



REPORT TO
BAPTISTCARE

ON
**APPENDIX O - PRELIMINARY (STAGE 1) SITE
INVESTIGATION**

FOR
PROPOSED REDEVELOPMENT MASTERPLAN

AT
157 BALACLAVA ROAD, MACQUARIE PARK, NSW

Date: 4 November 2022

Ref: E32891PRrpt

JKEnvironments
www.jkenvironments.com.au

T: +61 2 9888 5000

JK Environments Pty Ltd

ABN 90 633 911 403

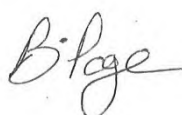


Report prepared by:



Craig Ridley
Senior Environmental Scientist

Report reviewed by:



Brendan Page
Principal Associate | Environmental Scientist
CEnvP SC



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

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Executive Summary

BaptistCare ('the client') commissioned JK Environments (JKE) to undertake a Preliminary (Stage 1) Site Investigation (PSI) to inform the masterplan for the proposed redevelopment at 157 Balaclava Road, Macquarie Park, NSW ('the site'). The site location is shown on Figure 1 and the extent of the development area is shown on Figure 2 attached in the report appendices.

This report has been prepared to accompany a State Significant Development Application (SSDA) for a Concept Master Plan for the site located at 157 Balaclava Road, Macquarie Park. Specifically, consent is sought for the following in this Concept SSDA:

- A mixed-use development comprising a maximum gross floor area (GFA) of 190,000m² dedicated to a range of land uses including:
 - Student Housing;
 - Seniors Housing;
 - Built to Rent;
 - Retail;
 - Residential;
 - Mixed uses including commercial and allied health; and
 - A school.
- Maximum building heights and GFA for each development block;
- Public domain landscape concept, including parks, streets and pedestrian connections; and
- Vehicular and intersection upgrades.

Selected conceptual masterplan drawings are attached in the appendices.

The site is legally identified as Lot 60 in DP 1107965 and is located near the corner of Herring Road and Epping Road within the City of Ryde Local Government Area (LGA). It is directly south of Macquarie University and in close proximity to Macquarie Shopping Centre. The surrounding area is characterised by a mix of commercial and education uses, as well as student accommodation and residential dwellings.

The site comprises a significant land holding with street frontages to Balaclava Road and Epping Road. It currently accommodates several low-medium density buildings that are connected via internal footpaths and lower order road networks. The total site area of the BaptistCare landholding is 63,871m².

This report has been prepared in response to the Secretary's Environmental Assessment Requirements (SEARS) dated 17 August 2022 for SSD-46561712. Specifically, this report has been prepared to respond to those SEARS summarised in the table below.

Item	Description of Requirement	Section Reference (this report)
13. Contamination	<p>Assess and quantify any soil and groundwater contamination and demonstrate that the site is suitable for the proposed use in accordance with SEPP (Resilience and Hazards) 2021. This must include the following prepared by certified consultants recognised by the NSW Environment Protection Authority</p> <ul style="list-style-type: none"> • Preliminary Site Investigation (PSI). • Detailed Site Investigation (DSI) where recommended in the PSI. • Remediation Action Plan (RAP) where remediation is required. This must specify the proposed remediation strategy. • Preliminary Long-term Environmental Management Plan (LTEMP) where containment is proposed on-site. 	<p>This report relates to the preliminary assessment of site contamination (i.e. the PSI). The results of the investigation are presented in Section 8. The conclusions of the investigation are presented in Section 11.</p> <p>Separate DSI and RAP reports will be prepared</p>

Item	Description of Requirement	Section Reference (this report)
		for future DAs as required.

The primary aims of the investigation were to identify any past or present potentially contaminating activities at the site, identify the potential for site contamination, and make a preliminary assessment of the soil contamination conditions. The 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 contamination conditions via implementation of a preliminary sampling and analysis program;
- Prepare a conceptual site model (CSM);
- Assess the potential risks posed by contamination to the receptors identified in the CSM (Tier 1 assessment);
- Provide a preliminary waste classification for off-site disposal of soil;
- Assess whether the site is suitable or can be made suitable for the proposed development (from a contamination viewpoint); and
- Assess whether further intrusive investigation and/or remediation is required.

The scope of work included a review of site history and site information, a site walkover inspection and soil sampling from 14 boreholes drilled within the site. The site history information indicated that the site was historically used for agricultural purposes (orchards). Since the 1960s, the site has been used as a residential care facility and retirement village.

The site history and site inspection identified the following potential contamination sources/AEC at the site:

- Historical filling activities at the site;
- Historical agricultural (orchards) use;
- Use of pesticides beneath the buildings and/or around the site;
- Flammable liquid storage cabinet and chemical storage shed; and
- Hazardous building materials within current and former buildings and structures at the site.

The investigation identified shallow fill soils to depths of approximately 0.2m below ground level (BGL) to 1.1mBGL, underlain by residual silty and/or sand clay and clayey sand to depths of approximately 0.35mBGL to 2.4mBGL. The residual soils were underlain by siltstone and/or sandstone bedrock. The fill typically comprised silty clay and silty sand with inclusions of ash, slag, gravel and root fibres. Fibre cement fragments (FCF) were encountered in surficial fill soils in two locations (BH604 and BH605, as shown on Figures 2 and 3 attached in the appendices). Groundwater seepage was encountered during drilling in several boreholes at depths ranging from 0.3mBGL to 5mBGL. The standing water levels (SWLs) in the monitoring wells installed for the geotechnical investigation were measured on 17 March 2022 by JKE and ranged from approximately 1mBGL to 5.5mBGL.

Selected fill and natural soil samples were analysed for a range of CoPC based on the CSM, and to provide spatial coverage of the site.

The investigation identified asbestos, in the form of FCF/asbestos containing material (ACM), in surficial (0-100mm) fill soils in BH604 and BH605 at concentrations above the human health-based site assessment criteria (SAC). The source of the asbestos is considered likely to be associated with historic demolition and/or possibly historical filling activities (but more likely the former). The FCF appeared to be in reasonable to good condition (i.e. bonded/non-friable asbestos). The site surface in the vicinity of BH604 and BH605 are currently grass/mulch covered. The site is currently occupied and the areas in the vicinity of BH604 and BH605 are accessible to the site occupants. As such, the soils in these areas may be disturbed. On this basis, a complete source-pathway-receptor (SPR) linkage could occur, however, we consider

that the presence of grass/mulch cover and the bonded/non-friable nature of the asbestos makes it unlikely that the generation of airborne asbestos fibres would occur during typical site use. Remediation will likely be required to address the potential risk. Interim measures should be undertaken to mitigate the risk to the current site occupants. JKE recommend preparing an Asbestos Management Plan (AMP) to outline the management strategy for addressing the risks posed by asbestos.

The investigation identified total recoverable hydrocarbons (TRH) F1 and F2 fractions above the human health SAC in surficial soils in BH611 (F1 only) and BH613 (F2 only), and within the underlying natural silty clayey sand in BH611. Further, TRH F2 and F3 fractions above the ecological SAC were detected in the surficial fill soils in BH611 (F3 only) and BH613, and within the underlying natural silty clayey sand in BH611. TRH concentrations were not recorded in the underlying sandstone bedrock sample collected from BH611. On this basis, the TRH impacts were likely confined to the fill and shallow residual soils and were considered unlikely to migrate to the groundwater. The source of the TRH concentrations in the soils is considered likely associated with localised surficial spills/releases permeating the site surface and migrating into the underlying soils. To a lesser extent, the TRH concentrations may also be attributable to interference from non-petroleum-based hydrocarbons (i.e. organic material and polar compounds).

The site surface in the vicinity of BH611 and BH613 was unsealed and comprised of gardens. As the site is currently occupied and the soils are accessible, there is potential for a complete SPR linkage to exist. It is noted that BH611 and BH613 are located within gardens/open space and buildings/structures were not observed in the immediate vicinity of BH611 and BH613. On this basis, JKE is of the opinion that it is unlikely for TRH concentrations in soil to volatilise, migrate into and accumulate within buildings/structures to the extent that the TRH concentrations pose an unacceptable risk to human health. JKE note that with regard to on-site ecological receptors, the vegetation across the site was considered to be healthy (based on a cursory inspection). Based on the above, the potential for TRH to pose risk to receptors in the current configuration is considered to be low. Further assessment is required to better assess the potential risks posed by TRH in the context of the proposed future developments in the vicinity of BH611 and BH613.

The SAC exceedances are shown on Figure 3 attached in the appendices. All other CoPC results were below the human health and ecological SAC.

Based on the results of the PSI, the fill soil across the site is assigned a preliminary classification of 'General Solid Waste (non-putrescible) containing Special Waste (asbestos)'. The natural silty clayey sand in the vicinity of BH611 is assigned a preliminary classification of General Solid Waste (non-putrescible). JKE is of the opinion that the remainder of the natural soil and bedrock will likely meet the definition of virgin excavated natural material (VENM). Further assessment is required to confirm these preliminary classifications.

Based on the findings of the investigation, JKE is of the opinion that the site can be made suitable for the developments outlined within the masterplan, subject to implementing the following recommendations:

- A suitably qualified/licensed contractor is to carry out an 'emu pick' to remove any visible FCF from the areas of the site with exposed soils. A surface clearance certificate for asbestos is then to be issued by a Licensed Asbestos Assessor (LAA). This is to occur as soon as practicable;
- Prepare an AMP to outline the management strategy for addressing the risks posed by asbestos. This should be prepared by the LAA;
- Undertake a Detailed Site Investigation (DSI) to better assess the risks associated with the AEC/potential sources of contamination, and to inform preparation of the Remediation Action Plan (RAP) (or RAPs), if required. The DSI should address the data gaps identified in this report. It is noted that the masterplan includes several stages of development. The staging of the development works may require separate DSIs to be undertaken for each development stage; and
- A hazardous building materials (HAZMAT) survey should be undertaken prior to demolition of any buildings/structures. Following demolition of the existing buildings/structures, an asbestos clearance certificate should be provided.

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

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Abbreviations

Asbestos Fines/Fibrous Asbestos	AF/FA
Ambient Background Concentrations	ABC
Added Contaminant Limits	ACL
Asbestos Containing Material	ACM
Australian Drinking Water Guidelines	ADWG
Area of Environmental Concern	AEC
Australian Height Datum	AHD
Acid Sulfate Soil	ASS
Above-Ground Storage Tank	AST
Below Ground Level	BGL
Benzo(a)pyrene Toxicity Equivalent Factor	BaP TEQ
Bureau of Meteorology	BOM
Benzene, Toluene, Ethylbenzene, Xylene	BTEX
Cation Exchange Capacity	CEC
Contaminated Land Management	CLM
Contaminant(s) of Potential Concern	CoPC
Chain of Custody	COC
Conceptual Site Model	CSM
Development Application	DA
Dial Before You Dig	DBYD
Data Quality Indicator	DQI
Data Quality Objective	DQO
Detailed Site Investigation	DSI
Ecological Investigation Level	EIL
Ecological Screening Level	ESL
Environmental Management Plan	EMP
Excavated Natural Material	ENM
Environment Protection Authority	EPA
Environmental Site Assessment	ESA
Fibre Cement Fragment(s)	FCF
General Approval of Immobilisation	GAI
Gross Floor Area	GFA
Hazardous Building Materials	HAZMAT
Health Investigation Level	HILs
Health Screening Level	HSL
Health Screening Level-Site Specific Assessment	HSL-SSA
International Organisation of Standardisation	ISO
JK Environments	JKE
Lab Control Spike	LCS
Local Government Area	LGA
Light Non-Aqueous Phase Liquid	LNAPL
Long Term Environmental Management Plan	LTEMP
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
Per- and Polyfluoroalkyl Substances	PFAS
Perfluorooctanoic Acid	PFOA
Perfluorooctanesulfonic Acid	PFOS



Perfluorohexane Sulfonate	PFHxS
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
Secretary's Environmental Assessment Requirements	SEARs
State Environmental Planning Policy	SEPP
Site Specific Assessment	SSA
State Significant Development Application	SSDA
Source, Pathway, Receptor	SPR
Specific Contamination Concentration	SCC
Standard Penetration Test	SPT
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	%
Percentage weight for weight	%w/w

1 INTRODUCTION

BaptistCare ('the client') commissioned JK Environments (JKE) to undertake a Preliminary (Stage 1) Site Investigation (PSI) to inform the masterplan for the proposed redevelopment at 157 Balaclava Road, Macquarie Park, NSW ('the site'). The site location is shown on Figure 1 and the extent of the development area is shown on Figure 2 attached in the report appendices.

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 - Residential;
 - Mixed uses including commercial and allied health; and
 - A school.
- Maximum building heights and GFA for each development block;
- Public domain landscape concept, including parks, streets and pedestrian connections; and
- Vehicular and intersection upgrades.

Selected conceptual masterplan drawings are attached in the appendices.

The site is located at 157 Balaclava Road, Macquarie Park and is legally identified as Lot 60 in DP 1107965. The site is located near the corner of Herring Road and Epping Road within the City of Ryde Local Government Area (LGA). It is directly south of Macquarie University and in close proximity to Macquarie Shopping Centre. The surrounding area is characterised by a mix of commercial and education uses, as well as student accommodation and residential dwellings.

The site comprises a significant land holding with street frontages to Balaclava Road and Epping Road. It currently accommodates several low-medium density buildings that are connected via internal footpaths and lower order road networks. The total site area of the BaptistCare landholding is 63,871m². The site is shown on the following figure.



Figure 1 - Location Plan

This report has been prepared in response to the Secretary's Environmental Assessment Requirements (SEARS) dated 17 August 2022 for SSD-46561712. Specifically, this report has been prepared to respond to those SEARS summarised in the table below.

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¹ State Environmental Planning Policy (Resilience and Hazards) 2021 (NSW) (referred to as SEPP Resilience and Hazards 2021)

1.1 Aims and Objectives

The primary aims of the investigation were to identify any past or present potentially contaminating activities at the site, identify the potential for site contamination, and make a preliminary assessment of the soil contamination conditions. The 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);
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- Assess the potential risks posed by contamination to the receptors identified in the CSM (Tier 1 assessment);
- Provide a preliminary waste classification for off-site disposal of soil;
- Assess whether the site is suitable or can be made suitable for the proposed development (from a contamination viewpoint); and
- Assess whether further intrusive investigation and/or remediation is required.

1.2 Scope of Work

The investigation was undertaken generally in accordance with a JKG proposal (Ref: P55233PN) of 22 October 2021 and email instruction from Ethos Urban, on behalf of the client, of 2 February 2022. The scope of work included the following:

- Review of site information, including background and site history information from various sources outlined in the report;
- 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)², other guidelines made under or with regards to the Contaminated Land Management Act (1997)³ and SEPP Resilience and Hazards 2021 (formerly known as SEPP55). A list of reference documents/guidelines is included in the appendices.

² National Environment Protection Council (NEPC), (2013). *National Environmental Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013)*. (referred to as NEPM 2013)

³ Contaminated Land Management Act 1997 (NSW) (referred to as CLM Act 1997)

2 SITE INFORMATION

2.1 Background

Geotechnical investigations were previously undertaken for the Dorothy Henderson Lodge in the south-west of the site in 1987⁴ and across the site in 2002⁵. The investigations included drilling 20 boreholes across the site using track-mounted drilling rigs (equipped with spiral flight augers) and hand tools.

The investigations typically encountered shallow fill soils comprised of silty clay topsoil, silty clay and/or clay to depths of approximately 0.8m below ground level (BGL). Hardstand pavements comprised of asphaltic concrete (AC) or concrete were encountered in a few locations and ranged in thickness from approximately 50mm to 130mm, and were underlain by gravelly silty sand fill. The fill was underlain by residual soils and shallow siltstone bedrock. Siltstone bedrock was typically encountered at depths of approximately 1.2-2.5mBGL.

Minor seepage of water was encountered during the drilling of one borehole at a depth of approximately 1.2mBGL, though was considered likely to be a minor volume of perched water from within the overlying fill. The standing water levels (SWLs) were measured in the boreholes and recorded water at depths of approximately 1.6mBGL to 6.2mBGL in six boreholes up to several hours after drilling. All other boreholes were dry on the completion of drilling and for a short time after.

2.2 Site Identification

Table 2-1: Site Identification

Current Site Owner (certificate of title):	Baptistcare NSW & ACT
Site Address:	157 Balaclava Road, Macquarie Park, NSW
Lot & Deposited Plan:	Lot 60 in DP1107965
Current Land Use:	Aged Care Facility and Independent Living
Proposed Land Use:	Residential (high density, build to rent, co-living, seniors housing), school, commercial and retail
Local Government Authority:	City of Ryde
Current Zoning:	B4: Mixed Use
Site Area (m²) (approx.):	63,871
RL (AHD in m) (approx.):	62 – 86

⁴ JKG (1987). *Geotechnical Investigation. Proposed Development for Baptist Home Trust. Cnr Epping and Balaclava Rds, North Ryde, NSW*. (Ref: 5271K, dated 14 September 1987)

⁵ JKG (2002). *Report to Baptist Community Services on Geotechnical Investigation for Proposed New Aged Care Facility at 157 Balaclava Road, Marsfield, NSW*. (Ref: 16876SLrpt, dated 9 July 2002)

Geographical Location (decimal degrees) (approx.):	Latitude: -33.778247 Longitude: 151.11099
Site Location Plan:	Figure 1
Sample Location Plan:	Figure 2

2.3 Site Location and Regional Setting

The site is located in a predominantly residential and commercial area of Macquarie Park and is bound by Epping Road to the south and Balaclava Road to the north-west. The site is located approximately 50m to the west of Kikkiya Creek.

2.4 Topography

The site is located in hilly terrain between a ridge at the north-west end of the site and a gully at the south-east end of the site. The site grades at approximately 5° overall from the north-west to the south-east. The regional topography is characterised by a south-east facing hillside and the site is located towards the top of the hillside. Parts of the site appear to have been levelled to account for the slope and accommodate the existing development.

2.5 Site Inspection

A walkover inspection of the site was undertaken by JKE on 23 March 2022. The inspection was limited to accessible areas of the site and immediate surrounds. An internal inspection of buildings was not undertaken. Selected site photographs obtained during the inspection are attached in the appendices.

A summary of the inspection findings is 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 site was occupied by a BaptistCare facility and included buildings for residential aged care services, home services and a retirement village.

No evidence indicating the former use of the site was identified during the site inspection.

2.5.2 Buildings, Structures and Roads

At the time of the JKE inspection, several buildings were observed on site including:

- Several single storey residential dwellings located within the central and eastern sections of the site, forming part of the Willandra Village (retirement village). The buildings predominantly comprised of brick, glass and timber construction, with fibre cement in-fill panels;
- Several 1-2 storey buildings located within the western portion of the site, forming the Dorothy Henderson Lodge (residential aged care facility) and the home services (Northern Sydney area). The buildings predominantly comprised of brick, glass, concrete and timber construction;

- A 1-2 storey residential aged care building (the Shalom Centre) was located in the north-west of the site. The building predominantly comprised of brick, glass and metal construction;
- A single storey community hall used for recreational purposes observed in the central portion of site. The hall was of brick, metal and concrete construction; and
- Two 3-storey buildings within the central portion of the site, forming part of the Coinda Court (aged care). The buildings were of brick, concrete, glass and timber construction.

AC sealed internal roads and carparks, and concrete paved pathways were observed within the site and provided vehicular and pedestrian access between the facilities. The pavements appeared in good condition with no visible evidence of subsidence or potholing observed.

2.5.3 Boundary Conditions, Soil Stability and Erosion

Metal fencing was generally present along the site boundaries. No evidence of erosion was observed during the inspection.

2.5.4 Presence of Drums/Chemical Storage and Waste

General household waste and recycling municipal waste bins were observed at a majority of the residential dwellings within the Willandra Village. Clinical and cytotoxic waste storage containers were observed in the western and central sections of the site. A 250L flammable liquid storage cabinet and a small corrugated metal storage shed (labelled as a chemical store) were observed in the south-west of site, near the Dorothy Henderson Lodge (see Figure 2). The cabinet and chemical store were locked and were not able to be inspected. No obvious indications of spills/releases (such as staining and/or odours) were observed on the site surface in the immediate vicinity of the storage areas. Notwithstanding, as the contents of the cabinet and store could not be inspected, the area has been considered in the CSM.

A large skip bin was observed in the south/south-eastern corner of the site. The contents of the bin included vegetation waste.

The wastes stored on the site were not considered to represent potential sources of contamination.

2.5.5 Evidence of Cut and Fill

Fill material (i.e. soils that appeared to have been historically imported/disturbed, as indicated by the presence of various inclusions) was visible in areas of exposed soil, including garden beds, and adjacent to pavements throughout the site.

2.5.6 Visible or Olfactory Indicators of Contamination (odours, spills etc)

A suspected grease-trap system was observed in the delivery and storage area of Dorothy Henderson Lodge, in the west/north-west of the site. The system was not opened/inspected, however no visible stains were observed at the surface or offensive odours encountered. JKE presume that the Coinda Court and the Shalom Centre likely also include grease-trap systems, though these were not identified.

During the inspection, no visible or olfactory indications of contamination, such as stained surfaces and/or surficial soils, or offensive odours, were encountered.

2.5.7 Drainage and Services

Stormwater dish drains and grated drain points were observed within the carparks and adjacent to some of the buildings on site. It was assumed that these drainage points discharged into the regional stormwater infrastructure. Infiltration of surface water runoff was expected to occur within unpaved/landscaped areas on site. Excess surface water flows from the site were expected to flow across paved surfaces towards the south-east, in sympathy with the site topography.

A possible stormwater interceptor/separator unit was identified in the north-west of the site, within the main entrance driveway.

2.5.8 Sensitive Environments

Kikkiya Creek is located approximately 50m to the east of the site, and is a tributary of the Lane Cove River. The Lotsearch report also indicated that Sydney Turpentine Ironbark Forests were mapped approximately 50m east and 250m south-east of the site. The Lotsearch report indicated the forests were highly disturbed and previously cleared prior to 1943.

2.5.9 Landscaped Areas and Visible Signs of Plant Stress

The on-site vegetation comprised of exotic and native grasses, weedy vegetation, shrubs and trees. Vegetable gardens (within above-ground planter boxes) and rose gardens were observed within the south-eastern section of Willandra Village. Native trees were observed predominantly near the site boundaries and were estimated to be approximately 5-10m in height. Based on a cursory inspection, the vegetation on-site appeared generally healthy with no obvious indications of stress or die-back.

2.6 Surrounding Land Use

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

- North-west: Balaclava Road and carparks associated with Macquarie University;
- North-east: Two child care centre buildings, University Avenue, and a multi-storey university building beyond;
- East: Kikkaya Creek, with Macquarie Park Baptist Church and Morling College beyond;
- South-east: Medium density (villas and walk-up apartments) and high-density residential buildings; and
- West – Epping Road, with a Caltex service station and low-density residential beyond.

JKE is of the opinion that the Caltex service station to the west of the site is not a potential off-site contamination source as the service station is located a reasonable distance from the site.

2.7 Underground Services

The 'Dial Before You Dig' (DBYD) plans were reviewed for the investigation 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 section 10.7 (2 and 5) planning certificates were reviewed for the investigation. Copies of the certificates are attached in the appendices. A summary of the relevant information is outlined below:

- The land 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 land is not the subject of a Site Audit Statement (SAS);
- The land is not located within an acid sulfate soil (ASS) risk area;
- The land is not located in a heritage conservation area.

3 GEOLOGY AND HYDROGEOLOGY

3.1 Regional Geology

Regional geological information was reviewed for the investigation. The information was sourced from the Lotsearch report attached in the appendices. The report indicates 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 ASS risk map prepared by Department of Land and Water Conservation (1997)⁶ indicated that the site is not located within a risk area.

ASS risk information presented in the Lotsearch report indicated that the site was located in an area mapped as being low to extremely low probability of ASS occurrence, and indicated that the site is not within an ASS risk Class 1, 2, 3, 4 or 5 area according to the council planning maps.

3.3 Hydrogeology

Hydrogeological information presented in the Lotsearch report 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 was a total of 22 registered bores within the report buffer of 2,000m. In summary:

- There were two registered bores located on-site. The bores were installed during the 1950s and were registered for irrigation purposes. It is unclear whether these bores are still in use;
- The majority of the off-site bores were registered for monitoring purposes;
- The nearest off-site bore registered for purposes other than monitoring (i.e. recreation) was located approximately 500m to the west of the site; and
- The drillers log information from the closest registered bores typically identified residual clay and sandstone. Fill soils were not logged in the bores drilled on-site. The SWLs in the on-site bores ranged from 4.5mBGL to 6mBGL. It is noted that the three water bearing zones recorded were at approximately 15mBGL, 25mBGL and 58mBGL. On this basis, JKE is of the opinion that the SWLs recorded may be representative of a perched aquifer.

The information reviewed for the PSI indicated that the subsurface conditions at the site are likely to consist of shallow fill, over relatively low permeability (residual) soils and shallow bedrock. The potential for viable groundwater abstraction and use of groundwater under these conditions is considered to be low. There is a reticulated water supply in the area and consumption of groundwater is not expected to occur. Use of groundwater is not proposed as part of the development.

Considering the local topography and surrounding land features, JKE anticipate groundwater to flow towards the east/south-east.

⁶ Department of Land and Water Conservation, (1997). *1:25,000 Acid Sulfate Soil Risk Map (Series 9130N3, Ed 2)*

3.4 Receiving Water Bodies

The closest surface water body is Kikkiya Creek located approximately 50m to the east of site, which flows to the Lane Cove River. Kikkiya Creek is considered to be a potential receptor.

4 SITE HISTORY INFORMATION

4.1 Review of Historical Aerial Photographs

Historical aerial photographs were reviewed for the investigation. The information was sourced from the Lotsearch report. JKE has reviewed the photographs, and summarised relevant information in the following table:

Table 4-1: Summary of Historical Aerial Photographs

Year	Details
1930	<p>On-site: The site appeared to be used for agricultural purposes. Orchards were visible occupying most of the northern and central sections of the site. Ploughing furrows and what appeared to be an orchard were observed in the northern and central portions of site. Two houses were visible in the north/north-west of the site, fronting Balaclava Road, a house was visible in the eastern section of the site (adjacent to the orchard), and a house was located in the south-eastern corner of the site. The eastern and south-eastern sections of the site appeared to be mostly cleared, though there were no discernible use of the land was visible in this area. A creek (assumed to be the original flow path of Kikkiya Creek) was visible in the south of the site, trending in a south-west to north-east direction.</p> <p>Off-site: The surrounds appeared similar to the site and were most likely used for agricultural purposes. Several buildings/structures associated with the orchard on-site were located within the property now identified as 159-161 Epping Road. Epping Road and Balaclava Road were visible.</p>
1943 1951	The site and surrounding features appeared generally similar to the previous photographs, with the exception that the buildings/structures adjacent to the south of the site had been demolished.
1955	<p>On-site: The site appeared generally similar to the previous photograph.</p> <p>Off-site: Several large sheds/structures were visible approximately 100-150m to the north/north-west of the site, beyond Balaclava Road. A residential sub-division (low-density) was visible approximately 250m to the south-east of the site, to the south-east of the intersection of Herring Road and Epping Road.</p>
1961	<p>On-site: The north/north-western section of the site had been cleared. Earthworks and construction were visible in this area. The remainder of the site appeared generally similar with the previous photograph.</p> <p>Off-site: The surrounds appeared generally similar to the previous photograph. Additional sheds/structures had been constructed approximately 150m to the north/north-west of the site, beyond Balaclava Road.</p>
1965	<p>On-site: Several large connected buildings had been constructed in the north of the site (the cleared portion in the previous photographs). The orchard along the northern boundary had been replaced by several smaller buildings forming part of Willandra Village (retirement living). Eucalyptus Street and Bluegum Road had been constructed. The creek in the south/south-east of the site (Kikkiya Creek) had been filled. It is possible that a culvert was installed to channel water along the creek alignment at this time.</p> <p>Off-site: The surrounding features appeared generally similar to the previous photograph. Several buildings associated with Morling College were visible to the east of the site.</p>
1970	On-site: Willandra Village had been extended and included several additional buildings constructed along the northern boundary and within the east of the site. Construction work was visible in the south of the site. The house within the south-eastern corner of the site remained. The west/south-western corner of the site appeared generally similar to the previous photograph.

Year	Details
	<p>Off-site: Most of the orchards and sheds/structures to the north-east, north-west and south-west (beyond Epping Road) had been cleared. Several large carparks and buildings associated with Macquarie University campus had been constructed to the north of the site. Low-density residential housing had been constructed to the south/south-west of the site, beyond Epping Road. A pub/hotel (The Ranch) had been constructed to the south of the site, at the intersection of Herring Road and Epping Road. The building appeared to be largely consistent with the current (2022) configuration.</p>
1978	<p>On-site: The construction in the south of the site had been completed and included several large buildings, including Cooina Court. Pathways and hardstands were visible throughout the site.</p> <p>Off-site: Additional development of the Macquarie University campus was visible to the north of the site and included additional carparking areas and large buildings. A residential town-house complex had been constructed adjacent to the south-eastern boundary of the site. Additional residential housing (low-density) had been constructed to the west and south-west of the site (beyond Epping Road). A large building consistent with the current (2022) Woolworths supermarket and carpark had been constructed to the west of the site, at the intersection of Epping Road and Balaclava Road.</p>
1982 1986 1991	<p>The site and surrounding features appeared generally similar to the previous photograph. The house in the west/south-western corner had been demolished. Additional residential developments to the south of the site, and additions to the Macquarie University campus were visible. By the 1991 photograph, a small building had been constructed in the west of the site, and a large complex building (possible apartment complex or hotel) had been constructed to the south-east of the site at the intersection of Herring Road and Epping Road.</p>
1994	<p>On-site: The Dorothy Henderson Lodge and associated car park were visible in the west/south-western section of site.</p> <p>Off-site: Several multi-storey carparks associated with the Macquarie University campus had been constructed to the north-east of the site.</p>
2000 2005	<p>The site and surrounding features appeared generally similar to the previous photograph. A service station had been constructed adjacent to the supermarket building to the west of the site, and a children's day care centre (Gumnut Cottage) was visible to the north-east of the site.</p>
2011	<p>On-site: The large buildings in the north/north-western section of the site had been replaced with a large building (the Shalom Centre). The site appeared to be in the current (2022) configuration.</p> <p>Off-site: Additional large buildings associated with the Macquarie University were visible to the north-east of site.</p>
2016 2022	<p>The site and surrounds appeared generally similar to the previous photographs. A complex of residential apartments had been constructed to the south-east of the site, and another residential apartment building was under construction adjacent to the site (159-161 Epping Road). A few of the multi-storey carparks to the north-east of the site had been replaced by large buildings associated with the university.</p>

4.2 Review of Historical Land Title Records

Historical land title records were reviewed for the investigation. The record search was undertaken by InfoTrack. Copies of the title records are attached in the appendices. The title records indicate the following:

- The site was privately owned by various individuals from as early as 1905. The individual owners had listed occupations such as orchardist, electric welder, investor, carpenter, miner and whip manufacturer;
- Substation premises were leased to The Sydney County Council in 1987 for electricity purposes and there was no evidence that this lease was surrendered;
- Part of the site was purchased by The Housing Commission of New South Wales in 1946;
- Parts of the site began to be purchased by NSW Baptist Homes Trust (now known as BaptistCare NSW & ACT) in 1959. By 1978, this entity acquired the entirety of the site and remains as the current site owner.

The historical land title records identified that the site was owned by orchardists between at least 1905 and 1968. The site ownership aligns with the historical aerial imagery for this period which included orchards. Agricultural/horticultural activities are listed in Table 1 of the Managing Land Contamination, Planning Guidelines SEPP55-Remediation of Land (1998)⁷ as a potentially contaminating activity.

4.3 Review of Council Records

Council records were sourced under an informal access to information request and were reviewed for the investigation. The council records indicate the following:

- An application was approved in 2009 (LDA2009/0374) for two non-illuminated pylon signs;
- An application to demolish an existing dwelling was lodged in 2012 (CDP2012/0196);
- An application was approved in 2013 (LDA2012/0486) for alterations and additions to the existing aged care facility including fire safety upgrade works, new porte-cochere, driveway amendments, new office area for staff and landscaping;
- An application was approved in 2013 (LDA2013/0331) for alterations and additions to combine units 405 and 406 within Willandra Retirement Village;
- An application was approved in 2014 (CDP2014/0544) for retrofitting of Fire Sprinkler Services to existing buildings;
- An application to erect four new carports over ten existing car spaces was approved in 2014 (LDA2014/0052);
- An application was approved in 2018 (LDA2018/0245) for alterations and additions to an existing kitchen;
- An application was approved in 2018 (LDA2018/0382) for a free-standing pylon sign (non-illuminated); and
- In 2018, an application was lodged for a concept Master Plan comprising of multiple buildings, road and open space.

⁷ Managing land Contamination, Planning Guidelines SEPP55 – Remediation of Land (1998) (referred to as the SEPP 55 Planning Guidelines)

The council records indicated various development applications had been submitted for the aged care facility including alterations and additions to combine units, fire safety upgrading works, driveway amendments, addition of new carports and non-illuminated pylon signs and alterations and additions to existing kitchen.

4.4 SafeWork NSW Records

SafeWork NSW records in relation to the registered storage of dangerous goods were not reviewed for the investigation. This has been identified as a data gap and is discussed further in Section 10.4.

4.5 NSW EPA and Department of Defence Records

A review of the NSW EPA and Department of Defence databases was undertaken for the PSI. Information from the following databases were sourced from the Lotsearch report:

- 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)⁸;
- Licensed activities under the Protection of the Environment Operations Act (1997)⁹;
- Sites being investigated under the NSW EPA per-and polyfluoroalkyl substances (PFAS) investigation program;
- Sites being investigated by the Department of Defence for PFAS contamination; and
- Sites being managed by the Department of Defence for PFAS contamination.

The search included the site and surrounding areas in the report buffer. A summary of the information is provided below:

Table 4-2: NSW EPA and Department of Defence Records

Records	On-site	Off-site
Records under Section 58 of the CLM Act 1997	None	None
Records under the Duty to Report Contamination under Section 60 of the CLM Act 1997	None	There was one property listed in the report buffer. This property was a service station located approximately 365m to the north-west of the site. Based on the surrounding topography and gully features, the service station was considered to be cross-gradient of the site. Due to the distance and cross-gradient location, the property is not considered to represent an off-site source of contamination.
Licences under the POEO Act 1997	None	Current and historical licences were identified for several properties within the report buffer, including the application of herbicides and pesticides along waterways, railway systems activities and pharmaceutical and veterinary products production, and hazardous waste generation or storage. Based on the types of activities undertaken and/or their location relative to the site, these activities are considered unlikely to pose a contamination risk to the site or represent an off-site source of contamination.

⁸ 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)

⁹ Protection of the Environment Operations Act 1997 (NSW) (referred to as POEO Act 1997)

Records	On-site	Off-site
Records relating to the NSW EPA PFAS Investigation Program	None	None
Records relating to the Department of Defence PFAS management and investigation programs	None	None

4.6 Historical Business Directory and Additional Lotsearch Information

Historical business records and other relevant information were reviewed for the investigation. The information was sourced from the Lotsearch report and summarised in the following table:

Table 4-3: Historical Business Directory and other Records

Records	On-site	Off-site
Historical dry cleaners, motor garages and service stations	None	<p>There were two listed in the report buffer between 1953-1970. These properties were service stations and were mapped to Epping Road, however the exact locations were not identified.</p> <p>Considering multiple lines of evidence (aerial photographs, local topography etc), JKE is of the opinion that these properties do not represent an off-site source of contamination.</p>
Other historical businesses that could represent potential sources of contamination	None	<p>There were several listed in the report buffer between 1950-1990, including motor panel beaters/painters, poultry farmers/hatcheries and nurseries. JKE note that the records indicate that the panel beaters/painters were co-located with the service stations listed above and therefore are not considered to represent an off-site source of contamination.</p> <p>A hatchery was listed approximately 100m to the west/north-west and up-gradient of the site. This was not considered to be a potential off-site source of contamination.</p>
National waste management site database	None	None
National liquid fuel facilities	None	<p>There were two listed in the report buffer, being service stations mapped approximately 40m to the west of the site, and approximately 360m to the north-west of the site.</p> <p>JKE note that the service station mapped to the west of the site was located on the western side of the property, and the canopy of the service station (and presumed tank area) was approximately 150m to the west of the site.</p> <p>Due to the distances from the site, the service stations are not considered to represent off-site sources of contamination.</p>

Records	On-site	Off-site
Mapped heritage items	None	Various heritage items were mapped in the report buffer. These are not considered to have any relevance in the context of the PSI objectives.
Mapped ecological constraints	None	Various ecological items were mapped in the report buffer. These are not considered to have any relevance in the context of the PSI objectives.
Mapped naturally occurring asbestos	None	None

4.7 Summary of Site History Information

A time line summary of the historical land uses and activities is presented in the following table. The information presented in the table is based on a weight of evidence assessment of the site history documentation and observations made by JKE.

Table 4-4: Summary of Historical Land Uses / Activities

Year(s)	On-site - Potential Land Use / Activities	Off-site - Potential Land Use / Activities
1930-1960s	<p>Agricultural (orchards/market gardens).</p> <p>1961: possible filling occurred for the construction of the residential care facility in the north-western portion of the site.</p> <p>1965: Kikkiya Creek was filled.</p>	Agricultural (orchards, poultry farming).
1960s - Current	Residential care facility and retirement living.	Residential and commercial.

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. JKE has 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 10.

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
<p><u>Fill material</u> – The site has been historically filled to achieve the existing levels. The fill may have been imported from various sources and could be contaminated.</p> <p>The previous JKG investigations at the site identified shallow topsoil and fill to depths of approximately 0.2-0.8mBGL. Deeper localised filling may be present where the creek was infilled.</p>	<p>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.</p>
<p><u>Historical agricultural use</u> – The site history information identified that the site has been used for agricultural (orchard) purposes. This could have resulted in contamination across the site via use of machinery, application of pesticides and building/ demolition of various structures. Irrigation pipes made from asbestos cement may also be associated with this AEC.</p>	<p>Heavy metals, TRH, PAHs, OCPs, PCBs, asbestos and Per- and Polyfluoroalkyl Substances (PFAS).</p> <p>JKE note that OCPs only became commercially available in the 1940s. Prior to this time pesticides were predominantly heavy metal compounds.</p>
<p><u>Use of pesticides</u> – Pesticides may have been used beneath the buildings and/or around the site.</p>	<p>Heavy metals and OCPs.</p>
<p><u>Hazardous Building Material</u> – 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.</p>	<p>Asbestos, lead and PCBs.</p>
<p><u>Flammable liquid storage cabinet and chemical storage shed</u> – Observed in the western section of the site during the site inspection (see Figure 2). The cabinet/shed were not accessible and the contents are unknown. The initial visual indicators suggested there was not likely to be impacts from contamination, however, as the contents were not inspected this has been listed as an AEC in the CSM.</p>	<p>To be confirmed.</p>

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

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

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

Table 5-2: CSM

Potential mechanism for contamination	<p>Potential mechanisms for contamination include:</p> <ul style="list-style-type: none"> • Fill material – importation of impacted material, ‘top-down’ impacts (e.g. placement of fill, leaching from surficial material etc), or sub-surface release (e.g. impacts from buried material); • Historical agricultural use – ‘top-down’ and spills (e.g. application of pesticides, refuelling or repairing machinery, and other activities at the ground surface level); • Use of pesticides – ‘top-down’ and spills (e.g. during normal use, application and/or improper storage); • Hazardous building materials – ‘top-down’ (e.g. demolition resulting in surficial impacts in unpaved areas); and • Flammable liquid storage cabinet and chemical storage shed – ‘top-down’ and spills.
Affected media	<p>Soil and groundwater have been identified as the potentially affected media. The potential for groundwater impacts is considered to be relatively low and would primarily be expected to occur due to significant contamination in soil.</p>
Receptor identification	<p>Human receptors include site occupants/users (including adults and children), construction workers and intrusive maintenance workers. Off-site human receptors include adjacent land users, groundwater users and recreational water users in down-gradient water bodies.</p> <p>Ecological receptors include terrestrial organisms and plants within unpaved areas (including the proposed landscaped areas), and freshwater ecology in Kikkiya Creek.</p>
Potential exposure pathways	<p>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/direct contact and ingestion.</p> <p>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. Exposure to groundwater may also occur during construction, in a drained basement scenario, and/or during irrigation. We note that historical irrigation bores (register in the mid-1900s) are registered on-site and it is unclear whether these are still in use. Groundwater use is not proposed as far as we are currently aware.</p>

	Exposure to groundwater may occur in Kikkiya Creek through direct migration. Groundwater may also enter the creek via the stormwater system (which is expected to discharge into the creek) in a drained basement scenario.
Potential exposure mechanisms	<p>The following have been identified as potential exposure mechanisms for site contamination:</p> <ul style="list-style-type: none"> • 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; • Exposure to groundwater during construction activities, or in a drained basement scenario. Although current use of groundwater/bore water via the registered groundwater bores on site has not been confirmed, contact with irrigation water is also a potential exposure mechanism; and • Migration of groundwater off-site and into nearby water bodies, including aquatic ecosystems and those being used for recreation.
Presence of preferential pathways for contaminant movement	Major services were not identified that would be expected to act as preferential pathways for contamination migration. The suspected culvert (including the associated backfill) in the former alignment of Kikkiya Creek may act as a preferential pathway for contaminant migration. Preferential pathways are to be considered further if contamination is identified.

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 1.1. The DQOs were prepared with reference to the process outlined in Schedule B2 of NEPM (2013). The seven-step DQO approach for this project is outlined in the following sub-sections.

The DQO process is validated in part by the Data Quality Assurance/Quality Control (QA/QC) Evaluation. The Data (QA/QC) Evaluation is summarised in Section 8.1 and the detailed evaluation is provided in the appendices.

6.1.1 Step 1 - State the Problem

The CSM identified potential sources of contamination/AEC at the site that may pose a risk to human health and the environment. Investigation data is required to assess the contamination status of the site, assess the risks posed by the contaminants in the context of the proposed development/intended land use, and assess whether remediation is required. This information will be considered by the consent authority in exercising its planning functions in relation to the development proposal.

A preliminary waste classification is required prior to off-site disposal of excavated soil and/or bedrock.

6.1.2 Step 2 - Identify the Decisions of the Study

The objectives of the investigation are outlined in Section 1.1. 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:

- Site information, including site observations and site history documentation;
- Sampling of potentially affected media, including soil and fibre cement fragments (FCF). Sampling of groundwater was outside the scope of the preliminary investigation;
- Observations of sub-surface variables such as soil type, photo-ionisation detector (PID) concentrations, and odours and staining,
- Laboratory analysis of soils and fibre cement 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 was confined to the site boundaries as shown in Figure 2 and was limited vertically to a maximum borehole depth of approximately 6mBGL (spatial boundary). The sampling was completed between 9 and 14 March 2022 (temporal boundary). The assessment of potential risk to adjacent land users has been made based on data collected within the site boundary.

Sampling and analysis of groundwater was outside the scope of the PSI.

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

6.1.5.1 Tier 1 Screening Criteria

The laboratory data will be assessed against relevant Tier 1 screening criteria (referred to as SAC), as outlined in Section 7. Exceedances of the SAC do not necessarily indicate a requirement for remediation or a risk to human health and/or the environment. Exceedances are considered in the context of the CSM and valid SPR-linkages.

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

6.1.5.2 Field and Laboratory QA/QC

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

6.1.5.3 Appropriateness of Practical Quantitation Limits (PQLs)

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

6.1.6 Step 6 – Specify Limits on Decision Errors

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

Decision errors can be controlled through the use of hypothesis testing. The test can be used to show either that the baseline condition is false or that there is insufficient evidence to indicate that the baseline condition is false. The null hypothesis is an assumption that is assumed to be true in the absence of contrary evidence. For this investigation, 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 investigation.

Quantitative limits on decision errors were not established as the sample plan was not probabilistic.

Data Quality Indicators (DQI) for field and laboratory QA/QC samples are defined in the QA/QC Data Evaluation in the appendices. An assessment of the DQI's was made in relation to precision, accuracy, representativeness, completeness and comparability.

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 investigation objectives. Adjustment of the investigation 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 investigation is outlined in the table below:

Table 6-1: Soil Sampling Plan and Methodology

Aspect	Input
Sampling Density	<p>Contamination samples for this PSI were collected from 14 locations (BH601 to BH614 inclusive) as shown on Figure 2 attached in the appendices. Based on the site area (63,871m²), this number of locations corresponded to a sampling density of approximately one sample per 4,560m². The sampling plan was not designed to meet the minimum sampling density for hotspot identification, as outlined in the NSW EPA Contaminated Sites Sampling Design Guidelines (1995)¹⁰.</p> <p>JKE note that since the time of soil sampling, the NSW EPA released the updated sampling guidelines titled NSW EPA Sampling design part 1 – application (August 2022)¹¹. The recommended sampling density in the updated guidelines remains unchanged for the site area.</p>

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

¹¹ NSW EPA, (2022), *Sampling design part 1 – application, Contaminated Land Guidelines* (referred to as EPA Sampling design guidelines 2022)

Aspect	Input
Sampling Plan	<p>The sampling locations were placed on a judgemental sampling plan and were generally determined by the concurrent JKG geotechnical investigation. The locations were considered to provide general site coverage. BH613 and BH614 were positioned to provide spatial coverage following consideration of the distribution of BH601 – BH612 inclusive. This sampling plan was considered suitable to make a preliminary assessment of potential widespread risks associated with the AEC and CoPC identified in the CSM, and assess whether further investigation is warranted.</p> <p>We note that the attached Figures 2 and 3 present additional sampling locations (500 series boreholes/test pits) in the proposed vertical village footprint. This data has not been considered under the scope of this PSI.</p>
Set-out and Sampling Equipment	<p>Sampling locations were set out using a differential GPS unit (with an accuracy of approximately $\pm 50\text{mm}$), or by taped measurements from existing site features. In-situ sampling locations were checked for underground services by an external contractor prior to sampling.</p> <p>Samples were collected using a drill rig equipped with spiral flight augers (100mm diameter) and a hand auger. Soil samples were obtained from a Standard Penetration Test (SPT) split-spoon sampler, and/or directly from the auger.</p>
Sample Collection and Field QA/QC	<p>Soil samples were obtained between 9 and 14 March 2022 in accordance with our standard field procedures. 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.</p> <p>Contamination samples (except for PFAS) were placed in glass jars with plastic caps and Teflon seals with minimal headspace. Samples for PFAS analysis were placed in laboratory provided plastic jars with plastic caps (no Teflon). Samples for asbestos analysis were placed in zip-lock plastic bags.</p> <p>During sampling, soil at selected depths was split into primary and duplicate samples for field QA/QC analysis. The field splitting procedure included alternately filling the sampling containers to obtain a representative split sample.</p>
Field Screening	<p>A portable Photo-ionisation Detector (PID) fitted with a 10.6mV lamp was used to screen the samples for the presence of volatile organic compounds (VOCs). PID screening for VOCs was undertaken on soil samples using the soil sample headspace method. VOC data was obtained from partly filled zip-lock plastic bags following equilibration of the headspace gases. PID calibration records are maintained on file by JKE.</p> <p>The field screening for asbestos quantification included the following:</p> <ul style="list-style-type: none"> • A representative bulk sample (approximately 10L samples to the extent achievable based on sample return, or smaller volume samples where obtaining a 10L sample was not practicable) was collected from fill at approximately 1m intervals, or from each distinct fill profile. The bulk sample intervals are shown on the attached borehole logs; • Each bulk sample was weighed using an electronic scale; • Each bulk sample was passed through a sieve with a 7.1mm aperture and inspected for the presence of fibre cement. Any soil clumps/nodules were disaggregated; and

Aspect	Input
	<ul style="list-style-type: none"> If observed, any fragments of fibre cement in the bulk 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. <p>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 JKE. The scale used to weigh the bulk 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.</p>
Decontamination and Sample Preservation	<p>Sampling personnel used disposable nitrile gloves during sampling activities. Re-usable sampling equipment was decontaminated potable water. Detergents (such as Decon90) were not utilised during the decontamination process as they may result in interference during PFAS analysis.</p> <p>Soil samples were preserved by immediate storage in an insulated sample container with ice. On completion of the fieldwork, the samples were stored temporarily in fridges in the JKE warehouse before being delivered in the insulated sample container to a NATA registered laboratory for analysis under standard chain of custody (COC) procedures.</p>

6.3 Analytical Schedule

The soil analysis typically targeted the fill soils and the first contact of natural soils. The shallow fill soil samples at each location were analysed for the CoPC relevant for fill soils. Deeper fill and natural soil samples were selected for analysis of heavy metals, BTEX/TRH and PAH, based on the encountered site conditions and to provide spatial coverage of the site. Selected fill soil samples were analysed for PFAS to provide spatial coverage of the site.

Selected fill soil samples were analysed for cation exchange capacity (CEC) following a staged approach. The fill soil samples were selected based on the detected concentrations of heavy metals to establish soil-specific criteria for ecological assessment.

6.3.1 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 6-2: 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)	290820, 290820-A, 291372, 291372-A



Samples	Laboratory	Report Reference
Inter-laboratory duplicates	EnviroLab Services Pty Ltd VIC, NATA Accreditation Number – 2901 (ISO/IEC 17025 compliance)	30499

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.

Soil data were compared to relevant Tier 1 screening criteria in accordance with NEPM (2013). Conservative criteria were selected to account for the sensitive land users (aged persons, children) and to allow for future flexibility of the conceptual designs which will include a variety of uses. The SAC are outlined below.

7.1 Human Health

- Health Investigation Levels (HILs) for a 'residential with accessible soils' exposure scenario (HIL-A);
- Health Screening Levels (HSLs) for a 'low-high density residential' exposure scenario (HSL-A & HSL-B). HSLs were calculated based on conservative assumptions including a 'sand' type and a depth interval of 0m to 1m. The 'sand' type soil was selected to account for the variability of pore space within fill soils;
- HIL-A criteria were adopted for PFAS assessment based on Table 2 in The PFAS National Environmental Management Plan (NEMP) Version 2.0 2020¹²;
- HSLs 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)¹³; and
- Asbestos was assessed against the HSL-A criteria as a conservative screening, although given the preliminary nature of the investigation, the results have also been considered in terms of whether asbestos is present/detected or absent/not detected. A summary of the asbestos HSL criteria is provided in the table below:

Table 7-1: Details for Asbestos SAC

Guideline	Applicability
Asbestos in Soil	<p>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 the Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2021)¹⁴. The SAC include the following:</p> <ul style="list-style-type: none"> • No visible asbestos at the surface/in the top 10cm of soil; • <0.01% w/w bonded asbestos containing material (ACM) in soil; and • <0.001% w/w asbestos fines/fibrous asbestos (AF/FA) in soil. <p>Concentrations for bonded ACM concentrations in soil are based on the following equation which is presented in Schedule B1 of NEPM (2013):</p> $\% \text{ w/w asbestos in soil} = \frac{\% \text{ asbestos content} \times \text{bonded ACM (kg)}}{\text{Soil volume (L)} \times \text{soil density (kg/L)}}$

¹² Heads of EPAs Australia and New Zealand (HEPA). PFAS National Environmental Management Plan Version 2.0 - January 2020 (referred to as NEMP 2020)

¹³ 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

¹⁴ Western Australian (WA) Department of Health (DoH), (2021). Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia. (referred to as WA DoH 2021)

Guideline	Applicability
	<p>However, we are of the opinion that the actual soil volume in a 10L bucket varies considerably due to the presence of voids, particularly when assessing cohesive soils. Therefore, each bucket sample was weighed using electronic scales and the above equation was adjusted as follows (we note that the units have also converted to grams):</p> $\% \text{ w/w asbestos in soil} = \frac{\% \text{ asbestos content} \times \text{bonded ACM (g)}}{\text{Soil weight (g)}}$

7.2 Environment (Ecological – terrestrial ecosystems)

- Ecological Investigation Levels (EILs) and Ecological Screening Levels (ESLs) for an 'urban residential and public open space' (URPOS) exposure scenario. These have only been applied to the top 2m of soil as outlined in NEPM (2013). The criterion for benzo(a)pyrene has been increased from the value presented in NEPM (2013) based on the Canadian Soil Quality Guidelines¹⁵;
- ESLs were adopted based on the soil type;
- The ecological (indirect exposure) guidelines for soil were adopted for PFAS assessment based on Table 3 in NEMP 2020; and
- EILs for selected metals were calculated based on the most conservative added contaminant limit (ACL) values presented in Schedule B(1) of NEPM (2013) and published ambient background concentration (ABC) values presented in the document titled Trace Element Concentrations in Soils from Rural and Urban Areas of Australia (1995)¹⁶ as an initial screening; and
- Based on the initial screening results, the EILs for nickel in silty gravelly sand and silty gravelly clay fill soil in the vicinity of BH601 and BH602 was adjusted using site specific soil parameters for cation exchange capacity (CEC). The sample collected from BH601 (0.05-0.15m) and BH602 (0.07-0.17m) were both analysed for CEC (15cmolc/kg and 24cmolc/kg respectively), and these data were used to select the ACL values presented in Schedule B(1) of NEPM (2013). This method is considered to be adequate for the Tier 1 screening.

7.3 Management Limits for Petroleum Hydrocarbons

Management limits for petroleum hydrocarbons (as presented in Schedule B1 of NEPM 2013) were considered.

7.4 Waste Classification

Data for the waste classification assessment were assessed in accordance with the Waste Classification Guidelines, Part 1: Classifying Waste (2014)¹⁷ as outlined in the following table:

¹⁵ Canadian Council of Ministers of the Environment, (1999). *Canadian soil quality guidelines for the protection of environmental and human health: Benzo(a)Pyrene (1997)* (referred to as the Canadian Soil Quality Guidelines)

¹⁶ 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

¹⁷ NSW EPA, (2014). *Waste Classification Guidelines, Part 1: Classifying Waste*. (referred to as Waste Classification Guidelines 2014)

Table 7-2: Waste Categories

Category	Description
General Solid Waste (non-putrescible)	<ul style="list-style-type: none"> If Specific Contaminant Concentration (SCC) \leq Contaminant Threshold (CT1) then Toxicity Characteristics Leaching Procedure (TCLP) not needed to classify the soil as general solid waste; and If TCLP \leq TCLP1 and SCC \leq SCC1 then treat as general solid waste.
Restricted Solid Waste (non-putrescible)	<ul style="list-style-type: none"> If SCC \leq CT2 then TCLP not needed to classify the soil as restricted solid waste; and If TCLP \leq TCLP2 and SCC \leq SCC2 then treat as restricted solid waste.
Hazardous Waste	<ul style="list-style-type: none"> If SCC $>$ CT2 then TCLP not needed to classify the soil as hazardous waste; and If TCLP $>$ TCLP2 and/or SCC $>$ SCC2 then treat as hazardous waste.
Virgin Excavated Natural Material (VENM)	<p>Natural material (such as clay, gravel, sand, soil or rock fines) that meet the following:</p> <ul style="list-style-type: none"> That has been excavated or quarried from areas that are not contaminated with manufactured chemicals, or with process residues, as a result of industrial, commercial mining or agricultural activities; That does not contain sulfidic ores or other waste; and Includes excavated natural material that meets such criteria for virgin excavated natural material as may be approved from time to time by a notice published in the NSW Government Gazette.

The PFAS data were assessed against the NSW EPA Addendum to the Waste Classification Guidelines (2014) – Part 1: classifying waste¹⁸.

¹⁸ NSW EPA, (2016). *Addendum to the Waste Classification Guidelines (2014) – Part 1: classifying waste*

8 RESULTS

8.1 Summary of Data (QA/QC) Evaluation

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

8.2 Subsurface Conditions

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

Table 8-1: Summary of Subsurface Conditions

Profile	Description
Pavement	Asphaltic Concrete (AC) pavement was encountered at the surface in BH601, BH602 and BH612 and ranged in thickness from approximately 50mm to 70mm. Concrete pavement was encountered at the surface in BH603 and BH606 and ranged in thickness from approximately 170mm to 250mm.
Fill	<p>Fill was encountered at the surface or beneath the pavement in all boreholes and extended to depths of approximately 0.2mBGL to 1.1mBGL.</p> <p>The fill typically comprised silty clay and silty sand with varying proportions of sand and gravel. Inclusions noted in the fill included ash, slag, igneous, sandstone and ironstone gravel, FCF (BH605 and BH606) and root fibres.</p> <p>No stained or odorous soils were encountered during the investigation.</p>
Natural Soil	Residual silty and/or sandy clay and silty clayey sand was encountered beneath the fill in all boreholes. BH613 and BH614 were terminated in residual silty clay at depths of approximately 0.85mBGL to 0.9mBGL. No stained or odorous soils were encountered during the investigation.
Bedrock	Siltstone and sandstone bedrock was encountered beneath the residual soil in all boreholes (with the exception of BH613 and BH614) at depths of approximately 0.35mBGL to 2.4mBGL.
Groundwater	Groundwater seepage was encountered in BH602, BH605 and BH608 to BH613 inclusive at depths of approximately 0.3mBGL (BH611) to 5mBGL (BH610). On completion of drilling, the SWLs measured in BH605, BH610 and BH612 were approximately 1.5mBGL, 1.3mBGL and 0.07mBGL respectively. All other boreholes were dry on the completion of drilling.

8.3 Field Screening

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

Table 8-2: Summary of Field Screening

Aspect	Details
PID Screening of Soil Samples for VOCs	PID soil sample headspace readings are presented in attached report tables and the COC documents attached in the appendices. The results ranged from 0.1ppm to 804ppm equivalent isobutylene (highest result was in BH611 0.3-0.5m). These results indicate PID detectable VOCs were present in some samples. Samples with elevated PID readings were analysed for TRH and BTEX.

Aspect	Details
Bulk Screening for Asbestos	The bulk field screening results are summarised in the attached report Table S5. ACM was encountered at concentrations exceeding the SAC in two bulk screening samples collected from BH604 and BH605. The presence of ACM in the initial 100mm from the surface is also considered an exceedance of the SAC.
Groundwater Depth & Flow	Groundwater monitoring wells were installed in BH601, BH605 and BH610 for the geotechnical investigation. The SWLs were measured by JKE on 17 March 2022 and ranged from approximately 1mBGL (BH605) to 5.5mBGL (BH601). BH610 was recorded as dry. The surface elevations of the wells were surveyed using the differential GPS unit, to an accuracy of approximately 50mm. Groundwater RLs calculated on these measurements ranged from approximately 61mAHD to 76mAHD. Based on these elevations, the groundwater was inferred to flow towards the south-east. The groundwater flow direction in the south-eastern section of the site is expected to be influenced by the former creek/culvert alignment.

8.4 Soil Laboratory Results

The soil laboratory results were assessed against the SAC presented in Section 7. Individual SAC are shown in the report tables attached in the appendices. A summary of the results 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	N	Max. (mg/kg)	N> Human Health SAC	N> Ecological SAC	Comments
Arsenic	21	12	0	0	-
Cadmium	21	0.4	0	NSL	-
Chromium (total)	21	74	0	0	-
Copper	21	45	0	0	-
Lead	21	76	0	0	-
Mercury	21	0.3	0	NSL	-
Nickel	21	100	0	0	-
Zinc	21	180	0	0	-
Total PAHs	21	0.5	0	NSL	-
Benzo(a)pyrene	21	0.07	NSL	0	-
Carcinogenic PAHs (as BaP TEQ)	21	<PQL	0	NSL	-

Analyte	N	Max. (mg/kg)	N> Human Health SAC	N> Ecological SAC	Comments
Naphthalene	21	<PQL	0	NSL	-
DDT+DDE+DDD	20	<PQL	0	NSL	-
DDT	20	<PQL	NSL	0	-
Aldrin and dieldrin	20	0.2	0	NSL	-
Chlordane	20	4.2	0	NSL	-
Heptachlor	20	<PQL	0	NSL	-
Chlorpyrifos (OPP)	14	<PQL	0	NSL	-
PCBs	14	<PQL	0	NSL	-
TRH F1	21	95	2	0	The TRH (F1) concentration exceeded the human health SAC (45mg/kg) in one fill soil and one natural soil sample collected from BH611 (0-0.1m and 0.3-0.5m respectively).
TRH F2	21	400	2	2	The TRH (F2) concentration exceeded the human health SAC (110mg/kg) and ecological SAC (120mg/kg) in one fill soil sample collected from BH613 (0-0.1m) and one natural soil sample collected from BH611 (0.3-0.5m).
TRH F3	21	1,800	0	3	The TRH F3 concentration exceeded the ecological SAC (300mg/kg) in two fill soil samples collected from BH611 (0-0.1m) and BH613 (0-0.1m), and one natural soil sample collected from BH611 (0.3-0.5m).
TRH F4	21	640	0	0	-
Benzene	21	<PQL	0	0	-
Toluene	21	<PQL	0	0	-
Ethylbenzene	21	<PQL	0	0	-
Xylenes	21	<PQL	0	0	-
PFOS	7	1.9µg/kg	NSL	0	We note that all PFAS results were also below the equivalent criteria being considered in the revised NEMP (3.0)

Analyte	N	Max. (mg/kg)	N> Human Health SAC	N> Ecological SAC	Comments
					currently issued in draft for public consultation.
PFOS + PFHxS	7	1.9µg/kg	0	NSL	-
PFOA	7	0.4µg/kg	0	0	-
Asbestos (in soil) (%w/w)	10	ACM AF/FA	0	NA	Asbestos was not identified within the soil samples analysed by the laboratory, including within the soil samples analysed from the fill profiles where FCF/ACM was found in the bulk samples.
Asbestos in fibre cement	2	Detected	2	NSL	Two FCF were detected during the bulk screen analysis, collected from BH604 (0-0.1m) and BH605 (0-0.1m). The laboratory confirmed the FCF contained asbestos. As the FCF were identified in the surficial (0-100mm) soils, the presence is considered an exceedance of the human health SAC.

Notes:

N: Total number (primary samples)

NSL: No set limit

NL: Not limiting

8.4.2 Waste Classification Assessment

The laboratory results were assessed against the criteria presented in Section 7.4. The results are presented in the report tables attached in the appendices. A summary of the results is presented in the following table:

Table 8-4: Summary of Soil Laboratory Results Compared to CT and SCC Criteria

Analyte	N	N > CT Criteria	N > SCC Criteria	Comments
Arsenic	21	0	0	-
Cadmium	21	0	0	-
Chromium	21	0	0	-
Copper	21	NSL	NSL	-
Lead	21	0	0	-
Mercury	21	0	0	-
Nickel	21	2	0	Nickel concentrations exceeded the CT1 criterion (40mg/kg) in two fill samples collected from BH601 (0-0.1m and laboratory duplicate sample), and BH602 (0.07-0.17m).

Analyte	N	N > CT Criteria	N > SCC Criteria	Comments
				The maximum nickel concentration was 100mg/kg.
Zinc	21	NSL	NSL	-
TRH (C ₆ -C ₉)	21	0	0	-
TRH (C ₁₀ -C ₃₆)	21	0	0	
BTEX	21	0	0	-
Total PAHs	21	0	0	-
Benzo(a)pyrene	21	0	0	-
Total Endosulfans	14	0	0	-
Chloropyrifos	14	0	0	-
Total Moderately Harmful Pesticides	14	0	0	-
Total Scheduled Chemicals	14	0	0	Concentrations of total scheduled chemicals exceeded the 2mg/kg threshold outlined in the Scheduled Chemicals Wastes Chemical Control Order 2004 ¹⁹ in one fill soil sample collected from BH612 (0.07-0.17m). On this basis, the fill must be managed and disposed of in accordance with the Scheduled Chemicals CCO 2004.
PCBs	14	0	0	-
PFOS + PFHxS	7	NSL	0	-
PFOA	7	NSL	0	-
Asbestos	16	-	-	FCF was encountered during the bulk screening of fill collected from BH604 (0-0.1m) and BH605 (0-0.1m). The FCF was confirmed by the laboratory to contain asbestos. As the presence of asbestos was confirmed, the fill soil is classified as Special Waste (Asbestos).

N: Total number (primary samples)

NSL: No set limit

¹⁹ NSW EPA, (2004). *Scheduled Chemical Wastes Chemicals Control Order 2004*. (Referred to as Scheduled Chemicals CCO 2004)

Table 8-5: Summary of Soil Laboratory Results Compared to TCLP Criteria

Analyte	N	N > TCLP Criteria	Comments
Nickel	2	0	The fill samples with nickel concentrations above the CT1 criterion were analysed for TCLP lead. All TCLP Nickel results were below the TCLP1 criterion (2mg/L).
PFOS + PFHxS	6	0	The fill samples with PFOS + PFHxS concentrations above the laboratory PQL were analysed for TCLP PFOS + PFHxS. All results were below the TCLP1 criterion (0.05mg/L).
PFOA	6	0	The fill samples with PFOA concentrations above the laboratory PQL were analysed for TCLP PFOA. All results were below the TCLP1 criterion (0.5mg/L).

N: Total number (primary samples)

8.4.3 TRH Management Limits

All TRH results were below the management limits.

9 PRELIMINARY WASTE CLASSIFICATION ASSESSMENT

9.1 Preliminary Waste Classification of Fill

Based on the results of the PSI, and at the time of reporting, the fill material is assigned a preliminary classification of **General Solid Waste (non-putrescible) containing Special Waste (asbestos)**. Due to the concentrations of scheduled chemicals detected, the fill must also be managed and disposed off-site as scheduled chemical waste in accordance with the Scheduled Chemicals CCO 2004.

Further assessment is required to confirm the extent of special waste and scheduled chemical waste prior to off-site disposal. A final waste classification must also be undertaken on all waste in accordance with the NSW EPA guidelines prior to the waste leaving the site. The anticipated waste quantities should also be confirmed at that time and documented in the report.

9.2 Preliminary Classification of Natural Soil and Bedrock

Based on the results of the PSI, and at the time of reporting, the natural silty clayey sand in the vicinity of BH611 is assigned a preliminary classification of **General Solid Waste (non-putrescible)** due to the elevated concentrations of TRH. Further assessment is required to confirm the lateral and vertical extents of the TRH-impacted natural soils prior to off-site disposal. The anticipated waste quantities should also be confirmed at that time and documented in the report.

With the exception of the silty clayey sand in the vicinity of BH611, JKE is of the opinion that the natural soil and bedrock at the site will likely meet the definition of **VENM** for off-site disposal or re-use purposes. Further assessment is required to confirm this classification prior to off-site disposal of the waste. The anticipated waste quantities should also be confirmed at that time and documented in the report.

10 DISCUSSION

10.1 Contamination Sources/AEC and Potential for Site Contamination

Based on the scope of work undertaken for this investigation, JKE identified the following potential contamination sources/AEC:

- Historical filling activities at the site;
- Historical agricultural (orchards) use;
- Use of pesticides beneath the buildings and/or around the site;
- Flammable liquid storage cabinet and chemical storage shed; and
- Hazardous building materials within current and former buildings and structures at the site.

Considering the above, and based on a qualitative assessment of various lines of evidence as discussed throughout this report, JKE is of the opinion that there is a potential for site contamination. The preliminary soil data collected for the investigation is discussed further in the following sub-section, as part of the Tier 1 risk assessment.

10.2 Tier 1 Risk Assessment and Review of CSM

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

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

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

10.2.1 Soil

10.2.1.1 Asbestos

Asbestos, in the form of FCF/ACM was encountered in surficial (0-100mm) fill soils collected from BH604 and BH605. BH604 was located along the north-eastern site boundary to the east of the Shalom Centre and BH605 was located along the north-eastern site boundary, in the north-eastern section of Willandra Village (refer to the Figure 3 attached in the appendices). The source of the asbestos is considered likely to be associated with historic demolition and/or possibly historical filling activities (but more likely the former). The FCF appeared to be in reasonable to good condition (i.e. bonded/non-friable asbestos).

The site surface in the vicinity of BH604 and BH605 are currently grass/mulch covered. The site is currently occupied and the areas in the vicinity of BH604 and BH605 are accessible to the site occupants. As such, the soils in these areas may be disturbed. On this basis, a complete SPR linkage could occur, however, we consider that the presence of grass/mulch cover and the bonded/non-friable nature of the asbestos makes it unlikely that the generation of airborne asbestos fibres would occur during typical site use. Remediation will likely be required to address the potential risk. Interim measures should be undertaken to mitigate the risk to the current site occupants.

JKE recommend preparing an Asbestos Management Plan (AMP) to outline the management strategy for addressing the risks posed by asbestos.

10.2.1.2 Hydrocarbons

TRH F1 and F2 concentrations above the human health SAC were detected in the surficial fill soils in BH611 (TRH F1 only) and BH613 (TRH F2 only), and within the underlying natural silty clayey sand in BH611. Further, TRH F2 and TRH F3 concentrations above the ecological SAC were detected in the surficial fill soils in BH611 (F3 only) and BH613, and within the underlying natural silty clayey sand in BH611. TRH concentrations were not recorded above the laboratory PQL in the underlying sandstone bedrock sample collected from BH611. On this basis, the TRH impacts were likely confined to the fill and shallow residual soils and were considered unlikely to migrate to the groundwater.

BH611 was located in the south-east of the site, near a carpark for Willandra Village, and BH613 was located in the west of the site, to the south-west of the carpark for the Dorothy Henderson Lodge (refer to Figure 3 attached in the appendices). Considering multiple lines of evidence (PID readings, analytical results, the proximity to the carparks, and composition of the fill), the source of the TRH concentrations in the soils is considered likely associated with localised surficial spills/releases permeating the site surface and migrating into the underlying soils. To a lesser extent, the TRH concentrations may also be attributable to interference from non-petroleum-based hydrocarbons (i.e. organic material and polar compounds). However, further assessment is required to confirm the potential for organic interference to influence the results.

The site surface in the vicinity of BH611 and BH613 was unsealed (gardens). As the site is currently occupied and the soils are accessible, there is potential for a complete SPR linkage to exist in relation to ecological receptors. It is noted that BH611 and BH613 are located within gardens/open space and buildings/structures were not observed in the immediate vicinity of BH611 and BH613. On this basis, JKE is of the opinion that it is unlikely for TRH concentrations in soil to volatilise, migrate into and accumulate within buildings/structures to the extent that the TRH concentrations pose an unacceptable risk to human health. JKE note that with regard to on-site ecological receptors, the vegetation across the site was considered to be healthy (based on a cursory inspection). Based on the above, the potential for TRH to pose risk to receptors in the current configuration is considered to be low.

JKE note that the SAC selected for the tier 1 screening were conservative. Further assessment is required to better assess the potential risks posed by TRH in the context of the proposed future developments in the vicinity of BH611 and BH613.

10.2.1.3 Other CoPC in Soil

All remaining CoPC were below the SAC. We note that PFAS concentrations were low and in our opinion the traces of PFAS that were found were not indicative of a site with PFAS contamination sources. Traces of PFAS are commonly found in fill and surficial soils due to the widespread use of these compounds and they can also be detected due to unavoidable cross-contamination artefacts associated with sampling and laboratory analysis.

10.3 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, as discussed in Section 10.1.

Are any results above the SAC?

Yes, as discussed in Section 8.4.

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

Yes, as discussed in 10.2.

Is remediation required?

Based on the encountered ACM-impacts to surficial fill, JKE is of the opinion that remediation will likely be required. Interim measures are required to manage the risks posed by surficial ACM impacts.

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

Further investigation is required to better assess the risks associated with the AEC/potential sources of contamination identified in this report.

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

JKE is of the opinion that the site can be made suitable for the proposed developments included in the masterplan. A DSI (or DSIs) is necessary to characterise the contamination conditions and, if required, to inform the preparation of a RAP (or RAPs) for the staged development of the site. Interim measures are required to manage the risks posed by surficial ACM impacts.

JKE is of the opinion that the DSI (or DSIs) and subsequent RAP (or RAPs), if required, may be staged to support future DAs.

10.4 Data Gaps

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

Table 10-1: Data Gap Assessment

Data Gap	Assessment
SafeWork records not reviewed	At the time of reporting, the site owner's permission to search the SafeWork NSW had not been received. Given the long-term use of the site for residential aged care, there is potential for records relating to the storage of dangerous goods (including USTs) to exist. A review of the records may identify additional AEC and refine the CSM. A review of the SafeWork NSW records for the storage of dangerous goods is recommended.
Groundwater flow direction not confirmed / groundwater contaminant conditions not assessed	Based on the site history and the soil results reported, the potential for groundwater contamination to pose a risk to the receptors is considered to be low. However, the potential for exposure to groundwater should be considered in the subsequent stages based on the development details (i.e. whether basements will intercept the groundwater). Additional groundwater monitoring wells will be required and groundwater contour plans are to be prepared.
Soil sampling density below minimum guideline density	<p>Sampling was limited to approximately 20% of the minimum sampling density recommended in the EPA Sampling Design Guidelines 2022. The investigation identified fill containing asbestos (in the form of FCF), ash and slag.</p> <p>Recommendations for additional soil sampling are included in the report to address this data gap.</p>
Asbestos quantification undertaken using boreholes.	<p>Asbestos quantification was undertaken from boreholes (100mm nominal diameter). The WA DOH (2021) guidance recommends the use of a 150mm nominal diameter auger, though preferably test pits. As asbestos was identified within surficial (0-100mm) soils in two locations, and based on the preliminary nature of the investigation, JKE consider there is potential for further asbestos impacts to be encountered considering the historical land uses.</p> <p>Additional investigation is recommended to quantify the extent of asbestos impacts at the site. The additional investigation may be undertaken as a component of a DSI (or DSIs) to be prepared for the site.</p>

11 CONCLUSIONS AND RECOMMENDATIONS

The investigation included a review of historical information and soil sampling from 14 boreholes. The site has historically been used for agricultural purposes (orchards). Since the 1960s, the site has been used as a residential care facility and retirement village.

Based on the scope of work undertaken for this investigation, JKE identified the following potential contamination sources/AEC:

- Historical filling activities at the site;
- Historical agricultural (orchards) use;
- Use of pesticides beneath the buildings and/or around the site;
- Flammable liquid storage cabinet and chemical storage shed; and
- Hazardous building materials within current and former buildings and structures at the site.

Based on the findings of the investigation, JKE is of the opinion that the site can be made suitable for the developments outlined within the masterplan as described in Section 1, subject to implementing the following recommendations:

- A suitably qualified/licensed contractor is to carry out an 'emu pick' to remove any visible FCF from the areas of the site with exposed soils. A surface clearance certificate for asbestos is then to be issued by a Licensed Asbestos Assessor (LAA). This is to occur as soon as practicable;
- Prepare an AMP to outline the management strategy for addressing the risks posed by asbestos. This should be prepared by the LAA;
- Undertake a DSI (or DSIs) to better assess the risks associated with the AEC/potential sources of contamination, and to inform preparation of the RAP (or RAPs), if required. The DSI should address the data gaps identified in Section 10.4. It is noted that the masterplan includes several stages of development. The staging of the development works may require separate DSIs to be undertaken for each development stage; and
- A hazardous building materials (HAZMAT) survey should be undertaken prior to demolition of any buildings/structures. Following demolition of the existing buildings/structures, an asbestos clearance certificate should be provided.

At this stage, JKE consider that there is no requirement to notify the NSW EPA under the NSW EPA Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997 (2015)²⁰. This requirement should be reviewed at the completion of the DSI.

JKE consider that the report objectives outlined in Section 1.1 have been addressed.

²⁰ 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)

12 LIMITATIONS

The report limitations are outlined below:

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

Important Information About This Report

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

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

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

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

JKE will not accept any responsibility whatsoever for situations where one or more of the above factors have changed since completion of the investigation. If the subject site is sold, ownership of the investigation report should be transferred by JKE to the new site owners who will be informed of the conditions and limitations under which the investigation was undertaken. No person should apply an investigation 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 investigation 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 investigations 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 investigation 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.

Investigation Limitations

Although information provided by a site investigation can reduce exposure to the risk of the presence of contamination, no environmental site investigation can eliminate the risk. Even a rigorous professional investigation 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 Investigations by Design Professionals

Costly problems can occur when other design professionals develop plans based on misinterpretation of an investigation 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 Investigation 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 investigation. 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 investigation. 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.

