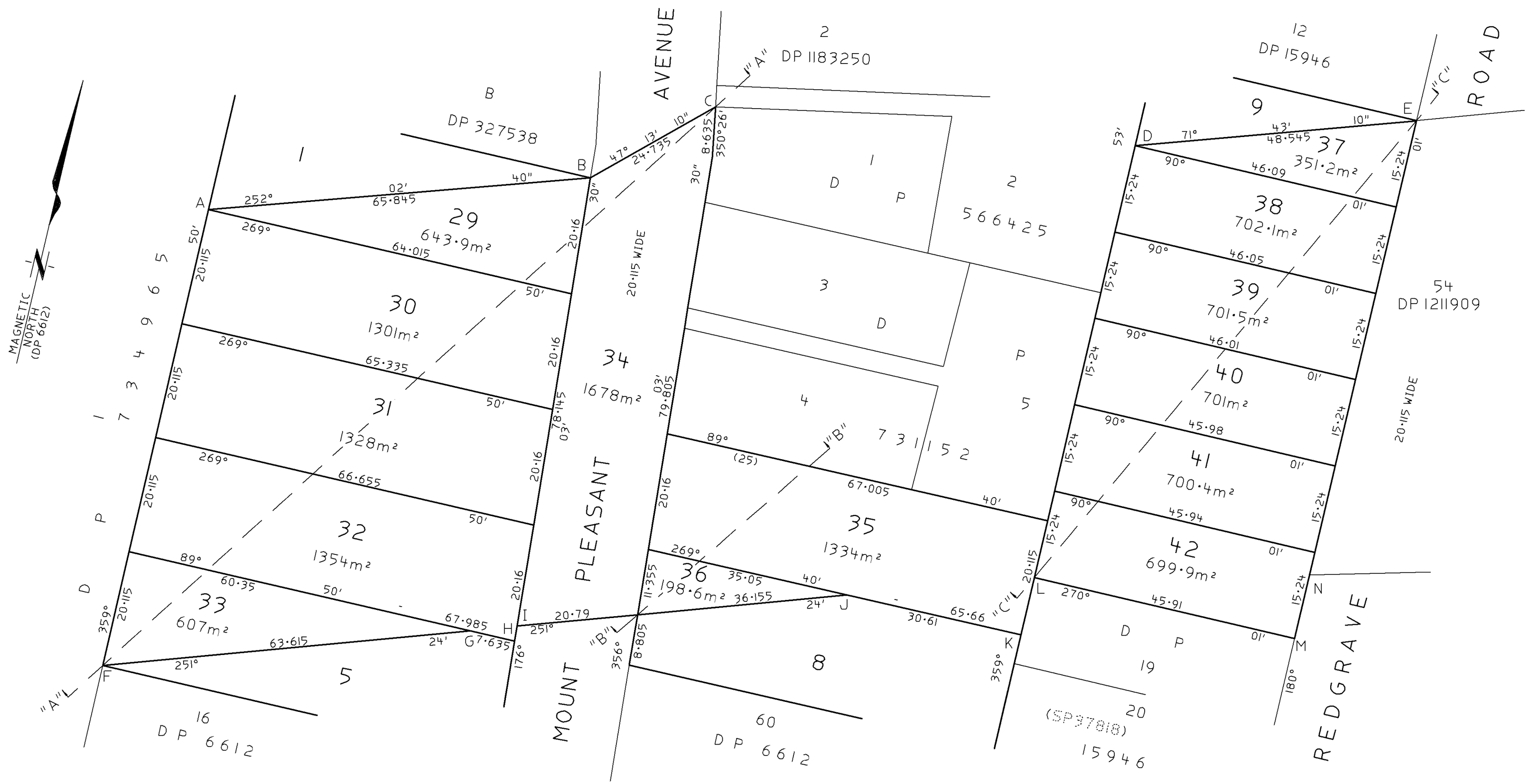
LOTS 21 & 23 TO 28 INCLUSIVE ARE STRATUM LIMITED IN HEIGHT LYING BELOW A HORIZONTAL PLANE AT R.L.163 A.H.D. IDENTIFIED HEREON AND ON SHEET 4 AS BOUNDARIES OF LOTS 7 & 9 TO 14 INCLUSIVE ABOVE AND LIMITED IN DEPTH LYING ABOVE A HORIZONTAL PLANE AT R.L.123 A.H.D. IDENTIFIED HEREON AND ON SHEET 4 AS BOUNDARIES OF LOTS 35 & 37 TO 42 INCLUSIVE BELOW.

Surveyor : DAVID KENNETH BURKE Date of Survey : N/A Surveyor's Ref : C11132B, CHECKLIST EXEMPTION : 2015M7100(119)RMS	PLAN OF LAND TO BE ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993.	L.G.A. : HORNSBY Locality : NORMANHURST Subdivision No : N/A Lengths are in metres. Reduction Ratio 1:500	Registered 12.04.2016	DP1218765

10 20 30 40 50 60 70 80 90 100 110 120 130 140

FILE : SF 2014/076318 PLAN: 6012 201 SS 4113

STRATUM VIEW AT R.L.121 A.H.D.



LOT 33 IS A STRATUM UNLIMITED IN DEPTH LYING BELOW A HORIZONTAL PLANE AT R.L.121 A.H.D. IDENTIFIED HEREON AND ON SHEET 4 AS A BOUNDARY OF LOT 19 ABOVE.

LOTS 29 TO 32 INCLUSIVE, 34 & 36 ARE STRATUM UNLIMITED IN DEPTH LYING BELOW A HORIZONTAL PLANE AT R.L.122 A.H.D. IDENTIFIED HEREON AND ON SHEET 4 AS BOUNDARIES OF LOTS 15 TO 18 INCLUSIVE, 20 & 22 ABOVE.

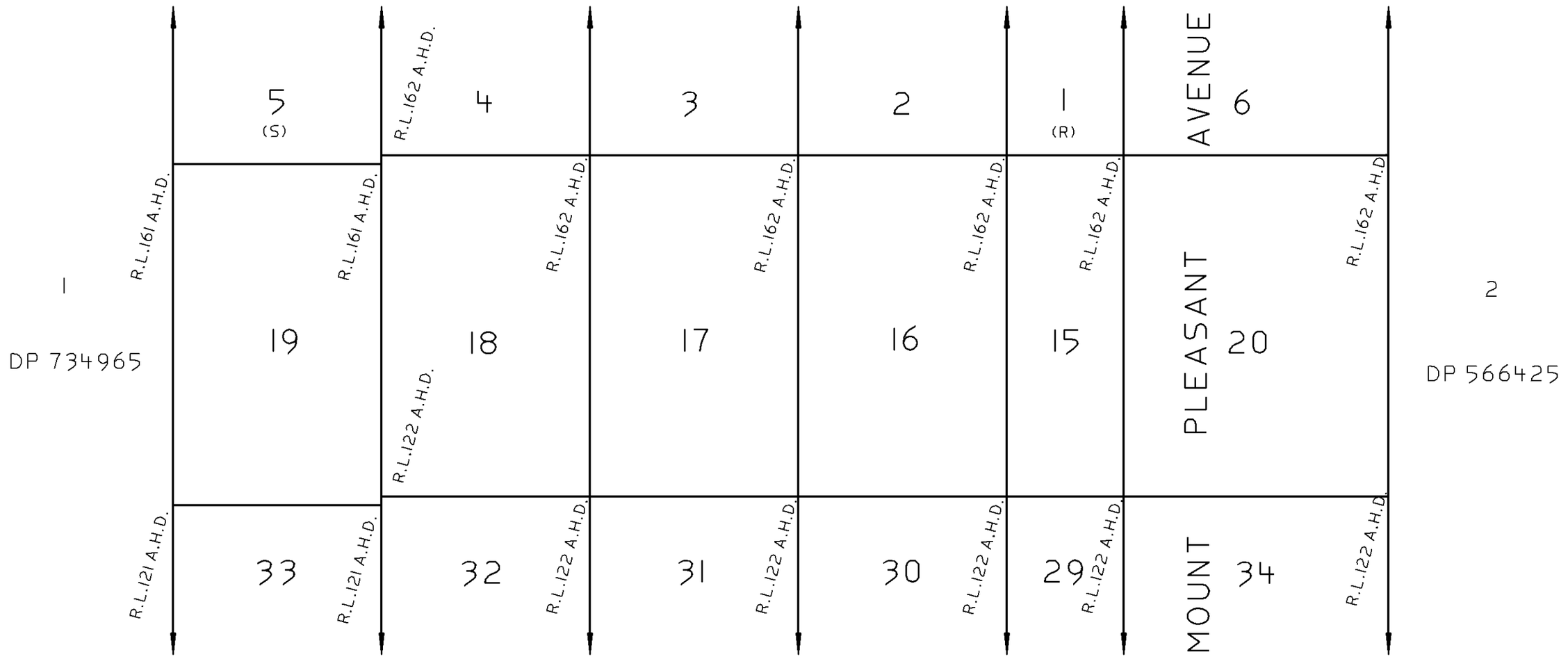
LOTS 35 & 37 TO 42 INCLUSIVE ARE STRATUM UNLIMITED IN DEPTH LYING BELOW A HORIZONTAL PLANE AT R.L.123 A.H.D. IDENTIFIED HEREON AND ON SHEET 4 AS BOUNDARIES OF LOTS 21 & 23 TO 28 INCLUSIVE ABOVE.

Surveyor : DAVID KENNETH BURKE Date of Survey : N/A Surveyor's Ref : C11132B, CHECKLIST EXEMPTION : 2015M7100(119)RMS	PLAN OF LAND TO BE ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993.	L.G.A. : HORNSBY Locality : NORMANHURST Subdivision No : N/A Lengths are in metres. Reduction Ratio 1:500	Registered 12.04.2016	DP1218765

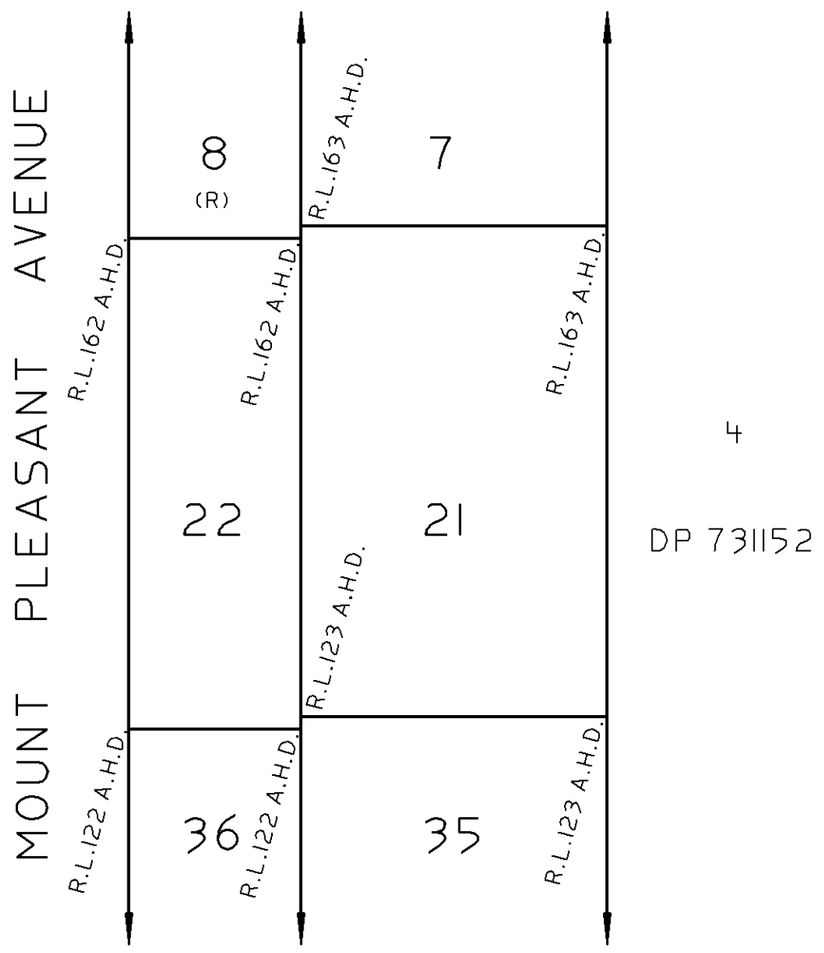
10 20 30 40 50 60 70 80 90 100 110 120 130 140

FILE : SF 2014/076318 PLAN: 6012 201 SS 4113

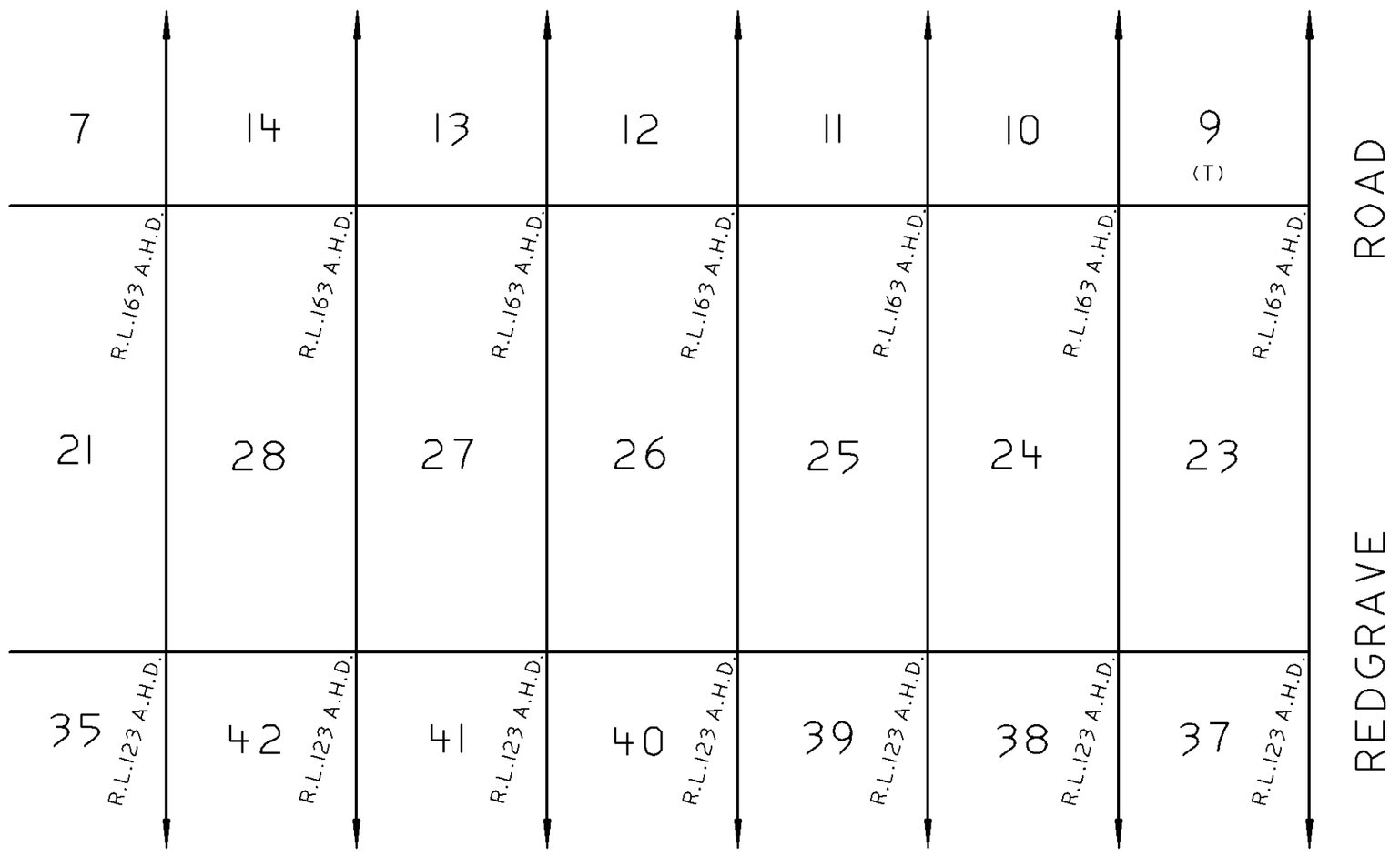
SECTION "A"-"A"
REDUCTION RATIO 1:500



SECTION "B"-"B"
REDUCTION RATIO 1:500



SECTION "C"-"C"
REDUCTION RATIO 1:500



Surveyor : DAVID KENNETH BURKE Date of Survey : N/A Surveyor's Ref : CIII32B, CHECKLIST EXEMPTION : 2015M7100(119)RMS	PLAN OF LAND TO BE ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993.	L.G.A. : HORNSBY Locality : NORMANHURST Subdivision No : N/A Lengths are in metres. Reduction Ratio 1:500	Registered 12.04.2016	DP1218765

10 20 30 40 50 60 70 80 90 100 110 120 130 140

FILE : SF 2014/076318

PLAN: 6012 201 SS 4113

PLAN FORM 6 (2013) WARNING: Creasing or folding will lead to rejection ePlan

DEPOSITED PLAN ADMINISTRATION SHEET

Sheet 1 of 2 sheets

Office Use Only

Registered: 13.04.2016

Title System: TORRENS

Purpose: ROADS ACT, 1993

Office Use Only

DP1218765

PLAN OF LAND TO BE ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993.

LGA: HORNSBY

Locality: NORMANHURST

Parish: SOUTH COLAH

County: CUMBERLAND

Crown Lands NSW/Western Lands Office Approval

I, ... (Authorised Officer) in approving this plan certify that all necessary approvals in regard to the allocation of the land shown herein have been given.

Signature: .....

Date: .....

File Number: .....

Office: .....

Subdivision Certificate

I, ...

*Authorised Person/*General Manager/*Accredited Certifier, certify that the provisions of s.109J of the *Environmental Planning and Assessment Act 1979* have been satisfied in relation to the proposed subdivision, new road or reserve set out herein.

Signature: .....

Accreditation number: .....

Consent Authority: .....

Date of endorsement: .....

Subdivision Certificate number: .....

File number: .....

*Strike through if inapplicable.

Survey Certificate

I, DAVID KENNETH BURKE.....

of ROADS AND MARITIME SERVICES .....

a surveyor registered under the *Surveying and Spatial Information Act 2002*, certify that:

*(a) ~~The land shown in the plan was surveyed in accordance with the~~ *Surveying and Spatial Information Regulation 2012*, is accurate and the survey was completed on .....

*(b) The part of the land shown in the plan (*being/*excluding ^.....) was surveyed in accordance with the *Surveying and Spatial Information Regulation 2012*, is accurate and the survey was completed on,..... the part not surveyed was compiled ~~in accordance with that Regulation~~.

*(c) The land shown in this plan was compiled in accordance with the *Surveying and Spatial Information Regulation 2012*.

Signature: D. K. Burke Dated: 29.2.16

Surveyor ID: 645 .....

Datum Line: .....

Type: *Urban/*~~Rural~~

The terrain is *Level-Undulating / *Steep-Mountainous.

*Strike through if inapplicable.

^Specify the land actually surveyed or specify any land shown in the plan that is not the subject of the survey.

Statements of intention to dedicate public roads create public reserves and drainage reserves, acquire/resume land.

LOTS 15 TO 42 INCLUSIVE ARE REQUIRED FOR FREEWAY UNDER SECTION 48 OF THE ROADS ACT, 1993.

ACCESS WILL BE RESTRICTED ACROSS THE BOUNDARIES OF LOTS 15, 20, 23 & 19, 18, 20, 22, 21, 28 AND 29, 34, 37 & 33, 32, 34, 36, 35, 42 MARKED A-B-C, D-E & F-G-H-I-J-K-L-M-N.

Plans used in the preparation of ~~survey~~/compilation.

DP 327538

DP 6612

DP 566425

DP 15946

DP 731152

DP 1211909

If space is insufficient continue on PLAN FORM 6A

Signatures, Seals and Section 88B Statements should appear on PLAN FORM 6A

Surveyor's Reference: CI1132B, CHECKLIST

EXEMPTION: 2015M7100(119)RMS

PLAN FORM 6A (2012) WARNING: Creasing or folding will lead to rejection ePlan

DEPOSITED PLAN ADMINISTRATION SHEET

Sheet 2 of 2 sheets

Office Use Only

Registered: 13.04.2016

Office Use Only

DP1218765

PLAN OF LAND TO BE ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993.

Subdivision Certificate number: .....

Date of Endorsement: .....

This sheet is for the provision of the following information as required:

- A schedule of lots and addresses - See 60(c) *SSI Regulation 2012*
- Statements of intention to create and release affecting interests in accordance with section 88B *Conveyancing Act 1919*
- Signatures and seals- see 195D *Conveyancing Act 1919*
- Any information which cannot fit in the appropriate panel of sheet 1 of the administration sheets.

LOT 1 – 91-93 PENNANT HILLS ROAD, NORMANHURST
LOT 2 – 91-93 PENNANT HILLS ROAD, NORMANHURST
LOT 3 – 91-93 PENNANT HILLS ROAD, NORMANHURST
LOT 4 – 14 MOUNT PLEASANT AVENUE, NORMANHURST
LOT 5 – 16-22 MOUNT PLEASANT AVENUE, NORMANHURST
LOT 6 – N/A
LOT 7 – 23 MOUNT PLEASANT AVENUE, NORMANHURST
LOT 8 – 25 MOUNT PLEASANT AVENUE, NORMANHURST
LOT 9 – 20 REDGRAVE ROAD, NORMANHURST
LOT 10 – 22 REDGRAVE ROAD, NORMANHURST
LOT 11 – 24 REDGRAVE ROAD, NORMANHURST
LOT 12 – 26 REDGRAVE ROAD, NORMANHURST
LOT 13 – 28 REDGRAVE ROAD, NORMANHURST
LOT 14 – 30 REDGRAVE ROAD, NORMANHURST
LOTS 15 TO 42 INCLUSIVE – N/A

APPROVED:

.....

A/ PRINCIPAL SURVEYOR
ROADS AND MARITIME SERVICES

If space is insufficient use additional annexure sheet

Surveyor's Reference: CI1132B, CHECKLIST EXEMPTION: 2015M7100(119)RMS

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 16/6612

SEARCH DATE	TIME	EDITION NO	DATE
24/8/2018	11:31 AM	-	-

VOL 2340 FOL 153 IS THE CURRENT CERTIFICATE OF TITLE

LAND

LOT 16 IN DEPOSITED PLAN 6612
LOCAL GOVERNMENT AREA HORNSBY
PARISH OF SOUTH COLAH COUNTY OF CUMBERLAND
TITLE DIAGRAM DP6612

FIRST SCHEDULE

TRUSTEES OF THE LORETO PROPERTY ASSOCIATION (T W279574)

SECOND SCHEDULE (1 NOTIFICATION)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

advlegs PRINTED ON 24/8/2018

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: AUTO CONSOL 4570-1

SEARCH DATE	TIME	EDITION NO	DATE
24/8/2018	11:30 AM	-	-

VOL 4570 FOL 1 IS THE CURRENT CERTIFICATE OF TITLE

LAND

LAND DESCRIBED IN SCHEDULE OF PARCELS
AT NORMANHURST
LOCAL GOVERNMENT AREA HORNSBY
PARISH OF SOUTH COLAH COUNTY OF CUMBERLAND
TITLE DIAGRAM SEE SCHEDULE OF PARCELS

FIRST SCHEDULE

TRUSTEES OF THE LORETO PROPERTY ASSOCIATION

SECOND SCHEDULE (3 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
* 2 C154950 COVENANT AS REGARDS LOT B IN DP327538
* 3 THE LAND ABOVE DESCRIBED IS LIMITED IN STRATUM IN THE MANNER DESCRIBED IN DP1218765 AS REGARDS LOT 1 IN DP1218765

NOTATIONS

CERTIFICATE OF TITLE NOT ISSUED. LODGED DEALINGS MUST BE ACCOMPANIED BY PRIOR CERTIFICATE OF TITLE VOL.4570 FOL.1

UNREGISTERED DEALINGS: NIL

SCHEDULE OF PARCELS	TITLE DIAGRAM
LOT B IN DP327538	DP327538
LOT 1 IN DP1218765	DP1218765.

*** END OF SEARCH ***

advlegs PRINTED ON 24/8/2018

Section 10.7 Certificates

Online Services Portal
Public User
Hornsby Shire Council

PLANNING CERTIFICATE UNDER SECTION 10.7 (2)
ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979 AS AMENDED

Certificate Number:	C1820765
Reference:	E31772KL (HL):86169
Issue Date:	28 August 2018
Receipt No.:	6378173
Fee Paid:	$133.00
ADDRESS:	No. 8 Mount Pleasant Avenue, NORMANHURST NSW 2076
DESCRIPTION:	Lot 1 DP 1218765, Lot B DP 327538
The land is zoned:	R2 Low Density Residential

The information contained in this certificate needs to be read in conjunction with the provisions of the Environmental Planning and Assessment Regulation 2000.

THIS CERTIFICATE IS DIRECTED TO THE FOLLOWING MATTERS PRESCRIBED UNDER SECTION 10.7 (2) OF THE ABOVE ACT.

1. Names of relevant planning instruments and DCPs

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

(A) **Local Environmental Plans**

The Hornsby Local Environmental Plan (HLEP) 2013, as amended, applies to all land in the Shire unless otherwise stated in this certificate.

Refer to Council's website www.hornsby.nsw.gov.au/hlep to view the HLEP.

State Environmental Planning Policies

SEPP No. 1 - Development Standards
SEPP No. 19 - Bushland in Urban Areas
SEPP No. 21 - Caravan Parks
SEPP No. 30 - Intensive Agriculture
SEPP No. 33 - Hazardous and Offensive Development
SEPP No. 44 - Koala Habitat Protection
SEPP No. 50 - Canal Estate Development
SEPP No. 55 - Remediation of Land
SEPP No. 62 – Sustainable Aquaculture
SEPP No. 64 – Advertising and Signage
SEPP No. 65 – Design Quality of Residential Apartment Development
SEPP No. 70 – Affordable Housing (Revised Schemes)
SEPP (Building Sustainability Index: BASIX) 2004
SEPP (Housing for Seniors or People with a Disability) 2004
SEPP (State Significant Precincts) 2005
SEPP (Mining, Petroleum Production and Extractive Industries) 2007
SEPP (Miscellaneous Consent Provisions) 2007
SEPP (Infrastructure) 2007
SEPP (Exempt and Complying Development Codes) 2008
SEPP (Affordable Rental Housing) 2009
SEPP (State and Regional Development) 2011
SEPP (Vegetation in Non-Rural Areas) 2017
SEPP (Educational Establishments and Child Care Facilities) 2017
SEPP (Coastal Management) 2018

Deemed State Environmental Planning Policies

SREP (Sydney Harbour Catchment) 2005

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

(A) **Proposed Local Environmental Plans**

No proposed Local Environmental Plans apply to this land.

(B) **Proposed State Environmental Planning Policies**

YES

The proposed State Environmental Planning Policy (Primary Production and Rural Development) 2017 applies to the land. The proposed aims of the new SEPP will support sustainable agriculture and aquaculture and consolidate five existing SEPPs, including SEPP 30 (Intensive Agriculture) and SEPP 62 (Sustainable Aquaculture) which apply to Hornsby LGA. Further information on the proposed new Primary Production and Rural Development SEPP can be obtained by viewing the Explanation and Intended Effect and Frequently Asked Questions on the proposed policy on the Department of Planning and Environment's website http://www.planning.nsw.gov.au/Policy-and-Legislation/State-Environmental-Planning-Policies-Review/Draft-Primary-Production-SEPP

YES

The proposed State Environmental Planning Policy (Environment) 2017 applies to the land. The proposed SEPP will combine seven existing policies into one with the aim of simplifying and modernising planning rules for a number of water catchments, waterways, urban bushland and Willandra Lakes World Heritage Property. The policies under review which apply in Hornsby Shire are: SEPP No. 19 (Bushland in Urban Areas); SREP No. 20 Hawkesbury-Nepean River 1997 and SREP (Sydney Harbour Catchment) 2005. Further information on the proposed new Environment SEPP can be obtained by viewing the Explanation and Intended Effect and Frequently Asked Questions on the proposed policy on the Department of Planning and Environment's website http://www.planning.nsw.gov.au/Policy-and-Legislation/State-Environmental-Planning-Policies-Review/Draft-Environment-SEPP

YES

The proposed amendment to State Environmental and Planning Policy (Housing for Seniors or People with a Disability) 2004 (Seniors Housing SEPP) applies to land that adjoins land zoned primarily for urban purposes, within a zone identified as "special uses", or used for purposes of an existing registered club, and where it also meets other specified requirements. The proposed amendment aims to address the issue of incremental expansion of Site Compatibility Certificates (SCCs). The proposed amendment to the Seniors Housing SEPP seeks to clarify that a SCC cannot be issued, amended or reissued for additional land, unless the additional land meets the SCC criteria. Further information on the proposed amendment to the Seniors Housing SEPP can be obtained by viewing the Explanation and Intended Effect and Frequently Asked

Questions on the proposed policy on the Department of Planning and Environment's website http://www.planning.nsw.gov.au/Policy-and-Legislation/Under-review-and-new-Policy-and-Legislation/Proposed-amendment-to-the-Seniors-Housing-SEPP

YES

The proposed amendment to State Environmental Planning Policy (State and Regional Development) 2011 applies to Government owned land immediately adjoining all Sydney Metro Northwest stations, including Cherrybrook. The proposed amendment nominates the Minister for Planning as the consent authority for future development on identified Government owned land along the Sydney metro Northwest corridor, if the development meets the criteria of State Significant Development. It proposes that the following development be identified as State Significant Development: 1) a principal subdivision establishing major lots or public domain areas or 2) the creation of new roadways and associated works or 3) has a capital investment value of more than $30 million. Further information on the proposed amendment to the SEPP including the Consultation Paper and Explanation of Intended Effect can be viewed on the Department of Planning and Environment's website http://planspolicies.planning.nsw.gov.au/index.pl?action=view_job&job_id=9213

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

Hornsby Development Control Plan (HDCP) 2013

Refer to Council's website www.hornsby.nsw.gov.au/hdcp to view the HDCP.

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

2. Zoning of land use under relevant LEPs

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

(A) The HLEP 2013 applies to the land unless otherwise stated in this certificate and identifies the land to be:

R2 Low Density Residential

(B) The purpose for which the instrument provides that development may be carried out within the zone without the need for development consent:

Refer to Attachment

Note: Also refer to the applicable SEPP instrument for provisions regarding Development without Consent and Exempt Development

(C) The purposes for which the instrument provides that development may not be carried out within the zone except the development consent:

Refer to Attachment

Note: Also refer to the applicable SEPP instrument for provisions regarding Development with Consent.

(D) The purposes for which the instrument provides that development is prohibited within the zone:

Refer to Attachment

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

NO

(F) Whether the land includes or comprises critical habitat?

NO

(G) Whether the land is in a conservation area (however described)?

NO

(H) Whether an item of environmental heritage (however described) is situated on the land?

NO

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

To the extent that the land is within any zone (however described) under:

(a) Part 3 of the *State Environmental Planning Policy (Sydney Region Growth Centres) 2006 and (the 2006 SEPP), or*
(b) a Precinct Plan (within the meaning of the 2006 SEPP), or
(c) a proposed Precinct Plan that is or has been the subject of community consultation or on public exhibition under the ACT.

NO

3. Complying Development

Whether or not the land is land on which complying development may be carried out under each of the codes for complying development because of the provisions of clauses 1.17A(1)(c) to (e), (2), (3) and (4), 1.18(1)(c3) and 1.19 of *State Environmental Planning*

Policy (Exempt and Complying Developments Code) 2008. If complying development may not be carried out on that land because of the provisions of clauses 1.17A (1) (c) to (e), (2), (3) and (4), 1.18 (1) (c3) and 1.19 of that Policy, the reasons why it may not be carried out under those clauses.

General Housing Code and Rural Housing Code

Complying Development under the General Housing Code or Rural Housing Code **may be** carried out on the land.

Low Rise Medium Density Housing Code

Complying Development under the Low Rise Medium Density Housing Code **may not** be carried out on the land.

Note: The Low Rise Medium Density Housing Code does not apply to land within the Hornsby Shire Council Local Government Area until 1 July 2019.

Commercial and Industrial (New Buildings and Additions) Code

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

Housing Alterations, General Development, Commercial and Industrial Alterations, Container Recycling Facilities, Subdivisions, Demolition and Fire Safety Codes (Other Codes)

Complying Development under the Housing Alterations Code, General Development Code, Commercial and Industrial Alterations Code, Container Recycling Facilities, Subdivisions Code, Demolition Code or Fire Safety Code **may be** carried out on the land.

4. **(Repealed)**

4A. **(Repealed)**

4B. **Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works**

Whether the owner (or previous owner) of the land has been consented in writing to the land being subject to annual charges under Section 496B of the *Local Government Act 1993* for coastal protection services that relate to existing coastal protection works (within the meaning of Section 553B of that Act).

NO

Note: "Existing coastal protection works" are works to reduce the impact of coastal hazards on land (such as seawalls, revetments, groynes and beach nourishment) that existed before the commencement of Section 553B of the *Local Government Act 1993*.

5. Mine subsidence

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

NO

6. Road widening and road realignment

Whether or not the land is affected by any road widening or road alignment under –

(A) Division 2 of Part 3 of the *Roads Act 1993*; or

NO

(B) any environmental planning instrument; or

NO

(C) any resolution of council?

NO

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

Whether or not the land is affected by a policy:

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

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

Council's and other public authorities' policies on hazard risk restrictions are as follows:

(A) **Landslip**

YES

All or part of the land has a gradient in excess of 20%. Section 1C.1.4 Earthworks and Slope of the *Hornsby DCP 2013* contains provisions that restrict development on land with the potential for landslip. Specifically, the provisions require certification from a geotechnical engineer as to the stability of the slope in regards to the proposed design of development on sloping sites with a gradient in excess of 20%.

Hornsby DCP 2013 can be viewed on Council's website hornsby.nsw.gov.au/hdcp or at Council's Administration Building or Libraries.

Note: This is a statement of Council and/or Public Authority Policy as the land has a landslip risk but NOT a statement on whether or not the property is or has been affected by landslip.

(B) **Bushfire**

NO

(C) **Tidal inundation**

NO

(D) **Subsidence**

NO

(E) **Acid Sulfate Soils**

NO

(F) **Land contamination**

NO

Council's electronic property records do not identify the land to be contaminated, being contaminated, as having been remediated or being remediated. Notwithstanding, consideration of Council's policy and the application of provisions under relevant State legislation may still be warranted if upon further evaluation the land is found to be contaminated or potentially contaminated.

Section 1.C.3.4 Land Contamination of the *Hornsby DCP 2013* contains provisions that restrict the development of land affected by contamination or that is potentially contaminated. Specifically, the provisions may require preliminary contamination assessments, detailed investigations, remedial action plans, validation reports and site audit statements to be undertaken pursuant to *SEPP No. 55 Remediation of Land* before a site is suitable for certain development.

Hornsby DCP 2013 can be viewed on Council's website hornsby.nsw.gov.au/hdcp or at Council's Administration Building or Libraries.

Notes: Council undertakes a thorough review of all relevant records (including hard copy property files) for land within zones with a higher propensity for potentially contaminating land uses (i.e. non-residential zoned land) to identify previously approved land uses which have the potential to cause contamination in accordance with the *Managing Land Contamination - Planning Guidelines*. The result of this review is provided on Certificates issued under Section 10.7 (5) of the *EP&A Act 1979*.

If you have any queries regarding a landowner's obligations in relation to contamination issues, it is recommended that you seek your own independent professional advice.

(G) **Any other risk**

NO

7A. Flood related development controls information

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

NO

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

NO

(3) Word and expressions in this clause have the same meanings as in the Standard Instrument.

8. Land reserved for acquisition

Whether or not any environmental planning instrument or proposed environmental planning instrument referred to in clause 1 makes provision in relation to the acquisition of the land by a public authority, as referred to in section 3.15 of the Act.

(A) **State Environmental Planning Policy?**

NO

(B) **Hornsby Local Environmental Plan 2013?**

NO

(C) **Planning Proposal?**

NO

9. Contribution plans

The name of each contribution plan applying to the land:

Hornsby Section 94 Development Contributions Plan 2014 – 2024
Hornsby Section 94A Development Contributions Plan 2014 – 2024

9A. Biodiversity certified land

Whether the land is biodiversity certified land under Part 8 of the *Biodiversity Conservation Act 2016*?

NO

Note: Biodiversity certified land includes land certified under Part 7AA of the *Threatened Species Conservation Act 1995* that is taken to be certified under Part 8 of the *Biodiversity Conservation Act 2016.*

10. Biodiversity stewardship sites

Whether the land is land to which a biodiversity stewardship site agreement under Part 5 of the *Biodiversity Conservation Act 2016* relates, (but only if the council has been notified of the existence of the agreement by the Chief Executive of the Office of the Environment and Heritage)?