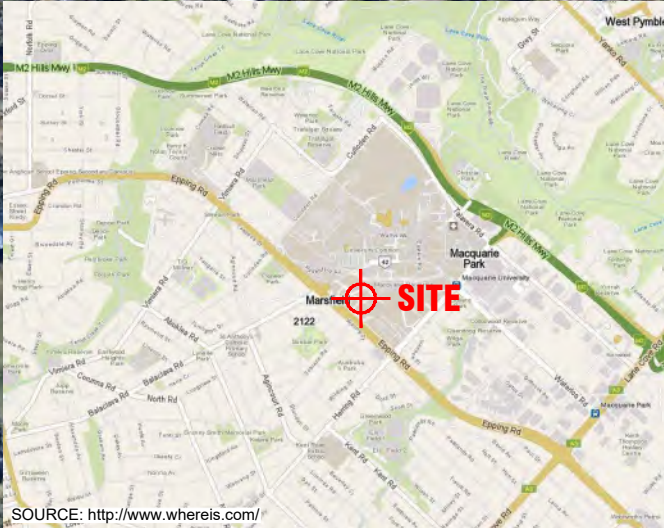
To reduce the likelihood of borehole and test pit log misinterpretation, the complete investigation should be available to persons or organisations involved in the project, such as contractors, for their use. Denial of such access and disclaiming responsibility for the accuracy of subsurface information 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 investigation 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 investigation, 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

Title:

SITE LOCATION PLAN

Location: CNR EPPING ROAD AND BALACLAVA ROAD,
MACQUARIE PARK, NSW

Project No: E32891PR

Figure No:

1

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

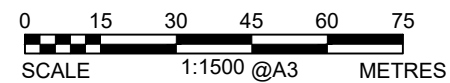
JKEnvironments



PLOT DATE: 12/10/2022 1:57:39 PM DWG FILE: K:\SC EIS JOBS\32007\SE\32891PR MACQUARIE PARK\CD\2022\E32891PR.DWG



AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM

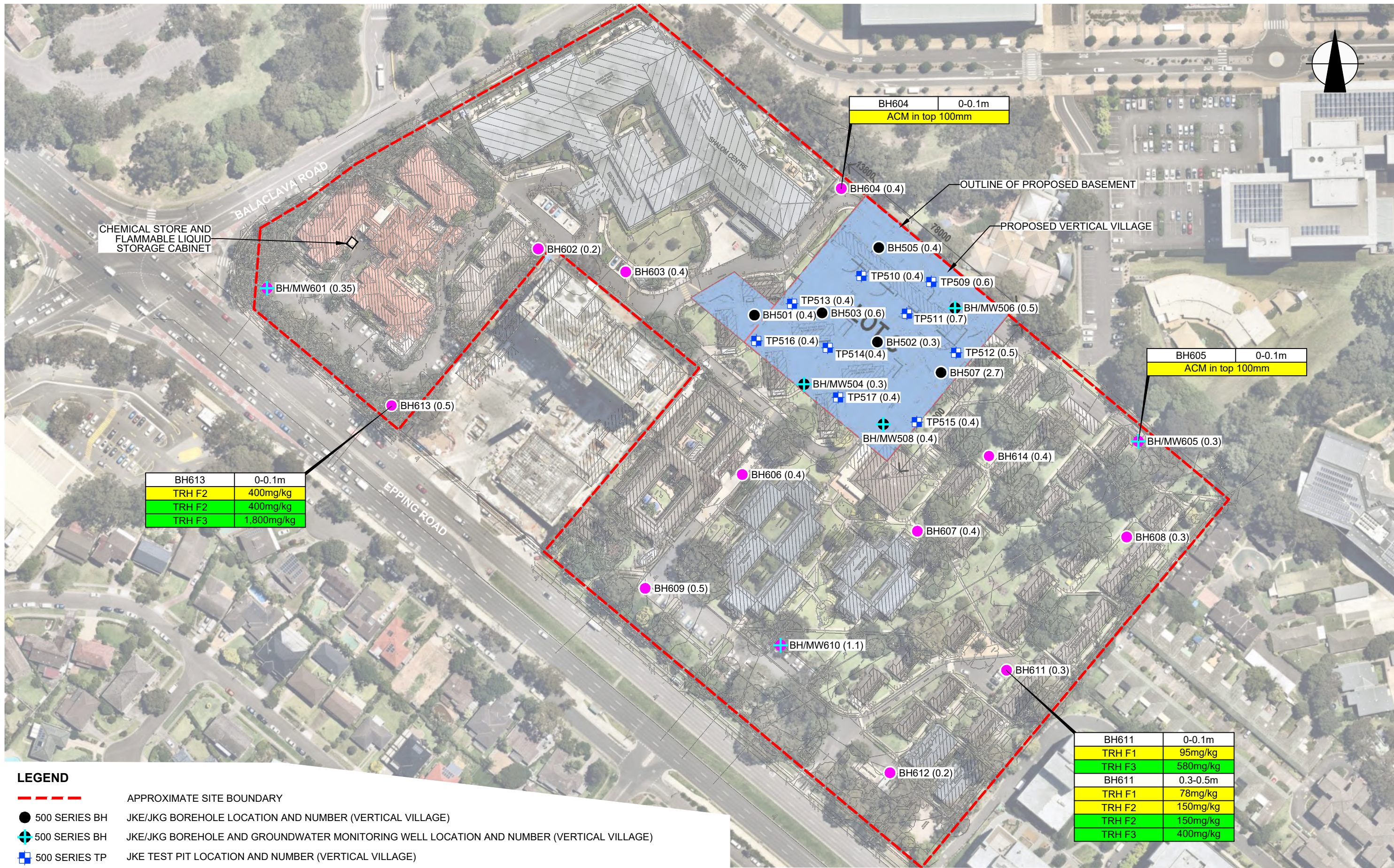


This plan should be read in conjunction with the Environmental report.

Title: SAMPLE LOCATION PLAN	
Location: CNR EPPING ROAD AND BALACLAVA ROAD, MACQUARIE PARK, NSW	
Project No: E32891PR	Figure No: 2
JKEnvironments	



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LEGEND

- APPROXIMATE SITE BOUNDARY
- 500 SERIES BH JKE/JKG BOREHOLE LOCATION AND NUMBER (VERTICAL VILLAGE)
- ⊕ 500 SERIES BH JKE/JKG BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION AND NUMBER (VERTICAL VILLAGE)
- ⊞ 500 SERIES TP JKE TEST PIT LOCATION AND NUMBER (VERTICAL VILLAGE)
- 600 SERIES BH JKE/JKG BOREHOLE LOCATION AND NUMBER
- ⊕ 600 SERIES BH JKE/JKG BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION AND NUMBER

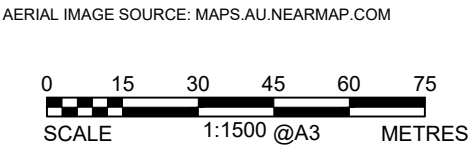
SAMPLE ID	DEPTH (metres)	SOIL/SURFACE SAMPLE EXCEEDANCE
CHEMICAL	CONCENTRATION	
		SOIL/SURFACE CONTAMINATION ABOVE SAC FOR HUMAN HEALTH RISK
		SOIL/SURFACE CONTAMINATION ABOVE SAC FOR ECOLOGICAL RISK

BH611	0-0.1m
TRH F1	95mg/kg
TRH F3	580mg/kg
BH611	0.3-0.5m
TRH F1	78mg/kg
TRH F2	150mg/kg
TRH F2	150mg/kg
TRH F3	400mg/kg

BH613	0-0.1m
TRH F2	400mg/kg
TRH F2	400mg/kg
TRH F3	1,800mg/kg

BH605	0-0.1m
ACM in top 100mm	

BH604	0-0.1m
ACM in top 100mm	



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

Title:**SAC EXCEEDANCE PLAN**

Location: CNR EPPING ROAD AND BALACLAVA ROAD, MACQUARIE PARK, NSW

Project No: E32891PR

Figure No: 3

JKEnvironments





Appendix B: Site Information and Site History



Selected Conceptual Development Plans

8. Masterplan Proposal

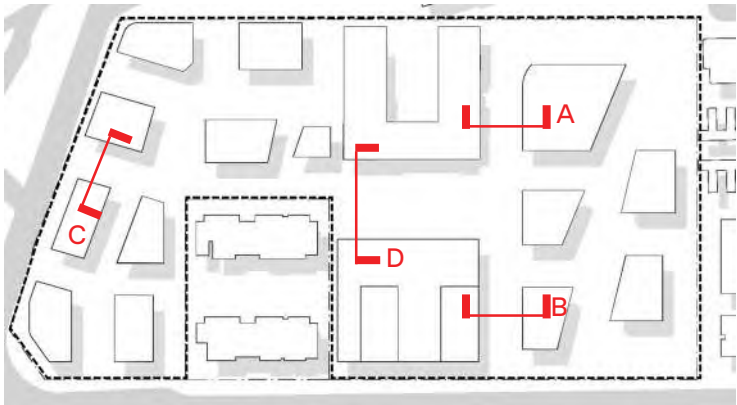
8.1 NEIGHBOURHOODS AND USES

- Retail frontages would define the civic plaza and park spaces
- A combination of school, student accommodation, residential, built-to-rent and aged care would promote multi-generational living
- The differing in residential offering of built-to-rent and built-to-sell would also create greater opportunity for a diverse community
- The school, retail, conference and well-being spaces will encourage visitors to the precinct, further enriching its diversity

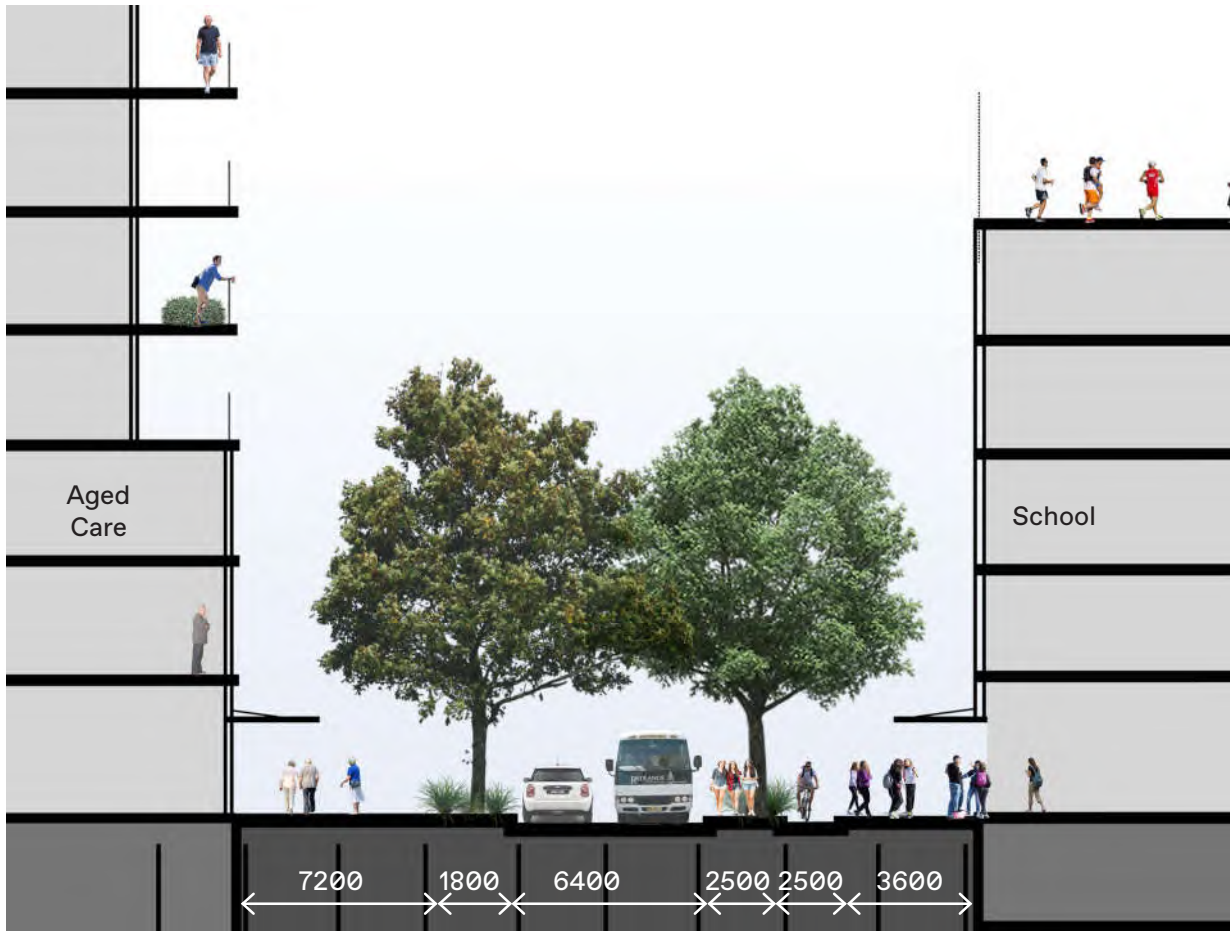


8. Masterplan Proposal

8.11 TOPOGRAPHICAL SECTIONS



Key Plan



Section A-A

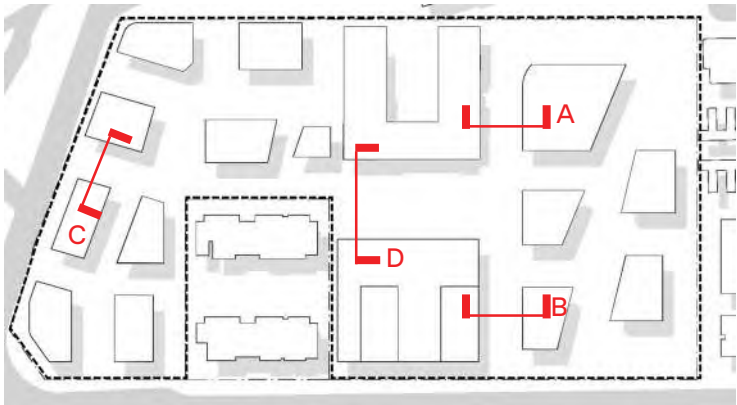


Section B-B

DRAFT

8. Masterplan Proposal

8.11 TOPOGRAPHICAL SECTIONS



Key Plan



Section C-C



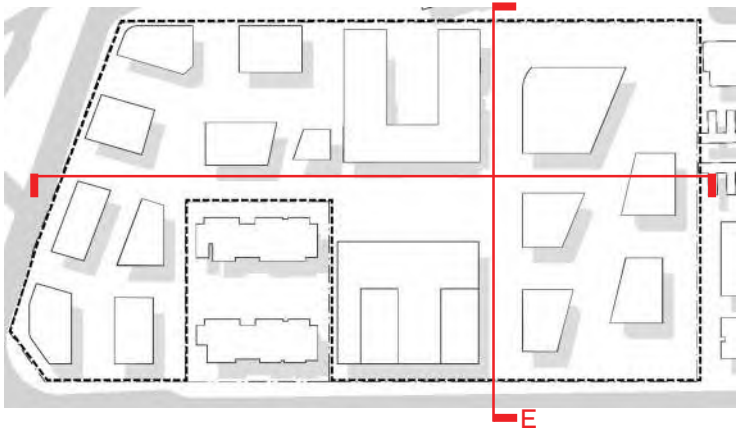
Section D-D

8. Masterplan Proposal

8.11 TOPOGRAPHICAL SECTIONS

Topography Sections

Section E-E
Section F-F



Key Plan

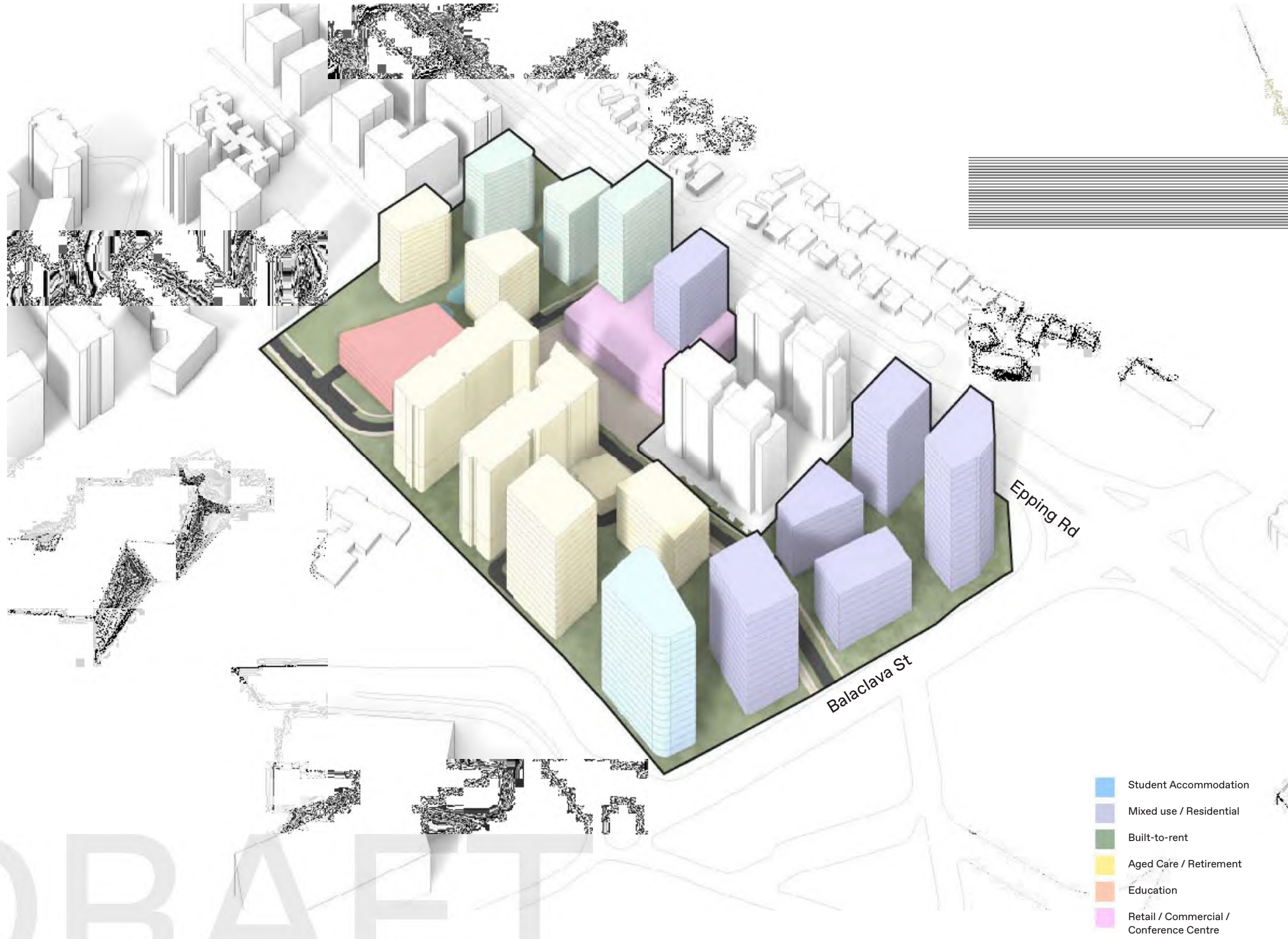


Section E-E



Section F-F

8.12 BUILT FORM ENVELOPE

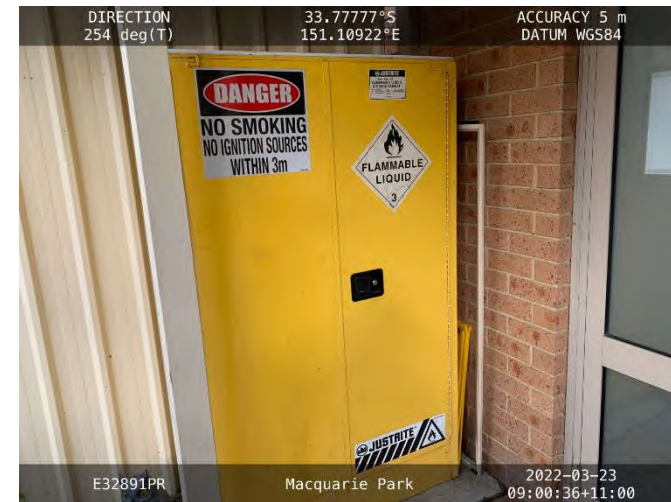




Selected Site Photographs



Photograph 1: Dorothy Henderson Lodge



Photograph 2: Flammable Liquid Storage Cabinet



Photograph 3: Chemical Store (Dorothy Henderson lodge)



Photograph 4: BH613 (Dorothy Henderson Lodge)



Photograph 5: Shalom Centre



Photograph 6: Cooinda Court



Photograph 7: Bin storage at Cooinda Court



Photograph 8: Willandra Village



Photograph 9: Willandra Village



Photograph 10: BH614 (Willandra Village)



Photograph 11: FCF in BH604



Photograph 12: FCF in BH605



Lotsearch Environmental Risk and Planning Report



LOTSEARCH

LOTSEARCH ENVIRO PROFESSIONAL

Date: 11 Mar 2022 08:23:01

Reference: LS030085 EP

Address: 157 Balaclava Road, Marsfield, NSW 2113

Disclaimer:

The purpose of this report is to provide an overview of some of the site history, environmental risk and planning information available, affecting an individual address or geographical area in which the property is located. It is not a substitute for an on-site inspection or review of other available reports and records. It is not intended to be, and should not be taken to be, a rating or assessment of the desirability or market value of the property or its features.

You should obtain independent advice before you make any decision based on the information within the report.

The detailed terms applicable to use of this report are set out at the end of this report.

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 On-site	No. Features within 100m	No. Features within Buffer
Cadastre Boundaries	NSW Department of Finance, Services & Innovation	04/01/2022	04/01/2022	Quarterly	-	-	-	-
Topographic Data	NSW Department of Finance, Services & Innovation	25/06/2019	25/06/2019	Annually	-	-	-	-
List of NSW contaminated sites notified to EPA	Environment Protection Authority	02/03/2022	09/02/2022	Monthly	1000m	0	0	1
Contaminated Land Records of Notice	Environment Protection Authority	03/03/2022	03/03/2022	Monthly	1000m	0	0	0
Former Gasworks	Environment Protection Authority	02/03/2022	14/07/2021	Quarterly	1000m	0	0	0
National Waste Management Facilities Database	Geoscience Australia	12/05/2021	07/03/2017	Annually	1000m	0	0	0
National Liquid Fuel Facilities	Geoscience Australia	15/02/2021	13/07/2012	Annually	1000m	0	1	2
EPA PFAS Investigation Program	Environment Protection Authority	25/02/2022	14/07/2021	Monthly	2000m	0	0	0
Defence PFAS Investigation & Management Program - Investigation Sites	Department of Defence	03/03/2022	03/03/2022	Monthly	2000m	0	0	0
Defence PFAS Investigation & Management Program - Management Sites	Department of Defence	03/03/2022	03/03/2022	Monthly	2000m	0	0	0
Airservices Australia National PFAS Management Program	Airservices Australia	02/03/2022	02/03/2022	Monthly	2000m	0	0	0
Defence 3 Year Regional Contamination Investigation Program	Department of Defence	03/03/2022	03/03/2022	Quarterly	2000m	0	0	0
EPA Other Sites with Contamination Issues	Environment Protection Authority	16/02/2022	13/12/2018	Annually	1000m	0	0	0
Licensed Activities under the POEO Act 1997	Environment Protection Authority	03/03/2022	03/03/2022	Monthly	1000m	0	0	3
Delicensed POEO Activities still regulated by the EPA	Environment Protection Authority	03/03/2022	03/03/2022	Monthly	1000m	0	0	1
Former POEO Licensed Activities now revoked or surrendered	Environment Protection Authority	03/03/2022	03/03/2022	Monthly	1000m	0	4	8
UBD Business Directories (Premise & Intersection Matches)	Hardie Grant			Not required	150m	0	25	27
UBD Business Directories (Road & Area Matches)	Hardie Grant			Not required	150m	-	79	79
UBD Business Directory Dry Cleaners & Motor Garages/Service Stations (Premise & Intersection Matches)	Hardie Grant			Not required	500m	0	0	0
UBD Business Directory Dry Cleaners & Motor Garages/Service Stations (Road & Area Matches)	Hardie Grant			Not required	500m	-	33	51
Points of Interest	NSW Department of Finance, Services & Innovation	19/08/2021	19/08/2021	Quarterly	1000m	4	4	60
Tanks (Areas)	NSW Department of Customer Service - Spatial Services	19/08/2021	19/08/2021	Quarterly	1000m	0	0	0
Tanks (Points)	NSW Department of Customer Service - Spatial Services	19/08/2021	19/08/2021	Quarterly	1000m	0	0	1
Major Easements	NSW Department of Finance, Services & Innovation	19/08/2021	19/08/2021	Quarterly	1000m	0	0	5
State Forest	Forestry Corporation of NSW	25/02/2021	14/02/2021	Annually	1000m	0	0	0
NSW National Parks and Wildlife Service Reserves	NSW Office of Environment & Heritage	10/02/2022	31/12/2021	Annually	1000m	0	0	1
Hydrogeology Map of Australia	Commonwealth of Australia (Geoscience Australia)	08/10/2014	17/03/2000	As required	1000m	1	1	1
Temporary Water Restriction (Botany Sands Groundwater Source) Order 2018	NSW Department of Planning, Industry and Environment	26/10/2020	21/02/2018	Annually	1000m	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	2000m	2	4	22

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features On-site	No. Features within 100m	No. Features within Buffer
Geological Units 1:100,000	NSW Department of Planning, Industry and Environment	20/08/2014		Annually	1000m	1	2	2
Geological Structures 1:100,000	NSW Department of Planning, Industry and Environment	20/08/2014		Annually	1000m	0	0	0
Naturally Occurring Asbestos Potential	NSW Dept. of Industry, Resources & Energy	04/12/2015	24/09/2015	Unknown	1000m	0	0	0
Atlas of Australian Soils	Australian Bureau of Agriculture and Resource Economics and Sciences (ABARES)	19/05/2017	17/02/2011	As required	1000m	2	2	2
Soil Landscapes of Central and Eastern NSW	NSW Department of Planning, Industry and Environment	14/10/2020	27/07/2020	Annually	1000m	1	2	4
Environmental Planning Instrument Acid Sulfate Soils	NSW Department of Planning, Industry and Environment	07/01/2022	17/12/2021	Monthly	500m	0	-	-
Atlas of Australian Acid Sulfate Soils	CSIRO	19/01/2017	21/02/2013	As required	1000m	2	2	2
Dryland Salinity - National Assessment	National Land and Water Resources Audit	18/07/2014	12/05/2013	None planned	1000m	0	0	0
Mining Subsidence Districts	NSW Department of Customer Service - Subsidence Advisory NSW	19/08/2021	05/08/2021	Quarterly	1000m	0	0	0
Current Mining Titles	NSW Department of Industry	09/02/2022	09/02/2022	Monthly	1000m	0	0	0
Mining Title Applications	NSW Department of Industry	09/02/2022	09/02/2022	Monthly	1000m	0	0	0
Historic Mining Titles	NSW Department of Industry	09/02/2022	09/02/2022	Monthly	1000m	9	9	9
Environmental Planning Instrument SEPP State Significant Precincts	NSW Department of Planning, Industry and Environment	15/11/2021	07/12/2018	Monthly	1000m	0	0	0
Environmental Planning Instrument Land Zoning	NSW Department of Planning, Industry and Environment	15/11/2021	05/11/2021	Monthly	1000m	1	8	71
Commonwealth Heritage List	Australian Government Department of the Agriculture, Water and the Environment	18/05/2021	20/11/2019	Annually	1000m	0	0	0
National Heritage List	Australian Government Department of the Agriculture, Water and the Environment	18/05/2021	20/11/2019	Annually	1000m	0	0	0
State Heritage Register - Curtilages	NSW Department of Planning, Industry and Environment	19/08/2021	25/06/2021	Quarterly	1000m	0	0	0
Environmental Planning Instrument Local Heritage	NSW Department of Planning, Industry and Environment	07/01/2022	17/12/2021	Monthly	1000m	0	1	4
Bush Fire Prone Land	NSW Rural Fire Service	07/03/2022	08/12/2021	Weekly	1000m	0	0	3
Native Vegetation of the Sydney Metropolitan Area	NSW Office of Environment & Heritage	01/03/2017	16/12/2016	As required	1000m	1	2	27
Ramsar Wetlands of Australia	Australian Government Department of Agriculture, Water and the Environment	24/02/2021	19/03/2020	Annually	1000m	0	0	0
Groundwater Dependent Ecosystems	Bureau of Meteorology	14/08/2017	15/05/2017	Annually	1000m	0	0	3
Inflow Dependent Ecosystems Likelihood	Bureau of Meteorology	14/08/2017	15/05/2017	Unknown	1000m	0	0	3
NSW BioNet Species Sightings	NSW Office of Environment & Heritage	08/03/2022	08/03/2022	Weekly	10000m	-	-	-

Site Diagram

157 Balaclava Road, Marsfield, NSW 2113



Legend

- ▬ Site Boundary
- ▬ Internal Parcel Boundaries

Total Area: 63985m²

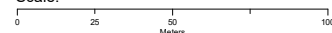
Total Perimeter: 1.31km

Disclaimers:

Measurements are approximate only and may have been simplified or smaller lengths removed for readability.

Parcels that make up a small percentage of the total site area have not been labelled for increased legibility.

Scale:



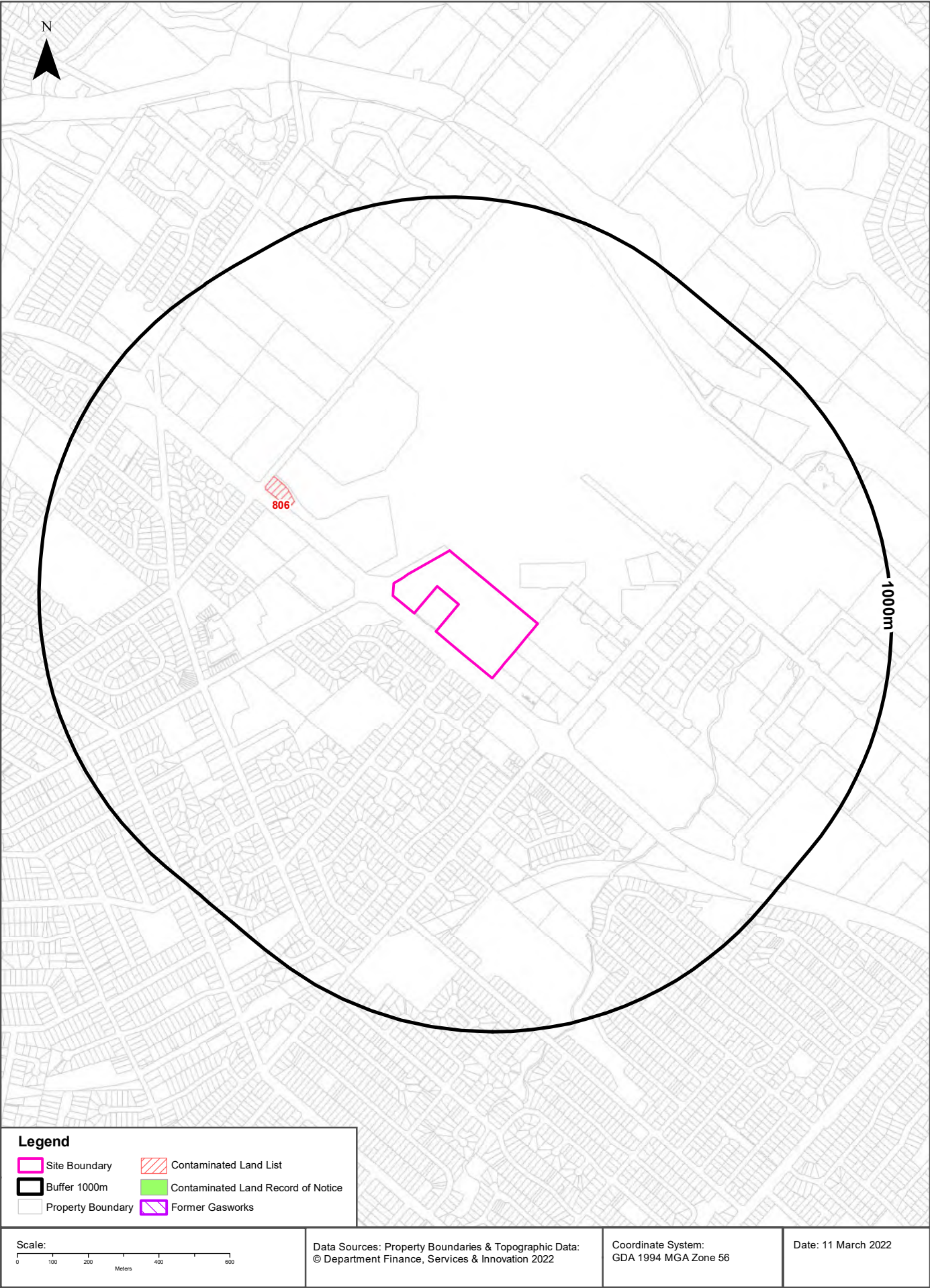
Data Source Aerial Imagery:
© Aerometrex Pty Ltd

Coordinate System:
GDA 1994 MGA Zone 56

Date: 11 March 2022

Contaminated Land

157 Balaclava Road, Marsfield, NSW 2113



Contaminated Land

157 Balaclava Road, Marsfield, NSW 2113

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	Direction
806	Coles Express Service Station Marsfield	189 Epping Road	Marsfield	Service Station	Regulation under CLM Act not required	Current EPA List	Premise Match	365m	North West

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
© State of New South Wales through the Environment Protection Authority

Contaminated Land

157 Balaclava Road, Marsfield, NSW 2113

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
© State of New South Wales through the Environment Protection Authority
Terms of use and disclaimer for Contaminated Land: Record of Notices, please visit
<http://www.epa.nsw.gov.au/clm/clmdisclaimer.htm>

Former Gasworks

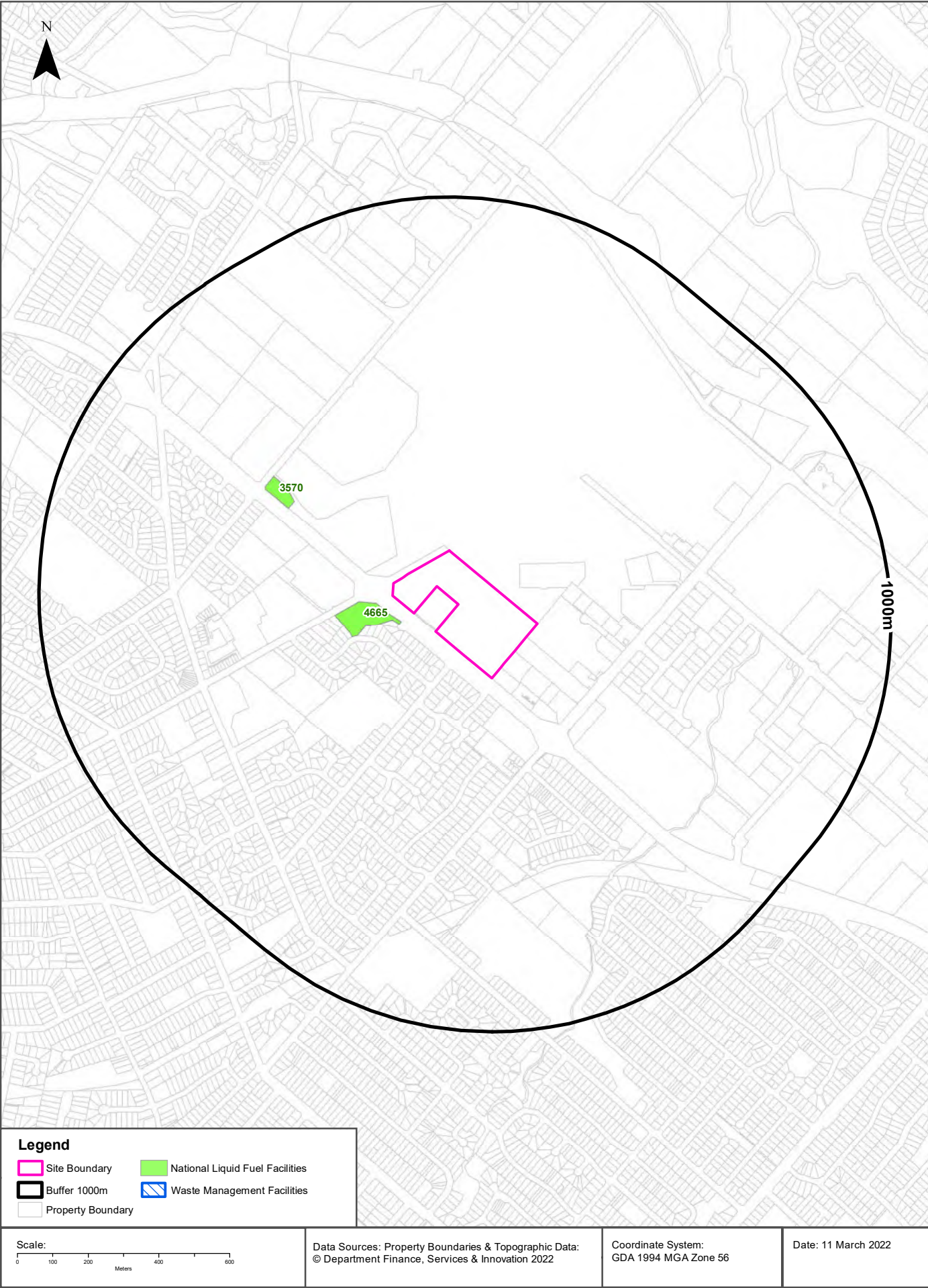
Former Gasworks within the dataset buffer:

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

Former Gasworks Data Source: Environment Protection Authority
© State of New South Wales through the Environment Protection Authority

Waste Management & Liquid Fuel Facilities

157 Balaclava Road, Marsfield, NSW 2113



Waste Management & Liquid Fuel Facilities

157 Balaclava Road, Marsfield, NSW 2113

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	Direction
N/A	No records in buffer											

Waste Management Facilities Data Source: Geoscience Australia

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National Liquid Fuel Facilities

National Liquid Fuel Facilities within the dataset buffer:

Map Id	Owner	Name	Address	Suburb	Class	Operational Status	Operator	Revision Date	Loc Conf	Dist	Direction
4665	Caltex	Woolworths Caltex Marsfield	155 Balaclava Road	Marsfield	Petrol Station	Operational		25/07/2011	Premise Match	41m	West
3570	Shell	Coles Express Marsfield	Hadenfeld Avenue	Macquarie Park	Petrol Station	Operational		25/07/2011	Premise Match	365m	North West

National Liquid Fuel Facilities Data Source: Geoscience Australia

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PFAS Investigation & Management Programs

157 Balaclava Road, Marsfield, NSW 2113

EPA PFAS Investigation Program

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

Map ID	Site	Address	Loc Conf	Dist	Dir
N/A	No records in buffer				

EPA PFAS Investigation Program: Environment Protection Authority
© State of New South Wales through the Environment Protection Authority

Defence PFAS Investigation Program

Sites being investigated by the Department of Defence for PFAS contamination within the dataset buffer:

Map ID	Base Name	Address	Loc Conf	Dist	Dir
N/A	No records in buffer				

Defence PFAS Investigation Program Data Custodian: Department of Defence, Australian Government

Defence PFAS Management Program

Sites being managed by the Department of Defence for PFAS contamination within the dataset buffer:

Map ID	Base Name	Address	Loc Conf	Dist	Dir
N/A	No records in buffer				

Defence PFAS Management Program Data Custodian: Department of Defence, Australian Government

Airservices Australia National PFAS Management Program

Sites being investigated or managed by Airservices Australia for PFAS contamination within the dataset buffer:

Map ID	Site Name	Impacts	Loc Conf	Dist	Dir
N/A	No records in buffer				

Airservices Australia National PFAS Management Program Data Custodian: Airservices Australia

Defence Sites

157 Balaclava Road, Marsfield, NSW 2113

Defence 3 Year Regional Contamination Investigation Program

Sites which have been assessed as part of the Defence 3 Year Regional Contamination Investigation Program within the dataset buffer:

Property ID	Base Name	Address	Known Contamination	Loc Conf	Dist	Dir
N/A	No records in buffer					

Defence 3 Year Regional Contamination Investigation Program, Data Custodian: Department of Defence, Australian Government

EPA Other Sites with Contamination Issues

157 Balaclava Road, Marsfield, NSW 2113

EPA Other Sites with Contamination Issues

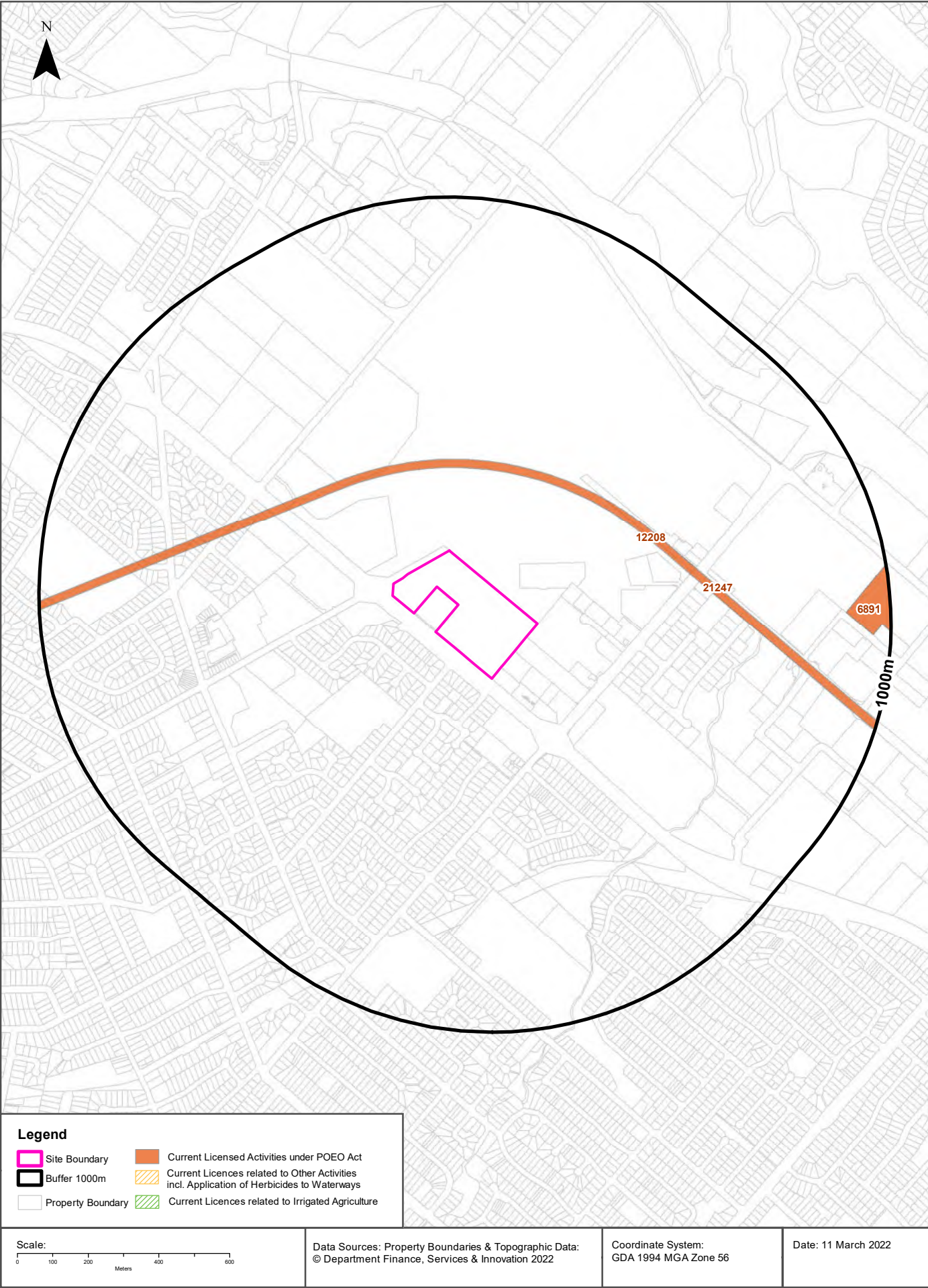
This dataset contains other sites identified on the EPA website as having contamination issues. This dataset currently includes:

- James Hardie asbestos manufacturing and waste disposal sites
- Radiological investigation sites in Hunter's Hill
- Pasminco Lead Abatement Strategy Area

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
© State of New South Wales through the Environment Protection Authority



EPA Activities

157 Balaclava Road, Marsfield, NSW 2113

Licensed Activities under the POEO Act 1997

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

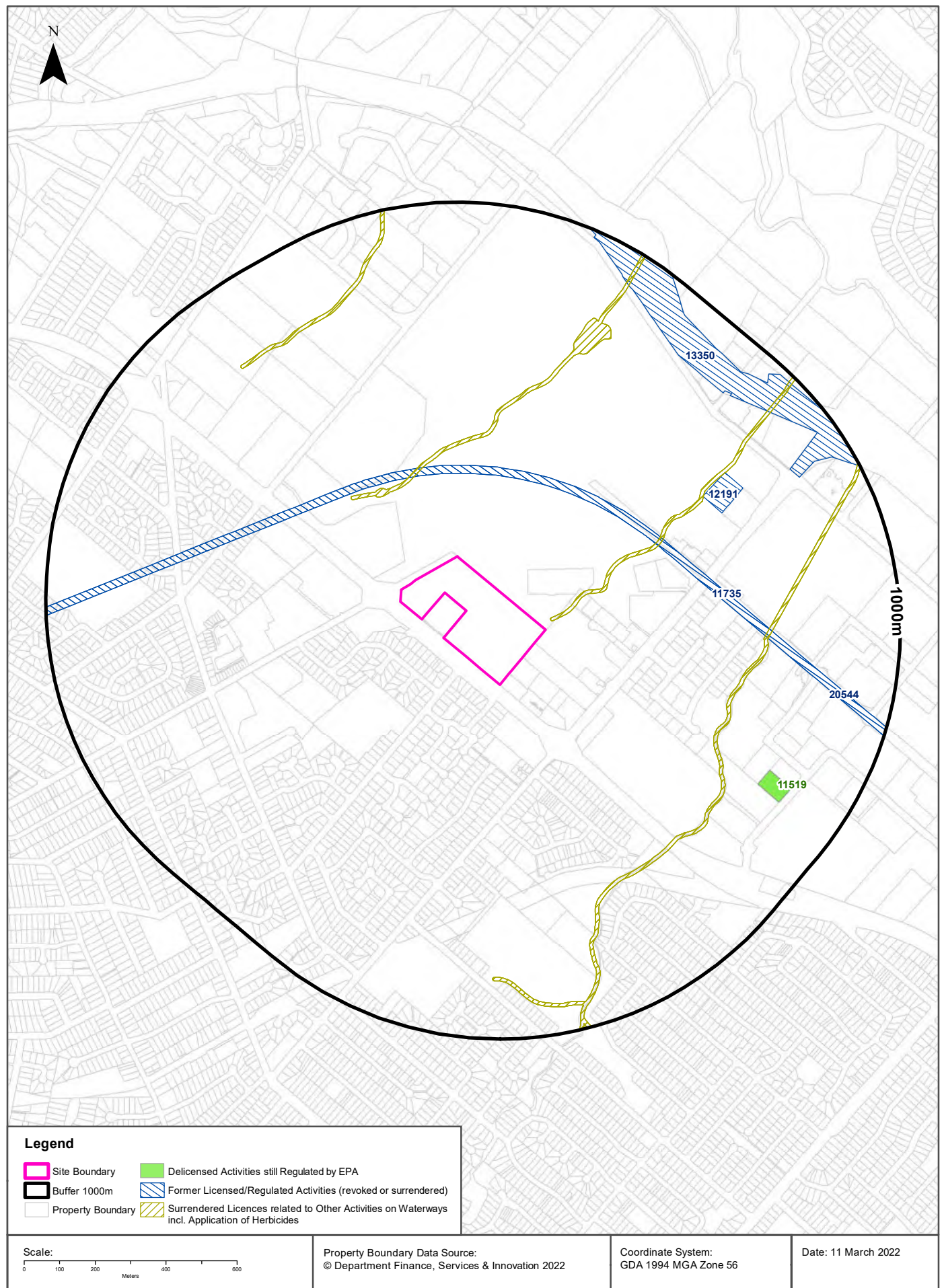
EPL	Organisation	Name	Address	Suburb	Activity	Loc Conf	Distance	Direction
12208	SYDNEY TRAINS		SYDNEY TRAINS, HAYMARKET, NSW 1238		Railway systems activities	Network of Features	235m	North
21247	Metro Trains Sydney Pty Ltd		SYDNEY METRO, ROUSE HILL, NSW 2155		Railway systems activities	Network of Features	235m	North
6891	ASTRAZENECA PTY LTD	ASTRAZENECA PTY LTD	47 TALAVERA ROAD, NORTH RYDE, NSW 2113	NORTH RYDE	Pharmaceutical and veterinary products production	Premise Match	873m	East

POEO Licence Data Source: Environment Protection Authority

© State of New South Wales through the Environment Protection Authority

Delicensed & Former Licensed EPA Activities

157 Balaclava Road, Marsfield, NSW 2113



EPA Activities

157 Balaclava Road, Marsfield, NSW 2113

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
11519	SPECIALIST DIAGNOSTIC SERVICES PTY LIMITED	SDS Pathology	10 Lyon Park Road	NORTH RYDE	Hazardous, Industrial or Group A Waste Generation or Storage	Premise Match	740m	South East

Delicensed Activities Data Source: Environment Protection Authority
© State of New South Wales through the Environment Protection Authority

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

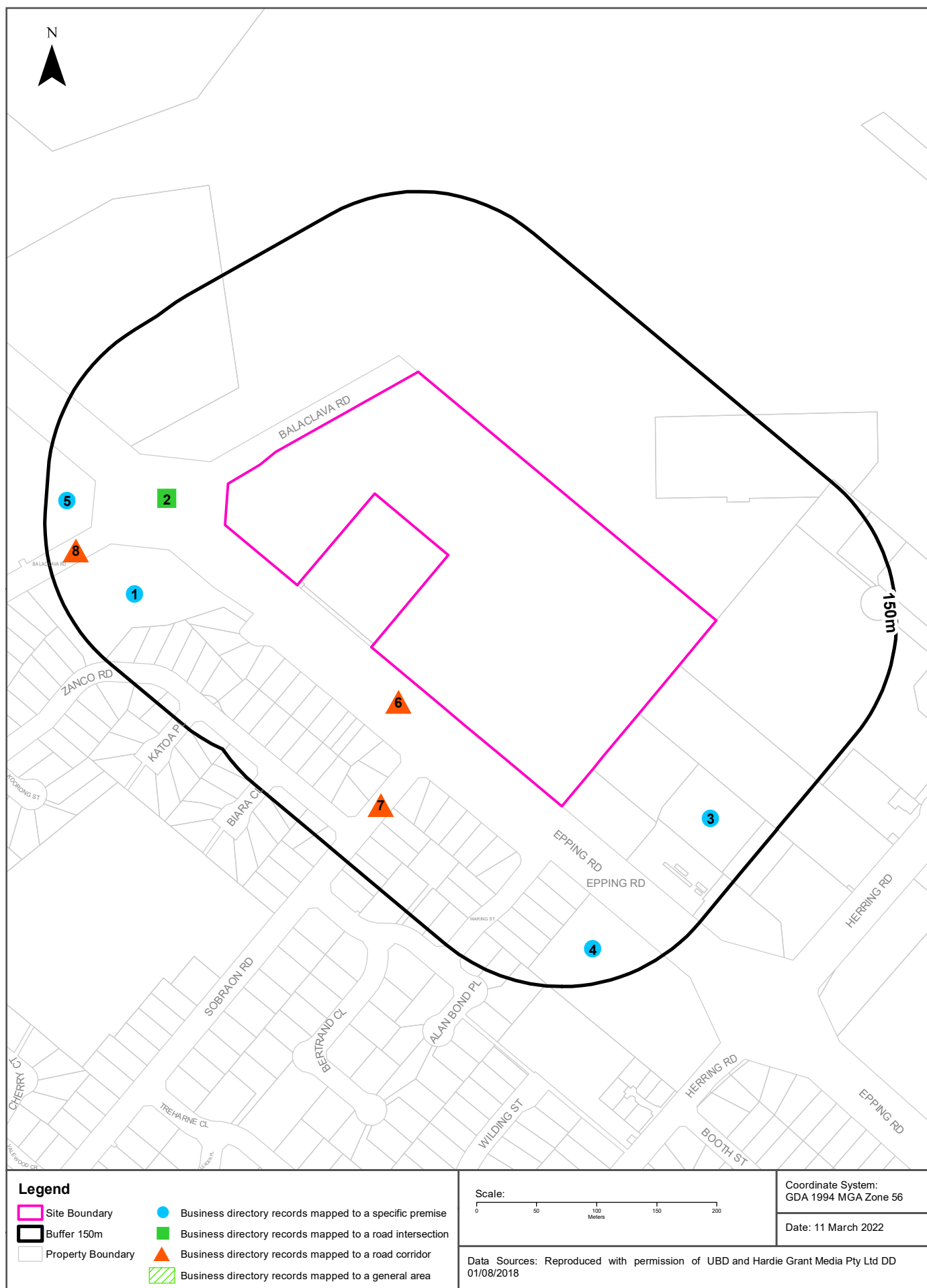
Former Licensed activities under the Protection of the Environment Operations Act 1997, now revoked or surrendered, within the dataset buffer:

Licence No	Organisation	Location	Status	Issued Date	Activity	Loc Conf	Distance	Direction
4653	LUHRMANN ENVIRONMENT MANAGEMENT PTY LTD	WATERWAYS THROUGHOUT NSW	Surrendered	06/09/2000	Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	31m	East
4838	Robert Orchard	Various Waterways throughout New South Wales - SYDNEY NSW 2000	Surrendered	07/09/2000	Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	31m	East
5030	CITY OF RYDE	AREAS REQUIRING MOSQUITO TREATMENT WITHIN THE LGA OF RYDE CITY COUNCIL - RYDE NSW 2112	Surrendered	11/08/2000	Miscellaneous licensed discharge to waters (at any time) - Pesticide application in areas requiring mosquito treatment	Network of Features	31m	East
6630	SYDNEY WEED & PEST MANAGEMENT PTY LTD	WATERWAYS THROUGHOUT NSW - PROSPECT, NSW, 2148	Surrendered	09/11/2000	Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	31m	East
11735	HOCHTIEF AG	-, MACQUARIE PARK, NSW 2113	Surrendered	04/09/2002	Railway systems activities	Network of Features	235m	North
20544	JOHN HOLLAND PTY LTD	North West Rail Link -Operations Trains and Stations Project, Between First Ponds Creek, Schofields and Cudgegong Road, ROUSE HILL, NSW 2155, ROUSE HILL	Surrendered	19/12/2014	Railway systems activities	Network of Features	235m	North
12191	EIFFEL TECHNOLOGIES LIMITED	3 Innovation Road, NORTH RYDE, NSW 2113	Surrendered	25/11/2004	Hazardous, Industrial or Group A Waste Generation or Storage, Pharmaceutical and veterinary products production	Premise Match	583m	North East
13350	CPB CONTRACTORS PTY LIMITED	M2 Motorway, Windsor Road, BAULKHAM HILLS, NSW 2153	Surrendered	23/12/2010	Road construction	Road Match	825m	North East

Former Licensed Activities Data Source: Environment Protection Authority
© State of New South Wales through the Environment Protection Authority

Historical Business Directories

157 Balaclava Road, Marsfield, NSW 2113



Historical Business Directories

157 Balaclava Road, Marsfield, NSW 2113

Business Directory Records 1950-1991 Premise or Road Intersection Matches

Universal Business Directory records from years 1991, 1986, 1982, 1978, 1975, 1970, 1965, 1961 & 1950, mapped to a premise or road intersection within the dataset buffer:

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
1	GROCERS-RETAIL.	Safeway Food Store, 155 Balaclava Rd., Eastwood. 2122	41091	1986	Premise Match	41m	West
2	Mixed Businesses	Zanco's Store, Epping & Balaclava Rds., Marsfield	119100	1965	Road Intersection	50m	West
	MIXED BUSINESS	Zanco's Store, Epping & Balaclava Rds., Marsfield	342858	1961	Road Intersection	50m	West
3	MISSIONS &/OR RELIGIOUS BODIES.	Gospel Recordings Inc., 110 Herring Rd., Eastwood. 2122	46541	1978	Premise Match	65m	South East
4	HOTELS-LICENSED.	El Rancho Hotel-Motel, Epping Rd., Eastwood. 2122	46673	1986	Premise Match	76m	South
	MOTELS.	El Rancho Hotel-Motel, Epping Rd., Eastwood. 2122	60574	1986	Premise Match	76m	South
	RESTAURANTS.	El Rancho Hotel-Motel, Epping Rd., Eastwood. 2122	81535	1986	Premise Match	76m	South
	HOTELS - LICENSED. (H7150)	El Rancho Millers Hotel-Motel, Epping Rd., Eastwood. 2122.	40716	1982	Premise Match	76m	South
	MOTELS. (M4620)	El Rancho Millers Hotel-Motel, Epping Rd., Eastwood. 2122.	53619	1982	Premise Match	76m	South
	RESTAURANTS. (R5180)	El Rancho Millers Hotel-Motel, Epping Rd., Eastwood. 2122.	70782	1982	Premise Match	76m	South
	HOTELS - LICENSED. (H7150)	Millers El-Rancho, Epping Rd., North Ryde. 2113.	40906	1982	Premise Match	76m	South
	RESTAURANTS. (R5180)	Millers El-Rancho, Epping Rd., North Ryde. 2113.	71360	1982	Premise Match	76m	South
	HOTELS-LICENSED.	El Rancho Millers Hotel-Motel. Epping Rd., Eastwood. 2122	36095	1978	Premise Match	76m	South
	RESTAURANTS.	El Rancho, Epping Rd, Eastwood. 2122	62944	1978	Premise Match	76m	South
	HOTELS-LICENSED.	El Rancho. Epping Rd., Eastwood. 2122	36096	1978	Premise Match	76m	South
	MOTELS.	El Rancho. Epping Rd., Eastwood. 2122	47201	1978	Premise Match	76m	South
	RESTAURANTS.	Millers El-Rancho, Epping Rd, North Ryde. 2113	63202	1978	Premise Match	76m	South
	HOTELS-LICENSED.	Millers El-Rancho, Epping Rd., North Ryde. 2113	36266	1978	Premise Match	76m	South
	HOTELS-LICENCED	El Rancho Millers Hotel-Motel., Epping Rd., Eastwood. 2122	42827	1975	Premise Match	76m	South
	MOTELS	El Rancho., Epping Rd., Eastwood. 2122	55999	1975	Premise Match	76m	South
	RESTAURANTS.	El Rancho., Epping Rd., Eastwood. 2122	73701	1975	Premise Match	76m	South
	HOTELS-LICENCED	Miller's El-Rancho., Epping Rd., North Ryde. 2113	43015	1975	Premise Match	76m	South
	RESTAURANTS.	Miller's El-Rancho., Epping Rd., North Ryde. 2113	73973	1975	Premise Match	76m	South
	HOTELS-LICENSED (H690)	El Rancho., Epping Rd., Eastwood	317224	1970	Premise Match	76m	South
	MOTELS (M442)	El Rancho., Epping Rd., Eastwood	334403	1970	Premise Match	76m	South
5	HATCHERIES	Carols, J. L., 190 Balaclava Rd., Eastwood	323868	1961	Premise Match	110m	West

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
5	POULTRY DEALERS-W'SALE	Carols, J. L., 190 Balaclava Rd., Eastwood	361515	1961	Premise Match	110m	West

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Business Directory Records 1950-1991

Road or Area Matches

Universal Business Directory records from years 1991, 1986, 1982, 1978, 1975, 1970, 1965, 1961 & 1950, 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:

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Road Corridor or Area
6	NURSERYMEN.	Greenslopes Nursery, Epping Rd., North Ryde. 2113	70022	1986	Road Match	0m
	MOTOR PANEL BEATERS &/OR SPRAY PAINTERS.	Perram & Harris Pty Ltd., 179 Epping Rd., Eastwood. 2122	66644	1986	Road Match	0m
	TELEVISION STATIONS.	United Telecasters Sydney Ltd., Epping Rd., North Ryde. 2113.	92774	1986	Road Match	0m
	NURSERYMEN (N1700)	Greenslopes Nursery, Epping Rd., North Ryde. 2113.	61164	1982	Road Match	0m
	MOTOR PANEL BEATERS &/OR SPRAY PAINTERS. (M7360)	Perram & Harris Pty. Ltd., 179 Epping Rd., Eastwood 2122.	58608	1982	Road Match	0m
	TELEVISION STATIONS. (T2275)	United Telecasters Sydney Ltd., Epping Rd., North Ryde. 2113.	79540	1982	Road Match	0m
	NURSERYMEN.	Greenslopes Nursery, Epping Rd, North Ryde 2113	54429	1978	Road Match	0m
	MOTOR PAINTERS.	Perram & Harris Pty. Ltd., 179 Epping Rd., Eastwood. 2122	51609	1978	Road Match	0m
	MOTOR PANEL BEATERS	Perram & Harris Pty. Ltd., 179 Epping Rd., Eastwood. 2122	52274	1978	Road Match	0m
	TELEVISION STATIONS.	United Telecasters Sydney Ltd., Epping Rd., North Ryde. 2113	70074	1978	Road Match	0m
	RESEARCH LABORATORIES.	Bread Research Institute of Australia., Epping Rd., North Ryde. 2113	73500	1975	Road Match	0m
	NURSERYMEN	Green slopes Nursery., Epping Rd., North Ryde. 2113	64226	1975	Road Match	0m
	MOTOR PAINTERS.	Perram & Harris., 179 Epping Rd., Eastwood. 2122	60354	1975	Road Match	0m
	MOTOR PANEL BEATERS.	Perram & Harris., 179 Epping Rd., Eastwood. 2122	61040	1975	Road Match	0m
	GROCERS-RETAIL	Red "S" Supermarket., Epping Rd., North Ryde. 2113	39797	1975	Road Match	0m
	TELEVISION STATIONS.	United Telecasters Sydney Ltd., Epping Rd., North Ryde. 2113	82524	1975	Road Match	0m
	FISH MERCHANTS-RETAIL (F245)	Bouquet, F., Epping Rd., North Ryde	303333	1970	Road Match	0m
	RESEARCH LABORATORIES (R300)	Bread Research Institute of Australia, Epping Rd., North Ryde	356768	1970	Road Match	0m
	ASSOCIATIONS & SOCIETIES (A612)	Bread Research Institute of Australia., Epping Rd., North Ryde	262747	1970	Road Match	0m
	FRUITERERS/GREENGROCER S (F640)	Brooklyn Fruit Stall, Shrimptons Ck., Epping Rd., N.Ryde	306721	1970	Road Match	0m
	TELEVISION STATIONS (T157)	Channel 10 Studios, Epping Rd., North Ryde	367723	1970	Road Match	0m
	NURSERYMEN (N190)	Greenslopes Nursery., Epping Rd., North Ryde	344488	1970	Road Match	0m
	MOTOR SERVICE STATIONS- PETROL,OIL,Etc.	Pollard, H. Service Station., 179 Epping Rd., EASTWOOD	341401	1970	Road Match	0m
	Fish Merchants - Retail	Bouquet, F., Epping Rd., North Ryde	86705	1965	Road Match	0m
	Research Laboratories	Bread Research Institute of Australia, Epping Rd., North Ryde	140286	1965	Road Match	0m
	Associations & Societies	Bread Research institute of Australia., Epping Rd., North Ryde	47663	1965	Road Match	0m
	Fruiterers & Greengrocers	Brooklyn Fruit Stall, Shrimptons Ck., Epping Rd., N. Ryde	90931	1965	Road Match	0m

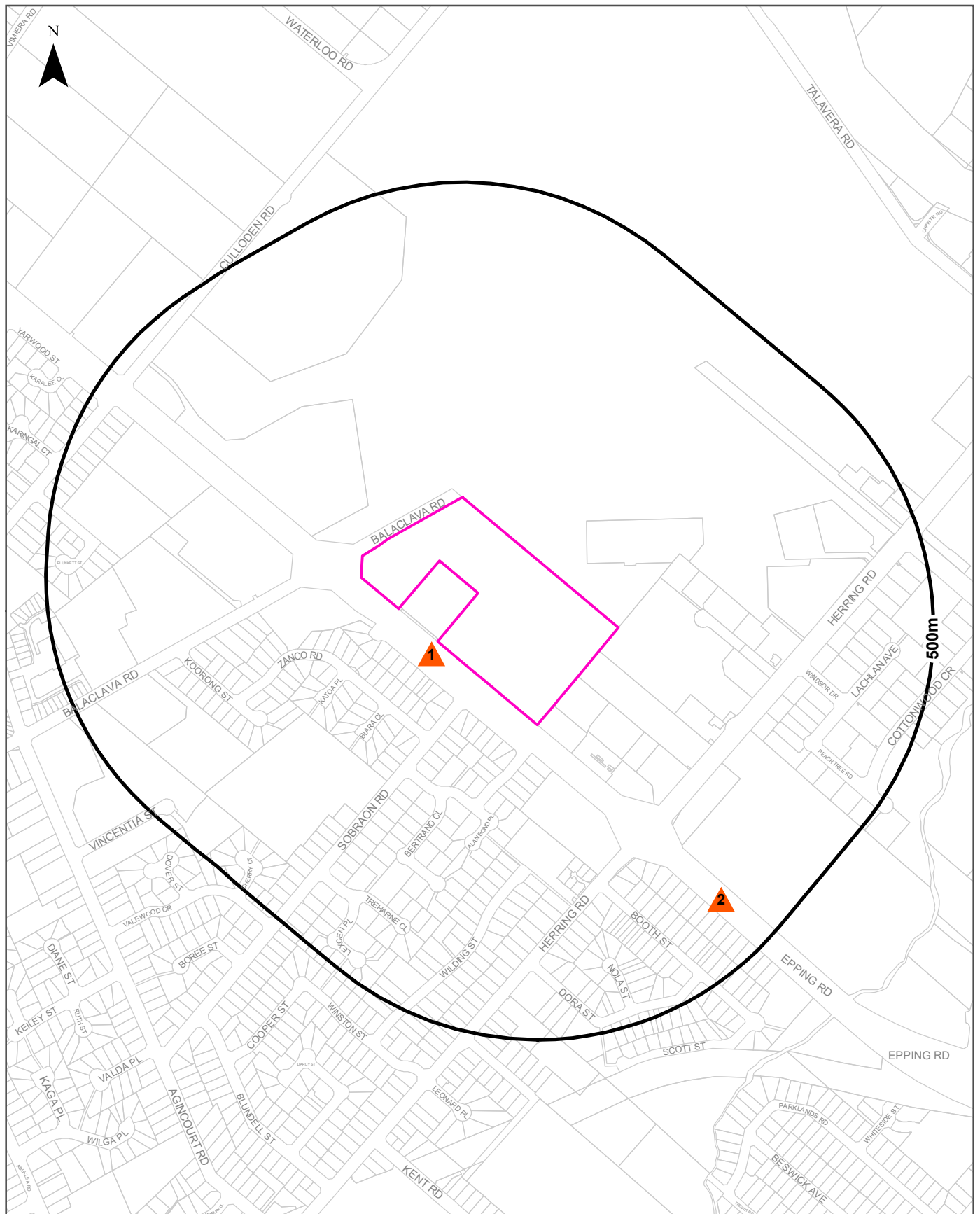
Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Road Corridor or Area
6	Cement Garden Ornament Mfrs.	Dionello, Albino, 175 Epping Rd., Eastwood	63751	1965	Road Match	0m
	Pottery Manufacturers/Distributors	Dionello, Albino., 171 Epping Rd., Eastwood	135347	1965	Road Match	0m
	Nurserymen	Greenslopes Nursery, Epping Highway., North Ryde	129105	1965	Road Match	0m
	Motor Service Stations - Petrol, Oil, Etc.	Perram & Harris, 179 Epping Rd. Eastwood	125664	1965	Road Match	0m
	Motor Painters	Perram & Harris, 179 Epping Rd., Eastwood	124162	1965	Road Match	0m
	Motor Panel Beaters	Perram & Harris, 179 Epping Rd., Eastwood	124924	1965	Road Match	0m
	Welders - Electric &/or Oxy	Perram & Harris., 179 Epping Rd., Eastwood	156735	1965	Road Match	0m
	Motor Service Stations - Petrol, Oil, Etc.	Pollard, H. Service Station, 179 Epping Rd. Eastwood	125665	1965	Road Match	0m
	Business Agents &/or Brokers	Rubal & Residential Realty Pty. Ltd., 173 Epping Rd., Eastwood	57665	1965	Road Match	0m
	Real Estate Agents/Valuers	Rural & Residential Realty Pty. Ltd., 173 Epping Rd. Eastwood	139208	1965	Road Match	0m
	STOCK/STATION AGENTS	Rural & Residential Realty Pty. Ltd., 173 Epping Rd., Eastwood	148916	1965	Road Match	0m
	POULTRY DEALERS-W'SALE	Bouquet, S. F., Epping Rd., North Ryde	361512	1961	Road Match	0m
	FISH MERCHANTS-RETAIL	Bouquet, F., Epping Rd., North Ryde	310902	1961	Road Match	0m
	ASSOCIATIONS & SOCIETIES	Bread Research Institute of Australia, Epping Rd., North Ryde	269113	1961	Road Match	0m
	RESEARCH LABORATORIES	Bread Research Institute of Australia, Epping Rd., North Ryde	245883	1961	Road Match	0m
	HATCHERIES	Briton, W. W., Epping Rd., North Ryde	323867	1961	Road Match	0m
	FRUITERERS/GREENGROCER S	Brooklyn Fruit Stall, Shrimptons Ck., Epping Rd., N. Ryde	315092	1961	Road Match	0m
	FURNITURE-GENERAL-MFRS. &/OR WHOLESALERS	Dionello, A., 173 Epping Rd., Eastwood	317480	1961	Road Match	0m
	NURSERYMEN	Dionello, A., 173 Epping Rd., Eastwood	354051	1961	Road Match	0m
	CELLULOSE PAPER IMPORTERS &/OR WHOLESALERS	Dionello, Albino, 171 Epping Rd., Eastwood	286193	1961	Road Match	0m
	CEMENT GARDEN ORNAMENT MFRS.	Dionello, Albino, 171 Epping Rd., Eastwood	286204	1961	Road Match	0m
	POTTERY MFRS./DISTS	Dionello, Albino, 171 Epping Rd., Eastwood	361370	1961	Road Match	0m
	NURSERYMEN	Greenslopes Nursery, Epping Highway, North Ryde	354085	1961	Road Match	0m
	MOTOR GARAGES & ENGINEERS	Morris, S. Grime & Co. Pty. Ltd., 179 Epping Rd. EASTWOOD	347744	1961	Road Match	0m
	MOTOR PAINTERS	Morris, S. Grime Pty. Ltd., 179 Epping Rd., Eastwood	349024	1961	Road Match	0m
	MOTOR PANEL BEATERS	Morris, S. Grime Pty. Ltd., 179 Epping Rd., Eastwood	349793	1961	Road Match	0m
	WELDERS-ELECTRIC &/OR OXY	Morris, S. Grime Pty. Ltd., 179 Epping Rd., Eastwood	262314	1961	Road Match	0m
	MOTOR PANEL BEATERS	Pearson, J. & B., Epping Rd., Eastwood	349852	1961	Road Match	0m
	MOTOR GARAGES & ENGINEERS	Pearson, J. & B., Epping Rd. EASTWOOD	347883	1961	Road Match	0m
	WELDERS-ELECTRIC &/OR OXY	Pearson, J. & B., Epping Rd., Eastwood	262372	1961	Road Match	0m
	MOTOR GARAGES & ENGINEERS	Rotary Hoe Garage, Epping Rd. EASTWOOD	348066	1961	Road Match	0m
	TIMBER MERCHANTS	Short, R. A. (Junr.), Epping Rd., North Ryde	257509	1961	Road Match	0m
	CLEARING CONTRACTORS	Short, R. A., Epping Rd., North Ryde	288891	1961	Road Match	0m
	POULTRY DEALERS-RETAIL	Bouquet, S. F., Epping Rd., North Ryde	93738	1950	Road Match	0m

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Road Corridor or Area
6	HATCHERIES	Briton, W. W., Epping Rd., North Ryde	61771	1950	Road Match	0m
	POULTRY FARMERS	Briton, W. W., Epping Rd., North Ryde	93891	1950	Road Match	0m
	HATCHERIES	Gordon Vale Stud Farm and Hatchery, Epping Rd., North Ryde	61785	1950	Road Match	0m
	POULTRY FARMERS	Gordon Vale Stud Farm and Hatchery, Epping Rd., North Ryde	94034	1950	Road Match	0m
	NURSERYMEN	Lacherdis, B., Epping Rd., Eastwood	89174	1950	Road Match	0m
	TIMBER MERCHANTS	Short, R. A. (Junr.), Epping Rd., North Ryde	78290	1950	Road Match	0m
	FENCING CONTRACTORS' SUPPLIERS	Short, R. A. (Junr.), Epping, Rd., North Ryde	43736	1950	Road Match	0m
7	NURSERYMEN	Smarts Nursery, Sobraon Rd., Eastwood	354211	1961	Road Match	58m
	HATCHERIES	Christie, R. G. and Son, Sobraon Rd., Eastwood	61774	1950	Road Match	58m
	POULTRY FARMERS	Christie, R. G. and Son, Sobraon Rd., Eastwood	93928	1950	Road Match	58m
	FLORISTS-RETAIL	Smart, H. E., Sobraon Rd., Eastwood	46180	1950	Road Match	58m
	FLORISTS-WHOLESALE	Smart's nurseries Pty. Ltd., Sobraon Rd., Eastwood	46283	1950	Road Match	58m
8	SUPERMARKETS.	Safeways, Balaclava Rd., Marsfield. 2122	89702	1986	Road Match	96m
	CHEMISTS-PHARMACEUTICAL.	Aus Macquarie Pharmacy, Balaclava Rd., North Ryde. 2113	12919	1978	Road Match	96m
	Hatcheries	Raymond's Breeding Farm, 154 Balaclava Rd., Eastwood	99770	1965	Road Match	96m
	Poultry Dealers - W'Sale	Raymonds Breeding Farm., 154 Balaclava Rd., Eastwood	135547	1965	Road Match	96m
	POULTRY DEALERS-W SALE	Raymonds Breeding Farm, 154 Balaclava Rd., Eastwood	361543	1961	Road Match	96m
	HATCHERIES	Raymond's Breeding Farm, 154 Balaclava Rd., Eastwood	323895	1961	Road Match	96m

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Dry Cleaners, Motor Garages & Service Stations

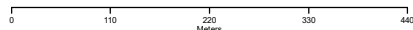
157 Balaclava Road, Marsfield, NSW 2113



Legend

- Site Boundary
- Buffer 500m
- Property Boundary
- Business directory records mapped to a specific premise
- Business directory records mapped to a road intersection
- ▲ Business directory records mapped to a road corridor
- Business directory records mapped to a general area

Scale:



Coordinate System:
GDA 1994 MGA Zone 56

Date: 11 March 2022

Data Sources: Reproduced with permission of UBD and Hardie Grant Media Pty Ltd DD 01/08/2018

Historical Business Directories

157 Balaclava Road, Marsfield, NSW 2113

Dry Cleaners, Motor Garages & Service Stations 1948-1993 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.

Note: The Universal Business Directories were published between 1948 and 1993. Dry Cleaners, Motor Garages & Service Stations have been extracted from all of these directories except the following years 1951, 1955, 1957, 1960, 1963, 1973, 1974, 1977, 1987.

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
N/A	No records in buffer						

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Dry Cleaners, Motor Garages & Service Stations 1948-1993

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.

Note: The Universal Business Directories were published between 1948 and 1993. Dry Cleaners, Motor Garages & Service Stations have been extracted from all of these directories except the following years 1951, 1955, 1957, 1960, 1963, 1973, 1974, 1977, 1987.

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Road Corridor or Area
1	MOTOR GARAGES &/OR ENGINEERS &/OR SERVICE STATIONS.	Perram Harris Pty. Ltd., 179 Epping Rd., Eastwood. 2122	33942	1984	Road Match	0m
	MOTOR GARAGES &/OR ENGINEERS &/OR SERVICE STATIONS.	Perram & Harris Pty. Ltd., 179 Epping Rd., Eastwood 2122	21388	1983	Road Match	0m
	MOTOR GARAGES &/OR ENGINEERS &/OR SERVICE STATIONS.	Pollard H. Service Station., 179 Epping Rd., Eastwood 2122	34738	1976	Road Match	0m
	MOTOR SERVICE STATIONS-PETROL, OIL, ETC.	Pollard H. Service Station., 179 Epping Rd Eastwood	16652	1972	Road Match	0m
	MOTOR SERVICE STATIONS-PETROL, OIL, ETC.	Pollard H. Service Station., 179 Epping Rd Eastwood	2124	1971	Road Match	0m
	MOTOR SERVICE STATIONS-PETROL,OIL,ETC.	Pollard, H. Service Station., 179 Epping Rd., EASTWOOD	341401	1970	Road Match	0m
	MOTOR SERVICE STATIONS-PETROL, OIL, ETC.	Perram & Harris., 179 Epping Rd Eastwood	47753	1969	Road Match	0m
	MOTOR SERVICE STATIONS-PETROL, OIL, ETC.	Pollard H. Service Station., 179 Epping Rd Eastwood	47754	1969	Road Match	0m
	MOTOR SERVICE STATIONS-PETROL, OIL, ETC.	Perram & Harris., 179 Epping Rd Eastwood	31189	1968	Road Match	0m
	MOTOR SERVICE STATIONS-PETROL, OIL, ETC.	Pollard H. Service Station., 179 Epping Rd Eastwood	31190	1968	Road Match	0m
	MOTOR SERVICE STATIONS-PETROL, OIL, ETC.	Perram & Harris., 179 Epping Rd Eastwood	15666	1967	Road Match	0m
	MOTOR SERVICE STATIONS-PETROL, OIL, ETC.	Pollard H. Service Station., 179 Epping Rd Eastwood	15667	1967	Road Match	0m
	MOTOR SERVICE STATIONS-PETROL, OIL, ETC.	Perram & Harris., 179 Epping Rd Eastwood	1241	1966	Road Match	0m
	MOTOR SERVICE STATIONS-PETROL, OIL, ETC.	Pollard H. Service Station., 179 Epping Rd Eastwood	1242	1966	Road Match	0m
	Motor Service Stations - Petrol, Oil, Etc.	Perram & Harris, 179 Epping Rd. Eastwood	125664	1965	Road Match	0m
	Motor Service Stations - Petrol, Oil, Etc.	Pollard, H. Service Station, 179 Epping Rd. Eastwood	125665	1965	Road Match	0m
	MOTOR SERVICE STATIONS-PETROL, OIL, ETC.	Pollard H. Service Station., 179 Epping Rd Eastwood	51954	1964	Road Match	0m
	MOTOR GARAGES & ENGINEERS.	Morris S. Grime & Co. Pty. Ltd., 179 Epping Rd Eastwood	29354	1962	Road Match	0m
	MOTOR GARAGES & ENGINEERS.	Pearson J. & B., Epping Rd Eastwood	29356	1962	Road Match	0m
	MOTOR GARAGES & ENGINEERS.	Rotary Hoe Garage., Epping Rd Eastwood	29358	1962	Road Match	0m

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Road Corridor or Area
1	MOTOR GARAGES & ENGINEERS	Morris, S. Grime & Co. Pty. Ltd., 179 Epping Rd. EASTWOOD	347744	1961	Road Match	0m
	MOTOR GARAGES & ENGINEERS	Pearson, J. & B., Epping Rd. EASTWOOD	347883	1961	Road Match	0m
	MOTOR GARAGES & ENGINEERS	Rotary Hoe Garage, Epping Rd. EASTWOOD	348066	1961	Road Match	0m
	MOTOR GARAGES & ENGINEERS.	Morris S. Grime & Co. Pty. Ltd., 179 Epping Rd Eastwood	14032	1959	Road Match	0m
	MOTOR GARAGES & ENGINEERS.	Pearson J. & B., Epping Rd Eastwood	14034	1959	Road Match	0m
	MOTOR GARAGES & ENGINEERS.	Rotary Hoe Garage., Epping Rd Eastwood	14036	1959	Road Match	0m
	MOTOR GARAGE/ENGINEERS.	Pearson J. & B., Epping Rd Eastwood	4734	1958	Road Match	0m
	MOTOR GARAGE/ENGINEERS.	Rotary Hoe Garage., Epping Rd Eastwood	4899	1958	Road Match	0m
	MOTOR GARAGES &/OR ENGINEERS.	Pearson J. & B., Epping Rd Eastwood	61272	1956	Road Match	0m
	MOTOR GARAGES &/OR ENGINEERS.	Rotary Hoe Garage., Epping Rd Eastwood	61425	1956	Road Match	0m
	MOTOR GARAGES &/OR ENGINEERS.	Pearson J. & B., Epping Rd Eastwood	49834	1954	Road Match	0m
	MOTOR GARAGES &/OR ENGINEERS.	Rotary Hoe Garage., Epping Rd Eastwood	54041	1954	Road Match	0m
	MOTOR GARAGES &/OR ENGINEERS.	Rotary Hoe Garage., Epping Rd Eastwood	40622	1953	Road Match	0m
2	MOTOR SERVICE STATIONS-PETROL,OIL,Etc.	Dobbie's Service Station., Epping Rd., NORTH RYDE	340851	1970	Road Match	303m
	MOTOR SERVICE STATIONS-PETROL, OIL, ETC.	Dobbie's Service Station., Epping Rd North Ryde	50549	1969	Road Match	303m
	MOTOR SERVICE STATIONS-PETROL, OIL, ETC.	Dobbie's Service Station., Epping Rd North Ryde	32576	1968	Road Match	303m
	MOTOR SERVICE STATIONS-PETROL, OIL, ETC.	Robinhood Service Station., Epping Rd North Ryde	32580	1968	Road Match	303m
	MOTOR SERVICE STATIONS-PETROL, OIL, ETC.	Dobbie's Service Station., Epping Rd North Ryde	16035	1967	Road Match	303m
	MOTOR SERVICE STATIONS-PETROL, OIL, ETC.	Robinhood Service Station., Epping Rd., North Ryde	16039	1967	Road Match	303m
	MOTOR SERVICE STATIONS-PETROL, OIL, ETC.	Dobbie's Service Station., Epping Rd North Ryde	1607	1966	Road Match	303m
	MOTOR SERVICE STATIONS-PETROL, OIL, ETC.	Robinhood Service Station., Epping Rd North Ryde	1610	1966	Road Match	303m
	Motor Service Stations - Petrol, Oil, Etc.	Dobbie's Service Station, Epping Rd. North Ryde	125972	1965	Road Match	303m
	MOTOR SERVICE STATIONS-PETROL, OIL, ETC.	Dobbie's Service Station., Epping Rd North Ryde	52246	1964	Road Match	303m
	MOTOR SERVICE STATIONS-PETROL, OIL, ETC.	Robinhood Service Station., Epping Rd North Ryde	52248	1964	Road Match	303m
	MOTOR SERVICE STATIONS-PETROL, OIL, ETC.	Dobbie's Service Station., Epping Rd North Ryde	38495	1962	Road Match	303m
	MOTOR SERVICE STATIONS-PETROL, OIL, ETC.	Robinhood Service Station., Epping Rd North Ryde	38498	1962	Road Match	303m
	MOTOR SERVICE STATIONS—PETROL, OIL, Etc.	Dobbie's Service Station, Epping Rd., North Ryde	350533	1961	Road Match	303m
	MOTOR SERVICE STATIONS-PETROL,. OIL, ETC.	Dobbie's Service Station., Epping Rd North Ryde	24418	1959	Road Match	303m

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Road Corridor or Area
2	MOTOR SERVICE STATIONS-PETROL, ETC.	Dobbie's Service Station., Epping Rd North Ryde	9493	1958	Road Match	303m
	MOTOR SERVICE STATIONS-PETROL, ETC.	Dobbie's Service Station., Epping Rd North Ryde	61876	1956	Road Match	303m
	MOTOR SERVICE STATIONS-PETROL, ETC.	Dobbie's Service Station., Epping Rd North Ryde	54449	1954	Road Match	303m

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Aerial Imagery 2022

157 Balaclava Road, Marsfield, NSW 2113



Aerial Imagery 2016

157 Balaclava Road, Marsfield, NSW 2113



Scale:
0 50 100 150 200
Meters

Data Source Aerial Imagery:
© Aerometrex Pty Ltd

Coordinate System:
GDA 1994 MGA Zone 56

Date: 11 March 2022

Aerial Imagery 2011

157 Balaclava Road, Marsfield, NSW 2113



Scale: 0 50 100 150 200 Meters	Data Source Aerial Imagery: © Aerometrex Pty Ltd	Coordinate System: GDA 1994 MGA Zone 56	Date: 11 March 2022
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Aerial Imagery 2005

157 Balaclava Road, Marsfield, NSW 2113





Scale: 0 50 100 150 200 Meters	Data Source Aerial Imagery: © Aerometrex Pty Ltd	Coordinate System: GDA 1994 MGA Zone 56	Date: 11 March 2022
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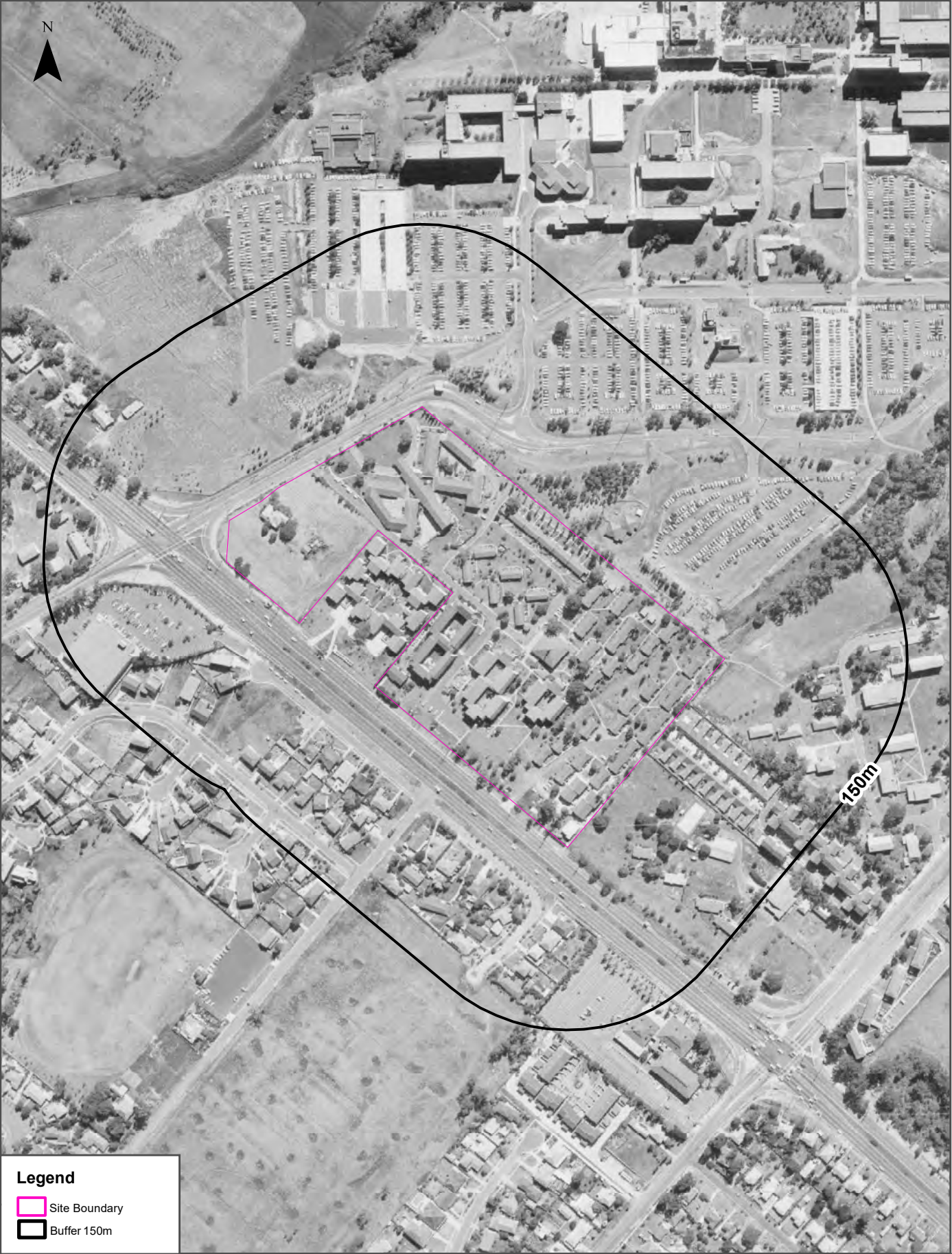








Data Sources: Aerial Imagery: © NSW Department of Customer Service	Coordinate System: GDA 1994 MGA Zone 56	Date: 11 March 2022
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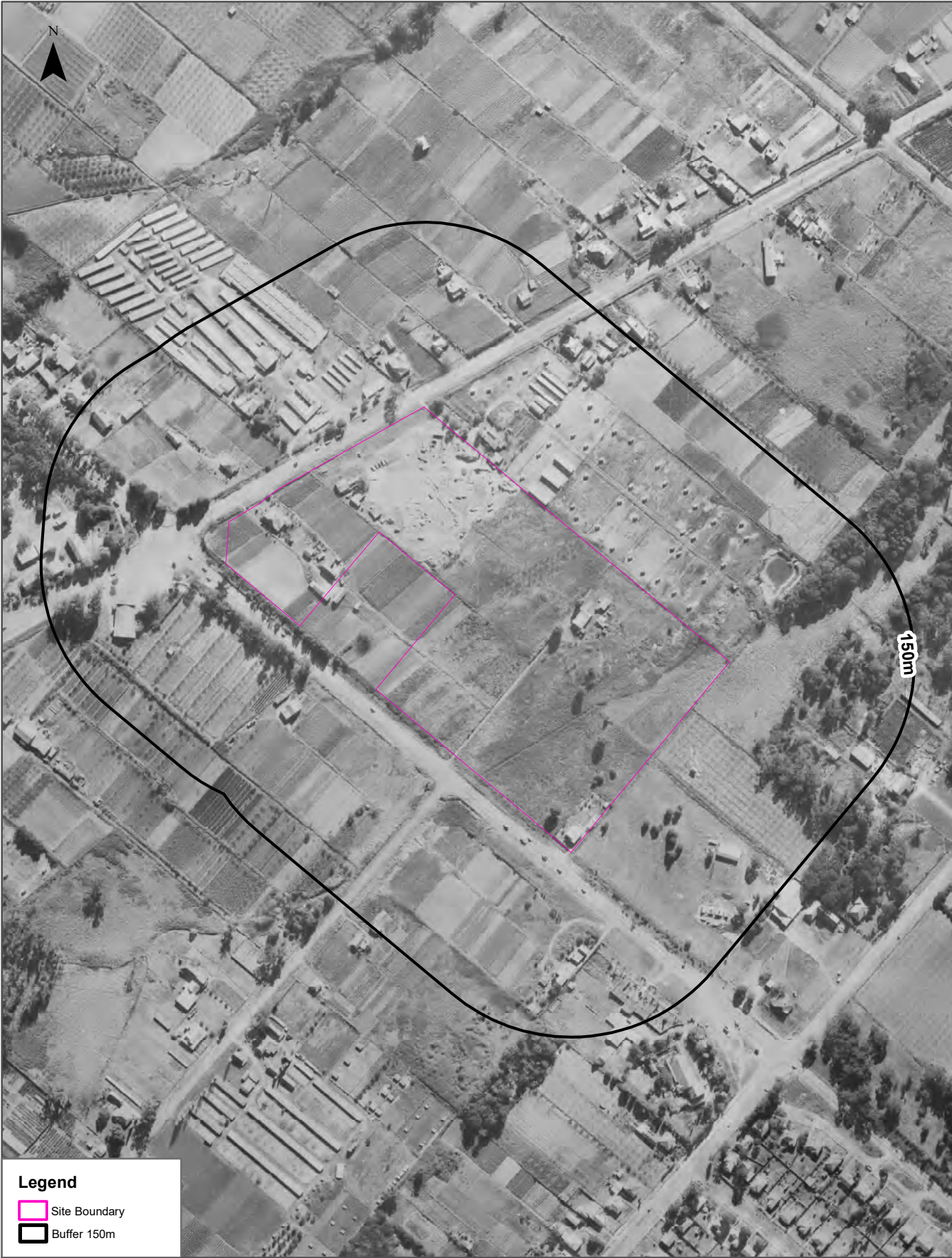
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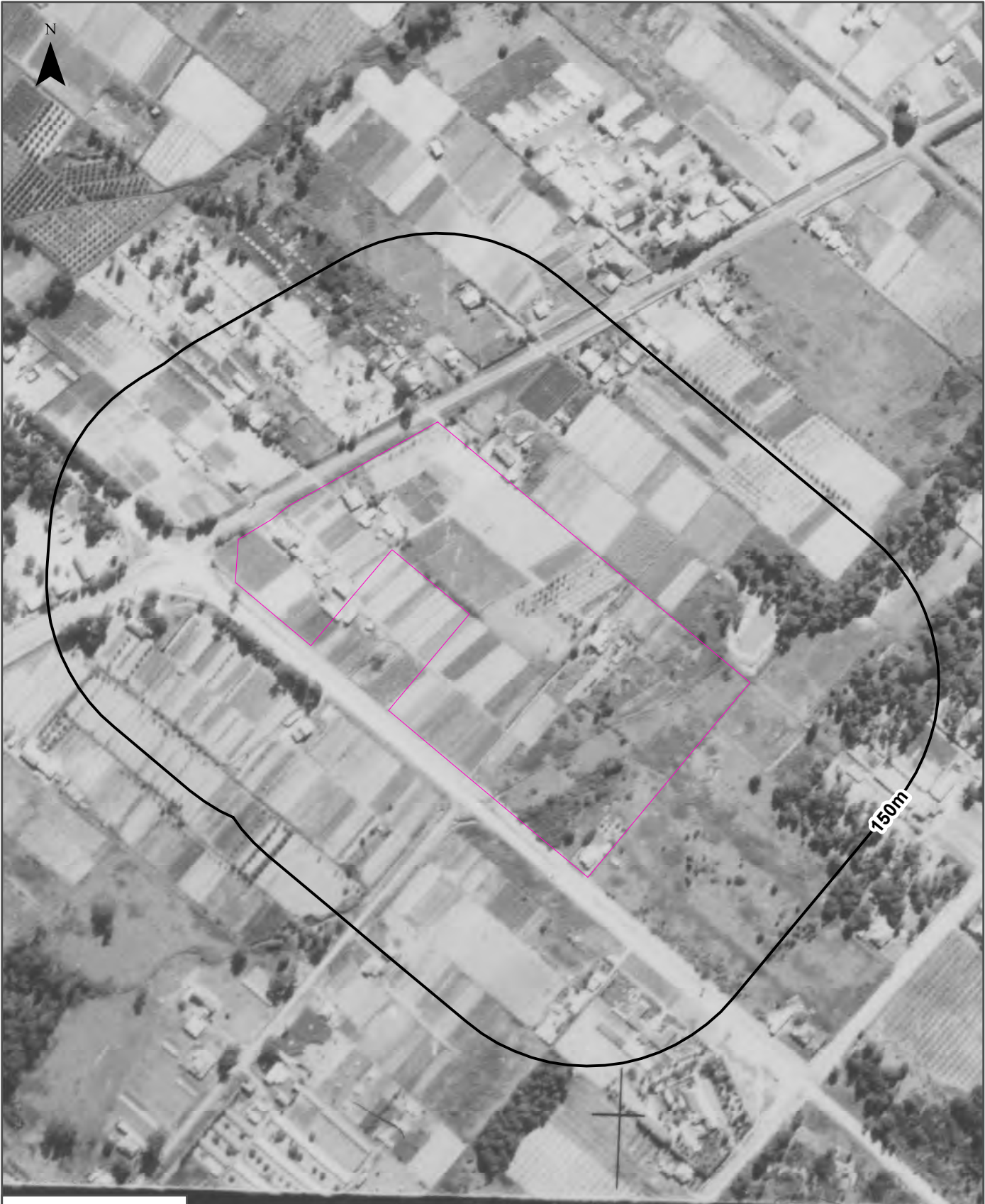
Data Source Aerial Imagery:
© NSW Department of Customer Service

Coordinate System:
GDA 1994 MGA Zone 56

Date: 09 March 2022







Legend

Site Boundary

Buffer 150m

<div>Scale:</div> <div><div>0</div><div>50</div><div>100</div><div>150</div><div>200</div></div> <div>Meters</div>	<div>Data Source Aerial Imagery:</div> <div>© NSW Department of Customer Service</div>	<div>Coordinate System:</div> <div>GDA 1994 MGA Zone 56</div>	<div>Date:</div> <div>09 March 2022</div>
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Data Source Aerial Imagery: © Aerometrex Pty Ltd	Coordinate System: GDA 1994 MGA Zone 56	Date: 11 March 2022
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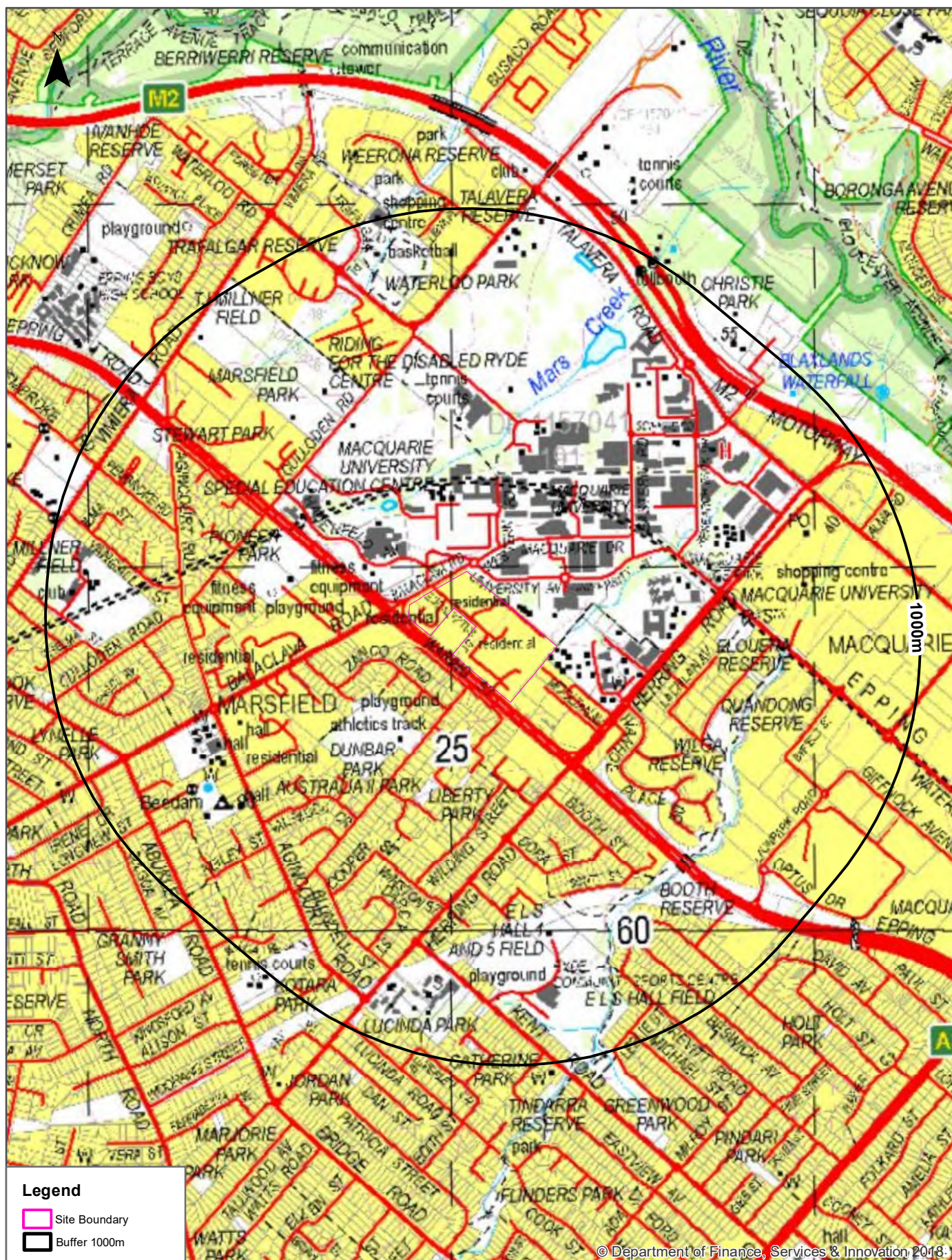
Aerial Imagery 1930

157 Balaclava Road, Marsfield, NSW 2113



Topographic Map 2015

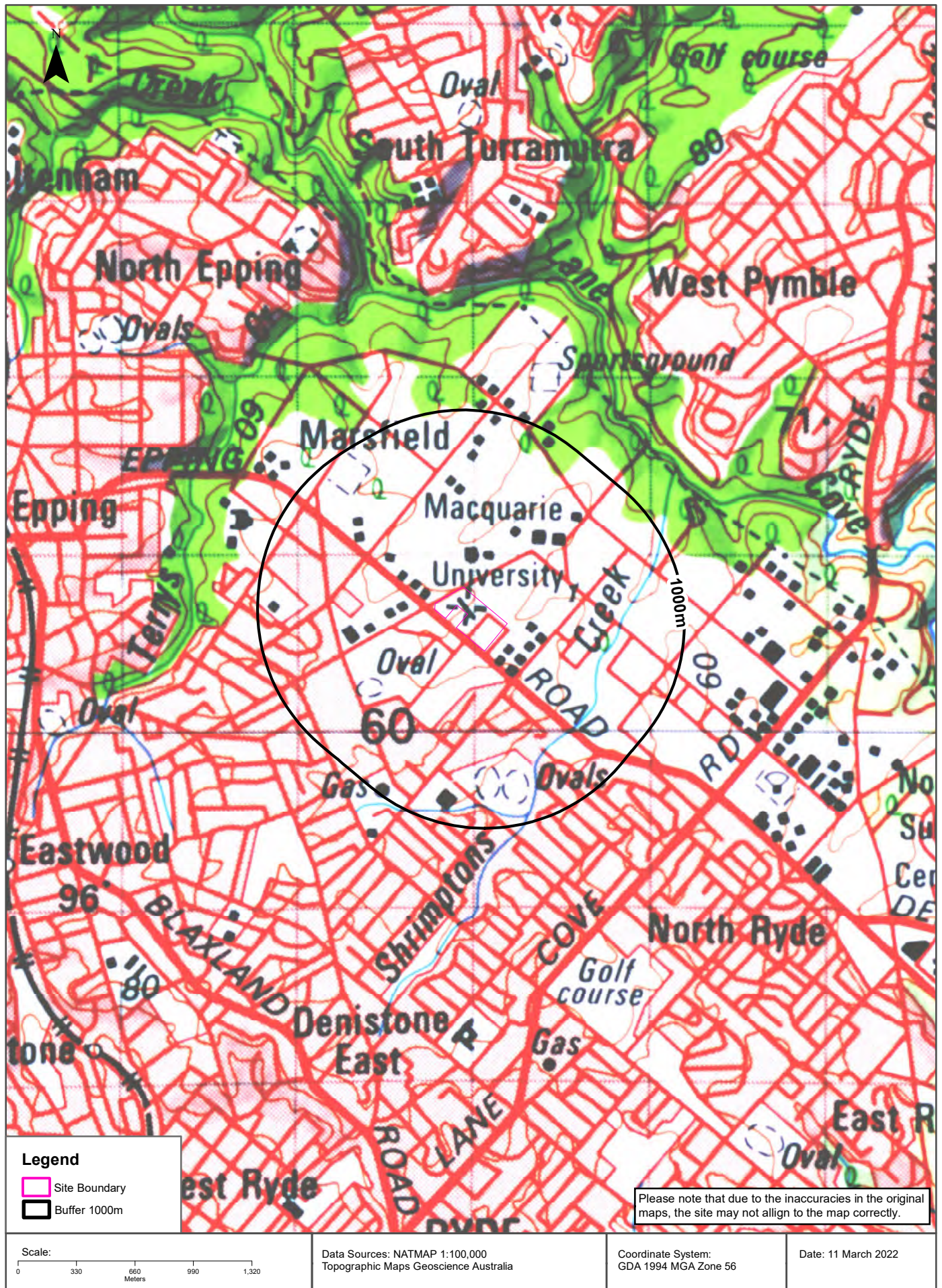
157 Balaclava Road, Marsfield, NSW 2113



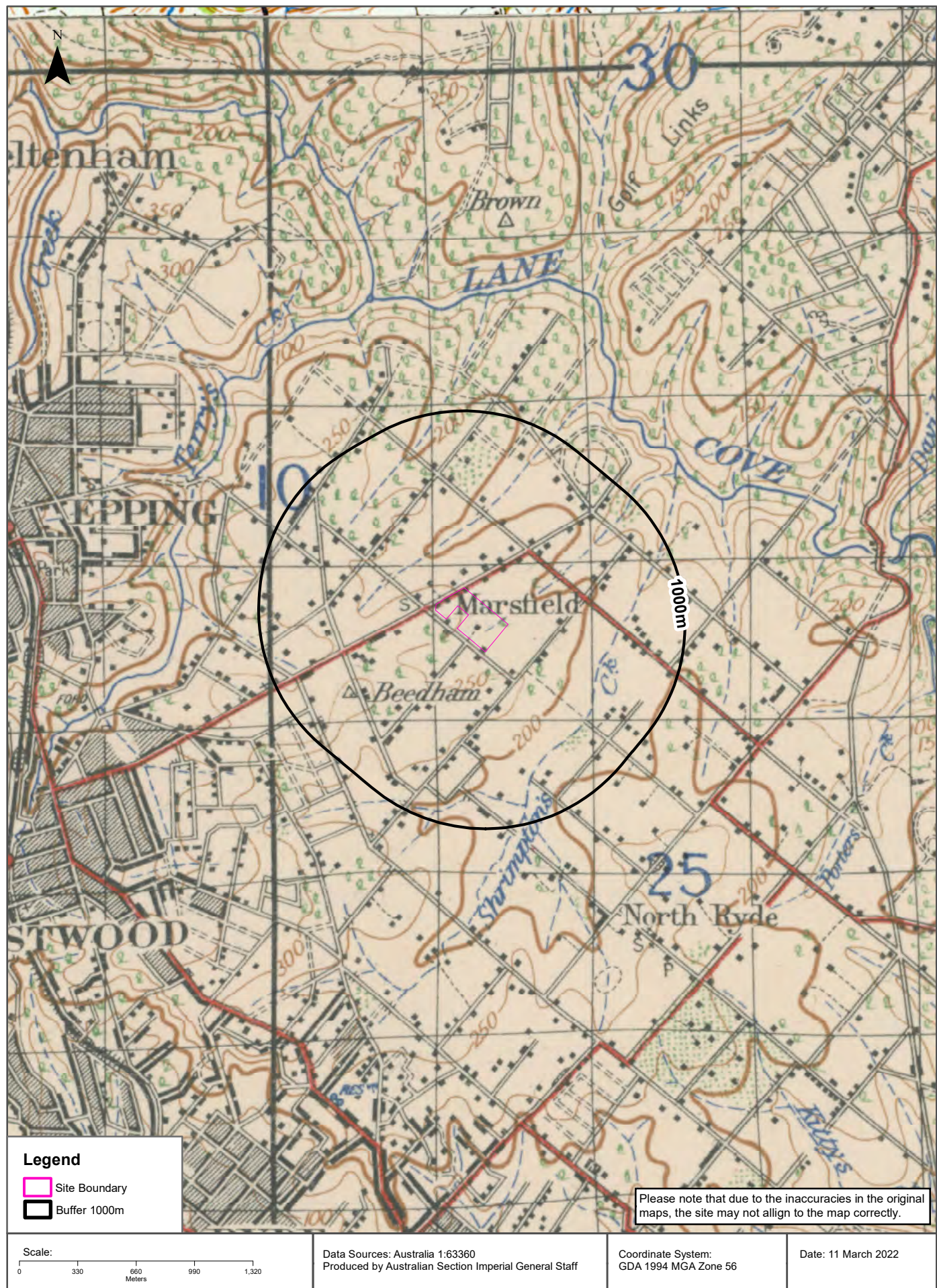
<p>Scale:</p> <p>0 170 340 510 680 Meters</p>	<p>Data Sources: Topographic Map Data © NSW Land and Property Information</p>	<p>Coordinate System: GDA 1994 MGA Zone 56</p>	<p>Date: 11 March 2022</p>
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Historical Map 1975

157 Balaclava Road, Marsfield, NSW 2113

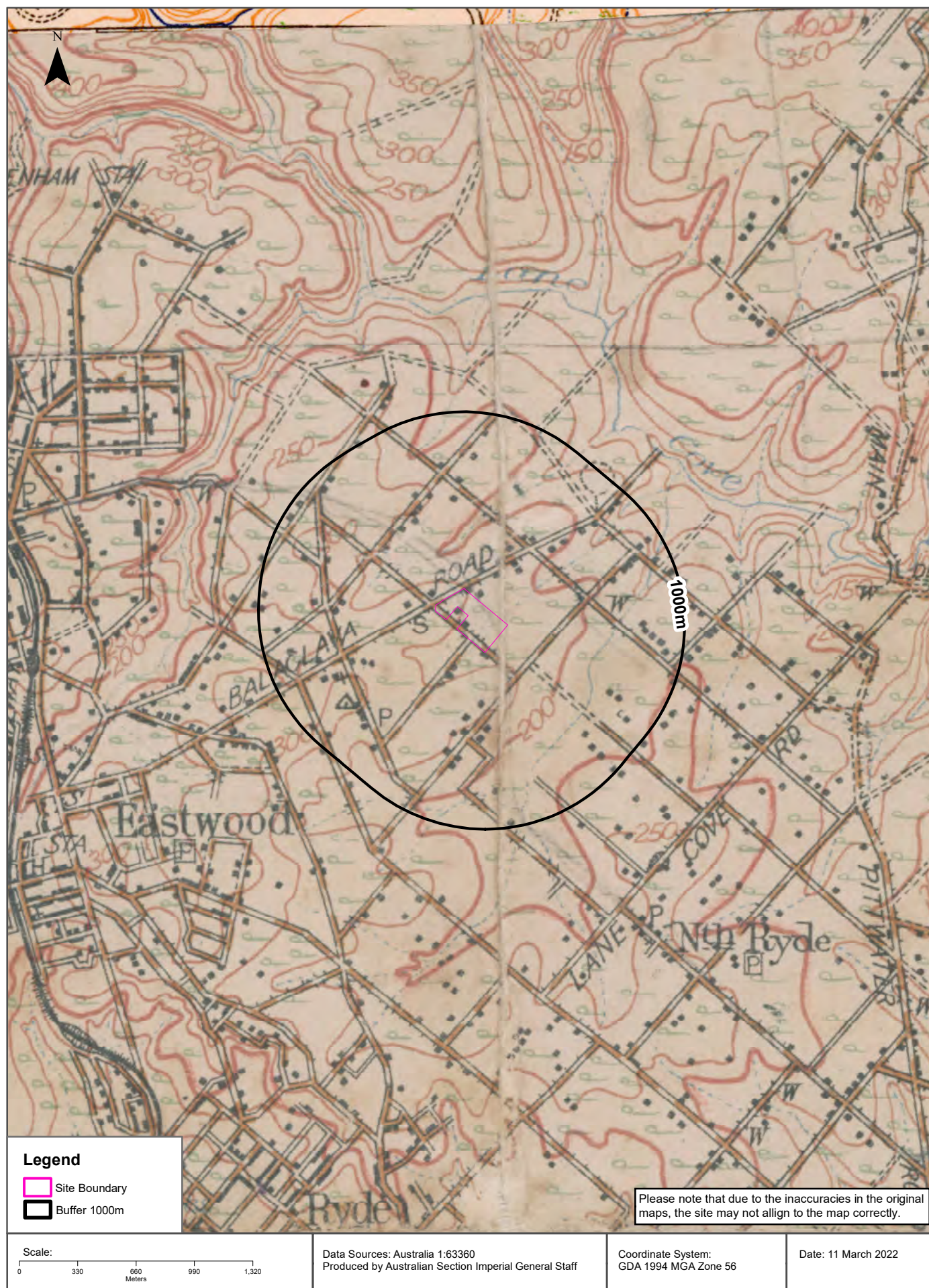


157 Balaclava Road, Marsfield, NSW 2113



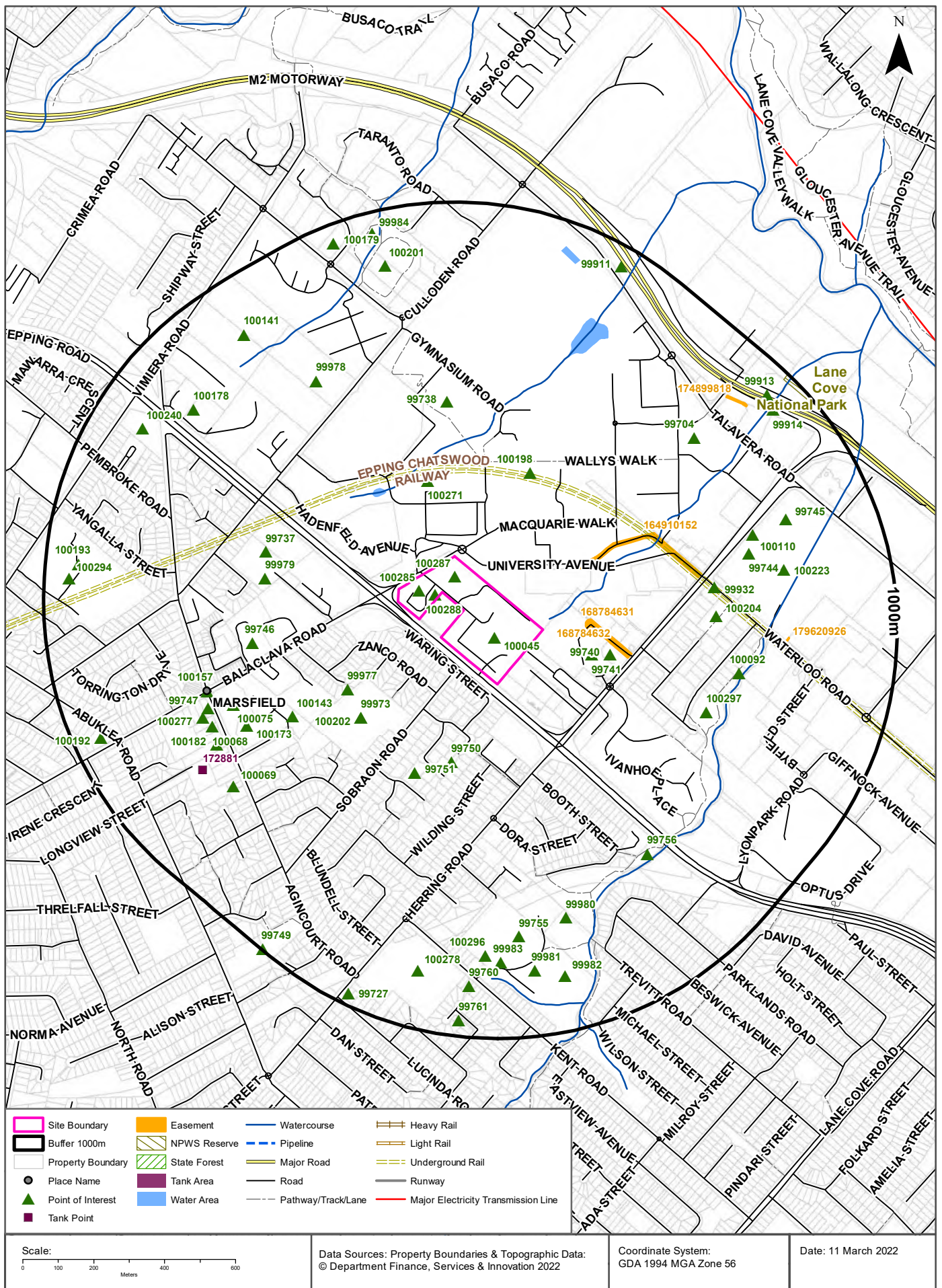
Historical Map 1917 - 1920

157 Balaclava Road, Marsfield, NSW 2113



Topographic Features

157 Balaclava Road, Marsfield, NSW 2113



Topographic Features

157 Balaclava Road, Marsfield, NSW 2113

Points of Interest

What Points of Interest exist within the dataset buffer?

Map Id	Feature Type	Label	Distance	Direction
100287	Nursing Home	BAPTISTCARE COOINDA COURT	0m	On-site
100288	Nursing Home	BAPTISTCARE SHALOM CENTRE	0m	On-site
100285	Nursing Home	BAPTISTCARE DOROTHY HENDERSON LODGE	0m	On-site
100045	Retirement Village	WILLANDRA VILLAGE	0m	On-site
99741	Education Facility	MORLING COLLEGE	155m	East
99740	Place Of Worship	BAPTIST CHURCH	203m	East
100271	Special School	MACQUARIE UNIVERSITY SPECIAL EDUCATION CENTRE	227m	North
99750	Park	LIBERTY PARK	255m	South
99977	Park	PLAYGROUND	283m	South West
100198	University	MACQUARIE UNIVERSITY	316m	North
100202	Sports Field	DUNBAR PARK	320m	South West
99973	Athletics Track	Athletics Track	320m	South West
99751	Park	AUSTRALIA II PARK	340m	South
99979	Picnic Area	PLAYGROUND	379m	West
99737	Sports Field	PIONEER PARK	390m	West
99746	Community Home	ST CATHERINE'S AGED CARE SERVICES	427m	West
99738	Sports Court	TENNIS COURTS	437m	North
100143	Retirement Village	SOUTHERN CROSS VILLAGE MARSFIELD	440m	South West
100204	Park	ELOUERA RESERVE	490m	East
99932	Railway Station	MACQUARIE UNIVERSITY RAILWAY STATION	499m	East
100297	Park	WILGA PARK	517m	East
100075	Community Facility	CURZON HALL	549m	West
100173	Nursing Home	SOUTHERN CROSS CARE MARSFIELD RESIDENTIAL AGED CARE	552m	South West
100092	Park	QUANDONG RESERVE	567m	East
100157	Suburb	MARSFIELD	595m	West
99747	Place Of Worship	CATHOLIC CHURCH	615m	West
99744	Sports Centre	MACQUARIE ICE RINK	620m	East
99978	Sports Centre	RIDING FOR THE DISABLED RYDE CENTRE	623m	North West
100068	Community Facility	ST ANTHONYS PARISH HALL	631m	South West
99756	Park	BOOTH RESERVE	638m	South East
100277	Primary School	ST ANTHONY'S CATHOLIC PRIMARY SCHOOL	641m	West

Map Id	Feature Type	Label	Distance	Direction
100110	Transport Interchange	MACQUARIE UNIVERSITY BUS INTERCHANGE	650m	East
100182	Place Of Worship	COMMUNITY CHURCH	652m	South West
99980	Sports Field	E L S HALL 3 FIELD	686m	South
99704	General Hospital	MACQUARIE UNIVERSITY HOSPITAL	688m	North East
100069	Community Facility	MARSFIELD SCOUT HALL	699m	South West
100223	Shopping Centre	MACQUARIE SHOPPING CENTRE	700m	East
99755	Sports Field	E L S HALL 1 AND 5 FIELD	715m	South
99745	Post Office	MACQUARIE CENTRE POST OFFICE	753m	East
100296	Park	E L S HALL PARK	766m	South
100178	Retirement Village	LEISURE LEA GARDENS	770m	North West
99983	Park	PLAYGROUND	786m	South
99981	Sports Centre	RYDE COMMUNITY SPORTS CENTRE	815m	South
100278	Primary School	KENT ROAD PUBLIC SCHOOL	838m	South
100141	Park	MARSFIELD PARK	841m	North West
99982	Sports Field	E L S HALL FIELD	843m	South
100201	Sports Field	WATERLOO PARK	844m	North
100240	Park	STEWART PARK	853m	North West
99760	Park	KENNETH PARK	855m	South
99914	Roadside Emergency Telephone	36	898m	North East
100193	Sports Field	T G MILLNER FIELD	907m	West
99913	Roadside Emergency Telephone	35	915m	North East
100192	Park	LYNELLE PARK	922m	West
100294	Club	EASTWOOD DIST RUGBY UNION CLUB	930m	West
99984	Sports Court	BASKETBALL	940m	North
99911	Roadside Emergency Telephone	34	943m	North East
100179	Park	TRAFALGAR RESERVE	947m	North
99761	Park	CATHERINE PARK	955m	South
99727	Park	LUCINDA PARK	967m	South
99749	Park	KOTARA PARK	998m	South West

Topographic Data Source: © Land and Property Information (2015)

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Topographic Features

157 Balaclava Road, Marsfield, NSW 2113

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
N/A	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
172881	Water	Operational		13/06/2001	727m	South West

Tanks Data Source: © Land and Property Information (2015)

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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
168784631	Primary	Right of way	16.105m & Var	121m	East
168784632	Primary	Right of way	16.105m	195m	East
164910152	Primary	Right of way		199m	North East
179620926	Primary	Right of way	2.01	687m	East
174899818	Primary	Right of way	VAR	834m	North East

Easements Data Source: © Land and Property Information (2015)

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Topographic Features

157 Balaclava Road, Marsfield, NSW 2113

State Forest

What State Forest exist within the dataset buffer?

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

State Forest Data Source: © NSW Department of Finance, Services & Innovation (2018)

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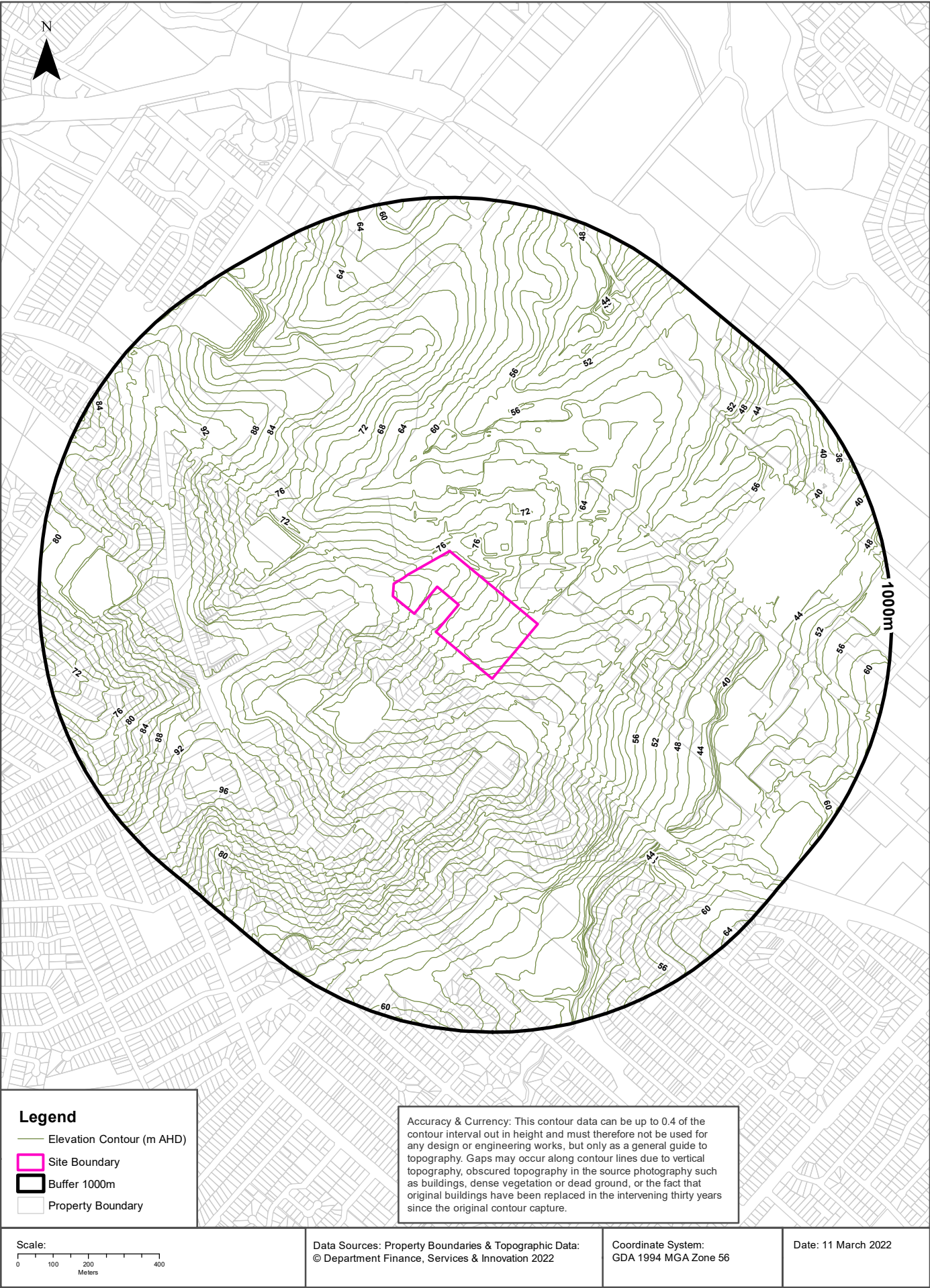
National Parks and Wildlife Service Reserves

What NPWS Reserves exist within the dataset buffer?

Reserve Number	Reserve Type	Reserve Name	Gazetted Date	Distance	Direction
N0083	NATIONAL PARK	Lane Cove National Park	24/04/1992	979m	North East

NPWS Data Source: © NSW Department of Finance, Services & Innovation (2018)

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Hydrogeology & Groundwater

157 Balaclava Road, Marsfield, NSW 2113

Hydrogeology

Description of aquifers within the dataset buffer:

Description	Distance	Direction
Porous, extensive aquifers of low to moderate productivity	0m	On-site

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

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Temporary Water Restriction (Botany Sands Groundwater Source) Order 2018

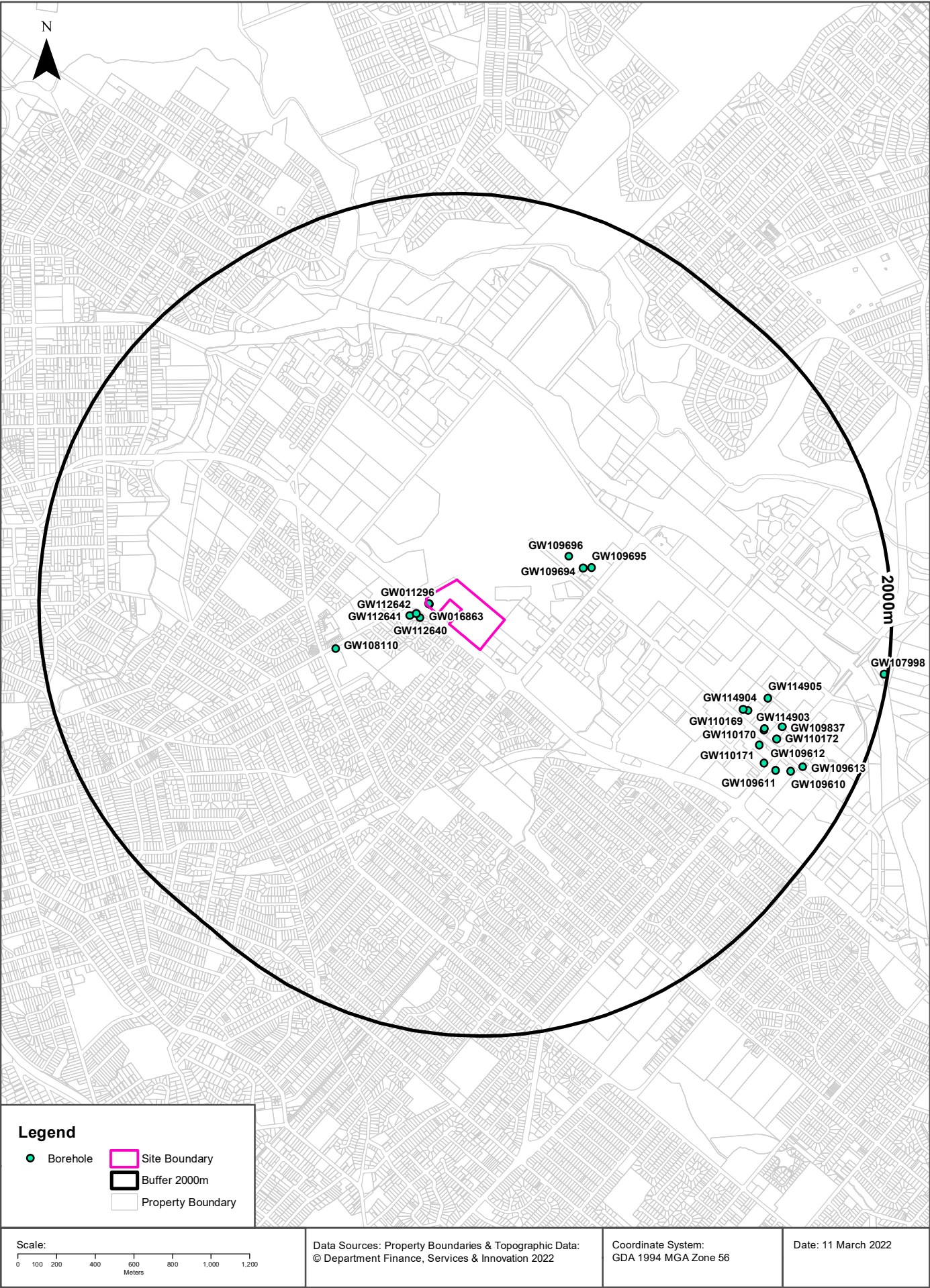
Temporary water restrictions relating to the Botany Sands aquifer within the dataset buffer:

Prohibition Area No.	Prohibition	Distance	Direction
N/A	No records in buffer		

Temporary Water Restriction (Botany Sands Groundwater Source) Order 2018 Data Source : NSW Department of Primary Industries

Groundwater Boreholes

157 Balaclava Road, Marsfield, NSW 2113



Hydrogeology & Groundwater

157 Balaclava Road, Marsfield, NSW 2113

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 bgl)	Yield (L/s)	Elev (AHD)	Dist	Dir
GW011 296	10BL004 479	Bore open thru rock	Private	Irrigation	Irrigation		01/09/1953	67.00	67.10	501-1000 ppm				0m	On-site
GW016 863	10BL007 238	Bore open thru rock	Private	Irrigation	Irrigation		01/01/1958	45.70	45.70	0-500 ppm				0m	On-site
GW112 642	10BL603 208	Bore	Private	Monitoring Bore	Monitoring Bore	Woolworths	05/08/2009	8.00	8.00					67m	West
GW112 640	10BL603 208	Bore	Private	Monitoring Bore	Monitoring Bore	Woolworths	05/08/2009	8.00	8.00					71m	West
GW112 641	10BL603 208	Bore	Private	Monitoring Bore	Monitoring Bore	Woolworths	05/08/2009	8.00	8.00					102m	West
GW109 696	10BL161 772	Bore	Other Govt	Monitoring Bore	Monitoring Bore		27/01/2000	35.50						467m	North East
GW109 694	10BL161 772	Bore	Other Govt	Monitoring Bore	Monitoring Bore		12/12/2001	46.40						487m	East
GW108 110	10BL164 626, 10BL602 106, 10WA10 9513	Bore		Recreation (groundwater), Test Bore	Recreation (groundwater)		01/02/2005	81.00	81.00	2500	7.30	2.500		518m	West
GW109 695	10BL161 772	Bore	Other Govt	Monitoring Bore	Monitoring Bore		18/01/2000	44.30						525m	East
GW114 904	10BL605 704	Bore	Other Govt	Monitoring Bore	Monitoring Bore		29/01/2015	9.00	9.00					1318m	East
GW110 169	10BL161 366	Bore	Private	Monitoring Bore	Monitoring Bore		09/09/2002	6.50	6.50					1346m	East
GW114 905	10BL605 704	Bore	Other Govt	Monitoring Bore	Monitoring Bore	Gvt Property NSW	29/01/2015	10.50	10.50					1422m	East
GW110 170	10BL161 366	Bore	Private	Monitoring Bore	Monitoring Bore		31/01/2000	43.00	43.00					1458m	East
GW114 903	10BL605 704	Bore	Other Govt	Monitoring Bore	Monitoring Bore	GOVERNMENT PROPERTY	29/01/2015	9.00	9.00					1459m	East
GW110 171	10BL161 366	Bore	Private	Monitoring Bore	Monitoring Bore		08/02/2000	36.10	36.10					1469m	South East
GW109 612	10BL161 773	Bore	Other Govt	Monitoring Bore	Monitoring Bore		18/12/2001	1.15						1534m	South East
GW110 172	10BL161 366	Bore	Private	Monitoring Bore	Monitoring Bore		09/03/2000	36.00	36.00					1536m	East
GW109 837	10BL161 221	Bore	Private	Monitoring Bore	Monitoring Bore		21/12/2002	36.60	36.60		18.00			1541m	East
GW109 611	10BL161 773	Bore	Other Govt	Monitoring Bore	Monitoring Bore		18/12/2001	1.00						1605m	South East
GW109 610	10BL161 773	Bore	Other Govt	Monitoring Bore	Monitoring Bore		09/12/2001	32.00						1676m	South East
GW109 613	10BL161 773	Bore	Other Govt	Monitoring Bore	Monitoring Bore		09/03/2000	41.80						1721m	South East
GW107 998	10BL163 679, 10BL600 207, 10WA10 9475	Bore		Industrial, Test Bore	Industrial		05/10/2004	180.00	180.00	2080	38.00	0.170		1984m	East

Borehole Data Source : NSW Department of Primary Industries - Office of Water / Water Administration Ministerial Corporation for all bores prefixed with GW. All other bores © Commonwealth of Australia (Bureau of Meteorology) 2015. Creative Commons 3.0 © Commonwealth of Australia <http://creativecommons.org/licenses/by/3.0/au/deed.en>

Hydrogeology & Groundwater

157 Balaclava Road, Marsfield, NSW 2113

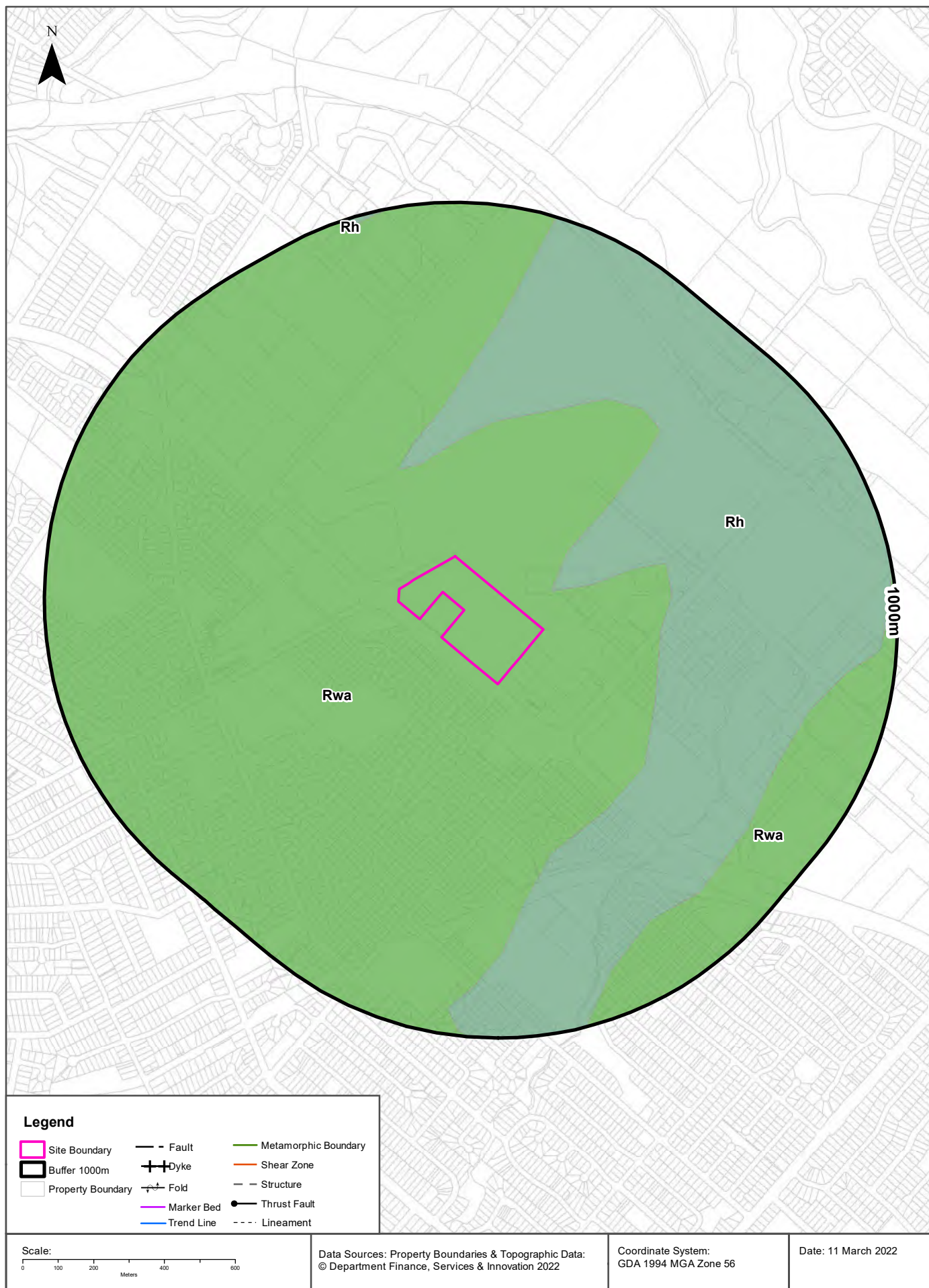
Driller's Logs

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

Groundwater No	Drillers Log	Distance	Direction
GW011296	0.00m-58.21m Sandstone 58.21m-65.22m Shale Water Supply 65.22m-67.05m Sandstone	0m	On-site
GW016863	0.00m-2.43m Clay Hard Sandy 2.43m-3.96m Sandstone 3.96m-5.79m Sandstone Yellow 5.79m-7.31m Sandstone White 7.31m-15.24m Sandstone Yellow 15.24m-17.67m Shale Sandy Water Supply 17.67m-24.99m Sandstone Yellow 24.99m-26.51m Shale Sandy Water Supply 26.51m-45.72m Sandstone White Silty	0m	On-site
GW112642	0.00m-2.00m FILL 2.00m-6.00m SAND 6.00m-8.00m SHALE	67m	West
GW112640	0.00m-2.00m FILL 2.00m-6.00m SAND 6.00m-8.00m SHALE	71m	West
GW112641	0.00m-2.00m FILL 2.00m-6.00m SAND 6.00m-8.00m SHALE	102m	West
GW108110	0.00m-15.00m SHALE WEATHERED 15.00m-81.00m SANDSTONE GREY	518m	West
GW114904	0.00m-1.80m FILL, GRAVELLY CLAY,BROWN FIRM 1.80m-2.00m IRONSTONE 2.00m-2.80m CLAY,GREY RED AND WHITE FIRM 2.80m-3.00m IRONSTONE 3.00m-3.20m CLAY GREY RED AND WHITE, FIRM 3.20m-3.40m IRONSTONE 3.40m-9.00m CLAY AND SHLAE,RED AND ORANGE, HARD	1318m	East
GW110169	0.00m-0.10m GRASS 0.10m-1.80m TOPSOIL,SILT,SAND,FINE,MEDIUM GRAINED,BROWN,DRY,FIRM 1.80m-3.00m SILTY CLAY,LOW PLASTICITY,GREY WITH ORANGE/RED MOTTLE,SOME IRONSTONE GRAVEL 3.00m-6.50m WEATHERED SHALE,BROWN,DRY,HARD, NO IRONSTONE GRAVEL	1346m	East
GW114905	0.00m-0.30m FILL, SANDY GRAVEL,BLACK 0.30m-2.20m CLAY AND SHALE ORANGE AND BROWN,SOFT 2.20m-10.50m SHALE GREY SOFT	1422m	East
GW110170	0.00m-0.10m ASPHALTIC CONCRETE,(30mm thick) 0.10m-0.25m FILL,SANDY GRAVEL,MEDIUM GRAINED 0.25m-5.25m SILTY CLAY,RED/BROWN AND GREY,MEDIUM-HIGH PLASTICITY,IRONSTONE 5.25m-6.50m SHALE,DARK GREY 6.50m-15.00m SHALE,DARK GREY 15.00m-21.20m SHALE AND SANDSTONE,SHALE DRK GREY,SANDSTONE L/GREY 21.20m-25.85m SANDSTONE L/GREY,FINE GRAINED,LAMINATED,SHALE 25.85m-39.50m SANDSTONE L/GREY,FINE TO MEDIUM GRAINED 39.50m-42.20m SANDSTONE,L/GREY,MEDIUM GRAINED 42.20m-43.00m SANDSTONE L/GREY,FINE TO MEDIUM GRAINED,MEDIUM BEDDED	1458m	East
GW114903	0.00m-0.30m FILL, SANDY GRAVEL, BLACK 0.30m-2.10m CLAY AND WEATHERED SHALE,RED,ORANGE,SOFT 2.10m-9.00m SHALE, RED AND GREY,SOFT	1459m	East

Groundwater No	Drillers Log	Distance	Direction
GW110171	0.00m-1.00m FILL,SANDY CLAYEY GRAVEL,BROWN,FINE TO COARSE 1.00m-2.30m SILTY CLAY,LIGHT GREY AND BROWN,HIGH PLASTICITY. 2.30m-3.40m SHALE,GREY AND BROWN,FINE TO COARSE GRAINED IRONSTONE,GRAVEL BANDS 3.40m-4.65m SHALE,DARK GREY AND BROWN ,VERY LOW STRENGH 4.65m-5.75m SHALE DARK GREY AND BROWN 5.75m-6.20m CORE LOSS (5.75m-6.2m) 6.20m-8.50m SHALE DARK GREY 8.50m-9.20m CORE LOOS (8.5m-9.2m) 9.20m-10.90m SHALE DRK GREY 10.90m-12.50m CORE LOSS (10.9m-12.5m) 12.50m-13.00m SHALE DARK GREY 13.00m-15.30m SHALE DARK GREY WITH LIGHT GRAINED SANDSTONE 15.30m-18.00m SHALE AND SANDSTONE 18.00m-22.40m SANDSTONE L/GREY,FINE GRAINED 22.40m-35.70m SANDSTONE L/GREY,MEDIUM GRAINED 35.70m-36.10m SANDSTONE L/GREY,FINE GRAINED	1469m	South East
GW110172	0.00m-0.10m SILTY SAND, BROWN,FINE GRAINED WITH ROOT,FIBRE 0.10m-0.40m FILL,(GRAVELLY SAND)BROWN,FINE TO MEDIUM GRAINED 0.40m-0.80m FILL,GRAVELLY SILTY CLAY,BROWN/GREY,MEDIUM PLASTICITY 0.80m-1.40m SILTY CLAY RED BROWN,MEDIUM TO HIGH PLASTICITY,IRONSTONE 1.40m-2.75m SILTY CLAY.RED. BROWN GREY,TRACES OF IRONSTONE/GRAVEL 2.75m-3.20m CORE LOSS 0.45m 3.20m-3.75m SHALE,LIGHT GREY/RED-BROWN WITH BABNDS OF IRONSTAINED SHALE 3.75m-8.30m SHALE,DARK GREY/BROW, IRONSTAINED 8.30m-13.30m SHALE,DARK GREY 13.30m-16.75m SHALE,DARK GREY,WITH FINE GRAINED LIGHT-GREY SANDSTONE 16.75m-20.20m SANDSTONE LIGHT GREY,FINE GRAINED,SHALE LAMINATIONS 20.20m-22.40m SANDSTONE L/GREY,FINE GRAINED 22.40m-27.90m SANDSTONE L/GREY,MEDIUM GRAINED 27.90m-30.10m SANDSTONE,L/GREY,MEDIUM COARSE GRAINED,GRAINED SHALE GRAVELS 30.10m-36.00m SANDSTONE LIGHT GREY,FINE TO MEDIUM GRAINED	1536m	East
GW109837	0.00m-3.60m FILL 3.60m-4.80m CLAY 4.80m-8.40m SHALE 8.40m-18.00m FINE SANDSTONE 18.00m-36.60m COARSE SANDSTONE	1541m	East
GW107998	0.00m-1.00m FILL 1.00m-6.50m SANDSTONE L/BROWN 6.50m-8.00m SHALE 8.00m-108.70m SANDSTONE GREY 108.70m-109.00m SANDSTONE FINE QUARTZ 109.00m-153.00m SANDSTONE GREY 153.00m-158.00m SANDSTONE D/GREY 158.00m-160.00m SANDSTONE FINE QUARTZ 160.00m-180.00m SANDSTONE GREY	1984m	East

Drill Log Data Source: NSW Department of Primary Industries - Office of Water / Water Administration Ministerial Corp
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Geology

157 Balaclava Road, Marsfield, NSW 2113

Geological Units 1:100,000

What are the Geological Units within the dataset buffer?

Symbol	Description	Unit Name	Group	Sub Group	Age	Dom Lith	Map Sheet	Dist	Dir
Rwa	Black to dark grey shale and laminate	Ashfield Shale	Wianamatta Group		Triassic		Sydney	0m	On-site
Rh	Medium to coarse grained quartz sandstone, very minor shale and laminate lenses				Triassic		Sydney	99m	East

Geological Structures 1:100,000

What are the Geological Structures within the dataset buffer?

Feature	Name	Description	Map Sheet	Distance	Direction
N/A	No records in buffer				

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

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Naturally Occurring Asbestos Potential

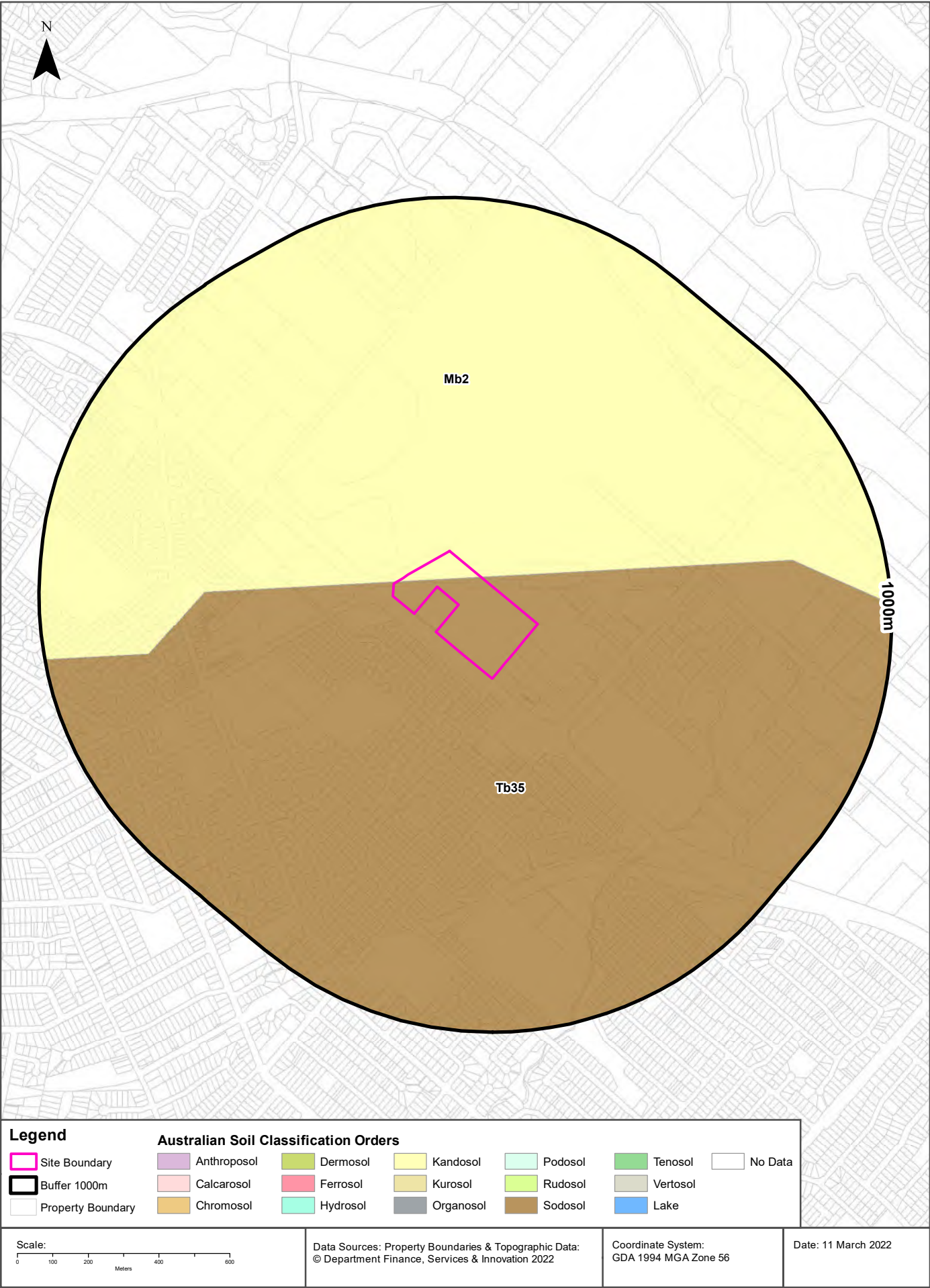
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Naturally Occurring Asbestos Potential

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												

Naturally Occurring Asbestos Potential Data Source: © State of New South Wales through NSW Department of Industry, Resources & Energy



Soils

157 Balaclava Road, Marsfield, NSW 2113

Atlas of Australian Soils

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

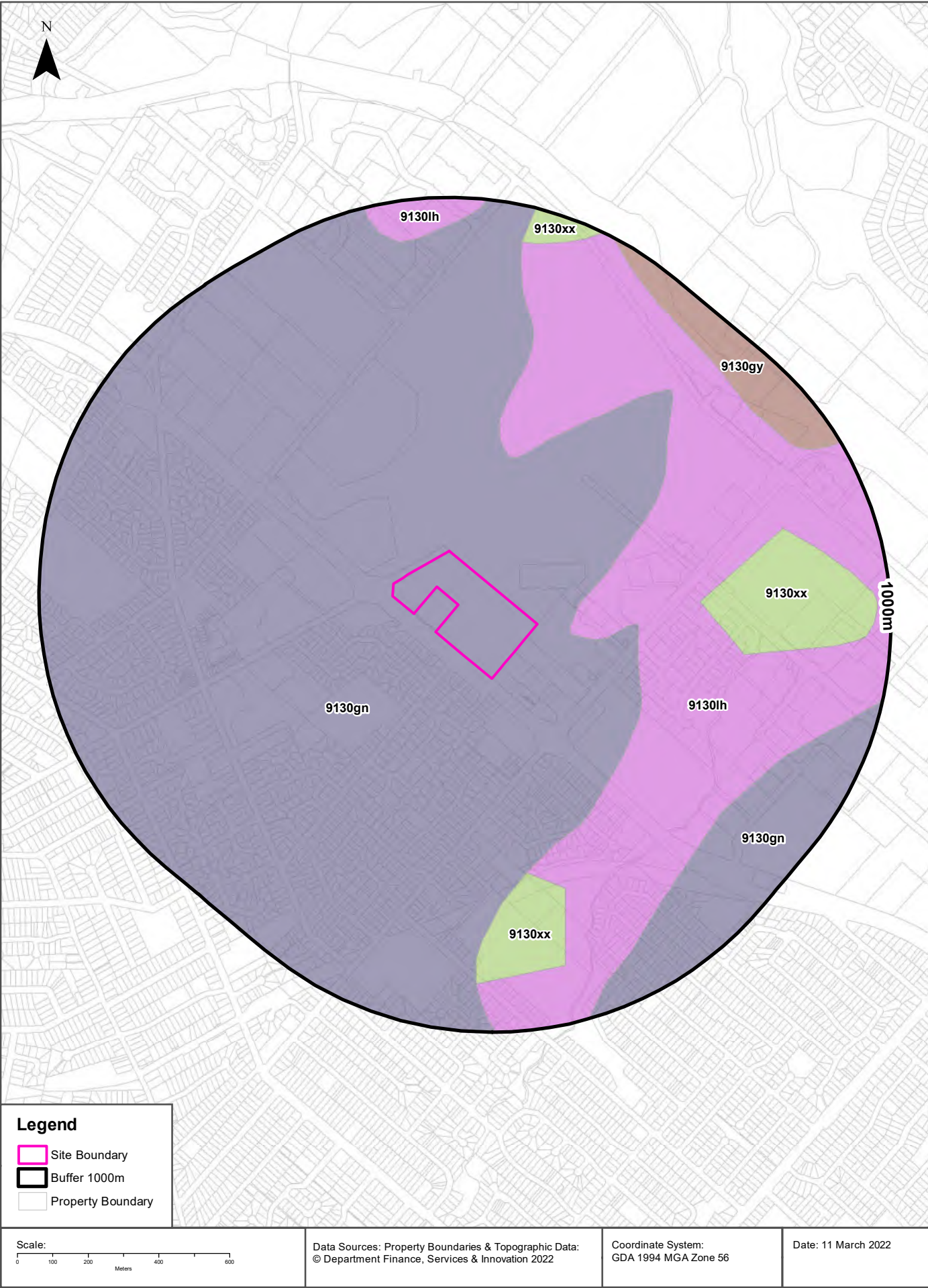
Map Unit Code	Soil Order	Map Unit Description	Distance	Direction
Tb35	Sodosol	Dissected plateau remnants--flat to undulating ridge tops with moderate to steep side slopes: chief soils are hard acidic yellow and yellow mottled soils (Dy3.41), (Dy2.21), and (Dy2.41) and hard acidic red soils (Dr2.21); 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	On-site
Mb2	Kandosol	Dissected sandstone plateau of moderate to strong relief with sandstone pillars, ledges, and slabs-- level to undulating ridges, irregularly benched slopes, steep ridges, cliffs, canyons, narrow sandy valleys: chief soils are (i) on areas of gentle to moderate relief, acid yellow leached earths (Gn2.74) and (Gn2.34) and acid leached yellow earths (Gn2.24)- sometimes these soils contain ironstone gravel; and (ii) on, or adjacent to, areas of strong relief, siliceous sands (Uc1.2), leached sands (Uc2.12) and (Uc2.2), and shallow forms of the above (Gn2) soils. Associated are: (i) on flat to gently undulating remnants of the original plateau surface, leached sands (Uc2.3), siliceous sands (Uc1.2), sandy earths (Uc5.22), and (Gn2) soils as for (i) above (these areas are in part comparable with unit Cb29); (ii) on flat ironstone gravelly remnants of the original plateau surface, (Gn2) soils as for unit Mb5(i); (iii) on gently undulating ridges where interbedded shales are exposed, shallow, often stony (Dy3.41), (Dr2.21), and related soils similar to unit Tb35; (iv) narrow valleys of (Uc2.3) soils flanked by moderate slopes of (Dy3.41) soils; (v) escarpments of steep hills with shallow (Dy) and (Dr) soils between sandstone pillars; and (vi) shallow (Um) soils, such as (Um6.21) on steep hills of basic rocks. As mapped, minor areas of units Mg20, Mm1, and Mw8 are included. Data are limited.	0m	On-site

Atlas of Australian Soils Data Source: CSIRO

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Soil Landscapes of Central and Eastern NSW

157 Balaclava Road, Marsfield, NSW 2113



Soils

157 Balaclava Road, Marsfield, NSW 2113

Soil Landscapes of Central and Eastern NSW

Soil Landscapes of Central and Eastern NSW within the dataset buffer:

Soil Code	Name	Distance	Direction
9130gn	Glenorie	0m	On-site
9130lh	Lucas Heights	92m	East
9130xx	Disturbed Terrain	465m	East
9130gy	Gymea	857m	North East

Soil Landscapes of Central and Eastern NSW: NSW Department of Planning, Industry and Environment
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Acid Sulfate Soils

157 Balaclava Road, Marsfield, NSW 2113

Environmental Planning Instrument - Acid Sulfate Soils

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

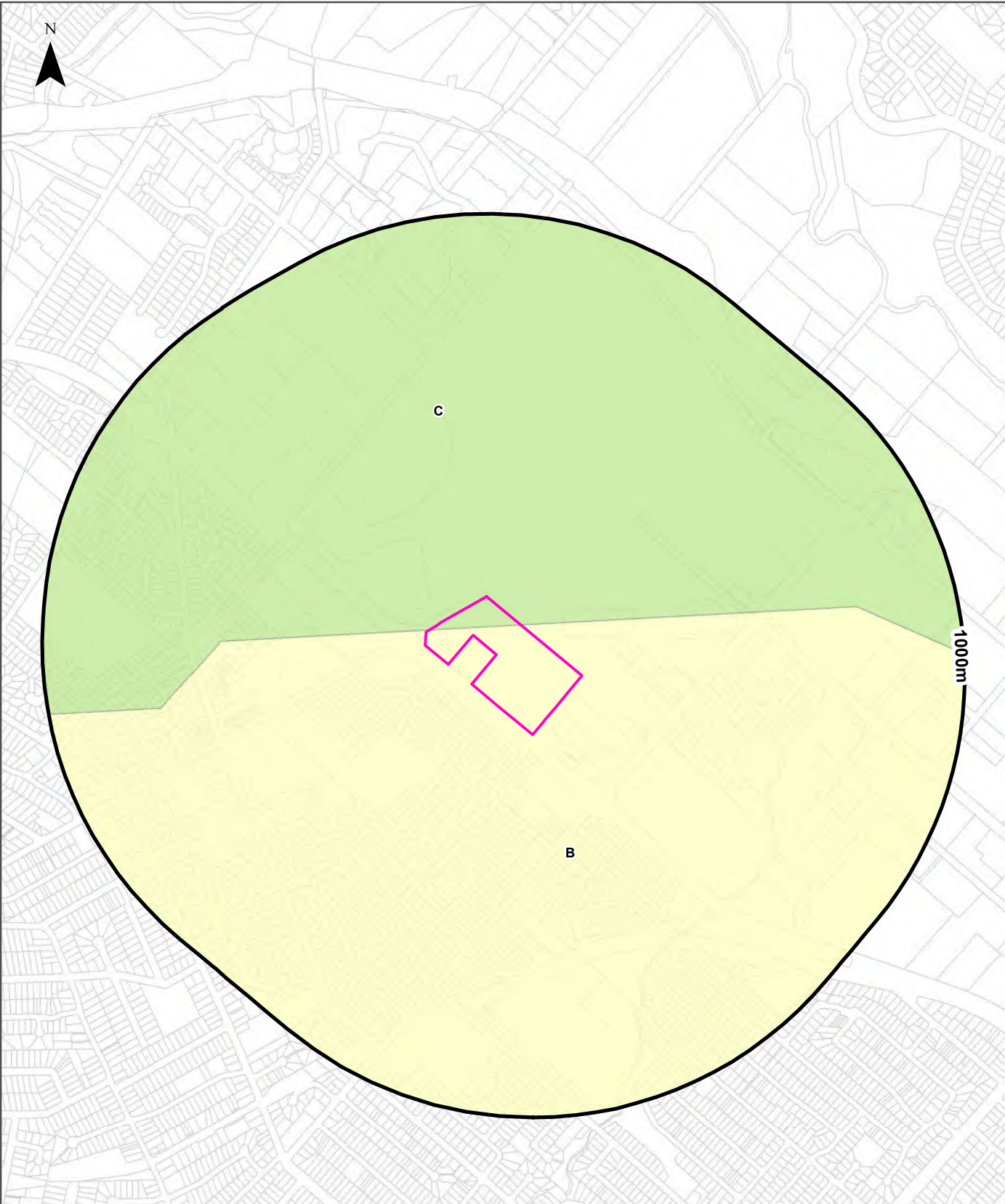
Soil Class	Description	EPI Name
N/A		

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

Soil Class	Description	EPI Name	Distance	Direction
N/A				

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Legend	
Site Boundary	Probability of occurrence of Acid Sulfate Soils
Buffer 1000m	A. High (>70%)
Property Boundary	C. Extremely Low (1-5%)
	B. Low (6-70%)
	D. No Chance (0%)
	No Data

Scale: 0 100 200 400 600 Meters	Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2022	Coordinate System: GDA 1994 MGA Zone 56	Date: 11March 2022
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Acid Sulfate Soils

157 Balaclava Road, Marsfield, NSW 2113

Atlas of Australian Acid Sulfate Soils

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

Class	Description	Distance	Direction
B	Low Probability of occurrence. 6-70% chance of occurrence.	0m	On-site
C	Extremely low probability of occurrence. 1-5% chance of occurrence with occurrences in small localised areas.	0m	On-site

Atlas of Australian Acid Sulfate Soils Data Source: CSIRO

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Dryland Salinity

157 Balaclava Road, Marsfield, NSW 2113

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		

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.