NO

Note: Biodiversity stewardship agreements include biobanking agreements under Part 7A of the *Threatened Species Conservation Act 1995* that are taken to be biodiversity stewardship agreements under Part 5 of the *Biodiversity Conservation Act 2016.*

10A. Native vegetation clearing set asides

Whether the land contains a set aside area under Section 60ZC of the *Local Land Services Act 2013*, (but only if the council has been notified of the existence of the set aside by Local Land Services or it is registered in the public register under that section)?

NO

11. Bush fire prone land

Whether any of the land has been identified as bush fire prone land?

NO

12. Property vegetation plans

Has the council been notified that a property vegetation plan under Part 4 of the *Native Vegetation Act 2003* (and that continues in force) applies to this land?

NO

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

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

NO

14. Directions under Part 3A

Whether there is a direction by the Minister in force under Section 75P_(2)(c1) of the Act that a provision of an environmental planning instrument prohibiting or restricting the carrying out of project or a stage of a project on the land under Part 4 of the Act does not have effect?

NO

15. Site compatibility certificates and conditions for seniors housing

(a) Whether there is a current site compatibility certificate (seniors housing) of which council is aware, issued under *State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004* in respect of proposed development on this land?

NO

(b) Whether there are any terms of a kind referred to in clause 18(2) of *State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004* that have imposed as a condition of consent to a development application granted after 11 October 2007 in respect of the land?

NO

16. Site compatibility certificates for infrastructure

Whether there is a valid site compatibility certificate (infrastructure) or site compatibility certificate (schools or TAFE establishments), issued in respect of proposed development on this land?

NO

17. Site compatibility certificates and conditions for affordable rental housing

(1) Whether there is a current site compatibility certificate (affordable rental housing), of which the council is aware, in respect of proposed development on the land?

NO

(2) Whether there are any terms of a kind referred to in clause 17(1) or 38(1) of State Environmental Planning Policy (Affordable Rental Housing) 2009 that have been imposed as a condition of consent to a development application in respect of the land?

NO

18. Paper subdivision information

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

NO DEVELOPMENT PLAN APPLIES

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

NO SUBDIVISION ORDER APPLIES

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

19. **Site verification certificates**

Whether there is a current site verification certificate, of which the council is aware, in respect of the land?

NO

20. Loose-fill asbestos insulation

Whether the land includes any residential premises (within the meaning of Division 1A of Part 8 of the *Home Building Act 1989*) that are listed on the register that is required to be maintained under that Division?

NO

21. Affected building notices and building product rectification orders

Whether there is any affected building notice of which the council is aware that is in force in respect of the land?

NO

Note: ***affected building notice*** has the same meaning as in the *Building Products (Safety) Act 2017.*
Building product rectification order has the same meaning as in the *Building Products (Safety) Act 2017.*

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

(a) that the land to which the certificate relates is significantly contaminated land within the meaning of the Act - if the land (or part of the land) is significantly contaminated land at the date when the certificate is issued,

NO

(b) that the land to which the certificate relates is subject to a management order within the meaning of the Act – if it is subject to such an order at the date when the certificate is issued,

NO

(c) that the land to which the certificate relates is the subject of an approved voluntary management proposal within the meaning of that Act – if it is the subject of such an approved proposal at the date when the certificate is issued,

NO

(d) that the land to which the certificate relates is subject to an ongoing maintenance order within the meaning of the Act – if it is subject to such an order at the date when the certificate is used,

NO

(e) that the land to which the certificate relates is the subject of a site audit statement within the meaning of the Act – if a copy of such a statement has been provided at any time to the local authority issuing the certificate.

NO

THIS PART IS DIRECTED TO THE FOLLOWING MATTERS PRESCRIBED UNDER SECTION 10.7 (5) OF THE ABOVE ACT

NOTE: "When information pursuant to Section 10.7 (5) is requested the council is under no obligation to furnish any of the information supplied herein pursuant to that Section. Council draws your attention to Section 10.7 (6), which states that a council shall not incur any liability in respect of any advice provided in good faith pursuant to sub-section (5). The absence of any reference to any matter affecting the land shall not imply that the land is not affected by any matter not referred to in this certificate."

A. Whether a resolution to prepare a Planning Proposal applies to the land?

NO

B. Whether there are draft amendments to the Hornsby Development Control Plan that are on exhibition, have been exhibited or have been adopted by Council for exhibition applying to the land?

NO

C. Whether there are any provisions applying to the land that control the management of trees and vegetation?

YES

Tree and Vegetation Preservation Provisions contained within the SEPP (Vegetation in Non-Rural Areas) 2017 and Hornsby DCP apply to the land.

Note: SEPP (Vegetation in Non-Rural Areas) 2017 can be viewed on the NSW Legislation website at: www.legislation.nsw.gov.au and the Hornsby DCP can be viewed on Council's website hornsby.nsw.gov.au/hdcp or at Council's Administration Building.

D. Whether there are any provisions within the Hornsby LEP applying to the land that controls the management of biodiversity?

NO

E. Whether there are any provisions applying to the land within the Hornsby Local Environmental Plan that control development within a foreshore area?

NO

F. Whether Council has adopted a Voluntary Planning Agreement within the meaning of S93F of the Environmental Planning and Assessment Act, 1979, as amended, in relation to the land?

NO

G. Whether the land is within or adjacent to the North West Rail Link as identified on the maps provided by Transport NSW?

NO

H. Whether the land is subject to the North West Rail Link Corridor Strategy prepared by the Department of Planning and Infrastructure?

NO

I. Whether the land is within or adjacent to an existing rail corridor?

NO

J. Whether the land is in a rural area or located adjacent to a rural area in which agriculture occurs?

NO

K. Whether Council's records show a history of potentially contaminating land use and the land is zoned:

- Business, Industrial and/or SP2 Infrastructure; or

NO

- RU1 Primary Production, RU2 Rural Landscape, RU4 Primary Production Small Lots or E3 Environmental Management.

NO

- Any other risk

NO

Note: This is NOT a statement on whether or not the property is affected by contamination. Council has a policy on contaminated land which may restrict the development of the land. This policy is implemented when zoning, land use changes or further development is proposed on lands which are contaminated, or have previously been used for certain purposes and the contamination status of the land is uncertain. Accordingly, consideration of Council's policy and the application of provisions under relevant State legislation is warranted. If you have any queries regarding a landowner's obligations in relation to contamination issues, it is recommended that you seek your own independent professional advice.

L. Whether the land is subject to risk of "future" exposure to tidal inundation?

NO

M. Whether the land is within or adjacent to the NorthConnex motorway link corridor as identified on the maps provided by the NorthConnex project team?

YES

Note: Any enquiries on the NorthConnex motorway link should be directed to the NorthConnex project team on 1800 997 057 or enquiries@northconnex.com.au

N. Whether there is potential for loose-fill asbestos insulation to be found on properties that are not listed on the NSW Department of Fair Trading's Loose-Fill Asbestos Public Register

YES

Note: Some residential homes located in Hornsby Shire have been identified as containing loose-fill asbestos insulation in the roof space. The NSW Department of Fair Trading maintains a Public Register of homes that are affected by loose-fill asbestos insulation.

You should make your own enquiries as to the age of the buildings on the land to which this certificate relates, and if it contains a building construction prior to 1980, it is recommended that any potential purchaser obtain advice from a licensed asbestos assessor to determine whether loose-fill asbestos is present in any building on the land and, if so, the risk (if any) this may pose for the building's occupants.

Further information can be obtained by contacting the NSW Department of Fair Trading and viewing the Department's website.

O. Whether there is potential for external combustible cladding to be found on multi-storey buildings on properties in Hornsby Shire?

YES

Note: Some buildings located in Hornsby Shire have been identified as containing combustible cladding. Combustible cladding is a material that is capable of readily burning.

You should make your own enquiries as to the type of materials that have been used to construct the building. It is recommended that the purchaser obtain a building report from an appropriately qualified person to determine if any cladding type material may pose a risk to the building's occupants. Council may issue orders to rectify a building where combustible cladding is found.

Steven Head

General Manager per

PLEASE NOTE: COUNCIL RETAINS THE ELECTRONIC ORIGINAL OF THIS CERTIFICATE.

WHERE THIS CERTIFICATE REFERS TO INFORMATION DISPLAYED ON COUNCIL'S WEBSITE OR TO ANY EXTERNAL WEBSITE, IT REFERS TO INFORMATION DISPLAYED ON THE WEBSITE ON THE DATE THIS CERTIFICATE IS ISSUED.

Hornsby Local Environmental Plan 2013 - Land Use Table

Zone R2Low Density Residential

1Objectives of zone

- To provide for the housing needs of the community within a low density residential environment.
- To enable other land uses that provide facilities or services to meet the day to day needs of residents.

2Permitted without consent

Environmental protection works; Home occupations

3Permitted with consent

Boarding houses; Building identification signs; Business identification signs; Centre-based childcare facilities; Community facilities; Dwelling houses; Educational establishments; Emergency services facilities; Exhibition homes; Flood mitigation works; Group homes; Home-based child care; Home businesses; Information and education facilities; Places of public worship; Public administration buildings; Recreation areas; Recreation facilities (outdoor); Respite day care centres; Roads; Tourist and visitor accommodation; Veterinary hospitals; Water reticulation systems

4Prohibited

Backpackers' accommodation; Farm stay accommodation; Hotel or motel accommodation; Serviced apartments; Any other development not specified in item 2 or 3

Online Services Portal
Public User
Hornsby Shire Council

PLANNING CERTIFICATE UNDER SECTION 10.7 (2)
ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979 AS AMENDED

Certificate Number:	C1820764
Reference:	E31772KL (HL):86169
Issue Date:	28 August 2018
Receipt No.:	6378173
Fee Paid:	$133.00
ADDRESS:	No. Loreto Convent School, 16-22 Mount Pleasant Avenue, NORMANHURST NSW 2076
DESCRIPTION:	Lot 5 DP 1218765, Lot 16 DP 6612
The land is zoned:	R2 Low Density Residential

The information contained in this certificate needs to be read in conjunction with the provisions of the Environmental Planning and Assessment Regulation 2000.

THIS CERTIFICATE IS DIRECTED TO THE FOLLOWING MATTERS PRESCRIBED UNDER SECTION 10.7 (2) OF THE ABOVE ACT.

1. Names of relevant planning instruments and DCPs

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

(A) **Local Environmental Plans**

The Hornsby Local Environmental Plan (HLEP) 2013, as amended, applies to all land in the Shire unless otherwise stated in this certificate.

Refer to Council's website www.hornsby.nsw.gov.au/hlep to view the HLEP.

State Environmental Planning Policies

SEPP No. 1 - Development Standards
SEPP No. 19 - Bushland in Urban Areas
SEPP No. 21 - Caravan Parks
SEPP No. 30 - Intensive Agriculture
SEPP No. 33 - Hazardous and Offensive Development
SEPP No. 44 - Koala Habitat Protection
SEPP No. 50 - Canal Estate Development
SEPP No. 55 - Remediation of Land
SEPP No. 62 – Sustainable Aquaculture
SEPP No. 64 – Advertising and Signage
SEPP No. 65 – Design Quality of Residential Apartment Development
SEPP No. 70 – Affordable Housing (Revised Schemes)
SEPP (Building Sustainability Index: BASIX) 2004
SEPP (Housing for Seniors or People with a Disability) 2004
SEPP (State Significant Precincts) 2005
SEPP (Mining, Petroleum Production and Extractive Industries) 2007
SEPP (Miscellaneous Consent Provisions) 2007
SEPP (Infrastructure) 2007
SEPP (Exempt and Complying Development Codes) 2008
SEPP (Affordable Rental Housing) 2009
SEPP (State and Regional Development) 2011
SEPP (Vegetation in Non-Rural Areas) 2017
SEPP (Educational Establishments and Child Care Facilities) 2017
SEPP (Coastal Management) 2018

Deemed State Environmental Planning Policies

SREP (Sydney Harbour Catchment) 2005

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

(A) **Proposed Local Environmental Plans**

No proposed Local Environmental Plans apply to this land.

(B) **Proposed State Environmental Planning Policies**

YES

The proposed State Environmental Planning Policy (Primary Production and Rural Development) 2017 applies to the land. The proposed aims of the new SEPP will support sustainable agriculture and aquaculture and consolidate five existing SEPPs, including SEPP 30 (Intensive Agriculture) and SEPP 62 (Sustainable Aquaculture) which apply to Hornsby LGA. Further information on the proposed new Primary Production and Rural Development SEPP can be obtained by viewing the Explanation and Intended Effect and Frequently Asked Questions on the proposed policy on the Department of Planning and Environment's website http://www.planning.nsw.gov.au/Policy-and-Legislation/State-Environmental-Planning-Policies-Review/Draft-Primary-Production-SEPP

YES

The proposed State Environmental Planning Policy (Environment) 2017 applies to the land. The proposed SEPP will combine seven existing policies into one with the aim of simplifying and modernising planning rules for a number of water catchments, waterways, urban bushland and Willandra Lakes World Heritage Property. The policies under review which apply in Hornsby Shire are: SEPP No. 19 (Bushland in Urban Areas); SREP No. 20 Hawkesbury-Nepean River 1997 and SREP (Sydney Harbour Catchment) 2005. Further information on the proposed new Environment SEPP can be obtained by viewing the Explanation and Intended Effect and Frequently Asked Questions on the proposed policy on the Department of Planning and Environment's website http://www.planning.nsw.gov.au/Policy-and-Legislation/State-Environmental-Planning-Policies-Review/Draft-Environment-SEPP

YES

The proposed amendment to State Environmental and Planning Policy (Housing for Seniors or People with a Disability) 2004 (Seniors Housing SEPP) applies to land that adjoins land zoned primarily for urban purposes, within a zone identified as "special uses", or used for purposes of an existing registered club, and where it also meets other specified requirements. The proposed amendment aims to address the issue of incremental expansion of Site Compatibility Certificates (SCCs). The proposed amendment to the Seniors Housing SEPP seeks to clarify that a SCC cannot be issued, amended or reissued for additional land, unless the additional land meets the SCC criteria. Further information on the proposed amendment to the Seniors Housing SEPP can be obtained by viewing the Explanation and Intended Effect and Frequently Asked

Questions on the proposed policy on the Department of Planning and Environment's website http://www.planning.nsw.gov.au/Policy-and-Legislation/Under-review-and-new-Policy-and-Legislation/Proposed-amendment-to-the-Seniors-Housing-SEPP

YES

The proposed amendment to State Environmental Planning Policy (State and Regional Development) 2011 applies to Government owned land immediately adjoining all Sydney Metro Northwest stations, including Cherrybrook. The proposed amendment nominates the Minister for Planning as the consent authority for future development on identified Government owned land along the Sydney metro Northwest corridor, if the development meets the criteria of State Significant Development. It proposes that the following development be identified as State Significant Development: 1) a principal subdivision establishing major lots or public domain areas or 2) the creation of new roadways and associated works or 3) has a capital investment value of more than $30 million. Further information on the proposed amendment to the SEPP including the Consultation Paper and Explanation of Intended Effect can be viewed on the Department of Planning and Environment's website http://planspolicies.planning.nsw.gov.au/index.pl?action=view_job&job_id=9213

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

Hornsby Development Control Plan (HDCP) 2013

Refer to Council's website www.hornsby.nsw.gov.au/hdcp to view the HDCP.

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

2. Zoning of land use under relevant LEPs

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

(A) The HLEP 2013 applies to the land unless otherwise stated in this certificate and identifies the land to be:

R2 Low Density Residential

(B) The purpose for which the instrument provides that development may be carried out within the zone without the need for development consent:

Refer to Attachment

Note: Also refer to the applicable SEPP instrument for provisions regarding Development without Consent and Exempt Development

(C) The purposes for which the instrument provides that development may not be carried out within the zone except the development consent:

Refer to Attachment

Note: Also refer to the applicable SEPP instrument for provisions regarding Development with Consent.

(D) The purposes for which the instrument provides that development is prohibited within the zone:

Refer to Attachment

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

NO

(F) Whether the land includes or comprises critical habitat?

NO

(G) Whether the land is in a conservation area (however described)?

NO

(H) Whether an item of environmental heritage (however described) is situated on the land?

YES

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

To the extent that the land is within any zone (however described) under:

(a) Part 3 of the *State Environmental Planning Policy (Sydney Region Growth Centres) 2006 and (the 2006 SEPP), or*
(b) a Precinct Plan (within the meaning of the 2006 SEPP), or
(c) a proposed Precinct Plan that is or has been the subject of community consultation or on public exhibition under the ACT.

NO

3. Complying Development

Whether or not the land is land on which complying development may be carried out under each of the codes for complying development because of the provisions of clauses 1.17A(1)(c) to (e), (2), (3) and (4), 1.18(1)(c3) and 1.19 of *State Environmental Planning Policy (Exempt and Complying Developments Code) 2008*. If complying development

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

General Housing Code and Rural Housing Code

Complying Development under the General Housing Code or Rural Housing Code **may not** be carried out on the land. The land is affected by specific land exemptions.

Note. Any specific land exemptions listed apply to all or part of the land. Complying development that is located on a part of the land that does not comprise the land that forms a specific land exemption may be carried out on that part of the land. The land that does not satisfy the various land based requirements under Clauses 1.17A, 1.18 and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 are shown coloured red in Council's web-based Mapping Application by ticking the "Code SEPP-Non Complying Land/General and Rural Housing" map layers. The Mapping Application can be accessed on desktop computers, tablets or mobile phones by clicking on the relevant link on Council's HLEP webpage www.hornsby.nsw.gov.au/hlep

- All or part of the land is an item that is listed under Schedule 5 Environmental Heritage of the *HLEP*. Complying development that is located on a part of the land that does not comprise the land that is listed under Schedule 5 Environmental Heritage of the HLEP may be carried out on that part of the land, if the heritage item is the only specific land exemption. (Clause 1.17A)

Low Rise Medium Density Housing Code

Complying Development under the Low Rise Medium Density Housing Code **may not** be carried out on the land.

Note: The Low Rise Medium Density Housing Code does not apply to land within the Hornsby Shire Council Local Government Area until 1 July 2019.

Commercial and Industrial (New Buildings and Additions) Code

Complying Development under the Commercial and Industrial (New Buildings and Additions) Code **may not** be carried out on the land. The land is affected by specific land exemptions.

Note. Any specific land exemptions listed apply to all or part of the land. Complying development that is located on a part of the land that does not comprise the land that forms a specific land exemption may be carried out on that part of the land. The land that does not satisfy the various land based requirements under Clauses 1.17A, 1.18 and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 are shown coloured orange in Council's web-based Mapping Application by ticking the "Code SEPP-Non Complying Land/Commercial and Industrial" map layers. The Mapping Application can be accessed on desktop computers, tablets or mobile phones by clicking on the relevant link on Council's HLEP webpage www.hornsby.nsw.gov.au/hlep

- All or part of the land is an item that is listed under Schedule 5 Environmental Heritage of the *HLEP*. Complying development that is located on a part of the land that does not comprise the land that is listed under Schedule 5 Environmental Heritage of the HLEP may be carried out on that part of the land, if the heritage item is the only specific land exemption. (Clause 1.17A)

Housing Alterations, General Development, Commercial and Industrial Alterations, Container Recycling Facilities, Subdivisions, Demolition and Fire Safety Codes (Other Codes)

Complying Development under the Housing Alterations Code, General Development Code, Commercial and Industrial Alterations Code, Container Recycling Facilities, Subdivisions Code, Demolition Code or Fire Safety Code **may not** be carried out on the land. The land is affected by specific land exemptions.

Note. Any specific land exemptions listed apply to all or part of the land. Complying development that is located on a part of the land that does not comprise the land that forms a specific land exemption may be carried out on that part of the land. The land that does not satisfy the various land based requirements under Clauses 1.17A, 1.18 and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 are shown coloured purple in Council's web-based Mapping Application by ticking the "Code SEPP-Non Complying Land/Codes Other" map layers. The Mapping Application can be accessed on desktop computers, tablets or mobile phones by clicking on the relevant link on Council's HLEP webpage www.hornsby.nsw.gov.au/hlep

- All or part of the land is an item that is listed under Schedule 5 Environmental Heritage of the *HLEP*. Complying development that is located on a part of the land that does not comprise the land that is listed under Schedule 5 Environmental Heritage of the HLEP may be carried out on that part of the land, if the heritage item is the only specific land exemption. (Clause 1.17A)

4. **(Repealed)**

4A. **(Repealed)**

4B. **Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works**

Whether the owner (or previous owner) of the land has been consented in writing to the land being subject to annual charges under Section 496B of the *Local Government Act 1993* for coastal protection services that relate to existing coastal protection works (within the meaning of Section 553B of that Act).

NO

Note: "Existing coastal protection works" are works to reduce the impact of coastal hazards on land (such as seawalls, revetments, groynes and beach nourishment) that existed before the commencement of Section 553B of the *Local Government Act 1993*.

5. Mine subsidence

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

NO

6. Road widening and road realignment

Whether or not the land is affected by any road widening or road alignment under –

(A) Division 2 of Part 3 of the *Roads Act 1993*; or

NO

(B) any environmental planning instrument; or

NO

(C) any resolution of council?

NO

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

Whether or not the land is affected by a policy:

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

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

Council's and other public authorities' policies on hazard risk restrictions are as follows:

(A) **Landslip**

NO

(B) **Bushfire**

NO

(C) **Tidal inundation**

NO

(D) **Subsidence**

NO

(E) **Acid Sulfate Soils**

NO

(F) **Land contamination**

NO

Council's electronic property records do not identify the land to be contaminated, being contaminated, as having been remediated or being remediated. Notwithstanding, consideration of Council's policy and the application of provisions under relevant State legislation may still be warranted if upon further evaluation the land is found to be contaminated or potentially contaminated.

Section 1.C.3.4 Land Contamination of the *Hornsby DCP 2013* contains provisions that restrict the development of land affected by contamination or that is potentially contaminated. Specifically, the provisions may require preliminary contamination assessments, detailed investigations, remedial action plans, validation reports and site audit statements to be undertaken pursuant to *SEPP No. 55 Remediation of Land* before a site is suitable for certain development.

Hornsby DCP 2013 can be viewed on Council's website hornsby.nsw.gov.au/hdcp or at Council's Administration Building or Libraries.

Notes: Council undertakes a thorough review of all relevant records (including hard copy property files) for land within zones with a higher propensity for potentially contaminating land uses (i.e. non-residential zoned land) to identify previously approved land uses which have the potential to cause contamination in accordance with the *Managing Land Contamination - Planning Guidelines*. The result of this review is provided on Certificates issued under Section 10.7 (5) of the *EP&A Act 1979*.

If you have any queries regarding a landowner's obligations in relation to contamination issues, it is recommended that you seek your own independent professional advice.

(G) **Any other risk**

NO

7A. Flood related development controls information

(1) Whether or not development on that land or part of the land for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not

including development for the purposes of group homes or seniors housing) is subject to flood related development controls?

NO

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

NO

(3) Word and expressions in this clause have the same meanings as in the Standard Instrument.

8. Land reserved for acquisition

Whether or not any environmental planning instrument or proposed environmental planning instrument referred to in clause 1 makes provision in relation to the acquisition of the land by a public authority, as referred to in section 3.15 of the Act.

(A) **State Environmental Planning Policy?**

NO

(B) **Hornsby Local Environmental Plan 2013?**

NO

(C) **Planning Proposal?**

NO

9. Contribution plans

The name of each contribution plan applying to the land:

Hornsby Section 94 Development Contributions Plan 2014 – 2024
Hornsby Section 94A Development Contributions Plan 2014 – 2024

9A. Biodiversity certified land

Whether the land is biodiversity certified land under Part 8 of the *Biodiversity Conservation Act 2016*?

NO

Note: Biodiversity certified land includes land certified under Part 7AA of the *Threatened Species Conservation Act 1995* that is taken to be certified under Part 8 of the *Biodiversity Conservation Act 2016.*

10. Biodiversity stewardship sites

Whether the land is land to which a biodiversity stewardship site agreement under Part 5 of the *Biodiversity Conservation Act 2016* relates, (but only if the council has been notified of the existence of the agreement by the Chief Executive of the Office of the Environment and Heritage)?

NO

Note: Biodiversity stewardship agreements include biobanking agreements under Part 7A of the *Threatened Species Conservation Act 1995* that are taken to be biodiversity stewardship agreements under Part 5 of the *Biodiversity Conservation Act 2016.*

10A. Native vegetation clearing set asides

Whether the land contains a set aside area under Section 60ZC of the *Local Land Services Act 2013*, (but only if the council has been notified of the existence of the set aside by Local Land Services or it is registered in the public register under that section)?

NO

11. Bush fire prone land

Whether any of the land has been identified as bush fire prone land?

NO

12. Property vegetation plans

Has the council been notified that a property vegetation plan under Part 4 of the *Native Vegetation Act 2003* (and that continues in force) applies to this land?

NO

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

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

NO

14. Directions under Part 3A

Whether there is a direction by the Minister in force under Section 75P_(2)(c1) of the Act that a provision of an environmental planning instrument prohibiting or restricting the carrying out of project or a stage of a project on the land under Part 4 of the Act does not have effect?

NO

15. Site compatibility certificates and conditions for seniors housing

(a) Whether there is a current site compatibility certificate (seniors housing) of which council is aware, issued under *State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004* in respect of proposed development on this land?

NO

(b) Whether there are any terms of a kind referred to in clause 18(2) of *State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004* that have imposed as a condition of consent to a development application granted after 11 October 2007 in respect of the land?

NO

16. Site compatibility certificates for infrastructure

Whether there is a valid site compatibility certificate (infrastructure) or site compatibility certificate (schools or TAFE establishments), issued in respect of proposed development on this land?

NO

17. Site compatibility certificates and conditions for affordable rental housing

(1) Whether there is a current site compatibility certificate (affordable rental housing), of which the council is aware, in respect of proposed development on the land?

NO

(2) Whether there are any terms of a kind referred to in clause 17(1) or 38(1) of State Environmental Planning Policy (Affordable Rental Housing) 2009 that have been imposed as a condition of consent to a development application in respect of the land?

NO

18. Paper subdivision information

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

NO DEVELOPMENT PLAN APPLIES

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

NO SUBDIVISION ORDER APPLIES

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

19. **Site verification certificates**

Whether there is a current site verification certificate, of which the council is aware, in respect of the land?

NO

20. Loose-fill asbestos insulation

Whether the land includes any residential premises (within the meaning of Division 1A of Part 8 of the *Home Building Act 1989*) that are listed on the register that is required to be maintained under that Division?

NO

21. Affected building notices and building product rectification orders

Whether there is any affected building notice of which the council is aware that is in force in respect of the land?

NO

Note: ***affected building notice*** has the same meaning as in the *Building Products (Safety) Act 2017.*
Building product rectification order has the same meaning as in the *Building Products (Safety) Act 2017.*

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

(a) that the land to which the certificate relates is significantly contaminated land within the meaning of the Act - if the land (or part of the land) is significantly contaminated land at the date when the certificate is issued,

NO

(b) that the land to which the certificate relates is subject to a management order within the meaning of the Act – if it is subject to such an order at the date when the certificate is issued,

NO

(c) that the land to which the certificate relates is the subject of an approved voluntary management proposal within the meaning of that Act – if it is the subject of such an approved proposal at the date when the certificate is issued,

NO

(d) that the land to which the certificate relates is subject to an ongoing maintenance order within the meaning of the Act – if it is subject to such an order at the date when the certificate is used,

NO

(e) that the land to which the certificate relates is the subject of a site audit statement within the meaning of the Act – if a copy of such a statement has been provided at any time to the local authority issuing the certificate.

NO

THIS PART IS DIRECTED TO THE FOLLOWING MATTERS PRESCRIBED UNDER SECTION 10.7 (5) OF THE ABOVE ACT

NOTE: "When information pursuant to Section 10.7 (5) is requested the council is under no obligation to furnish any of the information supplied herein pursuant to that Section. Council draws your attention to Section 10.7 (6), which states that a council shall not incur any liability in respect of any advice provided in good faith pursuant to sub-section (5). The absence of any reference to any matter affecting the land shall not imply that the land is not affected by any matter not referred to in this certificate."

A. Whether a resolution to prepare a Planning Proposal applies to the land?

NO

B. Whether there are draft amendments to the Hornsby Development Control Plan that are on exhibition, have been exhibited or have been adopted by Council for exhibition applying to the land?

NO

C. Whether there are any provisions applying to the land that control the management of trees and vegetation?

YES

Tree and Vegetation Preservation Provisions contained within the SEPP (Vegetation in Non-Rural Areas) 2017 and Hornsby DCP apply to the land.

Note: SEPP (Vegetation in Non-Rural Areas) 2017 can be viewed on the NSW Legislation website at: www.legislation.nsw.gov.au and the Hornsby DCP can be viewed on Council's website hornsby.nsw.gov.au/hdcp or at Council's Administration Building.

D. Whether there are any provisions within the Hornsby LEP applying to the land that controls the management of biodiversity?

NO

E. Whether there are any provisions applying to the land within the Hornsby Local Environmental Plan that control development within a foreshore area?

NO

F. Whether Council has adopted a Voluntary Planning Agreement within the meaning of S93F of the Environmental Planning and Assessment Act, 1979, as amended, in relation to the land?

NO

G. Whether the land is within or adjacent to the North West Rail Link as identified on the maps provided by Transport NSW?

NO

H. Whether the land is subject to the North West Rail Link Corridor Strategy prepared by the Department of Planning and Infrastructure?

NO

I. Whether the land is within or adjacent to an existing rail corridor?

NO

J. Whether the land is in a rural area or located adjacent to a rural area in which agriculture occurs?

NO

K. Whether Council's records show a history of potentially contaminating land use and the land is zoned:

- Business, Industrial and/or SP2 Infrastructure; or

NO

- RU1 Primary Production, RU2 Rural Landscape, RU4 Primary Production Small Lots or E3 Environmental Management.

NO

- Any other risk

NO

Note: This is NOT a statement on whether or not the property is affected by contamination. Council has a policy on contaminated land which may restrict the development of the land. This policy is implemented when zoning, land use changes or further development is proposed on lands which are contaminated, or have previously been used for certain purposes and the contamination status of the land is uncertain. Accordingly, consideration of Council's policy and the application of provisions under relevant State legislation is warranted. If you have any queries regarding a landowner's obligations in relation to contamination issues, it is recommended that you seek your own independent professional advice.

L. Whether the land is subject to risk of "future" exposure to tidal inundation?

NO

M. Whether the land is within or adjacent to the NorthConnex motorway link corridor as identified on the maps provided by the NorthConnex project team?

YES

Note: Any enquiries on the NorthConnex motorway link should be directed to the NorthConnex project team on 1800 997 057 or enquiries@northconnex.com.au

N. Whether there is potential for loose-fill asbestos insulation to be found on properties that are not listed on the NSW Department of Fair Trading's Loose-Fill Asbestos Public Register

YES

Note: Some residential homes located in Hornsby Shire have been identified as containing loose-fill asbestos insulation in the roof space. The NSW Department of Fair Trading maintains a Public Register of homes that are affected by loose-fill asbestos insulation.

You should make your own enquiries as to the age of the buildings on the land to which this certificate relates, and if it contains a building construction prior to 1980, it is recommended that any potential purchaser obtain advice from a licensed asbestos assessor to determine whether loose-fill asbestos is present in any building on the land and, if so, the risk (if any) this may pose for the building's occupants.

Further information can be obtained by contacting the NSW Department of Fair Trading and viewing the Department's website.

O. Whether there is potential for external combustible cladding to be found on multi-storey buildings on properties in Hornsby Shire?

YES

Note: Some buildings located in Hornsby Shire have been identified as containing combustible cladding. Combustible cladding is a material that is capable of readily burning.

You should make your own enquiries as to the type of materials that have been used to construct the building. It is recommended that the purchaser obtain a building report from an appropriately qualified person to determine if any cladding type material may pose a risk to the building's occupants. Council may issue orders to rectify a building where combustible cladding is found.

Steven Head

General Manager per

PLEASE NOTE: COUNCIL RETAINS THE ELECTRONIC ORIGINAL OF THIS CERTIFICATE.

WHERE THIS CERTIFICATE REFERS TO INFORMATION DISPLAYED ON COUNCIL'S WEBSITE OR TO ANY EXTERNAL WEBSITE, IT REFERS TO INFORMATION DISPLAYED ON THE WEBSITE ON THE DATE THIS CERTIFICATE IS ISSUED.

Hornsby Local Environmental Plan 2013 - Land Use Table

Zone R2Low Density Residential

1Objectives of zone

- To provide for the housing needs of the community within a low density residential environment.
- To enable other land uses that provide facilities or services to meet the day to day needs of residents.

2Permitted without consent

Environmental protection works; Home occupations

3Permitted with consent

Boarding houses; Building identification signs; Business identification signs; Centre-based childcare facilities; Community facilities; Dwelling houses; Educational establishments; Emergency services facilities; Exhibition homes; Flood mitigation works; Group homes; Home-based child care; Home businesses; Information and education facilities; Places of public worship; Public administration buildings; Recreation areas; Recreation facilities (outdoor); Respite day care centres; Roads; Tourist and visitor accommodation; Veterinary hospitals; Water reticulation systems

4Prohibited

Backpackers' accommodation; Farm stay accommodation; Hotel or motel accommodation; Serviced apartments; Any other development not specified in item 2 or 3

SafeWork NSW Records

NSW GOVERNMENT | SafeWork NSW

Locked Bag 2906, Lisarow NSW 2252
Customer Experience 13 10 50
ABN 81 913 830 179 | www.safework.nsw.gov.au

Our Ref: D19/062203

31 January 2019

Environmental Investigation Services
Harry Leonard
PO BOX 976
NORTH RYDE BC NSW 1670

Dear Mr Leonard

RE SITE: Lot 3 Pennant Hills Rd, Normanhurst NSW

I refer to your site search request received by SafeWork NSW on 15 January 2019 requesting information on Storage of Hazardous Chemicals for the above site.

Enclosed are copies of the documents that SafeWork NSW holds on record number 35/034456 relating to the storage of Hazardous Chemicals at the above-mentioned premises.

For further information or if you have any questions, please call us on 13 10 50 or email licensing@safework.nsw.gov.au

Yours sincerely

Customer Service Officer
Customer Experience - Operations
SafeWork NSW

Application for Licence to Keep Dangerous Goods

WorkCover NEW SOUTH WALES

expiry 7/6/2001.

Application for ☒ **new licence** ☐ **amendment** ☒ **transfer** ☐ **renewal of expired licence**

PART A – Applicant and site information See page 2 of Guidance Notes.

1 Name of applicant | ACN

LORETO NORMANHURST ASSOCIATION INCORPORATED | —

2 Postal address of applicant | Suburb/Town | Postcode

93 PENNANT HILLS ROAD | NORMANHURST | 2076

3 Trading name or site occupier's name

LORETO NORMANHURST

4 Contact for licence inquiries

Phone | Fax | Name

(02) 9487 3485 | (02) 9489 2348 | ROBERT HOGG

5 Previous licence number (if known) 35/ 03 4456

6 Previous occupier (if known)

licence issued 17/6/00

7 Site to be licensed

No | Street

93 | PENNANT HILLS ROAD

Suburb / Town | | Postcode

NORMANHURST | NSW | 2076

8 Main business of site SCHOOL

9 Site staffing: Hours per day 9½ Days per week 5

10 Site emergency contact

Phone | Name

(02) 9896 2296 (AH) 0407 905465 | ROBERT HOGG

11 Major supplier of dangerous goods ~~UNKNOWN AT THIS TIME~~ ELITE CHEMICALS

12 If a new site or for amendments to depots – see page 4 of Guidance Notes.

Plan stamped by: | Name of Accredited Consultant | Date stamped

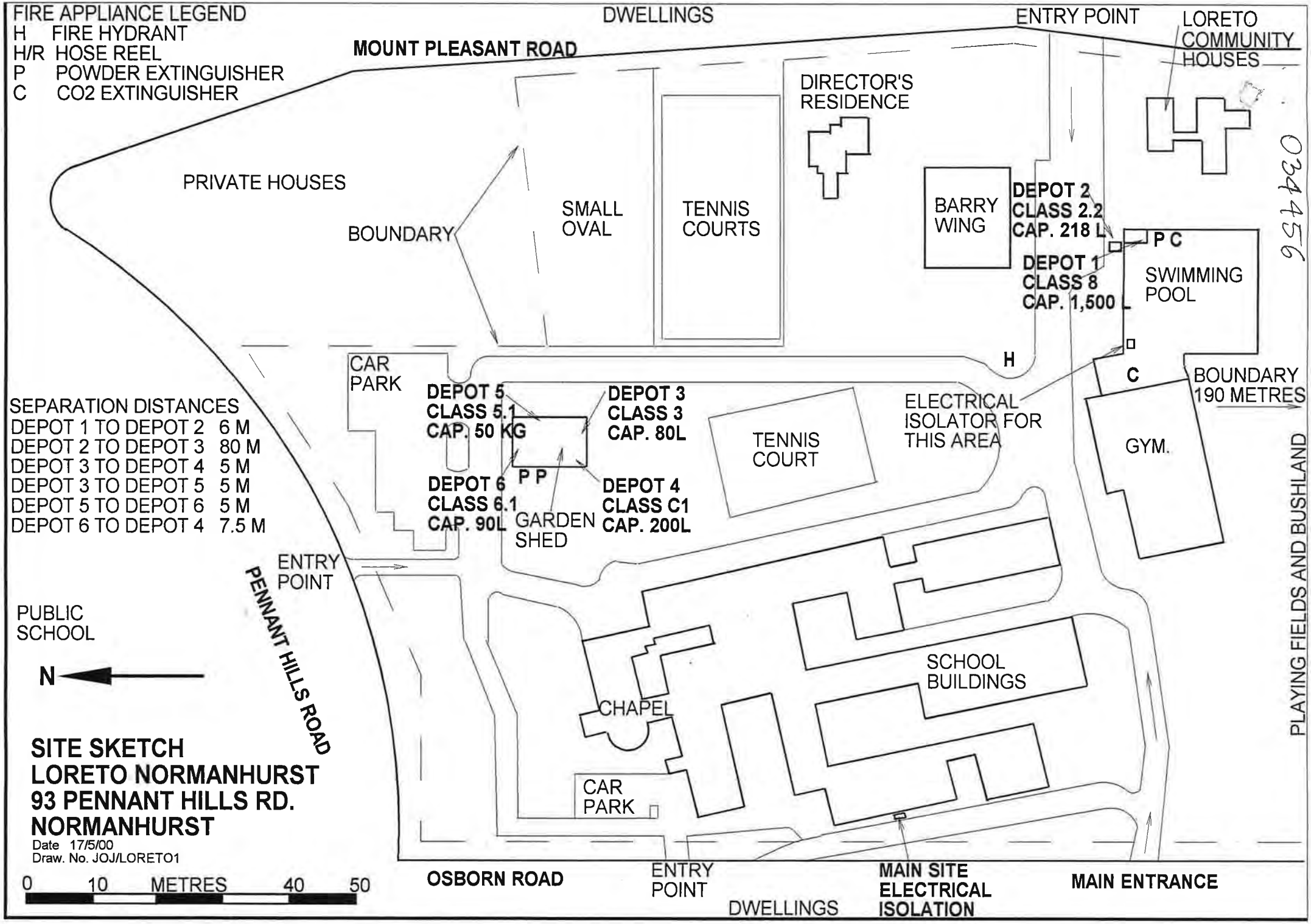
CARAMAN GOODFELLOW | 5/6/00

I certify that the details in this application (including any accompanying computer disk) are correct and cover all licensable quantities of dangerous goods kept on the premises.

13 Signature of applicant | Printed name | Date

R Hogg | ROBERT B. HOGG | 5/6/00

Please send your application, marked *CONFIDENTIAL*, to: **Dangerous Goods Licensing, WorkCover NSW, Level 3, GPO Box 5364, SYDNEY NSW 2001**


FIRE APPLIANCE LEGEND
H FIRE HYDRANT
H/R HOSE REEL
P POWDER EXTINGUISHER
C CO2 EXTINGUISHER
DWELLINGS
ENTRY POINT
LORETO COMMUNITY HOUSES
MOUNT PLEASANT ROAD
DIRECTOR'S RESIDENCE
PRIVATE HOUSES
BOUNDARY
SMALL OVAL
TENNIS COURTS
BARRY WING
DEPOT 2 CLASS 2.2 CAP. 218 L
P C
DEPOT 1 CLASS 8 CAP. 1,500 L
SWIMMING POOL
0344456
CAR PARK
H
C
BOUNDARY 190 METRES
DEPOT 5 CLASS 5.1 CAP. 50 KG
DEPOT 3 CLASS 3 CAP. 80L
ELECTRICAL ISOLATOR FOR THIS AREA
TENNIS COURT
GYM.
P P
DEPOT 6 CLASS 6.1 CAP. 90L
GARDEN SHED
DEPOT 4 CLASS C1 CAP. 200L
SEPARATION DISTANCES
DEPOT 1 TO DEPOT 2 6 M
DEPOT 2 TO DEPOT 3 80 M
DEPOT 3 TO DEPOT 4 5 M
DEPOT 3 TO DEPOT 5 5 M
DEPOT 5 TO DEPOT 6 5 M
DEPOT 6 TO DEPOT 4 7.5 M
ENTRY POINT
PENNANT HILLS ROAD
PUBLIC SCHOOL
N
SCHOOL BUILDINGS
CHAPEL
CAR PARK
PLAYING FIELDS AND BUSHLAND
SITE SKETCH
LORETO NORMANHURST
93 PENNANT HILLS RD.
NORMANHURST
Date 17/5/00
Draw. No. JOJ/LORETO1
0 10 METRES 40 50
OSBORN ROAD
ENTRY POINT
DWELLINGS
MAIN SITE ELECTRICAL ISOLATION
MAIN ENTRANCE

Depot Number	Type of Depot	Depot Class	Maximum Storage Capacity
1	ABOVE GROUND TANK	8	1,500 Litres

UN Number	Proper Shipping Name	Class	PG I,II,III	Product or Common Name	Typical Quantity	Units l,kg
1791	SODIUM HYPOCHLORITE SOLUTION	8	III	SODIUM HYPOCHLORITE	1,000	Lit

Depot Number	Type of Depot	Depot Class	Maximum Storage Capacity
2	ABOVE GROUND TANK	2.2	218 Litres

UN Number	Proper Shipping Name	Class	PG I,II,III	Product or Common Name	Typical Quantity	Units l,kg
1013	CARBON DIOXIDE	2.2		CARBON DIOXIDE	200	Lit

Depot Number	Type of Depot	Depot Class	Maximum Storage Capacity
3	ROOFED STORE	3	80 Litres

UN Number	Proper Shipping Name	Class	PG I,II,III	Product or Common Name	Typical Quantity	Units l,kg
1203	MOTOR SPIRIT	3	I	PETROL	60	Lit

Exempt Depot - for SCID records only

Depot Number	Type of Depot	Depot Class	Maximum Storage Capacity
4	ROOFED STORE	C1	200 Litres

UN Number	Proper Shipping Name	Class	PG I,II,III	Product or Common Name	Typical Quantity	Units l,kg
	DIESEL FUEL	C1		DIESEL FUEL	150	Lit

Exempt Depot - for SCID records only.

Depot Number	Type of Depot	Depot Class	Maximum Storage Capacity
5	ROOFED STORE	5.1	50 Kgs

UN Number	Proper Shipping Name	Class	PG I,II,III	Product or Common Name	Typical Quantity	Units l,kg
1942	AMMONIUM NITRATE	5.1	III	NITRAM	50	Kgs

Exempt Depot - for SCID records only

Depot Number	Type of Depot	Depot Class	Maximum Storage Capacity
6	ROOFED STORE	6.1	50 Litres

UN Number	Proper Shipping Name	Class	PG I,II,III	Product or Common Name	Typical Quantity	Units l,kg
2902	ENDOTHAL	6.1	III	ENDOTHAL	1	Lit
3082	BROMOXYNIL + MCPA	6.1	III	BINDI KILLER	1	Lit
3017	FENTHION	6.1	III	LEBAYCID	1	Lit
1950	OMETHOATE	6.1	III	FOLIMAT 50	1	Lit
3021	TRIFORINE + DIMETHYL FORMAMIDE	6.1	III	ROSE FUNGACIDE	2	Lit
2783	FENAMIPHOS	6.1	III	LAWN BETTLE KILLER	1	Kg
2757	CARBARYL	6.1	III	CARBARYL	1	Kg
3017	DIMETHOATE	6.1	III	ROGOR 400	2	Lit
3017	DIAZINON	6.1	III	LAWN GRUB + INSECT KILLER	1	Lit
1325	BENOMYL	6.1	III	BENLATE	1	Kg

12 Kg/Lit

Exempt Minor Storage - Recorded for SCID information only

3017 4L.

2000/00V509

437 f | 3012

Licence No. 35/034456

APPLICATION FOR RENEWAL

OF LICENCE TO KEEP DANGEROUS GOODS

ISSUED UNDER AND SUBJECT TO THE PROVISIONS OF THE DANGEROUS GOODS ACT, 1975 AND REGULATION THEREUNDER

DECLARATION: Please renew licence number 35/034456 to 6/06/2005 . I confirm that all the licence details shown below are correct (amend if necessary).

..... DAVID COLLINS 6/6/04

(Signature) *(Please print name)* *(Date signed)*

for: LORETO NORMANHURST ASSOCIATION INCORP

*THIS **SIGNED** DECLARATION SHOULD BE **RETURNED TO:***

WorkCover New South Wales
Dangerous Goods Licensing Section
LOCKED BAG 2906
LISAROW NSW 2252

Enquiries:ph (02) 43215500
fax (02) 92875500

Details of licence on 29 April 2004

Licence Number 35/034456 **Expiry Date** 6/06/2004

Licensee LORETO NORMANHURST ASSOCIATION INCORP

RECEIVED SERVICE CENTRE 21 JUN 2004 WORKCOVER NEW SOUTH WALES

Postal Address: 93 PENNANT HILLS RD NORMANHURST NSW 2076

Licensee Contact ROBERT HOGG Ph. 02 94873488 Fax. 02 9487 2348

Premises Licensed to Keep Dangerous Goods
LORETO NORMANHURST ASSOCIATION INCORP
93 PENNANT HILLS RD NORMANHURST 2076

Nature of Site SCHOOL EDUCATION

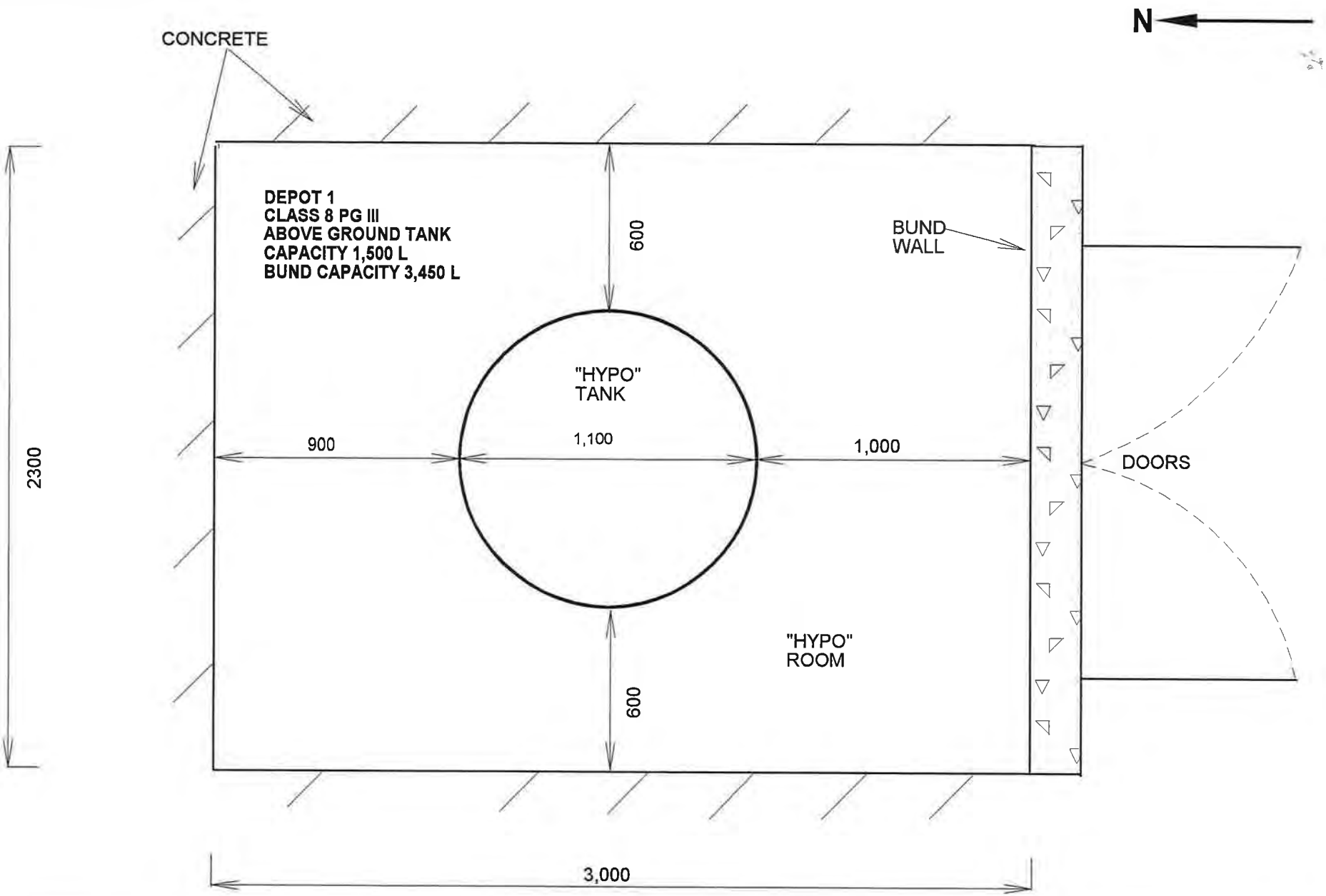
Major Supplier of Dangerous Goods ELITE CHEMICALS

Emergency Contact for this Site ~~ROBERT HOGG(0407 905 465) Ph. 02 9896 2296~~ GRAEME HARON 0400385144 Ph 94892646

Site staffing 9 1/2 HRS 5 DAYS

Details of Depots

Depot No.	Depot Type	Goods Stored in Depot		Qty
1	**ABOVE-GROUND TANK**	**Class 8**	**1500 L**	
	UN 1791 HYPOCHLORITE SOLUTION			1000 L
2	**ABOVE-GROUND TANK**	**Class 2.2**	**218 L**	
	UN 1013 CARBON DIOXIDE			200 L
3	**ROOFED STORE**	**Class 3**	**80 L**	
	UN 1203 PETROL		60 L	
4	**ROOFED STORE**	**Class C1**	**200 L**	
	UN 00C1 DIESEL		150 L	
5	**ROOFED STORE**	**Class 5.1**	**50 KG**	
	UN 1942 AMMONIUM NITRATE			50 KG
6	**ROOFED STORE**	**Class 6.1**	**50 L**	
	UN 1325 FLAMMABLE SOLID, ORGANIC, N.O.S.			1 KG
	UN 1950 AEROSOLS		1 L	
	UN 2757 CARBAMATE PESTICIDE, SOLID, TOXIC			1 KG
	UN 2783 ORGANOPHOSPHORUS PESTICIDE, SOLID, TOXIC			1 KG
	UN 2902 PESTICIDE, LIQUID, TOXIC, N.O.S.			1 L
	UN 3017 ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC, FL			4 L
	UN 3021 PESTICIDE, LIQUID, FLAMMABLE, TOXIC, N.O.S.			2 L
	UN 3082 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID,			1 L

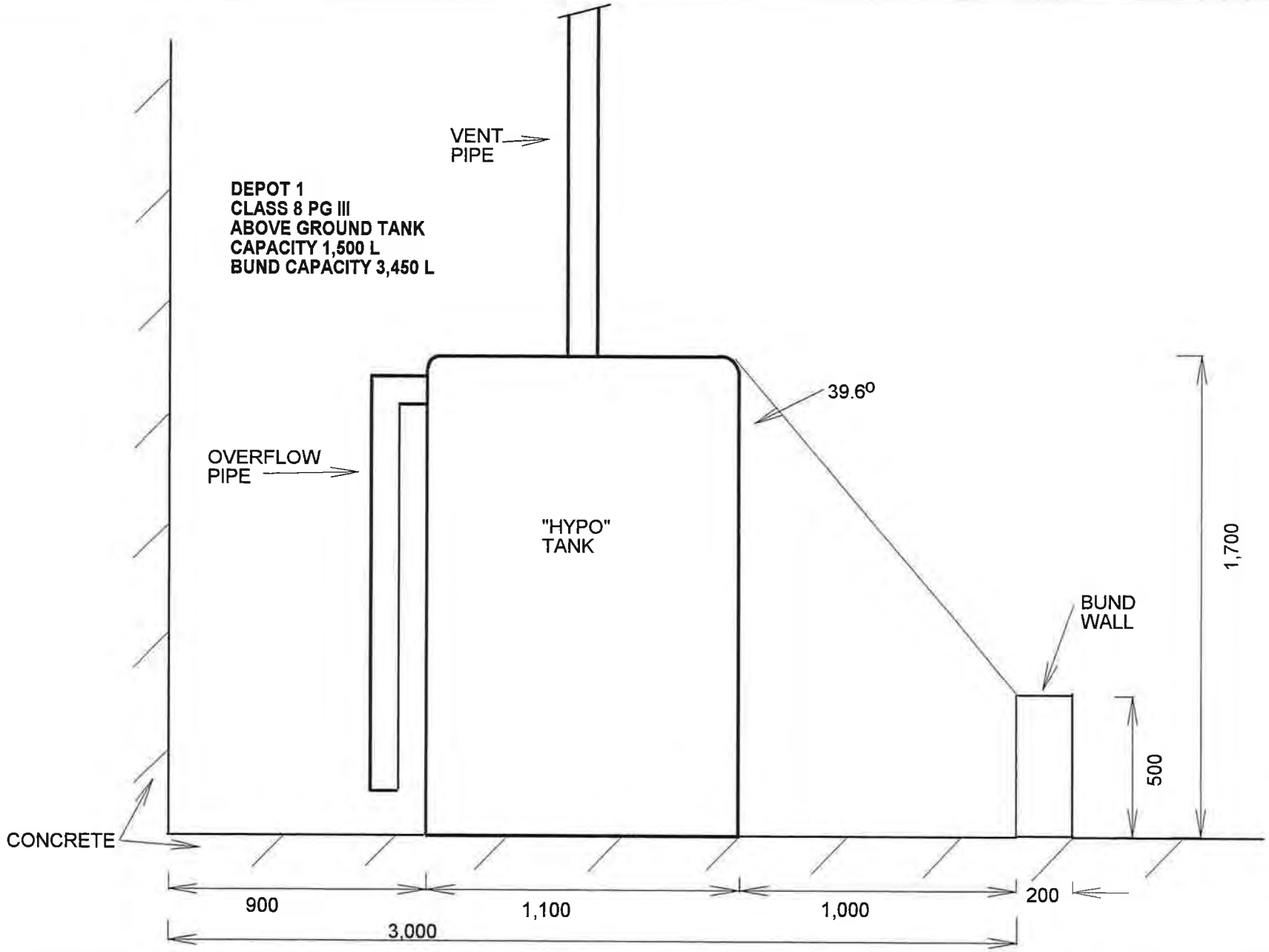


G R GOODFELLOW PTY LTD
58 Coolawin Road Northbridge NSW 2063
ABN 33/001 179 246 Ph 9958 1909 Fax 9958 0019

LORETO NORMANHURST
DEPOT 1
"HYPO" ROOM PLAN

Drawn JOJackson
Scale 1:20 Date 22/5/00

Drawing No.
JOJ/LORETO 2A

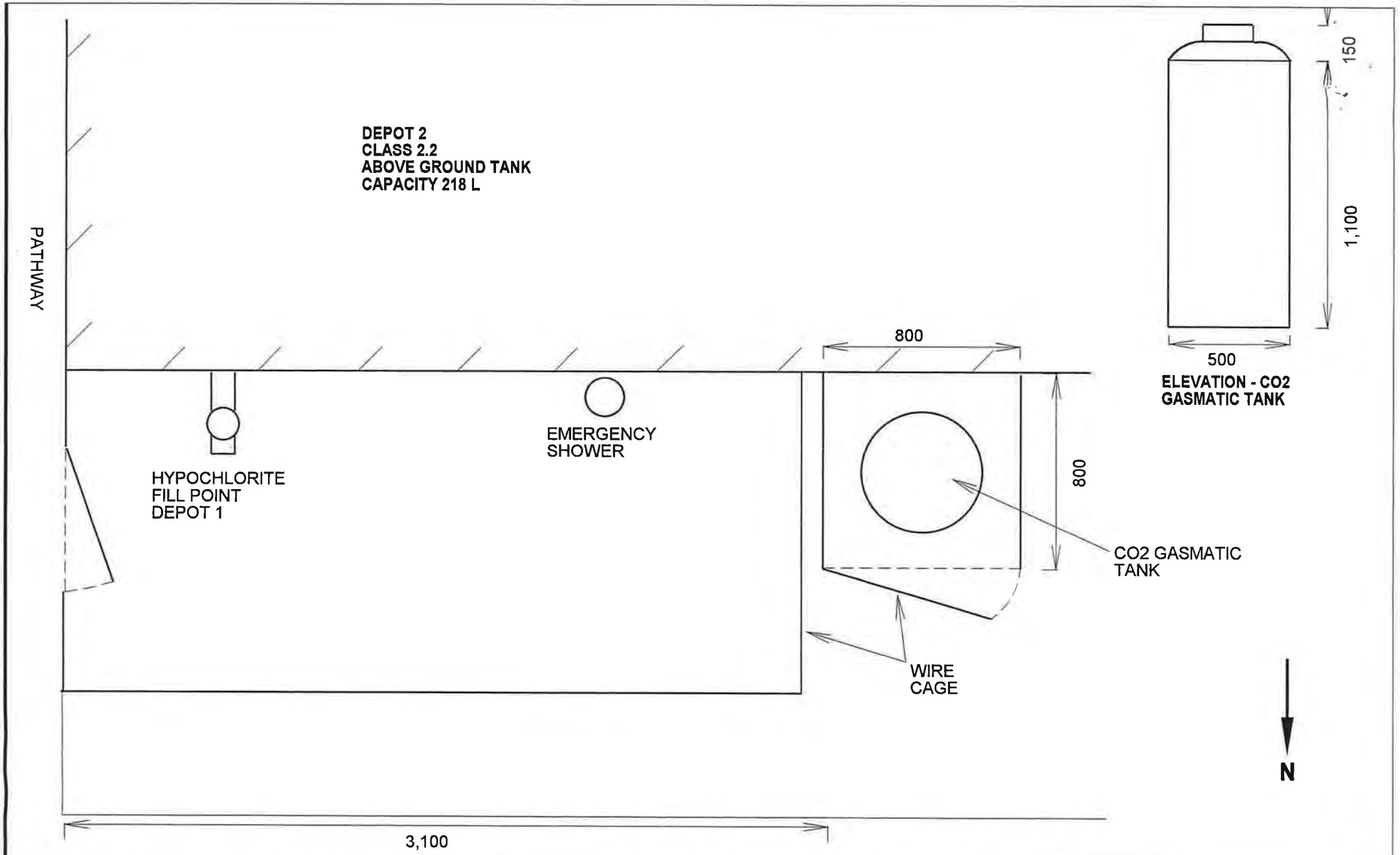


G R GOODFELLOW PTY LTD
58 Coolawin Road Northbridge NSW 2063
ABN 33/001 179 246 Ph 9958 1909 Fax 9958 0019

LORETO NORMANHURST
DEPOT 1
"HYPO" ROOM ELEVATION

Drawn JOJackson
Scale 1:20 Date 22/5/00

Drawing No.
JOJ/LORETO3A

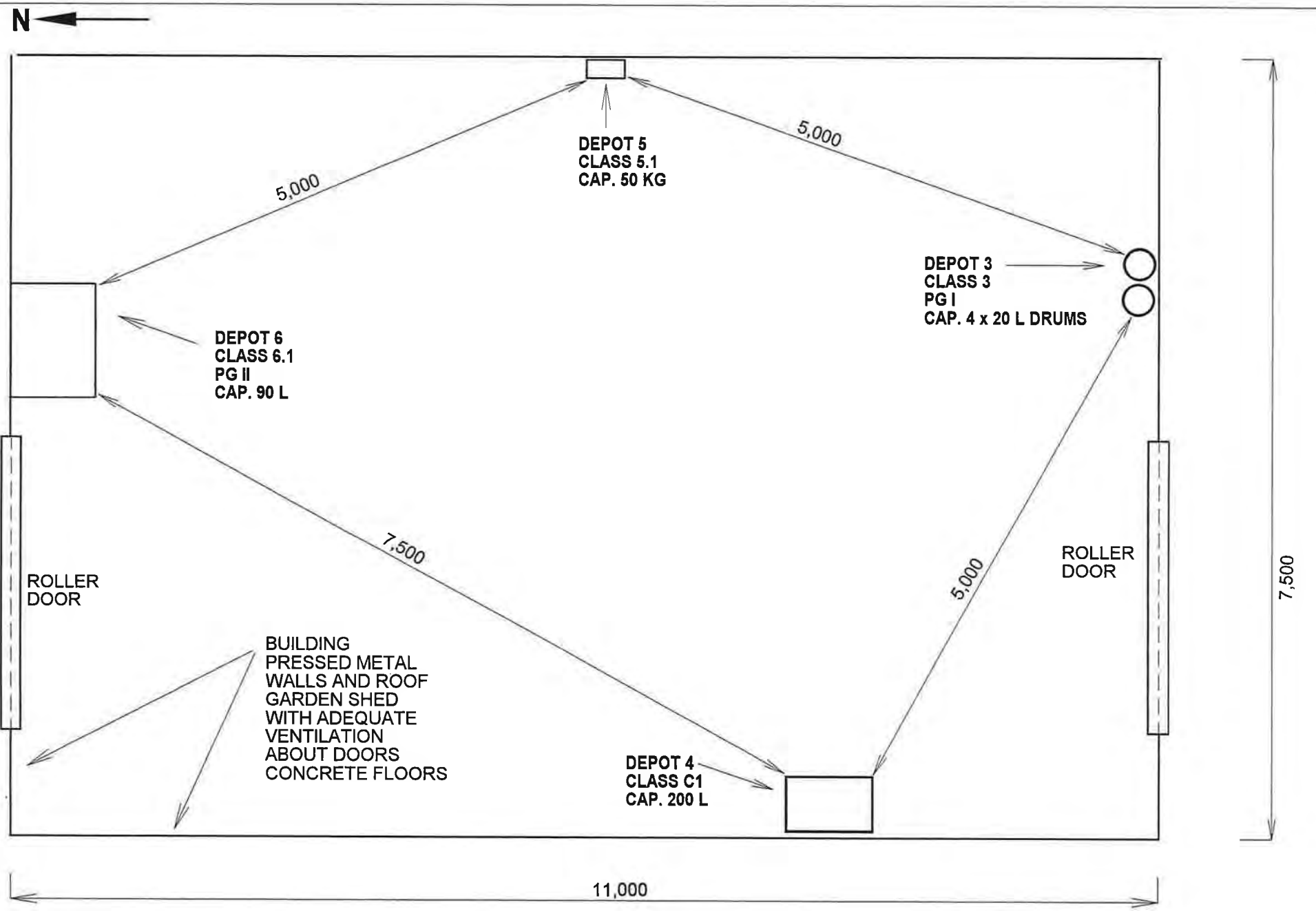


G R GOODFELLOW PTY LTD
58 Coolawin Road Northbridge NSW 2063
ABN 33/001 179 246 Ph 9958 1909 Fax 9958 0019

LORETO NORMANHURST
DEPOT 2
CO2 STORAGE

Drawn JOJackson
Scale 1:20 Date 22/5/00

Drawing No.
JOJ/LORETO 4A



G R GOODFELLOW PTY LTD
58 Coolawin Road Northbridge NSW 2063
ABN 33/001 179 246 Ph 9958 1909 Fax 9958 0019

LORETO NORMANHURST
DEPOT 3,4,5 and 6
MAINTENANCE SHED

Drawn JOJackson
Scale 1:50 Date 22/5/00

Drawing No.
JOJ/LORETO 5A

Appendix D: Borehole Logs

JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 1
1 / 2

BOREHOLE LOG

Client: TTW

Project: PROPOSED NEW SCHOOL BUILDING

Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: 31772L **Method:** SPIRAL AUGER **R.L. Surface:** ~181.2 m

Date: 5/9/18 **Datum:** AHD

Plant Type: JK308 **Logged/Checked By:** A.B./L.S.

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 AUGERING	■			■		181				FILL: Silty clay, low plasticity, dark brown, trace of roots.				GRASS COVER
									-	Extremely Weathered siltstone: silty CLAY, medium plasticity, light grey, with ironstone and dark grey low strength siltstone bands.	XW	(Hd)		ASHFIELD SHALE
	■			■			1							LOW TO MODERATE BANDS OF RESISTANCE
						180				REFER TO CORED BOREHOLE LOG				
							2							
						179								
							3							
						178								
							4							
						177								
							5							
						176								
							6							
						175								

JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 1
2 / 2

CORED BOREHOLE LOG

Client: TTW
Project: PROPOSED NEW SCHOOL BUILDING
Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: 31772L | **Core Size:** NMLC | **R.L. Surface:** ~181.2 m
Date: 5/9/18 | **Inclination:** VERTICAL | **Datum:** AHD
Plant Type: JK308 | **Bearing:** N/A | **Logged/Checked By:** A.B./L.S.

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 $I_s(50)$	DEFECT DETAILS: SPACING (mm)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
					START CORING AT 1.20m						
100% RETURN		180			NO CORE 1.09m						
			2								
		179			SILTSTONE: dark grey and light grey, bedded subhorizontally.	XW - HW	Hd - VL				Ashfield Shale
			3		SILTSTONE: dark grey, bedded subhorizontally.	HW	VL - L	0.20		(2.92m) J, 90°, P, R, Fe Sn (3.13m) J, 90°, P, S, Cn (3.18m) J, 10°, P, S, Fe Sn	
		178				XW	Hd			(3.30m) J, 90°, P, R, Cn	
					NO CORE 0.18m						
					SILTSTONE: light grey and dark grey, with iron indurated and low strength bands.	XW	Hd				Ashfield Shale
			4		NO CORE 0.31m						
		177			SILTSTONE: dark grey, with iron indurated bands bedded subhorizontally.	HW	VL - L	0.20		(4.33m) J, 50°, P, S, Fe Sn (4.39m) J, 30 - 90°, P, S, Fe Sn (4.45m) XWS, 0°, 7 mm.t (4.57m) J, 30°, P, S, Fe Sn (4.65m) XWS, 0°, 60 mm.t (4.71m) J, 50°, P, S, Fe Sn (4.75m) XWS, 0°, 70 mm.t (4.84m) J, 60 - 90°, P, S, Fe Sn (4.91m) Be, 0°, P, R, Cn (5.04m) XWS, 0°, 70 mm.t (5.12m) J, 90°, P, R, Cn	Ashfield Shale
			5								
		176				XW	Hd				
0% RETURN					NO CORE 0.07m	XW	Hd				Ashfield Shale
			6		SILTSTONE: orange brown and light grey, with clay seams.	SW	H	0.30		(5.71m) Be, 0°, P, S, Cn	
		175			SANDSTONE: fine to medium grained, orange brown.	FR		1.7			Hawkesbury Sandstone
					as above, but light grey with dark grey bands, bedded subhorizontally.			1.3		(6.54m) J, 80°, P, R, Cn	
			7					1.1			
		174						1.7			

END OF BOREHOLE AT 7.90 m

FRACTURES NOT MARKED ARE CONSIDERED TO BE DRILLING AND HANDLING BREAKS

JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 2
1 / 2

BOREHOLE LOG

Client: TTW
Project: PROPOSED NEW SCHOOL BUILDING
Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: 31772L **Method:** SPIRAL AUGER **R.L. Surface:** ~183.8 m
Date: 5/9/18 **Datum:** AHD
Plant Type: JK308 **Logged/Checked By:** A.B./L.S.

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 AUGERING	■								-	ASPHALTIC CONCRETE: 40mm.t FILL: Silty gravelly sand, fine to coarse grained, dark grey, fine to medium grained igneous gravel.	M			APPEARS MODERATELY COMPACTED
					N=SPT 5/ 20mm REFUSAL	183	1			FILL: Gravelly sand, fine to coarse grained, light brown, fine to coarse grained, grey igneous gravel.				
									CH	Silty CLAY: high plasticity, light grey and grey, trace fine to medium grained ironstone gravel.	w>PL	VSt - Hd		
	■			■	N = 15 6,4,11	182	2						460 400 360	
				■					-	Extremely Weathered siltstone: silty CLAY, medium plasticity, grey with ironstone and low strength bands.	XW	Hd		ASHFIELD SHALE VERY LOW 'TC' BIT RESISTANCE
						181	3							
										REFER TO CORED BOREHOLE LOG				
						180	4							
						179	5							
						178	6							
						177								

JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 2

CORED BOREHOLE LOG

Client: TTW

Project: PROPOSED NEW SCHOOL BUILDING

Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: 31772L | **Core Size:** NMLC | **R.L. Surface:** ~183.8 m

Date: 5/9/18 | **Inclination:** VERTICAL | **Datum:** AHD

Plant Type: JK308 | **Bearing:** N/A | **Logged/Checked By:** A.B./L.S.

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 $I_s(50)$	DEFECT DETAILS: SPACING (mm)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
					START CORING AT 3.26m						
100% RETURN		180			NO CORE 0.63m						
		179	4		SILTSTONE: dark grey, with iron indurated bands, bedded subhorizontally.	HW	VL	0.10	600 200 60 20	(3.91m) XWS, 0°, 20 mm.t (3.92m) J, 70°, P, R, Cn (4.00m) XWS, 0°, 40 mm.t (4.07m) J, 60°, P, R, Cn (4.11m) XWS, 0°, 10 mm.t (4.18m) J, 90°, P, R, Fe Sn (4.24m) CS, 0°, 15 mm.t (4.32m) J, 90°, P, R, Cn (4.41m) J, 90°, P, R, Cn (4.45m) CS, 0°, 5 mm.t (4.54m) J, 60 - 90°, P, R, Cn, XWS IN FILL (4.64m) XWS, 0°, 70 mm.t (4.77m) Be, 0°, P, R, Fe Sn (4.89m) J, 90°, P, R, Fe Sn (4.97m) CS, 0°, 15 mm.t	Ashfield Shale
			5					0.10		(5.16m) J, 90°, P, R, Fe Sn (5.26m) Be, 0°, P, S, Cn, XWS, IN FILL	
						XW	Hd			(5.45m) CS, 0°, 55 mm.t	
		178	6		NO CORE 0.38m						
80% RETURN		177			SILTSTONE: dark grey, bedded subhorizontally.	MW	VL - L	0.050	600 200 60 20	(6.14m) J, 90°, P, R, Cn (6.20m) J, 90°, P, R, Cn	Ashfield Shale
			7				L	0.10		(6.47m) CS, 0°, 4 mm.t (6.49m) J, 90°, P, R, Cn (6.54m) Be, 0°, P, S, Fe Sn (6.70m) J, 20°, P, S, Fe Sn (6.75m) J, 30°, P, S, Fe Sn (6.92m) CS, 0°, 1 mm.t (7.04m) J, 90°, P, R, Cn, WITH XWS SEAM, 25mm.t	
								0.30		(7.30m) J, 70°, P, R, Cn (7.34m) CS, 0°, 1 mm.t (7.38m) Be, 0°, P, R, Cn (7.44m) J, 20°, P, S, Cn (7.59m) J, 90°, P, R, Cn, WITH XWS SEAM, 30mm.t	
		176					M	0.50		(7.81m) J, 40 - 90°, Un, S, Cn	
			8							(7.96m) J, 90°, P, R, Cn	
										(8.17m) J, 90°, P, R, Cn (8.31m) XWS, 0°, 30 mm.t	
					NO CORE 0.14m						
		175			SILTSTONE: dark grey with light grey bands, bedded subhorizontally.	FR	H	0.40	600 200 60 20	(8.57m) J, 70°, P, S, Cn (8.70m) J, 30°, P, R, Cn (8.76m) J, 30°, Un, S, Cn	Ashfield Shale
			9					1.5		(8.96m) J, 20°, P, S, Cn	
								1.8		(9.17m) J, 20°, P, S, Cn (9.29m) J, 80°, P, S, Cn	
					as above, but bedded at 10°.						
		174						2.2		(9.80m) J, 70°, P, S, Cn	

END OF BOREHOLE AT 9.90 m

FRACTURES NOT MARKED ARE CONSIDERED TO BE DRILLING AND HANDLING BREAKS

JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 3
1 / 3

BOREHOLE LOG

Client: TTW

Project: PROPOSED NEW SCHOOL BUILDING

Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: 31772L **Method:** SPIRAL AUGER **R.L. Surface:** ~189.6 m

Date: 6/9/18 **Datum:** AHD

Plant Type: JK308 **Logged/Checked By:** A.B./L.S.