Mining

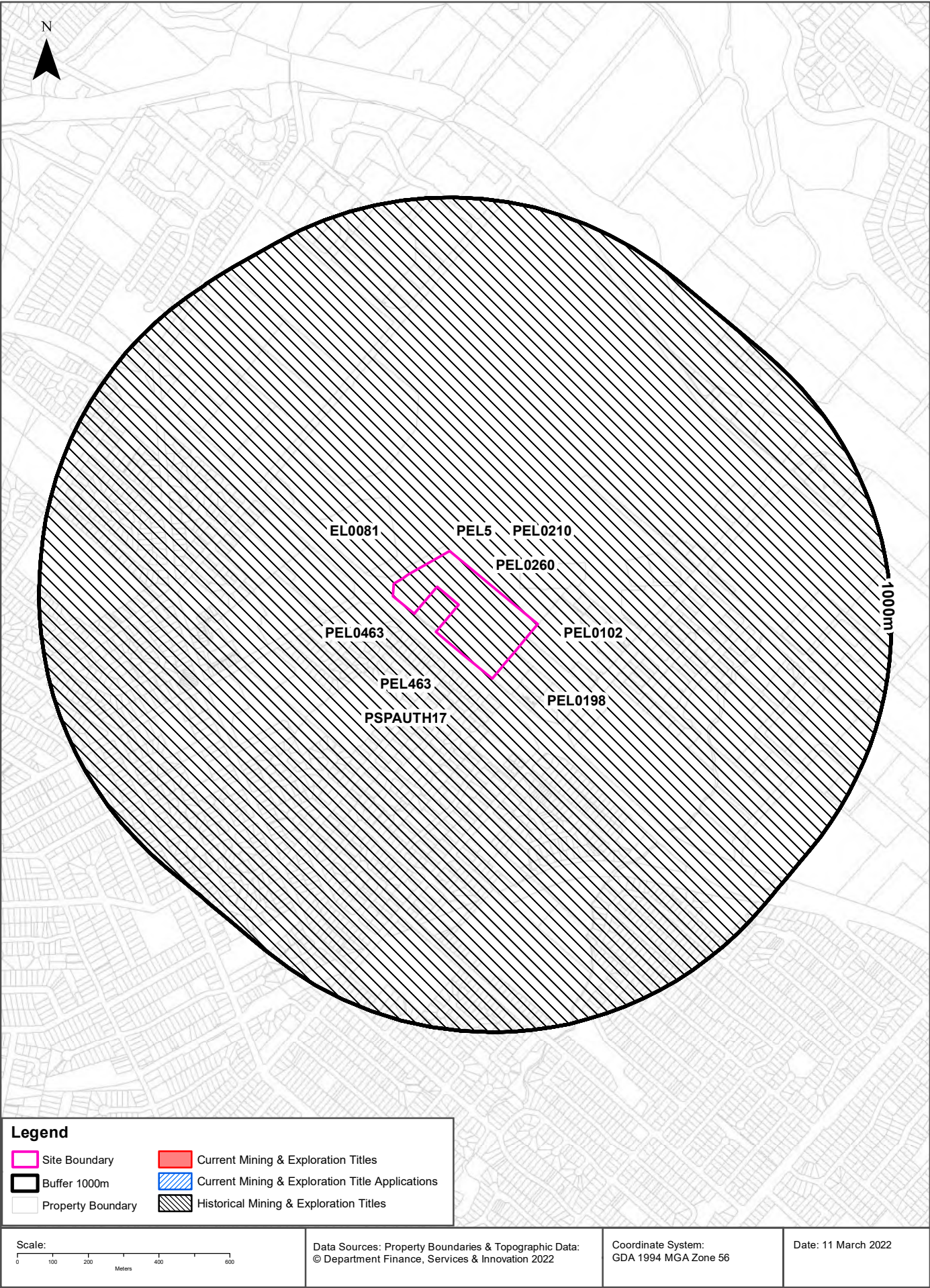
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Mining Subsidence Districts

Mining Subsidence Districts within the dataset buffer:

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

Mining Subsidence District Data Source: © Land and Property Information (2016)
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Mining

157 Balaclava Road, Marsfield, NSW 2113

Current Mining & Exploration Titles

Current Mining & Exploration Titles within the dataset buffer:

Title Ref	Holder	Grant Date	Expiry Date	Last Renewed	Operation	Resource	Minerals	Dist	Dir
N/A	No records in buffer								

Current Mining & Exploration Titles Data Source: © State of New South Wales through NSW Department of Industry

Current Mining & Exploration Title Applications

Current Mining & Exploration Title Applications within the dataset buffer:

Application Ref	Applicant	Application Date	Operation	Resource	Minerals	Dist	Dir
N/A	No records in buffer						

Current Mining & Exploration Title Applications Data Source: © State of New South Wales through NSW Department of Industry

Mining

157 Balaclava Road, Marsfield, NSW 2113

Historical Mining & Exploration Titles

Historical Mining & Exploration Titles within the dataset buffer:

Title Ref	Holder	Start Date	End Date	Resource	Minerals	Dist	Dir
PSPAUTH17	MACQUARIE ENERGY PTY LTD	8/03/2007	7/03/2008	PETROLEUM	Petroleum	0m	On-site
PEL0260	NORTH BULLI COLLIERIES PTY LTD, AGL PETROLEUM OPERATIONS PTY LTD, THE AUSTRALIAN GAS LIGHT CO.	9/09/1981	8/03/1993	PETROLEUM	Petroleum	0m	On-site
PEL0198	JOHN STREVS (TERRIGAL) NL			PETROLEUM	Petroleum	0m	On-site
PEL463	DART ENERGY (APOLLO) PTY LTD			MINERALS		0m	On-site
PEL5	AGL UPSTREAM INVESTMENTS PTY LIMITED			MINERALS		0m	On-site
EL0081	CONTINENTAL OIL CO OF AUSTRALIA LIMITED	01 Feb 1967	01 Feb 1968	MINERALS		0m	On-site
PEL0463	DART ENERGY (APOLLO) PTY LTD	22/10/2008	6/03/2015	PETROLEUM	Petroleum	0m	On-site
PEL0102	AUSTRALIAN OIL AND GAS CORPORATION LTD			PETROLEUM	Petroleum	0m	On-site
PEL0210	THE AUSTRALIAN GAS LIGHT COMPANY (AGL), NORTH BULLI COLLIERIES PTY LTD			PETROLEUM	Petroleum	0m	On-site

Historical Mining & Exploration Titles Data Source: © State of New South Wales through NSW Department of Industry

State Environmental Planning Policy

157 Balaclava Road, Marsfield, NSW 2113

State Significant Precincts

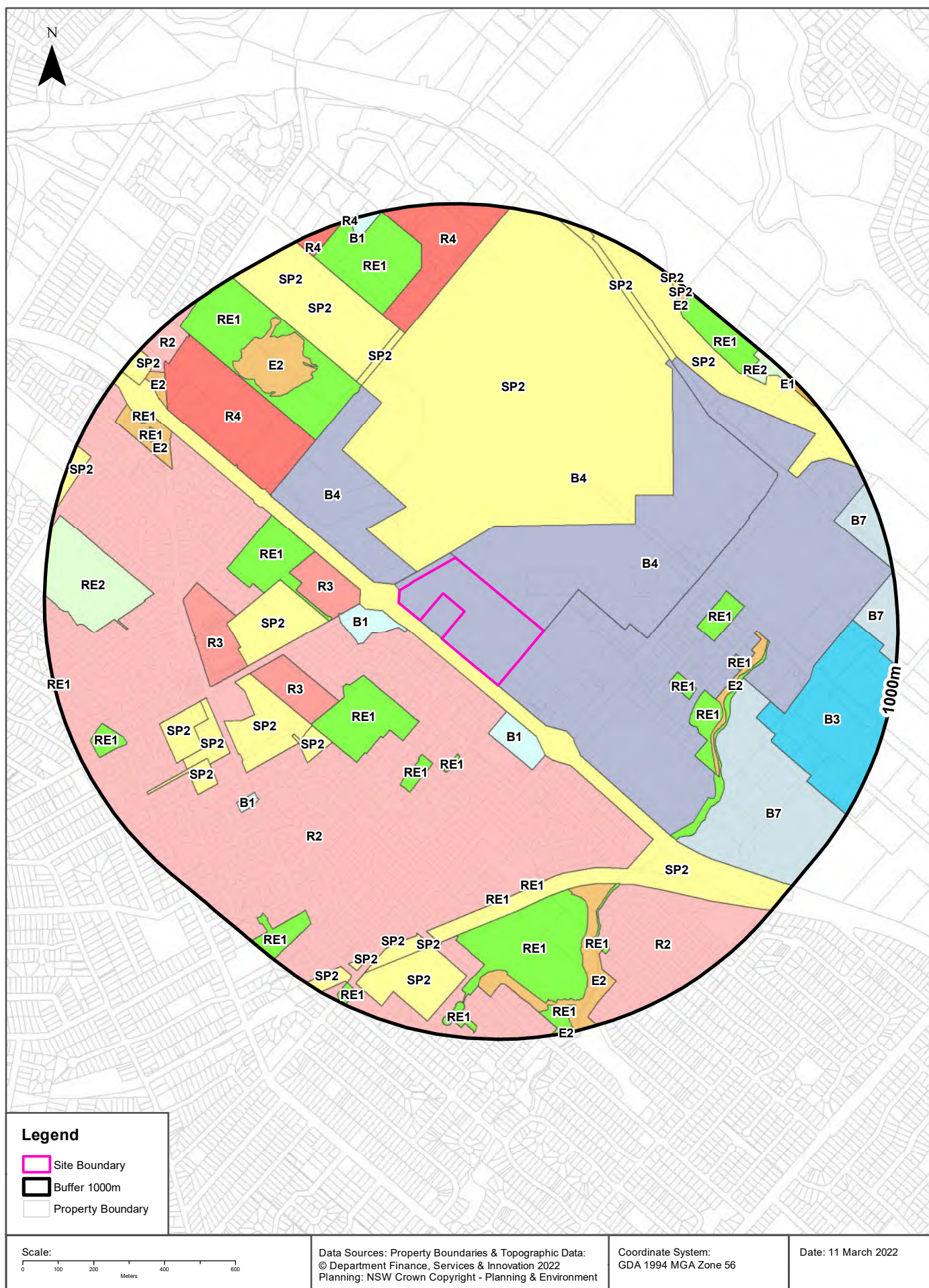
What SEPP State Significant Precincts exist within the dataset buffer?

Map Id	Precinct	EPI Name	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
N/A	No records in buffer							

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EPI Planning Zones

157 Balaclava Road, Marsfield, NSW 2113



Environmental Planning Instrument

157 Balaclava Road, Marsfield, NSW 2113

Land Zoning

What EPI Land Zones exist within the dataset buffer?

Zone	Description	Purpose	EPI Name	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
B4	Mixed Use		Ryde Local Environmental Plan 2014	29/07/2016	29/07/2016	18/01/2019	Amendment No 8	0m	On-site
B4	Mixed Use		State Environmental Planning Policy (State Significant Precincts) 2005	24/03/2016	24/03/2016	24/03/2016	State Environmental Planning Policy (Major Development) Amendment (State Significant Precincts) 2016	0m	North East
SP2	Infrastructure	Classified Road	Ryde Local Environmental Plan 2014	29/07/2016	29/07/2016	18/01/2019	Amendment No 8	0m	South
SP2	Infrastructure	Educational Establishment	State Environmental Planning Policy (State Significant Precincts) 2005	24/03/2016	24/03/2016	24/03/2016	State Environmental Planning Policy (Major Development) Amendment (State Significant Precincts) 2016	20m	North
B4	Mixed Use		State Environmental Planning Policy (State Significant Precincts) 2005	24/03/2016	24/03/2016	24/03/2016	State Environmental Planning Policy (Major Development) Amendment (State Significant Precincts) 2016	20m	North West
R2	Low Density Residential		Ryde Local Environmental Plan 2014	18/01/2019	18/01/2019	18/01/2019	Amendment No 23	40m	South West
B1	Neighbourhood Centre		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		41m	West
B1	Neighbourhood Centre		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		76m	South
R3	Medium Density Residential		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		110m	West
RE1	Public Recreation		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		195m	West
SP2	Infrastructure	Convent and Hospital	Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		203m	West
RE1	Public Recreation		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		221m	South West
RE1	Public Recreation		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		224m	South
RE1	Public Recreation		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		287m	South
R3	Medium Density Residential		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		322m	West
RE1	Public Recreation		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		382m	East
SP2	Infrastructure	Educational Establishment	Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		423m	South West
SP2	Infrastructure	Place of Public Worship	Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		423m	South West
RE1	Public Recreation		Ryde Local Environmental Plan 2014	29/07/2016	29/07/2016	18/01/2019	Amendment No 8	432m	East

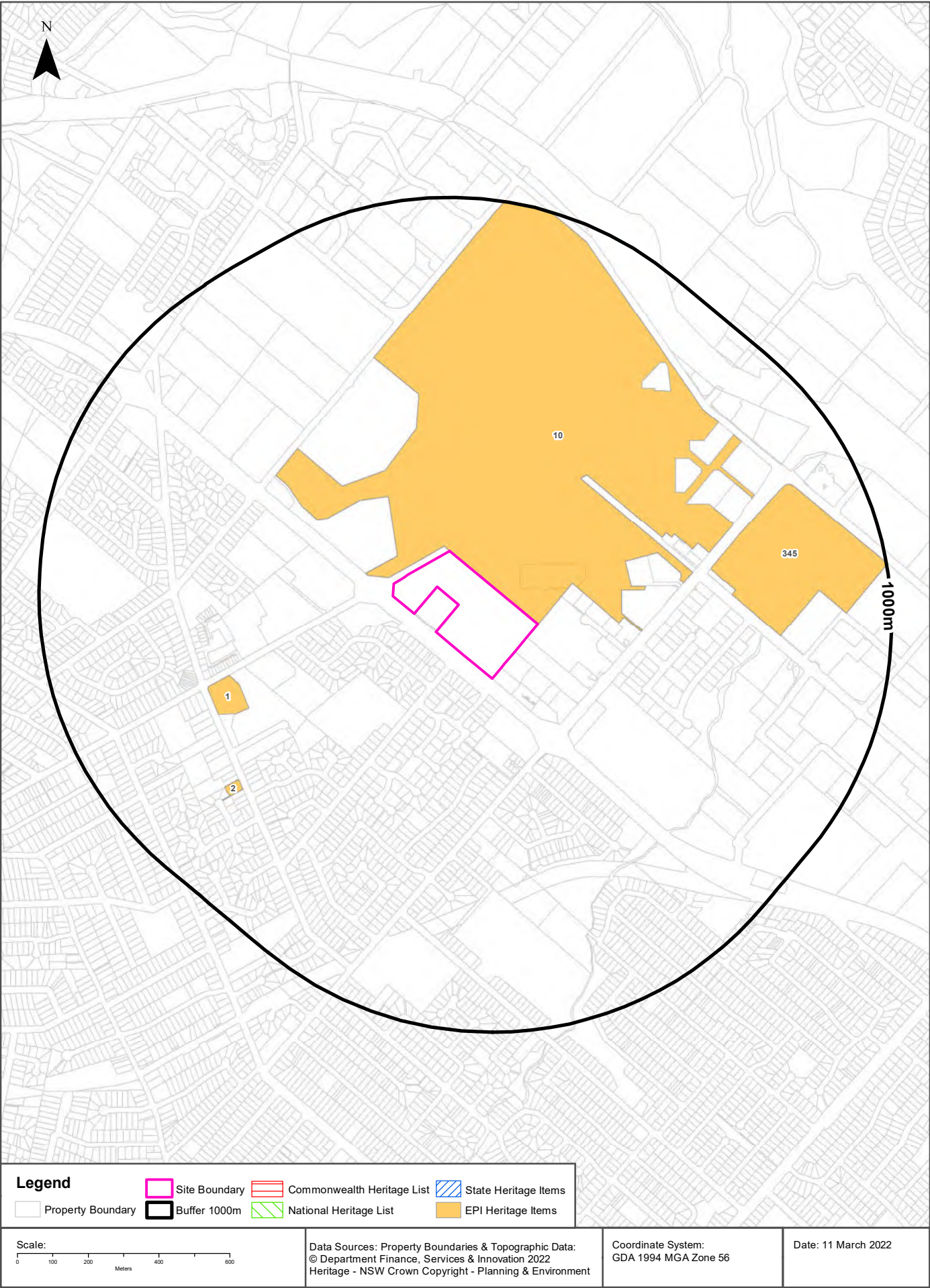
Zone	Description	Purpose	EPI Name	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
R4	High Density Residential		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		450m	North West
R3	Medium Density Residential		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		461m	West
RE1	Public Recreation		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		475m	South East
RE1	Public Recreation		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		486m	North West
E2	Environmental Conservation		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		521m	East
RE1	Public Recreation		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		531m	East
SP2	Infrastructure	Educational Establishment	Ryde Local Environmental Plan 2014	10/04/2014	10/04/2014	18/01/2019	Amendment No 2	555m	North
RE1	Public Recreation		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		562m	South
B7	Business Park		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		563m	South East
SP2	Infrastructure	Educational Establishment	Ryde Local Environmental Plan 2014	01/10/2015	01/10/2015	18/01/2019	State Environmental Planning Policy (Major Development) Amendment (Ryde) 2015	572m	North West
SP2	Infrastructure	Educational Establishment	State Environmental Planning Policy (State Significant Precincts) 2005	24/03/2016	24/03/2016	24/03/2016	State Environmental Planning Policy (Major Development) Amendment (State Significant Precincts) 2016	572m	North West
RE1	Public Recreation		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		593m	South
SP2	Infrastructure	Place of Public Worship	Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		606m	South West
RE1	Public Recreation		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		607m	South
E2	Environmental Conservation		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		607m	South
SP2	Infrastructure	Educational Establishment	Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		626m	West
E2	Environmental Conservation		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		640m	North West
B3	Commercial Core		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		647m	East
RE1	Public Recreation		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		650m	South
R4	High Density Residential		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		650m	North
B1	Neighbourhood Centre		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		672m	South West
RE2	Private Recreation		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		692m	West
SP2	Infrastructure	Water Supply System	Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		697m	South West
RE1	Public Recreation		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		718m	North
E2	Environmental Conservation		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		728m	North West
SP2	Infrastructure	Classified Road	Ryde Local Environmental Plan 2014	10/04/2015	10/04/2015	18/01/2019	Amendment No 2	735m	South
SP2	Infrastructure	Educational Establishment	Ryde Local Environmental Plan 2014	10/04/2015	10/04/2015	18/01/2019	Amendment No 2	758m	South
SP2	Infrastructure	Educational Establishment	Ryde Local Environmental Plan 2014	10/04/2015	10/04/2015	18/01/2019	Amendment No 2	774m	South
RE1	Public Recreation		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		811m	North West

Zone	Description	Purpose	EPI Name	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
SP2	Infrastructure	Educational Establishment	Ryde Local Environmental Plan 2014	29/07/2016	29/07/2016	18/01/2019	Amendment No 8	814m	North East
E2	Environmental Conservation		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		831m	North West
RE1	Public Recreation		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		835m	South West
SP2	Infrastructure	Classified Road	Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		847m	South
RE1	Public Recreation		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		859m	North West
RE1	Public Recreation		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		863m	West
B7	Business Park		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		873m	East
RE1	Public Recreation		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		899m	South
R2	Low Density Residential		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		905m	North West
SP2	Infrastructure	Classified Road	Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		909m	South
RE1	Public Recreation		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		912m	North East
RE1	Public Recreation		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		912m	South
RE2	Private Recreation		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		921m	North East
SP2	Infrastructure	Educational Establishment	Ryde Local Environmental Plan 2014	29/07/2016	29/07/2016	18/01/2019	Amendment No 8	937m	North West
R4	High Density Residential		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		940m	North West
B1	Neighbourhood Centre		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		940m	North
RE1	Public Recreation		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		941m	South
E2	Environmental Conservation		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		945m	North East
SP2	Infrastructure	Research Facility	Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		950m	West
SP2	Infrastructure	Educational Establishment	State Environmental Planning Policy (State Significant Precincts) 2005	24/03/2016	24/03/2016	24/03/2016	State Environmental Planning Policy (Major Development) Amendment (State Significant Precincts) 2016	961m	North East
SP2	Infrastructure	Educational Establishment	Ryde Local Environmental Plan 2014	01/10/2015	01/10/2015	18/01/2019	State Environmental Planning Policy (Major Development) Amendment (Ryde) 2015	961m	North East
E1	National Parks and Nature Reserves		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		979m	North East
RE1	Public Recreation		Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	18/01/2019		985m	West

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Heritage Items

157 Balaclava Road, Marsfield, NSW 2113



Heritage

157 Balaclava Road, Marsfield, NSW 2113

Commonwealth Heritage List

What are the Commonwealth Heritage List Items located within the dataset buffer?

Place Id	Name	Address	Place File No	Class	Status	Register Date	Distance	Direction
N/A	No records in buffer							

Heritage Data Source: Australian Government Department of the Environment and Energy - Heritage Branch
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National Heritage List

What are the National Heritage List Items located within the dataset buffer?

Note. Please click on Place Id to activate a hyperlink to online website.

Place Id	Name	Address	Place File No	Class	Status	Register Date	Distance	Direction
N/A	No records in buffer							

Heritage Data Source: Australian Government Department of the Environment and Energy - Heritage Branch
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State Heritage Register - Curtilages

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

Map Id	Name	Address	LGA	Listing Date	Listing No	Plan No	Distance	Direction
N/A	No records in buffer							

Heritage Data Source: NSW Crown Copyright - Office of Environment & Heritage
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Environmental Planning Instrument - Heritage

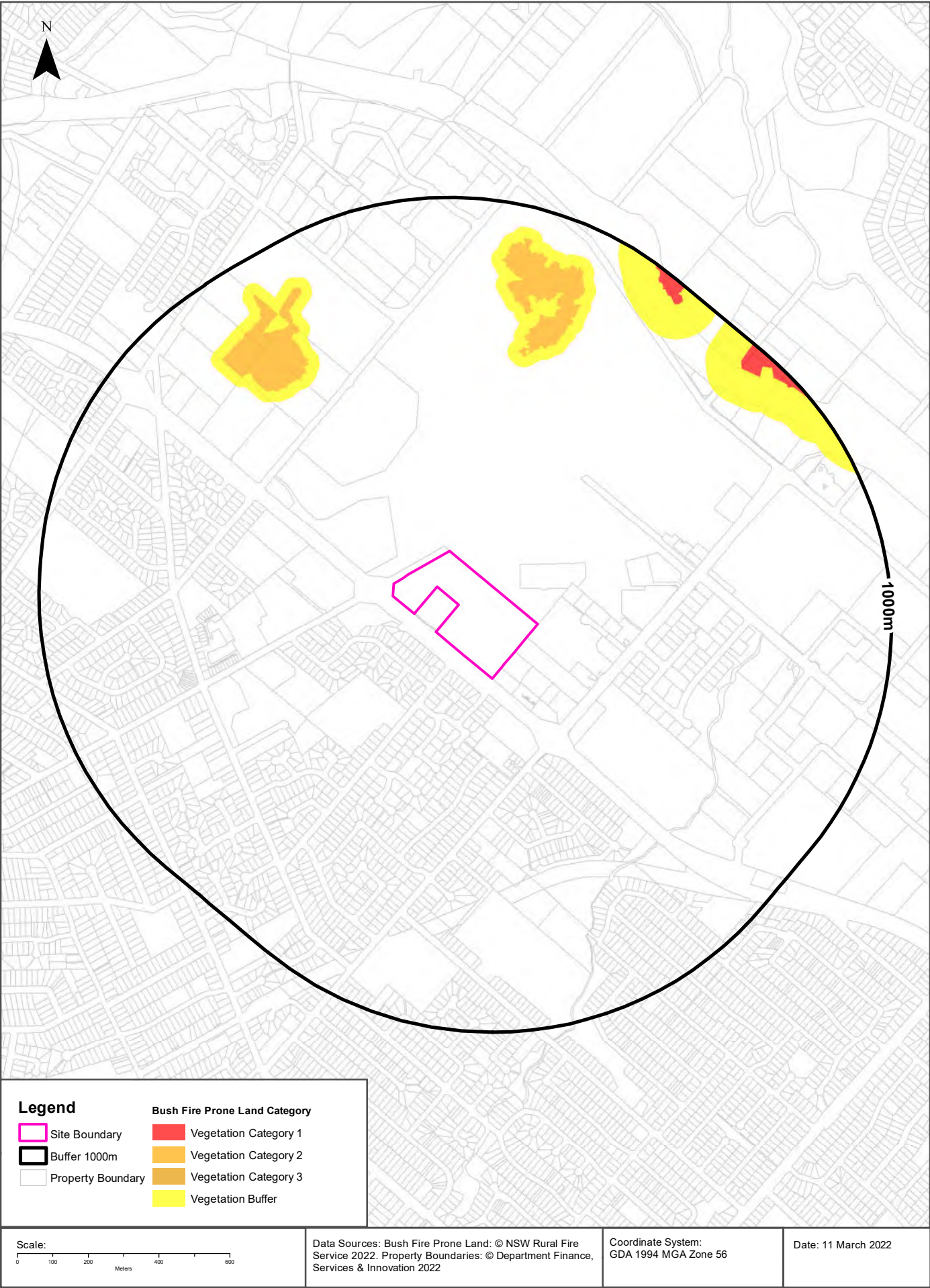
What are the EPI Heritage Items located within the dataset buffer?

Map Id	Name	Classification	Significance	EPI Name	Published Date	Commenced Date	Currency Date	Distance	Direction
10	Macquarie University (ruins)	Item - General	Local	Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	06/08/2021	0m	North
1	Curzon Hall (restaurant)	Item - General	State	Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	06/08/2021	502m	West

Map Id	Name	Classification	Significance	EPI Name	Published Date	Commenced Date	Currency Date	Distance	Direction
345	Macquarie Ice Rink - Olympic-sized rink with its setting within retail premises, including rink seating and associated rink facilities	Item - General	Local	Ryde Local Environmental Plan 2014	06/08/2021	06/08/2021	06/08/2021	513m	East
2	Eastwood Town Hall	Item - General	Local	Ryde Local Environmental Plan 2014	12/09/2014	12/09/2014	06/08/2021	678m	South West

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Natural Hazards

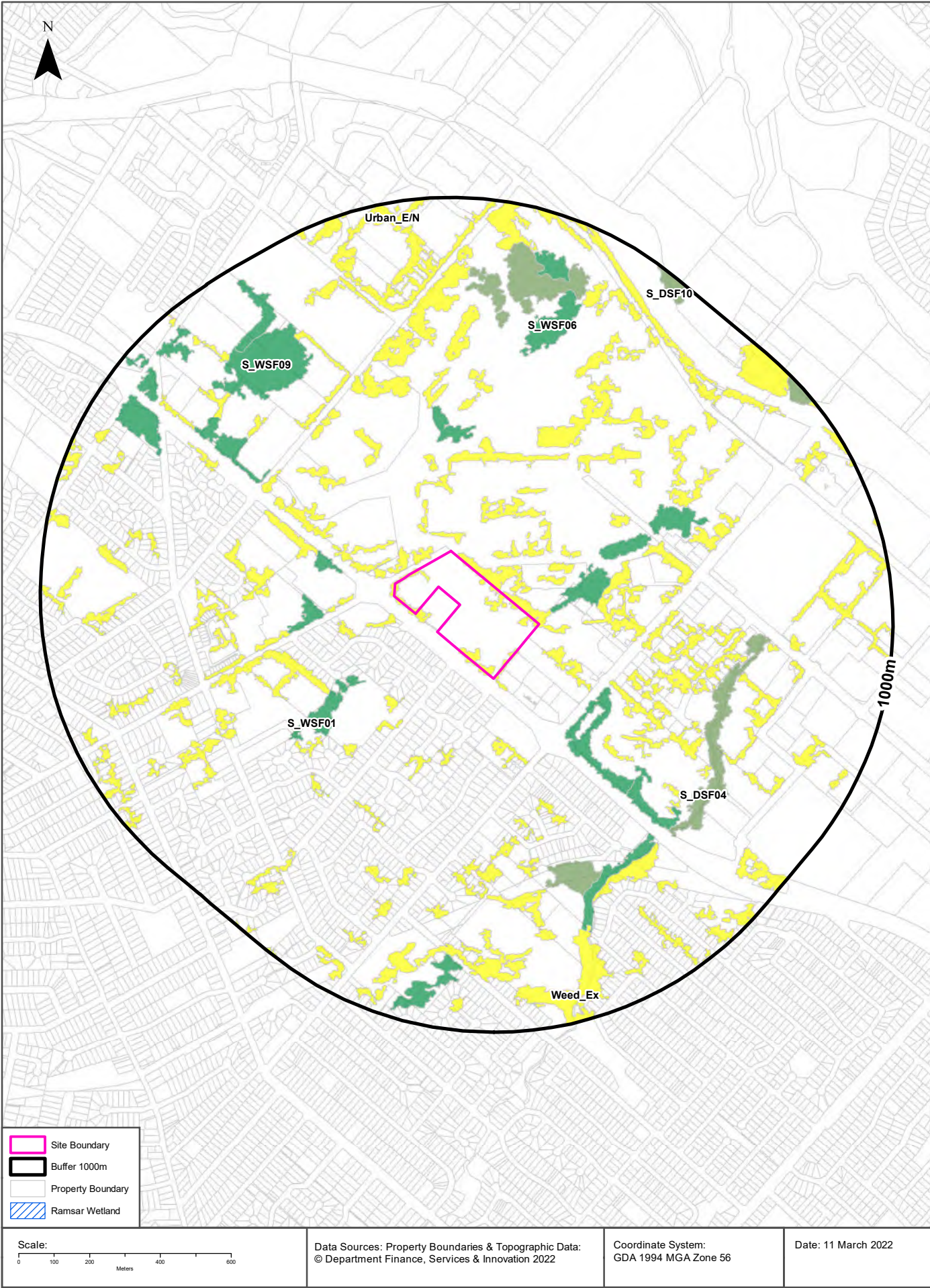
157 Balaclava Road, Marsfield, NSW 2113

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	557m	North
Vegetation Category 2	587m	North
Vegetation Category 1	924m	North East

NSW Bush Fire Prone Land - © NSW Rural Fire Service under Creative Commons 4.0 International Licence



Ecological Constraints

157 Balaclava Road, Marsfield, NSW 2113

Native Vegetation

What native vegetation exists within the dataset buffer?

Map ID	Map Unit Name	Threatened Ecological Community NSW	Threatened Ecological Community EPBC Act	Understorey	Disturbance	Disturbance Index	Dominant Species	Dist	Dir
Urban_E/N	Urban_E/N: Urban Exotic/Native			00: Not assessed	00: Not assessed	0: Not assessed	Urban Exotic/Native	0m	On-site
S_WSF09	S_WSF09: Sydney Turpentine-Ironbark Forest	Sydney Turpentine Ironbark Forest	Turpentine Ironbark Forest (possible)	15: Grassy natives and exotics	20: Previously cleared 1943	3: High	E.pilularis/S.glomuliferaA.costata/E.resinifera	50m	East
S_WSF01	S_WSF01: Blue Gum High Forest	Blue Gum High Forest		15: Grassy natives and exotics	31: Parkland open understorey	4: Very high	E.salignaE.pilularis/S.glomulifera/E.paniculata/A.costata	152m	West
S_WSF01	S_WSF01: Blue Gum High Forest	Blue Gum High Forest		15: Grassy natives and exotics	20: Previously cleared 1943	3: High	E.salignaE.pilularis/S.glomulifera/E.paniculata/A.costata	204m	West
S_WSF09	S_WSF09: Sydney Turpentine-Ironbark Forest	Sydney Turpentine Ironbark Forest	Turpentine Ironbark Forest (possible)	11: Semi sheltered dry/mesic	20: Previously cleared 1943	3: High	S.glomulifera/E.paniculata/E.resinifera	249m	South East
S_WSF09	S_WSF09: Sydney Turpentine-Ironbark Forest	Sydney Turpentine Ironbark Forest	Turpentine Ironbark Forest (possible)	20: Weeds and exotics	20: Previously cleared 1943	3: High	S.glomulifera/E.paniculata/E.resinifera	304m	North
S_WSF09	S_WSF09: Sydney Turpentine-Ironbark Forest	Sydney Turpentine Ironbark Forest	Turpentine Ironbark Forest (possible)	11: Semi sheltered dry/mesic	20: Previously cleared 1943	3: High	E.pilularis/S.glomuliferaA.costata/E.resinifera	464m	South East
S_WSF09	S_WSF09: Sydney Turpentine-Ironbark Forest	Sydney Turpentine Ironbark Forest	Turpentine Ironbark Forest (possible)	15: Grassy natives and exotics	20: Previously cleared 1943	3: High	S.glomulifera/E.paniculata/E.resinifera	474m	North West
S_DSF04	S_DSF04: Coastal Enriched Sandstone Dry Forest			20: Weeds and exotics	20: Previously cleared 1943	3: High	E.pilularis/A.costata/C.gummifera E.resinifera	527m	South East
S_DSF04	S_DSF04: Coastal Enriched Sandstone Dry Forest			12: Dry xeric shrubs	13: Weeds	1: Low	E.pilularis/S.glomuliferaA.costata/E.resinifera	552m	South
Weed_Ex	Weed_Ex: Weeds and Exotics			00: Not assessed	00: Not assessed	0: Not assessed	Exotic Species >90%cover	581m	North
S_WSF06	S_WSF06: Coastal Shale-Sandstone Forest			13: Dry shrubs and grasses	15: Regrowth	1: Low	E.resinifera/E.punctata	587m	North
S_WSF09	S_WSF09: Sydney Turpentine-Ironbark Forest	Sydney Turpentine Ironbark Forest	Turpentine Ironbark Forest (possible)	11: Semi sheltered dry/mesic	13: Weeds	3: High	E.pilularis/S.glomuliferaA.costata/E.resinifera	613m	South East
S_WSF09	S_WSF09: Sydney Turpentine-Ironbark Forest	Sydney Turpentine Ironbark Forest	Turpentine Ironbark Forest (possible)	11: Semi sheltered dry/mesic	13: Weeds	2: Moderate	S.glomulifera/E.paniculata/E.resinifera	630m	North West
S_DSF04	S_DSF04: Coastal Enriched Sandstone Dry Forest			15: Grassy natives and exotics	20: Previously cleared 1943	3: High	E.resinifera/E.punctata	644m	North
Weed_Ex	Weed_Ex: Weeds and Exotics			00: Not assessed	00: Not assessed	0: Not assessed	Urban Exotic/Native	648m	South East
S_DSF04	S_DSF04: Coastal Enriched Sandstone Dry Forest			15: Grassy natives and exotics	24: Urban mixed use	3: High	E.resinifera/E.punctata	701m	North

Map ID	Map Unit Name	Threatened Ecological Community NSW	Threatened Ecological Community EPBC Act	Understorey	Disturbance	Disturbance Index	Dominant Species	Dist	Dir
S_WSF09	S_WSF09: Sydney Turpentine-Ironbark Forest	Sydney Turpentine Ironbark Forest	Turpentine Ironbark Forest (possible)	11: Semi sheltered dry/mesic	14: Canopy gaps	1: Low	S.glomulifera/E.paniculata/E.resinifera	757m	North West
S_WSF09	S_WSF09: Sydney Turpentine-Ironbark Forest	Sydney Turpentine Ironbark Forest	Turpentine Ironbark Forest (possible)	20: Weeds and exotics	13: Weeds	3: High	S.glomulifera/E.paniculata/E.resinifera	785m	North West
S_WSF01	S_WSF01: Blue Gum High Forest	Blue Gum High Forest		15: Grassy natives and exotics	24: Urban mixed use	4: Very high	E.salignaE.pilularis/S.glomulifera/E.paniculata/A.costata	789m	South
S_WSF06	S_WSF06: Coastal Shale-Sandstone Forest			20: Weeds and exotics	19: Clearing/Part clearing	4: Very high	E.resinifera/E.punctata	819m	North
S_WSF09	S_WSF09: Sydney Turpentine-Ironbark Forest	Sydney Turpentine Ironbark Forest	Turpentine Ironbark Forest (possible)	11: Semi sheltered dry/mesic	13: Weeds	3: High	S.glomulifera/E.paniculata/E.resinifera	851m	North West
S_WSF09	S_WSF09: Sydney Turpentine-Ironbark Forest	Sydney Turpentine Ironbark Forest	Turpentine Ironbark Forest (possible)	24: Urban and hard surface	24: Urban mixed use	4: Very high	S.glomulifera/E.paniculata/E.resinifera	858m	North West
S_WSF09	S_WSF09: Sydney Turpentine-Ironbark Forest	Sydney Turpentine Ironbark Forest	Turpentine Ironbark Forest (possible)	15: Grassy natives and exotics	20: Previously cleared 1943	2: Moderate	S.glomulifera/E.paniculata/E.resinifera	936m	North West
S_DSF10	S_DSF10: Hornsby Enriched Sandstone Exposed Woodland			19: Dense heath	22: Fire	1: Low	E.haemastoma/A.littoralis/E.piperita/C.gummifera	943m	North East
S_DSF10	S_DSF10: Hornsby Enriched Sandstone Exposed Woodland			19: Dense heath	15: Regrowth	1: Low	A.hispida/A.littoralis/B.ericifolia/Kunzea spp	951m	North East
S_WSF09	S_WSF09: Sydney Turpentine-Ironbark Forest	Sydney Turpentine Ironbark Forest	Turpentine Ironbark Forest (possible)	20: Weeds and exotics	13: Weeds	3: High	E.pilularis/S.glomuliferaA.costata/E.resinifera	970m	South

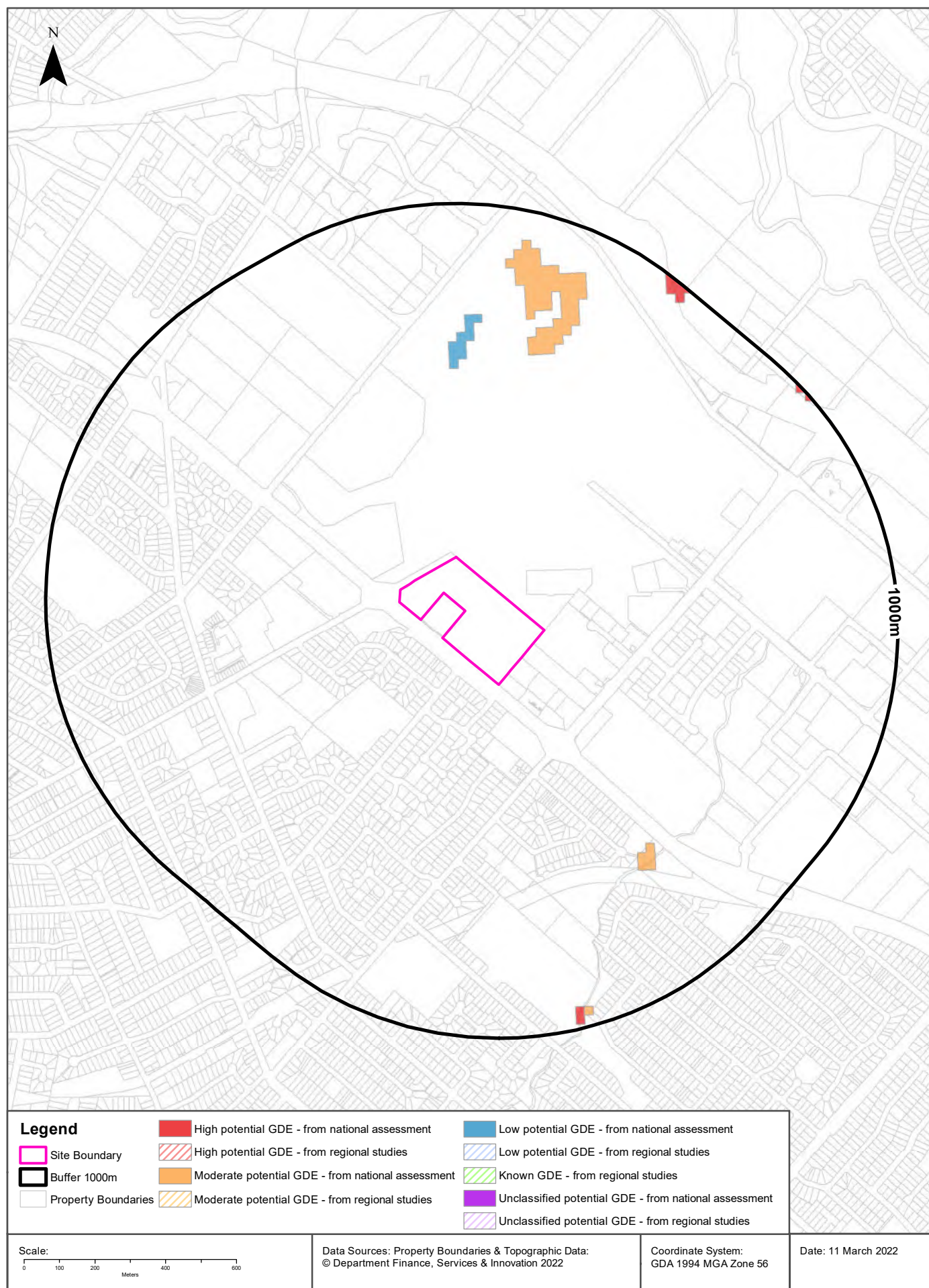
Native Vegetation of the Sydney Metropolitan Area : NSW Office of Environment and Heritage
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Ramsar Wetlands

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					

Ramsar Wetlands Data Source: © Commonwealth of Australia - Department of Agriculture, Water and the Environment



Ecological Constraints

157 Balaclava Road, Marsfield, NSW 2113

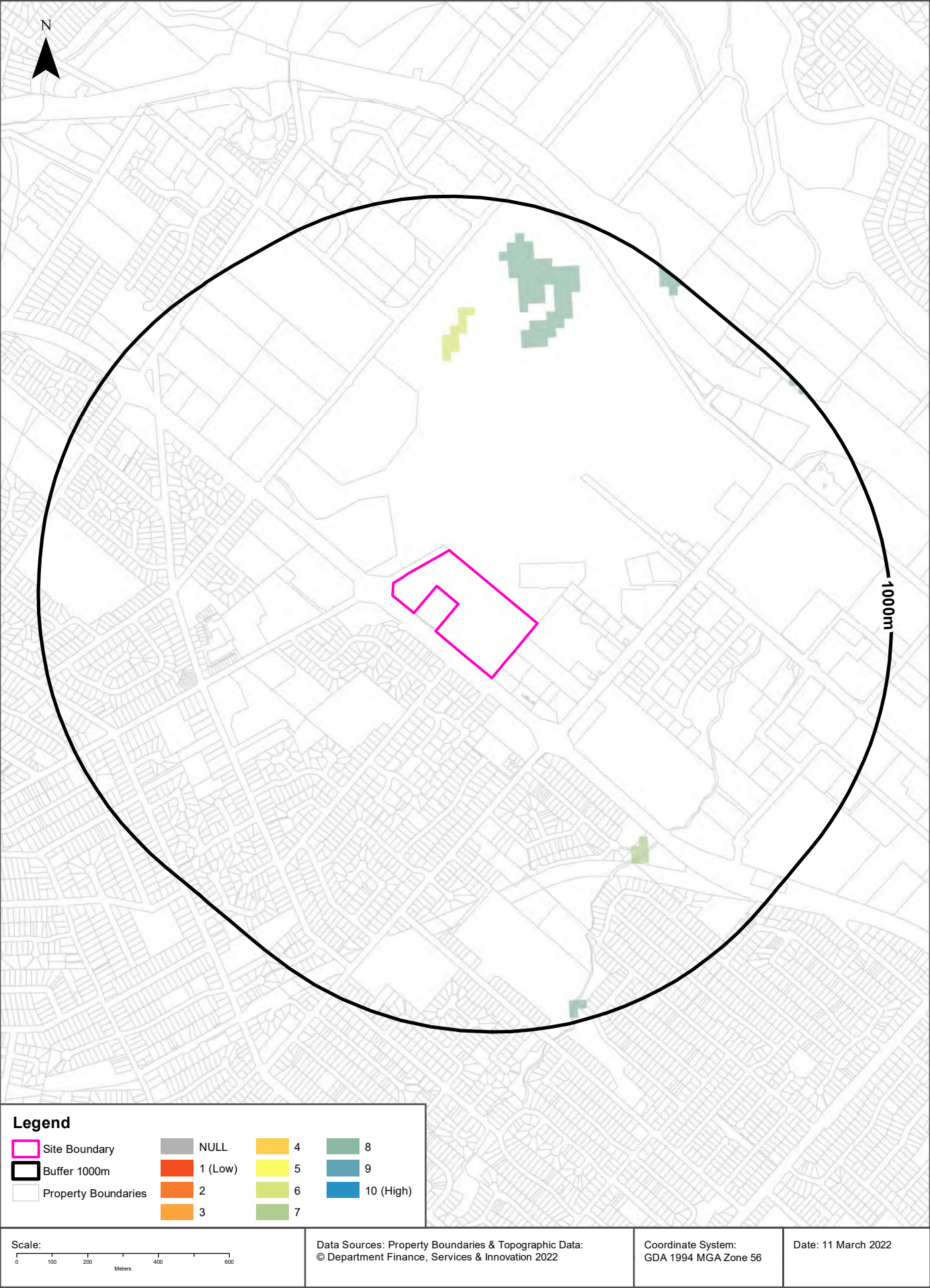
Groundwater Dependent Ecosystems Atlas

Type	GDE Potential	Geomorphology	Ecosystem Type	Aquifer Geology	Distance	Direction
Terrestrial	Low potential GDE - from national assessment	Deeply dissected sandstone plateaus.	Vegetation	Consolidated sedimentary	533m	North
Terrestrial	Moderate potential GDE - from national assessment	Deeply dissected sandstone plateaus.	Vegetation	Consolidated sedimentary	606m	North
Terrestrial	High potential GDE - from national assessment	Deeply dissected sandstone plateaus.	Vegetation	Consolidated sedimentary	935m	South

Groundwater Dependent Ecosystems Atlas Data Source: The Bureau of Meteorology
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Ecological Constraints - Inflow Dependent Ecosystems Likelihood

157 Balaclava Road, Marsfield, NSW 2113



Ecological Constraints

157 Balaclava Road, Marsfield, NSW 2113

Inflow Dependent Ecosystems Likelihood

Type	IDE Likelihood	Geomorphology	Ecosystem Type	Aquifer Geology	Distance	Direction
Terrestrial	6	Deeply dissected sandstone plateaus.	Vegetation	Consolidated sedimentary	533m	North
Terrestrial	8	Deeply dissected sandstone plateaus.	Vegetation	Consolidated sedimentary	606m	North
Terrestrial	7	Deeply dissected sandstone plateaus.	Vegetation	Consolidated sedimentary	611m	South East

Inflow Dependent Ecosystems Likelihood Data Source: The Bureau of Meteorology
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Ecological Constraints

157 Balaclava Road, Marsfield, NSW 2113

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?

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	Actitis hypoleucos	Common Sandpiper	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
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	Ardenna carneipes	Flesh-footed Shearwater	Vulnerable	Not Sensitive	Not Listed	ROKAMBA;JAMBA
Animalia	Aves	Ardenna tenuirostris	Short-tailed Shearwater	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Arenaria interpres	Ruddy Turnstone	Not Listed	Not Sensitive	Not Listed	ROKAMBA;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	Burhinus grallarius	Bush Stone-curlew	Endangered	Not Sensitive	Not Listed	
Animalia	Aves	Calidris acuminata	Sharp-tailed Sandpiper	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Calidris alba	Sanderling	Vulnerable	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Calidris canutus	Red Knot	Not Listed	Not Sensitive	Endangered	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Calidris ferruginea	Curlew Sandpiper	Endangered	Not Sensitive	Critically Endangered	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Calidris melanotos	Pectoral Sandpiper	Not Listed	Not Sensitive	Not Listed	ROKAMBA;JAMBA
Animalia	Aves	Calidris ruficollis	Red-necked Stint	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Calidris tenuirostris	Great Knot	Vulnerable	Not Sensitive	Critically Endangered	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Callocephalon fimbriatum	Gang-gang Cockatoo	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Callocephalon fimbriatum	Gang-gang Cockatoo	Endangered Population, Vulnerable	Category 3	Not Listed	
Animalia	Aves	Calyptorhynchus banksii samueli	Red-tailed Black-Cockatoo (inland subspecies)	Vulnerable	Category 2	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;CAMBA; JAMBA
Animalia	Aves	Charadrius leschenaultii	Greater Sand-plover	Vulnerable	Not Sensitive	Vulnerable	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Chlidonias leucopterus	White-winged Black Tern	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Aves	Chthonicola sagittata	Speckled Warbler	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Circus assimilis	Spotted Harrier	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Cuculus optatus	Oriental Cuckoo	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
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	Epthianura albigrons	White-fronted Chat	Endangered Population, Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Falco hypoleucos	Grey Falcon	Endangered	Category 2	Not Listed	
Animalia	Aves	Falco subniger	Black Falcon	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Gallinago hardwickii	Latham's Snipe	Not Listed	Not Sensitive	Not Listed	ROKAMBA;JAMBA
Animalia	Aves	Gelochelidon nilotica	Gull-billed Tern	Not Listed	Not Sensitive	Not Listed	CAMBA
Animalia	Aves	Glossopsitta pusilla	Little Lorikeet	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Grantiella picta	Painted Honeyeater	Vulnerable	Not Sensitive	Vulnerable	
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	
Animalia	Aves	Hieraaetus morphnoides	Little Eagle	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Hirundapus caudacutus	White-throated Needletail	Not Listed	Not Sensitive	Vulnerable	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Hydroprogne caspia	Caspian Tern	Not Listed	Not Sensitive	Not Listed	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	Limosa lapponica	Bar-tailed Godwit	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Limosa limosa	Black-tailed Godwit	Vulnerable	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Lophochroa leadbeateri	Major Mitchell's Cockatoo	Vulnerable	Category 2	Not Listed	
Animalia	Aves	Lophoictinia isura	Square-tailed Kite	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Menura alberti	Albert's Lyrebird	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Motacilla flava	Yellow Wagtail	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Neophema pulchella	Turquoise Parrot	Vulnerable	Category 3	Not Listed	
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 madagascariensis	Eastern Curlew	Not Listed	Not Sensitive	Critically Endangered	ROKAMBA;CAMBA; JAMBA

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Aves	Numenius minutus	Little Curlew	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Numenius phaeopus	Whimbrel	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Oxyura australis	Blue-billed Duck	Vulnerable	Not Sensitive	Not Listed	
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	Philomachus pugnax	Ruff	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Pluvialis fulva	Pacific Golden Plover	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Pluvialis squatarola	Grey Plover	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Polytelis anthopeplus monarchoides	Regent Parrot (eastern subspecies)	Endangered	Category 3	Vulnerable	
Animalia	Aves	Polytelis swainsonii	Superb Parrot	Vulnerable	Category 3	Vulnerable	
Animalia	Aves	Ptilinopus regina	Rose-crowned Fruit-Dove	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Ptilinopus superbus	Superb Fruit-Dove	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Rostratula australis	Australian Painted Snipe	Endangered	Not Sensitive	Endangered	
Animalia	Aves	Sterna hirundo	Common Tern	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Sternula albifrons	Little Tern	Endangered	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Stictonetta naevosa	Freckled Duck	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Thalasseus bergii	Crested Tern	Not Listed	Not Sensitive	Not Listed	JAMBA
Animalia	Aves	Tringa brevipes	Grey-tailed Tattler	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Tringa glareola	Wood Sandpiper	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Tringa nebularia	Common Greenshank	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Tringa stagnatilis	Marsh Sandpiper	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Tyto longimembris	Eastern Grass Owl	Vulnerable	Category 3	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	Aves	Xenus cinereus	Terek Sandpiper	Vulnerable	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Gastropoda	Pommerhelix duralensis	Dural Land Snail	Endangered	Not Sensitive	Endangered	
Animalia	Mammalia	Arctocephalus pusillus doriferus	Australian Fur-seal	Vulnerable	Not Sensitive	Not Listed	
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	Eubalaena australis	Southern Right Whale	Endangered	Not Sensitive	Endangered	
Animalia	Mammalia	Falsistrellus tasmaniensis	Eastern False Pipistrelle	Vulnerable	Not Sensitive	Not Listed	

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Mammalia	Isodon obesulus obesulus	Southern Brown Bandicoot (eastern)	Endangered	Not Sensitive	Endangered	
Animalia	Mammalia	Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Miniopterus australis	Little Bent-winged Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Miniopterus orianae oceanensis	Large Bent-winged Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Myotis macropus	Southern Myotis	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Perameles nasuta	Long-nosed Bandicoot	Endangered Population	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	Petaurus norfolcensis	Squirrel Glider	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Phascogalea cinerea	Koala	Vulnerable	Not Sensitive	Endangered	
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 Sheath-tail-bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Scoteanax rueppellii	Greater Broad-nosed Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Vespertilio acrocephalus	Eastern Cave Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Reptilia	Aspiderhina ramsayi	Woma	Vulnerable	Not Sensitive	Not Listed	
Animalia	Reptilia	Caretta caretta	Loggerhead Turtle	Endangered	Not Sensitive	Endangered	
Animalia	Reptilia	Chelonia mydas	Green Turtle	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Reptilia	Myuchelys bellii	Western Sawshelled Turtle, Bell's Turtle	Endangered	Not Sensitive	Vulnerable	
Animalia	Reptilia	Urolophos sphyrurus	Border Thick-tailed Gecko	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Reptilia	Varanus rosenbergi	Rosenberg's Goanna	Vulnerable	Not Sensitive	Not Listed	
Fungi	Flora	Camarophyllopsis kearneyi		Endangered	Not Sensitive	Not Listed	
Fungi	Flora	Hygrocybe anomala var. ianthinomarginata		Vulnerable	Not Sensitive	Not Listed	
Fungi	Flora	Hygrocybe aurantipes		Vulnerable	Not Sensitive	Not Listed	
Fungi	Flora	Hygrocybe austropratensis		Endangered	Not Sensitive	Not Listed	
Fungi	Flora	Hygrocybe collucera		Endangered	Not Sensitive	Not Listed	
Fungi	Flora	Hygrocybe griseoramosa		Endangered	Not Sensitive	Not Listed	
Fungi	Flora	Hygrocybe lanecovensensis		Endangered	Not Sensitive	Not Listed	
Fungi	Flora	Hygrocybe reesiae		Vulnerable	Not Sensitive	Not Listed	
Fungi	Flora	Hygrocybe rubronivea		Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Acacia bakeri	Marblewood	Vulnerable	Not Sensitive	Not Listed	

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Plantae	Flora	Acacia bynoeana	Bynoe's Wattle	Endangered	Not Sensitive	Vulnerable	
Plantae	Flora	Acacia clunies-rossiae	Kanangra Wattle	Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Acacia pubescens	Downy Wattle	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Acacia terminalis subsp. Eastern Sydney	Sunshine wattle	Endangered	Not Sensitive	Endangered	
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	Davidsonia jerseyana	Davidson's Plum	Endangered	Category 2	Endangered	
Plantae	Flora	Deyeuxia appressa		Endangered	Not Sensitive	Endangered	
Plantae	Flora	Dillwynia tenuifolia		Endangered Population, Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Dillwynia tenuifolia		Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Epacris purpurascens var. purpurascens		Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Epacris sparsa	Sparse Heath	Vulnerable	Not Sensitive	Vulnerable	
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 beadleana	Beadle's Grevillea	Endangered	Category 3	Endangered	
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	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	
Plantae	Flora	Lasiopetalum joyceae		Vulnerable	Not Sensitive	Vulnerable	

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
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	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	Rhizanthella slateri	Eastern Australian Underground Orchid	Vulnerable	Category 2	Endangered	
Plantae	Flora	Rhodamnia rubescens	Scrub Turpentine	Critically Endangered	Not Sensitive	Critically Endangered	
Plantae	Flora	Senecio behrianus		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	Thelymitra atronitida	Black-hooded Sun Orchid	Critically Endangered	Category 2	Not Listed	
Plantae	Flora	Triplarina imbricata	Creek Triplarina	Endangered	Not Sensitive	Endangered	
Plantae	Flora	Wahlenbergia multicaulis	Tadgell's Bluebell	Endangered Population	Not Sensitive	Not Listed	
Plantae	Flora	Wilsonia backhousei	Narrow-leafed Wilsonia	Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Zannichellia palustris		Endangered	Not Sensitive	Not Listed	

Data does not include NSW category 1 sensitive species.

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Area Match	Georeferenced to an approximate or general area
Road Match	Georeferenced to a road or rail corridor
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Buffered Point	A point feature buffered to x metres
Adjacent Match	Land adjacent to a georeferenced feature
Network of Features	Georeferenced to a network of features
Suburb Match	Georeferenced to a suburb boundary
As Supplied	Spatial data supplied by provider

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Land Title Records



ABN: 36 092 724 251
Ph: 02 9099 7400
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

Summary of Owners Report

Address: 157 Balaclava Road, Macquarie Park, NSW 2113

Description: - Lot 60 D.P. 1107965

As regards to the part numbered 1 on attached Cadastral Records Enquiry Report:

<u>Date of Acquisition and term held</u>	<u>Registered Proprietor(s) & Occupations where available</u>	<u>Reference to Title at Acquisition and sale</u>
31.08.1905 (1905 to 1947)	William Thomas Wilton (Orchardist) Archibald Ernst Wilton (Miner)	Volume 1631 Folios 110 to 111
14.02.1947 (1947 to 1968)	George Allotta (Orchardist) Caterina Allotta (Married Woman)	Volume 1631 Folios 110 to 111 Then Volume 5751 Folio 174 Now Volume 7855 Folio 28
23.09.1968 (1968 to 1978)	Corunna Investment Pty. Limited	Volume 7855 Folio 28 Now Volume 11362 Folio 2
12.01.1978 (1978 to Date)	# N.S.W. Baptist Homes Trust Then # Baptistcare Community Services – NSW & ACT Now # Baptistcare NSW & ACT	Volume 11362 Folio 2 Then 11/748174 Now 60/1107965

Denotes current registered proprietor

As regards to the part numbered 2 on attached Cadastral Records Enquiry Report:

<u>Date of Acquisition and term held</u>	<u>Registered Proprietor(s) & Occupations where available</u>	<u>Reference to Title at Acquisition and sale</u>
31.08.1905 (1905 to 1947)	William Thomas Wilton (Orchardist) Archibald Ernst Wilton (Miner)	Volume 1631 Folios 110 to 111
14.02.1947 (1947 to 1959)	George Allotta (Orchardist) Caterina Allotta (Married Woman)	Volume 1631 Folios 110 to 111 Now Volume 5751 Folio 174
12.06.1959 (1959 to 1967)	Laura Marne Donald (Widow)	Volume 5751 Folio 174 Now Volume 7837 Folio 212
08.09.1967 (1967 to Date)	# N.S.W. Baptist Homes Trust Then # Baptistcare Community Services – NSW & ACT Now # Baptistcare NSW & ACT	Volume 7837 Folio 212 Then 11/748174 Now 60/1107965

Denotes current registered proprietor

Email: mark.groll@infotrack.com.au
Email: taylor.wilson@infotrack.com.au



ABN: 36 092 724 251
Ph: 02 9099 7400
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

As regards to the part numbered 3 on attached Cadastral Records Enquiry Report:

<u>Date of Acquisition and term held</u>	<u>Registered Proprietor(s) & Occupations where available</u>	<u>Reference to Title at Acquisition and sale</u>
22.10.1915 (1915 to 1924)	Annie Kate Goodsell (Married Woman)	Volume 1215 Folio 6
11.11.1924 (1924 to 1963)	Thomas Naylor Goodsell (Electric Welder)	Volume 1215 Folio 6 Now Volume 3679 Folio 239
04.11.1963 (1963 to 1975)	Minnie Isabella Goodsell (Widow) (94 Application not investigated)	Volume 3679 Folio 239
29.01.1975 (1975 to Date)	# N.S.W. Baptist Homes Trust Then # Baptistcare Community Services – NSW & ACT Now # Baptistcare NSW & ACT	Volume 3679 Folio 239 Then Volume 13074 Folio 54 Then 11/748174 Now 60/1107965

Denotes current registered proprietor

As regards to the part numbered 4 on attached Cadastral Records Enquiry Report:

<u>Date of Acquisition and term held</u>	<u>Registered Proprietor(s) & Occupations where available</u>	<u>Reference to Title at Acquisition and sale</u>
22.10.1915 (1915 to 1932)	Annie Kate Goodsell (Married Woman)	Volume 1215 Folio 6 Now Volume 4023 Folio 11
30.11.1932 (1932 to 1936)	Elizabeth Spinks (Widow)	Volume 4023 Folio 11
24.07.1936 (1936 to 1942)	Andree Higginson (Married Woman)	Volume 4023 Folio 11
18.02.1942 (1942 to 1946)	Alfred Edward Bennett (Investor)	Volume 4023 Folio 11
24.05.1946 (1946 to 1963)	The Housing Commission of New South Wales (Resumed for the purpose of the Housing Act, 1912)	Volume 4023 Folio 11 (Government Gazette published 24.05.1946 Folios 1201 to 1202) Now Volume 5811 Folio 7
11.04.1963 (1963 to Date)	# N.S.W. Baptist Homes Trust Then # Baptistcare Community Services – NSW & ACT Now # Baptistcare NSW & ACT	Volume 5811 Folio 7 Then Volume 13074 Folio 54 Then 11/748174 Now 60/1107965

Denotes current registered proprietor

Email: mark.groll@infotrack.com.au
Email: taylor.wilson@infotrack.com.au



ABN: 36 092 724 251
Ph: 02 9099 7400
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

As regards to the part numbered 5 on attached Cadastral Records Enquiry Report:

<u>Date of Acquisition and term held</u>	<u>Registered Proprietor(s) & Occupations where available</u>	<u>Reference to Title at Acquisition and sale</u>
22.10.1915 (1915 to 1932)	Annie Kate Goodsell (Married Woman)	Volume 1215 Folio 6 Now Volume 4023 Folio 11
30.11.1932 (1932 to 1936)	Elizabeth Spinks (Widow)	Volume 4023 Folio 11
24.07.1936 (1936 to 1942)	Andree Higginson (Married Woman)	Volume 4023 Folio 11
18.02.1942 (1942 to 1948)	Alfred Edward Bennett (Investor)	Volume 4023 Folio 11
13.01.1948 (1948 to 1951)	Herbert Clinch (Tannery Employee) Ernest Arthur Linton (Member of the Australian Imperial Force)	Volume 4023 Folio 11 Now Volume 5844 Folios 84 to 85
20.02.1951 (1951 to 1961)	Leslie Ross Myers (Carpenter)	Volume 5844 Folios 84 to 85 Now Volume 6322 Folio 91
19.10.1961 (1961 to 1962)	Ernest Stafford Young (Missionary) John Stuart Mill (Missionary) Eric William Norgate (Missionary)	Volume 6322 Folio 91
10.04.1962 (1962 to Date)	# N.S.W. Baptist Homes Trust Then # Baptistcare Community Services – NSW & ACT Now # Baptistcare NSW & ACT	Volume 6322 Folio 91 Then Volume 13074 Folio 54 Then 11/748174 Now 60/1107965

Denotes current registered proprietor



ABN: 36 092 724 251
Ph: 02 9099 7400
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

As regards to the part numbered 6 on attached Cadastral Records Enquiry Report:

<u>Date of Acquisition and term held</u>	<u>Registered Proprietor(s) & Occupations where available</u>	<u>Reference to Title at Acquisition and sale</u>
31.05.1918 (1918 to	Robert Graham (Farmer) Catherine Graham (Married Woman)	Volume 1165 Folio 184
23.04.1919 (1919 to 1921)	Candid Clark (Whip Manufacturer)	Volume 1165 Folio 184
22.03.1921 (1921 to 1925)	George Allotta (Farmer now Orchardist)	Volume 1165 Folio 184
15.07.1925 (1925 to 1959)	George Allotta (Orchardist) Caterina Allotta (Married Woman)	Volume 1165 Folio 184 Now Volume 4593 Folio 8
09.10.1959 (1959 to Date)	# N.S.W. Baptist Homes Trust Then # Baptistcare Community Services – NSW & ACT Now # Baptistcare NSW & ACT	Volume 4593 Folio 8 Then Volume 7877 Folio 57 Then Volume 13074 Folio 54 Then 11/748174 Now 60/1107965

Denotes current registered proprietor

Leases, as to the whole: -

- 28.11.1966 (K557325): Lease to Sydney County Council of the premises known as Substation Premises No. 2491 together with right of way and easement for electricity purposes. Expired 13.03.1987. **(Copy Attached)**
- 13.03.1987 (W765118): Lease to Sydney County Council of Substation Premises No. 2491 together with right of way and easement for electricity purposes as shown in plan with K557325. Expires: 30.11.2036. **(Copy Attached)**

Note: We could find no evidence that this lease was ever surrendered.

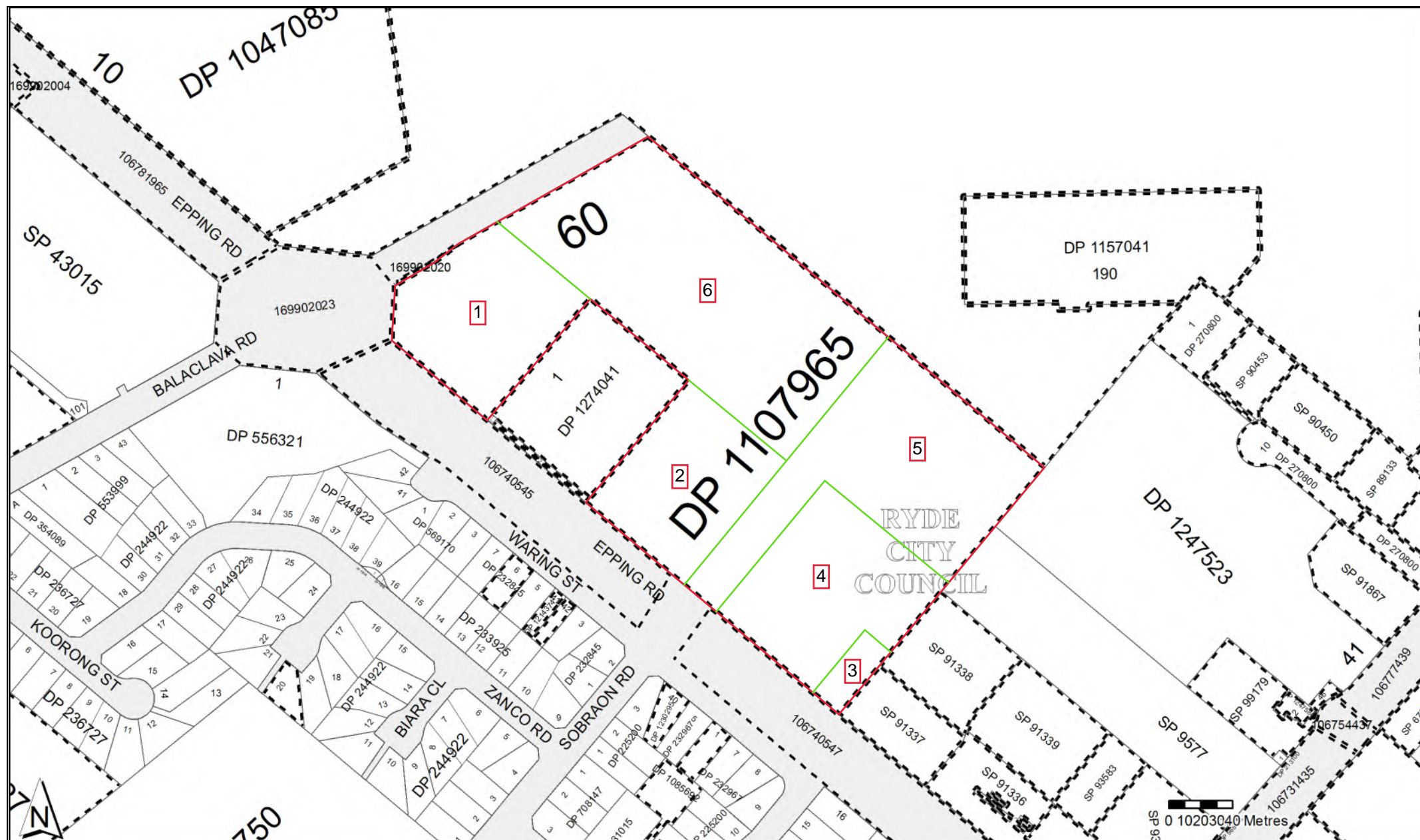
It would seem that this Substation Lease may still be in existence, unless evidence can be furnished that it has been surrendered.































Easements, as to the whole: -

- 06.01.2017 (D.P. 1220136): Easement to drain water 3.2 metre(s) wide affecting the part(s) shown so burdened in D.P. 1220136.

Yours Sincerely,
Taylor Wilson
21st March 2022

Email: mark.groll@infotrack.com.au
Email: taylor.wilson@infotrack.com.au



	Status	Surv/Comp	Purpose
DP232845			
Lot(s): 6			
 DP1281273	PRE-ALLOCATED	UNAVAILABLE	SUBDIVISION
DP244922			
Lot(s): 20			
 DP1274533	PRE-ALLOCATED	UNAVAILABLE	SUBDIVISION
DP270800			
Lot(s): 1, 4, 5, 10			
 DP368446	HISTORICAL	SURVEY	UNRESEARCHED
 DP876482	HISTORICAL	SURVEY	SUBDIVISION
 DP1163230	HISTORICAL	SURVEY	SUBDIVISION
 DP1163232	HISTORICAL	SURVEY	SUBDIVISION
Lot(s): 10			
 DP270800	HISTORICAL	SURVEY	COMMUNITY PLAN
 DP1187116	HISTORICAL	SURVEY	SUBDIVISION
Lot(s): 1			
 DP270800	REGISTERED	SURVEY	COMMUNITY SUBDIVISION PLAN
 DP1207744	REGISTERED	SURVEY	EASEMENT
 SP89133	REGISTERED	COMPILATION	PART STRATA
 SP90450	REGISTERED	COMPILATION	PART STRATA
 SP90453	REGISTERED	COMPILATION	PART STRATA
Lot(s): 1, 4			
 SP89124	REGISTERED	COMPILATION	PART STRATA
DP1047085			
Lot(s): 10			
 DP814087	HISTORICAL	SURVEY	SUBDIVISION
DP1048183			
Lot(s): 2			
 DP546114	HISTORICAL	COMPILATION	SUBDIVISION
 NSW GAZ. 14-02-2003 Folio : 2128	SUB-SURFACE STRATUM LOT 1 DP1048183 ACQUIRED FOR THE PURPOSES OF THE STATE RAIL AUTHORITY - SEE REQUEST 9630327		
 PA81292 - LOT 1 DP1048183, LOT 1 DP1048185, LOT 1 DP1048255, LOT 1 DP1048256			
DP1085692			
Lot(s): 2			
 DP710706	HISTORICAL	SURVEY	SUBDIVISION
Lot(s): 1, 2			
 DP232967	HISTORICAL	COMPILATION	SUBDIVISION
DP1107965			
Lot(s): 60			
 DP1220136	REGISTERED	SURVEY	EASEMENT
Lot(s): 60, 61			
 DP748174	HISTORICAL	COMPILATION	CONSOLIDATION
DP1157041			
Lot(s): 190			
 DP876483	HISTORICAL	SURVEY	SUBDIVISION
 DP879423	HISTORICAL	SURVEY	ROADS ACT, 1993
 DP1015626	HISTORICAL	SURVEY	SUBDIVISION
 DP1047085	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
 DP1058168	HISTORICAL	SURVEY	SUBDIVISION
 DP1112777	HISTORICAL	SURVEY	SUBDIVISION
 DP1129623	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
DP1214374			
Lot(s): 41, 42			
 DP232845	HISTORICAL	SURVEY	SUBDIVISION
DP1230295			
Lot(s): 40			
 DP225200	HISTORICAL	SURVEY	SUBDIVISION

Caution: 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.