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 AUGERING										FILL: Silty sandy clay, low plasticity, dark brown, fine to medium grained, trace fine to medium grained igneous gravel.	w<PL			GRASS COVER
									CH	Silty CLAY; high plasticity, orange brown.	w>PL	VSt - Hd		RESIDUAL
					N = 16 3,6,10	189				as above, but light grey with fine to coarse grained ironstone gravel, trace of fine to coarse grained very low strength siltstone gravel.		Hd	440 320 470	
							1		-	Extremely Weathered siltstone: silty CLAY, medium plasticity, light grey, with ironstone and very low to low strength bands.	XW	Hd		ASHFIELD SHALE
						188					XW - DW	Hd - VL		VERY LOW TO LOW 'TC' BIT RESISTANCE
							2							
						187								
							3							
						186				SILTSTONE: grey brown and dark grey, with iron indurated bands and extremely weathered seams.	DW	VL - L		LOW RESISTANCE
							4							
										REFER TO CORED BOREHOLE LOG				Groundwater monitoring well installed to 12.67m. Class 18 machine slotted 50mm dia. PVC standpipe 6.67m to 12.67m. Casing 0.1m to 6.67m. 2mm sand filter pack 5.70m to 12.67m. Bentonite seal 1.25m to 5.70m. Completed with a concreted gatic cover
						185								
							5							
						184								
							6							
						183								

JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 3
2 / 3

CORED BOREHOLE LOG

Client: TTW

Project: PROPOSED NEW SCHOOL BUILDING

Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: 31772L | **Core Size:** NMLC | **R.L. Surface:** ~189.6 m

Date: 6/9/18 | **Inclination:** VERTICAL | **Datum:** AHD

Plant Type: JK308 | **Bearing:** N/A | **Logged/Checked By:** A.B./L.S.

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 $I_s(50)$	DEFECT DETAILS SPACING (mm)	DEFECT DETAILS DESCRIPTION Type, orientation, defect roughness and shape, defect coatings and seams, openness and thickness Specific / General	Formation
					START CORING AT 4.34m						
		185			NO CORE 0.52m						
			5		SILTSTONE: light grey.	XW	Hd				
					SILTSTONE: dark grey, with iron indurated bands, bedded subhorizontally.	MW	VL - L	0.30 0.030 0.060 0.080		(5.02m) J, 90°, P, S, Fe Sn (5.16m) Be, 0°, P, S, Fe Sn (5.23m) Be, 0°, P, S, Fe Sn (5.38m) XWS, 0°, 12 mm.t (5.45m) CS, 0°, 4 mm.t (5.49m) Be, 0°, P, S, Fe Sn (5.60m) J, 90°, P, S, Fe Sn (5.68m) J, 60°, P, R, Fe Sn (5.73m) J, 90°, P, R, Cn (5.76m) CS, 0°, 3 mm.t (5.78m) CS, 0°, 2 mm.t (5.91m) J, 60°, P, S, Fe Sn (6.02m) CS, 0°, 20 mm.t (6.10m) Be, 0°, P, S, Fe Sn (6.18m) XWS, 0°, 30 mm.t (6.30m) J, 20°, P, R, Cn (6.32m) CS, 0°, 5 mm.t (6.36m) J, 90°, P, S, Cn (6.41m) XWS, 0°, 30 mm.t (6.58m) J, 90°, P, S, Fe Sn (6.70m) J, 90°, P, S, Fe Sn (6.90m) J, 90°, P, R, Cn (7.02m) XWS, 0°, 30 mm.t (7.07m) XWS, 0°, 10 mm.t	Ashfield Shale
		184	6								
		183	7								
ON 9/10/18					NO CORE 0.37m						
100% RETURN		182			SILTSTONE: dark grey with light grey bands, bedded subhorizontally.	MW	L - M	0.40 0.50 0.30 0.20 0.20	600 200 60 20	(7.51m) Be, 0°, P, S, Fe Sn (7.60m) Healed J, 70-80°, P (7.85m) J, 90°, P, S, Fe Sn (8.03m) J, 90°, P, S, Fe Sn (8.13m) J, 20°, P, S, Fe Sn (8.24m) J, 60°, P, S, Fe Sn (8.32m) J, 90°, P, R, Cn (8.42m) J, 90°, P, R, Cn (8.50m) J, 10°, P, S, Fe Sn (8.67m) J, 60°, P, S, Cn (8.73m) J, 10°, P, S, Cn (8.76m) XWS, 0°, 4 mm.t (8.83m) Healed J, 90°, P (8.88m) XWS, 0°, 25 mm.t (8.96m) XWS, 0°, 10 mm.t (9.02m) J, 30°, P, S, Cn (9.04m) Be, 0°, P, S, Cn (9.12m) J, 90°, P, S, Cn (9.30m) J, 90°, P, S, Cn (9.38m) Healed J, 40°, P (9.42m) J, 50°, P, R, Cn, XWS FILLED (9.45m) Healed J. 40°, P (9.57m) J, 90°, P, R, Cn (9.86m) Healed J, 80°-90°, Un (9.88m) J, 30°, P, R, Fe Sn (9.99m) J, 30°, P, S, Fe Sn	Ashfield Shale
		181	8								
		180	9								
			10		NO CORE 0.16m						
		179			SILTSTONE: dark grey, bedded subhorizontally.	MW	L	0.30 0.20	60 20	(10.27m) J, 60 - 90°, Un, R, Fe Sn (10.37m) J, 30°, P, S, Fe Sn (10.43m) CS, 0°, 2 mm.t (10.46m) J, 90°, P, R, Cn (10.52m) XWS, 0°, 50 mm.t (10.57m) J, 10°, P, S, Cn (10.81m) J, 90°, P, S, Fe Sn (10.92m) J, 80°, P, R, Cn	Ashfield Shale

FRACTURES NOT MARKED ARE CONSIDERED TO BE DRILLING AND HANDLING BREAKS

JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No.
3
3 / 3

CORED BOREHOLE LOG

Client: TTW

Project: PROPOSED NEW SCHOOL BUILDING

Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: 31772L | **Core Size:** NMLC | **R.L. Surface:** ~189.6 m

Date: 6/9/18 | **Inclination:** VERTICAL | **Datum:** AHD

Plant Type: JK308 | **Bearing:** N/A | **Logged/Checked By:** A.B./L.S.

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 $I_s(50)$	DEFECT DETAILS: SPACING (mm)	DEFECT DETAILS: DESCRIPTION (Type, orientation, defect roughness and shape, defect coatings and seams, openness and thickness) Specific / General	Formation
100% RETURN		178	12		SILTSTONE: dark grey, bedded subhorizontally.	MW	L - M	0.20	600 200 60 20	(11.12m) XWS, 0°, 25 mm.t (11.20m) J, 80°, P, S, Cn (11.27m) XWS, 0°, 70 mm.t	
					NO CORE 0.14m						
					SILTSTONE: dark grey, bedded subhorizontally.	MW	L	0.20		(11.46m) J, 30°, P, S, Cn (11.55m) J, 90°, P, S, Cn (11.62m) J, 60 - 90°, Un, S, Cn	Ashfield Shale
						XW - HW	Hd - VL				
						SW	M	0.40		(11.98m) J, 20°, P, S, Cn (12.04m) XWS, 0°, 10 mm.t (12.17m) J, 20°, P, S, Cn (12.21m) J, 10°, P, S, Cn (12.25m) J, 20°, P, S, Cn (12.28m) J, 50°, P, S, Cn (12.39m) J, 30°, P, S, Cn (12.48m) J, 10°, P, S, Cn (12.56m) J, 80°, P, S, Cn	
		177			SILTSTONE: dark grey with light grey bands, bedded at 20°.		M - H	1.0			
					END OF BOREHOLE AT 12.67 m						

FRACTURES NOT MARKED ARE CONSIDERED TO BE DRILLING AND HANDLING BREAKS

JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 4
1 / 3

BOREHOLE LOG

Client: TTW

Project: PROPOSED NEW SCHOOL BUILDING

Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: 31772L **Method:** SPIRAL AUGER **R.L. Surface:** ~186.0 m

Date: 4/9/18 **Datum:** AHD

Plant Type: JK308 **Logged/Checked By:** A.B./L.S.

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 AUGERING	■								CI-CH	Silty CLAY: medium to high plasticity, orange brown.	w<PL	Hd		RESIDUAL
									CH	Silty CLAY: high plasticity, light grey, trace fine to medium grained ironstone gravel.				
					N = 25 6,9,16								>600 >600	
						185	1		-	Extremely Weathered siltstone: silty CLAY, medium plasticity, light grey with ironstone bands and low strength bands.	XW	Hd		ASHFIELD SHALE VERY LOW 'TC' BIT RESISTANCE
						184	2							
				■						SILTSTONE: dark grey, with iron indurated bands.	DW	VL - L		LOW TO MODERATE RESISTANCE
						183	3							
										REFER TO CORED BOREHOLE LOG				
						182	4							
						181	5							
						180	6							

JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 4
2 / 3

CORED BOREHOLE LOG

Client: TTW

Project: PROPOSED NEW SCHOOL BUILDING

Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: 31772L | **Core Size:** NMLC | **R.L. Surface:** ~186.0 m

Date: 4/9/18 | **Inclination:** VERTICAL | **Datum:** AHD

Plant Type: JK308 | **Bearing:** N/A | **Logged/Checked By:** A.B./L.S.

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 $I_s(50)$	DEFECT DETAILS SPACING (mm) DESCRIPTION Type, orientation, defect roughness and shape, defect coatings and seams, openness and thickness Specific / General	Formation
					START CORING AT 3.20m					
100% RETURN					NO CORE 0.20m					
		182	4		SILTSTONE: dark grey, with iron indurated bands, bedded subhorizontally.	HW	VL - L	0.070 0.10 0.20	(3.46m) Be, 0°, P, R, Fe Sn (3.50m) CS, 0°, 35 mm.t (3.55m) J, 90°, P, R, Cn (3.60m) XWS, 0°, 20 mm.t (3.75m) XWS, 0°, 130 mm.t (3.91m) XWS, 0°, 70 mm.t (4.03m) XWS, 0°, 100 mm.t (4.12m) Be, 0°, P, S, Cn	Ashfield Shale
					NO CORE 0.69m					
		181	5		SILTSTONE: dark grey, bedded subhorizontally.	HW	VL - L	0.40	(4.90m) XWS, 0°, 50 mm.t (4.97m) J, 20°, P, S, Fe Sn (5.05m) XWS, 0°, 15 mm.t (5.17m) FRAGMENTED ZONE, 0°, 200mm.t (5.31m) J, 90°, P, R, Cn	Ashfield Shale
						XW	Hd			
		180	6			HW	L	0.20 0.30	(5.70m) XWS, 0°, 20 mm.t (5.75m) J, 90°, P, R, Cn (5.82m) J, 80°, P, S, Fe Sn (5.92m) J, 90°, P, S, Fe Sn (5.97m) XWS, 0°, 20 mm.t (6.08m) XWS, 0°, 10 mm.t (6.13m) Be, 0°, P, R, Fe Sn (6.21m) J, 90°, P, R, Cn (6.32m) FRAGMENTED ZONE, 0°, 170mm.t (6.49m) CS, 0°, 150 mm.t	
					NO CORE 0.36m					
50% RETURN		179	7		SILTSTONE: dark grey, bedded subhorizontally.	HW	L	0.40 0.20	(7.05m) FRAGMENTED ZONE, 0°, 100mm.t (7.18m) Be, 0°, P, S, Fe Sn (7.24m) J, 90°, P, R, Cn (7.32m) CS, 0°, 20 mm.t (7.38m) XWS, 0°, 70 mm.t (7.43m) J, 30°, P, S, Fe Sn (7.48m) Be, 0°, P, S, Fe Sn (7.51m) XWS, 0°, 5 mm.t (7.69m) J, 90°, P, R, Clay FILLED (7.77m) J, 90°, P, R, Fe Sn (7.87m) J, 90°, P, S, XWS, Clay FILLED (7.96m) XWS, 0°, 70 mm.t	Ashfield Shale
		178	8						(8.13m) J, 40°, P, R, Fe Sn (8.22m) XWS, 0°, 120 mm.t	
					NO CORE 0.23m					
		177	9		SILTSTONE: dark grey, bedded subhorizontally.	HW	M	0.60	(8.62m) J, 90°, P, R, Fe Sn, FRAGMENTING (8.81m) XWS, 0°, 15 mm.t	Ashfield Shale
						MW		0.70	(8.97m) J, 90°, P, R, Fe Sn, FRAGMENTING (9.03m) XWS, 0°, 3 mm.t (9.17m) CS, 0°, 3 mm.t (9.29m) Be, 0°, P, R, Fe, XWS, FILLED	
					SANDSTONE: fine grained, grey, bedded subhorizontally.	SW	M	0.50	(9.48m) XWS, 0°, 10 mm.t (9.51m) J, 90°, P, S, Cn (9.61m) Be, 0°, P, S, Fe Sn	
					as above, but fine to medium grained, light grey with dark grey bands, bedded subhorizontally.	FR	H	2.3		

JK 9.01.2 LIB:GLB Log, JK CORED BOREHOLE - MASTER 31772L NORMANHURST.GPJ <<DrawingFile>> 25/10/2018 10:27 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: JK 9.01.2 2018-04-02 Prj: JK 9.01.0 2018-03-20

FRACTURES NOT MARKED ARE CONSIDERED TO BE DRILLING AND HANDLING BREAKS

JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No.
4
3 / 3

CORED BOREHOLE LOG

Client: TTW

Project: PROPOSED NEW SCHOOL BUILDING

Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: 31772L | **Core Size:** NMLC | **R.L. Surface:** ~186.0 m

Date: 4/9/18 | **Inclination:** VERTICAL | **Datum:** AHD

Plant Type: JK308 | **Bearing:** N/A | **Logged/Checked By:** A.B./L.S.

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 roughness and shape, defect coatings and seams, openness and thickness Specific / General	Formation
50% RETURN		175	11		SANDSTONE: fine to medium grained, light grey with dark grey bands, bedded subhorizontally.	FR	H	1.8, 1.0, 1.2			Hawkesbury Sandstone
					END OF BOREHOLE AT 11.28 m						
		174	12								
		173	13								
		172	14								
		171	15								
		170	16								

FRACTURES NOT MARKED ARE CONSIDERED TO BE DRILLING AND HANDLING BREAKS

JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 5
1 / 3

BOREHOLE LOG

Client: TTW
Project: PROPOSED NEW SCHOOL BUILDING
Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: 31772L **Method:** SPIRAL AUGEER **R.L. Surface:** ~188.4 m
Date: 4/9/18 **Datum:** AHD
Plant Type: JK308 **Logged/Checked By:** A.B./L.S.

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 AUGERING	■									TOPSOIL: Silty clay, low plasticity, brown, trace of root fibres.	w<PL			
									CI-CH	Silty CLAY: medium to high plasticity, orange brown, trace of fine to coarse grained ironstone gravel.	w<PL	Hd		RESIDUAL
	■			■	N > 16 8,16/ 150mm REFUSAL	188							>600	
				■					-	Extremely Weathered siltstone: silty CLAY, medium plasticity, light grey with ironstone bands.	XW	Hd	>600	ASHFIELD SHALE
				■			1			SILTSTONE: dark grey, with iron indurated bands and extremely weathered seams.	DW	VL - L		VERY LOW 'TC' BIT RESISTANCE
				■		187								
												L - M		MODERATE RESISTANCE
				■			2							
						186								
										REFER TO CORED BOREHOLE LOG				
							3							
						185								
							4							
						184								
							5							
						183								
							6							
						182								

JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 5 2 / 3

CORED BOREHOLE LOG

Client: TTW
Project: PROPOSED NEW SCHOOL BUILDING
Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: 31772L | **Core Size:** NMLC | **R.L. Surface:** ~188.4 m
Date: 4/9/18 | **Inclination:** VERTICAL | **Datum:** AHD
Plant Type: JK308 | **Bearing:** N/A | **Logged/Checked By:** A.B./L.S.

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 $I_s(50)$	DEFECT DETAILS: SPACING (mm)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
		186			START CORING AT 2.64m						
100% RETURN		185	3		SILTSTONE: dark grey with light grey orange brown bands, bedded subhorizontally.	MW	L - M	1.3, 0.20, 0.90, 0.030, 1.2, 0.70, 0.80, 0.20, 0.20, 0.060, 1.3, 1.2, 1.2		(2.73m) J, 90°, P, S, Fe Sn (2.97m) J, 80 - 90°, P, S, Fe Sn (3.12m) Be, 0°, P, R, FRAGMENTED FILLED (3.39m) Be, 0°, P, R, FRAGMENTED FILLED (3.44m) XWS, 0°, 3 mm.t (3.53m) J, 40°, P, R, Cn (3.61m) XWS, 0°, 2 mm.t (3.70m) Be, 0°, P, R, Fe Sn (3.82m) CS, 0°, 1 mm.t (3.85m) J, 80°, P, S, Fe Sn (3.92m) J, 10°, P, S, Clay FILLED (4.32m) J, 15°, P, S, Clay FILLED (4.42m) J, 60 - 90°, Un, R, XW and FRAGMENTING (4.54m) CS, 0°, 1 mm.t (4.59m) J, 90°, P, S, Cn (4.75m) J, 20°, P, S, Fe Sn (4.82m) J, 20°, P, S, Fe Cn (5.11m) J, 20°, P, S, Fe Cn (5.32m) J, 20°, P, S, Fe Cn (5.40m) Jx2, 30 - 60°, P, S, Fe Sn (5.45m) Be, 0°, P, S, Fe Sn (5.50m) J, 90°, P, S, Cn (5.57m) Jx2, 20°, P, S, Fe Sn (5.73m) J, 90°, P, R, Cn (5.84m) J, 60 - 90°, Un, S, Fe Sn (5.94m) J, 90°, P, S, Fe Sn (6.18m) J, 10°, P, S, Fe Sn (6.33m) Be, 0°, P, S, Fe Sn (6.39m) CSx4, 5°, 1 mm.t, EACH (6.46m) J, 20 - 40°, Un, S, Fe Sn (6.54m) J, 10°, P, S, Cn (6.58m) J, 10°, P, S, Cn (6.62m) Be, 0°, P, R, Cn (6.67m) XWS, 0°, 2 mm.t (6.78m) J, 90°, P, S, Fe Sn (6.88m) J, 90°, P, S, Cn (7.00m) XWS, 0°, 3 mm.t (7.05m) HEALED J, 30°, P (7.10m) J, 90°, P, R, Cn (7.16m) J, 90°, P, R, Cn (7.23m) J, 20 - 60°, Un, S, Cn (7.29m) Be, 0°, P, S, Cn (7.39m) J, 60 - 90°, Un, S, Fe Sn (7.71m) J, 70°, P, S, Fe Sn (7.81m) J, 30°, P, R, Fe Sn (7.84m) J, 30°, P, R, Fe Sn (7.86m) J, 90°, P, R, Cn (7.90m) J, 30°, P, S, Cn (7.96m) J, 20°, P, S, Fe Sn (8.17m) J, 20°, P, S, Cn (8.21m) J, 90°, P, S, Cn (8.27m) J, 20°, P, S, Cn (8.40m) J, 20°, P, S, Cn (8.53m) Be, 0°, P, S, Fe Sn (8.77m) J, 20°, P, S, Cn (8.86m) J, 30°, P, S, Cn (8.92m) J, 50°, P, S, Cn	Ashfield Shale
		184	4								
		183	5								
		182	6								
		181	7								
		180	8		SILTSTONE: dark grey, bedded subhorizontally.	FR	H				

FRACTURES NOT MARKED ARE CONSIDERED TO BE DRILLING AND HANDLING BREAKS

JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No.
5
3 / 3

CORED BOREHOLE LOG

Client: TTW
Project: PROPOSED NEW SCHOOL BUILDING
Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: 31772L
Core Size: NMLC
R.L. Surface: ~188.4 m
Date: 4/9/18
Inclination: VERTICAL
Datum: AHD
Plant Type: JK308
Bearing: N/A
Logged/Checked By: A.B./L.S.

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 roughness and shape, defect coatings and seams, openness and thickness) Specific / General	Formation
100% RETURN		179	10		SILTSTONE: dark grey, bedded subhorizontally. *(continued)*	FR	H	1.3		(9.05m) J, 40°, P, S, Cn (9.08m) J, 20°, P, S, Cn (9.20m) J, 10°, P, S, Cn (9.25m) J, 15°, P, S, Cn (9.36m) J, 60°, P, S, Cn (9.74m) J, 85°, P, R, Fe Sn (9.90m) J, 85 - 90°, P, R, Fe Sn	Ashfield Shale
		178						0.70		(10.22m) J, 40°, P, S, Cn (10.28m) J, 30°, P, S, Cn (10.45m) J, 40 - 90°, Un, R, Cn	
					END OF BOREHOLE AT 10.48 m						
		177	11								
		176	12								
		175	13								
		174	14								
		173	15								

FRACTURES NOT MARKED ARE CONSIDERED TO BE DRILLING AND HANDLING BREAKS

JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 6
1 / 3

BOREHOLE LOG

Client: TTW
Project: PROPOSED NEW SCHOOL BUILDING
Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: 31772L **Method:** SPIRAL AUGER **R.L. Surface:** ~191.0 m
Date: 7/9/18 **Datum:** AHD
Plant Type: JK308 **Logged/Checked By:** A.B./L.S.

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 AUGERING										FILL: Silty clay, low plasticity, dark brown, trace fine to medium grained sand and root fibres.	w<PL			
									CH	Silty CLAY: high plasticity, orange brown, trace fine to coarse grained ironstone gravel.	w>PL	Hd		RESIDUAL
					N = 27 5,9,18				-	SILTSTONE: light grey and dark grey, with ironstone bands.	XW - DW	Hd - VL	580 500	ASHFIELD SHALE
						190	1							
						189	2							
											DW	VL - L		VERY LOW 'TC' BIT RESISTANCE WITH MODERATE BANDS
						188	3							
												L		LOW TO MODERATE RESISTANCE
						187	4							
										REFER TO CORED BOREHOLE LOG				Groundwater monitoring well installed to 14.0m. Class 18 machine slotted 50mm dia. PVC standpipe 8.0m to 14.0m. Casing 0.15m to 8.0m. 2mm sand filter pack 7.5m to14.0m. Bentonite seal 4.0m to 7.5m. Backfilled with sand to the surface. Completed with a concreted gatic cover
						186	5							
						185	6							

JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 6

CORED BOREHOLE LOG

Client: TTW
Project: PROPOSED NEW SCHOOL BUILDING
Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: 31772L | **Core Size:** NMLC | **R.L. Surface:** ~191.0 m
Date: 7/9/18 | **Inclination:** VERTICAL | **Datum:** AHD
Plant Type: JK308 | **Bearing:** N/A | **Logged/Checked By:** A.B./L.S.

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 4.34m						
ON 9/10/18	100% RETURN	186	5		SILTSTONE: dark grey, with iron indurated bands, bedded subhorizontally.	HW	L	0.10		(4.36m) XWS, 0°, 5 mm.t (4.40m) J, 90°, P, S, Fe Sn (4.44m) CSx2, 0°, 1 mm.t (4.46m) J, 90°, P, S, Cn (4.48m) CS, 0°, 20 mm.t (4.51m) J, 90°, P, S, Cn (4.56m) CS, 0°, 55 mm.t (4.62m) CS, 0°, 3 mm.t (4.65m) J, 90°, P, S, Fe Sn (4.68m) J, 60°, P, S, Fe Sn (4.70m) CS, 0°, 2 mm.t (4.78m) XWS, 0°, 12 mm.t (4.83m) Be, 0°, P, S, Fe Sn (5.04m) XWS, 0°, 10 mm.t (5.09m) J, 90°, P, R, Cn (5.16m) CS, 0°, 1 mm.t (5.39m) CS, 0°, 6 mm.t (5.43m) J, 90°, P, S, Fe Sn (5.50m) CS, 0°, 22 mm.t (5.61m) CS, 0°, 12 mm.t (5.64m) J, 20°, P, S, Fe Sn (5.72m) J, 20°, P, S, Fe Sn (5.82m) CS, 0°, 5 mm.t (5.86m) XWS, 0°, 30 mm.t (5.94m) XWS, 0°, 30 mm.t (5.99m) J, 90°, P, S, Cn (6.06m) J, 90°, P, S, Fe Sn (6.15m) Healed J, 90°, P (6.20m) Be, 0°, P, S, Fe Sn (6.34m) J, 90°, P, S, Cn (6.36m) CS, 0°, 7 mm.t (6.68m) J, 80°, P, R, Fe Sn (6.79m) J, 60 - 90°, Un, R, Fe Sn	Ashfield Shale
					as above, but with light grey bands.	MW		0.50			
							M	0.40			
		185	6					0.40			
								0.90			
								0.90			
		184	7		SILTSTONE: dark grey with light grey bands, bedded at 20-30°.			0.30		(6.96m) J, 30°, P, R, Fe Sn (7.02m) XWS, 0°, 50 mm.t (7.05m) J, 30°, P, S, Cn (7.12m) J, 60 - 90°, Un, S, Fe Sn	
								1.1		(7.34m) J, 10°, P, S, Fe Sn (7.44m) J, 90°, P, S, Fe Sn (7.51m) J, 15°, P, S, Fe Sn (7.58m) J, 40°, P, S, Fe Sn (7.65m) Be, 0°, P, S, Cn	
					NO CORE 0.22m						
		183	8		SILTSTONE: dark grey with light grey bands, bedded at 20°.	SW	M - H			(7.97m) J, 80°, P, S, Cn	Ashfield Shale
							H	0.40		(8.20m) J, 80°, P, S, Cn (8.30m) J, 90°, P, S, Cn	
								2.2		(8.65m) J, 70°, P, S, XW Infill	
		182	9							(8.85m) J, 80°, P, S, Cn	
								1.4		(9.07m) XWS, 20°, 10 mm.t	
						FR				(9.43m) J, 80°, P, R, Fe Sn (9.56m) J, 40°, P, R, Fe Sn	
								1.2		(9.69m) J, 70°, P, S, Cn (9.82m) J, 70°, P, S, Cn	
		181	10					2.1			
								4.2			

JK 9.01.2 LIB:GLB Log, JK CORED BOREHOLE - MASTER 31772L NORMANHURST.GPJ <<DrawingFile>> 25/10/2018 10:27 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: JK 9.01.2 2018-04-02 Prj: JK 9.01.0 2018-03-20

FRACTURES NOT MARKED ARE CONSIDERED TO BE DRILLING AND HANDLING BREAKS

JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 6
3 / 3

CORED BOREHOLE LOG

Client: TTW
Project: PROPOSED NEW SCHOOL BUILDING
Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: 31772L | **Core Size:** NMLC | **R.L. Surface:** ~191.0 m
Date: 7/9/18 | **Inclination:** VERTICAL | **Datum:** AHD
Plant Type: JK308 | **Bearing:** N/A | **Logged/Checked By:** A.B./L.S.

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 $I_s(50)$	DEFECT DETAILS: SPACING (mm)	DEFECT DETAILS: DESCRIPTION (Type, orientation, defect roughness and shape, defect coatings and seams, openness and thickness) Specific / General	Formation
100% RETURN		179	12		SILTSTONE: dark grey with light grey bands, bedded at 20°. *(continued)*	FR	H	2.4, 1.7, 1.8, 2.4, 1.2, 1.1	600, 200, 60, 20	(11.82m) J, 90°, P, S, Cn (12.10m) J, 90°, P, S, Cn (12.54m) J, 70°, P, S, Cn (12.82m) J, 30°, P, S, Cn (12.87m) J, 30°, P, S, Cn (12.90m) J, 40°, P, S, Cn (13.33m) J, 80°, P, S, Cn (13.74m) J, 70°, P, S, Cn	Ashfield Shale
		178	13		SILTSTONE: dark grey, bedded subhorizontally.						
		177	14		END OF BOREHOLE AT 14.00 m						
		176	15								
		175	16								
		174	17								

FRACTURES NOT MARKED ARE CONSIDERED TO BE DRILLING AND HANDLING BREAKS

JKEnvironments

ENVIRONMENTAL LOG

Log No. **BH101** 1/1

Environmental logs are not to be used for geotechnical purposes

Client: TTW

Project: PROPOSED NEW SCHOOL BUILDINGS

Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: E31772KL **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 27/3/19 **Datum:**

Plant Type: JK300 **Logged/Checked by:** A.M./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
	■		■		■		0		-	FILL: Silty clay, low to medium plasticity, dark brown, trace of root fibres.	w>PL			GRASS COVER 8.6kg BUCKET NO FCF
									CH	Silty CLAY: high plasticity, red brown mottled grey, trace of ironstone gravel.				
	■		■			N = 20 5,8,12	0.5							
							1			END OF BOREHOLE AT 1.0m				
							1.5							
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Log No. **BH102** 1/1

Environmental logs are not to be used for geotechnical purposes

Client: TTW

Project: PROPOSED NEW SCHOOL BUILDINGS

Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: E31772KL **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 27/3/19 **Datum:**

Plant Type: JK300 **Logged/Checked by:** A.M./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 clay, low to medium plasticity, dark brown, trace of root fibres.	w>PL			GRASS COVER 8.6kg BUCKET NO FCF
									CI-CH	Silty CLAY: medium to high plasticity, grey.	w<PL			
	■		■			N > 8 7,8/50mm	0.5							
						REFUSAL			-	Extremely Weathered siltstone: silty CLAY, low to medium plasticity, light grey, with ironstone and siltstone bands.	XW			ASHFIELD SHALE
							1			END OF BOREHOLE AT 1.0m				
							1.5							
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH103** **1/1**

Client: TTW

Project: PROPOSED NEW SCHOOL BUILDINGS

Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: E31772KL **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 27/3/19 **Datum:**

Plant Type: JK300 **Logged/Checked by:** A.M./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: Gravelly sand, fine to medium grained, brown, fine to medium grained ironstone, trace of ironstone gravel and siltstone fragments.	M			12.4kg BUCKET
									-	Extremely Weathered siltstone: silty CLAY, low to medium plasticity, light grey, with ironstone and siltstone bands.	XW			NO FCF
	■		■				0.5							ASHFIELD SHALE
										END OF BOREHOLE AT 0.7m				
							1							
							1.5							
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. BH104 **1/1**

Client: TTW

Project: PROPOSED NEW SCHOOL BUILDINGS

Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: E31772KL **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 27/3/19 **Datum:**

Plant Type: JK300 **Logged/Checked by:** A.M./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		-	ASPHALTIC CONCRETE: 30mm.t.				
									-	FILL: Silty gravelly sand, fine to coarse grained, brown, fine to coarse grained grey igneous gravel.	M			10.1kg BUCKET NO FCF
							0.5			FILL: Silty sandy clay, low to medium plasticity, grey, trace of igneous and ironstone gravel.	w>PL			10kg BUCKET NO FCF
						N > 16 4,8,8/ 100mm								
									CH	Silty CLAY: high plasticity, light grey, trace of ironstone gravel.	w>PL			RESIDUAL
						REFUSAL	1		-	Extremely Weathered siltstone: silty CLAY, medium plasticity, grey, with ironstone bands.	XW			ASHFIELD SHALE
							1.5			END OF BOREHOLE AT 1.5m				
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH105** **1/1**

Client: TTW

Project: PROPOSED NEW SCHOOL BUILDINGS

Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: E31772KL **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 27/3/19 **Datum:**

Plant Type: JK300 **Logged/Checked by:** A.M./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		-	ASPHALTIC CONCRETE: 50mm.t.				9.7kg BUCKET NO FCF
										FILL: Silty gravelly sand, fine to coarse grained, dark grey, fine to medium grained igneous gravel.				10.3kg BUCKET NO FCF
							0.5			FILL: Gravelly sand, fine to coarse grained, light brown, fine to coarse grained grey igneous gravel, trace of concrete, ironstone gravel and slag.				
										END OF BOREHOLE AT 0.6m				'TC' BIT REFUSAL ON OBSTRUCTION IN FILL
							1							
							1.5							
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH106** **1/1**

Client: TTW

Project: PROPOSED NEW SCHOOL BUILDINGS

Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: E31772KL **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 27/3/19 **Datum:**

Plant Type: JK300 **Logged/Checked by:** A.M./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		-	ASPHALTIC CONCRETE: 30mm.t.	M			12.4kg BUCKET NO FCF
									-	FILL: Silty gravelly sand, fine to coarse grained brown, fine to medium grained grey igneous gravel, trace of ironstone and siltstone gravel.				
							0.5			END OF BOREHOLE AT 0.4m				'TC' BIT REFUSAL ON OBSTRUCTION IN FILL
							1							
							1.5							
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH107** **1/1**

Client: TTW

Project: PROPOSED NEW SCHOOL BUILDINGS

Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: E31772KL **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 27/3/19 **Datum:**

Plant Type: JK300 **Logged/Checked by:** A.M./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 sandy clay, low to medium plasticity, brown, trace of ironstone gravel, root fibres and ash.	w>PL			GRASS COVER 9.8kg BUCKET NO FCF
	■		■			N = 7 2,4,3	0.5		CI-CH	Silty CLAY: medium to high plasticity, red brown mottled orange brown, trace of ironstone gravel and ash.	w>PL			RESIDUAL
							1			END OF BOREHOLE AT 1.0m				
							1.5							
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Log No. BH108 1/1

Environmental logs are not to be used for geotechnical purposes

Client: TTW

Project: PROPOSED NEW SCHOOL BUILDINGS

Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: E31772KL **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 28/3/19 **Datum:**

Plant Type: JK350 **Logged/Checked by:** A.M./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		-	ASPHALTIC CONCRETE: 50mm.t.				
									-	FILL: Silty clay, low to medium plasticity, grey, with asphalt.	w<PL			12.3kg BUCKET NO FCF
						N = 17 5,7,10	0.5		CI-CH	Silty CLAY: medium to high plasticity, red brown mottled orange brown, trace of ironstone gravel.	w>PL			RESIDUAL
							1			END OF BOREHOLE AT 1.0m				
							1.5							
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Log No. **BH109** 1/1

Environmental logs are not to be used for geotechnical purposes

Client: TTW

Project: PROPOSED NEW SCHOOL BUILDINGS

Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: E31772KL **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 27/3/19 **Datum:**

Plant Type: JK300 **Logged/Checked by:** A.M./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		-	ASPHALTIC CONCRETE: 50mm.t.				
									-	FILL: Sandy gravel, fine to medium grained, dark grey, igneous gravel, fine to medium grained, brown, trace of asphalt.	M			4.7kg BUCKET NO FCF
									CL-CI	Silty CLAY: low to medium plasticity, grey mottled red brown, trace of root fibres.	w>PL			RESIDUAL
						N = 7 2,3,4	0.5							
							1							
									-	Extremely Weathered siltstone: silty CLAY, low to medium plasticity, with ironstone and siltstone bands.	w<PL			ASHFIELD SHALE
							1.5			END OF BOREHOLE AT 1.5m				
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH110** **1/1**

Client: TTW

Project: PROPOSED NEW SCHOOL BUILDINGS

Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: E31772KL **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 28/3/19 **Datum:**

Plant Type: N/A **Logged/Checked by:** A.M./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
	■		■		■		0		-	FILL: Silty sandy clay, low to medium plasticity, brown, grey and orange brown, trace of igneous, ironstone and sandstone gravel and ash.	w≈PL			GRASS COVER 11kg BUCKET NO FCF
							0.5			END OF BOREHOLE AT 0.5m				HAND AUGER REFUSAL
							1							
							1.5							
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Log No. BH111 1/2

Environmental logs are not to be used for geotechnical purposes

Client: TTW

Project: PROPOSED NEW SCHOOL BUILDINGS

Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: E31772KL **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 28/3/19 **Datum:**

Plant Type: JK350 **Logged/Checked by:** A.M./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: 160mm.t.				
									-	FILL: Sandy gravel, fine to medium grained, grey, fine to coarse grained igneous gravel.	W			9.6kg BUCKET NO FCF
						N = 8 3,4,4	0.5			FILL: Silty clay, low to medium plasticity, brown, trace of ironstone gravel and ash.	w>PL			4kg BUCKET NO FCF
							1		CI-CH	Silty CLAY: medium to high plasticity, red brown mottled grey.	w<PL			RESIDUAL
						N = 10 3,5,5	1.5							
							2							
							2.5							
									-	Extremely Weathered siltstone: silty CLAY, low to medium plasticity, brown and grey	XW			ASHFIELD SHALE
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH111** **2/2**

Client: TTW

Project: PROPOSED NEW SCHOOL BUILDINGS

Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: E31772KL **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 28/3/19 **Datum:**

Plant Type: JK350 **Logged/Checked by:** A.M./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 COMPLET-ION							4			as above.	XW			
							4.5							
							5							
							5.5							
							6			END OF BOREHOLE AT 6.0m				GROUNDWATER MONITORING WELL INSTALLED TO 5.7m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 5.7m TO 2.7m. CASING 2.7m TO 0m SURFACE. 2mm SAND FILTER PACK 5.2m TO 2.1m. BENTONITE SEAL 2.1m TO 0.5m. BACKFILLED WITH SAND TO THE SURFACE. COMPLETED WITH A CONCRETED GATIC COVER.
							6.5							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH112** **1/1**

Client: TTW

Project: PROPOSED NEW SCHOOL BUILDINGS

Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: E31772KL **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 27/3/19 **Datum:**

Plant Type: JK300 **Logged/Checked by:** A.M./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 clay, low to medium plasticity, brown, trace of ironstone and siltstone gravel and ash.	w>PL			GRASS COVER 10kg BUCKET NO FCF
	■		■			N = 9 3,4,5	0.5		CI-CH	Silty CLAY: medium to high plasticity, red brown mottled grey, trace of ironstone gravel.	w>PL			RESIDUAL
							1			END OF BOREHOLE AT 1.0m				
							1.5							
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH113** **1/1**

Client: TTW

Project: PROPOSED NEW SCHOOL BUILDINGS

Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: E31772KL **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 27/3/19 **Datum:**

Plant Type: JK300 **Logged/Checked by:** A.M./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 clay, low to medium plasticity, brown, trace of ironstone gavel, root fibres and ash.	w>PL			GRASS COVER 10kg BUCKET NO FCF
						N = 7 3,3,4	0.5		CI-CH	Silty CLAY: medium to high plasticity, grey mottled orange brown, trace of root fibres.	w>PL			RESIDUAL
							1			END OF BOREHOLE AT 1.0m				
							1.5							
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Log No. **BH114** 1/1

Environmental logs are not to be used for geotechnical purposes

Client: TTW

Project: PROPOSED NEW SCHOOL BUILDINGS

Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: E31772KL **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 28/3/19 **Datum:**

Plant Type: JK350 **Logged/Checked by:** A.M./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		-	CONCRETE: 120mm.t.				
									-	FILL: Sandy gravel, fine to coarse grained, dark grey, fine to medium grained igneous gravel.	W			2kg BUCKET NO FCF
									CI-CH	Silty CLAY: medium to high plasticity, red brown mottled grey.	w>PL			RESIDUAL
						N = 6 2,3,3	0.5							
						N = 4 1,2,2	1							
							1.5			Silty CLAY: medium to high plasticity, grey, with siltstone banding.				
										END OF BOREHOLE AT 1.5m				
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Log No. **BH115** 1/1

Environmental logs are not to be used for geotechnical purposes

Client: TTW

Project: PROPOSED NEW SCHOOL BUILDINGS

Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: E31772KL **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 28/3/19 **Datum:**

Plant Type: JK350 **Logged/Checked by:** A.M./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		-	CONCRETE: 90mm.t.				
						N = 7 4,3,4	0.5		-	FILL: Silty clay, low to medium plasticity, brown, trace of igneous and ironstone gravel and ash.	w<PL			10.3kg BUCKET NO FCF
	■		■			N = 15 7,7,8	1		CI-CH	Silty CLAY: medium to high plasticity, red brown mottled grey, trace of ironstone gravel.	w>PL			RESIDUAL
							1.5			END OF BOREHOLE AT 1.5m				
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Log No. **BH116** 1/1

Environmental logs are not to be used for geotechnical purposes

Client: TTW

Project: PROPOSED NEW SCHOOL BUILDINGS

Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: E31772KL **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 28/3/19 **Datum:**

Plant Type: JK350 **Logged/Checked by:** A.M./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		-	ASPHALTIC CONCRETE: 50mm.t.				
									-	FILL: Gravelly sand, fine to medium grained, brown, fine to medium grained igneous gravel.	D			10kg BUCKET NO FCF
						N = 3 2,1,2	0.5			FILL: Silty clay, low to medium plasticity, yellow brown, trace of ironstone gravel.	w<PL			10.1kg BUCKET NO FCF
						N = 8 1,1,7	1.5		-	Extremely Weathered siltstone: silty CLAY, low to medium plasticity, brown.	XW			ASHFIELD SHALE
							2							
							2.5			END OF BOREHOLE AT 2.5m				
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Log No. **BH117** 1/1

Environmental logs are not to be used for geotechnical purposes

Client: TTW

Project: PROPOSED NEW SCHOOL BUILDINGS

Location: LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW

Job No.: E31772KL **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 28/3/19 **Datum:**

Plant Type: JK350 **Logged/Checked by:** A.M./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		-	CONCRETE: 130mm.t.				
						N = 6 3,3,3	0.5		-	FILL: Gravelly sand, fine to coarse grained, brown, fine to medium grained, igneous gravel.	W w>PL			10kg BUCKET NO FCF
										FILL: Silty clay, low to medium plasticity, brown, trace of ironstone gravel and ash.				
						N = 20 5,6,14	1		CI-CH	Silty CLAY: medium to high plasticity, red brown mottled grey, trace of ironstone gravel.	w<PL			RESIDUAL
							1.5			END OF BOREHOLE AT 1.5m				
							2							
							2.5							
							3							
							3.5							

Appendix E: Laboratory Report/s & 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 214605

Client Details

Client	Environmental Investigation Services
Attention	Harry Leonard
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E31772KL, Normanhurst**
Number of Samples	63 soil, 1 material
Date samples received	29/03/2019
Date completed instructions received	29/03/2019

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	05/04/2019
Date of Issue	05/04/2019

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Asbestos Approved By
Analysed by Asbestos Approved Identifier: Matt Tang
Authorised by Asbestos Approved Signatory: Matt Tang

Results Approved By
Giovanni Agosti, Group Technical Manager
Jeremy Faircloth, Operations Manager, Sydney
Ken Nguyen, Reporting Supervisor
Matthew Tang, Asbsestos Supervisor
Nancy Zhang, Laboratory Manager, Sydney
Nick Sarlamis, Inorganics Supervisor
Steven Luong, Organics Supervisor

Authorised By

Jacinta Hurst, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		214605-1	214605-2	214605-3	214605-5	214605-6
Your Reference	UNITS	BH101	BH101	BH102	BH103	BH103
Depth		0-0.1	0.6-0.8	0-0.2	0-0.1	0.2-0.3
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
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	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	91	91	71	92	83

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		214605-8	214605-9	214605-11	214605-12	214605-13
Your Reference	UNITS	BH104	BH104	BH105	BH106	BH107
Depth		0.4-0.6	0.8-0.9	0.2-0.4	0.03-0.15	0-0.1
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
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	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	92	92	92	92	87

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		214605-14	214605-15	214605-17	214605-18	214605-19
Your Reference	UNITS	BH107	BH108	BH109	BH109	BH110
Depth		0.5-0.8	0.05-0.2	0.05-0.15	0.5-0.7	0-0.1
Date Sampled		27/03/2019	28/03/2019	27/03/2019	27/03/2019	28/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
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	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	92	93	94	80	92

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		214605-21	214605-22	214605-23	214605-25	214605-26
Your Reference	UNITS	BH111	BH111	BH112	BH113	BH113
Depth		0.6-0.95	1.5-1.95	0-0.1	0-0.1	0.5-0.8
Date Sampled		28/03/2019	28/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
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	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	91	90	74	92	89

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		214605-27	214605-29	214605-30	214605-32	214605-34
Your Reference	UNITS	BH114	BH115	BH115	BH116	BH116
Depth		0.12-0.2	0.04-0.2	1.5-1.7	0.7-0.95	1.8-1.95
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
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	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	89	89	91	93	94

vTRH(C6-C10)/BTEXN in Soil					
Our Reference		214605-36	214605-37	214605-38	214605-39
Your Reference	UNITS	BH117	BH117	TB1	DUPRK1
Depth		0.2-0.4	1.0-1.2	-	-
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	91	94	96	92

svTRH (C10-C40) in Soil						
Our Reference		214605-1	214605-2	214605-3	214605-5	214605-6
Your Reference	UNITS	BH101	BH101	BH102	BH103	BH103
Depth		0-0.1	0.6-0.8	0-0.2	0-0.1	0.2-0.3
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	02/04/2019	02/04/2019	02/04/2019
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	%	99	100	101	96	98

svTRH (C10-C40) in Soil						
Our Reference		214605-8	214605-9	214605-11	214605-12	214605-13
Your Reference	UNITS	BH104	BH104	BH105	BH106	BH107
Depth		0.4-0.6	0.8-0.9	0.2-0.4	0.03-0.15	0-0.1
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	230	400	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	280	610	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	60	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	60	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	410	770	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	300	710	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	700	1,500	<50
Surrogate o-Terphenyl	%	93	96	99	107	100

svTRH (C10-C40) in Soil						
Our Reference		214605-14	214605-15	214605-17	214605-18	214605-19
Your Reference	UNITS	BH107	BH108	BH109	BH109	BH110
Depth		0.5-0.8	0.05-0.2	0.05-0.15	0.5-0.7	0-0.1
Date Sampled		27/03/2019	28/03/2019	27/03/2019	27/03/2019	28/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
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	130	<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	130	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	170	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	300	<50	<50
Surrogate o-Terphenyl	%	112	94	93	94	93

svTRH (C10-C40) in Soil						
Our Reference		214605-21	214605-22	214605-23	214605-25	214605-26
Your Reference	UNITS	BH111	BH111	BH112	BH113	BH113
Depth		0.6-0.95	1.5-1.95	0-0.1	0-0.1	0.5-0.8
Date Sampled		28/03/2019	28/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
TRH C_{10} - C_{14}	mg/kg	140	<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	120	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	120	<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	120	<50	<50	<50	<50
Surrogate o-Terphenyl	%	97	94	98	100	106

svTRH (C10-C40) in Soil						
Our Reference		214605-27	214605-29	214605-30	214605-32	214605-34
Your Reference	UNITS	BH114	BH115	BH115	BH116	BH116
Depth		0.12-0.2	0.04-0.2	1.5-1.7	0.7-0.95	1.8-1.95
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
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	%	108	97	95	94	97

svTRH (C10-C40) in Soil				
Our Reference		214605-36	214605-37	214605-39
Your Reference	UNITS	BH117	BH117	DUPRK1
Depth		0.2-0.4	1.0-1.2	-
Date Sampled		27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	170
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	180
TRH >C_{34} -C_{40}	mg/kg	<100	<100	200
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	380
Surrogate o-Terphenyl	%	94	93	94

PAHs in Soil						
Our Reference		214605-1	214605-2	214605-3	214605-5	214605-6
Your Reference	UNITS	BH101	BH101	BH102	BH103	BH103
Depth		0-0.1	0.6-0.8	0-0.2	0-0.1	0.2-0.3
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
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	0.4	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	1.2	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	1.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.4	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.4	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	0.7	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.4	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	0.2	<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	0.3	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	5.0	<0.05	<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	0.6	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	135	110	104	102	113

PAHs in Soil						
Our Reference		214605-8	214605-9	214605-11	214605-12	214605-13
Your Reference	UNITS	BH104	BH104	BH105	BH106	BH107
Depth		0.4-0.6	0.8-0.9	0.2-0.4	0.03-0.15	0-0.1
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
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	0.2	0.4	<0.1
Fluorene	mg/kg	<0.1	<0.1	0.2	0.2	<0.1
Phenanthrene	mg/kg	1.8	<0.1	5.4	5.5	<0.1
Anthracene	mg/kg	0.4	<0.1	1.1	1.3	<0.1
Fluoranthene	mg/kg	5.5	<0.1	13	14	<0.1
Pyrene	mg/kg	5.0	<0.1	12	12	<0.1
Benzo(a)anthracene	mg/kg	1.8	<0.1	4.1	4.2	<0.1
Chrysene	mg/kg	2.5	<0.1	5.6	5.5	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	3.7	<0.2	8.0	8.0	<0.2
Benzo(a)pyrene	mg/kg	1.7	<0.05	4.1	4.2	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	1.3	<0.1	2.7	3.0	<0.1
Dibenzo(a,h)anthracene	mg/kg	0.3	<0.1	0.6	0.6	<0.1
Benzo(g,h,i)perylene	mg/kg	1.9	<0.1	3.7	3.9	<0.1
Total +ve PAH's	mg/kg	26	<0.05	60	63	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	2.7	<0.5	6.3	6.4	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	2.7	<0.5	6.3	6.4	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	2.7	<0.5	6.3	6.4	<0.5
Surrogate p-Terphenyl-d14	%	111	108	102	104	101

PAHs in Soil						
Our Reference		214605-14	214605-15	214605-17	214605-18	214605-19
Your Reference	UNITS	BH107	BH108	BH109	BH109	BH110
Depth		0.5-0.8	0.05-0.2	0.05-0.15	0.5-0.7	0-0.1
Date Sampled		27/03/2019	28/03/2019	27/03/2019	27/03/2019	28/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
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	0.3	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	0.6	<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	0.4	<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	0.06
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	4.2	<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	0.6	<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	%	100	99	108	97	110

PAHs in Soil						
Our Reference		214605-21	214605-22	214605-23	214605-25	214605-26
Your Reference	UNITS	BH111	BH111	BH112	BH113	BH113
Depth		0.6-0.95	1.5-1.95	0-0.1	0-0.1	0.5-0.8
Date Sampled		28/03/2019	28/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
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	0.3	<0.1	<0.1	0.3	<0.1
Pyrene	mg/kg	0.3	<0.1	<0.1	0.3	<0.1
Benzo(a)anthracene	mg/kg	0.2	<0.1	<0.1	0.2	<0.1
Chrysene	mg/kg	0.3	<0.1	<0.1	0.2	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	0.4	<0.2	<0.2	0.4	<0.2
Benzo(a)pyrene	mg/kg	0.2	<0.05	0.05	0.2	<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	1.7	<0.05	0.05	1.8	<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	%	116	105	115	105	111

PAHs in Soil						
Our Reference		214605-27	214605-29	214605-30	214605-32	214605-34
Your Reference	UNITS	BH114	BH115	BH115	BH116	BH116
Depth		0.12-0.2	0.04-0.2	1.5-1.7	0.7-0.95	1.8-1.95
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
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	0.5	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	1.3	<0.1
Pyrene	mg/kg	0.2	<0.1	<0.1	1.2	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	0.6	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	0.8	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	1	<0.2
Benzo(a)pyrene	mg/kg	0.07	<0.05	<0.05	0.62	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	0.4	<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	0.5	<0.1
Total +ve PAH's	mg/kg	0.3	<0.05	<0.05	6.8	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	0.8	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	0.9	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	0.9	<0.5
Surrogate p-Terphenyl-d14	%	95	113	104	109	118

PAHs in Soil				
Our Reference		214605-36	214605-37	214605-39
Your Reference	UNITS	BH117	BH117	DUPRK1
Depth		0.2-0.4	1.0-1.2	-
Date Sampled		27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	0.6
Anthracene	mg/kg	<0.1	<0.1	0.1
Fluoranthene	mg/kg	<0.1	<0.1	1.3
Pyrene	mg/kg	<0.1	<0.1	1.4
Benzo(a)anthracene	mg/kg	<0.1	<0.1	0.5
Chrysene	mg/kg	<0.1	<0.1	0.8
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	1
Benzo(a)pyrene	mg/kg	<0.05	<0.05	0.56
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	0.3
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	0.5
Total +ve PAH's	mg/kg	<0.05	<0.05	7.0
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	0.8
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	0.8
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	0.9
Surrogate p-Terphenyl-d14	%	115	97	103

Organochlorine Pesticides in soil						
Our Reference		214605-1	214605-3	214605-5	214605-8	214605-11
Your Reference	UNITS	BH101	BH102	BH103	BH104	BH105
Depth		0-0.1	0-0.2	0-0.1	0.4-0.6	0.2-0.4
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
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	%	98	101	96	95	93

Organochlorine Pesticides in soil						
Our Reference		214605-12	214605-13	214605-15	214605-17	214605-19
Your Reference	UNITS	BH106	BH107	BH108	BH109	BH110
Depth		0.03-0.15	0-0.1	0.05-0.2	0.05-0.15	0-0.1
Date Sampled		27/03/2019	27/03/2019	28/03/2019	27/03/2019	28/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
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	%	90	97	98	96	95

Organochlorine Pesticides in soil						
Our Reference		214605-21	214605-23	214605-25	214605-27	214605-29
Your Reference	UNITS	BH111	BH112	BH113	BH114	BH115
Depth		0.6-0.95	0-0.1	0-0.1	0.12-0.2	0.04-0.2
Date Sampled		28/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
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	%	98	97	98	95	96

Organochlorine Pesticides in soil			
Our Reference		214605-32	214605-36
Your Reference	UNITS	BH116	BH117
Depth		0.7-0.95	0.2-0.4
Date Sampled		27/03/2019	27/03/2019
Type of sample		soil	soil
Date extracted	-	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019
HCB	mg/kg	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1
Surrogate TCMX	%	96	96

Organophosphorus Pesticides						
Our Reference		214605-1	214605-3	214605-5	214605-8	214605-11
Your Reference	UNITS	BH101	BH102	BH103	BH104	BH105
Depth		0-0.1	0-0.2	0-0.1	0.4-0.6	0.2-0.4
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
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	%	98	101	96	95	93

Organophosphorus Pesticides						
Our Reference		214605-12	214605-13	214605-15	214605-17	214605-19
Your Reference	UNITS	BH106	BH107	BH108	BH109	BH110
Depth		0.03-0.15	0-0.1	0.05-0.2	0.05-0.15	0-0.1
Date Sampled		27/03/2019	27/03/2019	28/03/2019	27/03/2019	28/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
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	%	90	97	98	96	95

Organophosphorus Pesticides						
Our Reference		214605-21	214605-23	214605-25	214605-27	214605-29
Your Reference	UNITS	BH111	BH112	BH113	BH114	BH115
Depth		0.6-0.95	0-0.1	0-0.1	0.12-0.2	0.04-0.2
Date Sampled		28/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
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	%	98	97	98	95	96

Organophosphorus Pesticides			
Our Reference		214605-32	214605-36
Your Reference	UNITS	BH116	BH117
Depth		0.7-0.95	0.2-0.4
Date Sampled		27/03/2019	27/03/2019
Type of sample		soil	soil
Date extracted	-	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1
Surrogate TCMX	%	96	96

PCBs in Soil						
Our Reference		214605-1	214605-3	214605-5	214605-8	214605-11
Your Reference	UNITS	BH101	BH102	BH103	BH104	BH105
Depth		0-0.1	0-0.2	0-0.1	0.4-0.6	0.2-0.4
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
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 TCLMX	%	98	101	96	95	93

PCBs in Soil						
Our Reference		214605-12	214605-13	214605-15	214605-17	214605-19
Your Reference	UNITS	BH106	BH107	BH108	BH109	BH110
Depth		0.03-0.15	0-0.1	0.05-0.2	0.05-0.15	0-0.1
Date Sampled		27/03/2019	27/03/2019	28/03/2019	27/03/2019	28/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
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 TCLMX	%	90	97	98	96	95

PCBs in Soil						
Our Reference		214605-21	214605-23	214605-25	214605-27	214605-29
Your Reference	UNITS	BH111	BH112	BH113	BH114	BH115
Depth		0.6-0.95	0-0.1	0-0.1	0.12-0.2	0.04-0.2
Date Sampled		28/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
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 TCLMX	%	98	97	98	95	96

PCBs in Soil			
Our Reference		214605-32	214605-36
Your Reference	UNITS	BH116	BH117
Depth		0.7-0.95	0.2-0.4
Date Sampled		27/03/2019	27/03/2019
Type of sample		soil	soil
Date extracted	-	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019
Aroclor 1016	mg/kg	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1
Surrogate TCLMX	%	96	96

Acid Extractable metals in soil						
Our Reference		214605-1	214605-2	214605-3	214605-5	214605-6
Your Reference	UNITS	BH101	BH101	BH102	BH103	BH103
Depth		0-0.1	0.6-0.8	0-0.2	0-0.1	0.2-0.3
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Arsenic	mg/kg	4	<4	4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	11	9	9	8	9
Copper	mg/kg	23	8	15	29	42
Lead	mg/kg	19	17	15	17	16
Mercury	mg/kg	<0.1	<0.1	<0.1	0.1	0.1
Nickel	mg/kg	8	<1	6	5	6
Zinc	mg/kg	100	2	31	30	32

Acid Extractable metals in soil						
Our Reference		214605-8	214605-9	214605-11	214605-12	214605-13
Your Reference	UNITS	BH104	BH104	BH105	BH106	BH107
Depth		0.4-0.6	0.8-0.9	0.2-0.4	0.03-0.15	0-0.1
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Arsenic	mg/kg	<4	5	<4	<4	8
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	7	4	12	38	17
Copper	mg/kg	30	21	67	86	29
Lead	mg/kg	19	28	14	14	150
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	3	1	12	40	11
Zinc	mg/kg	12	4	60	55	150

Acid Extractable metals in soil						
Our Reference		214605-14	214605-15	214605-17	214605-18	214605-19
Your Reference	UNITS	BH107	BH108	BH109	BH109	BH110
Depth		0.5-0.8	0.05-0.2	0.05-0.15	0.5-0.7	0-0.1
Date Sampled		27/03/2019	28/03/2019	27/03/2019	27/03/2019	28/03/2019
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Arsenic	mg/kg	6	<4	<4	4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	14	20	77	12	15
Copper	mg/kg	10	58	34	16	19
Lead	mg/kg	15	8	11	21	34
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	2	82	69	1	10
Zinc	mg/kg	5	41	47	5	33

Acid Extractable metals in soil						
Our Reference		214605-21	214605-22	214605-23	214605-25	214605-26
Your Reference	UNITS	BH111	BH111	BH112	BH113	BH113
Depth		0.6-0.95	1.5-1.95	0-0.1	0-0.1	0.5-0.8
Date Sampled		28/03/2019	28/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Arsenic	mg/kg	20	5	4	7	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	17	12	19	38	5
Copper	mg/kg	21	13	32	36	19
Lead	mg/kg	83	20	41	97	17
Mercury	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1
Nickel	mg/kg	6	<1	6	28	<1
Zinc	mg/kg	66	2	53	91	2

Acid Extractable metals in soil						
Our Reference		214605-27	214605-29	214605-30	214605-32	214605-34
Your Reference	UNITS	BH114	BH115	BH115	BH116	BH116
Depth		0.12-0.2	0.04-0.2	1.5-1.7	0.7-0.95	1.8-1.95
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Arsenic	mg/kg	6	5	6	5	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	1	<0.4
Chromium	mg/kg	17	8	16	20	7
Copper	mg/kg	28	28	17	35	59
Lead	mg/kg	75	120	26	250	18
Mercury	mg/kg	<0.1	<0.1	<0.1	0.3	<0.1
Nickel	mg/kg	11	3	1	14	12
Zinc	mg/kg	52	29	7	590	42

Acid Extractable metals in soil					
Our Reference		214605-36	214605-37	214605-39	214605-64
Your Reference	UNITS	BH117	BH117	DUPRK1	BH101 - [TRIPLICATE]
Depth		0.2-0.4	1.0-1.2	-	0-0.1
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Arsenic	mg/kg	<4	4	<4	5
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	12	5	64	11
Copper	mg/kg	20	20	30	21
Lead	mg/kg	22	26	10	18
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	3	<1	55	8
Zinc	mg/kg	9	5	46	43

Moisture						
Our Reference		214605-1	214605-2	214605-3	214605-5	214605-6
Your Reference	UNITS	BH101	BH101	BH102	BH103	BH103
Depth		0-0.1	0.6-0.8	0-0.2	0-0.1	0.2-0.3
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Moisture	%	28	18	23	10	6.2

Moisture						
Our Reference		214605-8	214605-9	214605-11	214605-12	214605-13
Your Reference	UNITS	BH104	BH104	BH105	BH106	BH107
Depth		0.4-0.6	0.8-0.9	0.2-0.4	0.03-0.15	0-0.1
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Moisture	%	16	19	14	7.3	18

Moisture						
Our Reference		214605-14	214605-15	214605-17	214605-18	214605-19
Your Reference	UNITS	BH107	BH108	BH109	BH109	BH110
Depth		0.5-0.8	0.05-0.2	0.05-0.15	0.5-0.7	0-0.1
Date Sampled		27/03/2019	28/03/2019	27/03/2019	27/03/2019	28/03/2019
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Moisture	%	21	5.5	12	21	15

Moisture						
Our Reference		214605-21	214605-22	214605-23	214605-25	214605-26
Your Reference	UNITS	BH111	BH111	BH112	BH113	BH113
Depth		0.6-0.95	1.5-1.95	0-0.1	0-0.1	0.5-0.8
Date Sampled		28/03/2019	28/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Moisture	%	19	21	28	21	20

Moisture						
Our Reference		214605-27	214605-29	214605-30	214605-32	214605-34
Your Reference	UNITS	BH114	BH115	BH115	BH116	BH116
Depth		0.12-0.2	0.04-0.2	1.5-1.7	0.7-0.95	1.8-1.95
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Moisture	%	22	17	16	16	9.2

Moisture				
Our Reference		214605-36	214605-37	214605-39
Your Reference	UNITS	BH117	BH117	DUPRK1
Depth		0.2-0.4	1.0-1.2	-
Date Sampled		27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019
Moisture	%	21	15	10

Asbestos ID - soils						
Our Reference		214605-1	214605-3	214605-5	214605-8	214605-11
Your Reference	UNITS	BH101	BH102	BH103	BH104	BH105
Depth		0-0.1	0-0.2	0-0.1	0.4-0.6	0.2-0.4
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil	soil
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Sample mass tested	g	Approx. 20g	Approx. 25g	Approx. 35g	Approx. 70g	Approx. 30g
Sample Description	-	Brown sandy soil & rocks	Brown sandy soil & rocks	Brown sandy soil & rocks	Brown sandy soil & rocks	Brown sandy 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		214605-12	214605-13	214605-15	214605-17	214605-19
Your Reference	UNITS	BH106	BH107	BH108	BH109	BH110
Depth		0.03-0.15	0-0.1	0.05-0.2	0.05-0.15	0-0.1
Date Sampled		27/03/2019	27/03/2019	28/03/2019	27/03/2019	28/03/2019
Type of sample		soil	soil	soil	soil	soil
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Sample mass tested	g	Approx. 50g	Approx. 20g	Approx. 30g	Approx. 40g	Approx. 25g
Sample Description	-	Brown sandy soil & rocks	Brown coarse-grained soil & rocks	Brown sandy soil & rocks	Brown sandy soil & rocks	Brown sandy 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		214605-21	214605-23	214605-25	214605-27	214605-29
Your Reference	UNITS	BH111	BH112	BH113	BH114	BH115
Depth		0.6-0.95	0-0.1	0-0.1	0.12-0.2	0.04-0.2
Date Sampled		28/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil	soil
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Sample mass tested	g	Approx. 30g	Approx. 30g	Approx. 20g	Approx. 40g	Approx. 25g
Sample Description	-	Brown sandy soil & rocks	Brown sandy soil & rocks	Brown sandy soil & rocks	Brown sandy soil & rocks	Brown sandy 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		214605-32	214605-36
Your Reference	UNITS	BH116	BH117
Depth		0.7-0.95	0.2-0.4
Date Sampled		27/03/2019	27/03/2019
Type of sample		soil	soil
Date analysed	-	01/04/2019	01/04/2019
Sample mass tested	g	Approx. 25g	Approx. 25g
Sample Description	-	Brown sandy soil & rocks	Brown sandy 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
Trace Analysis	-	No asbestos detected	No asbestos detected

Misc Inorg - Soil			
Our Reference		214605-13	214605-37
Your Reference	UNITS	BH107	BH117
Depth		0-0.1	1.0-1.2
Date Sampled		27/03/2019	27/03/2019
Type of sample		soil	soil
Date prepared	-	02/04/2019	02/04/2019
Date analysed	-	02/04/2019	02/04/2019
pH 1:5 soil:water	pH Units	6.6	5.1

Clay 50-120g			
Our Reference		214605-13	214605-37
Your Reference	UNITS	BH107	BH117
Depth		0-0.1	1.0-1.2
Date Sampled		27/03/2019	27/03/2019
Type of sample		soil	soil
Date prepared	-	02/04/2019	02/04/2019
Date analysed	-	02/04/2019	02/04/2019
Clay in soils <2µm	% (w/w)	28	43

CEC			
Our Reference		214605-13	214605-37
Your Reference	UNITS	BH107	BH117
Depth		0-0.1	1.0-1.2
Date Sampled		27/03/2019	27/03/2019
Type of sample		soil	soil
Date prepared	-	03/04/2019	03/04/2019
Date analysed	-	03/04/2019	03/04/2019
Exchangeable Ca	meq/100g	8.7	0.5
Exchangeable K	meq/100g	0.8	0.2
Exchangeable Mg	meq/100g	1.9	0.89
Exchangeable Na	meq/100g	<0.1	0.18
Cation Exchange Capacity	meq/100g	11	1.8

BTEX in Water		
Our Reference		214605-42
Your Reference	UNITS	FRAM1
Depth		-
Date Sampled		27/03/2019
Type of sample		soil
Date extracted	-	01/04/2019
Date analysed	-	03/04/2019
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Surrogate Dibromofluoromethane	%	99
Surrogate toluene-d8	%	97
Surrogate 4-BFB	%	96

Asbestos ID - materials		
Our Reference		214605-65
Your Reference	UNITS	AMF1
Depth		-
Date Sampled		27/03/2019
Type of sample		material
Date analysed	-	03/04/2019
Mass / Dimension of Sample	-	72x27x5mm
Sample Description	-	Beige layered fibre cement material
Asbestos ID in materials	-	Chrysotile asbestos detected Organic fibres detected

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.
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-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-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.
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.

Method ID	Methodology Summary
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-4	214605-3
Date extracted	-			01/04/2019	1	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			03/04/2019	1	03/04/2019	03/04/2019		03/04/2019	03/04/2019
TRH C_6 - C_9	mg/kg	25	Org-016	<25	1	<25	<25	0	88	94
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	1	<25	<25	0	88	94
Benzene	mg/kg	0.2	Org-016	<0.2	1	<0.2	<0.2	0	90	95
Toluene	mg/kg	0.5	Org-016	<0.5	1	<0.5	<0.5	0	93	94
Ethylbenzene	mg/kg	1	Org-016	<1	1	<1	<1	0	88	93
m+p-xylene	mg/kg	2	Org-016	<2	1	<2	<2	0	85	95
o-Xylene	mg/kg	1	Org-016	<1	1	<1	<1	0	89	96
naphthalene	mg/kg	1	Org-014	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	85	1	91	88	3	89	112

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	214605-32
Date extracted	-			[NT]	15	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			[NT]	15	03/04/2019	03/04/2019		03/04/2019	03/04/2019
TRH C_6 - C_9	mg/kg	25	Org-016	[NT]	15	<25	<25	0	97	91
TRH C_6 - C_{10}	mg/kg	25	Org-016	[NT]	15	<25	<25	0	97	91
Benzene	mg/kg	0.2	Org-016	[NT]	15	<0.2	<0.2	0	99	92
Toluene	mg/kg	0.5	Org-016	[NT]	15	<0.5	<0.5	0	104	96
Ethylbenzene	mg/kg	1	Org-016	[NT]	15	<1	<1	0	96	91
m+p-xylene	mg/kg	2	Org-016	[NT]	15	<2	<2	0	92	88
o-Xylene	mg/kg	1	Org-016	[NT]	15	<1	<1	0	97	91
naphthalene	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	15	93	94	1	96	88

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]	30	01/04/2019	01/04/2019		[NT]	[NT]
Date analysed	-			[NT]	30	03/04/2019	03/04/2019		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	[NT]	30	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	[NT]	30	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-016	[NT]	30	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-016	[NT]	30	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-016	[NT]	30	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-016	[NT]	30	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-016	[NT]	30	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-014	[NT]	30	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	30	91	86	6	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	214605-3
Date extracted	-			01/04/2019	1	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			01/04/2019	1	01/04/2019	01/04/2019		01/04/2019	02/04/2019
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	1	<50	<50	0	124	106
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	1	<100	<100	0	121	98
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	1	<100	<100	0	129	79
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	1	<50	<50	0	124	106
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	1	<100	<100	0	121	98
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	1	<100	<100	0	129	79
Surrogate o-Terphenyl	%		Org-003	94	1	99	107	8	108	101

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	214605-32
Date extracted	-			[NT]	15	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			[NT]	15	02/04/2019	02/04/2019		02/04/2019	02/04/2019
TRH C_{10} - C_{14}	mg/kg	50	Org-003	[NT]	15	<50	<50	0	102	88
TRH C_{15} - C_{28}	mg/kg	100	Org-003	[NT]	15	<100	<100	0	94	84
TRH C_{29} - C_{36}	mg/kg	100	Org-003	[NT]	15	<100	<100	0	100	81
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	[NT]	15	<50	<50	0	102	88
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	[NT]	15	<100	<100	0	94	84
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	[NT]	15	<100	<100	0	100	81
Surrogate o-Terphenyl	%		Org-003	[NT]	15	94	94	0	101	94

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	30	01/04/2019	01/04/2019		[NT]	[NT]
Date analysed	-			[NT]	30	02/04/2019	02/04/2019		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	[NT]	30	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	[NT]	30	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	[NT]	30	<100	<100	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	[NT]	30	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	[NT]	30	<100	<100	0	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	[NT]	30	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-003	[NT]	30	95	96	1	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	214605-3
Date extracted	-			01/04/2019	1	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			02/04/2019	1	02/04/2019	02/04/2019		02/04/2019	02/04/2019
Naphthalene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	107	103
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	112	109
Phenanthrene	mg/kg	0.1	Org-012	<0.1	1	0.4	0.2	67	117	112
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	1.2	0.5	82	109	105
Pyrene	mg/kg	0.1	Org-012	<0.1	1	1.1	0.5	75	109	105
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	1	0.4	0.2	67	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	1	0.4	0.2	67	110	109
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	1	0.7	0.3	80	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	1	0.4	0.1	120	107	97
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	1	0.2	<0.1	67	[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	0.3	0.1	100	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	130	1	135	109	21	112	105

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	214605-32
Date extracted	-			[NT]	15	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			[NT]	15	02/04/2019	02/04/2019		02/04/2019	02/04/2019
Naphthalene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	107	102
Acenaphthylene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	115	108
Phenanthrene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	116	112
Anthracene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	108	106
Pyrene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	107	105
Benzo(a)anthracene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	109	107
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	[NT]	15	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	[NT]	15	<0.05	<0.05	0	94	97
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	[NT]	15	99	106	7	107	89

QUALITY CONTROL: PAHs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	30	01/04/2019	01/04/2019		[NT]	[NT]
Date analysed	-			[NT]	30	02/04/2019	02/04/2019		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-012	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-012	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-012	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-012	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	[NT]	30	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	[NT]	30	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	[NT]	30	104	115	10	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	214605-3
Date extracted	-			01/04/2019	1	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			03/04/2019	1	03/04/2019	03/04/2019		03/04/2019	03/04/2019
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	82	75
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	82	73
Heptachlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	82	75
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	83	78
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	92	83
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	90	82
Dieldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	109	99
Endrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	97	90
pp-DDD	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	89	76
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	80	79
Methoxychlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	101	1	98	102	4	90	87

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	214605-32
Date extracted	-			[NT]	15	01/04/2019	01/04/2019		[NT]	01/04/2019
Date analysed	-			[NT]	15	03/04/2019	03/04/2019		[NT]	03/04/2019
HCB	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	68
gamma-BHC	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	67
Heptachlor	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	68
delta-BHC	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	68
Heptachlor Epoxide	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	76
gamma-Chlordane	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	73
Dieldrin	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	89
Endrin	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	82
pp-DDD	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	76
Endosulfan II	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	72
Methoxychlor	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	[NT]	15	98	99	1	[NT]	84

QUALITY CONTROL: Organophosphorus Pesticides						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	214605-3
Date extracted	-			01/04/2019	1	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			03/04/2019	1	03/04/2019	03/04/2019		03/04/2019	03/04/2019
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	99	100
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	95	97
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	105	106
Fenitrothion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	101	99
Malathion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	83	75
Parathion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	108	106
Ronnel	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	95	102
Surrogate TCMX	%		Org-008	101	1	98	102	4	99	97

QUALITY CONTROL: Organophosphorus Pesticides						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	214605-32
Date extracted	-			[NT]	15	01/04/2019	01/04/2019		[NT]	01/04/2019
Date analysed	-			[NT]	15	03/04/2019	03/04/2019		[NT]	03/04/2019
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	94
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	93
Dimethoate	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	102
Fenitrothion	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	99
Malathion	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	75
Parathion	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	96
Ronnel	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	91
Surrogate TCMX	%		Org-008	[NT]	15	98	99	1	[NT]	92

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	214605-3
Date extracted	-			01/04/2019	1	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			03/04/2019	1	03/04/2019	03/04/2019		03/04/2019	03/04/2019
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	104	101
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	101	1	98	102	4	99	97

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	214605-32
Date extracted	-			[NT]	15	01/04/2019	01/04/2019		[NT]	01/04/2019
Date analysed	-			[NT]	15	03/04/2019	03/04/2019		[NT]	03/04/2019
Aroclor 1016	mg/kg	0.1	Org-006	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	[NT]	15	<0.1	<0.1	0	[NT]	100
Aroclor 1260	mg/kg	0.1	Org-006	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	[NT]	15	98	99	1	[NT]	92

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	214605-3
Date prepared	-			01/04/2019	1	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			01/04/2019	1	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Arsenic	mg/kg	4	Metals-020	<4	1	4	6	40	105	107
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	112	106
Chromium	mg/kg	1	Metals-020	<1	1	11	10	10	109	103
Copper	mg/kg	1	Metals-020	<1	1	23	23	0	109	111
Lead	mg/kg	1	Metals-020	<1	1	19	19	0	105	101
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	105	121
Nickel	mg/kg	1	Metals-020	<1	1	8	7	13	106	102
Zinc	mg/kg	1	Metals-020	<1	1	100	40	86	106	103

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	214605-32
Date prepared	-			[NT]	15	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			[NT]	15	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Arsenic	mg/kg	4	Metals-020	[NT]	15	<4	<4	0	104	93
Cadmium	mg/kg	0.4	Metals-020	[NT]	15	<0.4	<0.4	0	109	87
Chromium	mg/kg	1	Metals-020	[NT]	15	20	20	0	107	105
Copper	mg/kg	1	Metals-020	[NT]	15	58	57	2	106	110
Lead	mg/kg	1	Metals-020	[NT]	15	8	9	12	105	#
Mercury	mg/kg	0.1	Metals-021	[NT]	15	<0.1	<0.1	0	106	126
Nickel	mg/kg	1	Metals-020	[NT]	15	82	79	4	104	94
Zinc	mg/kg	1	Metals-020	[NT]	15	41	41	0	104	#

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	30	01/04/2019	01/04/2019		[NT]	[NT]
Date analysed	-			[NT]	30	01/04/2019	01/04/2019		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	30	6	5	18	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	30	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	30	16	16	0	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	30	17	14	19	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	30	26	21	21	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	30	1	<1	0	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	30	7	3	80	[NT]	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			02/04/2019	[NT]	[NT]	[NT]	[NT]	02/04/2019	[NT]
Date analysed	-			02/04/2019	[NT]	[NT]	[NT]	[NT]	02/04/2019	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	102	[NT]

QUALITY CONTROL: CEC					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			03/04/2019	[NT]	[NT]	[NT]	[NT]	03/04/2019	[NT]
Date analysed	-			03/04/2019	[NT]	[NT]	[NT]	[NT]	03/04/2019	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	91	[NT]
Exchangeable K	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Exchangeable Na	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]

QUALITY CONTROL: BTEX in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			01/04/2019	[NT]	[NT]	[NT]	[NT]	01/04/2019	[NT]
Date analysed	-			03/04/2019	[NT]	[NT]	[NT]	[NT]	03/04/2019	[NT]
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	97	[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]	87	[NT]
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Surrogate Dibromofluoromethane	%		Org-016	99	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate toluene-d8	%		Org-016	97	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate 4-BFB	%		Org-016	100	[NT]	[NT]	[NT]	[NT]	89	[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.