CERTIFICATES, SIGNATURES AND SEALS

Sheet 1 of 1 sheet

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

DP1107965

Registered:



19.3.2007

Surveying Regulation 2006

I, ALAN R HAWDON
of ROADS AND TRAFFIC AUTHORITY
a surveyor registered under the *Surveying Act 2002*, certify that the
survey represented in this plan is accurate, has been made in
accordance with the *Surveying Regulation 2006* and was completed
on: 28-9-2006

The survey relates to LOT 61 AND CONNECTIONS

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

Signature Q. Hawdon Dated: 9/1/07
Surveyor registered under the *Surveying Act 2002*

Datum Line : "X" - "Y"
Type: Urban

**SIGNATURES, SEALS and STATEMENTS of intention
to dedicate public roads or to create public reserves
and drainage reserves.**

Department of Lands Approval

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

Signature:
Date:
File Number:
Office:

Subdivision Certificate

I certify that the provisions of s.109J of the Environmental Planning
and Assessment Act 1979 have been satisfied in relation to:

the proposed set out herein
(insert 'subdivision' or 'new road')

* Authorised Person/General Manager/Accredited Certifier

Consent Authority:
Date of Endorsement:
Accreditation no:
Subdivision Certificate no:
File no:

Note:
When the plan is to be lodged electronically in Land and Property
Information, it should include a signature in an electronic or digital
format approved by the Registrar-General.

* Delete whichever is inapplicable.

**THIS PLAN IS EXEMPT FROM SUBDIVISION
CERTIFICATION PURSUANT TO A DECISION
BETWEEN DUAP, RTA & LPI NSW - SEE 1997
M6 (Item 2). LAND IN THIS PLAN COMPRISES
ONLY ROAD OR ROAD AND RESIDUE.**

Mellor 12 JAN 07
**AUTHORISED OFFICER
ROADS AND TRAFFIC AUTHORITY, NSW**

APPROVED:


Mellor 12 JAN 07
**MANAGER, SURVEY SERVICES
HUNTER REGION
ROADS AND TRAFFIC AUTHORITY, NSW**

Use PLAN FORM 6A for additional
certificates, signatures and seals

* OFFICE USE ONLY

This negative is a photograph made as a permanent record of a document in the custody of the Registrar General this day. 16th October, 1987

10 20 30 40 50 60 70 Table of mm 110 120 130 140





K 557325

MEMORANDUM OF LEASE

(REAL PROPERTY ACT, 1900)

IN DUPLICATE

New South Wales

JAN 09 35 AM

56

R.P. I.

FEES—

Lodgment

Endorsements

\$8.00
6.00

\$14.00

11/1/67

Typing or handwriting in this instrument should not extend into any margin. Handwriting should be clear and legible and in permanent black non-copying ink.

a Name, full postal address, occupation or other designation of Lessor.

b If a less estate, strike out "in fee simple", and interline required alteration.

c All subsisting encumbrances must be noted on page 3 hereof.

d Name, full postal address, occupation or other designation of Lessee. If more than one, state whether they hold as tenants in common or joint tenants.

e "If part only of the land comprised in a Certificate or Certificates of Title is to be leased add "and being lot sec. D.P. " or "being the land shown in the plan annexed hereto", or "being the residue of the land in certificate (or grant) registered Vol. Fol.

A plan may be endorsed on the instrument. Any annexure must be signed by the parties and their signatures witnessed.

The Registrar General does not require evidence of council's approval of a subdivision by lease unless either the lease is for a period exceeding five years, or, irrespective of the term, contains an option of renewal.

Where it is intended to except, e.g., minerals, timber, etc., or to create easements, an appropriate clause may be noted in this column.

f State both in words and figures.

g Here insert times of payment.

h These relate on the part of Lessee to payment of rent and to repair; on the part of Lessor to right of entry to inspect and repair and of re-entry and forfeiture of lease subject to the Conveyancing Act, 1919, Sec. 129, after default in payment of rent or fulfilment of covenants.

I, N.S.W. BAPTIST HOMES TRUST

(hereinafter called or included in the expression Lessor)

being registered as the proprietor of an estate in fee simple^b in the land hereinafter described, subject, however, to such encumbrances,^c liens, and interests as are notified by memorandum underwritten or endorsed hereon Do hereby lease unto

d THE SYDNEY COUNTY COUNCIL (hereinafter called the lessee) all that part of the premises situate in Epping Road, Marsfield as shown on the plan hereto annexed marked "A" and thereon described "SUBSTATION PREMISES No.2491", which said premises are erected on :

(hereinafter called or included in the expression Lessee)

All that piece of land mentioned in the schedule following:—

County	Parish	Reference to Title			Description of Land (if part only) e
		Whole or part	Vol.	Fol.	
CUMBERLAND	HUNTERS HILL	WHOLE	5811	7	TOGETHER WITH full and free right and liberty for the lessee its officers servants workmen agents and contractors with or without tools materials plant and other apparatus and vehicles of all descriptions to pass and repass at all times of the night or day during the term hereby created over the land marked "Right of way and easement for electricity purposes various widths" on the said plan AND TOGETHER WITH full right liberty and licence for the lessee its officers servants workmen agents and contractors during the said term to construct lay down dismantle replace repair renew and maintain underground and/or overhead electricity conductors wires cables and other apparatus for the transmission of electric current through beneath and over the land marked "Right of way and easement for electricity purposes various widths" on the said plan AND ALSO free and uninterrupted passage of electricity and apparatus thereto appertaining through under or over

the land marked "Right of way and easement for electricity purposes various widths" on the said plan and through the said electricity conductors and To be held by the said Lessee

as tenant for the term of TWENTY (20) years computed from the First day of December, 1966.

at the yearly rent of ten cents dollars(\$0.10) payable as follows: at the expiration of the said term.

subject to the following covenants, conditions, and restrictions, viz.:—

1. To the covenants and powers implied^h in every Memorandum of Lease by virtue of the Conveyancing Act, 1919, secs. 84 and 85, or such of them, or so far, as not hereby expressly negatived or modified.

This form when filled in should be ruled up so that no alterations are possible. No alterations should be made by erasure. The words rejected should be scored through with the pen, and those substituted written over them, the alteration being verified by signature or initials in the margin, or noticed in the attestation.

[Rule up all blanks before signing]
 [Do not write or type in margins]

19369D

2. To the full effect of the covenants next hereinafter shortly noted as the same are set forth in words at length in the second column of Part 2 of the Fourth Schedule to the Conveyancing Act, 1919^{*}.

1. the Lessee covenants with the Lessor to pay rent.
21. and the Lessor covenants with the Lessee for quiet enjoyment.

3. The Lessee may during the term hereby created install erect construct dismantle repair replace renew and maintain upon the demised land such plant electricity conductors wires cables transformers and other apparatus for the transmission generation or storage of electric current or purposes incidental thereto and carry out such constructional work therein as to effectively establish a substation for the generation supply and/or distribution of electricity.

4. The Lessee shall have the right to supply other customers with electricity from the substation PROVIDED HOWEVER the requirements of the Lessor are first met.

5. The Lessee may at the expiration or sooner determination hereof take remove and carry away from the demised land all cables fixtures fittings plant machinery electrical appliances and other equipment laid erected or brought by it on under and about such premises during the said term and shall at the expiration or sooner determination hereof leave the demised land in the same condition as it now is and shall at its own expense make good any damage that may have been caused by reason of the erection maintenance and/or removal of the said equipment and all appurtenances thereto.

6. The Lessee will meet all reasonable legal expenses which might be incurred by the Lessor in connection with the preparation, stamping and registration of the within lease, including obtaining the consent of any mortgagee.

7. The Lessor will meet rates and taxes on the demised premises.

Here insert any of the following clauses suited to the case. To understand the full effect of each—refer to the Act.
And to pay taxes except for local improvements.
And to insure from fire in the joint names of the lessor and the lessee.
And to paint outside every [] year.
And to paint and paper inside every [] year
And to fence.
And to keep up fences.
And to cultivate.
That the lessee will not cut timber.
That the lessee will not without consent use premises otherwise than as a private dwelling house.
And will not assign or sublet without leave; no fine to be taken.
That the lessee will not carry on any offensive trade.
That the lessee will carry on the business of a hotelkeeper and conduct the same in an orderly manner.
And will apply for renewal of license.
And will facilitate the transfer of license.
The said (lessor) covenants with the said (lessee) for quiet enjoyment.
And the lessee may remove his fixtures.
The clauses may be varied in the manner mentioned in Section 86 of the Conveyancing Act, 1919, and the Fourth Schedule thereto.

Any other terms of the intended lease may then be added.*

* If the space provided for covenants is insufficient, a form of annexure, with the prescribed margins and of the same size and quality of paper as this instrument, should be used. Such annexure should be signed by the parties and the witnesses.

~~Marshall & Sons~~
Locality: Marsfield.

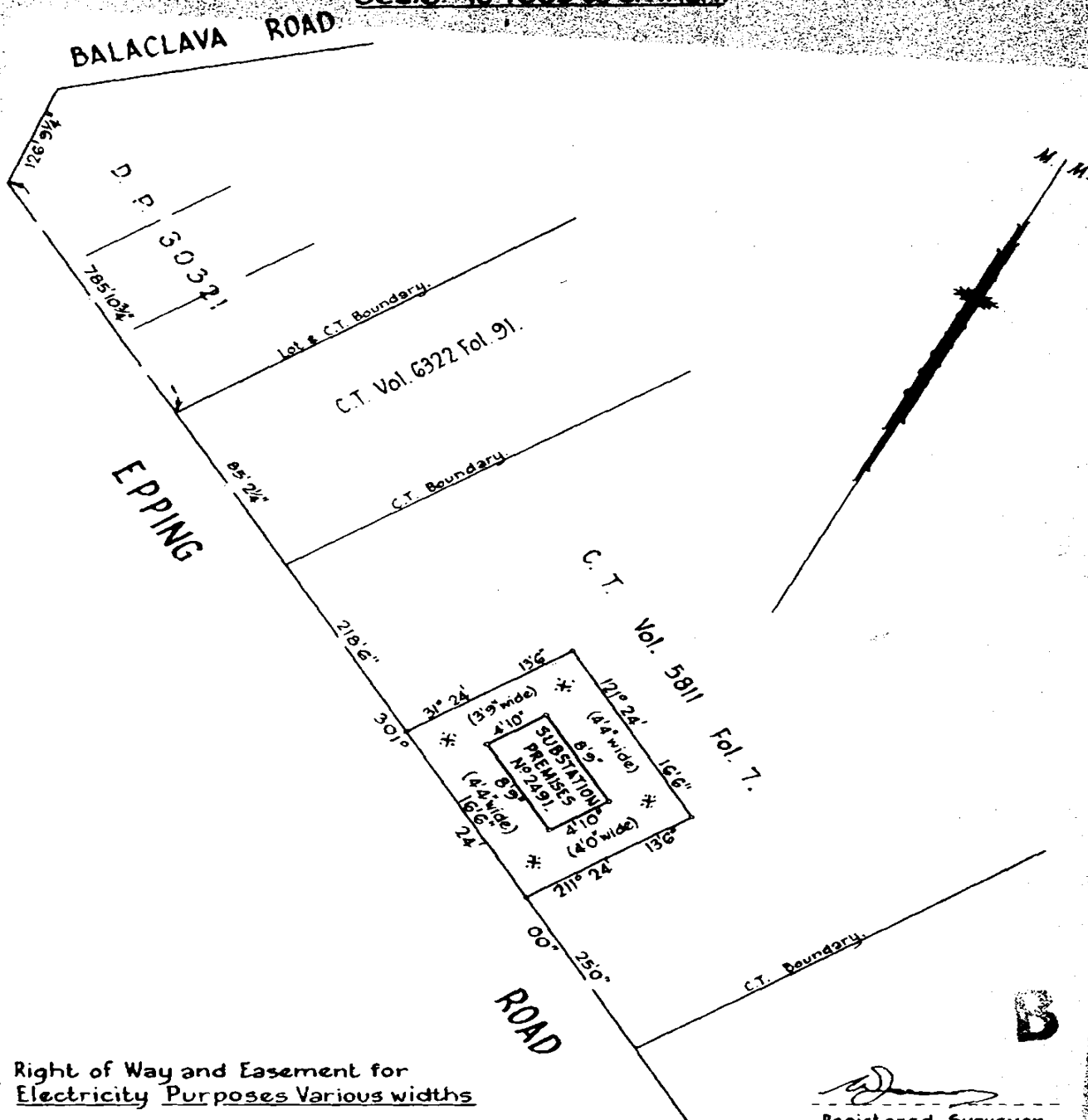
PLAIN

**SHOWING SUBSTATION PREMISES N°2491, RIGHT OF WAY AND
EASEMENT FOR ELECTRICITY PURPOSES WITHIN C.T. VOL. 5811 FOL. 7.**

Parish of Hunters Hill

County of Cumberland

Scale: 10 feet to an inch.



* Right of Way and Easement for
Electricity Purposes Various widths

[Signature]
Registered Surveyor.
20th. Sept., 1966.

Signatures and Seals of Parties.

This is the plan marked "A" referred to in Memorandum of Lease between

H. J. BAPTIST TRUST AND THE SYDNEY COUNTY COUNCIL

Signed for and on behalf of
H. J. Baptist Trust

Signed for and on behalf of
The Sydney County Council

[Signature]
[Signature]
[Signature]
R. C. Robertson
Secretary

[Signature]
General Manager
[Signature]
Chairman

j A very short note of the particulars will suffice.

MEMORANDUM OF ENCUMBRANCES, &c., REFERRED TO
Covenant contained in J323780

Dated at Lyons this Twenty Eight day of November, 1966.

k Execution in New South Wales may be proved if this instrument is signed or acknowledged before the Registrar General, or Deputy Registrar General, or a Notary Public, a J.P. or Commissioner for Affidavits, to whom the Lessor is known, otherwise the attesting witness should appear before one of the above functionaries who, having received affirmative answers to each of the questions set out in Sec. 108 (1) (b) of the Real Property Act, from the witness, should sign the certificate noted below (Form A).

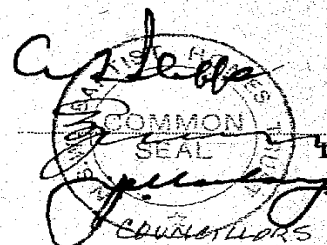
As to instruments executed elsewhere, see section 107, Real Property Act, 1900, Section 168, Conveyancing Act, 1919, and section 52A of the Evidence Act, 1898. If a signature be by a mark, the attestation must state that the instrument was read over and fully explained to the party, and that he appeared fully to understand the same.

l Name of Lessee.

m For the signature of the Lessee hereto an ordinary attestation is sufficient.

n Repeat attestation for additional parties, if required.

Signed in my presence, by the said -
The Seal of N.S.W. Baptist Homes Trust
was hereunto affixed by authority of the
Council of the said Trust by three
who is personally known to me
Councillors in the presence of -



Lessor^k

J.C. Robertson Secretary

I, THE SYDNEY COUNTY COUNCIL the within-named Lessee, do hereby
accept this lease as tenant, subject to the conditions, restrictions and covenants above set forth, and
certify it to be correct for the purposes of the Real Property Act, 1900.

The Common Seal of The Sydney County
~~Signed in my presence, by the said~~ Council was
hereto affixed pursuant to the General
Manager's Signed Order No. 23336 dated
14th October 1966 and in the presence of
who is personally known to me the Chairman
and General Manager whose signatures
appear opposite hereto:

K. Anderson Chairman Lessee^m
John Light General Manager

c To be signed by Registrar General, Deputy Registrar General, a Notary Public, J.P., Commissioner for Affidavits or other functionary before whom the attesting witness appears. Not required if the instrument itself be signed or acknowledged before one of these parties—see note "n".

p Name of witness and residence.

q Name of Lessor.

FORM A
CERTIFICATE OF J.P., &c., TAKING DECLARATION OF ATTESTING WITNESS†

Appeared before me^c, the _____ day of _____
one thousand nine hundred and _____
the attesting witness to this instrument, and declared that he personally knew ^a
the person signing the same, and whose
signature thereto he has attested; and that the name purporting to be such signature of the said ^a
is his own handwriting, and that he
was of sound mind, and freely and voluntarily signed the same.

† N.B.—If by the signing of two or more Lessors before different witnesses it becomes necessary to sign more than one certificate additional certificates can be entered on back hereof. For signature of the Lessee an ordinary attestation is sufficient.

No.

K 557325

Lodged by

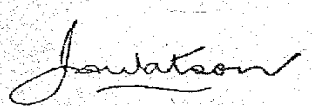

Address

Phone No.

..... & PURBELL
 NORWICH UNION HOUSE
 2 O'SUNNELL STREET
 SYDNEY - NSW 1392

LEASE

LEAVE THESE SPACES FOR DEPARTMENTAL USE

Indexed <i>[initials]</i>	Particulars entered in Register Book <div style="text-align: center;">13-2-1967</div> <div style="text-align: center;">at 2pm</div> <div style="text-align: center;">   Registrar General </div>
Checked <i>[initials]</i>	
Passed in S.D.B. <i>[initials]</i>	
Signed <i>[initials]</i>	
<i>[initials]</i>	

DOCUMENTS LODGED HERewith.

- | | |
|----------|--------------------------------|
| 1. _____ | } Received Docs.
Nos. _____ |
| 2. _____ | |
| 3. _____ | |

Receiving Clerk

*Lease of premises together
 with right of way and
 easement for electricity purposes
 13/2/67*

M.P.D.

FORM OF SURRENDER

No.

Surrender Lodged By

Address

Phone No.

I, _____
 registered proprietor of the Lease created by the within instrument, do in consideration of _____ hereby
 surrender all my estate or interest therein to the Lessor or other the present owner of the reversion thereon
 expectant. In witness whereof I have hereto subscribed my name at _____
 this _____ day of _____, 19____.

† Signed, in my presence, by the said _____

 who is personally known to me _____ } _____
 _____ } Lessee

Accepted, and I certify this surrender to be correct for the purposes of the
 Real Property Act, 1900.

† Signed, in my presence, by the said _____

 who is personally known to me _____ } _____
 _____ } Lessor

† *Mutatis mutandis* the rules of authentication which apply to a Lease or Transfer apply to a Surrender (see note k).

Note.—A Separate form of Transfer of Lease can be obtained at the Land Titles Office, Sydney.

RPIC

STAMP DUTY



W765118

LEASE

REAL PROPERTY ACT, 1900
 (To be lodged in duplicate)

A	1 of 1	X
\$	47	

DESCRIPTION OF LAND
 Note (a)

Torrens Title Reference	LAND of which LESSOR is registered proprietor If Part or Premises. See Note (a) (ii)	Location
Volume 13074 Folio 54	PART being that part of the premises shown on the plan annexed to Lease registered No. K557325 and thereon described as "Substation Premises No. 2491" hereinafter called the "demised premises" together with right of way and easement referred to in clauses 1 and 2 hereof.	Marsfield

LESSOR
 Note (b)

N.S.W. BAPTIST HOMES TRUST

(the abovenamed LESSOR) hereby leases to the LESSEE

LESSEE
 Note (b)

THE SYDNEY COUNTY COUNCIL of 570 George Street, Sydney

OFFICE USE ONLY

OVER

* sublet *

Note (c)

PRIOR ENCUMBRANCES

the premises above described, subject to the following PRIOR ENCUMBRANCES 1.

2.

3.

Notes (d) and (h)

for a TERM of **Fifty (50) years**

TERM
 Note (e)

commencing on **1 / 12 / 86** and TERMINATING on **30 / 11 / 2036**

OFFICE USE ONLY

Purchase Renewal

Note (f)

(with an OPTION TO PURCHASE and an OPTION OF REDEMPTION set forth in clause (s) of SCHEDULE TWO hereto.

Note (g)

together with and reserving the rights and liberties set forth in SCHEDULE ONE hereto).

at a rental of Ten cents (\$0.10) per annum payable at the expiration of the said term (if demanded)

RENT

Note (i)

Note (h)

SUBJECT TO the covenants and provisions:

- (i) implied by sections 84 and 85 of the Conveyancing Act, 1919, as are not expressly negated or modified herein;
- (ii) set forth in the Memorandum filed in the Land Titles Office as Number 159 and
- (iii) set forth in SCHEDULE TWO hereto, which covenants and provisions shall be deemed to be incorporated herein.

TO BE COMPLETED
 BY LODGING PARTY
 Notes (j) and (k)

LODGED BY		LOCATION OF DOCUMENTS	
		CT	OTHER
Delivery Box Number			Herewith.
			In L.T.O. with
			Produced by 182P
Checked eol	Passed	Secondary Directions	OFF L K 557325 EXPIRED
Signed sfy	Extra Fee	Delivery Directions	CT - 182P 1016-3-1987 OFF - 182P 1016-3-1987

OFFICE USE ONLY

\$47
 \$50

S SFY

ANNEXURE TO MEMORANDUM OF LEASE MADE THE DAY OF 19
BETWEEN N.S.W. BAPTIST HOMES TRUST AS LESSOR and THE SYDNEY COUNTY COUNCIL AS
LESSEE

SCHEDULE ONE HEREINBEFORE REFERRED TO


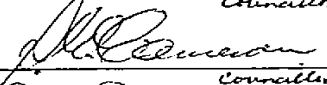
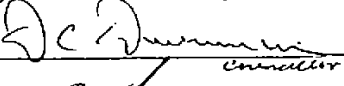
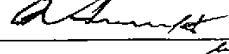
The Lessee shall have the benefit of the following rights and liberties;

1. The Lessee shall have full right and liberty for its officers servants workmen agents and contractors with or without tools materials plant and other apparatus and vehicles to pass and repass at all times of the day or night during the term hereby created over the land marked "Right of Way and Easement for Electricity Purposes (4'4" wide)(4'0" wide)(3'9" wide)" as shown on plan annexed to Lease registered no. K557325 (hereinafter referred to as "right of way") and during such times as the Lessee considers necessary to park vehicles upon the said right of way PROVIDED HOWEVER that access for the Lessor its agents tenants or licensees is not unnecessarily impeded.
2. The Lessee shall have full right liberty and licence for its officers servants workmen agents and contractors during the term hereby created to construct lay down dismantle replace repair renew and maintain underground/overhead electricity cables through beneath or over the land marked "Right of Way and Easement for Electricity Purposes (4'4" wide)(4'0" wide)(3'9" wide)" as shown on plan annexed to Lease registered no. K557325 (hereinafter referred to as "easement") AND ALSO free and uninterrupted passage of electricity through the cables within the said easement.

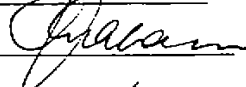
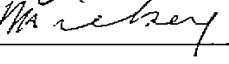
SCHEDULE TWO HEREINBEFORE REFERRED TO

3. The covenants and powers implied in every Lease by virtue of Sections 84 and 85 of the Conveyancing Act 1919 shall not apply to or be implied in this Lease except insofar as the same or some part or parts thereof are included in the covenants hereinafter contained.
4. To the full effect of the covenants hereinafter shortly noted as the same are set forth in words at length in the second column of Part 2 of the Fourth Schedule to the Conveyancing Act 1919 (as amended):
 1. The Lessee covenants with the Lessor to pay rent.
 16. and will not assign or sublet without leave, no fine to be taken.
 21. and the Lessor covenants with the Lessee for quiet enjoyment.
5. The Lessee shall have full right and liberty with or without tools, materials, plant and other apparatus and vehicles for access to the demised premises for its officers, servants, workmen, agents and contractors at all times of the day and night during the term hereby created.

SIGNED FOR AND ON BEHALF OF
N.S.W. BAPTIST HOMES TRUST


Councillor

Councillor

Councillor

Witness

SIGNED FOR AND ON BEHALF OF
THE SYDNEY COUNTY COUNCIL


Attorney

Witness

2.

6. The Lessee may during the term hereby created install erect construct dismantle repair replace renew and maintain upon the demised premises such plant electricity conductors wires cables transformers and other apparatus for the transmission or storage of electric current or purposes incidental thereto and carry out such construction work therein as to effectively establish a substation for the supply and/or distribution of electricity.

7. The Lessee shall have the right to use the substation installation and easement for the purpose of supplying other customers PROVIDED HOWEVER that in approving the connection of electrical loads to the substation the Lessee shall give priority to electrical loads which are located within the premises of the Lessor.

8. The Lessee shall have the right at the expiration or sooner determination hereof to take remove and carry away from the demised premises and the easement all cables fixtures fittings plant machinery and other equipment laid erected or brought by it on under and about such premises.

9. Each party will bear its own costs in relation to this Lease provided always that the Lessor shall be responsible for any costs in obtaining the consent of any mortgagee and arranging production of the title deed at the Land Titles Office. The Lessee will arrange for the stamping of the Lease and for its lodgment at the Land Titles Office.

10. The Lessor shall pay any rates and taxes which may be levied in respect of the demised premises or of the premises of which the demised premises forms part.

11. The Lessor shall maintain in a serviceable condition the right of way (and/or Right of Way and Easement) referred to on the plan annexed and any drainage system which may affect the demised premises.

12. The Lessor shall take all reasonable precautions to ensure any ventilation provided for the demised premises is not obstructed or impaired.

13. The Lessor shall not alter existing ground levels on or adjacent to the easement or the demised premises or permit the erection of any structure on above or below the easement referred to in Clause 2 hereof, without first obtaining the written consent of the Lessee.

SIGNED FOR AND ON BEHALF OF
N.S.W. BAPTIST HOMES TRUST

Cormack

Cormack

0375R _____
Cormack
A. S. Kew

SIGNED FOR AND ON BEHALF OF
THE SYDNEY COUNTY COUNCIL

Attorney

Witness

DATE 20th February 1987

EXECUTION
Note (o)

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

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

Signature of Witness

Name of Witness (BLOCK LETTERS)

Address and occupation of Witness

*The Common Seal of the NSW
Baptist Homes Trust was
presented & signed by authority
of a resolution of Councillors
and in the presence of
A. Smith*



Signature of Lessor

Note (o)

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

Signature of Witness

Name of Witness (BLOCK LETTERS)

Address and occupation of Witness

Signature of Lessee

SIGNED SEALED AND DELIVERED for and on)
behalf of THE SYDNEY COUNTY COUNCIL by)
BRIAN CHARLES GRAHAM)
its duly constituted Attorney pursuant)
to Power of Attorney registered Book 3684)
3550 No. 6148 AND I DECLARE that I have)
no notice of the revocation of the said)
Power of Attorney in the presence of:)

Brian Graham

Attorney (20-2-1987)

M. J. Kelly

Witness

INSTRUCTIONS FOR COMPLETION

Form RPIC is to be used for lease of the fee simple and for sub-leases where a folio of the Register has issued for the leasehold estate.

Use form RPIA for sub-leases where a folio of the Register has *not* issued for the leasehold estate.

This dealing should be stamped by the Commissioner of Stamp Duties before lodgment at the Land Titles Office.

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

Alterations are not to be made by erasure, the words rejected are to be ruled through and initialled by the parties to the dealing.

Rule up all blanks.

The following instructions relate to the side notes on the form.

(a) Description of land.

- (i) **TORRENS TITLE REFERENCE.**—Insert the current Folio Identifier or Volume and Folio of the Certificate of Title Crown Grant for the land being leased, e.g., 135 SP12345 or Vol. 8514 Fol. 128.
(ii) **PART-WHOLE.**—If part only of the land in the folio of the Register is being leased or the lease is of premises, delete the word "WHOLE" and insert the lot and plan number, reference to plan annexed, portion, &c., or adequate description of premises leased, e.g., all those premises known as 55 Numa Street, Ryde, erected on the said land.
Evidence of council approval is not required to a subdivision by lease unless the term exceeds 5 years, or the lease contains an option of renewal which extends the term beyond a 5 years period.
See also sections 327 and 327AA, Local Government Act, 1919.
(iii) **LOCATION.**—Insert the locality shown on the Certificate of Title Crown Grant, e.g., at Ryde. If no locality is shown, insert the Parish and County, e.g., Ph. Lismore Co. Rous.

(b) Show the full name, address and occupation or description.

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

(d) In the memorandum of encumbrances, state only the registered number of any mortgage, lease or charge (except where the consent of the mortgagee, lessee or chargee is furnished), and of any writ to which this lease is subject.

(e) Insert the term of the lease, e.g., 4 years commencing on 11/11/1979 and TERMINATING on 10/11/1983.

(f) Strike out such words as are not applicable. If an option to purchase or an option of renewal is included in the lease, the relevant clause in SCHEDULE TWO, in which it appears, should be shown and the option should be set out in full in SCHEDULE TWO.

(g) Strike out such words as are not applicable.

(h) Strike out whichever does not apply.

(i) Show terms of rent and method of repayment.

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

(k) The lodging party is to complete the LOCATION OF DOCUMENTS panel. Place a tick in the appropriate box to indicate the whereabouts of the Certificate of Title and, where appropriate, duplicate registered Lease. List, in an abbreviated form, other documents lodged, e.g., stat. dec. for statutory declaration.

(l) Any easement, exception, right, &c., intended to be granted or reserved should be set out in full in SCHEDULE ONE. If not applicable, rule through this space.

(m) This space on the lease form may be used for the insertion of additional covenants.

(n) If the space is insufficient, use insert sheets of the same size and quality of paper and having the same margins as the lease form. Each such insert sheet must be signed by the parties and attesting witnesses.

(o) Execution.

GENERALLY

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

ATTORNEY

- (iii) If the lease is executed by an attorney for the lessor/lessee pursuant to a registered power of attorney, the form of attestation must set out the full name of the attorney, and the form of execution must indicate the source of his/her authority, e.g., "AB by his/her attorney (or receiver or delegate, as the case may be) XY pursuant to power of attorney registered Book No.

AUTHORITY

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

CORPORATION

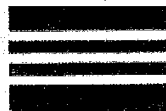
- (v) If the lease is executed by a corporation under seal, the form of execution should include a statement that the seal has been properly affixed, e.g., in accordance with the Articles of Association of the corporation. Each person attesting the affixing of the seal must state his/her position (e.g.,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

OFFICE USE ONLY

FIRST SCHEDULE DIRECTIONS

(A)	FOLIO IDENTIFIER	(B)	DIRECTION	(C)	NAME				
SECOND SCHEDULE AND OTHER DIRECTIONS									
(D)	FOLIO IDENTIFIER	(E)	DIRECTION	(F)	NOTFN TYPE	(G)	DEALING NUMBER	(H)	DETAILS
	13074 - 54	OFF ON		L L		K557325		EXPIRED	LEASE TO SHADNEY COUNTY COUNCIL OF SUBSTATION PREMISES NO 2491 TOGETHER WITH RIGHT OF WAY AND EASEMENT FOR ELECTRICITY PURPOSES AS SHOWN IN PLAN WITH K557325 EXPIRES 30-11-2036

NEW SOUTH WALES



CERTIFICATE OF TITLE
PROPERTY ACT, 1900, as amended.



11362002

Crown Grant Vol.1137 Fol.218

Prior Title Vol.7855 Fol. 28

Vol. **11362** Fol. **2**

CANCELLED [W]

Edition issued 13-7-1970

L862108



I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

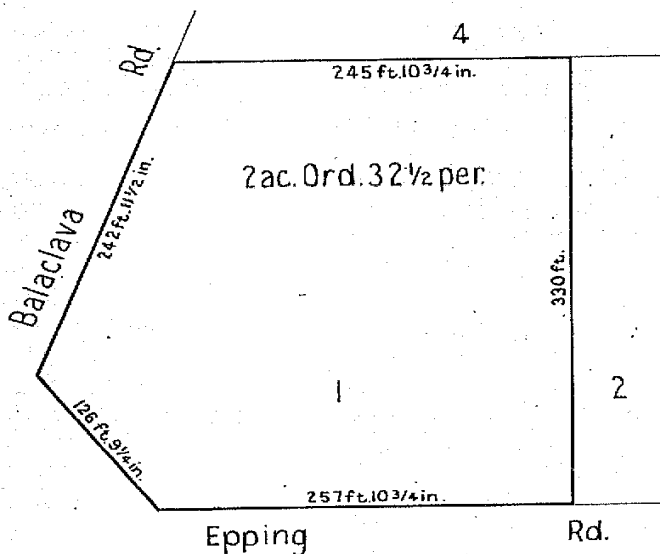
Witness

Barnes

Jawatson
Registrar General.



PLAN SHOWING LOCATION OF LAND



L862108 M.C.

M.C.

Scale: 100 feet to one inch

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 1 in Deposited Plan 30321 in the Municipality of Ryde Parish of Hunters Hill and County of Cumberland.

FIRST SCHEDULE

~~CORUNNA INVESTMENT PTY. LIMITED.~~

SECOND SCHEDULE

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.

Jawatson

Registrar General

M620130M
 M963053D
 - 050 M
 N6715
 Q505678E
 - 9M
 R59788D
 DP 748174

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR

N.S.W. Baptist Homes Trust

DP/ 748174 Registered 16-10-1987

This folio is cancelled as is whole upon creation of computer folios for lot 11 in the above-mentioned plan.



INSTRUMENT

NATURE

NUMBER

DATE

ENTERED

Signature of Registrar-General

Transfer

Q505678

12-1-1978

[Signature]

SECOND SCHEDULE (continued)

NATURE

INSTRUMENT

NUMBER

DATE

PARTICULARS

ENTERED

Signature of Registrar-General

CANCELLATION

Mortgage	M620130	11-2-1972	to Mutual Acceptance (Pty) Limited	6-3-1972	<i>[Signature]</i>	Discharged	M963053	<i>[Signature]</i>
Mortgage	M963054	18-10-1972	to Lombard Australia Limited	8-11-1972	<i>[Signature]</i>	Cancelled	Q505678	<i>[Signature]</i>
Mortgage	N61157	9-1-1973	to Lombard Australia Limited	30-1-1973	<i>[Signature]</i>	Cancelled	Q505678	<i>[Signature]</i>
Mortgage	Q505679	-----	to Lombard Australia Limited	12-1-1978	<i>[Signature]</i>	Discharged	R597878	<i>[Signature]</i>

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR-GENERAL ARE CANCELLED

SCHEDULE.

All that piece or parcel of land situate in the Municipality of Canterbury, parish of St. George, county of Cumberland, being lots numbered 172 and 173, shown in deposited plan No. 14,705,—and said to be in the possession of Mrs. Emily Whittall.

Dated at Sydney, this 15th day of May, 1946.

(L.S.) F. R. JORDAN, Lieutenant-Governor.

By His Excellency's Command.

(7754) JAMES MCGIRR, Minister for Housing.

HOUSING ACT, 1912, AS AMENDED.—PUBLIC WORKS ACT, 1912, AS AMENDED.

ACQUISITION OF LAND FOR HOUSING PURPOSES (HOUSING SCHEME AT YAGOONA, NEW SOUTH WALES).

IT is hereby notified and declared by His Excellency the Lieutenant-Governor, acting with the advice of the Executive Council, that in pursuance of the provisions of section 4 of the Housing Act, 1912, as amended by subsequent Acts, and as affected by the Housing Act, 1941, so much of the lands described in the Schedule hereunder as is Crown land is hereby appropriated, and so much of the said lands as is private property is hereby resumed, under the Public Works Act, 1912, as amended, for the purposes of the Housing Act, 1912, as amended, including all such mines and deposits under the said lands as are mentioned in section 141 of the said Public Works Act, 1912, and that the said lands are vested in The Housing Commission of New South Wales. (46-13,661—Schedule N317)

SCHEDULE.

All that piece or parcel of land situate in the Municipality of Banktown, parish of Liberty Plains, county of Cumberland, being lots numbered 643 to 650 inclusive, shown in deposited plan No. 13,125,—and said to be in the possession of Mrs. Jane Brown.

Dated at Sydney, this 15th day of May, 1946.

(L.S.) F. R. JORDAN, Lieutenant-Governor.

By His Excellency's Command,

(7862) JAMES MCGIRR, Minister for Housing.

HOUSING ACT, 1912, AS AMENDED.—PUBLIC WORKS ACT, 1912, AS AMENDED.

ACQUISITION OF LAND FOR HOUSING PURPOSES (HOUSING SCHEME AT CESSNOCK, NEW SOUTH WALES).

IT is hereby notified and declared by His Excellency the Lieutenant-Governor, acting with the advice of the Executive Council, that in pursuance of the provisions of section 4 of the Housing Act, 1912, as amended by subsequent Acts, and as affected by the Housing Act, 1941, so much of the lands described in the Schedule hereunder as is Crown land is hereby appropriated, and so much of the said lands as is private property is hereby resumed, under the Public Works Act, 1912, as amended, for the purposes of the Housing Act, 1912, as amended, and that the said lands are vested in The Housing Commission of New South Wales. (46-12,775—Schedule N265)

SCHEDULE.

All those pieces or parcels of land situate in the Municipality of Cessnock, parish of Pokolbin, county of Northumberland, being lots numbered 1 to 34 inclusive, shown in deposited plan No. 15,138,—and said to be in the possession of Robert Hunter.

Dated at Sydney, this 15th day of May, 1946.

(L.S.) F. R. JORDAN, Lieutenant-Governor.

By His Excellency's Command,

(7865) JAMES MCGIRR, Minister for Housing.

HOUSING ACT, 1912, AS AMENDED.—PUBLIC WORKS ACT, 1912, AS AMENDED.

ACQUISITION OF LAND FOR HOUSING PURPOSES (HOUSING SCHEME AT MARSFIELD, NEW SOUTH WALES).

IT is hereby notified and declared by His Excellency the Lieutenant-Governor, acting with the advice of the Executive Council, that in pursuance of the provisions of section 4 of the Housing Act, 1912, as amended by subsequent Acts, and as affected by the Housing Act, 1941, so much of the lands described in the Schedule hereunder as is Crown land is hereby appropriated, and so much of the said lands as is private property is hereby resumed, under the Public Works Act, 1912, as amended, for the purposes of the Housing Act, 1912, as amended, including all such mines and deposits under the said lands as are mentioned in section 141 of the said Public Works Act, 1912, and that the said lands are vested in The Housing Commission of New South Wales. (46-13,780—Schedule N308)

SCHEDULE.

All that piece or parcel of land situate in the Municipality of Eastwood, parish of Hunters Hill, county of Cumberland, being lot numbered 1, shown in deposited plan No. 21,—having an area of 11 acres 3 roods 36½ perches or thereabouts and said to be in the possession of Salvatore Tassone, Robert Percival Napier and the estate of John Ainslie Paton.

Also, all that piece or parcel of land situate as aforesaid, being part of lot numbered 2, shown in deposited plan No. 21, and being also the whole of the land comprised in Certificate of Title, registered volume 2,287, folio 124, EXCLUDING the 3 square feet of land shown in plan annexed to memorandum of transfer No. D. 11,630,—having an area of 9 acres 3 roods 39½ perches or thereabouts and said to be in the possession of Mrs. Maisie Allen Stobo.

And also, all that piece or parcel of land situate as aforesaid, being part of lot 3 shown in deposited plan No. 21, and being also the whole of the land comprised in Certificate of Title, registered volume 5,149, folio 64,—having an area of 4 acres 1 rood 17½ perches or thereabouts and said to be in the possession of Norman Wilson.

Dated at Sydney, this 15th day of May, 1946.

(L.S.) F. R. JORDAN, Lieutenant-Governor.

By His Excellency's Command,

(7864) JAMES MCGIRR, Minister for Housing.

HOUSING ACT, 1912, AS AMENDED.—PUBLIC WORKS ACT, 1912, AS AMENDED.

ACQUISITION OF LAND FOR HOUSING PURPOSES (HOUSING SCHEME AT LAKE COVE, NEW SOUTH WALES).

IT is hereby notified and declared by His Excellency the Lieutenant-Governor, acting with the advice of the Executive Council, that in pursuance of the provisions of section 4 of the Housing Act, 1912, as amended by subsequent Acts, and as affected by the Housing Act, 1941, so much of the lands described in the Schedule hereunder as is Crown land is hereby appropriated and so much of the said lands as is private property is hereby resumed, under the Public Works Act, 1912, as amended, for the purposes of the Housing Act, 1912, as amended, including all such mines and deposits under the said lands as are mentioned in section 141 of the said Public Works Act, 1912, and that the said lands are vested in The Housing Commission of New South Wales. (46-12,620—Schedule N309)

SCHEDULE.

All that piece or parcel of land situate in the Municipality of Lake Cove, parish of Willoughby, county of Cumberland, being portion 169 of parish and being also the whole of the land comprised in Certificate of Title, registered volume 2,579, folio 164, having an area of 8 acres 35 perches or thereabouts, and said to be in the possession of General Investments Proprietary Limited.

Also, all that piece or parcel of land situate as aforesaid, being portion 170 of parish and being also the whole of the land comprised in Certificate of Title, registered volume 3,116, folio 28,—having an area of 13 acres 3 roods 22½ perches or thereabouts, and said to be in the possession of General Investments Proprietary Limited.

And also, all those pieces or parcels of land situate as aforesaid, being portion 168 of parish and parts of portion 176 of parish and being also the whole of the land comprised in Certificate of Title, registered volume 4,883, folio 234, EXCLUDING, however, the area of 1 acre 35.8 perches of land resumed for roadway purposes from portion 176 by notification in the Government Gazette dated 15th December, 1939, folios 5786 and 5787,—having an area of 20 acres 2 roods 6 perches or thereabouts, and said to be in the possession of the estate of Thomas Dalton.

Dated at Sydney, this 15th day of May, 1946.

(L.S.) F. R. JORDAN, Lieutenant-Governor.

By His Excellency's Command,

(7867) JAMES MCGIRR, Minister for Housing.

HOUSING ACT, 1912, AS AMENDED.—PUBLIC WORKS ACT, 1912, AS AMENDED.

ACQUISITION OF LAND FOR HOUSING PURPOSES (HOUSING SCHEME AT MARSFIELD, NEW SOUTH WALES).

IT is hereby notified and declared by His Excellency the Lieutenant-Governor, acting with the advice of the Executive Council, that in pursuance of the provisions of section 4 of the Housing Act, 1912, as amended by subsequent Acts, and as affected by the Housing Act, 1941, so much of the lands described in the Schedule hereunder as is Crown land is hereby appropriated, and so much of the said lands as is private property is hereby resumed, under the Public Works Act, 1912, as amended, for the purposes of the Housing Act, 1912, as amended, including all such mines and deposits under the said lands as are mentioned in section 141 of the said Public Works Act, 1912, and that the said lands are vested in The Housing Commission of New South Wales. (46-13,770—Schedule N319)



SCHEDULE.

All that piece or parcel of land situate in the Municipality of Eastwood, parish of Hunters Hill, county of Cumberland, being portion 622 shown on plan catalogued C. 1,743-2,030 in the Department of Lands, Sydney, and being also the whole of the land comprised within Certificate of Title, registered volume 3,038, folios 74 and 88, at the Registrar-General's Office, Sydney,—having an area of 5 acres 2 roods 34 perches or thereabouts, and said to be in the possession of Archibald Ernest Wilton and William Thomas Wilton.

Also, all that piece or parcel of land situate as aforesaid, being part of portion 634 shown in plan catalogued C. 1,744-2,030 in the Department of Lands, Sydney: Commencing on the north-eastern side of Epping-road at the westernmost corner of the land comprised within Certificate of Title, registered volume 3,679, folio 239; and bounded thence on the south-west by that side of that road bearing 301 degrees 24 minutes 260 feet; on the north-west and on the north-east by lines bearing 31 degrees 24 minutes 330 feet and 121 degrees 24 minutes 326 feet successively to the northernmost corner of portion 622; on the south-east by part of the north-western boundary of that portion bearing 211 degrees 24 minutes 165 feet to the easternmost corner of the land comprised with Certificate of Title, registered volume 3,679, folio 239, aforesaid; and again on the south-west and south-east by the north-eastern and north-western boundaries of that land bearing 301 degrees 24 minutes 66 feet and 211 degrees 24 minutes 165 feet successively to the point of commencement,—having an area of 2 acres 35 perches or thereabouts, and said to be in the possession of Alfred Edward Bennett.

Dated at Sydney, this 15th day of May, 1946.

(L.S.) F. R. JORDAN, Lieutenant-Governor.

By His Excellency's Command,

(7866) JAMES MCGIRR, Minister for Housing.

HOUSING ACT, 1912, AS AMENDED.—PUBLIC WORKS ACT, 1912, AS AMENDED.

ACQUISITION OF LAND FOR HOUSING PURPOSES (HOUSING SCHEME AT RYDALMERE, NEW SOUTH WALES).

IT is hereby notified and declared by His Excellency the Lieutenant-Governor, acting with the advice of the Executive Council, that in pursuance of the provisions of section 4 of the Housing Act, 1912, as amended by subsequent Acts, and as affected by the Housing Act, 1941, so much of the lands described in the Schedule hereunder as is Crown land is hereby appropriated, and so much of the said lands as is private property is hereby resumed, under the Public Works Act, 1912, as amended, for the purposes of the Housing Act, 1912, as amended, including all such mines and deposits under the said land as are mentioned in section 141 of the said Public Works Act, 1912, and that the said lands are vested in The Housing Commission of New South Wales. (46-14,561—Schedule N287).

SCHEDULE.

All that piece or parcel of land situate in the Municipality of Ermington and Rydalmere, parish of Field of Mars, county of Cumberland, being lots numbered 9 and 10, shown in deposited plan No. 15,173,—and said to be in the possession of Mrs. Myra Lucy Francis.

Dated at Sydney, this 22nd day of May, 1946.

(L.S.) F. R. JORDAN, Lieutenant-Governor.

By His Excellency's Command,

(7513) JAMES MCGIRR, Minister for Housing.

HOUSING ACT, 1912, AS AMENDED.—PUBLIC WORKS ACT, 1912, AS AMENDED.

ACQUISITION OF LAND FOR HOUSING PURPOSES (HOUSING SCHEME AT WILEY PARK, NEW SOUTH WALES).

IT is hereby notified and declared by His Excellency the Lieutenant-Governor, acting with the advice of the Executive Council, that in pursuance of the provisions of section 4 of the Housing Act, 1912, as amended by subsequent Acts, and as affected by the Housing Act, 1941, so much of the lands described in the Schedule hereunder as is Crown land is hereby appropriated, and so much of the said lands as is private property is hereby resumed, under the Public Works Act, 1912, as amended, for the purposes of the Housing Act, 1912, as amended, including all such mines and deposits under the said lands as are mentioned in section 141 of the said Public Works Act, 1912, and that the said lands are vested in The Housing Commission of New South Wales. (46-12,378—Schedule N244)

SCHEDULE.

All that piece or parcel of land situate in the Municipality of Canterbury, parish of St. George, county of Cumberland, being part of the land shown in the plan lodged with Real Property Application No. 23,851, and part of the reserve 8

feet 7½ inches wide shown in deposited plan No. 4,494: Commencing at the easternmost corner of lot 63, shown in deposited plan No. 19,991; and bounded thence on the south-west by part of the north-eastern boundary of the said lot 63 bearing 324 degrees 10 minutes 160 feet; on the north-west by a line bearing 54 degrees 10 minutes 92 feet 7½ inches; on the north-east by a line and part of the south-western boundary of lot 1, section 3, shown in deposited plan No. 4,494, in all bearing 144 degrees 33 minutes 165 feet 4½ inches to the easternmost corner of the aforesaid reserve 8 feet 7½ inches wide; on the south-east by part of the south-eastern side of that reserve bearing 232 degrees 9 minutes 66 feet 0½ inch; again on the south-west by a line bearing 324 degrees 33 minutes 8 feet 7½ inches to the north-western side of the aforesaid reserve; and again on the south-east by that side of the said reserve bearing 232 degrees 9 minutes 25 feet 8 inches to the point of commencement,—having an area of 1 rood 15½ perches or thereabouts, and said to be in the possession of Mrs. Cecilia F. Hood and the Council of the Municipality of Canterbury.

Also, all that piece or parcel of land situate as aforesaid, being part of lots 1 to 4 inclusive, section 1, and part of the reserve 8 feet 7½ inches wide shown in deposited plan No. 4,494: Commencing at the easternmost corner of lot 39 shown in deposited plan No. 19,991; and bounded thence on the north-east by a line bearing 162 degrees 33 minutes 30 seconds 265 feet 3 inches to the southernmost corner of the aforesaid lot 4; on the south-west by the south-western boundaries of the aforesaid lots 1 to 4 inclusive, and a line in all bearing 323 degrees 15 minutes 248 feet 7½ inches to the south-eastern boundary of the aforesaid lot 39; and on the north-west by part of that boundary bearing 52 degrees 9 minutes 87 feet 8½ inches to the point of commencement,—having an area of 1 rood or thereabouts, and said to be in the possession of the Council of the Municipality of Canterbury, Mrs. Amy Elizabeth Fry, Patrick John Moore, Stanley James Smith and John and Violet B. Buchan.

Dated at Sydney, this 15th day of May, 1946.

(L.S.) F. R. JORDAN, Lieutenant-Governor.

By His Excellency's Command,

(7654) JAMES MCGIRR, Minister for Housing.

HOUSING ACT, 1912, AS AMENDED.—PUBLIC WORKS ACT, 1912, AS AMENDED.

ACQUISITION OF LAND FOR HOUSING PURPOSES (HOUSING SCHEME AT PARRAMATTA NORTH, NEW SOUTH WALES).

IT is hereby notified and declared by His Excellency the Lieutenant-Governor, acting with the advice of the Executive Council, that in pursuance of the provisions of section 4 of the Housing Act, 1912, as amended by subsequent Acts, and as affected by the Housing Act, 1941, so much of the lands described in the Schedule hereunder as is Crown land is hereby appropriated, and so much of the said lands as is private property is hereby resumed, under the Public Works Act, 1912, as amended, for the purposes of the Housing Act, 1912, as amended, including all such mines and deposits under the said lands as are mentioned in section 141 of the said Public Works Act, 1912, and that the said lands are vested in The Housing Commission of New South Wales. (46-13,813—Schedule N296)

SCHEDULE.

All that piece or parcel of land situate in the City of Parramatta, parish of Field of Mars, county of Cumberland, being allotments 56 and 57, section 27, Town of Parramatta, and being also the whole of the land comprised within Certificate of Title, registered volume 5,415, folio 20,—and said to be in the possession of Albert Edward O'Brien.

Dated at Sydney, this 15th day of May, 1946.

(L.S.) F. R. JORDAN, Lieutenant-Governor.

By His Excellency's Command,

(7579) JAMES MCGIRR, Minister for Housing.

(7988) Sydney, 20th May, 1946.

FISHERIES AND OYSTER FARMS ACT, 1935-1942.

PARTIAL SURRENDER OF OYSTER FARM.

APPROVAL has been given for the surrender of 7 a. 0 r. 5 p. of Mr. William Eric Judd's Oyster Farm No. 38-23 at Georges River, as from the 7th May, 1945, and for a corresponding reduction in the rental of the lease to £6 10s. per annum as from the 8th May, 1945.

J. M. BADDELEY.

(7909) Sydney, 13th May, 1946.

FISHERIES AND OYSTER FARMS ACT, 1935-1942.

SURRENDER AND PARTIAL SURRENDER OF OYSTER LEASES.

APPROVAL has been given to H. Woodward and Co. Pty. Limited to surrender (1) Oyster Leases Nos. 16,377, 9,609 and 40-166 of 400 yards, 100 yards and 600 yards respectively, at Camden Haven as from the 31st December, 1945; (2) Oyster Farm No. 44-51 of 100 yards, at Camden Haven, as from the 1st April, 1946; (3) sections 3, 4 and 5 of Oyster



CERTIFICATE OF TITLE

PROPERTY ACT, 1900



13074054

NEW SOUTH WALES

Crown Grants Vol.1165 Fol.184
Vol.1215 Fol.6

Prior Titles Vol.3679 Fol.239
Vol.5811 Fol.7
Vol.6322 Fol.91
Vol.7877 Fol.57



Vol. **13074** Fol. **54**
CANCELLED IN
EDITION ISSUED

28 6 1976

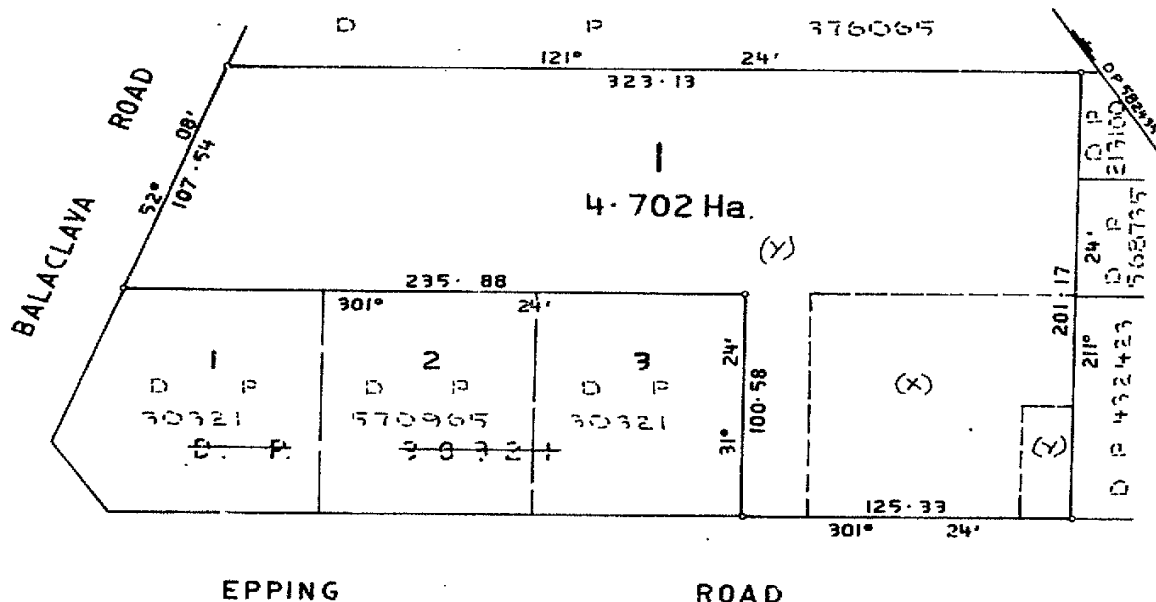
I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Janatson
Registrar General.



PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 1 in Deposited Plan 582435 at Marsfield in the Municipality of Ryde Parish of Hunters Hill and County of Cumberland.

FIRST SCHEDULE

N.S.W. BAPTIST HOMES TRUST.

SECOND SCHEDULE

- Reservations and conditions if any, contained in the Crown Grants above referred to as to the parts of the land above described designated (Y) shown in the plan hereon.
- Covenant created by Transfer No. J323780 affecting the parts of the land above described designated (X) shown in the plan hereon.
- Lease No. K557325 to The Sydney County Council of the premises shown as Substation Premises No.2491 together with right of way and easement for electricity purposes. Registered 19-2-1967. Exp. 13-3-1967

FIRST SCHEDULE (continued)

[illegible]

SECOND SCHEDULE (continued)

[illegible]

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED



SEARCH DATE

17/3/2022 4:12PM

FOLIO: 11/748174

First Title(s): VOL 1137 FOL 218 VOL 1165 FOL 184
VOL 1215 FOL 6

Prior Title(s): VOL 7837 FOL 212 VOL 11362 FOL 2
VOL 13074 FOL 54

Recorded	Number	Type of Instrument	C.T. Issue
20/10/1987	DP748174	DEPOSITED PLAN	FOLIO CREATED EDITION 1
12/2/1993	I116496	CHANGE OF NAME	EDITION 2
19/3/2007	DP1107965	DEPOSITED PLAN	
17/9/2007	AD344176	TRANSFER	FOLIO CANCELLED

Transfer of part of the
land to Roads & Traffic
Authority of NSW

*** END OF SEARCH ***



WARNING: ***** FOLIO CANCELLED *****

FOLIO: 11/748174

SEARCH DATE	TIME	EDITION NO	DATE
21/3/2022	2:41 PM	2	12/2/1993

LAND

LOT 11 IN DEPOSITED PLAN 748174

AT MARSFIELD

LOCAL GOVERNMENT AREA RYDE

PARISH OF HUNTERS HILL COUNTY OF CUMBERLAND

TITLE DIAGRAM DP748174

FIRST SCHEDULE

ROADS & TRAFFIC AUTHORITY OF NEW SOUTH WALES
OF LOT 61 IN DP1107965

BAPTIST COMMUNITY SERVICES - NSW & ACT

OF THE RESIDUE BEING LOT 60 IN DP1107965

(T AD344176)

SECOND SCHEDULE (3 NOTIFICATIONS)

- 1 RESERVATIONS AND CONDITIONS AFFECTING THE PART DESIGNATED (Y) IN THE TITLE DIAGRAM
- 2 J323780 COVENANT AFFECTING THE PART SHOWN SO BURDENED IN THE TITLE DIAGRAM.
- * 3 AD344176 ***** FOLIO CANCELLED ***** NEW FOLIOS HAVE BEEN CREATED FOR LOT(S) 60 AND 61 IN DP1107965

NOTATIONS

DP1107965 NOTE: PLAN OF ROADS ACT, 1993

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

Form: 01T
Licence: 05-11-638
Licensee: Softdocs
Coleman & Greig

①

TRANSFER
New South Wales
Real Property Act 1900



AD344176N

PRIVACY NOTE: Section 31B of the Real Property Act 1900 (RP Act) authorises the Registrar by this form for the establishment and maintenance of the Real Property Act Register. Section 96B RP Act requires that the Register is made available to any person for search upon payment of a fee, if any.

STAMP DUTY

Office of State Revenue use only

NEW SOUTH WALES DUTY
13-08-2007 0004481685-001
SECTION OTHER LEGN-TRANSFER
NO DUTY PAYABLE

(A) **FOlio OF THE REGISTER**
13-08-2007 \$15
ALTERATION
NOTED

Part Folio Identifier 11/~~748174~~ now being Folio Identifier 61/1107965

(B) **LODGED BY**

Document
Collection
Box

Name, Address or DX, Telephone, and LLPN if any

COLEMAN & GREIG
SOLICITORS
189 Y

CODE

T
TW
(Sheriff)

Reference (optional): RTA-BAPTIST: 70852

(C) **TRANSFEROR**

BAPTIST COMMUNITY SERVICES - NSW & ACT (000 049 525)

(D) **CONSIDERATION** The transferor acknowledges receipt of the consideration of \$ 80,151.52 and as regards the folio

(E) **ESTATE** of the Register specified above transfers to the transferee an estate in fee simple.

(F) **SHARE TRANSFERRED**

(G) **ENCUMBRANCES (if applicable):**

(H) **TRANSFEE**

ROADS & TRAFFIC AUTHORITY OF NEW SOUTH WALES

(I) **TENANCY:**

DATE

10.18.2007

(J) Certified correct for the purposes of the Real Property Act 1900 and executed on behalf of the corporation named below by the authorised person(s) whose signature(s) appear(s) below pursuant to the authority specified.

Corporation: BAPTIST COMMUNITY SERVICES - NSW & ACT

Authority: Section 127 of the Corporations Act 2001

Signature of authorised person:

Name of authorised person: GRAEME HOGAN

Office held: SECRETARY



Signature of authorised person:

Name of authorised person: ALAN RICE

Office held: DIRECTOR

Certified correct for the purposes of the Real Property Act 1900 by the person whose signature appears below.

Signature

Signatory's name: ANNE MACKINNON

Signatory's capacity: Solicitor for the transferee



SEARCH DATE

17/3/2022 4:12PM

FOLIO: 60/1107965

First Title(s): VOL 1137 FOL 218 VOL 1165 FOL 184
VOL 1215 FOL 6

Prior Title(s): 11/748174

Recorded	Number	Type of Instrument	C.T. Issue
19/3/2007	DP1107965	DEPOSITED PLAN	LOT RECORDED FOLIO NOT CREATED
17/9/2007	AD344176	TRANSFER	Transfer of part of the land to Roads & Traffic Authority of NSW FOLIO CREATED EDITION 1
19/2/2009	AE511968	POSITIVE COVENANT	EDITION 2
2/6/2010	AF516521	REQUEST	
24/12/2012	AH324594	REQUEST	
28/3/2014	AI475113	DEPARTMENTAL DEALING	
30/3/2015	AJ367339	CHANGE OF NAME	EDITION 3
6/1/2017	DP1220136	DEPOSITED PLAN	EDITION 4

*** END OF SEARCH ***



FOLIO: 60/1107965

SEARCH DATE	TIME	EDITION NO	DATE
17/3/2022	2:03 PM	4	6/1/2017

LAND

LOT 60 IN DEPOSITED PLAN 1107965

AT MACQUARIE PARK

LOCAL GOVERNMENT AREA RYDE

PARISH OF HUNTERS HILL COUNTY OF CUMBERLAND

TITLE DIAGRAM DP1107965

FIRST SCHEDULE

BAPTISTCARE NSW & ACT

(CN AJ367339)

SECOND SCHEDULE (5 NOTIFICATIONS)

- 1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S) AFFECTING THE PART DESIGNATED (Y) IN THE TITLE DIAGRAM
- 2 AH324594 PART OF THE LAND ABOVE DESCRIBED IS USED AS A RETIREMENT VILLAGE UNDER THE RETIREMENT VILLAGES ACT 1999 KNOWN AS WILLANDRA VILLAGE SHOWN HATCHED IN PLAN WITH AH324594
- 3 J323780 COVENANT AFFECTING THE PART SHOWN SO BURDENED IN THE TITLE DIAGRAM.
- 4 AE511968 POSITIVE COVENANT
- 5 DP1220136 EASEMENT TO DRAIN WATER 3.2 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN DP1220136

NOTATIONS

AF516521 NOTE: REFER ALL DEALINGS TO SD2 (RETIREMENT VILLAGE)

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***



Section 10.7 Certificates & Council Records

Jk Environments
Jk Environments, Po Box 976
NORTH RYDE BC NSW 1670

Issue Date: 08 March 2022
Certificate No: PLN2022/1043
Your Ref: E32891PR

PLANNING CERTIFICATE SECTION 10.7

NSW Environmental Planning and Assessment Act 1979 ('Act')

Property Address: 157 Balaclava Rd MACQUARIE PARK NSW 2113

Legal Description: Lot 60 DP 1107965

Property Reference: 501594

Land Reference: 51461

INFORMATION PROVIDED PURSUANT TO SECTION 10.7(2) OF THE ACT AND SCHEDULE 4 OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT REGULATION 2000

1. NAMES OF RELEVANT ENVIRONMENTAL PLANNING INSTRUMENTS AND DEVELOPMENT CONTROL PLANS

a) LOCAL ENVIRONMENTAL PLAN AND DEEMED ENVIRONMENTAL PLANNING INSTRUMENTS

Ryde Local Environment Plan 2014

b) PROPOSED LOCAL ENVIRONMENTAL PLANS that are or have been the subject of community consultation or public exhibition under the Act.

Nil

c) DEVELOPMENT CONTROL PLANS

City of Ryde Development Control Plan 2014

d) STATE ENVIRONMENTAL PLANNING POLICIES AND INSTRUMENTS

The Minister for Planning has notified Council that the following State Environmental Planning Policies and Proposed State Environmental Plans apply to the land and should be specified in this certificate:

State Environmental Planning Policies

State Environmental Planning Policy No 65 - Design Quality of Residential Apartment Development.

State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004

State Environmental Planning Policy (Exempt and Complying Development Codes) 2008

State Environmental Planning Policy (Biodiversity and Conservation) 2021

State Environmental Planning Policy (Housing) 2021

State Environmental Planning Policy (Industry and Employment) 2021

State Environmental Planning Policy (Planning Systems) 2021
State Environmental Planning Policy (Precincts - Eastern Harbour City) 2021
State Environmental Planning Policy (Primary Production) 2021
State Environmental Planning Policy (Resilience and Hazards) 2021
State Environmental Planning Policy (Resources and Energy) 2021
State Environmental Planning Policy (Transport and Infrastructure) 2021

Deemed State Environmental Planning Policies

NIL

Proposed State Environmental Planning Policies

State Environmental Planning Policy (Design and Place) 2021

***Note:** Specific constraints and zoning of the land may affect the applicability of certain provisions within the Policies listed above.*

2. ZONING AND LAND USE UNDER RELEVANT LOCAL ENVIRONMENTAL PLANS

(a) ZONING and ZONING TABLE

Ryde Local Environmental Plan 2014 - Zone B4 - Mixed Use

1 Objectives of zone

- To provide a mixture of compatible land uses.
- To integrate suitable business, office, residential, retail and other development in accessible locations so as to maximise public transport patronage and encourage walking and cycling.
- To ensure employment and educational activities within the Macquarie University campus are integrated with other businesses and activities.
- To promote strong links between Macquarie University and research institutions and businesses within the Macquarie Park corridor.

2 Permitted without consent

Home occupations

3 Permitted with consent

Boarding houses; Building identification signs; Business identification signs; Centre-based child care facilities; Commercial premises; Community facilities; Educational establishments; Entertainment facilities; Function centres; Hotel or motel accommodation; Information and education facilities; Medical centres; Oyster aquaculture; Passenger transport facilities; Recreation facilities (indoor); Registered clubs; Respite day care centres; Restricted premises; Roads; Seniors housing; Shop top housing; Tank-based aquaculture; Waste or resource transfer stations; Any other development not specified in item 2 or 4.

4 Prohibited

Agriculture; Air transport facilities; Animal boarding or training establishments; Biosolids treatment facilities; Camping grounds; Caravan parks; Depots; Eco-tourist facilities; Farm buildings; General industries; Heavy industrial storage establishments; Heavy industries; Home occupations (sex services); Industrial training facilities; Pond-based aquaculture; Resource recovery facilities; Sewage treatment plants; Sex services premises; Signage; Vehicle body repair workshops; Vehicle repair stations; Waste disposal facilities; Water recycling facilities; Water supply systems.

(b) DEVELOPMENT STANDARDS FOR THE ERECTION OF A DWELLING HOUSE

No development standards under the Local Environment Plan apply to the land that fix minimum land dimension for the erection of a dwelling house on the land.

(c) CRITICAL HABITAT

No. The land does not include or comprise critical habitat under Local Environmental Plan.

(d) CONSERVATION AREA (however described)

No. The land has not been identified as being within a heritage conservation area under the Local Environment Plan.

(e) ITEMS OF ENVIRONMENTAL HERITAGE (however described)

No. An item of environmental heritage is not situated on the land under the Local Environmental Plan.

2A. ZONING AND LAND USE UNDER STATE ENVIRONMENTAL PLANNING POLICY (SYDNEY REGION GROWTH CENTRES) 2006

This policy was repealed by *State Environmental Planning Policy (Precincts – Central River City) 2021* on 1 March 2022. The *State Environmental Planning Policy (Precincts – Central River City) 2021* does not apply to land within the Ryde Local Government Area.

OTHER PRESCRIBED INFORMATION

3. COMPLYING DEVELOPMENT

- (1) The extent to which the land is land on which complying development may be carried out under each of the codes for complying development because of the provisions of clauses 1.17A (1) (c) to (e), (2), (3) and (4), 1.18(1)(c3) and 1.19 of *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008*.
- (2) The extent to which complying development may not be carried out on that land because of the provisions of clauses 1.17A (1) (c) to (e), (2), (3) and (4), 1.18(1)(c3) and 1.19 of that Policy and the reasons why it may not be carried out under those clauses.
- (3) If the council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land, a statement that a restriction applies to the land, but it may not apply to all of the land, and that council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land.

Rural Housing Code, Greenfield Housing Code and Inland Code

The Rural Housing Code, Greenfield Housing Code and Inland Code **do not apply** to this Local Government Area.

Housing Code, Low Rise Housing Diversity Code, Industrial and Business Building Code, Housing Alterations Code, Industrial and Business Alterations Code, Subdivisions Code, General Development Code, Demolition Code, Fire Safety Code, and Container Recycling Facilities Code

Housing Code, Low Rise Housing Diversity Code, Industrial and Business Building Code, Housing Alterations Code, Industrial and Business Alterations Code, Subdivisions Code, General Development Code, Demolition Code, Fire Safety Code, and Container Recycling Facilities Code **do apply** to this Local Government Area.

Clause 1.17A(1)(c) to (e), (2), (3) and (4); 1.18(1)(c3); and 1.19 of the *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008* determine the extent to which complying development **may** or **may not** be carried out on land in response to the provisions of those clauses.

Refer to **Appendix 1** for detail on what codes **may** or **may not** allow complying development on the land.

Note: All Exempt and Complying Development Codes: Council does not have sufficient information to ascertain the extent of a land-based exclusion on a property. Despite any statement preventing the carrying out of complying development in the Codes listed in Appendix 1, complying development may still be carried out providing the development is not on the land affected by the exclusion and meets the requirements and standards of *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008*.

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

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 the Coal Mine Subsidence Compensation Act 2017.

No. The land has not been proclaimed to be a mine subsidence district.

6. ROAD WIDENING AND ROAD REALIGNMENT

Whether or not the land is affected by any road widening or road realignment.

The land is not affected by any road widening or road realignment under:

- (a) Division 2 of Part 3 of the Roads Act 1993, or
- (b) any environmental planning instrument, or
- (c) any resolution of Council.

7. COUNCIL AND OTHER PUBLIC AUTHORITY POLICIES ON HAZARD RISK RESTRICTIONS

Whether or not the land is affected by a policy adopted by the council, or 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:

- (i) landslip - NO.
- (ii) bush fire - NO.
- (iii) tidal inundation - NO.
- (iv) subsidence - NO.
- (v) acid sulphate soil - NO.
- (vi) any other risk (other than flooding) - NO.

Note: The fact that land has not been identified as being affected by a policy to restrict development because of the risks referred to does not mean that the risk is non-existent.

7A. FLOOD RELATED DEVELOPMENT CONTROLS

(1) Whether or not the land or part of the land is within the flood planning area and subject to flood related development controls - **YES**

(2) Whether or not the land or part of the land is between the flood planning area and the probable maximum flood and subject to flood related development controls - **YES**

(3) In this clause-

flood planning area has the same meaning as in the Floodplain Development Manual.

Floodplain Development Manual means the *Floodplain Development Manual* (ISBN 0 7347 5476 0) published by the NSW Government in April 2005.

probable maximum flood has the same meaning as in the Floodplain Development Manual.

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.

No Environmental Planning Instrument applying to the land provides for the acquisition of the land by a public authority as referred to in Section 3.15 of the Act.

9. CONTRIBUTIONS PLAN

The name of each contributions plan applying to the land:

- City of Ryde Section 7.11 Development Contributions Plan 2020.
- City of Ryde Fixed Rate Levy (Section 7.12) Development Contributions Plan 2020.

9A. BIODIVERSITY CERTIFIED LAND

This land is not biodiversity certified land Under Part 8 of the *Biodiversity Conservation Act 2016*.

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

The land is not the subject of a biodiversity stewardship agreement under Part 5 of the *Biodiversity Conservation Act 2016*.

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

Council has not been notified that the land contains a set aside area under section 60ZC of the *Local Land Services Act 2013* by Local Land Services.

11. BUSH FIRE PRONE LAND

The land described in this certificate is not bush fire prone land (as defined in the Act)

12. PROPERTY VEGETATION PLANS

The land is not subject to a property vegetation plan under the *Native Vegetation Act 2003*.

13. ORDERS UNDER TREES (DISPUTES BETWEEN NEIGHBOURS) ACT 2006

There has not been an order made under the Trees (Disputes between Neighbours) Act 2006 to carry out work in relation to a tree on the land.

14. DIRECTIONS UNDER PART 3A (REPEALED)

There is no direction in force under section 75P (2)(c1) of the *Environmental Planning and Assessment Act 1979*.

15. CONDITIONS FOR SENIORS HOUSING

There are no terms of a kind referred to in Clause 88(2) of Chapter 3, Part 5 of State Environmental Planning Policy (Housing) 2021 that have been imposed as a condition of development consent granted after 11 October 2007 in relation to the land.

16. SITE COMPATIBILITY CERTIFICATES FOR INFRASTRUCTURE, SCHOOLS OR TAFE ESTABLISHMENTS

There is no valid site compatibility certificate (infrastructure) or site compatibility certificate (schools or TAFE establishments), of which the Council is aware, in respect of proposed development on the land.

17. SITE COMPATIBILITY CERTIFICATES AND CONDITIONS FOR AFFORDABLE RENTAL HOUSING

(1) There is no current site compatibility certificate (affordable rental housing) that Council is aware of, in respect of proposed development on the land.

(2) There are no terms of a kind referred to in Clause 21(1) or 40(1) of Chapter 2, Part 2, Division 1 or 5 of State Environmental Planning Policy (Housing) 2021 that have been imposed as a condition of consent to a development application in respect of the land.

18. PAPER SUBDIVISION INFORMATION

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

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

(3) Words and expressions used in this clause have the same meaning as they have in Part 16C of *Environmental Planning and Assessment Regulation 2000*.

Note: *City of Ryde does not hold any paper subdivision within the meaning of this clause.*

19. SITE VERIFICATION CERTIFICATES

There is no current site verification certificate of which the Council is aware in respect of the land.

20. LOOSE-FILL ASBESTOS INSULATION

The land does NOT include 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.

21. AFFECTED BUILDING NOTICES AND BUILDING PRODUCT RECTIFICATION ORDERS

(1) Whether or not there is any affected building notice of which the council is aware that is in force in respect of the land.

No

(2) (a) Whether or not there is any building product rectification order of which the council is aware that is in force in respect of the land and has not been fully complied with,

No

and

(b) Whether or not there is any notice of intention to make a building product rectification order of which the council is aware that has been given in respect of the land and is outstanding.

No

(3) In this clause:

Affected building notice has the same meaning as in Part 4 of 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) The land to which this certificate relates IS NOT significantly contaminated land.
- (b) The land to which this certificate relates IS NOT subject to a management order.
- (c) The land to which this certificate relates IS NOT the subject of an approved voluntary management proposal.
- (d) The land to which this certificate relates IS NOT subject to an ongoing maintenance order.
- (e) The land to which this certificate relates IS NOT subject of a site audit statement.

ADDITIONAL INFORMATION UNDER SECTION 10.7(5) OF THE ACT

Environmental planning instruments or development control plans may place restrictions on matters such as:

- i) the purpose for which buildings, works or land may be erected, carried out or used;
- ii) the extent of development permitted;
- iii) minimum site requirements; and/or
- iv) the means of vehicular access to the land.

The instruments and the plans should be examined in relation to the specific restrictions which may apply to any development which may be proposed.

Registers of Consents may be examined at Council's Customer Service Centre for particulars relating to development consents which may have been issued for the use or development of the land.

Enquiries regarding areas reserved for Classified Road and Regional Open Space should be directed to the Roads and Maritime Services and Departments of Planning and Environment respectively.

The information provided concerning the Coastal Protection Act, 1979 is only to the extent that the Council has been notified by the Office of Environment and Heritage.

Council has adopted by resolution a policy concerning the management of contaminated land. This policy applies to all land in the City of Ryde and will restrict development of the land if the circumstances set out in the policy prevail. Copies of the policy are available on Council's Website at www.ryde.nsw.gov.au.

FURTHER ADDITIONAL INFORMATION UNDER SECTION 10.7(5) OF THE ACT

Heritage

The property is within the vicinity of a heritage item as listed in Schedule 5 of Ryde Local Environmental Plan 2014. Your attention is drawn to Clause 5.10(5) which addresses the need to assess the impact of proposed development on properties in the vicinity of a heritage item on the heritage significance, visual curtilage and setting of the heritage item itself.

Note: *The information in this certificate is current as of the date of the certificate.*

A handwritten signature in black ink, appearing to read 'Liz Coad', with a long horizontal flourish extending to the right.

Liz Coad
Director City Planning and Environment

Appendix 1 – Complying Development

Housing Alterations Code, Industrial and Business Alterations Code, Subdivisions Code, General Development Code, Demolition Code, Fire Safety Code, and Container Recycling Facilities Code.

If any of the following statements are **YES** in response to the provisions of Clause 1.17A(1)(c) to (e), (2), (3) and (4) and 1.18(1)(c3) complying development **may not** be carried out on land under the above codes:

1.17A Requirements for complying development for all environmental planning instruments	
To be complying development for the purposes of any environmental planning instrument, the development must not:	
be on land that is, or is part of, a wilderness area (within the meaning of the <i>Wilderness Act 1987</i>) (See 1.17A(1)(c))	NO
be carried out on land that: (i) comprises an item that is listed on the State Heritage Register under the <i>Heritage Act 1977</i> or on which such an item is located, (ii) is subject to an interim heritage order under that Act or on which is located an item that is so subject, or (iii) is identified as an item of environmental heritage or a heritage item by an environmental planning instrument or on which is located an item that is so identified. (See 1.17A(1)(d))	NO
Except as otherwise provided by this Policy, be on land that is within an environmentally sensitive area (See 1.17A(1)(e)).	NO
1.18 General requirements for complying development under this Policy	
To be complying development for the purposes of this Policy, the development must:	
Not be carried out on land that comprises, or on which there is, a draft heritage item (See 1.18(c3))	NO

Housing Code, Low Rise Housing Diversity Code, and Industrial and Business Building Code

If any of the following statements are **YES** in response to the provisions of Clause 1.17A(1)(c) to (e), (2), (3) and (4); 1.18(1)(c3); and 1.19 complying development **may not** be carried out on land under the above codes:

1.17A Requirements for complying development for all environmental planning instruments	
To be complying development for the purposes of any environmental planning instrument, the development must not:	
be on land that is, or is part of, a wilderness area (within the meaning of the <i>Wilderness Act 1987</i>) (See 1.17A(1)(c))	NO

<p>be carried out on land that:</p> <p>(i) comprises an item that is listed on the State Heritage Register under the <i>Heritage Act 1977</i> or on which such an item is located,</p> <p>(ii) is subject to an interim heritage order under that Act or on which is located an item that is so subject, or</p> <p>(iii) is identified as an item of environmental heritage or a heritage item by an environmental planning instrument or on which is located an item that is so identified.</p> <p>(See 1.17A(1)(d))</p>	NO
<p>Except as otherwise provided by this Policy, be on land that is within an environmentally sensitive area (See 1.17A(1)(e)).</p>	NO
1.18 General requirements for complying development under this Policy	
To be complying development for the purposes of this Policy, the development must:	
<p>Not be carried out on land that comprises, or on which there is, a draft heritage item (See 1.18(c3))</p>	NO
1.19 Land on which complying development may not be carried out	
To be complying development specified for the Housing Code, Low Rise Housing Diversity Code, and Industrial and Business Building Code the development must not be carried out on:	
<p>Land within a heritage conservation area or a draft heritage conservation area, unless the development is a detached outbuilding, detached development (other than a detached studio) or swimming pool (See 1.19(1)(a)).</p> <p>However, any complying development under the Industrial and Business Building Code must not be carried out on land within a heritage conservation area or a draft heritage conservation area (See 1.19(5)(a)).</p>	NO
<p>Land that is reserved for a public purpose by an environmental planning instrument (See 1.19(1)(b) and 1.19(5)(b))</p>	NO
<p>Land identified on an Acid Sulfate Soils Map as being Class 1 or Class 2 (See 1.19(1)(c) and 1.19(5)(c))</p>	NO
<p>Land that is significantly contaminated land within the meaning of the <i>Contaminated Land Management Act 1997</i> (see 1.19(1)(c1) and 1.19(5)(d))</p>	NO
<p>Land identified by an environmental planning instrument as being:</p> <p>(i) within a buffer area, or</p> <p>(ii) within a river front area, or</p> <p>(iii) within an ecologically sensitive area, or</p> <p>(iv) environmentally sensitive land, or</p> <p>(v) within a protected area.(See 1.19(1)(e) and 1.19(5)(f))</p>	<p>Council does not have sufficient information to ascertain the extent of this land-based exclusion on a property</p>

Land that is identified by an environmental planning instrument, a development control plan or a policy adopted by the council as being or affected by: (i) a coastline hazard, or (ii) a coastal hazard, or (iii) a coastal erosion hazard. (see 1.19(1)(f) and 1.19(5)(g))	Council does not have sufficient information to ascertain the extent of this land-based exclusion on a property
Land in a foreshore area (see 1.19(1)(g) and 1.19(5)(h))	NO
(3A) Development specified in the Low Rise Housing Diversity Code is not complying development under that code if it is carried out on land on which there is a heritage item or a draft heritage item.	NO

Record List (Record Number and Title)

Record Number	Title
PCA2019/150	DEVELOPMENT AND BUILDING CONTROLS - BUILDING AND DEVELOPMENT APPLICATIONS - Balaclava Road 157, Macquarie Park - Amended Construction Certificate - Alterations and additions to existing
PCA2019/43	DEVELOPMENT AND BUILDING CONTROLS - BUILDING AND DEVELOPMENT APPLICATIONS - Balaclava Road 157, Macquarie Park - Development - Alterations and additions to existing kitchen - CC-18279 -
PCA2018/399	DEVELOPMENT AND BUILDING CONTROLS - BUILDING AND DEVELOPMENT APPLICATIONS - Balaclava Road 157, Macquarie Park - Development - Proposed alterations to building and administration,
LDA18/382	Balaclava Road 157, Macquarie Park - Development
LDA2018/382	DEVELOPMENT AND BUILDING CONTROLS - BUILDING AND DEVELOPMENT APPLICATIONS - Balaclava Road 157, Macquarie Park - Development - Proposed free standing pylon sign (non illuminated)
LDA18/245	Balaclava Road 157, Macquarie Park - Development
LDA2018/245	DEVELOPMENT AND BUILDING CONTROLS - BUILDING AND DEVELOPMENT APPLICATIONS - Balaclava Road 157, Macquarie Park - Development - Alterations and additions to existing kitchen
PRL2018/5	LAND USE AND PLANNING - PLANNING - Balaclava Road 157, Macquarie Park - Concept Master Plan – comprising multiple buildings, road and open space and 160,250sqm (2.5:1)
CDP2014/544	DEVELOPMENT AND BUILDING CONTROLS - BUILDING AND DEVELOPMENT APPLICATIONS - Balaclava Road 157, Macquarie Park - Complying Development - Retrofitting of Fire Sprinkler Services to
PCA2014/183	DEVELOPMENT AND BUILDING CONTROLS - BUILDING AND DEVELOPMENT APPLICATIONS - Balaclava Road 157, Macquarie Park - Development - Alterations and additions to combine units 405 & 406
LDA14/52	Balaclava Road 157, Macquarie Park - Development
LDA2014/52	DEVELOPMENT AND BUILDING CONTROLS - BUILDING AND DEVELOPMENT APPLICATIONS - Balaclava Road 157, Macquarie Park - Development - Erect four new carports over ten existing car spaces
LDA13/331	Balaclava Road 157, Macquarie Park - Development
LDA2013/331	DEVELOPMENT AND BUILDING CONTROLS - BUILDING AND DEVELOPMENT APPLICATIONS - Balaclava Road 157, Macquarie Park - Development - Alterations & Additions to combine units 405 & 406 within
PCA2013/188	DEVELOPMENT AND BUILDING CONTROLS - BUILDING AND DEVELOPMENT APPLICATIONS - Balaclava Road 157, Macquarie Park - Development - Alterations and additions to the existing aged care facility
LDA12/486	Balaclava Road 157, Macquarie Park - Development
LDA2012/486	DEVELOPMENT AND BUILDING CONTROLS - BUILDING AND DEVELOPMENT APPLICATIONS - Balaclava Road 157, Macquarie Park - Development - Alterations and additions to existing health care facility
LDA2007/267	DEVELOPMENT AND BUILDING CONTROLS - BUILDING AND DEVELOPMENT APPLICATIONS - Balaclava Road 157, Macquarie Park - Development Application for construction of carport over 4 existing
CDP2012/196	DEVELOPMENT AND BUILDING CONTROLS - BUILDING AND DEVELOPMENT APPLICATIONS - Balaclava Road 157, Wilandra Cottage, Macquarie Park - Complying Development Certificate by Private
LDA2009/553	DEVELOPMENT AND BUILDING CONTROLS - BUILDING AND DEVELOPMENT APPLICATIONS - Balaclava Road 157 - CREATED IN TECH1 IN ERROR
PCA09/418	Balaclava Road 157, Macquarie Park - Development - Related to LDA2009/374
PCA2009/418	DEVELOPMENT AND BUILDING CONTROLS - BUILDING AND DEVELOPMENT APPLICATIONS - Balaclava Road 157, Macquarie Park - Development - 2 x advertising signs
LDA09/374	Balaclava Road 157, Macquarie Park - Development
LDA2009/374	DEVELOPMENT AND BUILDING CONTROLS - BUILDING AND DEVELOPMENT APPLICATIONS - Balaclava Road 157, Macquarie Park - Development - 2 x advertising signs
PCA2009/9	DEVELOPMENT AND BUILDING CONTROLS - BUILDING AND DEVELOPMENT APPLICATIONS - Balaclava Road 157 - Development - Private PCA
PCA2002/1239	DEVELOPMENT AND BUILDING CONTROLS - BUILDING AND DEVELOPMENT APPLICATIONS - Balaclava Road 157 - Development - Private PCA
LDA08/265	Balaclava Road 157, Macquarie Park - Development
LDA2008/265	DEVELOPMENT AND BUILDING CONTROLS - BUILDING AND DEVELOPMENT APPLICATIONS - Balaclava Road 157, Macquarie Park - Development - Alteration & additions to aged care facility.
PCA2007/267	DEVELOPMENT AND BUILDING CONTROLS - BUILDING AND DEVELOPMENT APPLICATIONS - Balaclava Road 157, Marsfield - Development
PCA07/267	Balaclava Road 157 - Development - Proposed carport over four existing car spaces (Baptist Community Services - Willandra Village) - Private PCA
LDA07/267	Balaclava Road 157 - Development - Proposed carport over four existing car spaces (Baptist Community Services - Willandra Village)
PCA05/383	Balaclava Road 157 - Development
LDA05/383	Balaclava Road 157 - Development
PCA02/1239	Balaclava Road 157 - Development - Private PCA

Record List (Record Number and Title)

Record Number	Title
LDA02/1239-05	Balaclava Road 157 - Development
LDA02/1239-04	Balaclava Road 157 - Development
P39.157-07	Balaclava Road 157
LDA02/1239-03	Balaclava Road 157 - Development
LDA02/1239-02	Balaclava Road 157 - Development
LDA02/1239-01	Balaclava Road 157 - Development
P39.157-06	Balaclava Road 157
P39.157-05	Balaclava Road 157
P39.157-04	Balaclava Road 157
P39.157-03	Balaclava Road 157
P39.157-02	Balaclava Road 157
P39.157-01	Balaclava Road 157



Appendix C: Laboratory Results Summary Tables

ABBREVIATIONS AND EXPLANATIONS

Abbreviations used in the Tables:

ABC:	Ambient Background Concentration	PCBs:	Polychlorinated Biphenyls
ACM:	Asbestos Containing Material	PCE:	Perchloroethylene (Tetrachloroethylene or Tetrachloroethene)
ADWG:	Australian Drinking Water Guidelines	PFAS:	Per- and polyfluoroalkyl substances
AF:	Asbestos Fines	PFHxS:	Perfluorohexanesulfonic acid
ANZG:	Australian and New Zealand Guidelines	PFOA:	Perfluorooctanoic acid
B(a)P:	Benzo(a)pyrene	PFOS:	Perfluorooctanesulfonic acid
CEC:	Cation Exchange Capacity	PQL:	Practical Quantitation Limit
CRC:	Cooperative Research Centre	RS:	Rinsate Sample
CT:	Contaminant Threshold	RSL:	Regional Screening Levels
EILs:	Ecological Investigation Levels	RSW:	Restricted Solid Waste
ESLs:	Ecological Screening Levels	SAC:	Site Assessment Criteria
FA:	Fibrous Asbestos	SCC:	Specific Contaminant Concentration
FTS:	Fluorotelomer sulfonic acid	SSA:	Site Specific Assessment
GIL:	Groundwater Investigation Levels	SSHSLs:	Site Specific Health Screening Levels
GSW:	General Solid Waste	TAA:	Total Actual Acidity in 1M KCL extract titrated to pH6.5
HILs:	Health Investigation Levels	TB:	Trip Blank
HSLs:	Health Screening Levels	TCA:	1,1,1 Trichloroethane (methyl chloroform)
HSL-SSA:	Health Screening Level-Site Specific Assessment	TCE:	Trichloroethylene (Trichloroethene)
kg/L	kilograms per litre	TCLP:	Toxicity Characteristics Leaching Procedure
NA:	Not Analysed	TS:	Trip Spike
NC:	Not Calculated	TRH:	Total Recoverable Hydrocarbons
NEMP:	National Environmental Management Plan	UCL:	Upper Level Confidence Limit on Mean Value
NEPM:	National Environmental Protection Measure	USEPA	United States Environmental Protection Agency
NHMRC:	National Health and Medical Research Council	VOCC:	Volatile Organic Chlorinated Compounds
NL:	Not Limiting	WHO:	World Health Organisation
NSL:	No Set Limit		
OCP:	Organochlorine Pesticides		
OPP:	Organophosphorus Pesticides		
PAHs:	Polycyclic Aromatic Hydrocarbons		
%w/w:	weight per weight		
ppm:	Parts per million		

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 referred 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.

QA/QC Table:

- Field blank, Inter and Intra laboratory duplicate results are reported in mg/kg.
- Trip spike results are reported as percentage recovery.
- Field rinsate results are reported in µg/L.



TABLE S1
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	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																				
BH601	0.05-0.15	F: Silty Gravelly Sand	<4	<0.4	10	45	2	<0.1	100	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
BH601 - [LAB_DUP]	0.05-0.15	Laboratory Duplicate	<4	<0.4	9	43	2	<0.1	89	28	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH601	0.5-0.7	Siltstone	4	<0.4	9	15	14	<0.1	20	10	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH602	0.07-0.17	F: Silty Gravelly Clay	<4	<0.4	74	27	7	<0.1	65	56	0.5	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH603	0.25-0.35	F: Silty Clay	7	<0.4	16	15	15	<0.1	3	14	<0.05	<0.5	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH603 - [LAB_DUP]	0.25-0.35	Laboratory Duplicate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	NA	NA	NA
BH604	0-0.1	F: Silty Clay	8	<0.4	19	36	34	0.1	8	49	0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH604 - [LAB_DUP]	0-0.1	Laboratory Duplicate	12	<0.4	27	38	37	0.1	5	51	0.3	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH605	0-0.1	F: Silty Clay	5	<0.4	14	10	27	<0.1	3	28	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH605	0.4-0.6	Silty Sand	<4	<0.4	7	1	4	<0.1	2	17	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH606	0.17-0.25	F: Silty Gravel	5	<0.4	28	12	12	<0.1	15	22	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH606	0.3-0.4	F: Silty Clay	5	<0.4	42	17	11	<0.1	28	28	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH607	0-0.1	F: Silty Sandy Clay	<4	<0.4	7	7	19	<0.1	2	21	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH608	0-0.1	F: Silty Clay	5	<0.4	20	10	22	<0.1	3	21	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH609	0-0.1	F: Silty Clay	7	<0.4	22	20	27	0.1	3	31	0.06	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH610	0-0.1	F: Silty Clay	10	<0.4	41	36	42	0.3	10	37	0.2	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH610	0.5-0.8	F: Silty Clay	12	<0.4	18	9	21	0.1	3	22	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH611	0-0.1	F: Silty Sandy Clay	6	<0.4	21	5	16	<0.1	2	14	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH611	0.3-0.5	Silty Clayey Sand	<4	<0.4	15	3	11	<0.1	2	10	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH611	0.7-1.0	Sandstone	<4	<0.4	7	<1	3	<0.1	<1	2	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH612	0.07-0.17	F: Silty Sandy Gravel	5	<0.4	37	18	30	<0.1	22	52	0.1	<0.5	<0.1	0.5	<0.1	<0.1	4.2	<0.1	<0.1	<0.1	<0.1	Not Detected
BH613	0-0.1	F: Sandy Silt	<4	0.4	8	41	20	<0.1	7	180	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH613	0.1-0.4	F: Silty Clay	8	<0.4	19	23	45	0.1	3	40	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH614	0-0.1	F: Silty Clay	<4	<0.4	11	4	76	<0.1	2	66	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH614 - [LAB_DUP]	0-0.1	Laboratory Duplicate	<4	<0.4	12	4	70	<0.1	2	60	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH604-FCF1	0-0.1	Fragment	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Detected
BH605-FCF1	0-0.1	Fragment	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Detected
SDUP3	0-0.1	Duplicate of BH611	6	<0.4	24	6	31	<0.1	3	38	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP3 - [LAB_DUP]	0-0.1	Laboratory Duplicate	5	<0.4	15	8	34	<0.1	4	44	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP3 - [TRIPLICATE]	0-0.1	Laboratory Triplicate	<4	<0.4	10	8	30	<0.1	3	41	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Number of Samples			27	27	27	27	27	27	27	27	26	26	20	20	20	20	20	20	20	19	19	16
Maximum Value			12	0.4	74	45	76	0.3	100	180	0.5	<PQL	<PQL	0.5	<PQL	0.2	4.2	<PQL	<PQL	<PQL	<PQL	Detected

Concentration above the SAC
Concentration above the PQL

VALUE
Bold

TABLE S2
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								
BH601	0.05-0.15	F: Silty Gravelly Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	2.2
BH601 - [LAB_DUP]	0.05-0.15	Laboratory Duplicate	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	NA
BH601	0.5-0.7	Siltstone	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	11.4
BH602	0.07-0.17	F: Silty Gravelly Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH603	0.25-0.35	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	NA
BH604	0-0.1	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.1
BH604 - [LAB_DUP]	0-0.1	Laboratory Duplicate	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	NA
BH605	0-0.1	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	10.8
BH605	0.4-0.6	Silty Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.2
BH606	0.17-0.25	F: Silty Gravel	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.1
BH606	0.3-0.4	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.1
BH607	0-0.1	F: Silty Sandy Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	4.4
BH608	0-0.1	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	11.2
BH609	0-0.1	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.9
BH610	0-0.1	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.3
BH610	0.5-0.8	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.1
BH611	0-0.1	F: Silty Sandy Clay	0m to <1m	Sand	95	110	<0.2	<0.5	<1	<1	<1	559
BH611	0.3-0.5	Silty Clayey Sand	0m to <1m	Sand	78	150	<0.2	<0.5	<1	<1	<1	804
BH611	0.7-1.0	Sandstone	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	81.7
BH612	0.07-0.17	F: Silty Sandy Gravel	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.2
BH613	0-0.1	F: Silty Silt	0m to <1m	Sand	<25	400	<0.2	<0.5	<1	<1	<1	0
BH613	0.1-0.4	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH614	0-0.1	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	1.7
BH614 - [LAB_DUP]	0-0.1	Laboratory Duplicate	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	NA
SDUP3	0-0.1	Duplicate of BH611	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	NA
SDUP3 - [LAB_DUP]	0-0.1	Laboratory Duplicate	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	NA
Total Number of Samples					26	26	26	26	26	26	26	20
Maximum Value					95	400	<PQL	<PQL	<PQL	<PQL	<PQL	804

Concentration above the SAC

VALUE

Concentration above the PQL

Bold

The guideline corresponding to the concentration above the SAC is highlighted in grey in the Site Assessment Criteria Table below

HSL SOIL ASSESSMENT CRITERIA

Sample Reference	Sample Depth	Sample Description	Depth Category	Soil Category	C ₆ -C ₁₀ (F1)	>C ₁₀ -C ₁₆ (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene
BH601	0.05-0.15	F: Silty Gravelly Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH601 - [LAB_DUP]	0.05-0.15	Laboratory Duplicate	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH601	0.5-0.7	Siltstone	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH602	0.07-0.17	F: Silty Gravelly Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH603	0.25-0.35	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH604	0-0.1	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH604 - [LAB_DUP]	0-0.1	Laboratory Duplicate	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH605	0-0.1	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH605	0.4-0.6	Silty Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH606	0.17-0.25	F: Silty Gravel	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH606	0.3-0.4	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH607	0-0.1	F: Silty Sandy Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH608	0-0.1	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH609	0-0.1	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH610	0-0.1	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH610	0.5-0.8	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH611	0-0.1	F: Silty Sandy Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH611	0.3-0.5	Silty Clayey Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH611	0.7-1.0	Sandstone	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH612	0.07-0.17	F: Silty Sandy Gravel	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH613	0-0.1	F: Silty Silt	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH613	0.1-0.4	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH614	0-0.1	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH614 - [LAB_DUP]	0-0.1	Laboratory Duplicate	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH604-FCF1	0-0.1	Fragment			NA	NA	NA	NA	NA	NA	NA
SDUP3	0-0.1	Duplicate of BH611	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP3 - [LAB_DUP]	-	Laboratory Duplicate	0m to <1m	Sand	45	110	0.5	160	55	40	3

TABLE S3
SOIL LABORATORY RESULTS COMPARED TO MANAGEMENT LIMITS
All data in mg/kg unless stated otherwise

			C ₆ -C ₁₀ (F1) plus BTEX	>C ₁₀ -C ₁₆ (F2) plus naphthalene	>C ₁₆ -C ₃₄ (F3)	>C ₃₄ -C ₄₀ (F4)
PQL - Envirolab Services			25	50	100	100
NEPM 2013 Land Use Category			RESIDENTIAL, PARKLAND & PUBLIC OPEN SPACE			
Sample Reference	Sample Depth	Soil Texture				
BH601	0.05-0.15	Coarse	<25	<50	110	190
BH601 - [LAB_DUP]	0.05-0.15	Coarse	<25	<50	130	160
BH601	0.5-0.7	Coarse	<25	<50	<100	<100
BH602	0.07-0.17	Coarse	<25	<50	<100	<100
BH603	0.25-0.35	Coarse	<25	<50	<100	<100
BH604	0-0.1	Coarse	<25	<50	<100	<100
BH604 - [LAB_DUP]	0-0.1	Coarse	<25	<50	<100	<100
BH605	0-0.1	Coarse	<25	<50	<100	<100
BH605	0.4-0.6	Coarse	<25	<50	<100	<100
BH606	0.17-0.25	Coarse	<25	<50	<100	<100
BH606	0.3-0.4	Coarse	<25	<50	<100	<100
BH607	0-0.1	Coarse	<25	<50	<100	<100
BH608	0-0.1	Coarse	<25	<50	<100	<100
BH609	0-0.1	Coarse	<25	<50	<100	<100
BH610	0-0.1	Coarse	<25	<50	<100	<100
BH610	0.5-0.8	Coarse	<25	<50	<100	<100
BH611	0-0.1	Coarse	95	110	580	110
BH611	0.3-0.5	Coarse	78	150	400	<100
BH611	0.7-1.0	Coarse	<25	<50	<100	<100
BH612	0.07-0.17	Coarse	<25	<50	<100	<100
BH613	0-0.1	Coarse	<25	400	1800	640
BH613	0.1-0.4	Coarse	<25	<50	<100	<100
BH614	0-0.1	Coarse	<25	<50	<100	<100
BH614 - [LAB_DUP]	0-0.1	Coarse	<25	<50	100	<100
SDUP3	0-0.1	Coarse	<25	<50	150	<100
SDUP3 - [LAB_DUP]	0-0.1	Coarse	<25	<50	170	<100
Total Number of Samples			26	26	26	26
Maximum Value			95	400	1800	640
Concentration above the SAC			VALUE			
Concentration above the PQL			Bold			

MANAGEMENT LIMIT ASSESSMENT CRITERIA

Sample Reference	Sample Depth	Soil Texture	C ₆ -C ₁₀ (F1) plus BTEX	>C ₁₀ -C ₁₆ (F2) plus naphthalene	>C ₁₆ -C ₃₄ (F3)	>C ₃₄ -C ₄₀ (F4)
BH601	0.05-0.15	Coarse	700	1000	2500	10000
BH601 - [LAB_DUP]	0.05-0.15	Coarse	700	1000	2500	10000
BH601	0.5-0.7	Coarse	700	1000	2500	10000
BH602	0.07-0.17	Coarse	700	1000	2500	10000
BH603	0.25-0.35	Coarse	700	1000	2500	10000
BH604	0-0.1	Coarse	700	1000	2500	10000
BH604 - [LAB_DUP]	0-0.1	Coarse	700	1000	2500	10000
BH605	0-0.1	Coarse	700	1000	2500	10000
BH605	0.4-0.6	Coarse	700	1000	2500	10000
BH606	0.17-0.25	Coarse	700	1000	2500	10000
BH606	0.3-0.4	Coarse	700	1000	2500	10000
BH607	0-0.1	Coarse	700	1000	2500	10000
BH608	0-0.1	Coarse	700	1000	2500	10000
BH609	0-0.1	Coarse	700	1000	2500	10000
BH610	0-0.1	Coarse	700	1000	2500	10000
BH610	0.5-0.8	Coarse	700	1000	2500	10000
BH611	0-0.1	Coarse	700	1000	2500	10000
BH611	0.3-0.5	Coarse	700	1000	2500	10000
BH611	0.7-1.0	Coarse	700	1000	2500	10000
BH612	0.07-0.17	Coarse	700	1000	2500	10000
BH613	0-0.1	Coarse	700	1000	2500	10000
BH613	0.1-0.4	Coarse	700	1000	2500	10000
BH614	0-0.1	Coarse	700	1000	2500	10000
BH614 - [LAB_DUP]	0-0.1	Coarse	700	1000	2500	10000
BH604-FCF1	0-0.1		NA	NA	NA	NA
SDUP3	0-0.1	Coarse	700	1000	2500	10000
SDUP3 - [LAB_DUP]	-	Coarse	700	1000	2500	10000

TABLE S4
SOIL LABORATORY RESULTS COMPARED TO DIRECT CONTACT CRITERIA
All data in mg/kg unless stated otherwise

Analyte		C ₆ -C ₁₀	>C ₁₀ -C ₁₆	>C ₁₆ -C ₃₄	>C ₃₄ -C ₄₀	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	PID
PQL - Envirolab Services		25	50	100	100	0.2	0.5	1	1	1	
CRC 2011 -Direct contact Criteria		4,400	3,300	4,500	6,300	100	14,000	4,500	12,000	1,400	
Site Use		RESIDENTIAL WITH ACCESSIBLE SOIL- DIRECT SOIL CONTACT									
Sample Reference	Sample Depth										
BH601	0.05-0.15	<25	<50	110	190	<0.2	<0.5	<1	<1	<1	2.2
BH601 - [LAB_DUP]	0.05-0.15	<25	<50	130	160	<0.2	<0.5	<1	<1	<1	NA
BH601	0.5-0.7	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	11.4
BH602	0.07-0.17	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH603	0.25-0.35	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	NA
BH604	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0.1
BH604 - [LAB_DUP]	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	NA
BH605	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	10.8
BH605	0.4-0.6	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0.2
BH606	0.17-0.25	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0.1
BH606	0.3-0.4	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0.1
BH607	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	4.4
BH608	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	11.2
BH609	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0.9
BH610	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0.3
BH610	0.5-0.8	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0.1
BH611	0-0.1	95	110	580	110	<0.2	<0.5	<1	<1	<1	559
BH611	0.3-0.5	78	150	400	<100	<0.2	<0.5	<1	<1	<1	804
BH611	0.7-1.0	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	81.7
BH612	0.07-0.17	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0.2
BH613	0-0.1	<25	400	1800	640	<0.2	<0.5	<1	<1	<1	0
BH613	0.1-0.4	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH614	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	1.7
BH614 - [LAB_DUP]	0-0.1	<25	<50	100	<100	<0.2	<0.5	<1	<1	<1	NA
SDUP3	0-0.1	<25	<50	150	<100	<0.2	<0.5	<1	<1	<1	NA
SDUP3 - [LAB_DUP]	0-0.1	<25	<50	170	<100	<0.2	<0.5	<1	<1	<1	NA
Total Number of Samples		26	26	26	26	26	26	26	26	26	20
Maximum Value		95	400	1800	640	<PQL	<PQL	<PQL	<PQL	<PQL	804
Concentration above the SAC		VALUE									
Concentration above the PQL		Bold									

TABLE 55 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	0.001
14/03/2022	BH601	0.05-0.15	No	--	1,850	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
14/03/2022	BH602	0.07-0.2	No	--	1,960	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9/03/2022	BH604	0-0.1	Yes	--	11,200	9.08	1.362	0.0122	No ACM <7mm observed	--	--	No FA observed	--	--	290820	BH604	0-0.1	404.83	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
9/03/2022	BH604	0.1-0.4	NA	--	3,350	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9/03/2022	BH605	0-0.1	Yes	--	10,020	6.64	0.996	0.0099	No ACM <7mm observed	--	--	No FA observed	--	--	290820	BH605	0-0.1	715.3	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
9/03/2022	BH605	0.1-0.3	NA	--	2,800	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	290820	BH606	0.17-0.25	862.01	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
9/03/2022	BH606	0.3-0.4	NA	--	3,400	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9/03/2022	BH609	0-0.1	No	--	4,650	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	290820	BH609	0-0.1	579.12	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
9/03/2022	BH609	0.1-0.5	NA	--	10,960	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9/03/2022	BH610	0-0.1	No	--	4,320	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	290820	BH610	0-0.1	503.05	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
9/03/2022	BH610	0.5-1.0	NA	--	4,380	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
14/03/2022	BH611	0-0.1	No	--	1,140	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9/03/2022	BH612	0.07-0.20	No	--	2,660	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	290820	BH612	0.07-0.17	543.28	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
11/03/2022	BH613	0-0.1	No	--	11,570	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	290820	BH613	0-0.1	157.45	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
11/03/2022	BH613	0.1-0.5	NA	--	10,330	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10/03/2022	BH614	0-0.1	No	--	10,430	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	290820	BH614	0-0.1	582.89	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
10/03/2022	BH614	0.1-0.4	NA	--	2,860	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	290820	BH604-FCF1	0-0.1	9.08	Chrysotile, Amosite and Crocidolite asbestos detected	[NT]	--	NA	--	--	NA	NA
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	290820	BH605-FCF1	0-0.1	6.64	Chrysotile, Amosite and Crocidolite asbestos detected	[NT]	--	NA	--	--	NA	NA
Concentration above the SAC			VALUE																							

TABLE S6
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																			
				pH	CEC (cmolc/kg)	Clay Content (% clay)	AGED HEAVY METALS-EILs						EILs		ESLs								
Arsenic	Chromium	Copper	Lead				Nickel	Zinc	Naphthalene	DDT	C ₆ -C ₁₀ (F1)	>C ₁₀ -C ₁₆ (F2)	>C ₁₆ -C ₃₄ (F3)	>C ₃₄ -C ₄₀ (F4)	Benzene	Toluene	Ethylbenzene	Total Xylenes	B(a)P				
PQL - Envirolab Services				-	1	-	4	1	1	1	1	1	0.1	25	50	100	100	0.2	0.5	1	1	0.05	
Ambient Background Concentration (ABC)				-	-	-	NSL	13	28	163	5	122	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	
Sample Reference	Sample Depth	Sample Description	Soil Texture																				
BH601	0.05-0.15	F: Silty Gravelly Sand	Coarse	NA	15	NA	<4	10	45	2	100	30	<1	<0.1	<25	<50	110	190	<0.2	<0.5	<1	<1	<0.05
	0.05-0.15	Laboratory Duplicate	Coarse	NA	15	NA	<4	9	43	2	89	28	<1	<0.1	<25	<50	130	160	<0.2	<0.5	<1	<1	<0.05
BH601	0.5-0.7	Siltstone	Fine	NA	NA	NA	4	9	15	14	20	10	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH602	0.07-0.17	F: Silty Gravelly Clay	Fine	NA	24	NA	<4	74	27	7	65	56	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH603	0.25-0.35	F: Silty Clay	Fine	NA	NA	NA	7	16	15	15	3	14	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH603 - [LAB_DUP]	0.25-0.35	Laboratory Duplicate	Fine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH604	0-0.1	F: Silty Clay	Fine	NA	NA	NA	8	19	36	34	8	49	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	0.05
BH604 - [LAB_DUP]	0-0.1	Laboratory Duplicate	Fine	NA	NA	NA	12	27	38	37	5	51	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	0.05
BH605	0-0.1	F: Silty Clay	Fine	NA	NA	NA	5	14	10	27	3	28	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH605	0.4-0.6	Silty Sand	Coarse	NA	NA	NA	<4	7	1	4	2	17	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH606	0.17-0.25	F: Silty Gravel	Coarse	NA	NA	NA	5	28	12	12	15	22	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH606	0.3-0.4	F: Silty Clay	Fine	NA	NA	NA	5	42	17	11	28	28	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH607	0-0.1	F: Silty Sandy Clay	Fine	NA	NA	NA	<4	7	7	19	2	21	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH608	0-0.1	F: Silty Clay	Fine	NA	NA	NA	5	20	10	22	3	21	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH609	0-0.1	F: Silty Clay	Fine	NA	NA	NA	7	22	20	27	3	31	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	0.06
BH610	0-0.1	F: Silty Clay	Fine	NA	NA	NA	10	41	36	42	10	37	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	0.07
BH610	0.5-0.8	F: Silty Clay	Fine	NA	NA	NA	12	18	9	21	3	22	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH611	0-0.1	F: Silty Sandy Clay	Fine	NA	NA	NA	6	21	5	16	2	14	<1	<0.1	95	110	580	110	<0.2	<0.5	<1	<1	<0.05
BH611	0.3-0.5	Silty Clayey Sand	Coarse	NA	NA	NA	<4	15	3	11	2	10	<1	NA	78	150	400	<100	<0.2	<0.5	<1	<1	<0.05
BH611	0.7-1.0	Sandstone	Coarse	NA	NA	NA	<4	7	<1	3	<1	2	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH612	0.07-0.17	F: Silty Sandy Gravel	Coarse	NA	NA	NA	5	37	18	30	22	52	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH613	0-0.1	F: Sandy Silt	Fine	NA	NA	NA	<4	8	41	20	7	180	<1	<0.1	<25	400	1800	640	<0.2	<0.5	<1	<1	<0.05
BH613	0.1-0.4	F: Silty Clay	Fine	NA	NA	NA	8	19	23	45	3	40	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH614	0-0.1	F: Silty Clay	Fine	NA	NA	NA	<4	11	4	76	2	66	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH614 - [LAB_DUP]	0-0.1	Laboratory Duplicate	Fine	NA	NA	NA	<4	12	4	70	2	60	<1	<0.1	<25	<50	100	<100	<0.2	<0.5	<1	<1	<0.05
SDUP3	0-0.1	Duplicate of BH611	Fine	NA	NA	NA	6	24	6	31	3	38	<1	<0.1	<25	<50	150	<100	<0.2	<0.5	<1	<1	<0.05
SDUP3 - [LAB_DUP]	0-0.1	Laboratory Duplicate	Fine	NA	NA	NA	5	15	8	34	4	44	<1	<0.1	<25	<50	170	<100	<0.2	<0.5	<1	<1	<0.05
SDUP3 - [TRIPLICATE]	0-0.1	Laboratory Triplicate	Fine	NA	NA	NA	<4	10	8	30	3	41	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Number of Samples				0	3	0	27	27	27	27	27	27	26	20	26	26	26	26	26	26	26	26	26
Maximum Value				NA	24	NA	12	74	45	76	100	180	<PQL	<PQL	95	400	1800	640	<PQL	<PQL	<PQL	<PQL	0.07
Concentration above the SAC				VALUE																			
Concentration above the PQL				Bold																			
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

Sample Reference	Sample Depth	Sample Description	Soil Texture	pH	CEC (cmolc/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	
BH601 - [LAB_DUP]	BH601	0.05-0.15	F: Silty Gravelly Sand	Coarse	NA	15	NA	100	200	90	1300	280	190	170	180	180	120	300	2800	50	85	70	105	20
		0.05-0.15	Laboratory Duplicate	Coarse	NA	15	NA	100	200	90	1300	280	190	170	180	180	120	300	2800	50	85	70	105	20
	BH601	0.5-0.7	Siltstone	Fine	NA	NA	NA	100	200	90	1300	35	190	170	--	180	120	1300	5600	65	105	125	45	20
BH602	0.07-0.17	F: Silty Gravelly Clay	Fine	NA	24	NA	100	200	90	1300	360	190	170	180	180	120	1300	5600	65	105	125	45	20	
BH603	0.25-0.35	F: Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20	
BH603 - [LAB_DUP]		0.25-0.35	Laboratory Duplicate	Fine	NA	NA	NA	--	--	--	--	--	--	180	--	--	--	--	--	--	--	--	--	--
BH604	0-0.1	F: Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20	
BH604 - [LAB_DUP]		0-0.1	Laboratory Duplicate	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH605	0-0.1	F: Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20	
BH605	0.4-0.6	Silty Sand	Coarse	NA	NA	NA	100	200	90	1300	35	190	170	--	180	120	300	2800	50	85	70	105	20	
BH606	0.17-0.25	F: Silty Gravel	Coarse	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	300	2800	50	85	70	105	20	
BH606	0.3-0.4	F: Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	--	180	120	1300	5600	65	105	125	45	20	
BH607	0-0.1	F: Silty Sandy Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20	
BH608	0-0.1	F: Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20	
BH609	0-0.1	F: Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20	
BH610	0-0.1	F: Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20	
BH610	0.5-0.8	F: Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	--	180	120	1300	5600	65	105	125	45	20	
BH611	0-0.1	F: Silty Sandy Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20	
BH611	0.3-0.5	Silty Clayey Sand	Coarse	NA	NA	NA	100	200	90	1300	35	190	170	--	180	120	300	2800	50	85	70	105	20	
BH611	0.7-1.0	Sandstone	Coarse	NA	NA	NA	100	200	90	1300	35	190	170	--	180	120	300	2800	50	85	70	105	20	
BH612	0.07-0.17	F: Silty Sandy Gravel	Coarse	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	300	2800	50	85	70	105	20	
BH613	0-0.1	F: Sandy Silt	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20	
BH613	0.1-0.4	F: Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	--	180	120	1300	5600	65	105	125	45	20	
BH614	0-0.1	F: Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20	
BH614 - [LAB_DUP]		0-0.1	Laboratory Duplicate	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
SDUP3	0-0.1	Duplicate of BH611	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20	
SDUP3 - [LAB_DUP]		0-0.1	Laboratory Duplicate	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
SDUP3 - [TRIPLICATE]		0-0.1	Laboratory Triplicate	Fine	NA	NA	NA	100	200	90	1300	35	190	--	--	--	--	--	--	--	--	--	--	--
SDUP3 - [TRIPLICATE]	-	Laboratory Triplicate	Coarse	NA	NA	NA	100	200	90	1300	35	190	--	--	--	--	--	--	--	--	--	--	--	--

TABLE S7
SOIL LABORATORY RESULTS COMPARED TO WASTE CLASSIFICATION GUIDELINES
All data in mg/kg unless stated otherwise

			HEAVY METALS								PAHs		OC/OP PESTICIDES				Total	TRH					BTX COMPOUNDS				ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	B(a)P	Total Endosulfans	Chloropyrifos	Total Moderately Harmful	Total Scheduled	PCBs	C ₆ -C ₉	C ₁₀ -C ₁₄	C ₁₅ -C ₂₈	C ₂₉ -C ₃₆	Total C ₁₀ -C ₃₆	Benzene	Toluene	Ethyl benzene	Total Xylenes	
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.05	0.1	0.1	0.1	0.1	0.1	25	50	100	100	50	0.2	0.5	1	1	100
General Solid Waste CT1			100	20	100	NSL	100	4	40	NSL	200	0.8	60	4	250	50	50	650	NSL			10,000	10	288	600	1,000	-
General Solid Waste SCC1			500	100	1900	NSL	1500	50	1050	NSL	200	10	108	7.5	250	50	50	650	NSL			10,000	18	518	1,080	1,800	-
Restricted Solid Waste CT2			400	80	400	NSL	400	16	160	NSL	800	3.2	240	16	1000	50	50	2600	NSL			40,000	40	1,152	2,400	4,000	-
Restricted Solid Waste SCC2			2000	400	7600	NSL	6000	200	4200	NSL	800	23	432	30	1000	50	50	2600	NSL			40,000	72	2,073	4,320	7,200	-
Sample Reference	Sample Depth	Sample Description																									
BH601	0.05-0.15	F: Silty Gravelly Sand	<4	<0.4	10	45	2	<0.1	100	30	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	150	150	<0.2	<0.5	<1	<1	Not Detected
BH601 - [LAB_DUP]	0.05-0.15	Laboratory Duplicate	<4	<0.4	9	43	2	<0.1	89	28	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	140	140	<0.2	<0.5	<1	<1	NA
BH601	0.5-0.7	Siltstone	4	<0.4	9	15	14	<0.1	20	10	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH602	0.07-0.17	F: Silty Gravelly Clay	<4	<0.4	74	27	7	<0.1	65	56	0.5	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH603	0.25-0.35	F: Silty Clay	7	<0.4	16	15	15	<0.1	3	14	<0.05	<0.05	<0.1	<0.1	<0.1	0.2	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH603 - [LAB_DUP]	0.25-0.35	Laboratory Duplicate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.1	NA	NA	0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH604	0-0.1	F: Silty Clay	8	<0.4	19	36	34	0.1	8	49	0.05	0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH604 - [LAB_DUP]	0-0.1	Laboratory Duplicate	12	<0.4	27	38	37	0.1	5	51	0.3	0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH605	0-0.1	F: Silty Clay	5	<0.4	14	10	27	<0.1	3	28	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH605	0.4-0.6	Silty Sand	<4	<0.4	7	1	4	<0.1	2	17	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH606	0.17-0.25	F: Silty Gravel	5	<0.4	28	12	12	<0.1	15	22	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH606	0.3-0.4	F: Silty Clay	5	<0.4	42	17	11	<0.1	28	28	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH607	0-0.1	F: Silty Sandy Clay	<4	<0.4	7	7	19	<0.1	2	21	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH608	0-0.1	F: Silty Clay	5	<0.4	20	10	22	<0.1	3	21	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH609	0-0.1	F: Silty Clay	7	<0.4	22	20	27	0.1	3	31	0.06	0.06	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH610	0-0.1	F: Silty Clay	10	<0.4	41	36	42	0.3	10	37	0.2	0.07	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH610	0.5-0.8	F: Silty Clay	12	<0.4	18	9	21	0.1	3	22	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH611	0-0.1	F: Silty Sandy Clay	6	<0.4	21	5	16	<0.1	2	14	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	78	570	130	778	<0.2	<0.5	<1	<1	Not Detected
BH611	0.3-0.5	Silty Clayey Sand	<4	<0.4	15	3	11	<0.1	2	10	<0.05	<0.05	NA	NA	NA	NA	NA	<25	86	460	<100	546	<0.2	<0.5	<1	<1	NA
BH611	0.7-1.0	Sandstone	<4	<0.4	7	<1	3	<0.1	<1	2	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH612	0.07-0.17	F: Silty Sandy Gravel	5	<0.4	37	18	30	<0.1	22	52	0.1	<0.05	0.5	<0.1	<0.1	4.3	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH613	0-0.1	F: Sandy Silt	<4	0.4	8	41	20	<0.1	7	180	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	190	1100	1200	2490	<0.2	<0.5	<1	<1	Not Detected
BH613	0.1-0.4	F: Silty Clay	8	<0.4	19	23	45	0.1	3	40	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH614	0-0.1	F: Silty Clay	<4	<0.4	11	4	76	<0.1	2	66	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH614 - [LAB_DUP]	0-0.1	Laboratory Duplicate	<4	<0.4	12	4	70	<0.1	2	60	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH605-FCF1	0-0.1	Fragment	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Detected
BH604-FCF1	0-0.1	Fragment	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Detected
SDUP3	0-0.1	Duplicate of BH611	6	<0.4	24	6	31	<0.1	3	38	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
SDUP3 - [LAB_DUP]	0-0.1	Laboratory Duplicate	5	<0.4	15	8	34	<0.1	4	44	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	110	100	210	<0.2	<0.5	<1	<1	NA
SDUP3 - [TRIPLICATE]	0-0.1	Laboratory Triplicate	<4	<0.4	10	8	30	<0.1	3	41	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Number of Samples			27	27	27	27	27	27	27	27	26	26	20	19	19	20	19	26	26	26	26	26	26	26	26	26	16
Maximum Value			12	0.4	74	45	76	0.3	100	180	0.5	0.07	0.5	<PQL	<PQL	4.3	<PQL	<PQL	190	1100	1200	2490	<PQL	<PQL	<PQL	<PQL	Detected

Concentration above the CT1
Concentration above SCC1
Concentration above the SCC2
Concentration above PQL

VALUE
VALUE
VALUE
Bold

TABLE S8
SOIL LABORATORY TCLP RESULTS
All data in mg/L unless stated otherwise

	Arsenic	Cadmium	Chromium	Lead	Mercury	Nickel	B(a)P
PQL - Envirolab Services	0.05	0.01	0.01	0.03	0.0005	0.02	0.001
TCLP1 - General Solid Waste	5	1	5	5	0.2	2	0.04
TCLP2 - Restricted Solid Waste	20	4	20	20	0.8	8	0.16
TCLP3 - Hazardous Waste	>20	>4	>20	>20	>0.8	>8	>0.16
Sample Reference	Sample Depth	Sample Description					
BH601	0.05-0.15	F: Silty Gravelly Sand	NA	NA	NA	NA	0.1
BH602	0.07-0.17	F: Silty Gravelly Clay	NA	NA	NA	NA	0.03
Total Number of samples			0	0	0	0	2
Maximum Value			NA	NA	NA	NA	0.1

General Solid Waste
Restricted Solid Waste
Hazardous Waste
Concentration above PQL

VALUE

VALUE

VALUE

Bold

TABLE S9
SUMMARY OF PFAS CONCENTRATIONS IN SOIL - ECOLOGY
Units are µg/Kg unless stated otherwise.

	PQL Envirolab Services	NEMP 2020 Indirect exposure All land use	BH601 0.05-0.15 F: Silty Gravelly Sand	BH601 0.05-0.15 [LAB_DUP]	BH605 0-0.1 F: Silty Clay	BH606 0.17-0.25 F: Silty Gravel	BH608 0-0.1 F: Silty Clay	BH611 0-0.1 F: Silty Sandy Clay	BH612 0.07-0.17 F: Silty Sandy Gravel	BH613 0-0.1 F: Sandy Silt	SDUP3 0-0.1 Duplicate of BH611
PFAS Compound											
Perfluorobutanesulfonic acid	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1
Perfluoropentanesulfonic acid	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1
Perfluorohexanesulfonic acid - PFHxS	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1
Perfluoroheptanesulfonic acid	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1
Perfluorooctanesulfonic acid PFOS	0.1	10	<0.1	<0.1	0.7	<0.1	1	1.4	0.2	1.8	1.9
Perfluorodecanesulfonic acid	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
Perfluorobutanoic acid	0.2	NSL	<0.2	<0.2	0.2	<0.2	0.4	0.2	<0.2	<2	0.4
Perfluoropentanoic acid	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
Perfluorohexanoic acid	0.1	NSL	<0.1	<0.1	0.1	<0.1	0.2	<0.1	<0.1	<1	<0.1
Perfluoroheptanoic acid	0.1	NSL	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<1	<0.1
Perfluorooctanoic acid PFOA	0.1	NSL	<0.1	<0.1	0.2	<0.1	0.4	0.2	<0.1	<1	0.2
Perfluorononanoic acid	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1
Perfluorodecanoic acid	0.5	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5
Perfluoroundecanoic acid	0.5	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5
Perfluorododecanoic acid	0.5	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5
Perfluorotridecanoic acid	0.5	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5
Perfluorotetradecanoic acid	5	NSL	<5	<5	<5	<5	<5	<5	<5	<50	<5
4:2 FTS	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1
6:2 FTS	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1
8:2 FTS	0.1	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
10:2 FTS	0.1	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
Perfluorooctane sulfonamide	1	NSL	<1	<1	<1	<1	<1	<1	<1	<10	<1
N-Methyl perfluorooctane sulfonamide	1	NSL	<1	<1	<1	<1	<1	<1	<1	<10	<1
N-Ethyl perfluorooctanesulfonamide	1	NSL	<1	<1	<1	<1	<1	<1	<1	<10	<1
N-Me perfluorooctanesulfonamid ethanol	1	NSL	<1	<1	<1	<1	<1	<1	<1	<10	<1
N-Et perfluorooctanesulfonamid ethanol	5	NSL	<5	<5	<5	<5	<5	<5	<5	<50	<5
MePerfluorooctanesulfamid oacetic acid	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
EtPerfluorooctanesulfamid oacetic acid	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
Total Positive PFHxS & PFOS	0.1	NSL	<0.1	<0.1	0.7	<0.1	1	1.4	0.2	1.8	1.9
Total Positive PFOS & PFOA	0.1	NSL	<0.1	<0.1	0.9	<0.1	1.4	1.5	0.2	1.8	2.1
Total Positive PFAS	0.1	NSL	<0.1	<0.1	1.3	<0.1	2.1	1.8	0.2	1.8	2.5
<div> <div>Positive PFAS result</div> <div>PFAS result above the SAC</div> </div> <div> <div>Bold</div> <div>Bold</div> </div>											

TABLE S10
SUMMARY OF PFAS CONCENTRATIONS IN SOIL - HUMAN HEALTH
Units are µg/Kg unless stated otherwise.

	PQL Envirolab Services	NEMP 2020 Residential accessible soil	BH601 0.05-0.15 F: Silty Gravelly Sand	BH601 0.05-0.15 [LAB_DUP]	BH605 0-0.1 F: Silty Clay	BH606 0.17-0.25 F: Silty Gravel	BH608 0-0.1 F: Silty Clay	BH611 0-0.1 F: Silty Sandy Clay	BH612 0.07-0.17 F: Silty Sandy Gravel	BH613 0-0.1 F: Sandy Silt	SDUP3 0-0.1 Duplicate of BH611
PFAS Compound											
Perfluorobutanesulfonic acid	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1
Perfluoropentanesulfonic acid	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1
Perfluorohexanesulfonic acid - PFHxS	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1
Perfluoroheptanesulfonic acid	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1
Perfluorooctanesulfonic acid PFOS	0.1	NSL	<0.1	<0.1	0.7	<0.1	1	1.4	0.2	1.8	1.9
Perfluorodecanesulfonic acid	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
Perfluorobutanoic acid	0.2	NSL	<0.2	<0.2	0.2	<0.2	0.4	0.2	<0.2	<2	0.4
Perfluoropentanoic acid	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
Perfluorohexanoic acid	0.1	NSL	<0.1	<0.1	0.1	<0.1	0.2	<0.1	<0.1	<1	<0.1
Perfluoroheptanoic acid	0.1	NSL	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<1	<0.1
Perfluorooctanoic acid PFOA	0.1	300	<0.1	<0.1	0.2	<0.1	0.4	0.2	<0.1	<1	0.2
Perfluorononanoic acid	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1
Perfluorodecanoic acid	0.5	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5
Perfluoroundecanoic acid	0.5	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5
Perfluorododecanoic acid	0.5	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5
Perfluorotridecanoic acid	0.5	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5
Perfluorotetradecanoic acid	5	NSL	<5	<5	<5	<5	<5	<5	<5	<50	<5
4:2 FTS	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1
6:2 FTS	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1
8:2 FTS	0.1	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
10:2 FTS	0.1	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
Perfluorooctane sulfonamide	1	NSL	<1	<1	<1	<1	<1	<1	<1	<10	<1
N-Methyl perfluorooctane sulfonamide	1	NSL	<1	<1	<1	<1	<1	<1	<1	<10	<1
N-Ethyl perfluorooctanesulfonamide	1	NSL	<1	<1	<1	<1	<1	<1	<1	<10	<1
N-Me perfluorooctanesulfonamid ethanolol	1	NSL	<1	<1	<1	<1	<1	<1	<1	<10	<1
N-Et perfluorooctanesulfonamid ethanolol	5	NSL	<5	<5	<5	<5	<5	<5	<5	<50	<5
MePerfluorooctanesulf-amid oacetic acid	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
EtPerfluorooctanesulf-amid oacetic acid	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
Total Positive PFHxS & PFOS	0.1	10	<0.1	<0.1	1	<0.1	1	1.4	0.2	1.8	1.9
Total Positive PFOS & PFOA	0.1	NSL	<0.1	<0.1	0.9	<0.1	1.4	1.5	0.2	1.8	2.1
Total Positive PFAS	0.1	NSL	<0.1	<0.1	1.3	<0.1	2.1	1.8	0.2	1.8	2.5
Positive PFAS result Bold PFAS result above the SAC Bold											

TABLE S11
SUMMARY OF PFAS CONCENTRATIONS IN SOIL - WASTE CLASSIFICATION
Units are µg/Kg unless stated otherwise.

	PQL EnviroLab Services	SCC1	SCC2	BH601 0.05-0.15 F: Silty Gravelly Sand	BH601 0.05-0.15 [LAB_DUP]	BH605 0-0.1 F: Silty Clay	BH606 0.17-0.25 F: Silty Gravel	BH608 0-0.1 F: Silty Clay	BH611 0-0.1 F: Silty Sandy Clay	BH612 0.07-0.17 F: Silty Sandy Gravel	BH613 0-0.1 F: Sandy Silt	SDUP3 0-0.1 Duplicate of BH611
PFAS Compound												
Perfluorobutanesulfonic acid	0.1	NSL	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1
Perfluoropentanesulfonic acid	0.1	NSL	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1
Perfluorohexanesulfonic acid - PFHxS	0.1	NSL	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1
Perfluoroheptanesulfonic acid	0.1	NSL	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1
Perfluorooctanesulfonic acid PFOS	0.1	NSL	NSL	<0.1	<0.1	0.7	<0.1	1	1.4	0.2	1.8	1.9
Perfluorodecanesulfonic acid	0.2	NSL	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
Perfluorobutanoic acid	0.2	NSL	NSL	<0.2	<0.2	0.2	<0.2	0.4	0.2	<0.2	<2	0.4
Perfluoropentanoic acid	0.2	NSL	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
Perfluorohexanoic acid	0.1	NSL	NSL	<0.1	<0.1	0.1	<0.1	0.2	<0.1	<0.1	<1	<0.1
Perfluoroheptanoic acid	0.1	NSL	NSL	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<1	<0.1
Perfluorooctanoic acid PFOA	0.1	18,000	72,000	<0.1	<0.1	0	<0.1	0	0.2	<0.1	<1	0.2
Perfluorononanoic acid	0.1	NSL	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1
Perfluorodecanoic acid	0.5	NSL	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5
Perfluoroundecanoic acid	0.5	NSL	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5
Perfluorododecanoic acid	0.5	NSL	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5
Perfluorotridecanoic acid	0.5	NSL	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5
Perfluorotetradecanoic acid	5	NSL	NSL	<5	<5	<5	<5	<5	<5	<5	<50	<5
4:2 FTS	0.1	NSL	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1
6:2 FTS	0.1	NSL	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1
8:2 FTS	0.1	NSL	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
10:2 FTS	0.1	NSL	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
Perfluorooctane sulfonamide	1	NSL	NSL	<1	<1	<1	<1	<1	<1	<1	<10	<1
N-Methyl perfluorooctane sulfonamide	1	NSL	NSL	<1	<1	<1	<1	<1	<1	<1	<10	<1
N-Ethyl perfluorooctanesulfonamide	1	NSL	NSL	<1	<1	<1	<1	<1	<1	<1	<10	<1
N-Me perfluorooctanesulfonamid oethanol	1	NSL	NSL	<1	<1	<1	<1	<1	<1	<1	<10	<1
N-Et perfluorooctanesulfonamid oethanol	5	NSL	NSL	<5	<5	<5	<5	<5	<5	<5	<50	<5
MePerfluorooctanesulf-amid oacetic acid	0.2	NSL	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
EtPerfluorooctanesulf-amid oacetic acid	0.2	NSL	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
Total Positive PFHxS & PFOS	0.1	1800	7,200	<0.1	<0.1	1	<0.1	1	1.4	0.2	1.8	1.9
Total Positive PFOS & PFOA	0.1	NSL	NSL	<0.1	<0.1	0.9	<0.1	1.4	1.5	0.2	1.8	2.1
Total Positive PFAS	0.1	NSL	NSL	<0.1	<0.1	1.3	<0.1	2.1	1.8	0.2	1.8	2.5
Result above SCC1 Criteria Bold												
Result above SCC2 Criteria Bold												

TABLE S12
SUMMARY OF PFAS CONCENTRATIONS IN TCLP LEACHATE - WASTE CLASSIFICATION
Units are µg/L unless stated otherwise.

	PQL EnviroLab Services	TCLP1	TCLP2	BH605 0-0.1	BH605 0-0.1 [LAB_DUP]	BH608 0-0.1	BH611 0-0.1	BH612 0.07-0.17	BH613 0-0.1	SDUP3 –
PFAS Compound										
Perfluorobutanesulfonic acid	0.1	NSL	NSL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoropentanesulfonic acid	0.1	NSL	NSL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorohexanesulfonic acid - PFHxS	0.1	NSL	NSL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptanesulfonic acid	0.1	NSL	NSL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanesulfonic acid PFOS	0.1	NSL	NSL	0.01	0.01	<0.01	0.02	<0.01	<0.01	0.01
Perfluorodecanesulfonic acid	0.2	NSL	NSL	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorobutanoic acid	0.2	NSL	NSL	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentanoic acid	0.2	NSL	NSL	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid	0.1	NSL	NSL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptanoic acid	0.1	NSL	NSL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanoic acid PFOA	0.1	500	2,000	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid	0.1	NSL	NSL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecanoic acid	0.5	NSL	NSL	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid	0.5	NSL	NSL	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid	0.5	NSL	NSL	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorotridecanoic acid	0.5	NSL	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorotetradecanoic acid	5	NSL	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
4:2 FTS	0.1	NSL	NSL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
6:2 FTS	0.1	NSL	NSL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
8:2 FTS	0.1	NSL	NSL	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
10:2 FTS	0.1	NSL	NSL	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide	1	NSL	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
N-Methyl perfluorooctane sulfonamide	1	NSL	NSL	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctanesulfonamide	1	NSL	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
N-Me perfluorooctanesulfonamid oethanol	1	NSL	NSL	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Et perfluorooctanesulfonamid oethanol	5	NSL	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MePerfluorooctanesulf-amid oacetic acid	0.2	NSL	NSL	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
EtPerfluorooctanesulf-amid oacetic acid	0.2	NSL	NSL	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Positive PFHxS & PFOS	0.1	50	200	0.01	0.01	<0.01	0.02	<0.01	<0.01	0.01
Total Positive PFOS & PFOA	0.1	NSL	NSL	0.01	0.01	<0.01	0.02	<0.01	<0.01	0.01
Total Positive PFAS	0.1	NSL	NSL	0.01	0.01	<0.01	0.02	<0.01	<0.01	0.01
Result above TCLP1 Criteria	Bold									
Result above TCLP2 Criteria	Bold									

[illegible]

TABLE Q2 SUMMARY OF PFAS FIELD QA/QC IN SOIL Units are µg/Kg unless stated otherwise.																																	
			Perfluorobutanesulfonic acid	Perfluoropentanesulfonic acid	Perfluorohexanesulfonic acid - PFHxS	Perfluoroheptanesulfonic acid	Perfluorooctanesulfonic acid PFOS	Perfluorodecanesulfonic acid	Perfluorobutanoic acid	Perfluoropentanoic acid	Perfluoroheptanoic acid	Perfluoroheptanoic acid	Perfluorooctanoic acid PFOA	Perfluorononanoic acid	Perfluorodecanoic acid	Perfluoroundecanoic acid	Perfluorododecanoic acid	Perfluorotridecanoic acid	Perfluorotetradecanoic acid	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Perfluorooctane sulfonamide	N-Methyl perfluorooctane sulfonamide	N-Ethyl perfluorooctanesulfonamide	N-Me perfluorooctanesulfonamid oethanol	N-Et perfluorooctanesulfonamid oethanol	MePerfluorooctanesulf-amid oacetic acid	EtPerfluorooctanesulf-amid oacetic acid	Total Positive PFHxS & PFOS	Total Positive PFOS & PFOA	Total Positive PFAS
PQL Envirolab Soil			0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.5	0.5	0.5	0.5	5	0.1	0.1	0.1	0.1	1	1	1	1	5	0.2	0.2	0.1	0.1	0.1
PQL Envirolab Rinsate µg/L			0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.02	0.02	0.05	0.1	0.5	0.01	0.01	0.02	0.02	0.1	0.05	0.1	0.05	0.5	0.02	0.02	0.01	0.01	0.01
Intra laboratory duplicate	BH611	0-0.1	<0.1	<0.1	<0.1	<0.1	1.4	<0.2	0.2	<0.2	<0.1	<0.1	0.2	<0.1	<0.5	<0.5	<0.5	<0.5	<5	<0.1	<0.1	<0.2	<0.2	<1	<1	<1	<1	<5	<0.2	<0.2	1.4	1.5	1.8
	SDUP3	0-0.1	<0.1	<0.1	<0.1	<0.1	1.9	<0.2	0.4	<0.2	<0.1	<0.1	0.2	<0.1	<0.5	<0.5	<0.5	<0.5	<5	<0.1	<0.1	<0.2	<0.2	<1	<1	<1	<1	<5	<0.2	<0.2	1.9	2.1	2.5
	MEAN		nc	nc	nc	nc	1.65	nc	0.3	nc	nc	nc	0.2	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	1.65	1.8	2.15
	RPD %		nc	nc	nc	nc	30%	nc	67%	nc	nc	nc	nc	0%	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	30%	33%	33%
Field Blank	TB-PFAS 14/03/2022		<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<5	<0.1	<0.1	<0.2	<0.2	<1	<1	<1	<1	<5	<0.2	<0.2	<0.1	<0.1	<0.1
Field Rinsate	FR-HA 11/03/2022	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.05	<0.1	<0.5	<0.01	<0.01	<0.02	<0.02	<0.1	<0.05	<0.1	<0.05	<0.5	<0.02	<0.02	<0.01	<0.01	<0.01
Result outside of QA/QC acceptance criteria			Value																														



Appendix D: Borehole Logs

BOREHOLE LOG



Borehole No.
601

1/1

EASTING: 324889.09
NORTHING: 6260872.04

Client: BAPTIST CARE
Project: PROPOSED AGED CARE REDEVELOPMENT
Location: CNR EPPING ROAD AND BALACLAVA ROAD, MACQUARIE PARK, NSW

Job No.: 32891PN2 **Method:** SPIRAL AUGER **R.L. Surface:** 81.46m
Date: 14/3/22 **Datum:** AHD
Plant Type: JK205 **Logged/Checked by:** S.D./N.E.S.

Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	U50	DB	DS									
DRY ON COMPLETION						0		-	ASPHALTIC CONCRETE: 50mm.t	M			SCREEN: 1.85kg
								-	FILL: Silty gravelly sand, fine to medium grained, dark grey, fine to medium grained igneous gravel.	w<PL	(Hd)		0.05-0.15, NO FCF
								-	Silty CLAY: high plasticity, brown.	DW	M		RESIDUAL
								-	SILTSTONE: grey and brown.				ASHFIELD SHALE
						1					L-M		MODERATE 'TC' BIT RESISTANCE
						2			as above, but with extremely weathered bands.				LOW TO MODERATE RESISTANCE
						3							GROUNDWATER MONITORING WELL INSTALLED TO 6.0m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 3.05m TO 6.0m. CASING 0.08m TO 3.05m. 2mm SAND FILTER PACK 2.3m TO 6.0m. BENTONITE SEAL 0.4m TO 2.3m. BACKFILLED WITH SAND TO THE SURFACE. COMPLETED WITH A CONCRETED GATIC COVER.
						4			SILTSTONE: dark grey.		L		LOW RESISTANCE
						5							
						6			END OF BOREHOLE AT 6.0m		M		MODERATE RESISTANCE
						7							

▼
ON
17/3/22

BOREHOLE LOG



Borehole No.
602

1/1

EASTING: 324998.27
NORTHING: 6260892.62

Client: BAPTIST CARE
Project: PROPOSED AGED CARE REDEVELOPMENT
Location: CNR EPPING ROAD AND BALACLAVA ROAD, MACQUARIE PARK, NSW

Job No.: 32891PN2 **Method:** SPIRAL AUGER **R.L. Surface:** 78.71m
Date: 14/3/22 **Datum:** AHD
Plant Type: JK205 **Logged/Checked by:** S.D./N.E.S.

Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	U50	DB	DS									
DRY ON COMPLETION						0		CI	ASPHALTIC CONCRETE: 70mm.t FILL: Silty gravelly clay, medium plasticity, grey and brown, fine to medium grained igneous gravel. Silty CLAY: medium plasticity, light grey mottled red brown, trace of fine to medium grained ironstone gravel.	w>PL w<PL	VSt-Hd	520 510 400	SCREEN: 1.96kg 0.07-0.2m, NO FCF RESIDUAL
					N = 9 4,4,5	1							
					N = SPT 12/100mm REFUSAL	2		-	Extremely Weathered siltstone: silty CLAY, medium plasticity, light grey.	XW	Hd		ASHFIELD SHALE VERY LOW 'TC' BIT RESISTANCE
						3			SILTSTONE: grey and brown. as above, but with medium strength bands and iron indurated bands and extremely weathered bands.	DW	L		TOO FRIABLE FOR HP TESTING LOW RESISTANCE WITH MODERATE BANDS
						4			SILTSTONE: dark grey.	(SW)	M		MODERATE TO HIGH RESISTANCE
						5							
						6			END OF BOREHOLE AT 6.0m				
						7							

BOREHOLE LOG



Borehole No.
603

1/1

EASTING: 325034.663
NORTHING: 6260881.70

Client: BAPTIST CARE
Project: PROPOSED AGED CARE REDEVELOPMENT
Location: CNR EPPING ROAD AND BALACLAVA ROAD, MACQUARIE PARK, NSW

Job No.: 32891PN2 **Method:** SPIRAL AUGER **R.L. Surface:** 76.89m
Date: 14/3/22 **Datum:** AHD
Plant Type: JK205 **Logged/Checked by:** S.D./N.E.S. **SDUP1:** 0.5-0.9m

Groundwater Record	ES	USO	DB	DS	SAMPLES	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: 250mm.t				NO OBSERVED REINFORCEMENT
									-	FILL: Silty clay, high plasticity, brown, trace of fine to medium grained igneous gravel.	w>PL			
						N = 10 3,4,6			CH	Silty CLAY: high plasticity, orange brown mottled light grey and red brown, trace of fine to medium grained ironstone gravel.	w<PL	Hd	500 530 500	RESIDUAL
							1							
						N > 16 10,16/ 120mm REFUSAL			-	Extremely Weathered siltstone: silty CLAY, medium plasticity, light grey mottled brown.	XW	Hd		ASHFIELD SHALE
							2			as above, but with iron indurated bands. SILTSTONE: grey.	DW	L		VERY LOW 'TC' BIT RESISTANCE
														TOO FRIABLE FOR HP TESTING
							3							LOW RESISTANCE WITH MODERATE BANDS
										SILTSTONE: grey and dark grey, with iron indurated bands and occasional extremely weathered bands.		M		
							4							
										SILTSTONE: dark grey and dark brown.		L		
							5							
							6			END OF BOREHOLE AT 6.0m				
							7							

BOREHOLE LOG



Borehole No.
604

1/1

EASTING: 325130.71
NORTHING: 6260903.41

Client: BAPTIST CARE
Project: PROPOSED AGED CARE REDEVELOPMENT
Location: CNR EPPING ROAD AND BALACLAVA ROAD, MACQUARIE PARK, NSW

Job No.: 32891PN2 **Method:** HAND AUGER / SPIRAL AUGER **R.L. Surface:** 72.58m
Date: 9/3/22 **Datum:** AHD
Plant Type: JK205 **Logged/Checked by:** S.D./N.E.S.

Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	U50	DB	DS									
DRY ON COMPLETION						0			FILL: Silty clay, medium plasticity, dark grey brown, with slag, trace of fine to medium grained igneous gravel.	w>PL			GRASS COVER SCREEN: 11.2kg 0-0.1m, FCF1
					N = 9 3,4,5			CH	Silty CLAY: high plasticity, orange brown mottled grey, trace of fine to medium grained ironstone gravel and root fibres.	w<PL	Hd	540 510 480	HAND AUGER TO 0.5m DEPTH
						1			as above, but light grey mottled red brown.				RESIDUAL
					N = 19 6,9,10							>600 >600 >600	
						2		-	SILTSTONE: grey, with iron indurated bands and extremely weathered bands	DW	L		ASHFIELD SHALE
						3							LOW 'TC' BIT RESISTANCE WITH MODERATE BANDS
						4			as above, but brown, dark grey, grey and red brown.		L-M		MODERATE RESISTANCE WITH LOW BANDS
						5			END OF BOREHOLE AT 4.6m				'TC' BIT REFUSAL
						6							
						7							

BOREHOLE LOG



Borehole No.
605

1/1

EASTING: 325252.59
NORTHING: 6260805.94

Client: BAPTIST CARE
Project: PROPOSED AGED CARE REDEVELOPMENT
Location: CNR EPPING ROAD AND BALACLAVA ROAD, MACQUARIE PARK, NSW

Job No.: 32891PN2 **Method:** SPIRAL AUGER **R.L. Surface:** 62.00m
Date: 9/3/22 **Datum:** AHD
Plant Type: JK205 **Logged/Checked by:** S.D./N.E.S.

Groundwater Record	SAMPLES			Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	US	DB									
ON 17/22 ON COMPLETION				N > 8 10,8/50mm REFUSAL	0		SM	FILL: Silty clay, medium plasticity, dark grey brown, trace of fine to medium grained sand, fibre cements fragments and root fibres. Silty SAND: fine to medium grained, orange brown and red brown, trace of clay.	w>PL M	MD		GRASS COVER SCREEN: 10.02kg 0-0.1m, FCF1
				N > 21 7,10,11 REFUSAL	1			as above, but with occasional ironstone gravel bands.				PROBABLY ALLUVIAL
					2		-	SANDSTONE: fine to medium grained, light grey and light brown.	DW	VL M-H		HAWKESBURY SANDSTONE MODERATE TO HIGH 'TC' BIT RESISTANCE
								END OF BOREHOLE AT 2.2m				'TC' BIT REFUSAL
					3							GROUNDWATER MONITORING WELL INSTALLED TO 1.8m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 0.8m TO 1.8m. CASING 0.1m TO 0.8m. 2mm SAND FILTER PACK 0.5m TO 1.8m. BENTONITE SEAL 0.1m TO 0.5m. BACKFILLED WITH SPOIL TO THE SURFACE. COMPLETED WITH A CONCRETED GATIC COVER.
					4							
					5							
					6							
					7							

BOREHOLE LOG



Borehole No.
606

1/1

EASTING: 325089.52
NORTHING: 6260796.49

Client: BAPTIST CARE
Project: PROPOSED AGED CARE REDEVELOPMENT
Location: CNR EPPING ROAD AND BALACLAVA ROAD, MACQUARIE PARK, NSW

Job No.: 32891PN2 **Method:** SPIRAL AUGER **R.L. Surface:** 70.19m
Date: 9/3/22 **Datum:** AHD
Plant Type: JK205 **Logged/Checked by:** S.D./N.E.S.

Groundwater Record	ES	US	DB	DS	SAMPLES	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: 170mm.t				8mm DIA. REINFORCEMENT, 80mm TOP COVER
						N = 9 3,3,6			CI-CH	FILL: Silty gravel, fine to medium grained, grey, igneous.	M w>PL w<PL	Hd		RESIDUAL
							1		CH	FILL: Silty clay, medium plasticity, dark grey brown, trace of fine to medium grained igneous gravel.			420 420 420	
						N > 16 4,6, 10/100mm REFUSAL				Silty CLAY: medium to high plasticity, brown mottled red brown.			530 580	
										Silty CLAY: high plasticity, light grey mottled red brown and orange brown.		VSt-Hd	390 540 550	
							2		CI	Sandy CLAY: medium plasticity, light brown, fine to medium grained sand.	w>PL DW	VSt M-H	300	HAWKESBURY SANDSTONE
									-	SANDSTONE: light grey and light brown.				
										END OF BOREHOLE AT 2.3m				MODERATE TO HIGH 'TC' BIT RESISTANCE 'TC' BIT REFUSAL
							3							
							4							
							5							
							6							
							7							

BOREHOLE LOG



Borehole No.
607

1/1

EASTING: 325162.45
NORTHING: 6260772.25

Client: BAPTIST CARE
Project: PROPOSED AGED CARE REDEVELOPMENT
Location: CNR EPPING ROAD AND BALACLAVA ROAD, MACQUARIE PARK, NSW

Job No.: 32891PN2 **Method:** SPIRAL AUGER **R.L. Surface:** 65.20m
Date: 14/3/22 **Datum:** AHD
Plant Type: JK205 **Logged/Checked by:** S.D./N.E.S.

Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	U50	DB	DS									
DRY ON COMPLETION						0			FILL: Silty sandy clay, medium plasticity, dark brown, fine to medium grained sand, trace of fine to medium grained ironstone gravel and root fibres.	w>PL			GRASS COVER
					N = 5 3,3,2			CI	Silty sandy CLAY: medium plasticity, orange brown, fine to medium grained sand, with very low strength sandstone bands.	w>PL	(St)		RESIDUAL TOO SANDY FOR HP TESTING
						1		-	SANDSTONE: fine to medium grained, light grey and brown, with occasional iron indurated bands. END OF BOREHOLE AT 1.5m	DW	M-H		HAWKESBURY SANDSTONE
													MODERATE TO HIGH 'TC' BIT RESISTANCE 'TC' BIT REFUSAL
						2							
						3							
						4							
						5							
						6							
						7							

BOREHOLE LOG



Borehole No.
608

1/1

EASTING: 325247.12
NORTHING: 6260768.44

Client: BAPTIST CARE		Project: PROPOSED AGED CARE REDEVELOPMENT		Location: CNR EPPING ROAD AND BALACLAVA ROAD, MACQUARIE PARK, NSW	
Job No.: 32891PN2		Method: SPIRAL AUGER		R.L. Surface: 61.66m	
Date: 14/3/22		Logged/Checked by: S.D./N.E.S.		Datum: AHD	
Plant Type: JK205					

Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/Weathering	Strength/Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	US	DB	DS									
DRY ON COMPLETION 						0			FILL: Silty clay, medium plasticity, dark brown, trace of fine to medium grained igneous and ironstone gravel, and root fibres.	w>PL			GRASS COVER
								CI-CH	Silty CLAY: medium to high plasticity, light brown mottled light grey brown and red brown, with fine to medium grained ironstone gravel.	w>PL	VSt	310 250 310	RESIDUAL
						1			Silty CLAY: medium to high plasticity, light grey, orange brown and red brown, trace of fine to medium grained sand and ironstone gravel,	w<PL			
											Hd	260 550 600	
						2		-	SANDSTONE: fine to medium grained, light grey and brown.	DW	M-H		HAWKESBURY SANDSTONE
						3			END OF BOREHOLE AT 2.6m				HIGH 'TC' BIT RESISTANCE 'TC' BIT REFUSAL
						4							
						5							
						6							
						7							

BOREHOLE LOG



Borehole No.
609

1/1

EASTING: 325042.89
NORTHING: 6260744.88

Client: BAPTIST CARE
Project: PROPOSED AGED CARE REDEVELOPMENT
Location: CNR EPPING ROAD AND BALACLAVA ROAD, MACQUARIE PARK, NSW

Job No.: 32891PN2 **Method:** SPIRAL AUGER **R.L. Surface:** 69.85m
Date: 9/3/22 **Datum:** AHD
Plant Type: JK205 **Logged/Checked by:** S.D./N.E.S.

Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	U50	DB	DS									
DRY ON COMPLETION						0			FILL: Silty clay, medium plasticity, dark brown, trace of root fibres.	w>PL			GRASS COVER
					N = 7 2,3,4			CH	Silty CLAY: high plasticity, brown, trace of fine to medium grained ironstone gravel, and ash.	w>PL	St- VSt	210 210	SCREEN: 4.65kg 0-0.1m, NO FCF
						1		CI	Silty CLAY: high plasticity, orange brown mottled light grey and red brown, trace of fine to medium grained ironstone gravel.	w≈PL	VSt-Hd	180 380	SCREEN: 10.96kg 0.1-0.5m, NO FCF
					N > 5 11,5/50mm REFUSAL				Silty CLAY: medium plasticity, grey and light grey, with fine to medium grained sand.	w>PL		520 420	RESIDUAL
						2			SANDSTONE: fine to medium grained, light grey and light brown.	(SW)	M-H	330 220 260	HAWKESBURY SANDSTONE
						3			as above, but light grey and red brown.				MODERATE TO HIGH 'TC' BIT RESISTANCE
									END OF BOREHOLE AT 3.2m				'TC' BIT REFUSAL
						4							
						5							
						6							
						7							

BOREHOLE LOG



Borehole No.
610

1/1

EASTING: 325098.77
NORTHING: 6260722.87

Client: BAPTIST CARE
Project: PROPOSED AGED CARE REDEVELOPMENT
Location: CNR EPPING ROAD AND BALACLAVA ROAD, MACQUARIE PARK, NSW

Job No.: 32891PN2 **Method:** SPIRAL AUGER **R.L. Surface:** 65.67m
Date: 9/3/22 **Datum:** AHD
Plant Type: JK205 **Logged/Checked by:** S.D./N.E.S.

Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	US	DB	DS									
DRY ON 17/3/22 ON COMPLETION						0			FILL: Silty clay, medium plasticity, dark grey brown mottled brown, trace of fine to medium grained igneous and sandstone gravel, and root fibres.	w>PL			GRASS COVER
					N > 8 3,4, 4/100mm REFUSAL							250 300 290	SCREEN: 4.32kg 0-0.1m, NO FCF
						1							SCREEN: 4.38kg 0.5-1.0m, NO FCF
					N = SPT 8/20mm REFUSAL			CI	Silty sandy CLAY: medium plasticity, brown mottled orange brown, with high strength iron indurated sandstone bands.	w>PL	(St)		RESIDUAL
						2							
						3		-	Extremely Weathered sandstone: silty CLAY, medium plasticity, light grey, with high strength iron indurated bands.	XW	Hd		HAWKESBURY SANDSTONE
						4			SANDSTONE: fine to medium grained, light grey and red brown.	DW	M		VERY LOW RESISTANCE WITH HIGH BANDS
						5			as above, but brown, light grey and light grey, with occasional iron indurated bands.	(SW)			MODERATE TO HIGH RESISTANCE
						6					M-H		GROUNDWATER MONITORING WELL INSTALLED TO 6.04m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 3.18m TO 6.04m. CASING 0.13m TO 3.18m. 2mm SAND FILTER PACK 3.2m TO 6.04m. BENTONITE
						7			END OF BOREHOLE AT 6.04m				SEAL 0.2m TO 3.2m. BACKFILLED WITH SAND TO THE SURFACE. COMPLETED WITH A CONCRETED GATIC COVER.

BOREHOLE LOG



Borehole No.
611

1/1

EASTING: 325200.65
NORTHING: 6260707.66

Client: BAPTIST CARE
Project: PROPOSED AGED CARE REDEVELOPMENT
Location: CNR EPPING ROAD AND BALACLAVA ROAD, MACQUARIE PARK, NSW

Job No.: 32891PN2 **Method:** SPIRAL AUGER **R.L. Surface:** 64.57m
Date: 14/3/22 **Datum:** AHD
Plant Type: JK205 **Logged/Checked by:** S.D./N.E.S.

Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	US	DB	DS									
DRY ON COMPLETION						0			FILL: Silty sandy clay, low plasticity, dark brown, fine to medium grained sand, trace of fine to medium grained sandstone gravel, and root fibres.	w>PL			GRASS COVER
								SC	Silty clayey SAND: fine to medium grained, orange brown.	W	MD		SCREEN: 11.40kg 0-0.1m, NO FCF
									SANDSTONE: fine to medium grained, light grey and brown.	DW	M		PROBABLY ALLUVIAL
						1			END OF BOREHOLE AT 1.1m		M-H		HAWKESBURY SANDSTONE
													MODERATE 'TC' BIT RESISTANCE
													HIGH RESISTANCE
													'TC' BIT REFUSAL
						2							
						3							
						4							
						5							
						6							
						7							

BOREHOLE LOG



Borehole No.
612

1/1

EASTING: 325149.71
NORTHING: 6260670.01

Client: BAPTIST CARE
Project: PROPOSED AGED CARE REDEVELOPMENT
Location: CNR EPPING ROAD AND BALACLAVA ROAD, MACQUARIE PARK, NSW

Job No.: 32891PN2 **Method:** SPIRAL AUGER **R.L. Surface:** 66.73m
Date: 9/3/22 **Datum:** AHD
Plant Type: JK205 **Logged/Checked by:** S.D./N.E.S.

Groundwater Record	SAMPLES	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/Weathering	Strength/Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
ON COMPLETION	ES USO DB DS		0			ASPHALTIC CONCRETE: 70mm.t	M			
		N > 15 6,6, 9/50mm REFUSAL	1		SM	FILL: Silty sandy gravel, fine to medium grained, dark grey, igneous, fine to medium grained sand. Silty SAND: fine to medium grained, brown, trace of clay, and fine to medium grained ironstone gravel. Silty SAND: medium plasticity, orange brown and red brown, trace of clay and fine to medium grained ironstone gravel.	M	MD		SCREEN: 2.66kg 0.07-0.2m, NO FCF PROBABLY ALLUVIAL
		N > 13 10,13/ 150mm REFUSAL	2		CI	Sandy CLAY: medium plasticity, light grey and light grey brown mottled orange brown, fine to medium grained sand. as above, but grey. SANDSTONE: fine to medium grained, light grey and light brown.	w>PL DW	VSt-Hd L-M	340 450 460 >600	PROBABLY RESIDUAL BANDED VERY LOW 'TC' BIT RESISTANCE HAWKESBURY SANDSTONE MODERATE RESISTANCE MODERATE RESISTANCE WITH LOW BANDS
			4			as above, but brown.		M		MODERATE TO HIGH RESISTANCE
			5					M-H		
			5.2			END OF BOREHOLE AT 5.2m				'TC' BIT REFUSAL
			6							
			7							

JKEnvironments

ENVIRONMENTAL LOG



Log No.
613
1/1

Environmental logs are not to be used for geotechnical purposes

Client:

BAPTIST CARE

Project:

PROPOSED AGED CARE REDEVELOPMENT

Location:

157 BALACLAVA ROAD, MACQUARIE PARK, NSW

Job No.:

E32891PR

Method:

HAND AUGER

R.L. Surface:

-

Date:

11/3/22

Datum:

-

Plant Type:

-

Logged/Checked by:

A.D./T.H.

Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB	PEAS									
						0		-	MULCH: brown, trace of igneous and ironstone gravel and root fibres.	M			SCREEN: 11.57kg 0-0.1m NO FCF SCREEN: 10.33kg 0.1-0.5m NO FCF
						0.5		CI	FILL: Silty clay, medium to high plasticity, brown, trace of ironstone gravel, sand and root fibres.	w≈PL			
										Silty CLAY: medium to high plasticity, brown mottled orange, trace of ironstone gravel, sand and root fibres.	w≈PL w>PL		
						1			END OF BOREHOLE AT 0.85m				
						1.5							
						2							
						2.5							
						3							
						3.5							

JKEnvironments

ENVIRONMENTAL LOG



Log No.
614

1/1

Environmental logs are not to be used for geotechnical purposes

Client: BAPTIST CARE Project: PROPOSED AGED CARE REDEVELOPMENT Location: 157 BALACLAVA ROAD, MACQUARIE PARK, NSW													
Job No.: E32891PR Date: 10/3/22 Plant Type: -			Method: HAND AUGER Logged/Checked by: A.D./T.H				R.L. Surface: - Datum: -						
Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB	PEAS									
DRY ON COMPLE TION						0		-	FILL: Silty clay, low to medium plasticity, brown, trace of ironstone and sandstone gravel, ash and root fibres.	w<PL			GRASS COVER SCREEN: 10.43kg 0-0.1m NO FCF
						0.5		CI	Silty CLAY: medium to high plasticity, orange brown, trace of ironstone and sandstone gravel and root fibres.	w≈PL			SCREEN: 2.86kg 0.1-0.4m NO FCF RESIDUAL
						1			END OF BOREHOLE AT 0.9m				
						1.5							
						2							
						2.5							
						3							
						3.5							



ENVIRONMENTAL LOGS EXPLANATION NOTES

INTRODUCTION

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

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

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

DESCRIPTION AND CLASSIFICATION METHODS

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

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

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

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

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

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

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

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

INVESTIGATION METHODS

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

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

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

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

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

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

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

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

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

Standard Penetration Tests: Standard Penetration Tests (SPT) are used mainly in non-cohesive soils, but can also be used in cohesive soils, as a means of indicating density or strength and also of obtaining a relatively undisturbed sample. The test procedure is

described in Australian Standard 1289.6.3.1–2004 (R2016) ‘*Methods of Testing Soils for Engineering Purposes, Soil Strength and Consolidation Tests – Determination of the Penetration Resistance of a Soil – Standard Penetration Test (SPT)*’.

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

The test results are reported in the following form:

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

N = 13
4, 6, 7

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

N > 30
15, 30/40mm

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

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

LOGS

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

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

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

GROUNDWATER

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

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

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

FILL

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

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

LABORATORY TESTING

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

SYMBOL LEGENDS

SOIL



FILL



TOPSOIL



CLAY (CL, CI, CH)



SILT (ML, MH)



SAND (SP, SW)



GRAVEL (GP, GW)



SANDY CLAY (CL, CI, CH)



SILTY CLAY (CL, CI, CH)



CLAYEY SAND (SC)



SILTY SAND (SM)



GRAVELLY CLAY (CL, CI, CH)



CLAYEY GRAVEL (GC)



SANDY SILT (ML, MH)



PEAT AND HIGHLY ORGANIC SOILS (Pt)

ROCK



CONGLOMERATE



SANDSTONE



SHALE/MUDSTONE



SILTSTONE



CLAYSTONE



COAL



LAMINITE



LIMESTONE



PHYLLITE, SCHIST



TUFF



GRANITE, GABBRO



DOLERITE, DIORITE



BASALT, ANDESITE



QUARTZITE

OTHER MATERIALS



BRICKS OR PAVERS



CONCRETE



ASPHALTIC CONCRETE



CLASSIFICATION OF COARSE AND FINE GRAINED SOILS

Major Divisions		Group Symbol	Typical Names	Field Classification of Sand and Gravel	Laboratory Classification	
Coarse grained soil (more than 60% of soil excluding oversize fraction is greater than 0.075mm)	GRAVEL (more than half of coarse fraction is larger than 2.36mm)	GW	Gravel and gravel-sand mixtures, little or no fines	Wide range in grain size and substantial amounts of all intermediate sizes, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	$C_u > 4$ $1 < C_c < 3$
		GP	Gravel and gravel-sand mixtures, little or no fines, uniform gravels	Predominantly one size or range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	Fails to comply with above
		GM	Gravel-silt mixtures and gravel-sand-silt mixtures	‘Dirty’ materials with excess of non-plastic fines, zero to medium dry strength	≥ 12% fines, fines are silty	Fines behave as silt
		GC	Gravel-clay mixtures and gravel-sand-clay mixtures	‘Dirty’ materials with excess of plastic fines, medium to high dry strength	≥ 12% fines, fines are clayey	Fines behave as clay
	SAND (more than half of coarse fraction is smaller than 2.36mm)	SW	Sand and gravel-sand mixtures, little or no fines	Wide range in grain size and substantial amounts of all intermediate sizes, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	$C_u > 6$ $1 < C_c < 3$
		SP	Sand and gravel-sand mixtures, little or no fines	Predominantly one size or range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	Fails to comply with above
		SM	Sand-silt mixtures	‘Dirty’ materials with excess of non-plastic fines, zero to medium dry strength	≥ 12% fines, fines are silty	N/A
		SC	Sand-clay mixtures	‘Dirty’ materials with excess of plastic fines, medium to high dry strength	≥ 12% fines, fines are clayey	

Laboratory Classification Criteria

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

$$C_u = \frac{D_{60}}{D_{10}} \quad \text{and} \quad C_c = \frac{(D_{30})^2}{D_{10} D_{60}}$$

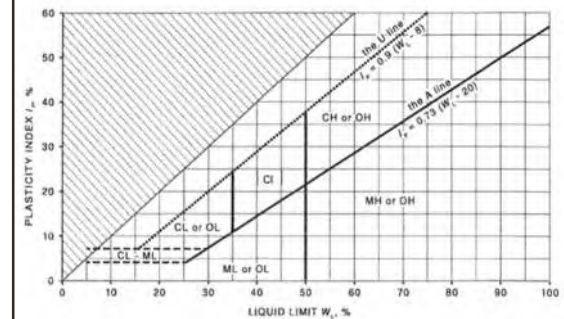
Where D_{10} , D_{30} and D_{60} are those grain sizes for which 10%, 30% and 60% of the soil grains, respectively, are smaller.

NOTES:

- For a coarse grained soil with a fines content between 5% and 12%, the soil is given a dual classification comprising the two group symbols separated by a dash; for example, for a poorly graded gravel with between 5% and 12% silt fines, the classification is GP-GM.
- Where the grading is determined from laboratory tests, it is defined by coefficients of curvature (C_c) and uniformity (C_u) derived from the particle size distribution curve.
- Clay soils with liquid limits $> 35\%$ and $\leq 50\%$ may be classified as being of medium plasticity.
- The U line on the Modified Casagrande Chart is an approximate upper bound for most natural soils.

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

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





LOG SYMBOLS

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



Log Column	Symbol	Definition
Hand Penetrometer Readings	300 250	Measures reading in kPa of unconfined compressive strength. Numbers indicate individual test results on representative undisturbed material unless noted otherwise.
Remarks	'V' bit 'TC' bit T_{60} Soil Origin	<p>Hardened steel 'V' shaped bit.</p> <p>Twin pronged tungsten carbide bit.</p> <p>Penetration of auger string in mm under static load of rig applied by drill head hydraulics without rotation of augers.</p> <p>The geological origin of the soil can generally be described as:</p> <p>RESIDUAL – soil formed directly from insitu weathering of the underlying rock. No visible structure or fabric of the parent rock.</p> <p>EXTREMELY WEATHERED – soil formed directly from insitu weathering of the underlying rock. Material is of soil strength but retains the structure and/or fabric of the parent rock.</p> <p>ALLUVIAL – soil deposited by creeks and rivers.</p> <p>ESTUARINE – soil deposited in coastal estuaries, including sediments caused by inflowing creeks and rivers, and tidal currents.</p> <p>MARINE – soil deposited in a marine environment.</p> <p>AEOLIAN – soil carried and deposited by wind.</p> <p>COLLUVIAL – soil and rock debris transported downslope by gravity, with or without the assistance of flowing water. Colluvium is usually a thick deposit formed from a landslide. The description 'slopewash' is used for thinner surficial deposits.</p> <p>LITTORAL – beach deposited soil.</p>

Classification of Material Weathering

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

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

Rock Material Strength Classification

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



Appendix E: Laboratory Reports & COC Documents

CERTIFICATE OF ANALYSIS 290820

Client Details

Client	JK Environments
Attention	C Ridley
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	<u>E32891PR, Macquarie Park</u>
Number of Samples	26 Soil, 2 Material, 1 Water
Date samples received	11/03/2022
Date completed instructions received	11/03/2022

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	21/03/2022
Date of Issue	21/03/2022
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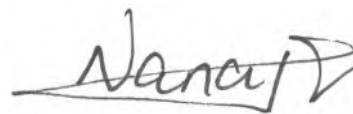
Asbestos Approved By

Analysed by Asbestos Approved Analyst: Wonnies Condos
 Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By

Alexander Mitchell Maclean, Senior Chemist
 Dragana Tomas, Senior Chemist
 Giovanni Agosti, Group Technical Manager
 Hannah Nguyen, Metals Supervisor
 Josh Williams, Organics and LC Supervisor
 Kyle Gavril, Chemist
 Lucy Zhu, Asbestos Supervisor
 Thomas Beenie, Lab Technician

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil

Our Reference		290820-1	290820-4	290820-6	290820-7	290820-8
Your Reference	UNITS	BH604	BH605	BH605	BH606	BH606
Depth		0-0.1	0-0.1	0.4-0.6	0.17-0.25	0.3-0.4
Date Sampled		09/03/2022	09/03/2022	09/03/2022	09/03/2022	09/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	21/03/2022	21/03/2022	21/03/2022	21/03/2022	21/03/2022
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	%	88	94	94	90	93

vTRH(C6-C10)/BTEXN in Soil

Our Reference		290820-10	290820-13	290820-14	290820-16	290820-19
Your Reference	UNITS	BH609	BH610	BH610	BH612	BH613
Depth		0-0.1	0-0.1	0.5-0.8	0.07-0.17	0-0.
Date Sampled		09/03/2022	09/03/2022	09/03/2022	09/03/2022	09/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	21/03/2022	21/03/2022	21/03/2022	21/03/2022	21/03/2022
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	90	95	107	81

vTRH(C6-C10)/BTEXN in Soil					
Our Reference		290820-20	290820-22	290820-27	290820-28
Your Reference	UNITS	BH613	BH614	TB-S1	TS-S1
Depth		0.1-0.4	0-0.1	-	-
Date Sampled		09/03/2022	09/03/2022	09/03/2022	09/03/2022
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	21/03/2022	21/03/2022	21/03/2022	21/03/2022
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	[NA]
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	[NA]
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	[NA]
Benzene	mg/kg	<0.2	<0.2	<0.2	100%
Toluene	mg/kg	<0.5	<0.5	<0.5	99%
Ethylbenzene	mg/kg	<1	<1	<1	99%
m+p-xylene	mg/kg	<2	<2	<2	100%
o-Xylene	mg/kg	<1	<1	<1	97%
Naphthalene	mg/kg	<1	<1	<1	[NA]
Total +ve Xylenes	mg/kg	<1	<1	<1	[NA]
Surrogate aaa-Trifluorotoluene	%	92	90	109	98

svTRH (C10-C40) in Soil						
Our Reference	UNITS	290820-1	290820-4	290820-6	290820-7	290820-8
Your Reference		BH604	BH605	BH605	BH606	BH606
Depth		0-0.1	0-0.1	0.4-0.6	0.17-0.25	0.3-0.4
Date Sampled		09/03/2022	09/03/2022	09/03/2022	09/03/2022	09/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
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
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
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	%	88	81	79	79	80

svTRH (C10-C40) in Soil						
Our Reference	UNITS	290820-10	290820-13	290820-14	290820-16	290820-19
Your Reference		BH609	BH610	BH610	BH612	BH613
Depth		0-0.1	0-0.1	0.5-0.8	0.07-0.17	0-0.
Date Sampled		09/03/2022	09/03/2022	09/03/2022	09/03/2022	09/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	190
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	1,100
TRH C ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	1,200
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	2,400
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	400
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	400
TRH >C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100	1,800
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	640
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	2,800
Surrogate o-Terphenyl	%	85	86	84	88	125

svTRH (C10-C40) in Soil				
Our Reference		290820-20	290820-22	290820-27
Your Reference	UNITS	BH613	BH614	TB-S1
Depth		0.1-0.4	0-0.1	-
Date Sampled		09/03/2022	09/03/2022	09/03/2022
Type of sample		Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022
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	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100	<100	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50
Surrogate o-Terphenyl	%	80	82	84

PAHs in Soil						
Our Reference		290820-1	290820-4	290820-6	290820-7	290820-8
Your Reference	UNITS	BH604	BH605	BH605	BH606	BH606
Depth		0-0.1	0-0.1	0.4-0.6	0.17-0.25	0.3-0.4
Date Sampled		09/03/2022	09/03/2022	09/03/2022	09/03/2022	09/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
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 <i>p</i> -Terphenyl-d14	%	111	96	84	105	108

PAHs in Soil						
Our Reference		290820-10	290820-13	290820-14	290820-16	290820-19
Your Reference	UNITS	BH609	BH610	BH610	BH612	BH613
Depth		0-0.1	0-0.1	0.5-0.8	0.07-0.17	0-0.
Date Sampled		09/03/2022	09/03/2022	09/03/2022	09/03/2022	09/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
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	0.06	0.07	<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	0.06	0.2	<0.05	0.1	<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	%	83	82	107	94	120

PAHs in Soil				
Our Reference		290820-20	290820-22	290820-27
Your Reference	UNITS	BH613	BH614	TB-S1
Depth		0.1-0.4	0-0.1	-
Date Sampled		09/03/2022	09/03/2022	09/03/2022
Type of sample		Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	88	106	93

Organochlorine Pesticides in soil						
Our Reference		290820-1	290820-4	290820-7	290820-10	290820-13
Your Reference	UNITS	BH604	BH605	BH606	BH609	BH610
Depth		0-0.1	0-0.1	0.17-0.25	0-0.1	0-0.1
Date Sampled		09/03/2022	09/03/2022	09/03/2022	09/03/2022	09/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	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
gamma-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
Endosulfan II	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
Endrin Aldehyde	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
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	103	95	104	82	88

Organochlorine Pesticides in soil					
Our Reference		290820-16	290820-19	290820-22	290820-27
Your Reference	UNITS	BH612	BH613	BH614	TB-S1
Depth		0.07-0.17	0-0.	0-0.1	-
Date Sampled		09/03/2022	09/03/2022	09/03/2022	09/03/2022
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	2.3	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	1.9	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	0.5	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	91	117	109	86

Organophosphorus Pesticides in Soil						
Our Reference		290820-1	290820-4	290820-7	290820-10	290820-13
Your Reference	UNITS	BH604	BH605	BH606	BH609	BH610
Depth		0-0.1	0-0.1	0.17-0.25	0-0.1	0-0.1
Date Sampled		09/03/2022	09/03/2022	09/03/2022	09/03/2022	09/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
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
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
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
Chlorpyrifos	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
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	103	95	104	82	88

Organophosphorus Pesticides in Soil					
Our Reference		290820-16	290820-19	290820-22	290820-27
Your Reference	UNITS	BH612	BH613	BH614	TB-S1
Depth		0.07-0.17	0-0.	0-0.1	-
Date Sampled		09/03/2022	09/03/2022	09/03/2022	09/03/2022
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	91	117	109	86

PCBs in Soil						
Our Reference		290820-1	290820-4	290820-7	290820-10	290820-13
Your Reference	UNITS	BH604	BH605	BH606	BH609	BH610
Depth		0-0.1	0-0.1	0.17-0.25	0-0.1	0-0.1
Date Sampled		09/03/2022	09/03/2022	09/03/2022	09/03/2022	09/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	103	95	104	82	88

PCBs in Soil					
Our Reference		290820-16	290820-19	290820-22	290820-27
Your Reference	UNITS	BH612	BH613	BH614	TB-S1
Depth		0.07-0.17	0-0.	0-0.1	-
Date Sampled		09/03/2022	09/03/2022	09/03/2022	09/03/2022
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	91	117	109	86

Acid Extractable metals in soil

Our Reference		290820-1	290820-4	290820-6	290820-7	290820-8
Your Reference	UNITS	BH604	BH605	BH605	BH606	BH606
Depth		0-0.1	0-0.1	0.4-0.6	0.17-0.25	0.3-0.4
Date Sampled		09/03/2022	09/03/2022	09/03/2022	09/03/2022	09/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Date analysed	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Arsenic	mg/kg	8	5	<4	5	5
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	19	14	7	28	42
Copper	mg/kg	36	10	1	12	17
Lead	mg/kg	34	27	4	12	11
Mercury	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	8	3	2	15	28
Zinc	mg/kg	49	28	17	22	28

Acid Extractable metals in soil

Our Reference		290820-10	290820-13	290820-14	290820-16	290820-19
Your Reference	UNITS	BH609	BH610	BH610	BH612	BH613
Depth		0-0.1	0-0.1	0.5-0.8	0.07-0.17	0-0.
Date Sampled		09/03/2022	09/03/2022	09/03/2022	09/03/2022	09/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Date analysed	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Arsenic	mg/kg	7	10	12	5	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	0.4
Chromium	mg/kg	22	41	18	37	8
Copper	mg/kg	20	36	9	18	41
Lead	mg/kg	27	42	21	30	20
Mercury	mg/kg	0.1	0.3	0.1	<0.1	<0.1
Nickel	mg/kg	3	10	3	22	7
Zinc	mg/kg	31	37	22	52	180

Acid Extractable metals in soil				
Our Reference		290820-20	290820-22	290820-27
Your Reference	UNITS	BH613	BH614	TB-S1
Depth		0.1-0.4	0-0.1	-
Date Sampled		09/03/2022	09/03/2022	09/03/2022
Type of sample		Soil	Soil	Soil
Date prepared	-	17/03/2022	17/03/2022	17/03/2022
Date analysed	-	17/03/2022	17/03/2022	17/03/2022
Arsenic	mg/kg	8	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4
Chromium	mg/kg	19	11	3
Copper	mg/kg	23	4	<1
Lead	mg/kg	45	76	3
Mercury	mg/kg	0.1	<0.1	<0.1
Nickel	mg/kg	3	2	<1
Zinc	mg/kg	40	66	2

Moisture						
Our Reference	UNITS	290820-1	290820-4	290820-6	290820-7	290820-8
Your Reference		BH604	BH605	BH605	BH606	BH606
Depth		0-0.1	0-0.1	0.4-0.6	0.17-0.25	0.3-0.4
Date Sampled		09/03/2022	09/03/2022	09/03/2022	09/03/2022	09/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Moisture	%	28	18	10	16	16

Moisture						
Our Reference	UNITS	290820-10	290820-13	290820-14	290820-16	290820-19
Your Reference		BH609	BH610	BH610	BH612	BH613
Depth		0-0.1	0-0.1	0.5-0.8	0.07-0.17	0-0.
Date Sampled		09/03/2022	09/03/2022	09/03/2022	09/03/2022	09/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Moisture	%	6.0	21	16	13	62

Moisture				
Our Reference	UNITS	290820-20	290820-22	290820-27
Your Reference		BH613	BH614	TB-S1
Depth		0.1-0.4	0-0.1	-
Date Sampled		09/03/2022	09/03/2022	09/03/2022
Type of sample		Soil	Soil	Soil
Date prepared	-	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	17/03/2022	17/03/2022	17/03/2022
Moisture	%	17	19	0.9

PFAS in Soils Extended					
Our Reference		290820-4	290820-7	290820-16	290820-19
Your Reference	UNITS	BH605	BH606	BH612	BH613
Depth		0-0.1	0.17-0.25	0.07-0.17	0-0.
Date Sampled		09/03/2022	09/03/2022	09/03/2022	09/03/2022
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Perfluorobutanesulfonic acid	µg/kg	<0.1	<0.1	<0.1	<1
Perfluoropentanesulfonic acid	µg/kg	<0.1	<0.1	<0.1	<1
Perfluorohexanesulfonic acid - PFHxS	µg/kg	<0.1	<0.1	<0.1	<1
Perfluoroheptanesulfonic acid	µg/kg	<0.1	<0.1	<0.1	<1
Perfluorooctanesulfonic acid PFOS	µg/kg	0.7	<0.1	0.2	1.8
Perfluorodecanesulfonic acid	µg/kg	<0.2	<0.2	<0.2	<2
Perfluorobutanoic acid	µg/kg	0.2	<0.2	<0.2	<2
Perfluoropentanoic acid	µg/kg	<0.2	<0.2	<0.2	<2
Perfluorohexanoic acid	µg/kg	0.1	<0.1	<0.1	<1
Perfluoroheptanoic acid	µg/kg	<0.1	<0.1	<0.1	<1
Perfluorooctanoic acid PFOA	µg/kg	0.2	<0.1	<0.1	<1
Perfluorononanoic acid	µg/kg	<0.1	<0.1	<0.1	<1
Perfluorodecanoic acid	µg/kg	<0.5	<0.5	<0.5	<5
Perfluoroundecanoic acid	µg/kg	<0.5	<0.5	<0.5	<5
Perfluorododecanoic acid	µg/kg	<0.5	<0.5	<0.5	<5
Perfluorotridecanoic acid	µg/kg	<0.5	<0.5	<0.5	<5
Perfluorotetradecanoic acid	µg/kg	<5	<5	<5	<50
4:2 FTS	µg/kg	<0.1	<0.1	<0.1	<1
6:2 FTS	µg/kg	<0.1	<0.1	<0.1	<1
8:2 FTS	µg/kg	<0.2	<0.2	<0.2	<2
10:2 FTS	µg/kg	<0.2	<0.2	<0.2	<2
Perfluorooctane sulfonamide	µg/kg	<1	<1	<1	<10
N-Methyl perfluorooctane sulfonamide	µg/kg	<1	<1	<1	<10
N-Ethyl perfluorooctanesulfonamide	µg/kg	<1	<1	<1	<10
N-Me perfluorooctanesulfonamid ethanol	µg/kg	<1	<1	<1	<10
N-Et perfluorooctanesulfonamid ethanol	µg/kg	<5	<5	<5	<50
MePerfluorooctanesulf- amid oacetic acid	µg/kg	<0.2	<0.2	<0.2	<2
EtPerfluorooctanesulf amid oacetic acid	µg/kg	<0.2	<0.2	<0.2	<2
Surrogate ¹³ C ₈ PFOS	%	88	86	91	98
Surrogate ¹³ C ₂ PFOA	%	103	108	109	103
Extracted ISTD ¹³ C ₃ PFBS	%	85	84	92	90
Extracted ISTD ¹⁸ O ₂ PFHxS	%	87	89	93	91
Extracted ISTD ¹³ C ₄ PFOS	%	99	103	101	92

PFAS in Soils Extended					
Our Reference		290820-4	290820-7	290820-16	290820-19
Your Reference	UNITS	BH605	BH606	BH612	BH613
Depth		0-0.1	0.17-0.25	0.07-0.17	0-0.
Date Sampled		09/03/2022	09/03/2022	09/03/2022	09/03/2022
Type of sample		Soil	Soil	Soil	Soil
Extracted ISTD ¹³ C ₄ PFBA	%	83	82	90	95
Extracted ISTD ¹³ C ₃ PFPeA	%	93	89	94	95
Extracted ISTD ¹³ C ₂ PFHxA	%	92	95	99	94
Extracted ISTD ¹³ C ₄ PFHpA	%	98	93	97	93
Extracted ISTD ¹³ C ₄ PFOA	%	102	95	101	98
Extracted ISTD ¹³ C ₅ PFNA	%	103	103	113	90
Extracted ISTD ¹³ C ₂ PFDA	%	103	105	112	95
Extracted ISTD ¹³ C ₂ PFUnDA	%	127	116	126	101
Extracted ISTD ¹³ C ₂ PFDoDA	%	134	125	144	96
Extracted ISTD ¹³ C ₂ PFTeDA	%	113	113	99	71
Extracted ISTD ¹³ C ₂ 4:2FTS	%	128	110	110	100
Extracted ISTD ¹³ C ₂ 6:2FTS	%	188	125	135	129
Extracted ISTD ¹³ C ₂ 8:2FTS	%	#	163	#	146
Extracted ISTD ¹³ C ₈ FOSA	%	99	107	113	75
Extracted ISTD d ₃ N MeFOSA	%	98	87	94	52
Extracted ISTD d ₅ N EtFOSA	%	90	94	94	73
Extracted ISTD d ₇ N MeFOSE	%	112	91	96	63
Extracted ISTD d ₉ N EtFOSE	%	84	92	102	64
Extracted ISTD d ₃ N MeFOSAA	%	142	109	151	89
Extracted ISTD d ₅ N EtFOSAA	%	#	110	178	65
Total Positive PFHxS & PFOS	µg/kg	0.7	<0.1	0.2	1.8
Total Positive PFOS & PFOA	µg/kg	0.9	<0.1	0.2	1.8
Total Positive PFAS	µg/kg	1.3	<0.1	0.2	1.8

Asbestos ID - soils NEPM - ASB-001

Our Reference		290820-1	290820-4	290820-7	290820-10	290820-13
Your Reference	UNITS	BH604	BH605	BH606	BH609	BH610
Depth		0-0.1	0-0.1	0.17-0.25	0-0.1	0-0.1
Date Sampled		09/03/2022	09/03/2022	09/03/2022	09/03/2022	09/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Sample mass tested	g	404.83	715.3	862.01	579.12	503.05
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		290820-16	290820-19	290820-22
Your Reference	UNITS	BH612	BH613	BH614
Depth		0.07-0.17	0-0.	0-0.1
Date Sampled		09/03/2022	09/03/2022	09/03/2022
Type of sample		Soil	Soil	Soil
Date analysed	-	18/03/2022	18/03/2022	18/03/2022
Sample mass tested	g	543.28	157.45	582.89
Sample Description	-	Brown coarse-grained soil & rocks	Brown fine-grained soil & debris	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
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos ^{#1}	g/kg	<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
ACM >7mm Estimation*	g	—	—	—
FA and AF Estimation*	g	—	—	—
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001

Asbestos ID - materials			
Our Reference	UNITS	290820-25	290820-26
Your Reference		BH605-FCF1	BH604-FCF1
Depth		0-0.1	0-0.1
Date Sampled		09/03/2022	09/03/2022
Type of sample		Material	Material
Date analysed	-	14/03/2022	14/03/2022
Mass / Dimension of Sample	-	40x25x5mm	50x25x5mm
Sample Description	-	Brown fibre cement material	Brown fibre cement material
Asbestos ID in materials	-	Chrysotile asbestos detected	Chrysotile asbestos detected
		Amosite asbestos detected	Amosite asbestos detected
		Crocidolite asbestos detected	Crocidolite asbestos detected
Trace Analysis	-	[NT]	[NT]

vTRH(C6-C10)/BTEXN in Water		
Our Reference		290820-29
Your Reference	UNITS	FR-HA
Depth		-
Date Sampled		09/03/2022
Type of sample		Water
Date extracted	-	14/03/2022
Date analysed	-	14/03/2022
TRH C ₆ - C ₉	µg/L	<10
TRH C ₆ - C ₁₀	µg/L	<10
TRH C ₆ - C ₁₀ less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	100
Surrogate toluene-d8	%	98
Surrogate 4-BFB	%	104

svTRH (C10-C40) in Water		
Our Reference		290820-29
Your Reference	UNITS	FR-HA
Depth		-
Date Sampled		09/03/2022
Type of sample		Water
Date extracted	-	17/03/2022
Date analysed	-	18/03/2022
TRH C ₁₀ - C ₁₄	µg/L	<50
TRH C ₁₅ - C ₂₈	µg/L	140
TRH C ₂₉ - C ₃₆	µg/L	<100
Total +ve TRH (C10-C36)	µg/L	140
TRH >C ₁₀ - C ₁₆	µg/L	99
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	µg/L	99
TRH >C ₁₆ - C ₃₄	µg/L	<100
TRH >C ₃₄ - C ₄₀	µg/L	<100
Total +ve TRH (>C10-C40)	µg/L	100
Surrogate o-Terphenyl	%	78

PAHs in Water		
Our Reference		290820-29
Your Reference	UNITS	FR-HA
Depth		-
Date Sampled		09/03/2022
Type of sample		Water
Date extracted	-	17/03/2022
Date analysed	-	17/03/2022
Naphthalene	µg/L	<1
Acenaphthylene	µg/L	<1
Acenaphthene	µg/L	<1
Fluorene	µg/L	<1
Phenanthrene	µg/L	<1
Anthracene	µg/L	<1
Fluoranthene	µg/L	<1
Pyrene	µg/L	<1
Benzo(a)anthracene	µg/L	<1
Chrysene	µg/L	<1
Benzo(b,j+k)fluoranthene	µg/L	<2
Benzo(a)pyrene	µg/L	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1
Dibenzo(a,h)anthracene	µg/L	<1
Benzo(g,h,i)perylene	µg/L	<1
Benzo(a)pyrene TEQ	µg/L	<5
Total +ve PAH's	µg/L	NIL (+)VE
Surrogate <i>p</i> -Terphenyl-d14	%	109

Metals in Water - Dissolved		
Our Reference		290820-29
Your Reference	UNITS	FR-HA
Depth		-
Date Sampled		09/03/2022
Type of sample		Water
Date digested	-	16/03/2022
Date analysed	-	16/03/2022
Arsenic - Dissolved	mg/L	<0.05
Cadmium - Dissolved	mg/L	<0.01
Chromium - Dissolved	mg/L	<0.01
Copper - Dissolved	mg/L	<0.01
Lead - Dissolved	mg/L	<0.03
Mercury - Dissolved	mg/L	<0.0005
Nickel - Dissolved	mg/L	<0.02
Zinc - Dissolved	mg/L	<0.02

PFAS in Waters Extended		
Our Reference		290820-29
Your Reference	UNITS	FR-HA
Depth		-
Date Sampled		09/03/2022
Type of sample		Water
Date prepared	-	14/03/2022
Date analysed	-	14/03/2022
Perfluorobutanesulfonic acid	µg/L	<0.01
Perfluoropentanesulfonic acid	µg/L	<0.01
Perfluorohexanesulfonic acid - PFHxS	µg/L	<0.01
Perfluoroheptanesulfonic acid	µg/L	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	<0.01
Perfluorodecanesulfonic acid	µg/L	<0.02
Perfluorobutanoic acid	µg/L	<0.02
Perfluoropentanoic acid	µg/L	<0.02
Perfluorohexanoic acid	µg/L	<0.01
Perfluoroheptanoic acid	µg/L	<0.01
Perfluorooctanoic acid PFOA	µg/L	<0.01
Perfluorononanoic acid	µg/L	<0.01
Perfluorodecanoic acid	µg/L	<0.02
Perfluoroundecanoic acid	µg/L	<0.02
Perfluorododecanoic acid	µg/L	<0.05
Perfluorotridecanoic acid	µg/L	<0.1
Perfluorotetradecanoic acid	µg/L	<0.5
4:2 FTS	µg/L	<0.01
6:2 FTS	µg/L	<0.01
8:2 FTS	µg/L	<0.02
10:2 FTS	µg/L	<0.02
Perfluorooctane sulfonamide	µg/L	<0.1
N-Methyl perfluorooctane sulfonamide	µg/L	<0.05
N-Ethyl perfluorooctanesulfonamide	µg/L	<0.1
N-Me perfluorooctanesulfonamid ethanol	µg/L	<0.05
N-Et perfluorooctanesulfonamid ethanol	µg/L	<0.5
MePerfluorooctanesulf- amid oacetic acid	µg/L	<0.02
EtPerfluorooctanesulf- amid oacetic acid	µg/L	<0.02
Surrogate ¹³ C ₈ PFOS	%	96
Surrogate ¹³ C ₂ PFOA	%	103
Extracted ISTD ¹³ C ₃ PFBS	%	117
Extracted ISTD ¹⁸ O ₂ PFHxS	%	113
Extracted ISTD ¹³ C ₄ PFOS	%	110

PFAS in Waters Extended		
Our Reference		290820-29
Your Reference	UNITS	FR-HA
Depth		-
Date Sampled		09/03/2022
Type of sample		Water
Extracted ISTD ¹³ C ₄ PFBA	%	116
Extracted ISTD ¹³ C ₃ PFPeA	%	114
Extracted ISTD ¹³ C ₂ PFHxA	%	108
Extracted ISTD ¹³ C ₄ PFHpA	%	131
Extracted ISTD ¹³ C ₄ PFOA	%	110
Extracted ISTD ¹³ C ₅ PFNA	%	125
Extracted ISTD ¹³ C ₂ PFDA	%	114
Extracted ISTD ¹³ C ₂ PFUnDA	%	127
Extracted ISTD ¹³ C ₂ PFDoDA	%	105
Extracted ISTD ¹³ C ₂ PFTeDA	%	108
Extracted ISTD ¹³ C ₂ 4:2FTS	%	130
Extracted ISTD ¹³ C ₂ 6:2FTS	%	124
Extracted ISTD ¹³ C ₂ 8:2FTS	%	148
Extracted ISTD ¹³ C ₈ FOSA	%	125
Extracted ISTD d ₃ N MeFOSA	%	116
Extracted ISTD d ₅ N EtFOSA	%	120
Extracted ISTD d ₇ N MeFOSE	%	117
Extracted ISTD d ₉ N EtFOSE	%	108
Extracted ISTD d ₃ N MeFOSAA	%	143
Extracted ISTD d ₅ N EtFOSAA	%	152
Total Positive PFHxS & PFOS	µg/L	<0.01
Total Positive PFOA & PFOS	µg/L	<0.01
Total Positive PFAS	µg/L	<0.01

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	<p>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.</p> <p>Results reported denoted with * are outside our scope of NATA accreditation.</p> <p>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)</p> <p>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.</p> <p>Estimation = Estimated asbestos weight</p> <p>Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.</p>
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-020	<p>Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.</p> <p>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.</p>
Org-020	<p>Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.</p> <p>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.</p> <p>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).</p>
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.

Method ID	Methodology Summary
Org-021	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-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. 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-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/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-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	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)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	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)-BTX 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.

Method ID	Methodology Summary
Org-029	<p>Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3.</p> <p>Analysis is undertaken with LC-MS/MS.</p> <p>PFAS results include the sum of branched and linear isomers where applicable.</p> <p>Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.3 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components.</p> <p>Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.</p>

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	[NT]
Date extracted	-			16/03/2022	1	16/03/2022	16/03/2022		16/03/2022	[NT]
Date analysed	-			21/03/2022	1	21/03/2022	21/03/2022		21/03/2022	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-023	<25	1	<25	<25	0	84	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-023	<25	1	<25	<25	0	84	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	75	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	80	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	83	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	90	[NT]
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	86	[NT]
Naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	94	1	88	91	3	89	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	22	16/03/2022	16/03/2022		[NT]	[NT]
Date analysed	-			[NT]	22	21/03/2022	21/03/2022		[NT]	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-023	[NT]	22	<25	<25	0	[NT]	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-023	[NT]	22	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	22	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	22	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	22	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	22	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	22	<1	<1	0	[NT]	[NT]
Naphthalene	mg/kg	1	Org-023	[NT]	22	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	22	90	94	4	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	[NT]
Date extracted	-			16/03/2022	1	16/03/2022	16/03/2022		16/03/2022	[NT]
Date analysed	-			18/03/2022	1	18/03/2022	18/03/2022		18/03/2022	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-020	<50	1	<50	<50	0	97	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-020	<100	1	<100	<100	0	101	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-020	<100	1	<100	<100	0	121	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-020	<50	1	<50	<50	0	97	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-020	<100	1	<100	<100	0	101	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-020	<100	1	<100	<100	0	121	[NT]
Surrogate o-Terphenyl	%		Org-020	90	1	88	87	1	107	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	22	16/03/2022	16/03/2022		[NT]	[NT]
Date analysed	-			[NT]	22	18/03/2022	18/03/2022		[NT]	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-020	[NT]	22	<50	<50	0	[NT]	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-020	[NT]	22	<100	<100	0	[NT]	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-020	[NT]	22	<100	<100	0	[NT]	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-020	[NT]	22	<50	<50	0	[NT]	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-020	[NT]	22	<100	100	0	[NT]	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-020	[NT]	22	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	22	82	81	1	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	[NT]
Date extracted	-			16/03/2022	1	16/03/2022	16/03/2022		16/03/2022	[NT]
Date analysed	-			18/03/2022	1	18/03/2022	18/03/2022		18/03/2022	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	93	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	103	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	101	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	100	[NT]
Anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	0.1	0	102	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	0.1	0	103	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	99	[NT]
Benzo(b,j,k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	1	0.05	0.05	0	98	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	93	1	111	110	1	110	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	22	16/03/2022	16/03/2022		[NT]	[NT]
Date analysed	-			[NT]	22	18/03/2022	18/03/2022		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j,k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	22	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	22	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	22	106	98	8	[NT]	[NT]

Client Reference: E32891PR, Macquarie Park

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	[NT]
Date extracted	-			16/03/2022	1	16/03/2022	16/03/2022		16/03/2022	[NT]
Date analysed	-			18/03/2022	1	18/03/2022	18/03/2022		18/03/2022	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	88	[NT]
HCB	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	96	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	85	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	105	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	108	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	105	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	108	[NT]
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	109	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	102	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	94	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	100	1	103	105	2	97	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	22	16/03/2022	16/03/2022		[NT]	[NT]
Date analysed	-			[NT]	22	18/03/2022	18/03/2022		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	22	109	94	15	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	[NT]
Date extracted	-			16/03/2022	1	16/03/2022	16/03/2022		16/03/2022	[NT]
Date analysed	-			18/03/2022	1	18/03/2022	18/03/2022		18/03/2022	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	97	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	85	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	77	[NT]
Malathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	95	[NT]
Chlorpyrifos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	98	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	74	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	88	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	100	1	103	105	2	97	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	22	16/03/2022	16/03/2022		[NT]	[NT]
Date analysed	-			[NT]	22	18/03/2022	18/03/2022		[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	22	109	94	15	[NT]	[NT]

Client Reference: E32891PR, Macquarie Park

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	[NT]
Date extracted	-			16/03/2022	1	16/03/2022	16/03/2022		16/03/2022	[NT]
Date analysed	-			18/03/2022	1	18/03/2022	18/03/2022		18/03/2022	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	99	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	100	1	103	105	2	97	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	22	16/03/2022	16/03/2022		[NT]	[NT]
Date analysed	-			[NT]	22	18/03/2022	18/03/2022		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	[NT]	22	109	94	15	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	[NT]
Date prepared	-			17/03/2022	1	17/03/2022	17/03/2022		17/03/2022	[NT]
Date analysed	-			17/03/2022	1	17/03/2022	17/03/2022		17/03/2022	[NT]
Arsenic	mg/kg	4	Metals-020	<4	1	8	12	40	97	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	95	[NT]
Chromium	mg/kg	1	Metals-020	<1	1	19	27	35	98	[NT]
Copper	mg/kg	1	Metals-020	<1	1	36	38	5	97	[NT]
Lead	mg/kg	1	Metals-020	<1	1	34	37	8	96	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	1	0.1	0.1	0	90	[NT]
Nickel	mg/kg	1	Metals-020	<1	1	8	5	46	98	[NT]
Zinc	mg/kg	1	Metals-020	<1	1	49	51	4	99	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	22	17/03/2022	17/03/2022		[NT]	[NT]
Date analysed	-			[NT]	22	17/03/2022	17/03/2022		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	22	<4	<4	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	22	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	22	11	12	9	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	22	4	4	0	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	22	76	70	8	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	22	2	2	0	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	22	66	60	10	[NT]	[NT]

QUALITY CONTROL: PFAS in Soils Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			16/03/2022	[NT]	[NT]	[NT]	[NT]	16/03/2022	[NT]
Date analysed	-			16/03/2022	[NT]	[NT]	[NT]	[NT]	16/03/2022	[NT]
Perfluorobutanesulfonic acid	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Perfluoropentanesulfonic acid	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Perfluoroheptanesulfonic acid	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Perfluorooctanesulfonic acid PFOS	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Perfluorodecanesulfonic acid	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	112	[NT]
Perfluorobutanoic acid	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	103	[NT]
Perfluoropentanoic acid	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	101	[NT]
Perfluorohexanoic acid	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Perfluoroheptanoic acid	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Perfluorooctanoic acid PFOA	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Perfluorononanoic acid	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Perfluorodecanoic acid	µg/kg	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	118	[NT]
Perfluoroundecanoic acid	µg/kg	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	104	[NT]
Perfluorododecanoic acid	µg/kg	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	105	[NT]
Perfluorotridecanoic acid	µg/kg	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	104	[NT]
Perfluorotetradecanoic acid	µg/kg	5	Org-029	<5	[NT]	[NT]	[NT]	[NT]	101	[NT]
4:2 FTS	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	111	[NT]
6:2 FTS	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	115	[NT]
8:2 FTS	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	102	[NT]
10:2 FTS	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	108	[NT]
Perfluorooctane sulfonamide	µg/kg	1	Org-029	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
N-Methyl perfluorooctane sulfonamide	µg/kg	1	Org-029	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
N-Ethyl perfluorooctanesulfonamide	µg/kg	1	Org-029	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
N-Me perfluorooctanesulfonamid oethanol	µg/kg	1	Org-029	<1	[NT]	[NT]	[NT]	[NT]	117	[NT]
N-Et perfluorooctanesulfonamid oethanol	µg/kg	5	Org-029	<5	[NT]	[NT]	[NT]	[NT]	109	[NT]
MePerfluorooctanesulf- amid oacetic acid	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	108	[NT]
EtPerfluorooctanesulf amid oacetic acid	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	105	[NT]
Surrogate ¹³ C ₈ PFOS	%		Org-029	100	[NT]	[NT]	[NT]	[NT]	90	[NT]
Surrogate ¹³ C ₂ PFOA	%		Org-029	106	[NT]	[NT]	[NT]	[NT]	100	[NT]

QUALITY CONTROL: PFAS in Soils Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Extracted ISTD ¹³ C ₃ PFBS	%		Org-029	99	[NT]	[NT]	[NT]	[NT]	98	[NT]
Extracted ISTD ¹⁸ O ₂ PFHxS	%		Org-029	98	[NT]	[NT]	[NT]	[NT]	97	[NT]
Extracted ISTD ¹³ C ₄ PFOS	%		Org-029	101	[NT]	[NT]	[NT]	[NT]	108	[NT]
Extracted ISTD ¹³ C ₄ PFBA	%		Org-029	99	[NT]	[NT]	[NT]	[NT]	97	[NT]
Extracted ISTD ¹³ C ₃ PFPeA	%		Org-029	98	[NT]	[NT]	[NT]	[NT]	98	[NT]
Extracted ISTD ¹³ C ₂ PFHxA	%		Org-029	98	[NT]	[NT]	[NT]	[NT]	99	[NT]
Extracted ISTD ¹³ C ₄ PFHpA	%		Org-029	103	[NT]	[NT]	[NT]	[NT]	99	[NT]
Extracted ISTD ¹³ C ₄ PFOA	%		Org-029	100	[NT]	[NT]	[NT]	[NT]	100	[NT]
Extracted ISTD ¹³ C ₅ PFNA	%		Org-029	103	[NT]	[NT]	[NT]	[NT]	102	[NT]
Extracted ISTD ¹³ C ₂ PFDA	%		Org-029	93	[NT]	[NT]	[NT]	[NT]	97	[NT]
Extracted ISTD ¹³ C ₂ PFUnDA	%		Org-029	93	[NT]	[NT]	[NT]	[NT]	98	[NT]
Extracted ISTD ¹³ C ₂ PFDoDA	%		Org-029	109	[NT]	[NT]	[NT]	[NT]	107	[NT]
Extracted ISTD ¹³ C ₂ PFTeDA	%		Org-029	120	[NT]	[NT]	[NT]	[NT]	118	[NT]
Extracted ISTD ¹³ C ₂ 4:2FTS	%		Org-029	103	[NT]	[NT]	[NT]	[NT]	103	[NT]
Extracted ISTD ¹³ C ₂ 6:2FTS	%		Org-029	101	[NT]	[NT]	[NT]	[NT]	99	[NT]
Extracted ISTD ¹³ C ₂ 8:2FTS	%		Org-029	104	[NT]	[NT]	[NT]	[NT]	96	[NT]
Extracted ISTD ¹³ C ₈ FOSA	%		Org-029	114	[NT]	[NT]	[NT]	[NT]	104	[NT]
Extracted ISTD d ₃ N MeFOSA	%		Org-029	100	[NT]	[NT]	[NT]	[NT]	98	[NT]
Extracted ISTD d ₅ N EtFOSA	%		Org-029	103	[NT]	[NT]	[NT]	[NT]	100	[NT]
Extracted ISTD d ₇ N MeFOSE	%		Org-029	101	[NT]	[NT]	[NT]	[NT]	99	[NT]

Client Reference: E32891PR, Macquarie Park

QUALITY CONTROL: PFAS in Soils Extended						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Extracted ISTD d ₉ N EtFOSE	%		Org-029	104	[NT]	[NT]	[NT]	[NT]	101	[NT]
Extracted ISTD d ₃ N MeFOSAA	%		Org-029	95	[NT]	[NT]	[NT]	[NT]	93	[NT]
Extracted ISTD d ₅ N EtFOSAA	%		Org-029	97	[NT]	[NT]	[NT]	[NT]	93	[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	-			14/03/2022	[NT]	[NT]	[NT]	[NT]	14/03/2022	[NT]
Date analysed	-			14/03/2022	[NT]	[NT]	[NT]	[NT]	14/03/2022	[NT]
TRH C ₆ - C ₉	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	101	[NT]
TRH C ₆ - C ₁₀	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	101	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	107	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Naphthalene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	100	[NT]	[NT]	[NT]	[NT]	102	[NT]
Surrogate toluene-d8	%		Org-023	98	[NT]	[NT]	[NT]	[NT]	101	[NT]
Surrogate 4-BFB	%		Org-023	103	[NT]	[NT]	[NT]	[NT]	107	[NT]

Client Reference: E32891PR, Macquarie Park

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			17/03/2022	[NT]	[NT]	[NT]	[NT]	17/03/2022	[NT]
Date analysed	-			18/03/2022	[NT]	[NT]	[NT]	[NT]	18/03/2022	[NT]
TRH C ₁₀ - C ₁₄	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	91	[NT]
TRH C ₁₅ - C ₂₈	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	88	[NT]
TRH C ₂₉ - C ₃₆	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	109	[NT]
TRH >C ₁₀ - C ₁₆	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	91	[NT]
TRH >C ₁₆ - C ₃₄	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	88	[NT]
TRH >C ₃₄ - C ₄₀	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	109	[NT]
Surrogate o-Terphenyl	%		Org-020	70	[NT]	[NT]	[NT]	[NT]	102	[NT]

QUALITY CONTROL: PAHs in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			17/03/2022	[NT]	[NT]	[NT]	[NT]	17/03/2022	[NT]
Date analysed	-			17/03/2022	[NT]	[NT]	[NT]	[NT]	17/03/2022	[NT]
Naphthalene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	91	[NT]
Acenaphthylene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	78	[NT]
Fluorene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	89	[NT]
Phenanthrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Anthracene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	83	[NT]
Pyrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	91	[NT]
Benzo(a)anthracene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	71	[NT]
Benzo(b,j+k)fluoranthene	µg/L	2	Org-022/025	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	78	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	122	[NT]	[NT]	[NT]	[NT]	93	[NT]

Client Reference: E32891PR, Macquarie Park

QUALITY CONTROL: Metals in Water - Dissolved					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date digested	-			16/03/2022	[NT]	[NT]	[NT]	[NT]	16/03/2022	[NT]
Date analysed	-			16/03/2022	[NT]	[NT]	[NT]	[NT]	16/03/2022	[NT]
Arsenic - Dissolved	mg/L	0.05	Metals-020	<0.05	[NT]	[NT]	[NT]	[NT]	107	[NT]
Cadmium - Dissolved	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	100	[NT]
Chromium - Dissolved	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	101	[NT]
Copper - Dissolved	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	103	[NT]
Lead - Dissolved	mg/L	0.03	Metals-020	<0.03	[NT]	[NT]	[NT]	[NT]	100	[NT]
Mercury - Dissolved	mg/L	0.0005	Metals-021	<0.0005	[NT]	[NT]	[NT]	[NT]	114	[NT]
Nickel - Dissolved	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	102	[NT]
Zinc - Dissolved	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	98	[NT]

QUALITY CONTROL: PFAS in Waters Extended						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			14/03/2022	[NT]	[NT]	[NT]	[NT]	14/03/2022	[NT]
Date analysed	-			14/03/2022	[NT]	[NT]	[NT]	[NT]	14/03/2022	[NT]
Perfluorobutanesulfonic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	96	[NT]
Perfluoropentanesulfonic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	107	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	104	[NT]
Perfluoroheptanesulfonic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	102	[NT]
Perfluorooctanesulfonic acid PFOS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	101	[NT]
Perfluorodecanesulfonic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	87	[NT]
Perfluorobutanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	102	[NT]
Perfluoropentanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	102	[NT]
Perfluorohexanoic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	107	[NT]
Perfluoroheptanoic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	102	[NT]
Perfluorooctanoic acid PFOA	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	101	[NT]
Perfluorononanoic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	102	[NT]
Perfluorodecanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	106	[NT]
Perfluoroundecanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	107	[NT]
Perfluorododecanoic acid	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	101	[NT]
Perfluorotridecanoic acid	µg/L	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Perfluorotetradecanoic acid	µg/L	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	103	[NT]
4:2 FTS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	100	[NT]
6:2 FTS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	99	[NT]
8:2 FTS	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	107	[NT]
10:2 FTS	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	94	[NT]
Perfluorooctane sulfonamide	µg/L	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	99	[NT]
N-Methyl perfluorooctane sulfonamide	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	104	[NT]
N-Ethyl perfluorooctanesulfonamide	µg/L	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
N-Me perfluorooctanesulfonamidethanol	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	118	[NT]
N-Et perfluorooctanesulfonamidethanol	µg/L	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	109	[NT]
MePerfluorooctanesulfonamidacetic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	97	[NT]
EtPerfluorooctanesulfonamidacetic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	93	[NT]
Surrogate ¹³ C ₈ PFOS	%		Org-029	96	[NT]	[NT]	[NT]	[NT]	98	[NT]
Surrogate ¹³ C ₂ PFOA	%		Org-029	102	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: PFAS in Waters Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Extracted ISTD ¹³ C ₃ PFBS	%		Org-029	104	[NT]	[NT]	[NT]	[NT]	106	[NT]
Extracted ISTD ¹⁸ O ₂ PFHxS	%		Org-029	104	[NT]	[NT]	[NT]	[NT]	102	[NT]
Extracted ISTD ¹³ C ₄ PFOS	%		Org-029	104	[NT]	[NT]	[NT]	[NT]	103	[NT]
Extracted ISTD ¹³ C ₄ PFBA	%		Org-029	108	[NT]	[NT]	[NT]	[NT]	103	[NT]
Extracted ISTD ¹³ C ₃ PFPeA	%		Org-029	108	[NT]	[NT]	[NT]	[NT]	102	[NT]
Extracted ISTD ¹³ C ₂ PFHxA	%		Org-029	101	[NT]	[NT]	[NT]	[NT]	103	[NT]
Extracted ISTD ¹³ C ₄ PFHpA	%		Org-029	113	[NT]	[NT]	[NT]	[NT]	111	[NT]
Extracted ISTD ¹³ C ₄ PFOA	%		Org-029	107	[NT]	[NT]	[NT]	[NT]	103	[NT]
Extracted ISTD ¹³ C ₅ PFNA	%		Org-029	120	[NT]	[NT]	[NT]	[NT]	117	[NT]
Extracted ISTD ¹³ C ₂ PFDA	%		Org-029	111	[NT]	[NT]	[NT]	[NT]	105	[NT]
Extracted ISTD ¹³ C ₂ PFUnDA	%		Org-029	116	[NT]	[NT]	[NT]	[NT]	111	[NT]
Extracted ISTD ¹³ C ₂ PFDoDA	%		Org-029	110	[NT]	[NT]	[NT]	[NT]	112	[NT]
Extracted ISTD ¹³ C ₂ PFTeDA	%		Org-029	101	[NT]	[NT]	[NT]	[NT]	105	[NT]
Extracted ISTD ¹³ C ₂ 4:2FTS	%		Org-029	114	[NT]	[NT]	[NT]	[NT]	114	[NT]
Extracted ISTD ¹³ C ₂ 6:2FTS	%		Org-029	118	[NT]	[NT]	[NT]	[NT]	113	[NT]
Extracted ISTD ¹³ C ₂ 8:2FTS	%		Org-029	145	[NT]	[NT]	[NT]	[NT]	136	[NT]
Extracted ISTD ¹³ C ₈ FOSA	%		Org-029	116	[NT]	[NT]	[NT]	[NT]	111	[NT]
Extracted ISTD d ₃ N MeFOSA	%		Org-029	104	[NT]	[NT]	[NT]	[NT]	106	[NT]
Extracted ISTD d ₅ N EtFOSA	%		Org-029	109	[NT]	[NT]	[NT]	[NT]	106	[NT]
Extracted ISTD d ₇ N MeFOSE	%		Org-029	106	[NT]	[NT]	[NT]	[NT]	100	[NT]

Client Reference: E32891PR, Macquarie Park

QUALITY CONTROL: PFAS in Waters Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Extracted ISTD d ₉ N EtFOSE	%		Org-029	104	[NT]	[NT]	[NT]	[NT]	105	[NT]
Extracted ISTD d ₃ N MeFOSAA	%		Org-029	125	[NT]	[NT]	[NT]	[NT]	121	[NT]
Extracted ISTD d ₅ N EtFOSAA	%		Org-029	127	[NT]	[NT]	[NT]	[NT]	127	[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.	
The recommended maximums for analytes in urine are taken from "2018 TLVs and BEIs", as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.	
Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2	

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 (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

For PFAS Extracted Internal Standards denoted with # or outside the 50-150% acceptance range, the respective target analyte results may be unaffected, in other circumstances the PQL has been raised to accommodate the outlier(s).

PFAS in Soil:

PQL raised for 290820-19 due to the high moisture content of the sample.

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.

TRH_W_NEPM:

The positive result in the rinsate sample is due to a single peak with no hydrocarbon profile that is consistent with the use of plastic containers.

SAMPLE RECEIPT ADVICE

Client Details

Client	JK Environments
Attention	C Ridley

Sample Login Details

Your reference	E32891PR, Macquarie Park
Envirolab Reference	290820
Date Sample Received	11/03/2022
Date Instructions Received	11/03/2022
Date Results Expected to be Reported	21/03/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	26 Soil, 2 Material, 1 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	15
Cooling Method	Ice
Sampling Date Provided	YES

Comments

BH606-FCF1 missing but received BH604-FCF1

Please direct any queries to:

Aileen Hie

Phone: 02 9910 6200
Fax: 02 9910 6201
Email: ahie@envirolab.com.au

Jacinta Hurst

Phone: 02 9910 6200
Fax: 02 9910 6201
Email: jhurst@envirolab.com.au

Analysis Underway, details on the following page:

Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBs in Soil	Acid Extractable metals in soil	PFAS in Soils Extended	Asbestos ID - soils NEPM - ASB-001	Asbestos ID - materials	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHs in Water	Metals in Water - Dissolved	PFAS in Waters Extended	On Hold
BH604-0-0.1	✓	✓	✓	✓	✓	✓	✓		✓							
BH604-0.2-0.4																✓
BH604-0.5-0.8																✓
BH605-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓							
BH605-0.2-0.3																✓
BH605-0.4-0.6	✓	✓	✓				✓									
BH606-0.17-0.25	✓	✓	✓	✓	✓	✓	✓	✓	✓							
BH606-0.3-0.4	✓	✓	✓				✓									
BH606-0.6-0.8																✓
BH609-0-0.1	✓	✓	✓	✓	✓	✓	✓		✓							
BH609-0.2-0.4																✓
BH609-0.5-0.8																✓
BH610-0-0.1	✓	✓	✓	✓	✓	✓	✓		✓							
BH610-0.5-0.8	✓	✓	✓				✓									
BH610-1.0-1.2																✓
BH612-0.07-0.17	✓	✓	✓	✓	✓	✓	✓	✓	✓							
BH612-0.2-0.3																✓
BH612-0.5-0.6																✓
BH613-0-0.	✓	✓	✓	✓	✓	✓	✓	✓	✓							
BH613-0.1-0.4	✓	✓	✓				✓									
BH613-0.5-0.7																✓
BH614-0-0.1	✓	✓	✓	✓	✓	✓	✓		✓							
BH614-0.2-0.4																✓
BH614-0.6-0.8																✓
BH605-FCF1-0-0.1										✓						
BH606-FCF1-0-0.1										✓						
TB-S1	✓	✓	✓	✓	✓	✓	✓									
TS-S1	✓															
FR-HA											✓	✓	✓	✓	✓	

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

Additional Info


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

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

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

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

SAMPLE AND CHAIN OF CUSTODY FORM

TO: ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen		JKE Job Number: E32891PR Date Results Required: STANDARD Page: 1 of 2		FROM:  JKE Environments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: cridley@jkenvironments.com.au	
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Location: Macquarie Park							Sample Preserved in Esky on Ice									
Sampler: AD							Tests Required									
Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 2	Combo 3	Combo 6	Combo 6a	8 Metals	PAHs	TRH/BTEX	BTEX	Asbestos NEPM	Asbestos PFAS (Routine, extended)
9/03/2022	1	BH604	0-0.1	G, A, P	0.1	F: Silty Clay			X						X	
9/03/2022	2	BH604	0.2-0.4	G, A, P	0.1	F: Silty Clay										
9/03/2022	3	BH604	0.5-0.8	G, A, P	0.1	Silty Clay										
9/03/2022	4	BH605	0-0.1	G, A, P	10.8	F: Silty Clay			X						X	X
9/03/2022	5	BH605	0.2-0.3	G, A, P	0.4	F: Silty Clay										
9/03/2022	6	BH605	0.4-0.6	G, A, P	0.2	Silty Sand		X								
9/03/2022	7	BH606	0.17-0.25	G, A, P	0.1	F: Silty Gravel			X						X	X
9/03/2022	8	BH606	0.3-0.4	G, A, P	0.1	F: Silty Clay		X								
9/03/2022	9	BH606	0.6-0.8	G, A, P	0	Silty Clay										
9/03/2022	10	BH609	0-0.1	G, A, P	0.9	F: Silty Clay			X						X	
9/03/2022	11	BH609	0.2-0.4	G, A, P	0	Silty Clay										
9/03/2022	12	BH609	0.5-0.8	G, A, P	0.3	Silty Clay										
9/03/2022	13	BH610	0-0.1	G, A, P	0.3	F: Silty Clay			X						X	
9/03/2022	14	BH610	0.5-0.8	G, A, P	0.1	F: Silty Clay		X								
9/03/2022	15	BH610	1.0-1.2	G, A	0.1	Silty Sandy Clay										
9/03/2022	16	BH612	0.07-0.17	G, A, P	0.2	F: Silty Sandy Gravel			X						X	X
9/03/2022	17	BH612	0.2-0.3	G, A, P	0.1	Silty Sand										
9/03/2022	18	BH612	0.5-0.6	G, A, P	0.2	Silty Sand										
11/03/2022	19	BH613	0-0.1	G, Ax2, P	0	F: Sandy Silt			X						X	X
11/03/2022	20	BH613	0.1-0.4	G, A, P	0	F: Silty Clay		X								
11/03/2022	21	BH613	0.5-0.7	G, A, P	0	Silty Clay										
10/03/2022	22	BH614	0-0.1	G, A, P	1.7	F: Silty Clay			X						X	
10/03/2022	23	BH614	0.2-0.4	G, A, P	0.9	F: Silty Clay										
10/03/2022	24	BH614	0.6-0.8	G, A, P	3.3	Silty Clay										
9/03/2022	25	BH605-FCF1	0-0.1	A	-	Fragment										X
9/03/2022	26	BH606-FCF1	0-0.1	A	-	Fragment										X

Remarks (comments/detection limits required):		Sample Containers: G - 250mg Glass Jar A - Ziplock Asbestos Bag P - PFAS PVC Jar		290820	
Relinquished By: AD	Date: 11/03/22	Time: 1:40pm	Received By: C. Mulcahy	Date: 11/3/22	1815

SAMPLE AND CHAIN OF CUSTODY FORM

[illegible]

CERTIFICATE OF ANALYSIS 290820-A

Client Details

Client	JK Environments
Attention	C Ridley
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	<u>E32891PR, Macquarie Park</u>
Number of Samples	additional analysis
Date samples received	11/03/2022
Date completed instructions received	25/03/2022

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.

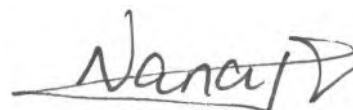
Report Details

Date results requested by	01/04/2022
Date of Issue	29/03/2022
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Results Approved By

Josh Williams, Organics and LC Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

PFAS in TCLP Extended				
Our Reference		290820-A-4	290820-A-16	290820-A-19
Your Reference	UNITS	BH605	BH612	BH613
Depth		0-0.1	0.07-0.17	0-0.
Date Sampled		09/03/2022	09/03/2022	09/03/2022
Type of sample		Soil	Soil	Soil
Date prepared	-	28/03/2022	28/03/2022	28/03/2022
Date analysed	-	28/03/2022	28/03/2022	28/03/2022
pH of soil for fluid# determ.	pH units	7.3	8.5	6.5
pH of soil TCLP (after HCl)	pH units	1.6	1.6	1.6
Extraction fluid used	-	1	1	1
pH of final Leachate	pH units	4.9	5.1	4.9
Perfluorobutanesulfonic acid	µg/L	<0.01	<0.01	<0.01
Perfluoropentanesulfonic acid	µg/L	<0.01	<0.01	<0.01
Perfluorohexanesulfonic acid - PFHxS	µg/L	<0.01	<0.01	<0.01
Perfluoroheptanesulfonic acid	µg/L	<0.01	<0.01	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	0.01	<0.01	<0.01
Perfluorodecanesulfonic acid	µg/L	<0.02	<0.02	<0.02
Perfluorobutanoic acid	µg/L	<0.02	<0.02	<0.02
Perfluoropentanoic acid	µg/L	<0.02	<0.02	<0.02
Perfluorohexanoic acid	µg/L	<0.01	<0.01	<0.01
Perfluoroheptanoic acid	µg/L	<0.01	<0.01	<0.01
Perfluorooctanoic acid PFOA	µg/L	<0.01	<0.01	<0.01
Perfluorononanoic acid	µg/L	<0.01	<0.01	<0.01
Perfluorodecanoic acid	µg/L	<0.02	<0.02	<0.02
Perfluoroundecanoic acid	µg/L	<0.02	<0.02	<0.02
Perfluorododecanoic acid	µg/L	<0.05	<0.05	<0.05
Perfluorotridecanoic acid	µg/L	<0.1	<0.1	<0.1
Perfluorotetradecanoic acid	µg/L	<0.5	<0.5	<0.5
4:2 FTS	µg/L	<0.01	<0.01	<0.01
6:2 FTS	µg/L	<0.01	<0.01	<0.01
8:2 FTS	µg/L	<0.02	<0.02	<0.02
10:2 FTS	µg/L	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide	µg/L	<0.1	<0.1	<0.1
N-Methyl perfluorooctane sulfonamide	µg/L	<0.05	<0.05	<0.05
N-Ethyl perfluorooctanesulfonamide	µg/L	<0.1	<0.1	<0.1
N-Me perfluorooctanesulfonamid oethanol	µg/L	<0.05	<0.05	<0.05
N-Et perfluorooctanesulfonamid oethanol	µg/L	<0.5	<0.5	<0.5
MePerfluorooctanesulf- amid oacetic aci	µg/L	<0.02	<0.02	<0.02
EtPerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02	<0.02
Surrogate ¹³ C ₈ PFOS	%	98	102	100

PFAS in TCLP Extended				
Our Reference		290820-A-4	290820-A-16	290820-A-19
Your Reference	UNITS	BH605	BH612	BH613
Depth		0-0.1	0.07-0.17	0-0.
Date Sampled		09/03/2022	09/03/2022	09/03/2022
Type of sample		Soil	Soil	Soil
Surrogate ¹³ C ₂ PFOA	%	94	93	89
Extracted ISTD ¹³ C ₃ PFBS	%	95	93	93
Extracted ISTD ¹⁸ O ₂ PFHxS	%	96	96	98
Extracted ISTD ¹³ C ₄ PFOS	%	104	104	101
Extracted ISTD ¹³ C ₄ PFBA	%	90	90	85
Extracted ISTD ¹³ C ₃ PFPeA	%	89	94	91
Extracted ISTD ¹³ C ₂ PFHxA	%	101	102	105
Extracted ISTD ¹³ C ₄ PFHpA	%	109	109	104
Extracted ISTD ¹³ C ₄ PFOA	%	104	107	111
Extracted ISTD ¹³ C ₅ PFNA	%	110	110	111
Extracted ISTD ¹³ C ₂ PFDA	%	97	98	100
Extracted ISTD ¹³ C ₂ PFUnDA	%	108	106	114
Extracted ISTD ¹³ C ₂ PFDoDA	%	107	116	107
Extracted ISTD ¹³ C ₂ PFTeDA	%	99	99	101
Extracted ISTD ¹³ C ₂ 4:2FTS	%	94	97	107
Extracted ISTD ¹³ C ₂ 6:2FTS	%	83	92	96
Extracted ISTD ¹³ C ₂ 8:2FTS	%	91	82	89
Extracted ISTD ¹³ C ₈ FOSA	%	116	118	111
Extracted ISTD d ₃ N MeFOSA	%	111	110	109
Extracted ISTD d ₅ N EtFOSA	%	120	121	127
Extracted ISTD d ₇ N MeFOSE	%	103	104	98
Extracted ISTD d ₉ N EtFOSE	%	109	112	111
Extracted ISTD d ₃ N MeFOSAA	%	104	106	109
Extracted ISTD d ₅ N EtFOSAA	%	89	88	85
Total Positive PFHxS & PFOS	µg/L	0.01	<0.01	<0.01
Total Positive PFOS & PFOA	µg/L	0.01	<0.01	<0.01
Total Positive PFAS	µg/L	0.01	<0.01	<0.01

Method ID	Methodology Summary
INORG-004	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-004	<p>Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439 and USEPA 1311.</p> <p>Please note that the mass used may be scaled down from default based on sample mass available.</p> <p>Samples are stored at 2-6oC before and after leachate preparation.</p>
Org-029	<p>Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3.</p> <p>Analysis is undertaken with LC-MS/MS.</p> <p>PFAS results include the sum of branched and linear isomers where applicable.</p> <p>Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.3 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components.</p> <p>Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.</p>

QUALITY CONTROL: PFAS in TCLP Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	290820-A-16
Date prepared	-			28/03/2022	4	28/03/2022	28/03/2022		28/03/2022	28/03/2022
Date analysed	-			28/03/2022	4	28/03/2022	28/03/2022		28/03/2022	28/03/2022
Perfluorobutanesulfonic acid	µg/L	0.01	Org-029	<0.01	4	<0.01	<0.01	0	104	101
Perfluoropentanesulfonic acid	µg/L	0.01	Org-029	<0.01	4	<0.01	<0.01	0	106	107
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.01	Org-029	<0.01	4	<0.01	<0.01	0	123	120
Perfluoroheptanesulfonic acid	µg/L	0.01	Org-029	<0.01	4	<0.01	<0.01	0	103	100
Perfluorooctanesulfonic acid PFOS	µg/L	0.01	Org-029	<0.01	4	0.01	0.01	0	139	102
Perfluorodecanesulfonic acid	µg/L	0.02	Org-029	<0.02	4	<0.02	<0.02	0	105	100
Perfluorobutanoic acid	µg/L	0.02	Org-029	<0.02	4	<0.02	<0.02	0	105	106
Perfluoropentanoic acid	µg/L	0.02	Org-029	<0.02	4	<0.02	<0.02	0	99	102
Perfluorohexanoic acid	µg/L	0.01	Org-029	<0.01	4	<0.01	<0.01	0	103	106
Perfluoroheptanoic acid	µg/L	0.01	Org-029	<0.01	4	<0.01	<0.01	0	101	105
Perfluorooctanoic acid PFOA	µg/L	0.01	Org-029	<0.01	4	<0.01	<0.01	0	96	99
Perfluorononanoic acid	µg/L	0.01	Org-029	<0.01	4	<0.01	<0.01	0	101	107
Perfluorodecanoic acid	µg/L	0.02	Org-029	<0.02	4	<0.02	<0.02	0	94	92
Perfluoroundecanoic acid	µg/L	0.02	Org-029	<0.02	4	<0.02	<0.02	0	105	102
Perfluorododecanoic acid	µg/L	0.05	Org-029	<0.05	4	<0.05	<0.05	0	105	105
Perfluorotridecanoic acid	µg/L	0.1	Org-029	<0.1	4	<0.1	<0.1	0	111	102
Perfluorotetradecanoic acid	µg/L	0.5	Org-029	<0.5	4	<0.5	<0.5	0	107	103
4:2 FTS	µg/L	0.01	Org-029	<0.01	4	<0.01	<0.01	0	112	112
6:2 FTS	µg/L	0.01	Org-029	<0.01	4	<0.01	<0.01	0	128	111
8:2 FTS	µg/L	0.02	Org-029	<0.02	4	<0.02	<0.02	0	126	114
10:2 FTS	µg/L	0.02	Org-029	<0.02	4	<0.02	<0.02	0	119	116
Perfluorooctane sulfonamide	µg/L	0.1	Org-029	<0.1	4	<0.1	<0.1	0	102	105
N-Methyl perfluorooctane sulfonamide	µg/L	0.05	Org-029	<0.05	4	<0.05	<0.05	0	109	107
N-Ethyl perfluorooctanesulfonamide	µg/L	0.1	Org-029	<0.1	4	<0.1	<0.1	0	91	88
N-Me perfluorooctanesulfonamidethanol	µg/L	0.05	Org-029	<0.05	4	<0.05	<0.05	0	108	109
N-Et perfluorooctanesulfonamidethanol	µg/L	0.5	Org-029	<0.5	4	<0.5	<0.5	0	124	121
MePerfluorooctanesulfonamidacetic acid	µg/L	0.02	Org-029	<0.02	4	<0.02	<0.02	0	89	92
EtPerfluorooctanesulfonamidacetic acid	µg/L	0.02	Org-029	<0.02	4	<0.02	<0.02	0	107	109
Surrogate ¹³ C ₈ PFOS	%		Org-029	101	4	98	103	5	106	98
Surrogate ¹³ C ₂ PFOA	%		Org-029	90	4	94	91	3	98	93

QUALITY CONTROL: PFAS in TCLP Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	290820-A-16
Extracted ISTD ¹³ C ₃ PFBS	%		Org-029	94	4	95	96	1	94	94
Extracted ISTD ¹⁸ O ₂ PFHxS	%		Org-029	100	4	96	94	2	95	95
Extracted ISTD ¹³ C ₄ PFOS	%		Org-029	104	4	104	104	0	98	103
Extracted ISTD ¹³ C ₄ PFBA	%		Org-029	98	4	90	90	0	92	86
Extracted ISTD ¹³ C ₃ PFPeA	%		Org-029	95	4	89	90	1	94	86
Extracted ISTD ¹³ C ₂ PFHxA	%		Org-029	104	4	101	102	1	103	97
Extracted ISTD ¹³ C ₄ PFHpA	%		Org-029	109	4	109	102	7	106	103
Extracted ISTD ¹³ C ₄ PFOA	%		Org-029	109	4	104	106	2	103	106
Extracted ISTD ¹³ C ₅ PFNA	%		Org-029	113	4	110	109	1	110	107
Extracted ISTD ¹³ C ₂ PFDA	%		Org-029	102	4	97	96	1	98	97
Extracted ISTD ¹³ C ₂ PFUnDA	%		Org-029	113	4	108	105	3	104	107
Extracted ISTD ¹³ C ₂ PFDoDA	%		Org-029	116	4	107	113	5	105	109
Extracted ISTD ¹³ C ₂ PFTeDA	%		Org-029	109	4	99	100	1	99	96
Extracted ISTD ¹³ C ₂ 4:2FTS	%		Org-029	108	4	94	87	8	96	93
Extracted ISTD ¹³ C ₂ 6:2FTS	%		Org-029	91	4	83	88	6	84	88
Extracted ISTD ¹³ C ₂ 8:2FTS	%		Org-029	98	4	91	88	3	89	87
Extracted ISTD ¹³ C ₈ FOSA	%		Org-029	116	4	116	115	1	110	111
Extracted ISTD d ₃ N MeFOSA	%		Org-029	114	4	111	108	3	106	108
Extracted ISTD d ₅ N EtFOSA	%		Org-029	123	4	120	117	3	117	115
Extracted ISTD d ₇ N MeFOSE	%		Org-029	103	4	103	100	3	101	104

Client Reference: E32891PR, Macquarie Park

QUALITY CONTROL: PFAS in TCLP Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	290820-A-16
Extracted ISTD d ₉ N EtFOSE	%		Org-029	109	4	109	109	0	101	107
Extracted ISTD d ₃ N MeFOSAA	%		Org-029	109	4	104	104	0	103	96
Extracted ISTD d ₅ N EtFOSAA	%		Org-029	92	4	89	83	7	89	83

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.	
The recommended maximums for analytes in urine are taken from "2018 TLVs and BEIs", as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.	
Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2	

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 (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

SAMPLE RECEIPT ADVICE

Client Details

Client	JK Environments
Attention	C Ridley

Sample Login Details

Your reference	E32891PR, Macquarie Park
Envirolab Reference	290820-A
Date Sample Received	11/03/2022
Date Instructions Received	25/03/2022
Date Results Expected to be Reported	01/04/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	15
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie

Phone: 02 9910 6200
Fax: 02 9910 6201
Email: ahie@envirolab.com.au

Jacinta Hurst

Phone: 02 9910 6200
Fax: 02 9910 6201
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	PFAS in TCLP Extended	On Hold
BH604-0-0.1		✓
BH604-0.2-0.4		✓
BH604-0.5-0.8		✓
BH605-0-0.1	✓	
BH605-0.2-0.3		✓
BH605-0.4-0.6		✓
BH606-0.17-0.25		✓
BH606-0.3-0.4		✓
BH606-0.6-0.8		✓
BH609-0-0.1		✓
BH609-0.2-0.4		✓
BH609-0.5-0.8		✓
BH610-0-0.1		✓
BH610-0.5-0.8		✓
BH610-1.0-1.2		✓
BH612-0.07-0.17	✓	
BH612-0.2-0.3		✓
BH612-0.5-0.6		✓
BH613-0-0.	✓	
BH613-0.1-0.4		✓
BH613-0.5-0.7		✓
BH614-0-0.1		✓
BH614-0.2-0.4		✓
BH614-0.6-0.8		✓
BH605-FCF1-0-0.1		✓
BH604-FCF1-0-0.1		✓
TB-S1		✓
TS-S1		✓
FR-HA		✓

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

Additional Info

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

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

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

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

Ming To

Subject:

FW: Results for Registration 290820 E32891PR, Macquarie Park

Ref: 290820-A
TAT: Standard
Due: 01/04/2022
MT



290820-A

From: Craig Ridley <CRidley@jkenvironments.com.au>
Sent: Friday, 25 March 2022 8:59 AM
To: Greta Petzold <GPetzold@envirolab.com.au>
Cc: Samplereceipt <Samplereceipt@envirolabservices.com.au>
Subject: Re: Results for Registration 290820 E32891PR, Macquarie Park

CAUTION: This email originated from outside of the organisation. Do not act on instructions, click links or open attachments unless you recognise the sender and know the content is authentic and safe.