Report Comments

METALS_S:

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 214605-1 for Zn. Therefore a triplicate result has been issued as laboratory sample number 214605-64.
Percent recovery is not possible to report due to the high concentration of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

Asbestos: Excessive sample volumes were provided for asbestos analysis. A portion of the supplied sample was sub-sampled according to Envirolab procedures. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g (50mL) of sample in its own container as per AS4964-2004.
Note: Samples requested for asbestos testing were sub-sampled from bags provided by the client.

PAHs in Soil - The RPD for duplicate results is accepted due to the non homogenous nature of sample 1.

Envirolab Services Pty Ltd
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SAMPLE RECEIPT ADVICE

Client Details

Client	Environmental Investigation Services
Attention	Harry Leonard

Sample Login Details

Your reference	E31772KL, Normanhurst
Envirolab Reference	214605
Date Sample Received	29/03/2019
Date Instructions Received	29/03/2019
Date Results Expected to be Reported	05/04/2019

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	63 soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	23.3
Cooling Method	Ice
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
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Sample ID	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	Misc Inorg - Soil	Clay 50-120g	CEC	BTEX in Water	On Hold
BH101-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓					
BH101-0.6-0.8	✓	✓	✓				✓						
BH102-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓					
BH102-0.5-0.7													✓
BH103-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓					
BH103-0.2-0.3	✓	✓	✓				✓						
BH104-0.03-0.15													✓
BH104-0.4-0.6	✓	✓	✓	✓	✓	✓	✓	✓					
BH104-0.8-0.9	✓	✓	✓				✓						
BH105-0.05-0.2													✓
BH105-0.2-0.4	✓	✓	✓	✓	✓	✓	✓	✓					
BH106-0.03-0.15	✓	✓	✓	✓	✓	✓	✓	✓					
BH107-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
BH107-0.5-0.8	✓	✓	✓				✓						
BH108-0.05-0.2	✓	✓	✓	✓	✓	✓	✓	✓					
BH108-0.5-0.95													✓
BH109-0.05-0.15	✓	✓	✓	✓	✓	✓	✓	✓					
BH109-0.5-0.7	✓	✓	✓				✓						
BH110-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓					
BH111-0.16-0.3													✓
BH111-0.6-0.95	✓	✓	✓	✓	✓	✓	✓	✓					
BH111-1.5-1.95	✓	✓	✓				✓						
BH112-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓					
BH112-0.5-0.7													✓
BH113-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓					
BH113-0.5-0.8	✓	✓	✓				✓						
BH114-0.12-0.2	✓	✓	✓	✓	✓	✓	✓	✓					
BH114-0.2-0.4													✓
BH115-0.04-0.2	✓	✓	✓	✓	✓	✓	✓	✓					
BH115-1.5-1.7	✓	✓	✓				✓						
BH116-0.05-0.2													✓
BH116-0.7-0.95	✓	✓	✓	✓	✓	✓	✓	✓					

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Sample ID	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	Misc Inorg - Soil	Clay 50-120g	CEC	BTEX in Water	On Hold
BH116-1.5-1.7													✓
BH116-1.8-1.95	✓	✓	✓				✓						
BH117-0.13-0.2													✓
BH117-0.2-0.4	✓	✓	✓	✓	✓	✓	✓	✓					
BH117-1.0-1.2	✓	✓	✓				✓		✓	✓	✓		
TB1	✓												
DUPRK1	✓	✓	✓				✓						
DUPRK3													✓
DUPRK4													✓
FRAM1												✓	
BH101-0-0.3													✓
BH102-0-0.2													✓
BH103-0-0.1													✓
BH104-0.03-0.4													✓
BH104-0.4-0.8													✓
BH105-0.05-0.2													✓
BH105-0.2-0.6													✓
BH106-0.03-0.4													✓
BH107-0-0.5													✓
BH108-0.05-0.2													✓
BH109-0.05-0.3													✓
BH110-0-0.5													✓
BH111-0.16-0.6													✓
BH111-0.6-1.0													✓
BH112-0-0.5													✓
BH113-0-0.45													✓
BH114-0.12-0.2													✓
BH115-0.09-1.0													✓
BH116-0.05-0.7													✓
BH116-0.7-1.7													✓
BH117-0.2-0.7													✓

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

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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.

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: E31772KL Date Results Required: STANDARD Page: 1	JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Harry Leonard

Location: Normanhurst
Sampler: AM
Sample Preserved in Esky on Ice
Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 6a	Combo 3	Asbestos	WA Asbestos (500mL)	BTEX	pH/CEC	Clay content (%)
27/3/19	1	BH101	0-0.1	G, A	0	Fill: Silty Clay	X						
	2	BH101	0.6-0.8		0	Silty Clay		X					
	3	BH102	0-0.2		6	F: Silty Clay	X						
	4	BH102	0.5-0.7		0.5	Silty Clay							
	5	BH103	0-0.1		0	F: Gravelly Sand	X						
	6	BH103	0.2-0.3		0	Siltstone		X					
	7	BH104	0.03-0.15		0	F: Silty Gravelly Sand							
	8	BH104	0.4-0.6		0	F: Silty Sandy Clay	X						
	9	BH104	0.8-0.9	G,A	0	Silty Clay		X					
	10	BH105	0.05-0.2	G,A	0	F: Silty Gravelly Sand							
	11	BH105	0.2-0.4		6.1	F: Gravelly Sand	X						
	12	BH106	0.03-0.15		0.1	↓	X						
	13	BH107	0-0.1		1.9	F: Silty Clay	X					X	X
↓	14	BH107	0.5-0.8		122.6	Silty Clay		X					
28/3/19	15	BH108	0.05-0.2		0	F: Silty Clay	X						
↓	16	BH108	0.5-0.95		0	Silty Clay							
27/3/19	17	BH109	0.05-0.15		0.9	Fill: Sandy Gravel	X						
↓	18	BH109	0.5-0.7		0.2	Silty Clay		X					
28/3/19	19	BH110	0-0.1		0	F: Silty Sandy Clay	X						
	20	BH111	0.16-0.3		0	F: Sandy Gravel							
	21	BH111	0.6-0.95		19.1	F: Silty Clay	X						
↓	22	BH111	1.5-1.95		0	Silty Clay		X					
27/3/19	23	BH112	0-0.1		0	F: Silty Clay	X						
↓	24	BH112	0.5-0.7		9.3	Silty Clay							
↓	25	BH113	0-0.1	↓	0	F: Silty Clay	X						

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

Job No: 214605
Date Received: 29/3/19
Time Received: 13:58
Received by: IN
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Remarks (comments/detection limits required):
DUPRK2 – Inter-lab duplicate
DUPRK1 – Intra-lab duplicate

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

Relinquished By:	Date:	Time:	Received By:	Date:
M Lf	29/3/2019		T. Nguyen	29/3/19

SAMPLE AND CHAIN OF CUSTODY FORM

TO: ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen	EIS Job Number: E31772KL Date Results Required: STANDARD Page: 2/3	**FROM:** JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Harry Leonard

Location: Normanhurst — Sample Preserved in Esky on Ice

Sampler: AM — Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 6a	Combo 3	Asbestos	WA Asbestos (500mL)	BTEX	pH/CEC	Clay content (%)					
27/3/19	26	BH113	0.5-0.8	G, A	13.7	Silty Clay		X										
28/3/19	27	BH114	0.12-0.2		0	Fill: Sandy Gravel	X											
	28	↓	0.2-0.4		0	Silty Clay												
	29	BH115	0.09-0.2		0	F: Silty Clay	X											
	30	↓	1.5-1.7		0	Silty Clay		X										
	31	BH116	0.05-0.2		0	Fill: Gravelly Sand												
	32		0.7-0.95		0	F: Silty Clay	X											
	33		1.5-1.7	↓	0	↓												
	34	↓	1.8-1.95	G	0	Siltstone		X										
	35	BH117	0.13-0.2	G, A	0	Fill: Gravelly Sand												
	36		0.2-0.4		0	F: Silty Clay	X											
↓	37	↓	1.0-1.2	↓	0	Silty Clay		X				X	X					
26/3/19	38	TB1	—	G	—	Trip blank Soil					X							
27/3/19	39	DUPRK1	-		—	Dup Soil		X										
	—	DUPRK2	—		—			X										
	40	DUPRK3	—		—													
	41	DUPRK4	—	↓	—	↓												
	42	FRAM1	—	V	—	Rinsate Water					X							
	43	BH101	0-0.3	A	—	F: Silty Clay												
	44	BH102	0-0.2		—	↓												
	45	BH103	0-0.1		—	F: Gravelly Sand												
	46	BH104	0.03-0.4		—	F: Silty Gravelly Sand												
	47	↓	0.4-0.8		—	F: Silty Sand/Clay												
	48	BH105	0.05-0.2		—	F: Silty Gravelly Sand												
↓	49	↓	0.2-0.6	↓	—	F: Gravelly Sand												

Remarks (comments/detection limits required):
DUPRK2 – Inter-lab duplicate
DUPRK1 – Intra-lab duplicate

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

Relinquished By:	Date:	Time:	Received By:	Date:
	29/3/2019		T. Nguyen	29/3/19

214605

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: E31772KL Date Results Required: STANDARD Page: 3/3	JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Harry Leonard

Location: Normanhurst — Sample Preserved in Esky on Ice

Sampler: AM — Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 6a	Combo 3	Asbestos	WA Asbestos (500mL)	BTEX	pH/CEC	Clay content (%)					
27/3/19	50	BH106	0.03-0.4	G, A	–	F: Silty Gravelly Sand												
↓	51	BH107	0-0.5		–	F: Silty Clay												
28/3/19	52	BH108	0.05-0.2		–	" ↓												
27/3/19	53	BH109	0.05-0.3		–	F: Sandy Gravel												
28/3/19	54	BH110	0-0.5		–	F: Silty Sandy Clay												
↓	55	BH111	0.16-0.6		–	F: Sandy Gravel												
↓	56	↓	0.6-1.0		–	F: Silty Clay												
27/3/19	57	BH112	0-0.5		–	F: Silty Clay												
↓	58	BH113	0-0.45		–	↓												
28/3/19	59	BH114	0.12-0.2		–	F: Sandy Gravel												
↓	60	BH115	0.07-1.0		–	F: Silty Clay												
↓	61	BH116	0.05-0.7		–	F: Gravelly Sand												
↓	62	↓	0.7-1.7		–	F: Silty Clay												
6 NP ↓	~~63~~	BH117	0.13-0.2		–	F: Gravelly Sand												
63 ↓	~~64~~	↓	0.2-0.7	↓	–	F: Silty Clay												
NP 27/3/19	~~65~~	AMF1	Surface	A	–	Fragment			X									

Remarks (comments/detection limits required):
As page 1 duplicates.
*Please hold 500mL samples. To be filtered.

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

Relinquished By:	Date:	Time:	Received By:	Date:
	29/3/2019.		T. Nguyen	29/3/19

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CERTIFICATE OF ANALYSIS 214605-A

Client Details

Client	Environmental Investigation Services
Attention	Harry Leonard
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E31772KL, Normanhurst**
Number of Samples	63 soil, 1 material
Date samples received	29/03/2019
Date completed instructions received	16/05/2019

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	21/05/2019
Date of Issue	20/05/2019

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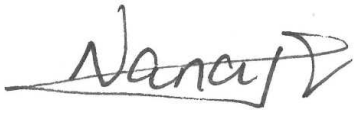
Asbestos Approved By
Analysed by Asbestos Approved Identifier: Matt Tang, Lucy Zhu
Authorised by Asbestos Approved Signatory: Lucy Zhu
Results Approved By
Lucy Zhu, Senior Asbestos Analyst

Authorised By



Nancy Zhang, Laboratory Manager

Asbestos ID - soils NEPM - ASB-001						
Our Reference		214605-A-43	214605-A-44	214605-A-45	214605-A-46	214605-A-47
Your Reference	UNITS	BH101	BH102	BH103	BH104	BH104
Depth		0-0.3	0-0.2	0-0.1	0.03-0.4	0.4-0.8
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil	soil
Date analysed	-	20/05/2019	20/05/2019	20/05/2019	20/05/2019	20/05/2019
Sample mass tested	g	534.47	453.94	758.54	763.45	509.28
Sample Description	-	Brown coarse-grained soil & rocks	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	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
Total Asbestos#1	g/kg	<0.1	<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	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	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM - ASB-001						
Our Reference		214605-A-48	214605-A-49	214605-A-50	214605-A-51	214605-A-52
Your Reference	UNITS	BH105	BH105	BH106	BH107	BH108
Depth		0.05-0.2	0.2-0.6	0.03-0.4	0-0.5	0.05-0.2
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil	soil
Date analysed	-	20/05/2019	20/05/2019	20/05/2019	20/05/2019	20/05/2019
Sample mass tested	g	726.94	600.84	780.67	429.63	784.28
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	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	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
Total Asbestos#1	g/kg	<0.1	<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	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	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM - ASB-001						
Our Reference		214605-A-53	214605-A-54	214605-A-55	214605-A-56	214605-A-57
Your Reference	UNITS	BH109	BH110	BH111	BH111	BH112
Depth		0.05-0.3	0-0.5	0.16-0.6	0.6-1.0	0-0.5
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil	soil
Date analysed	-	20/05/2019	20/05/2019	20/05/2019	20/05/2019	20/05/2019
Sample mass tested	g	684.56	639.32	711.12	329.33	503.23
Sample Description	-	Brown coarse-grained soil & rocks	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	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
Total Asbestos#1	g/kg	<0.1	<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	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	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM - ASB-001						
Our Reference		214605-A-58	214605-A-59	214605-A-60	214605-A-61	214605-A-62
Your Reference	UNITS	BH113	BH114	BH115	BH116	BH116
Depth		0-0.45	0.12-0.2	0.09-1.0	0.05-0.7	0.7-1.7
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		soil	soil	soil	soil	soil
Date analysed	-	20/05/2019	20/05/2019	20/05/2019	20/05/2019	20/05/2019
Sample mass tested	g	460.24	480.4	561.15	906.93	630.74
Sample Description	-	Brown coarse-grained soil & rocks	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	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
Total Asbestos#1	g/kg	<0.1	<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	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	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM - ASB-001		
Our Reference		214605-A-63
Your Reference	UNITS	BH117
Depth		0.2-0.7
Date Sampled		27/03/2019
Type of sample		soil
Date analysed	-	20/05/2019
Sample mass tested	g	552.09
Sample Description	-	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
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

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.

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

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.

Note: All samples analysed as received. However, samples 214605-A-44, 47, 51, 56, 58, 59 are below the minimum 500mL sample volume as per National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013.

Envirolab Services Pty Ltd
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12 Ashley St Chatswood NSW 2067
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www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Environmental Investigation Services
Attention	Harry Leonard

Sample Login Details

Your reference	E31772KL, Normanhurst
Envirolab Reference	214605-A
Date Sample Received	29/03/2019
Date Instructions Received	16/05/2019
Date Results Expected to be Reported	21/05/2019

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	63 soil, 1 material
Turnaround Time Requested	3 days
Temperature on Receipt (°C)	23.3
Cooling Method	Ice
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	Asbestos ID - soils NEPM - ASB-001	On Hold
BH101-0-0.1		✓
BH101-0.6-0.8		✓
BH102-0-0.2		✓
BH102-0.5-0.7		✓
BH103-0-0.1		✓
BH103-0.2-0.3		✓
BH104-0.03-0.15		✓
BH104-0.4-0.6		✓
BH104-0.8-0.9		✓
BH105-0.05-0.2		✓
BH105-0.2-0.4		✓
BH106-0.03-0.15		✓
BH107-0-0.1		✓
BH107-0.5-0.8		✓
BH108-0.05-0.2		✓
BH108-0.5-0.95		✓
BH109-0.05-0.15		✓
BH109-0.5-0.7		✓
BH110-0-0.1		✓
BH111-0.16-0.3		✓
BH111-0.6-0.95		✓
BH111-1.5-1.95		✓
BH112-0-0.1		✓
BH112-0.5-0.7		✓
BH113-0-0.1		✓
BH113-0.5-0.8		✓
BH114-0.12-0.2		✓
BH114-0.2-0.4		✓
BH115-0.04-0.2		✓
BH115-1.5-1.7		✓
BH116-0.05-0.2		✓
BH116-0.7-0.95		✓

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Sample ID	Asbestos ID - soils NEPM - ASB-001	On Hold
BH116-1.5-1.7		✓
BH116-1.8-1.95		✓
BH117-0.13-0.2		✓
BH117-0.2-0.4		✓
BH117-1.0-1.2		✓
TB1		✓
DUPRK1		✓
DUPRK3		✓
DUPRK4		✓
FRAM1		✓
BH101-0-0.3	✓	
BH102-0-0.2	✓	
BH103-0-0.1	✓	
BH104-0.03-0.4	✓	
BH104-0.4-0.8	✓	
BH105-0.05-0.2	✓	
BH105-0.2-0.6	✓	
BH106-0.03-0.4	✓	
BH107-0-0.5	✓	
BH108-0.05-0.2	✓	
BH109-0.05-0.3	✓	
BH110-0-0.5	✓	
BH111-0.16-0.6	✓	
BH111-0.6-1.0	✓	
BH112-0-0.5	✓	
BH113-0-0.45	✓	
BH114-0.12-0.2	✓	
BH115-0.09-1.0	✓	
BH116-0.05-0.7	✓	
BH116-0.7-1.7	✓	
BH117-0.2-0.7	✓	
BH101 - [TRIPLICATE]-0-0.1		✓

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Sample ID	Asbestos ID - soils NEPM - ASB-001	On Hold
AMF1		✓

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.

Andrew Fitzsimons

From: Harry Leonard <HLeonard@jkenvironments.com.au>
Sent: Thursday, 16 May 2019 7:40 AM
To: Nancy Zhang
Cc: Customer Service
Subject: RE: Results for Registration 214605 E31772KL, Normanhurst
Attachments: 2718_001.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Nancy,

43-63

Would you be able to schedule the samples highlighted in the attached COC for WA Asbestos analysis?

If we could get them on a 3 day turnaround that would be great.

Any issues or questions please let me know.

Ref: 214605-A
TAT: 3 days
Due: 21/5/19

Regards,

Harry Leonard
Senior Environmental Scientist
NSW Licensed Asbestos Assessor

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JKEnvironments

EIS ENVIRONMENTAL INVESTIGATION SERVICES
CONSULTING ENVIRONMENTAL ENGINEERS AND SCIENTISTS
PO Box 976, North Ryde BC NSW 1670
115 Wicks Rd, Macquarie Park NSW 2113

Ref: 214605-A
Due: 21/5/19

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: E31772KL Date Results Required: STANDARD Page: 2/3	JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Harry Leonard

Location: Normanhurst
Sampler: AM

Sample Preserved in Esky on Ice

Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 6a	Combo 3	Asbestos	WA Asbestos (500mL)	BTEX	pH/CEC	Clay content (%)
27/3/19	26	BH113	0.5-0.8	G, A	13.7	Silty Clay		X					
28/3/19	27	BH114	0.12-0.2		0	Fill: Gravel	X						
	28	↓	0.2-0.4		0	Silty Clay							
	29	BH115	0.09-0.2		0	F: Silty Clay	X						
	30	↓	1.5-1.7		0	Silty Clay		X					
	31	BH116	0.05-0.2		0	Fill: Gravelly Sand							
	32		0.7-0.95		0	F: Silty Clay	X						
	33		1.5-1.7	↓	0	↓							
	34	↓	1.8-1.95	G	0	Siltstone		X					
	35	BH117	0.13-0.2	G, A	0	Fill: Gravelly Sand							
	36		0.2-0.4		0	F: Silty Clay	X						
↓	37	↓	1.0-1.2	↓	0	Silty Clay		X				X	X
26/3/19	38	TB1	—	G	—	Trip blank Soil					X		
27/3/19	39	DUPRK1	-		—	Dup Soil		X					
	—	DUPRK2	—		—			X					
	40	DUPRK3	—		—								
	A1	DUPRK4	—	↓	—								
	A2	FRAM1	—	V	—	Rinsate Water					X		
	A3	BH101	0-0.3	A	—	F: Silty Clay				X			
	A4	BH102	0-0.2		—	↓				X			
	A5	BH103	0-0.1		—	F: Gravelly Sand				X			
	A6	BH104	0.03-0.4		—	F: Gravelly Sand				X			
	A7	↓	0.4-0.8		—	F: Silty Clay				X			
	A8	BH105	0.05-0.2		—	F: Gravelly Sand				X			
V	49	↓	0.2-0.6	↓	—	F: Gravelly Sand				X			

Remarks (comments/detection limits required):
DUPRK2 – Inter-lab duplicate
DUPRK4 – Intra-lab duplicate

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

Relinquished By:	Date:	Time:	Received By:	Date:
	29/3/2019		T. Nguyen	29/3/19

214605

Ref: 214605-A
Due: 21/5/19

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: E31772KL Date Results Required: STANDARD Page: 3/3	JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Harry Leonard

Location: Normanhurst
Sampler: AM
Sample Preserved in Esky on Ice
Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 6a	Combo 3	Asbestos	WA Asbestos (500cm3)	BTEX	pH/CEC	Clay content (%)
27/3/19	50	BH106	0.03-0.4	G, A	-	F: Silty Gravelly Sand				X			
↓	51	BH107	0-0.5		-	F: Silty Clay				X			
28/3/19	52	BH108	0.05-0.2		-	↓				X			
27/3/19	53	BH109	0.05-0.3		-	F: Sandy Gravel				X			
28/3/19	54	BH110	0-0.5		-	F: Silty Sandy Clay				X			
↓	55	BH111	0.16-0.6		-	F: Sandy Gravel				X			
↓	56	↓	0.6-1.0		-	F: Silty Clay				X			
27/3/19	57	BH112	0-0.5		-	F: Silty Clay				X			
↓	58	BH113	0-0.15		-	↓				X			
28/3/19	59	BH114	0.12-0.2		-	F: Sandy Gravel				X			
	60	BH115	0.07-1.0		-	F: Silty Clay				X			
	61	BH116	0.05-0.7		-	F: Gravelly Sand				X			
	62	↓	0.7-1.7		-	F: Silty Clay				X			
	~~63~~	BH117	0.13-0.3		-	F: Gravelly Sand				X			
63	↓	↓	0.2-0.7	↓	-	F: Silty Clay				X			
NS 27/3/19	~~64~~	AMF1	Surface	A	-	Fragment			X				

Remarks (comments/detection limits required):
As page 1 duplicates.
* Please hold 500mL samples. To be filed/held

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

Relinquished By:	Date:	Time:	Received By:	Date:
	29/3/2019.		T. Nguyen	29/3/19

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melbourne@envirolab.com.au
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CERTIFICATE OF ANALYSIS 16446

Client Details

Client	Environmental Investigation Services
Attention	Harry Leonard
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E31772KL**
Number of Samples	1 Soil
Date samples received	02/04/2019
Date completed instructions received	02/04/2019

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	08/04/2019
Date of Issue	08/04/2019

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

Results Approved By
Chris De Luca, Operations Manager

Authorised By

Pamela Adams, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		16446-1
Your Reference	UNITS	DUPRK2
Date Sampled		27/03/2019
Type of sample		Soil
Date extracted	-	03/04/2019
Date analysed	-	04/04/2019
vTRH C_6 - C_9	mg/kg	<25
vTRH C_6 - C_{10}	mg/kg	<25
TRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
Naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	101

TRH Soil C10-C40 NEPM		
Our Reference		16446-1
Your Reference	UNITS	DUPRK2
Date Sampled		27/03/2019
Type of sample		Soil
Date extracted	-	03/04/2019
Date analysed	-	04/04/2019
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	140
TRH C_{29} - C_{36}	mg/kg	340
Total +ve TRH (C10-C36)	mg/kg	480
TRH >C_{10} -C_{16}	mg/kg	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50
TRH >C_{16} -C_{34}	mg/kg	350
TRH >C_{34} -C_{40}	mg/kg	420
Total +ve TRH (>C10-C40)	mg/kg	770
Surrogate o-Terphenyl	%	77

PAHs in Soil		
Our Reference		16446-1
Your Reference	UNITS	DUPRK2
Date Sampled		27/03/2019
Type of sample		Soil
Date extracted	-	03/04/2019
Date analysed	-	06/04/2019
Naphthalene	mg/kg	<1
Acenaphthylene	mg/kg	<1
Acenaphthene	mg/kg	<1
Fluorene	mg/kg	<1
Phenanthrene	mg/kg	7.7
Anthracene	mg/kg	1.6
Fluoranthene	mg/kg	17
Pyrene	mg/kg	14
Benzo(a)anthracene	mg/kg	5.6
Chrysene	mg/kg	5.8
Benzo(b,j&k)fluoranthene	mg/kg	10
Benzo(a)pyrene	mg/kg	5.2
Indeno(1,2,3-c,d)pyrene	mg/kg	4.5
Dibenzo(a,h)anthracene	mg/kg	1.5
Benzo(g,h,i)perylene	mg/kg	5.8
Total +ve PAH's	mg/kg	80
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	8.8
Benzo(a)pyrene TEQ calc (Half)	mg/kg	8.8
Benzo(a)pyrene TEQ calc (PQL)	mg/kg	8.8
Surrogate p-Terphenyl-d_{14}	%	92

Acid Extractable metals in soil		
Our Reference		16446-1
Your Reference	UNITS	DUPRK2
Date Sampled		27/03/2019
Type of sample		Soil
Date digested	-	03/04/2019
Date analysed	-	03/04/2019
Arsenic	mg/kg	<4
Cadmium	mg/kg	<0.4
Chromium	mg/kg	40
Copper	mg/kg	110
Lead	mg/kg	15
Mercury	mg/kg	<0.1
Nickel	mg/kg	41
Zinc	mg/kg	42

Moisture		
Our Reference		16446-1
Your Reference	UNITS	DUPRK2
Date Sampled		27/03/2019
Type of sample		Soil
Date prepared	-	03/04/2019
Date analysed	-	04/04/2019
Moisture	%	7.6

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	-			03/04/2019	[NT]	[NT]	[NT]	[NT]	03/04/2019	[NT]
Date analysed	-			04/04/2019	[NT]	[NT]	[NT]	[NT]	04/04/2019	[NT]
vTRH C_6 - C_9	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	92	[NT]
vTRH C_6 - C_{10}	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	92	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	[NT]	[NT]	85	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	[NT]	[NT]	96	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	93	[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]	97	[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	-			03/04/2019	[NT]	[NT]	[NT]	[NT]	03/04/2019	[NT]
Date analysed	-			04/04/2019	[NT]	[NT]	[NT]	[NT]	04/04/2019	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	98	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	90	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	93	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	98	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	90	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	93	[NT]
Surrogate o-Terphenyl	%		Org-003	82	[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	-			03/04/2019	[NT]	[NT]	[NT]	[NT]	03/04/2019	[NT]
Date analysed	-			06/04/2019	[NT]	[NT]	[NT]	[NT]	06/04/2019	[NT]
Naphthalene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	110	[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]	104	[NT]
Phenanthrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	110	[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]	110	[NT]
Pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	110	[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]	108	[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]	100	[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	104	[NT]	[NT]	[NT]	[NT]	104	[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	-			03/04/2019	[NT]	[NT]	[NT]	[NT]	03/04/2019	[NT]
Date analysed	-			03/04/2019	[NT]	[NT]	[NT]	[NT]	03/04/2019	[NT]
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	[NT]	[NT]	98	[NT]
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	[NT]	[NT]	[NT]	[NT]	100	[NT]
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	[NT]	[NT]	114	[NT]
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	96	[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.

Report Comments

PAH_S: PQL has been raised due to the high concentration of analytes in the sample/s, resulting in the sample/s requiring dilution.

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	Harry Leonard

Sample Login Details

Your reference	E31772KL
Envirolab Reference	16446
Date Sample Received	02/04/2019
Date Instructions Received	02/04/2019
Date Results Expected to be Reported	09/04/2019

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	1 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	17.6
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:

Envirolab Services Pty Ltd
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25 Research Drive Croydon South VIC 3136
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melbourne@envirolab.com.au
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Sample ID	vTRH(C6-C10)/BTEXN in Soil	TRH Soil C10-C40 NEPM	PAHs in Soil	Acid Extractable metalsin soil
DUPRK2	✓	✓	✓	✓

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.

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: E31772KL Date Results Required: STANDARD Page: 2/3	JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Harry Leonard

Location: Normanhurst
Sampler: AM

Sample Preserved in Esky on Ice

Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 6a	Combo 3	Asbestos	WA Asbestos (500mL)	BTEX	pH/CEC	Clay content (%)
27/3/19	26	BH113	0.5-0.8	G, A	13.7	Silty Clay Sandy Gravel		X					
28/3/19	27	BH114	0.12-0.2		0	Fill: Gravelly	X						
	28	↓	0.2-0.4		0	Silty Clay							
	29	BH115	0.09-0.2		0	F: Silty Clay	X						
	30	↓	1.5-1.7		0	Silty Clay		X					
	31	BH116	0.05-0.2		0	Fill: Gravelly Sand							
	32		0.7-0.95		0	F: Silty Clay	X						
	33		1.5-1.7	↓	0	↓							
	34	↓	1.8-1.95	G	0	Siltstone		X					
	35	BH117	0.13-0.2	G,A	0	Fill: Gravelly Sand							
	36		0.2-0.4		0	F: Silty Clay	X						
↓	37	↓	1.0-1.2	↓	0	Silty Clay		X				X	X
26/3/19	38	TB1	–	G	–	Trip blank soil					X		
27/3/19	39	DUPRK1	–		–	Dup Soil		X					
	–	DUPRK2	–		–			X					
	40	DUPRK3	–		–								
	41	DUPRK4	–	↓	–	↓							
	42	FRAM1	–	V	–	Rinsate Water					X		
	43	BH101	0-0.3	A	–	F: Silty Clay							
	44	BH102	0-0.2		–	↓							
	45	BH103	0-0.1		–	F: Gravelly Sand							
	46	BH104	0.03-0.4		–	F: Silty Gravelly Sand							
	47	↓	0.4-0.8		–	F: Silty Sandy Clay							
	48	BH105	0.05-0.2		–	F: Silty Gravelly Sand							
↓	49	↓	0.2-0.6	↓	–	F: Gravelly Sand							

Envirolab Services
25 Research Drive
Croydon South VIC 3136
Ph: (03) 9763 2500

ENVIROLAB GROUP

Job No: 16446
Date Received: 2/4/19
Time Received: 12:50
Received By: GS
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

17.6

Remarks (comments/detection limits required):
DUPRK2 – Inter lab duplicate
DUPRK1 – Intra lab duplicate

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

Relinquished By:	Date:	Time:	Received By:	Date:
	29/3/2019		T. Nguyen	29/3/19

Relinquished: Tony Doherty
1/4/19 12:15
ELS

214605

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 215092

Client Details

Client	Environmental Investigation Services
Attention	Harry Leonard
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E31772KL, Normanhurst**
Number of Samples	3 WATER
Date samples received	05/04/2019
Date completed instructions received	05/04/2019

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	12/04/2019
Date of Issue	12/04/2019

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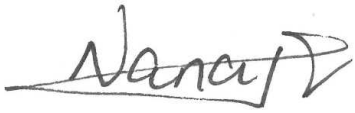
Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Giovanni Agosti, Group Technical Manager
Nancy Zhang, Laboratory Manager, Sydney
Steven Luong, Organics Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

VOCs in water		
Our Reference		215092-1
Your Reference	UNITS	MW111
Date Sampled		04/04/2019
Type of sample		WATER
Date extracted	-	07/04/2019
Date analysed	-	07/04/2019
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	<1
2,2-dichloropropane	µg/L	<1
1,2-dichloroethane	µg/L	<1
1,1,1-trichloroethane	µg/L	<1
1,1-dichloropropene	µg/L	<1
Cyclohexane	µg/L	<1
Carbon tetrachloride	µg/L	<1
Benzene	µg/L	<1
Dibromomethane	µg/L	<1
1,2-dichloropropane	µg/L	<1
Trichloroethene	µg/L	<1
Bromodichloromethane	µg/L	<1
trans-1,3-dichloropropene	µg/L	<1
cis-1,3-dichloropropene	µg/L	<1
1,1,2-trichloroethane	µg/L	<1
Toluene	µg/L	<1
1,3-dichloropropane	µg/L	<1
Dibromochloromethane	µg/L	<1
1,2-dibromoethane	µg/L	<1
Tetrachloroethene	µg/L	<1
1,1,1,2-tetrachloroethane	µg/L	<1
Chlorobenzene	µg/L	<1
Ethylbenzene	µg/L	<1
Bromoform	µg/L	<1

VOCs in water		
Our Reference		215092-1
Your Reference	UNITS	MW111
Date Sampled		04/04/2019
Type of sample		WATER
m+p-xylene	µg/L	<2
Styrene	µg/L	<1
1,1,2,2-tetrachloroethane	µg/L	<1
o-xylene	µg/L	<1
1,2,3-trichloropropane	µg/L	<1
Isopropylbenzene	µg/L	<1
Bromobenzene	µg/L	<1
n-propyl benzene	µg/L	<1
2-chlorotoluene	µg/L	<1
4-chlorotoluene	µg/L	<1
1,3,5-trimethyl benzene	µg/L	<1
Tert-butyl benzene	µg/L	<1
1,2,4-trimethyl benzene	µg/L	<1
1,3-dichlorobenzene	µg/L	<1
Sec-butyl benzene	µg/L	<1
1,4-dichlorobenzene	µg/L	<1
4-isopropyl toluene	µg/L	<1
1,2-dichlorobenzene	µg/L	<1
n-butyl benzene	µg/L	<1
1,2-dibromo-3-chloropropane	µg/L	<1
1,2,4-trichlorobenzene	µg/L	<1
Hexachlorobutadiene	µg/L	<1
1,2,3-trichlorobenzene	µg/L	<1
Surrogate Dibromofluoromethane	%	101
Surrogate toluene-d8	%	100
Surrogate 4-BFB	%	106

vTRH(C6-C10)/BTEXN in Water			
Our Reference		215092-1	215092-3
Your Reference	UNITS	MW111	TS1
Date Sampled		04/04/2019	04/04/2019
Type of sample		WATER	WATER
Date extracted	-	07/04/2019	07/04/2019
Date analysed	-	07/04/2019	07/04/2019
TRH C_6 - C_9	µg/L	<10	[NA]
TRH C_6 - C_{10}	µg/L	<10	[NA]
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	[NA]
Benzene	µg/L	<1	100%
Toluene	µg/L	<1	98%
Ethylbenzene	µg/L	<1	101%
m+p-xylene	µg/L	<2	97%
o-xylene	µg/L	<1	102%
Naphthalene	µg/L	<1	[NA]
Surrogate Dibromofluoromethane	%	101	101
Surrogate toluene-d8	%	100	101
Surrogate 4-BFB	%	106	104

svTRH (C10-C40) in Water		
Our Reference		215092-1
Your Reference	UNITS	MW111
Date Sampled		04/04/2019
Type of sample		WATER
Date extracted	-	09/04/2019
Date analysed	-	09/04/2019
TRH C_{10} - C_{14}	µg/L	<50
TRH C_{15} - C_{28}	µg/L	190
TRH C_{29} - C_{36}	µg/L	<100
TRH >C_{10} - C_{16}	µg/L	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50
TRH >C_{16} - C_{34}	µg/L	220
TRH >C_{34} - C_{40}	µg/L	<100
Surrogate o-Terphenyl	%	75

PAHs in Water - Low Level		
Our Reference		215092-1
Your Reference	UNITS	MW111
Date Sampled		04/04/2019
Type of sample		WATER
Date extracted	-	09/04/2019
Date analysed	-	10/04/2019
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	%	128

HM in water - dissolved		
Our Reference		215092-1
Your Reference	UNITS	MW111
Date Sampled		04/04/2019
Type of sample		WATER
Date prepared	-	09/04/2019
Date analysed	-	09/04/2019
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	9
Zinc-Dissolved	µg/L	52

Cations in water Dissolved		
Our Reference	UNITS	215092-1
Your Reference		MW111
Date Sampled		04/04/2019
Type of sample		WATER
Date digested	-	09/04/2019
Date analysed	-	09/04/2019
Calcium - Dissolved	mg/L	52
Magnesium - Dissolved	mg/L	20
Hardness	mgCaCO 3 /L	210

Method ID	Methodology Summary
Metals-020	Determination of various metals by ICP-AES.
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	-			07/04/2019	[NT]	[NT]	[NT]	[NT]	07/04/2019	[NT]
Date analysed	-			07/04/2019	[NT]	[NT]	[NT]	[NT]	07/04/2019	[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]	108	[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]	112	[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]	111	[NT]
1,1,1-trichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
1,1-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[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]	111	[NT]
Bromodichloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	109	[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]	111	[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]	116	[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]
o-xylene	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]
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	102	[NT]	[NT]	[NT]	[NT]	102	[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	-			07/04/2019	[NT]	[NT]	[NT]	[NT]	07/04/2019	[NT]
Date analysed	-			07/04/2019	[NT]	[NT]	[NT]	[NT]	07/04/2019	[NT]
TRH C_6 - C_9	µg/L	10	Org-016	<10	[NT]	[NT]	[NT]	[NT]	109	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-016	<10	[NT]	[NT]	[NT]	[NT]	109	[NT]
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	109	[NT]
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	110	[NT]
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	110	[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	102	[NT]	[NT]	[NT]	[NT]	102	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			09/04/2019	[NT]	[NT]	[NT]	[NT]	09/04/2019	[NT]
Date analysed	-			09/04/2019	[NT]	[NT]	[NT]	[NT]	09/04/2019	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	76	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	70	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	88	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	76	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	70	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	88	[NT]
Surrogate o-Terphenyl	%		Org-003	95	[NT]	[NT]	[NT]	[NT]	110	[NT]

QUALITY CONTROL: PAHs in Water - Low Level						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			09/04/2019	[NT]	[NT]	[NT]	[NT]	09/04/2019	[NT]
Date analysed	-			10/04/2019	[NT]	[NT]	[NT]	[NT]	10/04/2019	[NT]
Naphthalene	µg/L	0.2	Org-012	<0.2	[NT]	[NT]	[NT]	[NT]	108	[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]	106	[NT]
Phenanthrene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	96	[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]	108	[NT]
Pyrene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	114	[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]	132	[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]	106	[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	130	[NT]	[NT]	[NT]	[NT]	130	[NT]

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date prepared	-			09/04/2019	[NT]	[NT]	[NT]	[NT]	09/04/2019	[NT]
Date analysed	-			09/04/2019	[NT]	[NT]	[NT]	[NT]	09/04/2019	[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]	99	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	[NT]	[NT]	94	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]

QUALITY CONTROL: Cations in water Dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date digested	-			09/04/2019	[NT]	[NT]	[NT]	[NT]	09/04/2019	[NT]
Date analysed	-			09/04/2019	[NT]	[NT]	[NT]	[NT]	09/04/2019	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	110	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	110	[NT]
Hardness	mgCaCO 3 /L	3		<3	[NT]	[NT]	[NT]	[NT]	[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.

Report Comments

For the determination of dissolved metals the unpreserved sample was filtered through 0.45um filter at the lab due to the appearance of colloids and/or sediment in the supplied HNO3 bottle.

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	Harry Leonard

Sample Login Details

Your reference	E31772KL, Normanhurst
Envirolab Reference	215092
Date Sample Received	05/04/2019
Date Instructions Received	05/04/2019
Date Results Expected to be Reported	12/04/2019

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	3 WATER
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	11.2
Cooling Method	Ice
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	Cations in water Dissolved
MW111	✓	✓	✓	✓	✓	✓	✓	✓
DUPAMW1					✓			
TS1		✓						

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.

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD	EIS Job Number: E31772KL	ENVIRONMENTAL INVESTIGATION SERVICES
12 ASHLEY STREET		REAR OF 115 WICKS ROAD
CHATSWOOD NSW 2067		MACQUARIE PARK, NSW 2113
P: (02) 99106200	Date Results Required: STANDARD	P: 02-9888 5000 F: 02-9888 5001
F: (02) 99106201		
Attention: Aileen	Page: 1	Attention: Harry Leonard

Location: Normanhurst

Sampler: AM

Sample Preserved in Esky on Ice

Tests Required

Date Sampled	Lab Ref:	Sample Number	Sample Containers	PID	Sample Description	Combo 2	Combo 3L	VOCs	pH / EC	8 Metals	PAHs	TRH/BTEX	BTEX	Hardness
4.4.19	1	MW111	G1, 4 x V, H		Water		X	X	X					X
4.4.19	2	DUPAMW1	H		Dup water					X				
4.4.19	[redacted]	DUPAMW2	H		Dup water					X				
4.4.19	3	TS1	V		Trip Spike								X	

ENVIROLAB

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

Job No: 215092
Date Received: 5/4/19
Time Received: 1405
Received by: SZ
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Remarks (comments/detection limits required):
Please send to Envirolab Victoria
All analysis PQLs to ANZECC (2000) Detection Limits Please

Sample Containers:
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:
Aileen Ottelen	5.4.19	1405	[illegible]	5/4/19

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 199899

Client Details

Client	Environmental Investigation Services
Attention	H Wang
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E31772KL, Normanhurst**
Number of Samples	7 Soil
Date samples received	03/09/2018
Date completed instructions received	03/09/2018

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	10/09/2018
Date of Issue	07/09/2018

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Asbestos Approved By
Analysed by Asbestos Approved Identifier: Panika Wongchanda
Authorised by Asbestos Approved Signatory: Matt Tang

Results Approved By
Giovanni Agosti, Group Technical Manager
Matthew Tang, Asbsestos Analyst
Nancy Zhang, Assistant Lab Manager
Steven Luong, Senior Chemist

Authorised By

Jacinta Hurst, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		199899-1	199899-2	199899-3	199899-6	199899-7
Your Reference	UNITS	BH8	BH8	BH10	DUP1	TB
Depth		0-0.1	0.7-0.95	0-0.1	-	-
Date Sampled		31/08/2018	31/08/2018	31/08/2018	31/08/2018	31/08/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/09/2018	04/09/2018	04/09/2018	04/09/2018	04/09/2018
Date analysed	-	07/09/2018	07/09/2018	07/09/2018	07/09/2018	07/09/2018
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	[NA]
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	[NA]
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	[NA]
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	[NA]
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	[NA]
Surrogate aaa-Trifluorotoluene	%	106	106	104	104	110

svTRH (C10-C40) in Soil					
Our Reference		199899-1	199899-2	199899-3	199899-6
Your Reference	UNITS	BH8	BH8	BH10	DUP1
Depth		0-0.1	0.7-0.95	0-0.1	-
Date Sampled		31/08/2018	31/08/2018	31/08/2018	31/08/2018
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	04/09/2018	04/09/2018	04/09/2018	04/09/2018
Date analysed	-	05/09/2018	05/09/2018	05/09/2018	05/09/2018
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50
Surrogate o-Terphenyl	%	94	95	95	94

PAHs in Soil					
Our Reference		199899-1	199899-2	199899-3	199899-6
Your Reference	UNITS	BH8	BH8	BH10	DUP1
Depth		0-0.1	0.7-0.95	0-0.1	-
Date Sampled		31/08/2018	31/08/2018	31/08/2018	31/08/2018
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	04/09/2018	04/09/2018	04/09/2018	04/09/2018
Date analysed	-	05/09/2018	05/09/2018	05/09/2018	05/09/2018
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<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
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	86	86	87	85

Organochlorine Pesticides in soil				
Our Reference		199899-1	199899-3	199899-6
Your Reference	UNITS	BH8	BH10	DUP1
Depth		0-0.1	0-0.1	-
Date Sampled		31/08/2018	31/08/2018	31/08/2018
Type of sample		Soil	Soil	Soil
Date extracted	-	04/09/2018	04/09/2018	04/09/2018
Date analysed	-	06/09/2018	06/09/2018	06/09/2018
HCB	mg/kg	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	91	89	90

Organophosphorus Pesticides				
Our Reference		199899-1	199899-3	199899-6
Your Reference	UNITS	BH8	BH10	DUP1
Depth		0-0.1	0-0.1	-
Date Sampled		31/08/2018	31/08/2018	31/08/2018
Type of sample		Soil	Soil	Soil
Date extracted	-	04/09/2018	04/09/2018	04/09/2018
Date analysed	-	06/09/2018	06/09/2018	06/09/2018
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	91	89	90

PCBs in Soil				
Our Reference		199899-1	199899-3	199899-6
Your Reference	UNITS	BH8	BH10	DUP1
Depth		0-0.1	0-0.1	-
Date Sampled		31/08/2018	31/08/2018	31/08/2018
Type of sample		Soil	Soil	Soil
Date extracted	-	04/09/2018	04/09/2018	04/09/2018
Date analysed	-	06/09/2018	06/09/2018	06/09/2018
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1
Surrogate TCLMX	%	91	89	90

Acid Extractable metals in soil					
Our Reference		199899-1	199899-2	199899-3	199899-6
Your Reference	UNITS	BH8	BH8	BH10	DUP1
Depth		0-0.1	0.7-0.95	0-0.1	-
Date Sampled		31/08/2018	31/08/2018	31/08/2018	31/08/2018
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	04/09/2018	04/09/2018	04/09/2018	04/09/2018
Date analysed	-	05/09/2018	05/09/2018	05/09/2018	05/09/2018
Arsenic	mg/kg	<4	<4	7	6
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	46	9	12	9
Copper	mg/kg	17	29	14	11
Lead	mg/kg	17	13	52	43
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	32	<1	5	4
Zinc	mg/kg	41	5	72	64

Moisture					
Our Reference		199899-1	199899-2	199899-3	199899-6
Your Reference	UNITS	BH8	BH8	BH10	DUP1
Depth		0-0.1	0.7-0.95	0-0.1	-
Date Sampled		31/08/2018	31/08/2018	31/08/2018	31/08/2018
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	04/09/2018	04/09/2018	04/09/2018	04/09/2018
Date analysed	-	05/09/2018	05/09/2018	05/09/2018	05/09/2018
Moisture	%	14	8.1	15	14

Asbestos ID - soils			
Our Reference		199899-1	199899-3
Your Reference	UNITS	BH8	BH10
Depth		0-0.1	0-0.1
Date Sampled		31/08/2018	31/08/2018
Type of sample		Soil	Soil
Date analysed	-	06/09/2018	06/09/2018
Sample mass tested	g	Approx. 30g	Approx. 25g
Sample Description	-	Brown coarse-grained soil & rocks	Brown 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
Trace Analysis	-	No asbestos detected	No asbestos detected

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.
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.
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.

Method ID	Methodology Summary
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-6	[NT]
Date extracted	-			04/09/2018	[NT]	[NT]	[NT]	[NT]	04/09/2018	[NT]
Date analysed	-			07/09/2018	[NT]	[NT]	[NT]	[NT]	07/09/2018	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	111	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	111	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	[NT]	[NT]	115	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	[NT]	[NT]	113	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	110	[NT]
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	105	[NT]	[NT]	[NT]	[NT]	109	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	[NT]
Date extracted	-			04/09/2018	[NT]	[NT]	[NT]	[NT]	04/09/2018	[NT]
Date analysed	-			05/09/2018	[NT]	[NT]	[NT]	[NT]	05/09/2018	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	110	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	101	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	104	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	110	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	101	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	104	[NT]
Surrogate o-Terphenyl	%		Org-003	96	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	[NT]
Date extracted	-			04/09/2018	[NT]	[NT]	[NT]	[NT]	04/09/2018	[NT]
Date analysed	-			05/09/2018	[NT]	[NT]	[NT]	[NT]	05/09/2018	[NT]
Naphthalene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	103	[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]	100	[NT]
Phenanthrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	108	[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]	105	[NT]
Pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	97	[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]	101	[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]	106	[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	86	[NT]	[NT]	[NT]	[NT]	91	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	[NT]
Date extracted	-			04/09/2018	[NT]	[NT]	[NT]	[NT]	04/09/2018	[NT]
Date analysed	-			06/09/2018	[NT]	[NT]	[NT]	[NT]	06/09/2018	[NT]
HCB	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	115	[NT]
gamma-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Heptachlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
delta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Dieldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Endrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	109	[NT]
pp-DDD	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	125	[NT]
Endosulfan II	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	111	[NT]
Methoxychlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-005	94	[NT]	[NT]	[NT]	[NT]	116	[NT]

QUALITY CONTROL: Organophosphorus Pesticides						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	[NT]
Date extracted	-			04/09/2018	[NT]	[NT]	[NT]	[NT]	04/09/2018	[NT]
Date analysed	-			06/09/2018	[NT]	[NT]	[NT]	[NT]	06/09/2018	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Dimethoate	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Fenitrothion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Malathion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	74	[NT]
Parathion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Ronnel	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	117	[NT]
Surrogate TCMX	%		Org-008	94	[NT]	[NT]	[NT]	[NT]	91	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	[NT]
Date extracted	-			04/09/2018	[NT]	[NT]	[NT]	[NT]	04/09/2018	[NT]
Date analysed	-			06/09/2018	[NT]	[NT]	[NT]	[NT]	06/09/2018	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	129	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCLMX	%		Org-006	94	[NT]	[NT]	[NT]	[NT]	91	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	[NT]
Date prepared	-			04/09/2018	[NT]	[NT]	[NT]	[NT]	04/09/2018	[NT]
Date analysed	-			05/09/2018	[NT]	[NT]	[NT]	[NT]	05/09/2018	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	107	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	103	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	105	[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.

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	H Wang

Sample Login Details

Your reference	E31772KL, Normanhurst
Envirolab Reference	199899
Date Sample Received	03/09/2018
Date Instructions Received	03/09/2018
Date Results Expected to be Reported	10/09/2018

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	7 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	9.6
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
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12 Ashley St Chatswood NSW 2067
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Sample ID	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	On Hold
BH8-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	
BH8-0.7-0.95	✓	✓	✓				✓		
BH10-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	
BH10-0.4-0.5									✓
BH10-0.7-0.95									✓
DUP1	✓	✓	✓	✓	✓	✓	✓		
TB	✓								

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.

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: E31772KL Date Results Required: STANDARD Page: 1 of 1	ENVIRONMENTAL INVESTIGATION SERVICES REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: hwang@lkgroup.net.au

Location: Normanhurst

Sampler: HW

Sample Preserved in Esky on Ice

Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 6a	Combo 3	PAHs	TRH/BTEX	BTEX	Asbestos	pH, CEC, Clay Content	TCLP 6 Metals and PAHs	Combo 6			
31/08/2018	1	BH8	0-0.1	G, A	0	F:Sandy Silty clay	X											
	2	↓	0.7-0.95	G, A	14.9	Silty CLAY		X										
	3	BH10	0-0.1	G, A	1	F:Silty Clay	X											
	4		0.4-0.5	G, A	0	Silty CLAY												
	5	↓	0.7-0.95	G, A	0	Silty CLAY												
	6	DUP1	—	G	—	Soil									X			
↓	—	DUP2	—	G	—	Soil									X	Please send to VIC.		
	7	TB	—	G	—	Soil					X							

ENVIROLAB

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

Job No: 199899

Date Received: 03.09.18
Time Received: 14:30
Received By: JC
Temp: Cool/Ambient 9.6°C
Cooling: Ice/Icepack
Security: Intact/Broken/None

Remarks (comments/detection limits required):
Please send DUP2 as inter-lab duplicate to Victoria

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

Relinquished By:	Date:	Time:	Received By:	Date:
HW	3/9/2018		JGUBLEN	3/9/18

14:3

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www.envirolab.com.au

CERTIFICATE OF ANALYSIS 200697

Client Details

Client	Environmental Investigation Services
Attention	Harry Leonard
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E31772KL, Normanhurst**
Number of Samples	17 Soil
Date samples received	13/09/2018
Date completed instructions received	13/09/2018

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	20/09/2018
Date of Issue	20/09/2018

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

Results Approved By
Jeremy Faircloth, Organics Supervisor
Long Pham, Team Leader, Metals
Lucy Zhu, Asbsestos Analyst
Nancy Zhang, Assistant Lab Manager
Nick Sarlamis, Inorganics Supervisor
Priya Samarawickrama, Senior Chemist

Authorised By

Jacinta Hurst, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		200697-1	200697-2	200697-3	200697-5	200697-6
Your Reference	UNITS	BH1	BH1	BH2	BH3	BH3
Depth		0.0-0.1	0.8-1.0	0.04-0.2	0.0-0.1	0.5-0.6
Date Sampled		05/09/2018	05/09/2018	05/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Date analysed	-	17/09/2018	17/09/2018	17/09/2018	17/09/2018	17/09/2018
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	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	102	105	102	98	97

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		200697-7	200697-8	200697-9	200697-10	200697-12
Your Reference	UNITS	BH4	BH5	BH5	BH6	BH7
Depth		0.0-0.1	0.0-0.1	0.5-0.6	0.0-0.1	0.0-0.1
Date Sampled		04/09/2018	04/09/2018	04/09/2018	07/09/2018	03/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Date analysed	-	17/09/2018	17/09/2018	17/09/2018	17/09/2018	17/09/2018
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	0.6
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	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	105	104	105	99	99

vTRH(C6-C10)/BTEXN in Soil			
Our Reference		200697-15	200697-17
Your Reference	UNITS	BH9	BH9
Depth		0.5-0.95	3.10-3.15
Date Sampled		03/09/2018	03/09/2018
Type of sample		Soil	Soil
Date extracted	-	14/09/2018	14/09/2018
Date analysed	-	17/09/2018	17/09/2018
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	<1	<1
Surrogate aaa-Trifluorotoluene	%	106	99

svTRH (C10-C40) in Soil						
Our Reference		200697-1	200697-2	200697-3	200697-5	200697-6
Your Reference	UNITS	BH1	BH1	BH2	BH3	BH3
Depth		0.0-0.1	0.8-1.0	0.04-0.2	0.0-0.1	0.5-0.6
Date Sampled		05/09/2018	05/09/2018	05/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Date analysed	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	940	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	920	<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	1,700	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	720	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	2,400	<50	<50
Surrogate o-Terphenyl	%	99	113	104	90	92

svTRH (C10-C40) in Soil						
Our Reference		200697-7	200697-8	200697-9	200697-10	200697-12
Your Reference	UNITS	BH4	BH5	BH5	BH6	BH7
Depth		0.0-0.1	0.0-0.1	0.5-0.6	0.0-0.1	0.0-0.1
Date Sampled		04/09/2018	04/09/2018	04/09/2018	07/09/2018	03/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Date analysed	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	15/09/2018
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	77
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	160
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	110
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	110
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	170
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	280
Surrogate o-Terphenyl	%	92	92	92	94	101

svTRH (C10-C40) in Soil			
Our Reference		200697-15	200697-17
Your Reference	UNITS	BH9	BH9
Depth		0.5-0.95	3.10-3.15
Date Sampled		03/09/2018	03/09/2018
Type of sample		Soil	Soil
Date extracted	-	14/09/2018	14/09/2018
Date analysed	-	15/09/2018	15/09/2018
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	<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	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50
Surrogate o-Terphenyl	%	93	91

PAHs in Soil						
Our Reference		200697-1	200697-2	200697-3	200697-5	200697-6
Your Reference	UNITS	BH1	BH1	BH2	BH3	BH3
Depth		0.0-0.1	0.8-1.0	0.04-0.2	0.0-0.1	0.5-0.6
Date Sampled		05/09/2018	05/09/2018	05/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Date analysed	-	17/09/2018	17/09/2018	17/09/2018	17/09/2018	17/09/2018
Naphthalene	mg/kg	<0.1	<0.1	4.9	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	0.4	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	1.2	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	5.4	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	59	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	12	<0.1	<0.1
Fluoranthene	mg/kg	0.2	<0.1	140	0.1	<0.1
Pyrene	mg/kg	0.3	<0.1	120	0.1	<0.1
Benzo(a)anthracene	mg/kg	0.2	<0.1	49	<0.1	<0.1
Chrysene	mg/kg	0.2	<0.1	48	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	0.3	<0.2	82	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.2	0.06	50	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	<0.1	29	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	5.3	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.2	<0.1	36	<0.1	<0.1
Total +ve PAH's	mg/kg	1.6	0.06	640	0.2	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	73	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	73	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	73	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	93	89	89	92	92

PAHs in Soil						
Our Reference		200697-7	200697-8	200697-9	200697-10	200697-12
Your Reference	UNITS	BH4	BH5	BH5	BH6	BH7
Depth		0.0-0.1	0.0-0.1	0.5-0.6	0.0-0.1	0.0-0.1
Date Sampled		04/09/2018	04/09/2018	04/09/2018	07/09/2018	03/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Date analysed	-	17/09/2018	17/09/2018	17/09/2018	17/09/2018	17/09/2018
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	<0.05	<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	<0.05	<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	%	99	96	88	99	87

PAHs in Soil			
Our Reference		200697-15	200697-17
Your Reference	UNITS	BH9	BH9
Depth		0.5-0.95	3.10-3.15
Date Sampled		03/09/2018	03/09/2018
Type of sample		Soil	Soil
Date extracted	-	14/09/2018	14/09/2018
Date analysed	-	17/09/2018	17/09/2018
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	0.07	<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	0.07	<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	%	86	86

Organochlorine Pesticides in soil						
Our Reference		200697-1	200697-3	200697-5	200697-7	200697-8
Your Reference	UNITS	BH1	BH2	BH3	BH4	BH5
Depth		0.0-0.1	0.04-0.2	0.0-0.1	0.0-0.1	0.0-0.1
Date Sampled		05/09/2018	05/09/2018	06/09/2018	04/09/2018	04/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Date analysed	-	17/09/2018	18/09/2018	17/09/2018	17/09/2018	17/09/2018
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	%	87	91	86	86	103

Organochlorine Pesticides in soil				
Our Reference		200697-10	200697-12	200697-15
Your Reference	UNITS	BH6	BH7	BH9
Depth		0.0-0.1	0.0-0.1	0.5-0.95
Date Sampled		07/09/2018	03/09/2018	03/09/2018
Type of sample		Soil	Soil	Soil
Date extracted	-	14/09/2018	14/09/2018	14/09/2018
Date analysed	-	17/09/2018	17/09/2018	17/09/2018
HCB	mg/kg	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	87	89	87

Organophosphorus Pesticides						
Our Reference		200697-1	200697-3	200697-5	200697-7	200697-8
Your Reference	UNITS	BH1	BH2	BH3	BH4	BH5
Depth		0.0-0.1	0.04-0.2	0.0-0.1	0.0-0.1	0.0-0.1
Date Sampled		05/09/2018	05/09/2018	06/09/2018	04/09/2018	04/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Date analysed	-	17/09/2018	18/09/2018	17/09/2018	17/09/2018	17/09/2018
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	%	87	91	86	86	103

Organophosphorus Pesticides				
Our Reference		200697-10	200697-12	200697-15
Your Reference	UNITS	BH6	BH7	BH9
Depth		0.0-0.1	0.0-0.1	0.5-0.95
Date Sampled		07/09/2018	03/09/2018	03/09/2018
Type of sample		Soil	Soil	Soil
Date extracted	-	14/09/2018	14/09/2018	14/09/2018
Date analysed	-	17/09/2018	17/09/2018	17/09/2018
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	87	89	87

PCBs in Soil						
Our Reference		200697-1	200697-3	200697-5	200697-7	200697-8
Your Reference	UNITS	BH1	BH2	BH3	BH4	BH5
Depth		0.0-0.1	0.04-0.2	0.0-0.1	0.0-0.1	0.0-0.1
Date Sampled		05/09/2018	05/09/2018	06/09/2018	04/09/2018	04/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Date analysed	-	17/09/2018	18/09/2018	17/09/2018	17/09/2018	17/09/2018
Aroclor 1016	mg/kg	<0.1	<0.1	<0.5	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.5	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.5	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.5	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.5	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.5	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.5	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.5	<0.1	<0.1
Surrogate TCLMX	%	87	91	86	86	103

PCBs in Soil				
Our Reference		200697-10	200697-12	200697-15
Your Reference	UNITS	BH6	BH7	BH9
Depth		0.0-0.1	0.0-0.1	0.5-0.95
Date Sampled		07/09/2018	03/09/2018	03/09/2018
Type of sample		Soil	Soil	Soil
Date extracted	-	14/09/2018	14/09/2018	14/09/2018
Date analysed	-	17/09/2018	17/09/2018	17/09/2018
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1
Surrogate TCLMX	%	87	89	87

Acid Extractable metals in soil						
Our Reference		200697-1	200697-2	200697-3	200697-5	200697-6
Your Reference	UNITS	BH1	BH1	BH2	BH3	BH3
Depth		0.0-0.1	0.8-1.0	0.04-0.2	0.0-0.1	0.5-0.6
Date Sampled		05/09/2018	05/09/2018	05/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Date analysed	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Arsenic	mg/kg	<4	6	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	12	8	18	25	9
Copper	mg/kg	19	28	53	51	15
Lead	mg/kg	24	33	21	9	27
Mercury	mg/kg	0.2	0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	8	5	25	110	1
Zinc	mg/kg	34	22	49	55	3

Acid Extractable metals in soil						
Our Reference		200697-7	200697-8	200697-9	200697-10	200697-12
Your Reference	UNITS	BH4	BH5	BH5	BH6	BH7
Depth		0.0-0.1	0.0-0.1	0.5-0.6	0.0-0.1	0.0-0.1
Date Sampled		04/09/2018	04/09/2018	04/09/2018	07/09/2018	03/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Date analysed	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Arsenic	mg/kg	5	6	6	7	6
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	15	14	14	8	16
Copper	mg/kg	33	22	20	16	19
Lead	mg/kg	23	27	16	57	26
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	0.5
Nickel	mg/kg	6	6	3	4	4
Zinc	mg/kg	26	24	18	54	22

Acid Extractable metals in soil				
Our Reference		200697-15	200697-17	200697-18
Your Reference	UNITS	BH9	BH9	BH9 - [TRIPLICATE]
Depth		0.5-0.95	3.10-3.15	0.5-0.95
Date Sampled		03/09/2018	03/09/2018	03/09/2018
Type of sample		Soil	Soil	Soil
Date prepared	-	14/09/2018	14/09/2018	14/09/2018
Date analysed	-	14/09/2018	14/09/2018	14/09/2018
Arsenic	mg/kg	7	20	5
Cadmium	mg/kg	<0.4	<0.4	<0.4
Chromium	mg/kg	8	14	18
Copper	mg/kg	14	6	17
Lead	mg/kg	11	21	22
Mercury	mg/kg	0.1	<0.1	<0.1
Nickel	mg/kg	7	<1	4
Zinc	mg/kg	26	1	13

Moisture						
Our Reference		200697-1	200697-2	200697-3	200697-5	200697-6
Your Reference	UNITS	BH1	BH1	BH2	BH3	BH3
Depth		0.0-0.1	0.8-1.0	0.04-0.2	0.0-0.1	0.5-0.6
Date Sampled		05/09/2018	05/09/2018	05/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Date analysed	-	17/09/2018	17/09/2018	17/09/2018	17/09/2018	17/09/2018
Moisture	%	8.2	8.0	8.7	12	20

Moisture						
Our Reference		200697-7	200697-8	200697-9	200697-10	200697-12
Your Reference	UNITS	BH4	BH5	BH5	BH6	BH7
Depth		0.0-0.1	0.0-0.1	0.5-0.6	0.0-0.1	0.0-0.1
Date Sampled		04/09/2018	04/09/2018	04/09/2018	07/09/2018	03/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Date analysed	-	17/09/2018	17/09/2018	17/09/2018	17/09/2018	17/09/2018
Moisture	%	12	12	6.9	20	17

Moisture			
Our Reference		200697-15	200697-17
Your Reference	UNITS	BH9	BH9
Depth		0.5-0.95	3.10-3.15
Date Sampled		03/09/2018	03/09/2018
Type of sample		Soil	Soil
Date prepared	-	14/09/2018	14/09/2018
Date analysed	-	17/09/2018	17/09/2018
Moisture	%	15	20

Asbestos ID - soils						
Our Reference		200697-1	200697-3	200697-5	200697-7	200697-8
Your Reference	UNITS	BH1	BH2	BH3	BH4	BH5
Depth		0.0-0.1	0.04-0.2	0.0-0.1	0.0-0.1	0.0-0.1
Date Sampled		05/09/2018	05/09/2018	06/09/2018	04/09/2018	04/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	19/09/2018	19/09/2018	19/09/2018	19/09/2018	19/09/2018
Sample mass tested	g	Approx. 25g	Approx. 45g	Approx. 40g	Approx. 40g	Approx. 30g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown 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		200697-10	200697-12	200697-15
Your Reference	UNITS	BH6	BH7	BH9
Depth		0.0-0.1	0.0-0.1	0.5-0.95
Date Sampled		07/09/2018	03/09/2018	03/09/2018
Type of sample		Soil	Soil	Soil
Date analysed	-	19/09/2018	19/09/2018	19/09/2018
Sample mass tested	g	Approx. 10g	Approx. 25g	Approx. 40g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown 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
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected

Misc Inorg - Soil			
Our Reference		200697-3	200697-12
Your Reference	UNITS	BH2	BH7
Depth		0.04-0.2	0.0-0.1
Date Sampled		05/09/2018	03/09/2018
Type of sample		Soil	Soil
Date prepared	-	17/09/2018	17/09/2018
Date analysed	-	17/09/2018	17/09/2018
pH 1:5 soil:water	pH Units	9.2	5.6

CEC			
Our Reference		200697-3	200697-12
Your Reference	UNITS	BH2	BH7
Depth		0.04-0.2	0.0-0.1
Date Sampled		05/09/2018	03/09/2018
Type of sample		Soil	Soil
Date prepared	-	18/09/2018	18/09/2018
Date analysed	-	18/09/2018	18/09/2018
Exchangeable Ca	meq/100g	24	5.1
Exchangeable K	meq/100g	0.4	0.6
Exchangeable Mg	meq/100g	0.64	2.6
Exchangeable Na	meq/100g	0.20	0.22
Cation Exchange Capacity	meq/100g	26	8.5

Clay 50-120g			
Our Reference		200697-3	200697-12
Your Reference	UNITS	BH2	BH7
Depth		0.04-0.2	0.0-0.1
Date Sampled		05/09/2018	03/09/2018
Type of sample		Soil	Soil
Date prepared	-	20/09/2018	20/09/2018
Date analysed	-	20/09/2018	20/09/2018
Clay in soils <2µm	% (w/w)	7	35

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.
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-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-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.
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.

Method ID	Methodology Summary
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	200697-3
Date extracted	-			14/09/2018	1	14/09/2018	14/09/2018		14/09/2018	14/09/2018
Date analysed	-			17/09/2018	1	17/09/2018	17/09/2018		17/09/2018	17/09/2018
TRH C_6 - C_9	mg/kg	25	Org-016	<25	1	<25	<25	0	115	98
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	1	<25	<25	0	115	98
Benzene	mg/kg	0.2	Org-016	<0.2	1	<0.2	<0.2	0	115	97
Toluene	mg/kg	0.5	Org-016	<0.5	1	<0.5	<0.5	0	115	98
Ethylbenzene	mg/kg	1	Org-016	<1	1	<1	<1	0	115	99
m+p-xylene	mg/kg	2	Org-016	<2	1	<2	<2	0	115	98
o-Xylene	mg/kg	1	Org-016	<1	1	<1	<1	0	115	98
naphthalene	mg/kg	1	Org-014	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	108	1	102	111	8	114	100

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]	15	14/09/2018	14/09/2018		[NT]	[NT]
Date analysed	-			[NT]	15	17/09/2018	17/09/2018		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	[NT]	15	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	[NT]	15	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-016	[NT]	15	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-016	[NT]	15	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-016	[NT]	15	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-016	[NT]	15	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-016	[NT]	15	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	15	106	100	6	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	200697-3
Date extracted	-			14/09/2018	1	14/09/2018	14/09/2018		14/09/2018	14/09/2018
Date analysed	-			14/09/2018	1	14/09/2018	14/09/2018		14/09/2018	14/09/2018
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	1	<50	<50	0	130	70
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	1	<100	<100	0	116	85
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	1	<100	<100	0	112	#
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	1	<50	<50	0	130	70
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	1	<100	<100	0	116	85
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	1	<100	<100	0	112	#
Surrogate o-Terphenyl	%		Org-003	104	1	99	102	3	104	88

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	15	14/09/2018	14/09/2018		[NT]	[NT]
Date analysed	-			[NT]	15	15/09/2018	15/09/2018		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	[NT]	15	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	[NT]	15	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	[NT]	15	<100	<100	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	[NT]	15	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	[NT]	15	<100	<100	0	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	[NT]	15	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-003	[NT]	15	93	93	0	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	200697-3
Date extracted	-			14/09/2018	1	14/09/2018	14/09/2018		14/09/2018	14/09/2018
Date analysed	-			18/09/2018	1	17/09/2018	17/09/2018		17/09/2018	17/09/2018
Naphthalene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	104	88
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	106	84
Phenanthrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	111	#
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	112	69
Pyrene	mg/kg	0.1	Org-012	<0.1	1	0.3	0.2	40	102	68
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	1	0.2	<0.1	67	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	1	0.2	<0.1	67	104	#
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	1	0.3	<0.2	40	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	1	0.2	0.1	67	102	75
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	0.2	<0.1	67	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	95	1	93	95	2	90	75

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	15	14/09/2018	14/09/2018		[NT]	[NT]
Date analysed	-			[NT]	15	17/09/2018	17/09/2018		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	[NT]	15	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	[NT]	15	0.07	<0.05	33	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	[NT]	15	86	92	7	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	200697-3
Date extracted	-			14/09/2018	1	14/09/2018	14/09/2018		14/09/2018	14/09/2018
Date analysed	-			17/09/2018	1	17/09/2018	17/09/2018		17/09/2018	18/09/2018
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	88	104
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	75	86
Heptachlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	85	103
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	86	93
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	86	97
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	86	96
Dieldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	89	99
Endrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	98	112
pp-DDD	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	92	92
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	76	87
Methoxychlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	88	1	87	91	4	107	92

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	15	14/09/2018	14/09/2018		[NT]	[NT]
Date analysed	-			[NT]	15	17/09/2018	17/09/2018		[NT]	[NT]
HCB	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	[NT]	15	87	85	2	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	200697-3
Date extracted	-			14/09/2018	1	14/09/2018	14/09/2018		14/09/2018	14/09/2018
Date analysed	-			17/09/2018	1	17/09/2018	17/09/2018		17/09/2018	18/09/2018
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	76	111
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	120	117
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	88	101
Fenitrothion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	98	117
Malathion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	68	97
Parathion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	97	118
Ronnel	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	81	131
Surrogate TCMX	%		Org-008	88	1	87	91	4	87	89

QUALITY CONTROL: Organophosphorus Pesticides						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	15	14/09/2018	14/09/2018		[NT]	[NT]
Date analysed	-			[NT]	15	17/09/2018	17/09/2018		[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-008	[NT]	15	87	85	2	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	200697-3
Date extracted	-			14/09/2018	1	14/09/2018	14/09/2018		14/09/2018	14/09/2018
Date analysed	-			17/09/2018	1	17/09/2018	17/09/2018		17/09/2018	18/09/2018
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	114
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	88	1	87	91	4	87	89

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	15	14/09/2018	14/09/2018		[NT]	[NT]
Date analysed	-			[NT]	15	17/09/2018	17/09/2018		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	[NT]	15	87	85	2	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	200697-3
Date prepared	-			14/09/2018	1	14/09/2018	14/09/2018		14/09/2018	14/09/2018
Date analysed	-			14/09/2018	1	14/09/2018	14/09/2018		14/09/2018	14/09/2018
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	110	90
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	103	85
Chromium	mg/kg	1	Metals-020	<1	1	12	14	15	108	86
Copper	mg/kg	1	Metals-020	<1	1	19	21	10	112	123
Lead	mg/kg	1	Metals-020	<1	1	24	25	4	108	95
Mercury	mg/kg	0.1	Metals-021	<0.1	1	0.2	0.2	0	109	128
Nickel	mg/kg	1	Metals-020	<1	1	8	7	13	110	88
Zinc	mg/kg	1	Metals-020	<1	1	34	33	3	105	79

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	15	14/09/2018	14/09/2018		[NT]	[NT]
Date analysed	-			[NT]	15	14/09/2018	14/09/2018		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	15	7	5	33	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	15	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	15	8	20	86	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	15	14	20	35	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	15	11	26	81	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	15	0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	15	7	6	15	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	15	26	21	21	[NT]	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			17/09/2018	[NT]	[NT]	[NT]	[NT]	17/09/2018	[NT]
Date analysed	-			17/09/2018	[NT]	[NT]	[NT]	[NT]	17/09/2018	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	102	[NT]

QUALITY CONTROL: CEC					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			18/09/2018	[NT]	[NT]	[NT]	[NT]	18/09/2018	[NT]
Date analysed	-			18/09/2018	[NT]	[NT]	[NT]	[NT]	18/09/2018	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Exchangeable K	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Exchangeable Na	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	100	[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.

Report Comments

TRH Soil C10-C40 NEPM -(3MS) # Percent recovery is not possible to report as the high concentration of analytes in the sample/s have caused interference.
PAHs in Soil - # Percent recovery is not possible to report due to interference from analytes (other than those being tested) in the sample 3ms.

PCBs in Soil - PQL has been raised due to interference from analytes(other than those being tested) in the sample/s.

Asbestos: Excessive sample volume was provided for asbestos analysis. A portion of the supplied sample was sub-sampled according to Envirolab procedures. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g (50mL) of sample in its own container as per AS4964-2004.
Note: Samples 200697-7,8 were sub-sampled from bags provided by the client.

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 200697-15 for Cr and Pb. Therefore a triplicate result has been issued as laboratory sample number 200697-18.

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	Harry Leonard

Sample Login Details

Your reference	E31772KL, Normanhurst
Envirolab Reference	200697
Date Sample Received	13/09/2018
Date Instructions Received	13/09/2018
Date Results Expected to be Reported	20/09/2018

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	17 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	10.0
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
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Sample ID	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	Misc Inorg - Soil	CEC	Clay 50-120g	On Hold
BH1-0.0-0.1	✓	✓	✓	✓	✓	✓	✓	✓				
BH1-0.8-1.0	✓	✓	✓				✓					
BH2-0.04-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
BH2-1.5-1.9												✓
BH3-0.0-0.1	✓	✓	✓	✓	✓	✓	✓	✓				
BH3-0.5-0.6	✓	✓	✓				✓					
BH4-0.0-0.1	✓	✓	✓	✓	✓	✓	✓	✓				
BH5-0.0-0.1	✓	✓	✓	✓	✓	✓	✓	✓				
BH5-0.5-0.6	✓	✓	✓				✓					
BH6-0.0-0.1	✓	✓	✓	✓	✓	✓	✓	✓				
BH6-0.6-0.95												✓
BH7-0.0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
BH7-0.5-0.95												✓
BH9-0.0-0.1												✓
BH9-0.5-0.95	✓	✓	✓	✓	✓	✓	✓	✓				
BH9-1.85-1.95												✓
BH9-3.10-3.15	✓	✓	✓				✓					

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.

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: E31772KL Date Results Required: STANDARD Page: 1 of 1	ENVIRONMENTAL INVESTIGATION SERVICES REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Harry Leonard

Location: Normanhurst

Sampler: AB

Sample Preserved In Esky on Ice

Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 6a	Combo 3	pH	CEC	Clay Content	PAHs	TRH/BTEX	BTEX	Asbestos
5/9/18	1	BH1	0-0.1	G,A	0.0	clay F	X								
↓	2	BH1	0.8-1.0	G		siltstone		X							
	3	BH2	0.04-0.2	G,A		sand F	X		X	X	X				
↓	4	BH2	1.5-1.9	G		clay									
6/9/18	5	BH3	0-0.1	G,A		clay F	X								
↓	6	BH3	0.5-0.6	G		clay		X							
4/9/18	7	BH4	0-0.1	G,A		clay	X								
	8	BH5	0-0.1	G,A		clay F	X								
↓	9	BH5	0.5-0.6	G		clay		X							
7/9/18	10	BH6	0-0.1	G,A		clay F	X								
↓	11	BH6	0.6-0.95	G		siltstone									
3/9/18	12	BH7	0-0.1	G,A		clay F	X		X	X	X				
	13	BH7	0.5-0.95	G		clay									
	14	BH9	0-0.1	G,A		clay F									
	15	BH9	0.5-0.95	G,A		clay F	X								
	16	BH9	1.85-1.95	G,A		clay F									
↓	17	BH9	3.10-3.15	G	↓	clay		X							

ENVIROLAB

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

Job No: 200697

Date Received: 13/9/18
Time Received: 12:10 10.0
Received By: LN
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:
	13/9/2018			13/9/18 12:10

Envirolab Services Pty Ltd
ABN 37 112 535 645 - 002
25 Research Drive Croydon South VIC 3136
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melbourne@envirolab.com.au
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CERTIFICATE OF ANALYSIS 14768

Client Details

Client	Environmental Investigation Services
Attention	H. Wang
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E31772KL**
Number of Samples	1 Soil
Date samples received	05/09/2018
Date completed instructions received	05/09/2018

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	11/09/2018
Date of Issue	11/09/2018

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Results Approved By
Chris De Luca, Senior Chemist

Authorised By

Pamela Adams, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		14768-1
Your Reference	UNITS	DUP2
Date Sampled		31/08/2018
Type of sample		Soil
Date extracted	-	06/09/2018
Date analysed	-	07/09/2018
vTRH C_6 - C_9	mg/kg	<25
vTRH C_6 - C_{10}	mg/kg	<25
TRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
Naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	118

TRH Soil C10-C40 NEPM		
Our Reference		14768-1
Your Reference	UNITS	DUP2
Date Sampled		31/08/2018
Type of sample		Soil
Date extracted	-	06/09/2018
Date analysed	-	07/09/2018
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	<100
TRH C_{29} - C_{36}	mg/kg	<100
Total +ve TRH (C10-C36)	mg/kg	<50
TRH >C_{10} -C_{16}	mg/kg	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50
TRH >C_{16} -C_{34}	mg/kg	<100
TRH >C_{34} -C_{40}	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	90

PAHs in Soil		
Our Reference		14768-1
Your Reference	UNITS	DUP2
Date Sampled		31/08/2018
Type of sample		Soil
Date extracted	-	06/09/2018
Date analysed	-	07/09/2018
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j&k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Total +ve PAH's	mg/kg	<0.05
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	0
Benzo(a)pyrene TEQ calc (Half)	mg/kg	0.1
Benzo(a)pyrene TEQ calc (PQL)	mg/kg	0.2
Surrogate p-Terphenyl-d_{14}	%	100

OCP in Soil		
Our Reference		14768-1
Your Reference	UNITS	DUP2
Date Sampled		31/08/2018
Type of sample		Soil
Date extracted	-	06/09/2018
Date analysed	-	07/09/2018
alpha-BHC	mg/kg	<0.1
Hexachlorobenzene	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Total +ve reported DDT+DDD+DDE	mg/kg	<0.1
Surrogate p-Terphenyl-d_{14}	%	100

OP in Soil		
Our Reference		14768-1
Your Reference	UNITS	DUP2
Date Sampled		31/08/2018
Type of sample		Soil
Date extracted	-	06/09/2018
Date analysed	-	07/09/2018
Azinphos-methyl	mg/kg	<0.1
Bromophos-ethyl	mg/kg	<0.1
Chlorpyrifos	mg/kg	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1
Diazinon	mg/kg	<0.1
Dichlorovos	mg/kg	<0.1
Dimethoate	mg/kg	<0.1
Ethion	mg/kg	<0.1
Fenitrothion	mg/kg	<0.1
Malathion	mg/kg	<0.1
Parathion	mg/kg	<0.1
Ronnel	mg/kg	<0.1
Surrogate p-Terphenyl-d_{14}	%	100

PCBs in Soil		
Our Reference		14768-1
Your Reference	UNITS	DUP2
Date Sampled		31/08/2018
Type of sample		Soil
Date extracted	-	06/09/2018
Date analysed	-	07/09/2018
Aroclor 1016	mg/kg	<0.1
Aroclor 1221	mg/kg	<0.1
Aroclor 1232	mg/kg	<0.1
Aroclor 1242	mg/kg	<0.1
Aroclor 1248	mg/kg	<0.1
Aroclor 1254	mg/kg	<0.1
Aroclor 1260	mg/kg	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1
Surrogate p-Terphenyl-d_{14}	%	100

Acid Extractable metals in soil		
Our Reference		14768-1
Your Reference	UNITS	DUP2
Date Sampled		31/08/2018
Type of sample		Soil
Date digested	-	07/09/2018
Date analysed	-	07/09/2018
Arsenic	mg/kg	<4
Cadmium	mg/kg	<0.4
Chromium	mg/kg	45
Copper	mg/kg	16
Lead	mg/kg	17
Mercury	mg/kg	<0.1
Nickel	mg/kg	36
Zinc	mg/kg	38

Moisture		
Our Reference		14768-1
Your Reference	UNITS	DUP2
Date Sampled		31/08/2018
Type of sample		Soil
Date prepared	-	06/09/2018
Date analysed	-	07/09/2018
Moisture	%	13

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.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Note, For OCs 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-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-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.

Method ID	Methodology Summary
Org-012	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD or GC-MS. 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-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	-			06/09/2018	[NT]	[NT]	[NT]	[NT]	06/09/2018	[NT]
Date analysed	-			07/09/2018	[NT]	[NT]	[NT]	[NT]	07/09/2018	[NT]
vTRH C_6 - C_9	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	86	[NT]
vTRH C_6 - C_{10}	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	86	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	[NT]	[NT]	89	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	[NT]	[NT]	90	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	84	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	83	[NT]
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	84	[NT]
Naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	119	[NT]	[NT]	[NT]	[NT]	111	[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	-			06/09/2018	[NT]	[NT]	[NT]	[NT]	06/09/2018	[NT]
Date analysed	-			06/09/2018	[NT]	[NT]	[NT]	[NT]	06/09/2018	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	68	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	73	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	67	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	68	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	73	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	67	[NT]
Surrogate o-Terphenyl	%		Org-003	90	[NT]	[NT]	[NT]	[NT]	84	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			06/09/2018	[NT]	[NT]	[NT]	[NT]	06/09/2018	[NT]
Date analysed	-			07/09/2018	[NT]	[NT]	[NT]	[NT]	07/09/2018	[NT]
Naphthalene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	76	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	72	[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]	76	[NT]
Phenanthrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	68	[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]	68	[NT]
Pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	68	[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]	72	[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]	68	[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	92	[NT]	[NT]	[NT]	[NT]	88	[NT]

QUALITY CONTROL: OCP in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			06/09/2018	[NT]	[NT]	[NT]	[NT]	06/09/2018	[NT]
Date analysed	-			07/09/2018	[NT]	[NT]	[NT]	[NT]	07/09/2018	[NT]
alpha-BHC	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	68	[NT]
Hexachlorobenzene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	64	[NT]
gamma-BHC	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	64	[NT]
delta-BHC	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	64	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	68	[NT]
gamma-Chlordane	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	68	[NT]
alpha-chlordane	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	68	[NT]
Dieldrin	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	68	[NT]
Endrin	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	68	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	68	[NT]
Methoxychlor	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d_{14}	%		Org-012	92	[NT]	[NT]	[NT]	[NT]	88	[NT]

QUALITY CONTROL: OP in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			06/09/2018	[NT]	[NT]	[NT]	[NT]	06/09/2018	[NT]
Date analysed	-			07/09/2018	[NT]	[NT]	[NT]	[NT]	07/09/2018	[NT]
Azinphos-methyl	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	68	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dichlorovos	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	76	[NT]
Fenitrothion	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	68	[NT]
Malathion	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Parathion	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d_{14}	%		Org-012	92	[NT]	[NT]	[NT]	[NT]	88	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			06/09/2018	[NT]	[NT]	[NT]	[NT]	06/09/2018	[NT]
Date analysed	-			07/09/2018	[NT]	[NT]	[NT]	[NT]	07/09/2018	[NT]
Aroclor 1016	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Aroclor 1260	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d_{14}	%		Org-012	92	[NT]	[NT]	[NT]	[NT]	88	[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	-			06/09/2018	[NT]	[NT]	[NT]	[NT]	06/09/2018	[NT]
Date analysed	-			07/09/2018	[NT]	[NT]	[NT]	[NT]	07/09/2018	[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]	107	[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]	101	[NT]
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	103	[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.

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	H. Wang

Sample Login Details

Your reference	E31772KL
Envirolab Reference	14768
Date Sample Received	05/09/2018
Date Instructions Received	05/09/2018
Date Results Expected to be Reported	11/09/2018

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	1 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	11
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:

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 ID	vTRH(C6-C10)/BTEXN in Soil	TRH Soil C10-C40 NEPM	PAHs in Soil	OCP in Soil	OP in Soil	PCBsin Soil	Acid Extractable metalsin soil
DUP2	✓	✓	✓	✓	✓	✓	✓

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.

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: E31772KL Date Results Required: STANDARD Page: 1 of 1	ENVIRONMENTAL INVESTIGATION SERVICES REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: hwang@ikgroup.net.au

Location: Normanhurst
Sampler: HW

Sample Preserved in Esky on Ice

Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 6a	Combo 3	PAHs	TRH/BTEX	BTEX	Asbestos	pH, CEC, Clay Content	TCLP 6 Metals and PAHs	Combo 6			
31/08/2018	1	BH8	0-0.1	G, A	0	F: Sandy Silty clay	X											
	2	↓	0.7-0.95	G, A	14.9	SILTY CLAY		X										
	3	BH10	0-0.1	G, A	1	F: Silty Clay	X											
	4	↓	0.4-0.5	G, A	0	SILTY CLAY												
	5	↓	0.7-0.95	G, A	0	SILTY CLAY												
	6	DUP1	—	G	—	Soil									X			
(1)	—	DUP2	—	G	—	Soil									X	Please send to VIC.		
	7	TB	—	G	—	Soil					X							

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

Job No: 199899
Date Received: 03.09.18
Time Received: 14:30
Received By: JE
Temp: Cool/Ambient 9.6°C
Cooling: Ice/Icepack
Security: Intact/Broken/None

Envirolab Services
Campbellfield
Ph: (03) 9763 2500

Job No: 147683
Date Received: 5/9/18
Time Received: 13:15
Received by: CP
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

PC 11

Remarks (comments/detection limits required):
Please send DUP2 as inter-lab duplicate to Victoria.

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

Relinquished By:	Date:	Time:	Received By:	Date:
HW Kevin Wang	3/9/2018 4/9/18		JGHALEN	3/9/18 14:3

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
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CERTIFICATE OF ANALYSIS 200697-A

Client Details

Client	Environmental Investigation Services
Attention	Harry Leonard
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E31772KL, Normanhurst**
Number of Samples	17 Soil
Date samples received	13/09/2018
Date completed instructions received	10/10/2018

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	12/10/2018
Date of Issue	12/10/2018

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Results Approved By
Leon Ow, Chemist
Steven Luong, Senior Chemist

Authorised By

Jacinta Hurst, Laboratory Manager

Metals in TCLP USEPA1311			
Our Reference		200697-A-3	200697-A-5
Your Reference	UNITS	BH2	BH3
Depth		0.04-0.2	0.0-0.1
Date Sampled		05/09/2018	06/09/2018
Type of sample		Soil	Soil
Date extracted	-	12/10/2018	12/10/2018
Date analysed	-	12/10/2018	12/10/2018
pH of soil for fluid# determ.	pH units	9.9	8.1
pH of soil TCLP (after HCl)	pH units	1.7	1.7
Extraction fluid used	-	1	1
pH of final Leachate	pH units	5.7	5.0
Arsenic in TCLP	mg/L	[NA]	<0.05
Cadmium in TCLP	mg/L	[NA]	<0.01
Chromium in TCLP	mg/L	[NA]	<0.01
Copper in TCLP	mg/L	[NA]	<0.01
Lead in TCLP	mg/L	[NA]	<0.03
Mercury in TCLP	mg/L	[NA]	<0.0005
Nickel in TCLP	mg/L	[NA]	0.03
Zinc in TCLP	mg/L	[NA]	0.04

PAHs in TCLP (USEPA 1311)		
Our Reference		200697-A-3
Your Reference	UNITS	BH2
Depth		0.04-0.2
Date Sampled		05/09/2018
Type of sample		Soil
Date extracted	-	12/10/2018
Date analysed	-	12/10/2018
Naphthalene in TCLP	mg/L	<0.001
Acenaphthylene in TCLP	mg/L	<0.001
Acenaphthene in TCLP	mg/L	<0.001
Fluorene in TCLP	mg/L	<0.001
Phenanthrene in TCLP	mg/L	0.002
Anthracene in TCLP	mg/L	<0.001
Fluoranthene in TCLP	mg/L	0.001
Pyrene in TCLP	mg/L	<0.001
Benzo(a)anthracene in TCLP	mg/L	<0.001
Chrysene in TCLP	mg/L	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001
Total +ve PAH's	mg/L	0.0025
Surrogate p-Terphenyl-d14	%	95

Method ID	Methodology Summary
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.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-012	Leachates are extracted with Dichloromethane and analysed by GC-MS.
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.

QUALITY CONTROL: Metals in TCLP USEPA1311					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			12/10/2018	[NT]	[NT]	[NT]	[NT]	12/10/2018	[NT]
Date analysed	-			12/10/2018	[NT]	[NT]	[NT]	[NT]	12/10/2018	[NT]
Arsenic in TCLP	mg/L	0.05	Metals-020 ICP-AES	<0.05	[NT]	[NT]	[NT]	[NT]	107	[NT]
Cadmium in TCLP	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	[NT]	[NT]	104	[NT]
Chromium in TCLP	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	[NT]	[NT]	102	[NT]
Copper in TCLP	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	[NT]	[NT]	104	[NT]
Lead in TCLP	mg/L	0.03	Metals-020 ICP-AES	<0.03	[NT]	[NT]	[NT]	[NT]	100	[NT]
Mercury in TCLP	mg/L	0.0005	Metals-021 CV-AAS	<0.0005	[NT]	[NT]	[NT]	[NT]	107	[NT]
Nickel in TCLP	mg/L	0.02	Metals-020 ICP-AES	<0.02	[NT]	[NT]	[NT]	[NT]	100	[NT]
Zinc in TCLP	mg/L	0.02	Metals-020 ICP-AES	<0.02	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: PAHs in TCLP (USEPA 1311)					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			12/10/2018	[NT]	[NT]	[NT]	[NT]	12/10/2018	[NT]
Date analysed	-			12/10/2018	[NT]	[NT]	[NT]	[NT]	12/10/2018	[NT]
Naphthalene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	82	[NT]
Acenaphthylene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	85	[NT]
Phenanthrene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	88	[NT]
Anthracene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	83	[NT]
Pyrene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	74	[NT]
Benzo(a)anthracene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	81	[NT]
Benzo(bjk)fluoranthene in TCLP	mg/L	0.002	Org-012	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	85	[NT]
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	92	[NT]	[NT]	[NT]	[NT]	100	[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.

Report Comments

PAHs in TCLP USEPA 1311 was analysed outside of recommended holding time.

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SAMPLE RECEIPT ADVICE

Client Details

Client	Environmental Investigation Services
Attention	Harry Leonard

Sample Login Details

Your reference	E31772KL, Normanhurst
Envirolab Reference	200697-A
Date Sample Received	13/09/2018
Date Instructions Received	10/10/2018
Date Results Expected to be Reported	12/10/2018

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	17 Soil
Turnaround Time Requested	2 days
Temperature on Receipt (°C)	10.0
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	pH of soil for fluid#determ.	pH of soil TCLP (after HCl)	Extraction fluid used	pH of final Leachate	Arsenic in TCLP	Cadmium in TCLP	Chromium in TCLP	Copper in TCLP	Lead in TCLP	Mercury in TCLP	Nickel in TCLP	Zinc in TCLP	Naphthalene in TCLP	Acenaphthylene in TCLP	Acenaphthene in TCLP	Fluorene in TCLP	Phenanthrene in TCLP	Anthracene in TCLP	Fluoranthene in TCLP	Pyrene in TCLP	Benzo(a)anthracene in TCLP	Chrysene in TCLP	Benzo(bjk)fluoranthene in TCLP	Benzo(a)pyrene in TCLP	Indeno(1,2,3-c,d)pyrene - TCLP	Dibenzo(a,h)anthracene in TCLP	Benzo(g,h,i)perylene in TCLP	Total +vePAH's	Surrogate p-Terphenyl-d14	On Hold
BH1-0.0-0.1																														✓
BH1-0.8-1.0																														✓
BH2-0.04-0.2	✓	✓	✓	✓									✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
BH2-1.5-1.9																														✓
BH3-0.0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓																		
BH3-0.5-0.6																														✓
BH4-0.0-0.1																														✓
BH5-0.0-0.1																														✓
BH5-0.5-0.6																														✓
BH6-0.0-0.1																														✓
BH6-0.6-0.95																														✓
BH7-0.0-0.1																														✓
BH7-0.5-0.95																														✓
BH9-0.0-0.1																														✓
BH9-0.5-0.95																														✓
BH9-1.85-1.95																														✓
BH9-3.10-3.15																														✓
BH9 - [TRIPLICATE]-0.5-0.95																														✓

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

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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.

Andrew Fitzsimons

From: Harry Leonard <HLeonard@jkgroup.net.au>
Sent: Wednesday, 10 October 2018 10:07 AM
To: Customer Service
Cc: Ken Nguyen
Subject: RE: Results for Registration 200697 E31772KL, Normanhurst

Hi,

Could I please order TCLP leachate analysis for the following samples:

- BH2 (0.04-0.2) for PAHs; and - 3
- BH3 (0-0.2) for heavy metals. - 5

ELS: 200697-A
TAT: 2 DAYS
DUE: 12/10/18

Could I please have these on a 2 day turnaround.

Any issues, please let me know.

Regards,

Harry Leonard
Senior Environmental Scientist
NSW Licensed Asbestos Assessor

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F: +612 9888 5001
HLeonard@jkgroup.net.au
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JK Group is Re-branding. For more information, click here

ENVIRONMENTAL INVESTIGATION SERVICES
CONSULTING ENVIRONMENTAL ENGINEERS AND SCIENTISTS
PO Box 976, North Ryde BC NSW 1670
115 Wicks Rd, Macquarie Park NSW 2113

From: Ken Nguyen [mailto:KNguyen@envirolab.com.au]
Sent: Thursday, 20 September 2018 5:31 PM
To: Harry Leonard <HLeonard@jkgroup.net.au>
Subject: Results for Registration 200697 E31772KL, Normanhurst

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.

We have a new reporting format and would welcome your feedback. Sydney@envirolab.com.au

Appendix F: 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 EIS. The purpose of these protocols is to provide standard methods for: sampling, decontamination procedures for sampling equipment, sample preservation, sample storage and sample handling. Deviations from these procedures must be recorded.

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 EIS job number, sample location (eg. BH1), sampling depth interval and date. If more than one sample container is used, this should also be indicated (eg. 2 = Sample jar 1 of 2 jars).
- 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 AS1726-1993[22].
- 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.

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

- 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 was less than 0.2 units and the difference in conductivity was less than 10%.
- 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) should be 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)[23] methods and those described in *Environmental Sampling and Analysis, A Practical Guide,* (1991)[24].

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;

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

[24] 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 G: 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)	DUP1 (primary sample BH10 0-0.1m)	Approximately 2% of primary samples	Heavy metals, TRH/BTEX, PAHs, OCPs, OPPs and PCBs
Intra-laboratory duplicate (soil)	DUPRK1 (primary sample BH109 0.05-0.15m)	As above	Heavy metals, TRH/BTEX, PAHs
Inter-laboratory duplicate (soil)	DUP2 (primary sample BH8 0-0.1m)	Approximately 2% of primary samples	Heavy metals, TRH/BTEX, PAHs, OCPs, OPPs and PCBs
Inter-laboratory duplicate (soil)	DUPRK2 (primary sample BH105 0.2-0.4m)	As above	Heavy metals, TRH/BTEX, PAHs
Trip blank (soil)	TB1 (31/08/2018)	One for the assessment to demonstrate adequacy of storage and transport methods	BTEX
Trip blank (soil)	TB1 (27/03/2019)	One for the assessment to demonstrate adequacy of storage and transport methods	BTEX
Rinsate (soil)	FRAM1 (27/03/2019)	One for the assessment to demonstrate adequacy of decontamination methods	BTEX

The results for the field QA/QC samples are detailed in the laboratory summary tables (Table H to Table M inclusive) attached to the assessment report and are discussed in the subsequent sections of this Data (QA/QC) Evaluation report.

3. Data Assessment Criteria

EIS 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 less than 50% RPD for concentrations greater than 10 times the PQL, less than 75% RPD for concentrations between five and 10 times the PQL and less than 100% RPD for concentrations that are less than five times the PQL. RPD failures will be considered qualitatively on a case-by-case basis taking into account factors such as the sample type, collection methods and the specific analyte where the RPD exceedance was reported.

Field Blanks and Rinsates

Acceptable targets for field blank and rinsate 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.

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 EIS 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.

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

The PQL for VOCs in the inter-lab soil duplicate DUPRK2 was raised due to the high concentration of analytes in the sample, resulting in the sample requiring dilution. The PQL was raised to 1mg/kg which was still below the SAC. Therefore EIS are of the opinion that this is not significant and it does not affect the quality of the dataset or the outcome of the assessment.

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, EIS 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.

Appropriate PQLs were adopted for the analysis and all PQLs were below the SAC for the remaining analytes.

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 fluoranthene and pyrene in DUPRK1/BH109 (0.05-0.15m). As both the primary and duplicate sample results were less than the SAC, the exceedances are not considered to have had an adverse impact on the data set as a whole;

- Elevated RPDs were reported for chromium and nickel in DUPRK2/BH105 (0.2-0.4). As both the primary and duplicate sample results were less than the SAC, the exceedances are not considered to have had an adverse impact on the data set as a whole; and
- Elevated RPDs were reported for dibenzo(ah)anthracene in DUPRK2/BH105 (0.2-0.4). As both the primary and duplicate sample results were less than the SAC, the exceedances are not considered to have had an adverse impact on the data set as a whole.

As both the primary and duplicate sample results were less than the SAC, the exceedances are not considered to have had an adverse impact on the data set as a whole.

Field Blanks

During the investigations, two soil trip blanks were 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.

Rinsates

All results were below the PQL. This indicated that cross-contamination artefacts associated with sampling equipment were not present and the potential for cross-contamination to have occurred was low.

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:

- The laboratory RPD acceptance criteria was exceeded for zinc in sample BH101 (0-0.1m). Therefore a triplicate result was issued. Both the original and triplicate result has been reported and are both below the SAC. This is not considered to have an impact on the data quality for this assessment; and
- Samples BH102 (0-0.2), BH104 (0.4-0.8), BH107 (0-0.5), BH111 (0.6-1.0), BH113 (0-0.45) and BH114 (0.12-0.2) were below the minimum 500mL sample volume as per the NEPM 2013 guidance. As the results were all below the SAC, this is not considered to have an impact on the data quality for this assessment.

C. DATA QUALITY SUMMARY

EIS are of the opinion that the data are adequately precise, accurate, representative, comparable and complete to serve as a basis for interpretation to achieve the investigation objectives.

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 H: Field Work Documents

JKEnvironments

Client:	TTW	**Job No.:**	E31772KL
Project:	Proposed New School Buildings	**Well No.:**	MW111
Location:	LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW	**Depth (m):**	6m

WELL FINISH DETAILS

	Gatic Cover ☑	**Standpipe** ☐	**Other (describe)** ☐

WELL DEVELOPMENT DETAILS

Method:	Development	**SWL – Before (m):**	–
Date:	28/03/19	**Time – Before:**	1:30pm
Undertaken By:	AM/RK	**SWL – After (m):**	–
Total Vol. Removed:	0L	**Time – After:**	–
PID Reading (ppm):	0ppm		

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:	AM/RK
Date Tested:	28/3/19
Checked By:	HL
Date:	28/3/19.

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:	TTW	Job No.:	E31772KL
Project:	Proposed New School Buildings	Well No.:	DUPAMW1
Location:	LORETO NORMANHURST GIRLS SCHOOL, NORMANHURST, NSW	Depth (m):	5.7 m

WELL FINISH

X	Gatic Cover		Standpipe		Other (describe)

WELL PURGE DETAILS:

Method:	~~Peristaltic~~ Bailer	SWL – Before:	5.12m
Date:	4.4.19	Time – Before:	11:10
Undertaken By:	AM	Total Vol Removed:	1 L
Pump Program No:	85937	PID (ppm):	40

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
12:10	5.42	0.5		17.8	5.4	2234	6.17	212.9
Stopped	Sampling							

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO) Steady State Achieved (YES / NO)

Gw silt loading

Sampling Containers Used: 1 x glass amber, 4 x BTEX vials, 3 x HNO3 plastic, x H2SO4 plastic, x unpreserved plastic

YSI used: 3 DUPAMW1 — DUPAMW2

Tested By: Alistair Mitchell	**Remarks:**
Date Tested: 4.4.19	- Steady state conditions
Checked By: HL 9/4/19	- difference in the pH less than 0.2 units, difference in conductivity less than 10% 10% and SWL stable/not in drawdown
Date: 9/4/19.	

Appendix I: Calculation Sheets

UCL Statistics for Uncensored Full Data Sets

User Selected Options	
Date/Time of Computation	ProUCL 5.122/05/2019 10:18:06 AM
From File	Carcinogenic PAHs.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Carcinogenic PAHs

General Statistics

Total Number of Observations	10	Number of Distinct Observations	8
		Number of Missing Observations	19
Minimum	0.07	Mean	9.167
Maximum	73	Median	0.9
SD	22.56	Std. Error of Mean	7.133
Coefficient of Variation	2.461	Skewness	3.097

Normal GOF Test

Shapiro Wilk Test Statistic	0.45	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.842	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.449	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.262	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	22.24	95% Adjusted-CLT UCL (Chen-1995)	28.36
		95% Modified-t UCL (Johnson-1978)	23.41

Gamma GOF Test

A-D Test Statistic	0.908	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.803	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.265	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.286	Detected data appear Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.359	k star (bias corrected MLE)	0.318
Theta hat (MLE)	25.56	Theta star (bias corrected MLE)	28.85
nu hat (MLE)	7.172	nu star (bias corrected)	6.354
MLE Mean (bias corrected)	9.167	MLE Sd (bias corrected)	16.26
		Approximate Chi Square Value (0.05)	1.823
Adjusted Level of Significance	0.0267	Adjusted Chi Square Value	1.434

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	31.94	95% Adjusted Gamma UCL (use when n<50)	40.62

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.961	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.191	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.262	Data appear Lognormal at 5% Significance Level

56	**Data appear Lognormal at 5% Significance Level**											
57												
58	**Lognormal Statistics**											
59						Minimum of Logged Data	-2.659			Mean of logged Data		0.348
60						Maximum of Logged Data	4.29			SD of logged Data		1.978
61												
62	**Assuming Lognormal Distribution**											
63						95% H-UCL	339.8			90% Chebyshev (MVUE) UCL		19.56
64						95% Chebyshev (MVUE) UCL	25.4			97.5% Chebyshev (MVUE) UCL		33.51
65						99% Chebyshev (MVUE) UCL	49.43					
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
69												
70	**Nonparametric Distribution Free UCLs**											
71						95% CLT UCL	20.9			95% Jackknife UCL		22.24
72						95% Standard Bootstrap UCL	20.37			95% Bootstrap-t UCL		105.6
73						95% Hall's Bootstrap UCL	88.84			95% Percentile Bootstrap UCL		22.95
74						95% BCA Bootstrap UCL	30.12					
75						90% Chebyshev(Mean, Sd) UCL	30.57			95% Chebyshev(Mean, Sd) UCL		40.26
76						97.5% Chebyshev(Mean, Sd) UCL	53.71			99% Chebyshev(Mean, Sd) UCL		80.14
77												
78	**Suggested UCL to Use**											
79						95% Adjusted Gamma UCL	40.62					
80												
81	When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test											
82	When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL											
83												
84	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
85	Recommendations are based upon data size, data distribution, and skewness.											
86	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
87	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
88												

UCL Statistics for Uncensored Full Data Sets

User Selected Options	
Date/Time of Computation	ProUCL 5.122/05/2019 10:22:20 AM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

C0

General Statistics

Total Number of Observations	16	Number of Distinct Observations	15
		Number of Missing Observations	13
Minimum	0.05	Mean	51.12
Maximum	640	Median	3
SD	158.4	Std. Error of Mean	39.59
Coefficient of Variation	3.098	Skewness	3.891

Normal GOF Test

Shapiro Wilk Test Statistic	0.356	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.887	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.408	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.213	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	120.5	95% Adjusted-CLT UCL (Chen-1995)	157.4
		95% Modified-t UCL (Johnson-1978)	126.9

Gamma GOF Test

A-D Test Statistic	1.175	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.863	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.273	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.236	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.245	k star (bias corrected MLE)	0.241
Theta hat (MLE)	208.8	Theta star (bias corrected MLE)	212.5
nu hat (MLE)	7.835	nu star (bias corrected)	7.699
MLE Mean (bias corrected)	51.12	MLE Sd (bias corrected)	104.2
		Approximate Chi Square Value (0.05)	2.562
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	2.237

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	153.6	95% Adjusted Gamma UCL (use when n<50)	175.9

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.967	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.887	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.114	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.213	Data appear Lognormal at 5% Significance Level

56	**Data appear Lognormal at 5% Significance Level**											
57												
58	**Lognormal Statistics**											
59					Minimum of Logged Data	-2.996			Mean of logged Data	1.023		
60					Maximum of Logged Data	6.461			SD of logged Data	2.648		
61												
62	**Assuming Lognormal Distribution**											
63					95% H-UCL	4643			90% Chebyshev (MVUE) UCL	154.1		
64					95% Chebyshev (MVUE) UCL	202.4			97.5% Chebyshev (MVUE) UCL	269.3		
65					99% Chebyshev (MVUE) UCL	400.9						
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
69												
70	**Nonparametric Distribution Free UCLs**											
71					95% CLT UCL	116.2			95% Jackknife UCL	120.5		
72					95% Standard Bootstrap UCL	114			95% Bootstrap-t UCL	514.9		
73					95% Hall's Bootstrap UCL	504			95% Percentile Bootstrap UCL	128.2		
74					95% BCA Bootstrap UCL	169.5						
75					90% Chebyshev(Mean, Sd) UCL	169.9			95% Chebyshev(Mean, Sd) UCL	223.7		
76					97.5% Chebyshev(Mean, Sd) UCL	298.4			99% Chebyshev(Mean, Sd) UCL	445		
77												
78	**Suggested UCL to Use**											
79					99% Chebyshev (Mean, Sd) UCL	445						
80												
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
82	Recommendations are based upon data size, data distribution, and skewness.											
83	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
84	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
85												

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

CRC Care, (2011). Technical Report No. 10 – Health screening levels for hydrocarbons in soil and groundwater Part 1: Technical development document

CRC Care, (2017). Technical Report No. 39 – Risk-based management and guidance for benzo(a)pyrene

Contaminated Land Management Act 1997 (NSW)

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

Managing Land Contamination, Planning Guidelines SEPP55 – Remediation of Land (1998)

National Health and Medical Research Council (NHMRC), (2011). National Water Quality Management Strategy, Australian Drinking Water Guidelines

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 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

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World Health Organisation (WHO), (2008). Petroleum Products in Drinking-water, Background document for the development of WHO Guidelines for Drinking Water Quality

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