Hi Greta,

Can we please organise the following additional tests for this sample batch (on standard turnaround):

Sample ID	Lab Reference	Test Required
BH605 (0-0.1) (4)	290820-4	TCLP PFAS
BH612 (0.07-0.17) (16)	290820-16	TCLP PFAS
BH613 (0-0.1) (19)	290820-19	TCLP PFAS

Thanks,

Regards
Craig Ridley
Senior Environmental Scientist



T: +612 9888 5000
D: 0421 856 992
E: cridley@jkenvironments.com.au
www.jkenvironments.com.au

PO Box 976
NORTH RYDE BC NSW 1670
115 Wicks Road
MACQUARIE PARK NSW 2113

JKEnvironments

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From: Greta Petzold <GPetzold@envirolab.com.au>

Sent: Monday, March 21, 2022 5:33 PM

CERTIFICATE OF ANALYSIS 291372

Client Details

Client	JK Environments
Attention	C Ridley
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	<u>E32891PR, Macquarie Park</u>
Number of Samples	23 Soil
Date samples received	18/03/2022
Date completed instructions received	18/03/2022

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	25/03/2022
Date of Issue	25/03/2022
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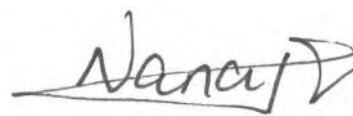
Asbestos Approved By

Analysed by Asbestos Approved Analyst: Panika Wongchanda
 Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By

Alexander Mitchell Maclean, Senior Chemist
 Dragana Tomas, Senior Chemist
 Giovanni Agosti, Group Technical Manager
 Josh Williams, Organics and LC Supervisor
 Liam Timmins, Chemist
 Lucy Zhu, Asbestos Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil

Our Reference		291372-1	291372-2	291372-3	291372-6	291372-8
Your Reference	UNITS	BH601	BH601	BH602	BH603	BH607
Depth		0.05-0.15	0.5-0.7	0.07-0.17	0.25-0.35	0-0.1
Date Sampled		14/03/2022	14/03/2022	14/03/2022	14/03/2022	14/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	22/03/2022	22/03/2022	22/03/2022	22/03/2022	22/03/2022
Date analysed	-	24/03/2022	24/03/2022	24/03/2022	24/03/2022	24/03/2022
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	%	99	109	110	104	101

vTRH(C6-C10)/BTEXN in Soil

Our Reference		291372-11	291372-14	291372-15	291372-16	291372-19
Your Reference	UNITS	BH608	BH611	BH611	BH611	SDUP3
Depth		0-0.1	0-0.1	0.3-0.5	0.7-1.0	-
Date Sampled		14/03/2022	14/03/2022	14/03/2022	14/03/2022	14/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	22/03/2022	22/03/2022	22/03/2022	22/03/2022	22/03/2022
Date analysed	-	24/03/2022	24/03/2022	24/03/2022	24/03/2022	24/03/2022
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	95	78	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	95	78	<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	%	98	106	98	104	93

vTRH(C6-C10)/BTEXN in Soil			
Our Reference		291372-21	291372-22
Your Reference	UNITS	TB-S2	TS-S2
Depth		-	-
Date Sampled		14/03/2022	14/03/2022
Type of sample		Soil	Soil
Date extracted	-	22/03/2022	22/03/2022
Date analysed	-	24/03/2022	24/03/2022
TRH C ₆ - C ₉	mg/kg	<25	[NA]
TRH C ₆ - C ₁₀	mg/kg	<25	[NA]
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	[NA]
Benzene	mg/kg	<0.2	88%
Toluene	mg/kg	<0.5	90%
Ethylbenzene	mg/kg	<1	92%
m+p-xylene	mg/kg	<2	90%
o-Xylene	mg/kg	<1	92%
Naphthalene	mg/kg	<1	[NT]
Total +ve Xylenes	mg/kg	<1	[NT]
Surrogate aaa-Trifluorotoluene	%	111	86

svTRH (C10-C40) in Soil						
Our Reference	UNITS	291372-1	291372-2	291372-3	291372-6	291372-8
Your Reference		BH601	BH601	BH602	BH603	BH607
Depth		0.05-0.15	0.5-0.7	0.07-0.17	0.25-0.35	0-0.1
Date Sampled		14/03/2022	14/03/2022	14/03/2022	14/03/2022	14/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	22/03/2022	22/03/2022	22/03/2022	22/03/2022	22/03/2022
Date analysed	-	24/03/2022	24/03/2022	24/03/2022	24/03/2022	24/03/2022
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	150	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	150	<50	<50	<50	<50
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	110	<100	<100	<100	<100
TRH >C ₃₄ -C ₄₀	mg/kg	190	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	300	<50	<50	<50	<50
Surrogate o-Terphenyl	%	110	107	109	106	106

svTRH (C10-C40) in Soil						
Our Reference	UNITS	291372-11	291372-14	291372-15	291372-16	291372-19
Your Reference		BH608	BH611	BH611	BH611	SDUP3
Depth		0-0.1	0-0.1	0.3-0.5	0.7-1.0	-
Date Sampled		14/03/2022	14/03/2022	14/03/2022	14/03/2022	14/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	22/03/2022	22/03/2022	22/03/2022	22/03/2022	22/03/2022
Date analysed	-	24/03/2022	24/03/2022	24/03/2022	24/03/2022	24/03/2022
TRH C ₁₀ - C ₁₄	mg/kg	<50	78	86	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	570	460	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	130	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	780	540	<50	<50
TRH >C ₁₀ -C ₁₆	mg/kg	<50	110	150	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	110	150	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100	580	400	<100	150
TRH >C ₃₄ -C ₄₀	mg/kg	<100	110	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	800	550	<50	150
Surrogate o-Terphenyl	%	106	119	118	107	115

svTRH (C10-C40) in Soil		
Our Reference		291372-21
Your Reference	UNITS	TB-S2
Depth		-
Date Sampled		14/03/2022
Type of sample		Soil
Date extracted	-	22/03/2022
Date analysed	-	24/03/2022
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	%	110

PAHs in Soil						
Our Reference		291372-1	291372-2	291372-3	291372-6	291372-8
Your Reference	UNITS	BH601	BH601	BH602	BH603	BH607
Depth		0.05-0.15	0.5-0.7	0.07-0.17	0.25-0.35	0-0.1
Date Sampled		14/03/2022	14/03/2022	14/03/2022	14/03/2022	14/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	22/03/2022	22/03/2022	22/03/2022	22/03/2022	22/03/2022
Date analysed	-	23/03/2022	23/03/2022	23/03/2022	23/03/2022	23/03/2022
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	0.4	<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	0.5	<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	%	101	97	98	99	97

PAHs in Soil						
Our Reference		291372-11	291372-14	291372-15	291372-16	291372-19
Your Reference	UNITS	BH608	BH611	BH611	BH611	SDUP3
Depth		0-0.1	0-0.1	0.3-0.5	0.7-1.0	-
Date Sampled		14/03/2022	14/03/2022	14/03/2022	14/03/2022	14/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	24/03/2022	24/03/2022	24/03/2022	24/03/2022	24/03/2022
Date analysed	-	24/03/2022	24/03/2022	24/03/2022	24/03/2022	24/03/2022
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	%	92	93	95	90	100

PAHs in Soil		
Our Reference		291372-21
Your Reference	UNITS	TB-S2
Depth		-
Date Sampled		14/03/2022
Type of sample		Soil
Date extracted	-	24/03/2022
Date analysed	-	24/03/2022
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Total +ve PAH's	mg/kg	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	100

Organochlorine Pesticides in soil						
Our Reference	UNITS	291372-1	291372-3	291372-6	291372-8	291372-11
Your Reference		BH601	BH602	BH603	BH607	BH608
Depth		0.05-0.15	0.07-0.17	0.25-0.35	0-0.1	0-0.1
Date Sampled		14/03/2022	14/03/2022	14/03/2022	14/03/2022	14/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	22/03/2022	22/03/2022	22/03/2022	22/03/2022	24/03/2022
Date analysed	-	23/03/2022	23/03/2022	23/03/2022	23/03/2022	24/03/2022
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	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
gamma-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	0.2	<0.1	<0.1
Endrin	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-DDD	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
pp-DDT	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	%	102	94	94	100	97

Organochlorine Pesticides in soil				
Our Reference		291372-14	291372-19	291372-21
Your Reference	UNITS	BH611	SDUP3	TB-S2
Depth		0-0.1	-	-
Date Sampled		14/03/2022	14/03/2022	14/03/2022
Type of sample		Soil	Soil	Soil
Date extracted	-	24/03/2022	24/03/2022	24/03/2022
Date analysed	-	24/03/2022	24/03/2022	24/03/2022
alpha-BHC	mg/kg	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1
gamma-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
Endosulfan II	mg/kg	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1
pp-DDT	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	%	93	103	107

Organophosphorus Pesticides in Soil

Our Reference		291372-1	291372-3	291372-6	291372-8	291372-11
Your Reference	UNITS	BH601	BH602	BH603	BH607	BH608
Depth		0.05-0.15	0.07-0.17	0.25-0.35	0-0.1	0-0.1
Date Sampled		14/03/2022	14/03/2022	14/03/2022	14/03/2022	14/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	22/03/2022	22/03/2022	22/03/2022	22/03/2022	24/03/2022
Date analysed	-	23/03/2022	23/03/2022	23/03/2022	23/03/2022	24/03/2022
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
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
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
Chlorpyrifos	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
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	102	94	94	100	97

Organophosphorus Pesticides in Soil				
Our Reference		291372-14	291372-19	291372-21
Your Reference	UNITS	BH611	SDUP3	TB-S2
Depth		0-0.1	-	-
Date Sampled		14/03/2022	14/03/2022	14/03/2022
Type of sample		Soil	Soil	Soil
Date extracted	-	24/03/2022	24/03/2022	24/03/2022
Date analysed	-	24/03/2022	24/03/2022	24/03/2022
Dichlorvos	mg/kg	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1
Ronnel	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
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	93	103	107

PCBs in Soil						
Our Reference		291372-1	291372-3	291372-6	291372-8	291372-11
Your Reference	UNITS	BH601	BH602	BH603	BH607	BH608
Depth		0.05-0.15	0.07-0.17	0.25-0.35	0-0.1	0-0.1
Date Sampled		14/03/2022	14/03/2022	14/03/2022	14/03/2022	14/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	22/03/2022	22/03/2022	22/03/2022	22/03/2022	24/03/2022
Date analysed	-	23/03/2022	23/03/2022	23/03/2022	23/03/2022	24/03/2022
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	102	94	94	100	97

PCBs in Soil				
Our Reference		291372-14	291372-19	291372-21
Your Reference	UNITS	BH611	SDUP3	TB-S2
Depth		0-0.1	-	-
Date Sampled		14/03/2022	14/03/2022	14/03/2022
Type of sample		Soil	Soil	Soil
Date extracted	-	24/03/2022	24/03/2022	24/03/2022
Date analysed	-	24/03/2022	24/03/2022	24/03/2022
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 TCMX	%	93	103	107

Acid Extractable metals in soil

Our Reference		291372-1	291372-2	291372-3	291372-6	291372-8
Your Reference	UNITS	BH601	BH601	BH602	BH603	BH607
Depth		0.05-0.15	0.5-0.7	0.07-0.17	0.25-0.35	0-0.1
Date Sampled		14/03/2022	14/03/2022	14/03/2022	14/03/2022	14/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	23/03/2022	23/03/2022	23/03/2022	23/03/2022	23/03/2022
Date analysed	-	23/03/2022	23/03/2022	23/03/2022	23/03/2022	23/03/2022
Arsenic	mg/kg	<4	4	<4	7	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	10	9	74	16	7
Copper	mg/kg	45	15	27	15	7
Lead	mg/kg	2	14	7	15	19
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	100	20	65	3	2
Zinc	mg/kg	30	10	56	14	21

Acid Extractable metals in soil

Our Reference		291372-11	291372-14	291372-15	291372-16	291372-19
Your Reference	UNITS	BH608	BH611	BH611	BH611	SDUP3
Depth		0-0.1	0-0.1	0.3-0.5	0.7-1.0	-
Date Sampled		14/03/2022	14/03/2022	14/03/2022	14/03/2022	14/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	23/03/2022	23/03/2022	23/03/2022	23/03/2022	23/03/2022
Date analysed	-	23/03/2022	23/03/2022	23/03/2022	23/03/2022	23/03/2022
Arsenic	mg/kg	5	6	<4	<4	6
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	20	21	15	7	24
Copper	mg/kg	10	5	3	<1	6
Lead	mg/kg	22	16	11	3	31
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	3	2	2	<1	3
Zinc	mg/kg	21	14	10	2	38

Acid Extractable metals in soil			
Our Reference		291372-21	291372-24
Your Reference	UNITS	TB-S2	SDUP3 - [TRIPLICATE]
Depth		-	-
Date Sampled		14/03/2022	14/03/2022
Type of sample		Soil	Soil
Date prepared	-	23/03/2022	23/03/2022
Date analysed	-	23/03/2022	23/03/2022
Arsenic	mg/kg	<4	<4
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	3	10
Copper	mg/kg	<1	8
Lead	mg/kg	3	30
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	<1	3
Zinc	mg/kg	2	41

Moisture						
Our Reference	UNITS	291372-1	291372-2	291372-3	291372-6	291372-8
Your Reference		BH601	BH601	BH602	BH603	BH607
Depth		0.05-0.15	0.5-0.7	0.07-0.17	0.25-0.35	0-0.1
Date Sampled		14/03/2022	14/03/2022	14/03/2022	14/03/2022	14/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	22/03/2022	22/03/2022	22/03/2022	22/03/2022	22/03/2022
Date analysed	-	23/03/2022	23/03/2022	23/03/2022	23/03/2022	23/03/2022
Moisture	%	5.2	8.5	14	14	17

Moisture						
Our Reference	UNITS	291372-11	291372-14	291372-15	291372-16	291372-19
Your Reference		BH608	BH611	BH611	BH611	SDUP3
Depth		0-0.1	0-0.1	0.3-0.5	0.7-1.0	-
Date Sampled		14/03/2022	14/03/2022	14/03/2022	14/03/2022	14/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	22/03/2022	22/03/2022	22/03/2022	22/03/2022	22/03/2022
Date analysed	-	23/03/2022	23/03/2022	23/03/2022	23/03/2022	23/03/2022
Moisture	%	17	26	19	7.5	33

Moisture			
Our Reference	UNITS	291372-21	291372-23
Your Reference		TB-S2	TB-PFAS
Depth		-	-
Date Sampled		14/03/2022	14/03/2022
Type of sample		Soil	Soil
Date prepared	-	22/03/2022	22/03/2022
Date analysed	-	23/03/2022	23/03/2022
Moisture	%	1.6	1

PFAS in Soils Extended						
Our Reference		291372-1	291372-11	291372-14	291372-19	291372-23
Your Reference	UNITS	BH601	BH608	BH611	SDUP3	TB-PFAS
Depth		0.05-0.15	0-0.1	0-0.1	-	-
Date Sampled		14/03/2022	14/03/2022	14/03/2022	14/03/2022	14/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	22/03/2022	22/03/2022	22/03/2022	22/03/2022	22/03/2022
Date analysed	-	22/03/2022	22/03/2022	22/03/2022	22/03/2022	22/03/2022
Perfluorobutanesulfonic acid	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanesulfonic acid	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorohexanesulfonic acid - PFHxS	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoroheptanesulfonic acid	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorooctanesulfonic acid PFOS	µg/kg	<0.1	1	1.4	1.9	<0.1
Perfluorodecanesulfonic acid	µg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Perfluorobutanoic acid	µg/kg	<0.2	0.4	0.2	0.4	<0.2
Perfluoropentanoic acid	µg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Perfluorohexanoic acid	µg/kg	<0.1	0.2	<0.1	<0.1	<0.1
Perfluoroheptanoic acid	µg/kg	<0.1	0.1	<0.1	<0.1	<0.1
Perfluorooctanoic acid PFOA	µg/kg	<0.1	0.4	0.2	0.2	<0.1
Perfluorononanoic acid	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorodecanoic acid	µg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Perfluoroundecanoic acid	µg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Perfluorododecanoic acid	µg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Perfluorotridecanoic acid	µg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Perfluorotetradecanoic acid	µg/kg	<5	<5	<5	<5	<5
4:2 FTS	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
6:2 FTS	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
8:2 FTS	µg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
10:2 FTS	µg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Perfluorooctane sulfonamide	µg/kg	<1	<1	<1	<1	<1
N-Methyl perfluorooctane sulfonamide	µg/kg	<1	<1	<1	<1	<1
N-Ethyl perfluorooctanesulfonamide	µg/kg	<1	<1	<1	<1	<1
N-Me perfluorooctanesulfonamid ethanol	µg/kg	<1	<1	<1	<1	<1
N-Et perfluorooctanesulfonamid ethanol	µg/kg	<5	<5	<5	<5	<5
MePerfluorooctanesulf- amid oacetic acid	µg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
EtPerfluorooctanesulf amid oacetic acid	µg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Surrogate ¹³ C ₈ PFOS	%	100	102	103	102	100
Surrogate ¹³ C ₂ PFOA	%	105	106	100	104	100
Extracted ISTD ¹³ C ₃ PFBS	%	118	109	109	104	121
Extracted ISTD ¹⁸ O ₂ PFHxS	%	107	93	97	99	111
Extracted ISTD ¹³ C ₄ PFOS	%	107	96	97	95	111

PFAS in Soils Extended						
Our Reference		291372-1	291372-11	291372-14	291372-19	291372-23
Your Reference	UNITS	BH601	BH608	BH611	SDUP3	TB-PFAS
Depth		0.05-0.15	0-0.1	0-0.1	-	-
Date Sampled		14/03/2022	14/03/2022	14/03/2022	14/03/2022	14/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Extracted ISTD ¹³ C ₄ PFBA	%	106	99	97	96	108
Extracted ISTD ¹³ C ₃ PFPeA	%	124	115	118	119	131
Extracted ISTD ¹³ C ₂ PFHxA	%	106	97	107	105	117
Extracted ISTD ¹³ C ₄ PFHpA	%	105	89	93	92	112
Extracted ISTD ¹³ C ₄ PFOA	%	113	106	116	107	130
Extracted ISTD ¹³ C ₅ PFNA	%	122	118	110	108	130
Extracted ISTD ¹³ C ₂ PFDA	%	130	122	126	125	128
Extracted ISTD ¹³ C ₂ PFUnDA	%	113	112	138	124	127
Extracted ISTD ¹³ C ₂ PFDoDA	%	118	128	143	139	136
Extracted ISTD ¹³ C ₂ PFTeDA	%	123	117	108	102	132
Extracted ISTD ¹³ C ₂ 4:2FTS	%	94	103	123	120	109
Extracted ISTD ¹³ C ₂ 6:2FTS	%	95	109	132	131	105
Extracted ISTD ¹³ C ₂ 8:2FTS	%	111	129	186	187	113
Extracted ISTD ¹³ C ₈ FOSA	%	143	124	117	113	147
Extracted ISTD d ₃ N MeFOSA	%	106	96	76	79	112
Extracted ISTD d ₅ N EtFOSA	%	118	104	97	94	123
Extracted ISTD d ₇ N MeFOSE	%	126	108	97	102	124
Extracted ISTD d ₉ N EtFOSE	%	110	97	88	79	127
Extracted ISTD d ₃ N MeFOSAA	%	122	129	194	199	133
Extracted ISTD d ₅ N EtFOSAA	%	129	143	195	197	149
Total Positive PFHxS & PFOS	µg/kg	<0.1	1	1.4	1.9	<0.1
Total Positive PFOS & PFOA	µg/kg	<0.1	1.4	1.5	2.1	<0.1
Total Positive PFAS	µg/kg	<0.1	2.1	1.8	2.5	<0.1

Asbestos ID - soils NEPM - ASB-001

Our Reference		291372-1	291372-3	291372-6	291372-8	291372-11
Your Reference	UNITS	BH601	BH602	BH603	BH607	BH608
Depth		0.05-0.15	0.07-0.17	0.25-0.35	0-0.1	0-0.1
Date Sampled		14/03/2022	14/03/2022	14/03/2022	14/03/2022	14/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	25/03/2022	25/03/2022	25/03/2022	25/03/2022	25/03/2022
Sample mass tested	g	993.63	791.15	507.55	459.72	447.94
Sample Description	-	Grey coarse-grained soil & rocks	Grey 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		291372-14
Your Reference	UNITS	BH611
Depth		0-0.1
Date Sampled		14/03/2022
Type of sample		Soil
Date analysed	-	25/03/2022
Sample mass tested	g	414.63
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	<p>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.</p> <p>Results reported denoted with * are outside our scope of NATA accreditation.</p> <p>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)</p> <p>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.</p> <p>Estimation = Estimated asbestos weight</p> <p>Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.</p>
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-020	<p>Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.</p> <p>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.</p>
Org-020	<p>Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.</p> <p>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.</p> <p>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).</p>
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.

Method ID	Methodology Summary
Org-021	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-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. 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-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/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-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	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)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	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)-BTX 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.

Method ID	Methodology Summary
Org-029	<p>Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3.</p> <p>Analysis is undertaken with LC-MS/MS.</p> <p>PFAS results include the sum of branched and linear isomers where applicable.</p> <p>Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.3 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components.</p> <p>Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.</p>

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			22/03/2022	1	22/03/2022	22/03/2022		22/03/2022	[NT]
Date analysed	-			24/03/2022	1	24/03/2022	24/03/2022		24/03/2022	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-023	<25	1	<25	<25	0	95	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-023	<25	1	<25	<25	0	95	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	92	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	88	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	83	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	105	[NT]
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	79	[NT]
Naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	112	1	99	105	6	100	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	19	22/03/2022	22/03/2022		[NT]	[NT]
Date analysed	-			[NT]	19	24/03/2022	24/03/2022		[NT]	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-023	[NT]	19	<25	<25	0	[NT]	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-023	[NT]	19	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	19	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	19	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	19	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	19	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	19	<1	<1	0	[NT]	[NT]
Naphthalene	mg/kg	1	Org-023	[NT]	19	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	19	93	94	1	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			22/03/2022	1	22/03/2022	22/03/2022		22/03/2022	[NT]
Date analysed	-			23/03/2022	1	24/03/2022	24/03/2022		23/03/2022	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-020	<50	1	<50	<50	0	122	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-020	<100	1	<100	<100	0	126	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-020	<100	1	150	140	7	119	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-020	<50	1	<50	<50	0	122	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-020	<100	1	110	130	17	126	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-020	<100	1	190	160	17	119	[NT]
Surrogate o-Terphenyl	%		Org-020	105	1	110	130	17	97	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	19	22/03/2022	22/03/2022		[NT]	[NT]
Date analysed	-			[NT]	19	24/03/2022	24/03/2022		[NT]	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-020	[NT]	19	<50	<50	0	[NT]	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-020	[NT]	19	<100	110	10	[NT]	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-020	[NT]	19	<100	100	0	[NT]	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-020	[NT]	19	<50	<50	0	[NT]	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-020	[NT]	19	150	170	12	[NT]	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-020	[NT]	19	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	19	115	114	1	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			24/03/2022	1	22/03/2022	22/03/2022		22/03/2022	[NT]
Date analysed	-			24/03/2022	1	23/03/2022	23/03/2022		23/03/2022	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	105	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	103	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	107	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	102	[NT]
Anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	108	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	113	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	93	[NT]
Benzo(b,j,k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	1	<0.05	<0.05	0	112	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	102	1	101	99	2	108	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	19	24/03/2022	24/03/2022		[NT]	[NT]
Date analysed	-			[NT]	19	24/03/2022	24/03/2022		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j,k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	19	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	19	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	19	100	98	2	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			24/03/2022	1	22/03/2022	22/03/2022		22/03/2022	[NT]
Date analysed	-			24/03/2022	1	23/03/2022	23/03/2022		23/03/2022	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	102	[NT]
HCB	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	106	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	95	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	105	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	112	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	107	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	112	[NT]
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	103	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	104	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	78	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	104	1	102	102	0	104	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	6	22/03/2022	22/03/2022		[NT]	[NT]
Date analysed	-			[NT]	6	23/03/2022	23/03/2022		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	6	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	6	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	6	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	6	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	6	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	6	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	6	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	6	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	6	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	6	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	6	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	6	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	6	0.2	0.1	67	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	6	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	6	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	6	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	6	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	6	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	6	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	6	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	6	94	92	2	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	19	24/03/2022	24/03/2022		[NT]	[NT]
Date analysed	-			[NT]	19	24/03/2022	24/03/2022		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	19	103	101	2	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			24/03/2022	1	22/03/2022	22/03/2022		22/03/2022	[NT]
Date analysed	-			24/03/2022	1	23/03/2022	23/03/2022		23/03/2022	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	120	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	101	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	107	[NT]
Malathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	121	[NT]
Chlorpyrifos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	110	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	113	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	108	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	104	1	102	102	0	104	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	19	24/03/2022	24/03/2022		[NT]	[NT]
Date analysed	-			[NT]	19	24/03/2022	24/03/2022		[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	19	103	101	2	[NT]	[NT]

Client Reference: E32891PR, Macquarie Park

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			24/03/2022	1	22/03/2022	22/03/2022		22/03/2022	[NT]
Date analysed	-			24/03/2022	1	23/03/2022	23/03/2022		23/03/2022	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	104	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	104	1	102	102	0	104	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	19	24/03/2022	24/03/2022		[NT]	[NT]
Date analysed	-			[NT]	19	24/03/2022	24/03/2022		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	[NT]	19	103	101	2	[NT]	[NT]

Client Reference: E32891PR, Macquarie Park

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date prepared	-			23/03/2022	1	23/03/2022	23/03/2022		23/03/2022	[NT]
Date analysed	-			23/03/2022	1	23/03/2022	23/03/2022		23/03/2022	[NT]
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	100	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	101	[NT]
Chromium	mg/kg	1	Metals-020	<1	1	10	9	11	101	[NT]
Copper	mg/kg	1	Metals-020	<1	1	45	43	5	97	[NT]
Lead	mg/kg	1	Metals-020	<1	1	2	2	0	100	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	81	[NT]
Nickel	mg/kg	1	Metals-020	<1	1	100	89	12	101	[NT]
Zinc	mg/kg	1	Metals-020	<1	1	30	28	7	102	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	19	23/03/2022	23/03/2022		[NT]	[NT]
Date analysed	-			[NT]	19	23/03/2022	23/03/2022		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	19	6	5	18	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	19	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	19	24	15	46	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	19	6	8	29	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	19	31	34	9	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	19	3	4	29	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	19	38	44	15	[NT]	[NT]

QUALITY CONTROL: PFAS in Soils Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			22/03/2022	1	22/03/2022	22/03/2022		22/03/2022	[NT]
Date analysed	-			22/03/2022	1	22/03/2022	22/03/2022		22/03/2022	[NT]
Perfluorobutanesulfonic acid	µg/kg	0.1	Org-029	<0.1	1	<0.1	<0.1	0	92	[NT]
Perfluoropentanesulfonic acid	µg/kg	0.1	Org-029	<0.1	1	<0.1	<0.1	0	88	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/kg	0.1	Org-029	<0.1	1	<0.1	<0.1	0	100	[NT]
Perfluoroheptanesulfonic acid	µg/kg	0.1	Org-029	<0.1	1	<0.1	<0.1	0	99	[NT]
Perfluorooctanesulfonic acid PFOS	µg/kg	0.1	Org-029	<0.1	1	<0.1	<0.1	0	98	[NT]
Perfluorodecanesulfonic acid	µg/kg	0.2	Org-029	<0.2	1	<0.2	<0.2	0	104	[NT]
Perfluorobutanoic acid	µg/kg	0.2	Org-029	<0.2	1	<0.2	<0.2	0	110	[NT]
Perfluoropentanoic acid	µg/kg	0.2	Org-029	<0.2	1	<0.2	<0.2	0	101	[NT]
Perfluorohexanoic acid	µg/kg	0.1	Org-029	<0.1	1	<0.1	<0.1	0	95	[NT]
Perfluoroheptanoic acid	µg/kg	0.1	Org-029	<0.1	1	<0.1	<0.1	0	111	[NT]
Perfluorooctanoic acid PFOA	µg/kg	0.1	Org-029	<0.1	1	<0.1	<0.1	0	88	[NT]
Perfluorononanoic acid	µg/kg	0.1	Org-029	<0.1	1	<0.1	<0.1	0	89	[NT]
Perfluorodecanoic acid	µg/kg	0.5	Org-029	<0.5	1	<0.5	<0.5	0	106	[NT]
Perfluoroundecanoic acid	µg/kg	0.5	Org-029	<0.5	1	<0.5	<0.5	0	94	[NT]
Perfluorododecanoic acid	µg/kg	0.5	Org-029	<0.5	1	<0.5	<0.5	0	106	[NT]
Perfluorotridecanoic acid	µg/kg	0.5	Org-029	<0.5	1	<0.5	<0.5	0	110	[NT]
Perfluorotetradecanoic acid	µg/kg	5	Org-029	<5	1	<5	<5	0	102	[NT]
4:2 FTS	µg/kg	0.1	Org-029	<0.1	1	<0.1	<0.1	0	100	[NT]
6:2 FTS	µg/kg	0.1	Org-029	<0.1	1	<0.1	<0.1	0	109	[NT]
8:2 FTS	µg/kg	0.2	Org-029	<0.2	1	<0.2	<0.2	0	99	[NT]
10:2 FTS	µg/kg	0.2	Org-029	<0.2	1	<0.2	<0.2	0	71	[NT]
Perfluorooctane sulfonamide	µg/kg	1	Org-029	<1	1	<1	<1	0	100	[NT]
N-Methyl perfluorooctane sulfonamide	µg/kg	1	Org-029	<1	1	<1	<1	0	94	[NT]
N-Ethyl perfluorooctanesulfonamide	µg/kg	1	Org-029	<1	1	<1	<1	0	96	[NT]
N-Me perfluorooctanesulfonamidethanol	µg/kg	1	Org-029	<1	1	<1	<1	0	129	[NT]
N-Et perfluorooctanesulfonamidethanol	µg/kg	5	Org-029	<5	1	<5	<5	0	99	[NT]
MePerfluorooctanesulfonamidacetic acid	µg/kg	0.2	Org-029	<0.2	1	<0.2	<0.2	0	99	[NT]
EtPerfluorooctanesulfonamidacetic acid	µg/kg	0.2	Org-029	<0.2	1	<0.2	<0.2	0	92	[NT]
Surrogate ¹³ C ₈ PFOS	%		Org-029	101	1	100	104	4	101	[NT]
Surrogate ¹³ C ₂ PFOA	%		Org-029	103	1	105	100	5	94	[NT]

QUALITY CONTROL: PFAS in Soils Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Extracted ISTD ¹³ C ₃ PFBS	%		Org-029	119	1	118	118	0	119	[NT]
Extracted ISTD ¹⁸ O ₂ PFHxS	%		Org-029	115	1	107	108	1	111	[NT]
Extracted ISTD ¹³ C ₄ PFOS	%		Org-029	115	1	107	104	3	113	[NT]
Extracted ISTD ¹³ C ₄ PFBA	%		Org-029	112	1	106	106	0	111	[NT]
Extracted ISTD ¹³ C ₃ PFPeA	%		Org-029	124	1	124	118	5	123	[NT]
Extracted ISTD ¹³ C ₂ PFHxA	%		Org-029	112	1	106	107	1	111	[NT]
Extracted ISTD ¹³ C ₄ PFHpA	%		Org-029	106	1	105	103	2	100	[NT]
Extracted ISTD ¹³ C ₄ PFOA	%		Org-029	125	1	113	117	3	128	[NT]
Extracted ISTD ¹³ C ₅ PFNA	%		Org-029	126	1	122	115	6	131	[NT]
Extracted ISTD ¹³ C ₂ PFDA	%		Org-029	131	1	130	123	6	121	[NT]
Extracted ISTD ¹³ C ₂ PFUnDA	%		Org-029	115	1	113	110	3	115	[NT]
Extracted ISTD ¹³ C ₂ PFDoDA	%		Org-029	116	1	118	113	4	115	[NT]
Extracted ISTD ¹³ C ₂ PFTeDA	%		Org-029	138	1	123	123	0	135	[NT]
Extracted ISTD ¹³ C ₂ 4:2FTS	%		Org-029	99	1	94	99	5	101	[NT]
Extracted ISTD ¹³ C ₂ 6:2FTS	%		Org-029	99	1	95	93	2	103	[NT]
Extracted ISTD ¹³ C ₂ 8:2FTS	%		Org-029	116	1	111	110	1	101	[NT]
Extracted ISTD ¹³ C ₈ FOSA	%		Org-029	148	1	143	141	1	143	[NT]
Extracted ISTD d ₃ N MeFOSA	%		Org-029	111	1	106	105	1	110	[NT]
Extracted ISTD d ₅ N EtFOSA	%		Org-029	128	1	118	113	4	125	[NT]
Extracted ISTD d ₇ N MeFOSE	%		Org-029	131	1	126	121	4	127	[NT]

Client Reference: E32891PR, Macquarie Park

QUALITY CONTROL: PFAS in Soils Extended						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Extracted ISTD d ₉ N EtFOSE	%		Org-029	122	1	110	116	5	121	[NT]
Extracted ISTD d ₃ N MeFOSAA	%		Org-029	129	1	122	121	1	127	[NT]
Extracted ISTD d ₅ N EtFOSAA	%		Org-029	136	1	129	134	4	137	[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.	
The recommended maximums for analytes in urine are taken from "2018 TLVs and BEIs", as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.	
Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2	

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 (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 291372-18 for Cr. Therefore a triplicate result has been issued as laboratory sample number 291372-24.

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.

SAMPLE RECEIPT ADVICE

Client Details

Client	JK Environments
Attention	C Ridley

Sample Login Details

Your reference	E32891PR, Macquarie Park
Envirolab Reference	291372
Date Sample Received	18/03/2022
Date Instructions Received	18/03/2022
Date Results Expected to be Reported	25/03/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	23 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	15
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie

Phone: 02 9910 6200
Fax: 02 9910 6201
Email: ahie@envirolab.com.au

Jacinta Hurst

Phone: 02 9910 6200
Fax: 02 9910 6201
Email: jhurst@envirolab.com.au

Analysis Underway, details on the following page:

Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBs in Soil	Acid Extractable metals in soil	PFAS in Soils Extended	Asbestos ID - soils NEPM - ASB-001	On Hold
BH601-0.05-0.15	✓	✓	✓	✓	✓	✓	✓	✓	✓	
BH601-0.5-0.7	✓	✓	✓				✓			
BH602-0.07-0.17	✓	✓	✓	✓	✓	✓	✓		✓	
BH602-0.2-0.4										✓
BH602-0.8-1.0										✓
BH603-0.25-0.35	✓	✓	✓	✓	✓	✓	✓		✓	
BH603-0.5-0.9										✓
BH607-0-0.1	✓	✓	✓	✓	✓	✓	✓		✓	
BH607-0.2-0.4										✓
BH607-0.6-0.8										✓
BH608-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	
BH608-0.2-0.3										✓
BH608-0.8-1.0										✓
BH611-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	
BH611-0.3-0.5	✓	✓	✓				✓			
BH611-0.7-1.0	✓	✓	✓				✓			
SDUP1										✓
SDUP2										✓
SDUP3	✓	✓	✓	✓	✓	✓	✓	✓		
SDUP4										✓
TB-S2	✓	✓	✓	✓	✓	✓	✓			
TS-S2	✓									
TB-PFAS								✓		

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

Additional Info

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

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


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

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

291372

Updated COC
21/03/2022

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		JKE Job Number: E32891PR Date Results Required: STANDARD Page: 1 of 1		FROM:  JK Environments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: critley@jkenvironments.com.au	
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Location: Macquarie Park		Sample Preserved in Esky on Ice																
Sampler: AD		Tests Required																
Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 2	Combo 3	Combo 6	Combo 6a	8 Metals	PAHs	TRH/BTEX	BTEX	Asbestos NEPM	Asbestos	PFAS (Routine, extended)	
14/03/2022	1	BH601	0.05-0.15	G, A, P	2.2	F: Silty Gravelly Sand			X						X		X	
14/03/2022	2	BH601	0.5-0.7	G, A, P	11.4	Siltstone		X										
14/03/2022	3	BH602	0.07-0.17	G, A, P	0	F: Silty Gravelly Clay			X						X			
14/03/2022	4	BH602	0.2-0.4	G, A, P	2.9	Silty Clay												
14/03/2022	5	BH602	0.8-1.0	G, A, P	9.1	Silty Clay												
14/03/2022	6	BH603	0.25-0.35	G, A	5.1	F: Silty Clay			X						X			
14/03/2022	7	BH603	0.5-0.9	G, A, P	3.2	Silty Clay												
14/03/2022	8	BH607	0-0.1	G, A, P	4.4	F: Silty Sandy Clay			X						X			
14/03/2022	9	BH607	0.2-0.4	G, A, P	1.3	F: Silty Sandy Clay												
14/03/2022	10	BH607	0.6-0.8	G, A, P	4.5	Silty Sandy Clay												
14/03/2022	11	BH608	0-0.1	G, A, P	11.2	F: Silty Clay			X						X		X	
14/03/2022	12	BH608	0.2-0.3	G, A, P	11.2	F: Silty Clay												
14/03/2022	13	BH608	0.8-1.0	G, A, P	6.1	Silty Clay												
14/03/2022	14	BH611	0-0.1	G, A, P	559	F: Silty Sandy Clay			X						X		X	
14/03/2022	15	BH611	0.3-0.5	G, A, P	804	Silty Clayey Sand		X										
14/03/2022	16	BH611	0.7-1.0	G, A, P	81.7	Sandstone		X										
14/03/2022	17	SDUP1	-	G, A, P	-	Soil Duplicate												
14/03/2022	18	SDUP2	-	G, A, P	-	Soil Duplicate												
14/03/2022	19	SDUP3	-	G, A, P	-	Soil Duplicate			X								X	
14/03/2022	20	SDUP4	-	G, A, P	-	Soil Duplicate			X		SEND AS INTERLAB DUPLICATE							
14/03/2022	21	TB-S2	-	G	-	Trip Blank			X									
14/03/2022	22	TS-S2	-	V	-	Trip Spike								X				
14/03/2022	23	TB-PFAS	-	P	-	PFAS Soil Blank											X	
Remarks (comments/detection limits required):						Sample Containers: G - 250mg Glass Jar A - Ziplock Asbestos Bag P - PFAS PVC Jar												
Relinquished By:				Date:		Time: 16:30		Received By: <i>Tanya Deherly</i>				Date: 18/03/2022						

291372

CERTIFICATE OF ANALYSIS 291372-A

Client Details

Client	JK Environments
Attention	C Ridley
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	<u>E32891PR, Macquarie Park</u>
Number of Samples	additional analysis
Date samples received	18/03/2022
Date completed instructions received	28/04/2022

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.

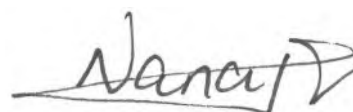
Report Details

Date results requested by	04/04/2022
Date of Issue	04/04/2022
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Results Approved By

Giovanni Agosti, Group Technical Manager
 Josh Williams, Organics and LC Supervisor
 Steven Luong, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

CEC			
Our Reference		291372-A-1	291372-A-3
Your Reference	UNITS	BH601	BH602
Depth		0.05-0.15	0.07-0.17
Date Sampled		14/03/2022	14/03/2022
Type of sample		Soil	Soil
Date prepared	-	01/04/2022	01/04/2022
Date analysed	-	01/04/2022	01/04/2022
Exchangeable Ca	meq/100g	9.3	19
Exchangeable K	meq/100g	0.7	0.4
Exchangeable Mg	meq/100g	1.7	4.0
Exchangeable Na	meq/100g	3.7	0.2
Cation Exchange Capacity	meq/100g	15	24

TCLP Preparation - Acid

Our Reference		291372-A-1	291372-A-3	291372-A-11	291372-A-14	291372-A-19
Your Reference	UNITS	BH601	BH602	BH608	BH611	SDUP3
Depth		0.05-0.15	0.07-0.17	0-0.1	0-0.1	-
Date Sampled		14/03/2022	14/03/2022	14/03/2022	14/03/2022	14/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
pH of soil for fluid# determ.	pH units	9.8	9.2	8.1	8.4	8.5
pH of soil TCLP (after HCl)	pH units	1.6	1.6	1.6	1.6	5.0
Extraction fluid used	-	1	1	1	1	1
pH of final Leachate	pH units	5.0	5.0	4.9	4.9	4.9

Metals from Leaching Fluid pH 2.9 or 5			
Our Reference		291372-A-1	291372-A-3
Your Reference	UNITS	BH601	BH602
Depth		0.05-0.15	0.07-0.17
Date Sampled		14/03/2022	14/03/2022
Type of sample		Soil	Soil
Date extracted	-	28/03/2022	28/03/2022
Date analysed	-	30/03/2022	30/03/2022
Nickel	mg/L	0.1	0.03

PFAS in TCLP Extended				
Our Reference		291372-A-11	291372-A-14	291372-A-19
Your Reference	UNITS	BH608	BH611	SDUP3
Depth		0-0.1	0-0.1	-
Date Sampled		14/03/2022	14/03/2022	14/03/2022
Type of sample		Soil	Soil	Soil
Date prepared	-	30/03/2022	30/03/2022	30/03/2022
Date analysed	-	30/03/2022	30/03/2022	30/03/2022
Perfluorobutanesulfonic acid	µg/L	<0.01	<0.01	<0.01
Perfluoropentanesulfonic acid	µg/L	<0.01	<0.01	<0.01
Perfluorohexanesulfonic acid - PFHxS	µg/L	<0.01	<0.01	<0.01
Perfluoroheptanesulfonic acid	µg/L	<0.01	<0.01	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	<0.01	0.02	0.01
Perfluorodecanesulfonic acid	µg/L	<0.02	<0.02	<0.02
Perfluorobutanoic acid	µg/L	<0.02	<0.02	<0.02
Perfluoropentanoic acid	µg/L	<0.02	<0.02	<0.02
Perfluorohexanoic acid	µg/L	<0.01	<0.01	<0.01
Perfluoroheptanoic acid	µg/L	<0.01	<0.01	<0.01
Perfluorooctanoic acid PFOA	µg/L	<0.01	<0.01	<0.01
Perfluorononanoic acid	µg/L	<0.01	<0.01	<0.01
Perfluorodecanoic acid	µg/L	<0.02	<0.02	<0.02
Perfluoroundecanoic acid	µg/L	<0.02	<0.02	<0.02
Perfluorododecanoic acid	µg/L	<0.05	<0.05	<0.05
Perfluorotridecanoic acid	µg/L	<0.1	<0.1	<0.1
Perfluorotetradecanoic acid	µg/L	<0.5	<0.5	<0.5
4:2 FTS	µg/L	<0.01	<0.01	<0.01
6:2 FTS	µg/L	<0.01	<0.01	<0.01
8:2 FTS	µg/L	<0.02	<0.02	<0.02
10:2 FTS	µg/L	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide	µg/L	<0.1	<0.1	<0.1
N-Methyl perfluorooctane sulfonamide	µg/L	<0.05	<0.05	<0.05
N-Ethyl perfluorooctanesulfonamide	µg/L	<0.1	<0.1	<0.1
N-Me perfluorooctanesulfonamid ethanol	µg/L	<0.05	<0.05	<0.05
N-Et perfluorooctanesulfonamid ethanol	µg/L	<0.5	<0.5	<0.5
MePerfluorooctanesulf- amid oacetic aci	µg/L	<0.02	<0.02	<0.02
EtPerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02	<0.02
Surrogate ¹³ C ₈ PFOS	%	101	99	96
Surrogate ¹³ C ₂ PFOA	%	93	92	89
Extracted ISTD ¹³ C ₃ PFBS	%	97	99	96
Extracted ISTD ¹⁸ O ₂ PFHxS	%	95	96	95
Extracted ISTD ¹³ C ₄ PFOS	%	112	112	118

PFAS in TCLP Extended				
Our Reference		291372-A-11	291372-A-14	291372-A-19
Your Reference	UNITS	BH608	BH611	SDUP3
Depth		0-0.1	0-0.1	-
Date Sampled		14/03/2022	14/03/2022	14/03/2022
Type of sample		Soil	Soil	Soil
Extracted ISTD ¹³ C ₄ PFBA	%	97	97	97
Extracted ISTD ¹³ C ₃ PFPeA	%	97	101	97
Extracted ISTD ¹³ C ₂ PFHxA	%	110	110	112
Extracted ISTD ¹³ C ₄ PFHpA	%	103	101	106
Extracted ISTD ¹³ C ₄ PFOA	%	112	113	111
Extracted ISTD ¹³ C ₅ PFNA	%	109	108	111
Extracted ISTD ¹³ C ₂ PFDA	%	105	104	104
Extracted ISTD ¹³ C ₂ PFUnDA	%	111	110	115
Extracted ISTD ¹³ C ₂ PFDoDA	%	121	128	119
Extracted ISTD ¹³ C ₂ PFTeDA	%	90	91	87
Extracted ISTD ¹³ C ₂ 4:2FTS	%	99	97	94
Extracted ISTD ¹³ C ₂ 6:2FTS	%	98	101	100
Extracted ISTD ¹³ C ₂ 8:2FTS	%	91	100	101
Extracted ISTD ¹³ C ₈ FOSA	%	110	110	111
Extracted ISTD d ₃ N MeFOSA	%	99	101	101
Extracted ISTD d ₅ N EtFOSA	%	108	109	108
Extracted ISTD d ₇ N MeFOSE	%	111	106	112
Extracted ISTD d ₉ N EtFOSE	%	121	122	121
Extracted ISTD d ₃ N MeFOSAA	%	97	95	102
Extracted ISTD d ₅ N EtFOSAA	%	90	91	90
Total Positive PFHxS & PFOS	µg/L	<0.01	0.02	0.01
Total Positive PFOS & PFOA	µg/L	<0.01	0.02	0.01
Total Positive PFAS	µg/L	<0.01	0.02	0.01

Method ID	Methodology Summary
INORG-004	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-004	<p>Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439 and USEPA 1311.</p> <p>Please note that the mass used may be scaled down from default based on sample mass available.</p> <p>Samples are stored at 2-6oC before and after leachate preparation.</p>
Metals-020	Determination of various metals by ICP-AES following buffer determination as per USEPA 1311 and hence AS 4439.3. Extraction Fluid 1 refers to the pH 5.0 buffer and Extraction Fluid 2 is the pH 2.9 buffer.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-OES analytical finish.
Org-029	<p>Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3.</p> <p>Analysis is undertaken with LC-MS/MS.</p> <p>PFAS results include the sum of branched and linear isomers where applicable.</p> <p>Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.3 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components.</p> <p>Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.</p>

Client Reference: E32891PR, Macquarie Park

QUALITY CONTROL: CEC					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			01/04/2022	[NT]	[NT]	[NT]	[NT]	01/04/2022	[NT]
Date analysed	-			01/04/2022	[NT]	[NT]	[NT]	[NT]	01/04/2022	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	119	[NT]

Client Reference: E32891PR, Macquarie Park

QUALITY CONTROL: Metals from Leaching Fluid pH 2.9 or 5						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			28/03/2022	[NT]	[NT]	[NT]	[NT]	28/03/2022	[NT]
Date analysed	-			30/03/2022	[NT]	[NT]	[NT]	[NT]	30/03/2022	[NT]
Nickel	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	97	[NT]

QUALITY CONTROL: PFAS in TCLP Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			30/03/2022	[NT]	[NT]	[NT]	[NT]	30/03/2022	[NT]
Date analysed	-			30/03/2022	[NT]	[NT]	[NT]	[NT]	30/03/2022	[NT]
Perfluorobutanesulfonic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	101	[NT]
Perfluoropentanesulfonic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	105	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	97	[NT]
Perfluoroheptanesulfonic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	101	[NT]
Perfluorooctanesulfonic acid PFOS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	101	[NT]
Perfluorodecanesulfonic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	104	[NT]
Perfluorobutanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	100	[NT]
Perfluoropentanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	103	[NT]
Perfluorohexanoic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	90	[NT]
Perfluoroheptanoic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	105	[NT]
Perfluorooctanoic acid PFOA	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	99	[NT]
Perfluorononanoic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	90	[NT]
Perfluorodecanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	90	[NT]
Perfluoroundecanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	95	[NT]
Perfluorododecanoic acid	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	105	[NT]
Perfluorotridecanoic acid	µg/L	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Perfluorotetradecanoic acid	µg/L	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	110	[NT]
4:2 FTS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	116	[NT]
6:2 FTS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	110	[NT]
8:2 FTS	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	98	[NT]
10:2 FTS	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	103	[NT]
Perfluorooctane sulfonamide	µg/L	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
N-Methyl perfluorooctane sulfonamide	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	104	[NT]
N-Ethyl perfluorooctanesulfon amide	µg/L	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
N-Me perfluorooctanesulfonamid oethanol	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	99	[NT]
N-Et perfluorooctanesulfonamid oethanol	µg/L	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	104	[NT]
MePerfluorooctanesulf- amid oacetic aci	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	88	[NT]
EtPerfluorooctanesulf- amid oacetic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	103	[NT]
Surrogate ¹³ C ₈ PFOS	%		Org-029	103	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate ¹³ C ₂ PFOA	%		Org-029	91	[NT]	[NT]	[NT]	[NT]	92	[NT]

QUALITY CONTROL: PFAS in TCLP Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Extracted ISTD ¹³ C ₃ PFBS	%		Org-029	99	[NT]	[NT]	[NT]	[NT]	96	[NT]
Extracted ISTD ¹⁸ O ₂ PFHxS	%		Org-029	99	[NT]	[NT]	[NT]	[NT]	96	[NT]
Extracted ISTD ¹³ C ₄ PFOS	%		Org-029	107	[NT]	[NT]	[NT]	[NT]	111	[NT]
Extracted ISTD ¹³ C ₄ PFBA	%		Org-029	94	[NT]	[NT]	[NT]	[NT]	90	[NT]
Extracted ISTD ¹³ C ₃ PFPeA	%		Org-029	98	[NT]	[NT]	[NT]	[NT]	92	[NT]
Extracted ISTD ¹³ C ₂ PFHxA	%		Org-029	108	[NT]	[NT]	[NT]	[NT]	111	[NT]
Extracted ISTD ¹³ C ₄ PFHpA	%		Org-029	104	[NT]	[NT]	[NT]	[NT]	99	[NT]
Extracted ISTD ¹³ C ₄ PFOA	%		Org-029	112	[NT]	[NT]	[NT]	[NT]	106	[NT]
Extracted ISTD ¹³ C ₅ PFNA	%		Org-029	107	[NT]	[NT]	[NT]	[NT]	105	[NT]
Extracted ISTD ¹³ C ₂ PFDA	%		Org-029	102	[NT]	[NT]	[NT]	[NT]	107	[NT]
Extracted ISTD ¹³ C ₂ PFUnDA	%		Org-029	108	[NT]	[NT]	[NT]	[NT]	105	[NT]
Extracted ISTD ¹³ C ₂ PFDoDA	%		Org-029	114	[NT]	[NT]	[NT]	[NT]	115	[NT]
Extracted ISTD ¹³ C ₂ PFTeDA	%		Org-029	86	[NT]	[NT]	[NT]	[NT]	89	[NT]
Extracted ISTD ¹³ C ₂ 4:2FTS	%		Org-029	84	[NT]	[NT]	[NT]	[NT]	82	[NT]
Extracted ISTD ¹³ C ₂ 6:2FTS	%		Org-029	104	[NT]	[NT]	[NT]	[NT]	90	[NT]
Extracted ISTD ¹³ C ₂ 8:2FTS	%		Org-029	83	[NT]	[NT]	[NT]	[NT]	93	[NT]
Extracted ISTD ¹³ C ₈ FOSA	%		Org-029	111	[NT]	[NT]	[NT]	[NT]	104	[NT]
Extracted ISTD d ₃ N MeFOSA	%		Org-029	98	[NT]	[NT]	[NT]	[NT]	98	[NT]
Extracted ISTD d ₅ N EtFOSA	%		Org-029	104	[NT]	[NT]	[NT]	[NT]	103	[NT]
Extracted ISTD d ₇ N MeFOSE	%		Org-029	108	[NT]	[NT]	[NT]	[NT]	109	[NT]

Client Reference: E32891PR, Macquarie Park

QUALITY CONTROL: PFAS in TCLP Extended						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Extracted ISTD d ₉ N EtFOSE	%		Org-029	117	[NT]	[NT]	[NT]	[NT]	117	[NT]
Extracted ISTD d ₃ N MeFOSAA	%		Org-029	93	[NT]	[NT]	[NT]	[NT]	92	[NT]
Extracted ISTD d ₅ N EtFOSAA	%		Org-029	88	[NT]	[NT]	[NT]	[NT]	86	[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.	
The recommended maximums for analytes in urine are taken from "2018 TLVs and BEIs", as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.	
Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2	

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 (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

SAMPLE RECEIPT ADVICE

Client Details

Client	JK Environments
Attention	C Ridley

Sample Login Details

Your reference	E32891PR, Macquarie Park
Envirolab Reference	291372-A
Date Sample Received	18/03/2022
Date Instructions Received	28/04/2022
Date Results Expected to be Reported	04/04/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	15
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie

Phone: 02 9910 6200
Fax: 02 9910 6201
Email: ahie@envirolab.com.au

Jacinta Hurst

Phone: 02 9910 6200
Fax: 02 9910 6201
Email: jhurst@envirolab.com.au

Analysis Underway, details on the following page:



Sample ID	CEC	TCLP Preparation - Acid	Nickel	PFAS in TCLP Extended	On Hold
BH601-0.05-0.15	✓	✓	✓		
BH601-0.5-0.7					✓
BH602-0.07-0.17	✓	✓	✓		
BH602-0.2-0.4					✓
BH602-0.8-1.0					✓
BH603-0.25-0.35					✓
BH603-0.5-0.9					✓
BH607-0-0.1					✓
BH607-0.2-0.4					✓
BH607-0.6-0.8					✓
BH608-0-0.1		✓		✓	
BH608-0.2-0.3					✓
BH608-0.8-1.0					✓
BH611-0-0.1		✓		✓	
BH611-0.3-0.5					✓
BH611-0.7-1.0					✓
SDUP1					✓
SDUP2					✓
SDUP3		✓		✓	
SDUP4					✓
TB-S2					✓
TS-S2					✓
TB-PFAS					✓
SDUP3 - [TRIPLICATE]					✓

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

Additional Info

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

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

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

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

Ming To

Subject:

FW: Results for Registration 291372 E32891PR, Macquarie Park

Ref: 291372-A
TAF: Standard
Due: 04/04/2022
M7



291372-A

From: Craig Ridley <CRidley@jkenvironments.com.au>
Sent: Monday, 28 March 2022 10:05 AM
To: Greta Petzold <GPetzold@envirolab.com.au>
Cc: Samplereceipt <Samplereceipt@envirolabservices.com.au>
Subject: RE: Results for Registration 291372 E32891PR, Macquarie Park

CAUTION: This email originated from outside of the organisation. Do not act on instructions, click links or open attachments unless you recognise the sender and know the content is authentic and safe.

Hi Greta,

Can we please arrange for the following additional testing for this sample batch (standard turnaround):

Sample ID	Lab Reference	Test Required
① BH601 (0.05-0.15)	291372-1	TCLP Nickel, CEC
③ BH602 (0.07-0.17)	291372-3	TCLP Nickel, CEC
⑪ BH608 (0-0.1)	291372-11	TCLP PFAS
⑭ BH611 (0-0.1)	291372-14	TCLP PFAS
⑯ SDUP3	291372-19	TCLP PFAS

Thanks,

Regards
Craig Ridley
Senior Environmental Scientist



T: +612 9888 5000
D: 0421 856 992
E: cr Ridley@jkenvironments.com.au
www.jkenvironments.com.au

JKEnvironments

PO Box 976
NORTH RYDE BC NSW 1670
115 Wicks Road
MACQUARIE PARK NSW 2113

CERTIFICATE OF ANALYSIS 30499

Client Details

Client	JK Environments
Attention	Craig Ridley
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	<u>E32891PR</u>
Number of Samples	1 Soil
Date samples received	22/03/2022
Date completed instructions received	22/03/2022

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	29/03/2022
Date of Issue	29/03/2022
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
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		30499-1
Your Reference	UNITS	SDUP4
Date Sampled		14/03/2022
Type of sample		Soil
Date extracted	-	23/03/2022
Date analysed	-	25/03/2022
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 BTEX	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	93

TRH Soil C10-C40 NEPM		
Our Reference		30499-1
Your Reference	UNITS	SDUP4
Date Sampled		14/03/2022
Type of sample		Soil
Date extracted	-	23/03/2022
Date analysed	-	25/03/2022
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	%	93

PAHs in Soil		
Our Reference		30499-1
Your Reference	UNITS	SDUP4
Date Sampled		14/03/2022
Type of sample		Soil
Date extracted	-	23/03/2022
Date analysed	-	24/03/2022
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j&k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Total +ve PAH's	mg/kg	<0.05
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc (Half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc (PQL)	mg/kg	<0.5
Surrogate <i>p</i> -Terphenyl-d ₁₄	%	128

OCP in Soil		
Our Reference		30499-1
Your Reference	UNITS	SDUP4
Date Sampled		14/03/2022
Type of sample		Soil
Date extracted	-	23/03/2022
Date analysed	-	24/03/2022
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 Aldrin + Dieldrin	mg/kg	<0.1
Total +ve reported DDT+DDD+DDE	mg/kg	<0.1
Surrogate 2-chlorophenol-d4	%	98

OP in Soil		
Our Reference		30499-1
Your Reference	UNITS	SDUP4
Date Sampled		14/03/2022
Type of sample		Soil
Date extracted	-	23/03/2022
Date analysed	-	24/03/2022
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 2-chlorophenol-d4	%	98

PCBs in Soil		
Our Reference		30499-1
Your Reference	UNITS	SDUP4
Date Sampled		14/03/2022
Type of sample		Soil
Date extracted	-	23/03/2022
Date analysed	-	24/03/2022
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 2-fluorobiphenyl	%	110

Acid Extractable metals in soil		
Our Reference		30499-1
Your Reference	UNITS	SDUP4
Date Sampled		14/03/2022
Type of sample		Soil
Date digested	-	24/03/2022
Date analysed	-	24/03/2022
Arsenic	mg/kg	5
Cadmium	mg/kg	<0.4
Chromium	mg/kg	23
Copper	mg/kg	10
Lead	mg/kg	19
Mercury	mg/kg	<0.1
Nickel	mg/kg	3
Zinc	mg/kg	18

Moisture		
Our Reference	UNITS	30499-1
Your Reference		SDUP4
Date Sampled		14/03/2022
Type of sample		Soil
Date prepared	-	23/03/2022
Date analysed	-	24/03/2022
Moisture	%	16

Method ID	Methodology Summary
Inorg-008	Moisture content determined by heating at 105°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-020	<p>Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.</p> <p>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.</p> <p>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).</p>
Org-021/022	<p>Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD or GC-MS.</p> <p>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.</p>
Org-022	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-022	<p>Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.</p> <p>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.</p>

Method ID	Methodology Summary
Org-022	<p>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.</p> <p>For soil results:-</p> <ol style="list-style-type: none"> 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. <p>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.</p>
Org-022	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	<p>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.</p> <p>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.</p>

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	-			23/03/2022	[NT]	[NT]	[NT]	[NT]	23/03/2022	[NT]
Date analysed	-			25/03/2022	[NT]	[NT]	[NT]	[NT]	25/03/2022	[NT]
vTRH C ₆ - C ₉	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	103	[NT]
vTRH C ₆ - C ₁₀	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	103	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	105	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	103	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	105	[NT]
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Naphthalene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	112	[NT]	[NT]	[NT]	[NT]	101	[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	-			23/03/2022	[NT]	[NT]	[NT]	[NT]	23/03/2022	[NT]
Date analysed	-			25/03/2022	[NT]	[NT]	[NT]	[NT]	25/03/2022	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	89	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	100	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	120	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	89	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	100	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	120	[NT]
Surrogate o-Terphenyl	%		Org-020	89	[NT]	[NT]	[NT]	[NT]	92	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			23/03/2022	[NT]	[NT]	[NT]	[NT]	23/03/2022	[NT]
Date analysed	-			24/03/2022	[NT]	[NT]	[NT]	[NT]	24/03/2022	[NT]
Naphthalene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Acenaphthylene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Fluorene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Phenanthrene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Anthracene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Pyrene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Benzo(b,j&k)fluoranthene	mg/kg	0.2	Org-022	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022	<0.05	[NT]	[NT]	[NT]	[NT]	98	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d ₁₄	%		Org-022	114	[NT]	[NT]	[NT]	[NT]	106	[NT]

QUALITY CONTROL: OCP in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			23/03/2022	[NT]	[NT]	[NT]	[NT]	23/03/2022	[NT]
Date analysed	-			24/03/2022	[NT]	[NT]	[NT]	[NT]	24/03/2022	[NT]
alpha-BHC	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Hexachlorobenzene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
gamma-BHC	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	76	[NT]
delta-BHC	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	84	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
alpha-chlordane	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Dieldrin	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Endrin	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	68	[NT]
Methoxychlor	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 2-chlorophenol-d4	%		Org-022	86	[NT]	[NT]	[NT]	[NT]	90	[NT]

QUALITY CONTROL: OP in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			23/03/2022	[NT]	[NT]	[NT]	[NT]	23/03/2022	[NT]
Date analysed	-			24/03/2022	[NT]	[NT]	[NT]	[NT]	24/03/2022	[NT]
Azinphos-methyl	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Diazinon	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Dichlorovos	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Fenitrothion	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	78	[NT]
Malathion	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 2-chlorophenol-d4	%		Org-022	86	[NT]	[NT]	[NT]	[NT]	90	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			23/03/2022	[NT]	[NT]	[NT]	[NT]	23/03/2022	[NT]
Date analysed	-			24/03/2022	[NT]	[NT]	[NT]	[NT]	24/03/2022	[NT]
Aroclor 1016	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Aroclor 1260	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 2-fluorobiphenyl	%		Org-022	108	[NT]	[NT]	[NT]	[NT]	110	[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	-			24/03/2022	[NT]	[NT]	[NT]	[NT]	24/03/2022	[NT]
Date analysed	-			24/03/2022	[NT]	[NT]	[NT]	[NT]	24/03/2022	[NT]
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	[NT]	[NT]	97	[NT]
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	[NT]	[NT]	[NT]	[NT]	99	[NT]
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	94	[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]	98	[NT]
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	94	[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.	
The recommended maximums for analytes in urine are taken from "2018 TLVs and BEIs", as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.	
Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2	

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 (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

SAMPLE RECEIPT ADVICE

Client Details

Client	JK Environments
Attention	Craig Ridley

Sample Login Details

Your reference	E32891PR
Envirolab Reference	30499
Date Sample Received	22/03/2022
Date Instructions Received	22/03/2022
Date Results Expected to be Reported	29/03/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	1 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	16.1
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Pamela Adams

Phone: 03 9763 2500
Fax: 03 9763 2633
Email: padams@envirolab.com.au

Chris De Luca

Phone: 03 9763 2500
Fax: 03 9763 2633
Email: cdeluca@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	PCBs in Soil	Acid Extractable metals in soil
SDUP4	✓	✓	✓	✓	✓	✓	✓

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

Additional Info

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


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

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

291372

Updated COC
21/03/2022

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	JKE Job Number: E32891PR Date Results Required: STANDARD Page: 1 of 1	FROM:  JK Environments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: gridlev@jkenvironments.com.au
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Location: Macquarie Park							Sample Preserved in Esky on Ice										
Sampler: AD							Tests Required										
Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 2	Combo 3	Combo 6	Combo 6a	8 Metals	PAHs	TH/BTEX	BTEX	Asbestos NEPM	Asbestos	PFAS (Routine, extended)
14/03/2022	1	BH601	0.05-0.15	G, A, P	2.2	F: Silty Gravelly Sand			X						X		X
14/03/2022	2	BH601	0.5-0.7	G, A, P	11.4	Siltstone		X									
14/03/2022	3	BH602	0.07-0.17	G, A, P	0	F: Silty Gravelly Clay			X								
14/03/2022	4	BH602	0.2-0.4	G, A, P	2.9	Silty Clay											
14/03/2022	5	BH602	0.8-1.0	G, A, P	9.1	Silty Clay											
14/03/2022	6	BH603	0.25-0.35	G, A	5.1	F: Silty Clay			X								
14/03/2022	7	BH603	0.5-0.9	G, A, P	3.2	Silty Clay											
14/03/2022	8	BH607	0-0.1	G, A, P	4.4	F: Silty Sandy Clay			X								
14/03/2022	9	BH607	0.2-0.4	G, A, P	1.3	F: Silty Sandy Clay											
14/03/2022	10	BH607	0.6-0.8	G, A, P	4.5	Silty Sandy Clay											
14/03/2022	11	BH608	0-0.1	G, A, P	11.2	F: Silty Clay			X								
14/03/2022	12	BH608	0.2-0.3	G, A, P	11.2	F: Silty Clay											
14/03/2022	13	BH608	0.8-1.0	G, A, P	6.1	Silty Clay											
14/03/2022	14	BH611	0-0.1	G, A, P	559	F: Silty Sandy Clay			X								
14/03/2022	15	BH611	0.3-0.5	G, A, P	804	Silty Clayey Sand		X									
14/03/2022	16	BH611	0.7-1.0	G, A, P	81.7	Sandstone		X									
14/03/2022	17	SDUP1	-	G, A, P	-	Soil Duplicate											
14/03/2022	18	SDUP2	-	G, A, P	-	Soil Duplicate											
14/03/2022	19	SDUP3	-	G, A, P	-	Soil Duplicate			X								X
14/03/2022	20	SDUP4	-	G, A, P	-	Soil Duplicate			X								
14/03/2022	21	TB-S2	-	G	-	Trip Blank			X								
14/03/2022	22	TS-S2	-	V	-	Trip Spike								X			
14/03/2022	23	TB-PFAS	-	P	-	PFAS Soil Blank											X
Remarks (comments/detection limits required):							Sample Containers: G - 250mg Glass Jar A - Ziplock Asbestos Bag P - PFAS PVC Jar										
Relinquished By: ELISSA D. A-BM					Date: 21/3/22		Time: 16:30		Received By: Tony Doherty					Date: 18/03/2022			

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Appendix F: Report Explanatory Notes



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)²¹ methods and those described in *Environmental Sampling and Analysis, A Practical Guide*, (1991)²². The NEPM (2013) is consistent with these documents.

A. **Practical Quantitation Limit (PQL), Limit of Reporting (LOR) & Estimated Quantitation Limit (EQL)**

These terms all refer to the concentration above which results can be expressed with a minimum 95% confidence level. The laboratory reporting limits are generally set at ten times the standard deviation for the Method Detection Limit for each specific analyte. For the purposes of this report the LOR, PQL, and EQL are considered to be equivalent.

When assessing laboratory data it should be borne in mind that values at or near the PQL have two important limitations: *“The uncertainty of the measurement value can approach, and even equal, the reported value. Secondly, confirmation of the analytes reported is virtually impossible unless identification uses highly selective methods. These issues diminish when reliably measurable amounts of analytes are present. Accordingly, legal and regulatory actions should be limited to data at or above the reliable detection limit”* (Keith, 1991).

B. **Precision**

The degree to which data generated from repeated measurements differ from one another due to random errors. Precision is measured using the standard deviation or Relative Percent Difference (RPD).

C. **Accuracy**

Accuracy is a measure of the agreement between an experimental result and the true value of the parameter being measured (i.e. the proximity of an averaged result to the true value, where all random errors have been statistically removed). The assessment of accuracy for an analysis can be achieved through the analysis of known reference materials or assessed by the analysis of surrogates, field blanks, trip spikes and matrix spikes. Accuracy is typically reported as percent recovery.

D. **Representativeness**

Representativeness expresses the degree to which sample data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is primarily dependent upon the design and implementation of the sampling program. Representativeness of the data is partially ensured by the avoidance of contamination, adherence to sample handling 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;
- All blank data reported;

²¹ US EPA, (1994). *SW-846: Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*. (US EPA SW-846)

²² Keith., H, (1991). *Environmental Sampling and Analysis, A Practical Guide*

- 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%.

$$\frac{(\text{Spike Sample Result} - \text{Sample Result}) \times 100}{\text{Concentration of Spike Added}}$$

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 investigation is provided in the following table:

Sample Type	Sample Identification	Frequency (of Sample Type)	Analysis Performed
Intra-laboratory duplicate (soil)	SDUP3 (primary sample BH611 0-0.1m)	Approximately 5% of primary samples	Heavy metals, TRH/BTEX, PAHs, OCPs, OPPs, PFAS and PCBs
Inter-laboratory duplicate (soil)	SDUP4 (primary sample BH608 0-0.1m)	Approximately 5% of primary samples	Heavy metals, TRH/BTEX, PAHs, OCPs and OPPs
Trip spike (soil)	TS-S1 (11/03/22) TS-S2 (14/03/22)	One per analytical batch to demonstrate adequacy of preservation, storage and transport methods	BTEX
Trip blank (soil)	TB-S1 (11/03/22) TB-S2 (14/03/22) TB-PFAS (11/3/22)	One per analytical batch to demonstrate adequacy of preservation, storage and transport methods	Heavy metals, TRH/BTEX, PAHs, OCPs, OPPs, PFAS (only in TB-PFAS) and PCBs
Rinsate (soil - hand auger)	FR-HA (11/03/22)	One for the investigation to demonstrate adequacy of decontamination methods	Heavy metals, TRH/BTEX, PAHs, PFAS and OCPs

The results for the field QA/QC samples are detailed in the laboratory summary Tables Q1 and Q2 attached to the investigation report and are discussed in the subsequent sections of this Data (QA/QC) Evaluation report.

3. Data Assessment Criteria

JKE adopted the following criteria for assessing the field and laboratory QA/QC analytical results:

Field Duplicates

Acceptable targets for precision of field duplicates in this report will be 30% or less, consistent with NEPM (2013). RPD failures will be considered qualitatively on a case-by-case basis taking into account factors such as the concentrations used to calculate the RPD (i.e. RPD exceedance where concentrations are close to the PQL are typically not as significant as those where concentrations are reported at least five or 10 times the PQL), sample type, collection methods and the specific analyte where the RPD exceedance was reported.

Field/Trip 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.

Trip Spikes

Acceptable targets for trip spike samples in this report will be 70% to 130%.

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 our standard sampling procedures. Field sampling procedures were designed 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 investigation.

JKE note that the temperature on receipt of soil samples at the primary laboratory was reported to be up to 15°C, and up to 16.1°C on receipt of the inter-laboratory duplicate samples at the secondary laboratory. JKE understand that the temperature is measured at the laboratory using an infrared temperature probe by scanning the outside of the sample container (i.e. one sample jar/container at the time of registering the samples). This procedure is not considered to be robust as there is a potential for the outside of the jar to warm to ambient temperature, or at least to increase from that of the internal contents, relatively quickly. However, the increase in temperature may have also occurred in the inter-laboratory samples due to the transit time to get the samples to the laboratory in Melbourne. JKE is of the opinion that the temperatures reported on the Sample Receipts are unlikely to be reliable or representative of the overall batch. This is further supported by the trip spike recovery results (discussed further below) which reported adequate recovery in the range of 88% to 100%.

Review of the project data also indicated that:

- COC documentation was adequately maintained;
- Sample receipt advice documentation was provided for all sample batches;
- All analytical results were reported; and
- Consistent units were used to report the analysis results.

2. Laboratory PQLs

Appropriate PQLs were adopted for the analysis and all PQLs were below the SAC.

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 lead, nickel and zinc, TRHs and two PFAS compounds in SDUP3/BH611 (0-0.1m);
- Elevated RPDs were reported for TRHs and total PCBs in SDUP4/BH608 (0-0.1m);

Values outside the acceptable limits have been attributed to minor sample heterogeneity and the difficulties associated with obtaining homogenous duplicate samples of heterogeneous matrices. Where applicable, the higher duplicate value has been adopted as a conservative measure (see attached report tables).

Field/Trip Blanks

During the investigation, three soil trip blanks were placed in the esky during sampling and transported back to the laboratory.

The soil trip blank results were all less than the PQLs with the exception of Chromium, Lead and Zinc with reported concentrations ranging from 2mg/kg to 3mg/kg. Low level metals concentrations are typical in washed sand which is utilised as blank material. In JKE's experience, the concentrations reported were consistent with background concentrations in a sand matrix and were not indicative of cross-contamination. On this basis, cross contamination between samples that may have significance for data validity did not occur.

Rinsates

A low concentration of TRH was detected in the rinsate sample. This detection is consistent with the use of plastic containers which were used to store the rinsate water, as noted in the Envirolab report comments (report ref: 290820). Considering this and the soil analysis results obtained during the investigation, there is considered to be a low potential for cross contamination to have occurred to an extent that may have significance for data validity.

Trip Spikes

The results ranged from 88% to 100% and indicated that field preservation methods were appropriate.

4. Laboratory QA/QC

The analytical methods implemented by the laboratory were performed in accordance with their NATA accreditation and were consistent with Schedule B(3) of NEPM (2013). The frequency of data reported for the laboratory QA/QC (i.e. duplicates, spikes, blanks, LCS) was considered to be acceptable for the purpose of this investigation. JKE note that due to the limited number of samples submitted for analysis, duplicates and matrix spikes were not reported. This is not considered to have an impact on the data quality for this investigation.

A review of the laboratory QA/QC data identified the following minor non-conformances:

- Report 290820: The PQL for PFAS in one soil sample was raised due to the high moisture content of the sample;
- Report 290820: The TRH results in the rinsate sample was due to a single peak with no hydrocarbon profile. The laboratory identified the result was consistent with the use of plastic containers. We note that the rinsate water was held in a plastic container and plastic bucket and we consider these to be the most likely cause for the TRHs; and
- Report 291372: The RPD for chromium in one soil sample exceeded the acceptance criteria. The laboratory issued the result as a triplicate sample.



C. DATA QUALITY SUMMARY

JKE is 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.



Appendix H: Guidelines and Reference Documents



Acid Sulfate Soils Management Advisory Committee (ASSMAC), (1998). Acid Sulfate Soils Manual

Australian and New Zealand Environment Conservation Council (ANZECC), (2000). Australian and New Zealand Guidelines for Fresh and Marine Water Quality

Canadian Council of Ministers of the Environment, (1999). Canadian soil quality guidelines for the protection of environmental and human health: Benzo(a)Pyrene (1997)

CRC Care, (2011). Technical Report No. 10 – Health screening levels for hydrocarbons in soil and groundwater Part 1: Technical development document

Contaminated Land Management Act 1997 (NSW)

Department of Land and Water Conservation, (1997). 1:25,000 Acid Sulfate Soil Risk Map Series

Managing Land Contamination, Planning Guidelines SEPP55 – Remediation of Land (1998)

National Health and Medical Research Council (NHMRC), (2021). National Water Quality Management Strategy, Australian Drinking Water Guidelines 2011

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

NSW EPA, (1995). Contaminated Sites Sampling Design Guidelines

NSW EPA, (2014). Waste Classification Guidelines - Part 1: Classifying Waste

NSW EPA, (2015). Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997

NSW EPA, (2017). Guidelines for the NSW Site Auditor Scheme, 3rd Edition

NSW EPA, (2020). Consultants Reporting on Contaminated Land, Contaminated Land Guidelines

NSW EPA, (2022). Sampling Design Part 1 – Application, Contaminated Land Guidelines

National Environment Protection Council (NEPC), (2013). National Environmental Protection (Assessment of Site Contamination) Measure 1999 as amended (2013)

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

Protection of the Environment Operations Act 1997 (NSW)

State Environmental Planning Policy (Resilience and Hazards) 2021 (NSW)

World Health Organisation (WHO), (2008). Petroleum Products in Drinking-water, Background document for the development of WHO Guidelines for Drinking Water Quality

Western Australia Department of Health, (2021). Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia