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Report

Preliminary Site Investigation Report
Proposed Rural Subdivision Development
Part Lot 3 DP 1201486 No 80 Silverdale Road
The Oaks NSW

Prepared for
Mr & Mrs Nocera
C\-Proficient Constructions (Aust) Pty Ltd
PO Box 885
NARELLAN NSW 2567

Ref: JC24471A-r1(rev)
March 2024

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15th April 2024

Our Ref: JC24471A-r1(rev)

Mr & Mrs Nocera
C\-Proficient Constructions (Aust) Pty Ltd
PO Box 885
NARELLAN NSW 2567

Attention: Mr Chad Ghassibe

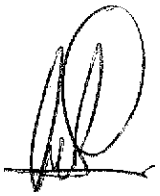
Dear Sir

Re: Preliminary Site Investigation (PSI) Report
Proposed Rural Subdivision Development
Part Lot 3 DP 1201486 No 80 Silverdale Road, The Oaks

We are pleased to submit our Preliminary Site Investigation report for the Proposed Rural Subdivision Development at the above address.

Should you have any queries, please contact the undersigned.

Yours faithfully
GeoEnviro Consultancy Pty Ltd



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Director

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Client	Mr & Mrs Nocera C\-Proficient Constructions (Aust) Pty Ltd

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Executive Summary

GeoEnviro Consultancy Pty Ltd have completed a Preliminary Site Investigation Report (PSI) for the front portion of the property at No 80 Silverdale Road in The Oaks and identified as Part Lot 3 Deposited Plan (DP) 1201486 (ie Subject Site) to investigate the likelihood of contamination at the site to facilitate the proposed development.

We understand the proposed development will include subdivision of the Subject Site into 9 rural residential lots and construction of residential roads.

The purpose of this assessment was to investigate the likelihood of ground contamination on the site from current and previous land use. The investigation consisted of a review of site history information, site inspections, test pit investigation, soil sampling and laboratory analysis.

No 80 Silverdale Road is located on the eastern side of Silverdale Road in The Oaks. We understand the subject site consists of the western front portion of Lot 3 DP 1201486 (ie Subject Site) as shown on Drawing No 1. The site is irregular in shape measuring about 370m along the Silverdale Road frontage and extending to the east about 140m. Total site area is about 5.1 hectares.

Based on historical information and aerial photographs, the Subject Site appears to have been vacant with no apparent land use except for drainage purposes for at least the last 30 years although there appeared to have been significant land disturbance over the years with a previous dam also being filled in and the swale being constructed. As part of these works, it is likely fill to have been placed throughout the site.

A site visit was carried out on the 4th March 2024 by an environmental scientist to observe existing site features and identify obvious or suspected areas of potential contamination. At the time of our site inspection, the site was largely vacant with grass cover and a large vegetated stockpile at the south-western portion of the site which may have been generated from construction of the swale within the property. There was a swale transecting the middle of the site in a north-south direction from the adjoining residential properties to the south to the dam to the north. There was also an access road along the northern boundary of the site. The eastern boundary of the site falls steeply to the east at angles of between 20and 40 degrees to the remainder of the property.

Soil sampling was carried out on the 4th March 2024 and involved excavation at twenty-one locations (TP 1 to TP 21) at accessible locations. Soil sampling was conducted at all twenty-one sampling points (i.e. test pits). The following is a summary of the subsurface profiles encountered;

- Topsoil and Topsoil/Fill consisting of Gravelly Sandy Silt and Clayey Silt was encountered on the surface of all test pits or below the fill in TP 1, 4, 5, 8, 15 and 16 with thickness ranging from 100mm to 500mm.

- Fill was encountered on the surface and below the topsoil/fill in all test pits except TP 6 and 15 comprising of Gravelly Clayey Sandy/Gravelly Sandy Clay, Gravelly Silty Clay, Silty Clay and Clayey Silt. Some foreign inclusions were encountered in TP 1, 8, 16 and 17 including asphalt, concrete, glass, metal, plastic, tile and Styrofoam fragments with fibre-cement fragments encountered in TP 8 and 17. The fill was found to have thickness ranging from 0.2m to 2.1m below existing ground level and was generally assessed to be dry to moist.

- Natural soil was encountered below the topsoil, topsoil/fill and fill in all test pits generally of medium plasticity Silty Clay and Gravelly Silty Clay with varying amounts of ironstone gravel and bands. Based on the hand penetrometer test results, the natural clay was generally assessed to be dry to moist (ie moisture content less than or equal to the plastic limit) and very stiff to hard.

- Bedrock consisting of Shale was encountered in TP 3 to 9, 11, 12, 15 and 18 to 21 at depths ranging from 0.6m to 2.4m below existing ground level.

Soil sampling was conducted at all 21 sampling points (i.e., test pits) and a total of 26 soil samples were analysed for a range of COPC including heavy metals (As, Cd, Cr, Cu, Hg, Pb, Ni and Zn), OCP, PCB, TRH, BTEX and asbestos.

The reported concentrations of COPC did not exceed the laboratory's LOR and/or assessment criteria except for the following;

- TP 1 (0.4-0.5m) which encountered slightly elevated concentrations of Copper and Nickel of 110mg/kg and 20mg/kg respectively above the ESL Criteria of 70mg/kg and 15mg/kg. These concentrations are not considered significant and therefore acceptable.

- The material samples in TP 8 and 17 confirm the presence of Chrysotile and Amosite Asbestos.

The absence of apparent widespread chemical contaminations within the soil indicates that the potential for groundwater contamination at the site is low and the potential off-site impacts of contaminants on groundwater and waterbodies are also negligible.

Within the context of the scope of work, we are of the opinion that the risk of gross chemical contamination within the Subject Site is generally considered to be low and therefore suitable for the proposed residential subdivision development subject to removal of the Asbestos impacted fill in TP 8 and 17 to an EPA approved landfill facility. The removal of the asbestos impacted material may be undertaken during earthworks and road construction. Following excavation of the impacted material, these areas should be validated by sampling and laboratory analysis to ensure all asbestos impacted material is removed from the areas

Section 8 of this report provides a list of environmental issues that need to be considered for the proposed development.

1. INTRODUCTION

This report presents the results of a Preliminary Site Investigation Report (PSI) for the front portion of the property at No 80 Silverdale Road in The Oaks and identified as Part Lot 3 Deposited Plan (DP) 1201486 (ie Subject Site) as shown in Drawing No 1. The investigation was commissioned by Mr Chad Ghassibe of Proficient Constructions (Aust) Pty Ltd on behalf of the property owners, Mr & Mrs Nocera. The scope of this assessment was carried out in general accordance with our proposal referenced PC23376A dated 9th January 2024.

We understand the proposed development will include subdivision of the Subject Site into 9 rural residential lots and construction of residential roads.

The objectives of this study were to assess if significant land contamination is likely to exist on site that may present a risk to human health and/or the environment as a result of previous and current land use and to provide our assessment and recommendation on the suitability of site for the proposed residential subdivision development.

2. SCOPE OF WORK

This contamination assessment was performed in general conformance with our understanding of the guidelines by the National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPC 2013) and NSW Environment Protection Authority (EPA).

The scope of work conducted consisted of:

- A review of available information on the site history from aerial photographs and historical titles search from NSW Land and Property Information (LPI),
- A search of records on previous notices issued by NSW EPA,
- A search of information on Groundwater Boreholes in the area from the NSW Natural Resource Atlas (NRA),
- A review of the Wollondilly Shire Council's Section 10.7 (2) Planning Certificate,
- An inspection of the site to identify apparent or suspected areas of contamination,
- Prepare a sampling, analysis and quality plan (SAQP),
- Undertake intrusive investigation by excavation of test pits using a 5-tonne excavator to assess subsurface ground condition,
- Undertake subsurface soil sampling from the test pits for laboratory analysis,
- Scheduling samples and laboratory analysis by EnviroLab Services Pty Ltd to detect the presence or otherwise of the contaminants of concern,

- Develop a preliminary conceptual site model (CSM) identifying potential sources of contamination and impacted areas.
- Preparation of this report on the results of the PSI.

3. SITE INFORMATION

3.1 Site Location

No 80 Silverdale Road is located on the eastern side of Silverdale Road in The Oaks. We understand the subject site consists of the western portion of Lot 3 DP 1201486 (ie Subject Site) as shown on Drawing No 1. The site is irregular in shape measuring about 370m along the Silverdale Road frontage and extending to the east about 140m. Total site area is about 5.1 hectares.

The remainder of the property consists of bushland and undeveloped land, and is to be retained as part of the residential subdivision development. The site is within the jurisdiction of The Wollondilly Shire Council.

3.2 Surrounding Land Use

The site is situated within a semi-rural residential area with adjoining properties to the north and east consisting of semi-rural lots. The adjoining property to the south consists of residential lots.

3.3 Site Topography and Geological Setting

The site is situated on gently to moderately undulating terrain with ground surface within the site sloping to the north-east at angles of less than 5 degrees. Based on Google Earth, the ground surface within the site ranges in elevation from about 280m to 270mabove sea level.

The 1:100,000 Soil Landscape of Penrith prepared by the Soil Conservation Services of NSW indicates the site to be underlain by Residual soil belonging to the Blacktown landscape group (ref. 9030bt). Blacktown Landscape Group Soils typically consists of low permeability, highly plastic and moderately reactive soil. Refer to Drawing No 3.

The 1:100,000 Geological Map of Penrith indicates the site to be underlain by Bringelly shale of the Wianamatta Group consisting of shale, carbonaceous claystone, claystone, laminite, fine to medium grained lithic sandstone, rare coal and tuff. Refer to Drawing No 4 for Geological Map.

3.4 Hydrology and Hydrogeology

Topography, surface cover and geology control the hydrogeology of the site. It is anticipated that the majority of rainfall runoff will to the north into a dam to the north of the site.

Groundwater is expected to flow north and north-west into Werribee Creek. Due to the anticipated relatively impervious nature of the underlying subsurface soil and bedrock, rainfall runoff infiltrating through the subsurface soil and expected bedrock profiles is expected to be minimal.

Based on our local knowledge and previous investigation of the general surrounding area, we expect regional groundwater to be at a significant depth (i.e. in excess of 3 m from ground surface).

Our search of the NSW Department of Primary Industries groundwater database indicates no groundwater bores within 500m from the Subject Site.

Groundwater is not considered to be a significant resource for the general area based on the presence of reticulated water supply.

3.5 Soil Salinity Map

Based on Salinity Potential in Western Sydney 2002 prepared by the Western Sydney Regional Organisation of Councils Ltd, the site is situated in area with moderate salinity potential.

3.6 Acid Sulfate Soil Risk Map

Based on acid sulfate soil risk maps prepared by the Land and Water Conservation, the site is situated in an area with no known occurrence of acid sulfate soils.

3.7 Existing Site Conditions and Description

A site visit was carried out on the 4th March 2024 by an environmental scientist to observe existing site features and identify obvious or suspected areas of potential contamination. Reference should be made to Drawing No 1 for site locality and features plan.

At the time of our site inspection, the site was largely vacant with grass cover and a large vegetated stockpile at the south-western portion of the site which may have been generated from construction of the swale within the property. There was a swale transecting the middle of the site in a north-south direction from the adjoining residential properties to the south to the dam to the north. There was also an access road along the northern boundary of the site. The eastern boundary of the site falls steeply to the east at angles of between 20and 40 degrees to the remainder of the property.

4. HISTORICAL/DESKTOP REVIEW

4.1 Historical Aerial Photographs

A review of aerial photographs taken from 1969 to 2005 was carried out to assess historical land use. Refer to Appendix B for aerial photographs. The following is a summary of the observations made from the review;

Year	Description
1969	The site appeared to have been cleared and possibly cultivated. There was a small dam at the central eastern portion of the site. Silverdale Road was formed. The larger property also appeared largely vacant with no land use although several dams were present including the dam immediately north of the subject site although shaped slightly different to its current form. Surrounding properties consisted of vacant land and bushland with no significant agricultural use evident.
1978	There appeared to have been some significant land disturbance within the site particularly at the southern and eastern portions with the previous small dam at the central eastern portion of the site filled. No land use was evident within the site. There was no change within the immediate surrounding properties.
1989-2005	The site appears similar to its current state with the swale in the middle of the site was constructed leading to the dam to the dam immediately to the north of the site which appeared to have been located in its current position. There was ground disturbance on the western side of swale. The immediate southern property was subdivided with the current dwellings constructed. The surrounding properties to the north and east remained largely the same and vacant.

4.2 Land Titles Records

Description of historical information on the previous owners of the site was obtained from NSW Land & Property Information (LPI). The information can often be linked to possible land uses and provides an indication of potential contamination at the site. Refer to Appendix C for Land Titles.

Date of Acquisition and term held	**Registered Proprietor(s) & Occupations where available**	**Reference to Title at Acquisition and sale**
06.10.1948 (1948 to 1971)	Arthur Halford Clinch (Clerk)	Book 2064 No. 447
17.12.1971 (1971 to 2024)	A H Clinch Investments Pty Limited	Book 3065 No. 859 Then 1/749126 Now 3/1201486
01.02.2024 (2024 to date)	# Maryann Nocera # Domenico Nocera	3/1201486

# Denotes current registered proprietor

Leases: – Nil

Easements: -

- 19.06.1970 (Book 2978 No. 306) Easement for Transmission Line 30.48 wide.
- 04.04.2016 (DP749126) Easement to Drain Water, 1 wide, 10 wide & 35 wide.

4.3 NSW EPA Contaminated Land and POEO Public Register

A search of NSW EPA's contaminated land register and licensing register indicates the site to have no records kept under the Contaminated Land Management Act 1997 and Environmentally Hazardous Chemical Act 1985. Refer to Appendix D for details of the NSW EPA search.

A search for records under the Protection of Environment Operation Act 1997 (POEO) did not identify any of the following in relation to the site:

- Environmental protection licences.
- Applications for new licences and to transfer or vary existing licences.
- Environment protection and noise control notices.
- Penalty notices issued by the EPA.
- Convictions in prosecutions under the POEO Act.
- The results of civil proceedings.
- Licence review information.
- Exemptions from the provisions of the POEO Act or regulation.
- Approvals granted under Clause 9 of the POEO (Clean Air) Regulation.
- Audits required to be undertaken in relation to a licence.
- Pollution studies required by a condition of a licence.
- Pollution reduction programs required by a condition of a licence.
- Penalty notice issued in relation to a premise.

4.4 Section 10.7 (2) Planning Certificate

Copies of the Section 10.7 (2) certificates were obtained from Wollondilly Shire Council to determine conditions applicable to the site in relation to the Contaminated Land Management Act 1997 and Contaminated Land Management Amendment Act 2009. Reference may be made to the certificate attached in Appendix E.

The certificates indicate the following:

- The site is not significantly contaminated within the meaning of the CLM Act.
- The site is not subject to a management order within the meaning of the CLM Act.
- The site is not the subject of a voluntary management proposal within the meaning of CLM Act.
- The site is not subject to an ongoing maintenance order within the meaning of the CLM Act
- The site is not the subject of a site audit statement within the meaning of the CLM Act.

4.5 Underground Storage Tanks and Utilities

There were no visible or obvious signs of underground storage tanks such as ventilation pipes, inlet pit and bowsers/refuelling pumps noted during our site inspection. A Workcover search for licenses to store dangerous goods was not carried out as it was not considered necessary given the site's history. A search of underground utilities records supplied by Dial-before-you-dig indicate no major services within the site.

5. INITIAL CONCEPTUAL SITE MODEL

A conceptual site model (CSM) is a representation of site-related information regarding contamination sources and migration/exposure pathways between those sources and potential receptors. The CSM provides the framework for identifying how the site became contaminated and how potential receptors may be exposed to contamination either in the present or the future and it enables an assessment of the potential pathways.

5.1 Potentially Contaminated Media

The potential for contaminated media for the subject site includes fill, topsoil/fill, topsoil, natural soil and surface water. Some buried fill may also be present in disturbed area which may also be classified as potentially contaminated media.

Any fill encountered within the site has the potential to be contaminated with Heavy Metals, OCP, PCB TRH, BTEX, PAH and asbestos (ACM, AF/FA).

The potential leachability through rainfall and stormwater runoffs can lead to infiltration of the contaminated media through the topsoil/surface fill material and contaminating the underlying natural soil.

As the property has mainly been vacant with no land use for at least the last 20 years, contamination through ground water media is not conceivable.

5.2 Exposure Pathways

Taking into consideration the existing land and the future potential site development activities, the potential contaminants in the above media has the potential to be mobilised through the following pathways;

- Dermal and oral contact to contaminated topsoil and surface fill (and associated dust) during excavation and construction works.
- Leaching of lead and other contaminants into the ground and uptake of contaminants by vegetation (eg vegetables and fruit trees).
- Ingestion via eating edible plants (eg vegetables and fruit trees) by site occupants.
- Direct ingestion of soil by children playing on the ground surface in unpaved areas and
- Inhalation of dust (including asbestos) by site occupants and construction workers.

5.3 Potential for Migration

Contaminants can migrate from site through wind, stormwater runoffs, infiltration of surface water and groundwater flows. The factors influencing the potential for contaminants to migrate include;

- Type of contaminants (eg mobility characteristics, bioavailability).
- Extent (eg localised or widespread) and concentrations of contaminants.
- Locality and source of contaminants
- Physical characteristics of the site (eg topography, geology, hydrology and hydrogeology).

The potential contaminants identified on this site are present in soil (eg impacted soil or fill). There were no forms of liquid contaminants encountered on the surface of the site that can result in off-site migration.

There is a potential for stormwater runoff infiltrating through the contaminated fill and leaching contaminants into the underlying natural soil. Excess stormwater runoffs has the potential to carry asbestos dust downstream and into adjoining sites.

As the site has a low probability of having buried underground storage tanks, there is low potential for vapours or ground gases associated with volatile contaminants generated from the site and impacting on adjoining sites.

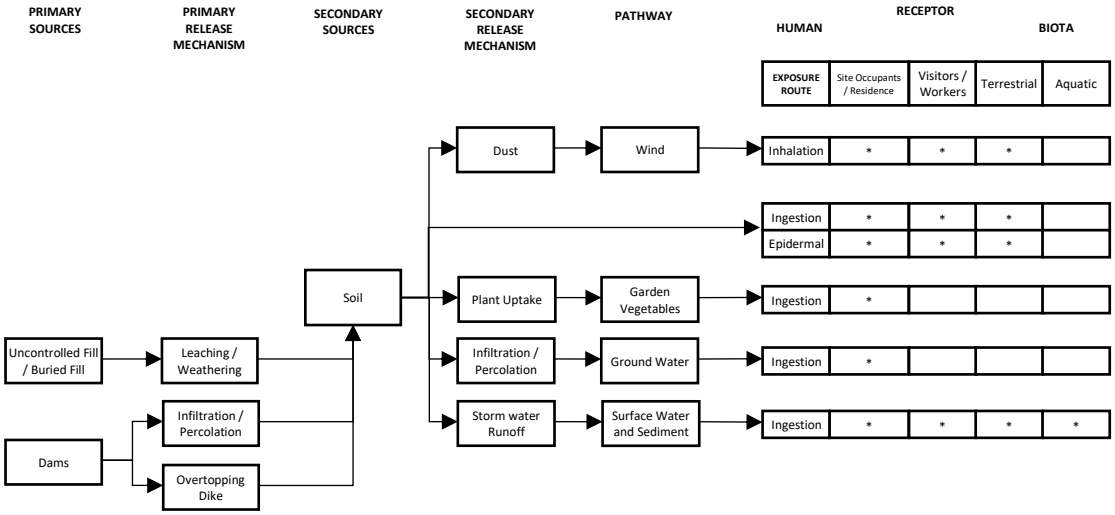
5.4 Sensitive Receptors

Potential receptors of environmental impacts on the subject site include'

- Construction and maintenance workers during construction site redevelopment.
- Future site users following development of the site with the most sensitive receptor being a child.
- Land users in adjacent areas.

5.5 Schematic CSM

Based on our preliminary desktop/historic review of the site and site inspections, our preliminary CSM for the subject site being used for semi-rural residential may be illustrated on the following flow chart:



5.6 Potential Contamination Sources

5.6.1 On-Site Source

5.6.1.1 Agricultural Activities

Based on historical information and aerial photographs, the Subject Site appears to have been vacant with no apparent land use except for drainage purposes for at least the last 30 years.

Common chemicals that are used in agricultural activities are Organochlorine Pesticides (OCP), Organophosphorus Pesticides (OPP), herbicides and fungicides. OCP is the most persistent of these chemicals, with residues lasting in the environment up to 20 years, whilst OPP, herbicides and fungicides are less persistent in the environment and therefore not considered significant. Fertilisers used in market gardens can also contain heavy metals which are more persistent in the environment

As the site has not been used for agricultural activities including land cultivation since at least the 1960s, there is a low risk of ground contamination associated with agricultural activities.

5.6.1.2 Fill Areas

Based on aerial photographs, there appeared to have been significant land disturbance over the years with a previous dam being also being filled in and the swale being constructed. As part of these works, it is likely fill to have been placed throughout the site.

As the origin of the fill used are not known, it is possible for the fill to be contaminated with common contaminants such as Heavy metals [ie Arsenic (As), Cadmium (Cd), Chromium (Cr), Copper (Cu), Nickel (Ni), Lead (Pb), Mercury (Hg) and Zinc (Zn)], OCP, Polychlorinated Biphenyls (PCB), Total Recoverable Hydrocarbons (TRH), Benzene, Toluene, Ethyl Benzene and Xylene (BTEX), Polycyclic Aromatic Hydrocarbons (PAH) asbestos and other foreign inclusions.

As the site is underlain by relatively impervious natural clay, fill contamination is likely to be confined to the upper surface and not likely to significantly impact the underlying natural clayey soil

5.6.2 Off-Site Source

The adjoining properties to the south consists of residential properties with the northern and eastern properties vacant with no land use. The risk of migration of residue contamination to the site through surface runoff is considered low.

5.7 Potential Contaminated Areas and Receptors

Our review of the site has identified the whole of the site being a Potentially Contaminated Area with potential contamination being Uncontrolled fill, Anthropogenic Materials, Heavy Metals, OCP, TRH, BTEX, PAH and Asbestos (ACM/ AF/FA).

Potential receptors include residents, visitors, construction/maintenance workers, future site users, the public, and terrestrial flora and fauna.

6. SAMPLING AND ANALYSIS

6.1 Objectives

The objective of the Preliminary Site Investigation was to undertake intrusive investigation, soil sampling and laboratory analysis to determine if the identified areas of potential contamination have resulted in soil contamination to a level that presents or potentially presents an unacceptable risk of harm to human health and/or the environment.

6.2 Sampling, Analytical and Quality Plan

6.2.1 Overview

The sampling analytical and quality plan has been developed in order to ensure that the data collected for this investigation is representative for the site assessment decisions. The plan has been completed in general accordance with the NSW EPA guidelines and includes;

- Data quality objectives
- Sampling methodologies and procedures
- Field screening methods
- Sample handling, preservation and storage procedures
- Analytical QA/QC

6.2.2 Assessment Criteria

The results of laboratory analyses for this investigation will be compared with published Australian contamination assessment criteria. These criteria are sourced from the National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPM) – Schedule B1 (1999 amended 2013) (Reference 5) which includes health-based soil investigation levels (HILs) for four generic land use settings.

Given the proposed residential development, the appropriate HIL for the site is HIL A - Residential with garden/accessible soil. The results of laboratory analysis of samples have been directly compared with the following Criteria.

6.2.2.1 Health Investigation Levels (HILs) – Direct Contact

HILs are scientifically based, generic assessment criteria designed to be used in the first stage (Tier 1 or 'screening') of an assessment of potential risks to human health from chronic exposure to contaminants. They are intentionally conservative and are based on a reasonable worst-case scenario.

For the purpose of assessing the contamination status of the site, the HIL A criteria from the ASC NEPM has been adopted as the site criteria. The relevant assessment criteria are shown on the attached Tables 3 to 8. For petroleum hydrocarbons, the soil health screening levels for direct contact from CRC CARE (Reference 6), which have been developed for exposure through dermal contact, incidental oral ingestion and dust inhalation and then combined as a single HSL for direct contact with soil, have been adopted.

Chemical	**Health-based investigation levels (mg/kg)** [1]
	Residential A
Arsenic [2]	100
Cadmium	20
Chromium (VI)	100
Copper	6000
Lead [3]	300
Mercury (inorganic)	40
Nickel	400
Zinc	7400
Carcinogenic PAHs (as BaP TEQ) [4]	3
Total PAHs [5]	300
Aldrin and dieldrin	6
chlordane	50
DDT+DDE+DDD	240
Endosulfan	270
Endrin	10
Heptachlor	6
Methoxychlor	300

Notes:

1. HIL A – Residential
2. Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability may be important and should be considered where appropriate (refer Schedule B7).
3. Lead: HIL is based on blood lead models (IEUBK for HILs A, B and C and adult lead model for HIL D where 50% oral bioavailability has been considered. Site-specific bioavailability may be important and should be considered where appropriate.
4. Carcinogenic PAHs: HIL is based on the 8 carcinogenic PAHs and their TEFs (potency relative to B(a)P) adopted by CCME 2008 (refer Schedule B7). The B(a)P TEQ is calculated by multiplying the concentration of each carcinogenic PAH in the sample by its B(a)P TEF, given below, and summing these products.
5. Total PAHs: HIL is based on the sum of the 16 PAHs most commonly reported for contaminated sites (WHO 1998).

PAH species	TEF	PAH species	TEF
Benzo(a)anthracene	0.1	Benzo(g,h,i)perylene	0.01
Benzo(a)pyrene	1	Chrysene	0.01
Benzo(b+j)fluoranthene	0.1	Dibenz(a,h)anthracene	1
Benzo(k)fluoranthene	0.1	Indeno(1,2,3-c,d)pyrene	0.1

For the purpose of assessing the contamination status of the site for TRH, BTEX and naphthalene, for direct contact, the HSL A Residential (Low Density) have been adopted from the CRC CARE (Reference 6). The relevant assessment criteria are shown on the attached Table 6.

Chemical	HSL A – Residential (Low Density) mg/kg
Toluene	14,000
Ethylbenzene	4,500
Xylenes	12,000
Naphthalene	1,400
Benzene	100
C6-C10 TRH	4,400
>C10-C16 TRH	3,300
>C16-C34 TRH	4,500
>C34-C40 TRH	6,300

6.2.2.2 Health Screening Levels (HSLs) – Inhalation/Vapour Intrusion

The NEPM criteria (Reference 5) have included Health Screening Levels (HSL) developed by the Cooperative Research Centre for Contamination Assessment and Remediation of the Environment (CRC Care 2011) (Reference 6) leading to the adoption of health criteria for TRH, BTEX and PAH. The HSLs have been developed for selected petroleum compounds and fractions and are applicable to assessing human health risk via the inhalation and direct contact pathways. The HSLs depend on specific soil physicochemical properties, land use scenarios, and the characteristics of building structures and they apply to different soil types and depths below surface up to 4 m depth.

HSLs are for assessing human health risk associated with inhalation, and depend on specific soil properties and depths, types of land use and characteristics of buildings for each land use scenario. The material type adopted was silt and clay, which represents the most conservative soil texture for application of the HSLs.

Health Screening Levels (HSLs) for hydrocarbons in soil have been adopted from Table 1A(3) of Schedule B1 Guideline on Investigation Levels for Soil and Groundwater of the ASC NEPM (2013). The HSLs for hydrocarbons are based on vapour intrusion risk associated with petroleum hydrocarbon contamination.

For the purpose of assessing the contamination status of the site for TRH, BTEX and PAH, the HSL A and B (Low to high density residential) have been adopted. The relevant assessment criteria are shown on the attached Table 6.

Chemical	**HSL A & HSL B (mg/kg)**			
	Low – high density residential			
	0 m to <1 m	**1 m to <2 m**	**2 m to <4m**	**4 m+**
SAND				
Toluene	160	220	310	540
Ethylbenzene	55	NL	NL	NL
Xylenes	40	60	95	170
Naphthalene	3	NL	NL	NL
Benzene	0.5	0.5	0.5	0.5
F1	45	70	110	200
F2	110	240	440	NL
SILT				
Toluene	390	NL	NL	NL
Ethylbenzene	NL	NL	NL	NL
Xylenes	95	210	NL	NL
Naphthalene	4	NL	NL	NL
Benzene	0.6	0.7	1	2
F1	40	65	100	190
F2	230	NL	NL	NL
CLAY				
Toluene	480	NL	NL	NL
Ethylbenzene	NL	NL	NL	NL
Xylenes	110	310	NL	NL
Naphthalene	5	NL	NL	NL
Benzene	0.7	1	2	3
F1	50	90	150	290
F2	280	NL	NL	NL

Notes:
mg/kg Milligrams per kilogram
NL Not limiting as the soil vapour concentration could not exceed a level that would result in the maximum allowable vapour risk.

6.2.2.3 Health Screening Levels for Asbestos in Soil (HSLs – Asbestos)

The following HSLs for asbestos contamination in soil have been adopted from Table 7 of Schedule B1 Guideline on Investigation Levels for Soil and Groundwater of the ASC NEPM (2013).

Form of asbestos	**HSL A – Residential A (w/w)**
Bonded ACM[1]	0.01% w/w
FA[2] and AF[2] (friable asbestos)	0.001% w/w
All forms of asbestos	No visible asbestos for surface soil

Notes:
1. ACM – Asbestos containing material
2. FA – Fibrous asbestos; AF – Asbestos fines

6.2.2.4 Ecological Investigation Levels (EILs)

The NEPM also includes EIL criteria for the protection of species based on 95% survival and this criterion is based on average background concentrations (ABC) for individual sites and added contaminant levels (ACL) calculated from survival rates for various species to contaminant exposures in different settings.

The following site-specific parameters for pH, Cation Exchange Capacity (CEC) and clay content in soil were adopted for ACL concentrations in accordance to the ASC NEPM guidelines.

Analytical Parameters

Average pH	5.5
Cation Exchange Capacity (CEC) – meq/100g	3
Clay Content %	5

The adopted EIL have been derived from the ASC NEPM Excel Spreadsheet – eil-calculation-spreadsheet-December-2010(1). The EIL criteria have been included in the relevant tables as a sensitivity measure for the protection of ecological diversity within the site.

The relevant assessment criteria are shown on the attached Tables 3.

Chemical	**EIL for Urban residential and public open space (mg/kg)**
Arsenic	100
Chromium (III)	270
Copper	160
Lead	1100
Nickel	170
Zinc	320

6.2.2.5 Ecological Screening Levels (ESLs)

For ecological levels for TRH, BTEX and PAH, the NEPM has provided ecological screening level (ESL) for the assessment. The relevant assessment criteria are shown on the attached Tables 6 and 7.

Chemical	**Soil texture**	**ESLs (mg/kg dry soil)**
		Urban residential and public open space
F1 >C6-C10	Coarse / Fine	180
F2 >C10-C16		120
F3 >C16-C34	Coarse	300
	Fine	1300
F4 >C34-C40	Coarse	2800
	Fine	5600
Benzene	Coarse	50
	Fine	65
Toluene	Coarse	85
	Fine	105
Ethylbenzene	Coarse	70
	Fine	125
Xylenes	Coarse	105
	Fine	45
Benzo(a)pyrene	Coarse	0.7
	Fine	0.7

6.2.2.6 Management Limits

The adopted management limits (MLs) and health screening levels (HSLs) for hydrocarbons in soil for public open space will be applied for potential direct contact by maintenance workers involved in subsurface works in a recreational/ open space land use scenario.

Analyte	Soil Texture	Management Limits
F1 (C_6- C_{10})	Coarse	700
	Fine	800
F2 (>C_{10}-C_{16})	Coarse	1,000
	Fine	1,000
F3 (>C_{16}-C_{34})	Coarse	2,500
	Fine	3,500
F4 (>C_{34}-C_{40})	Coarse	10,000
	Fine	10,000

6.2.2.7 Aesthetics

In addition to the above, the NEPM 2013 guidelines address the issue of aesthetic considerations in relation to non-hazardous inert foreign material (refuse) in soil or fill resulting from human activities. The guidelines permit the presence of foreign matter within the fill to be retained within the site subject to compliant of the fill material to the Site Criteria and aesthetically acceptable (eg malodorous soils, discoloured chemical deposits, stained soil, large monolithic deposits/large inert foreign matter, putrescible refuse and animal remains). Though the guidelines do not outline specific trigger values, we consider fill containing greater than 2% by weight of foreign matter to be aesthetically unacceptable.

In addition to the above criteria, considerations should be given to odour (eg hydrocarbon and solvents) where adoption of lower threshold criteria may be required if causes significant nuisance.

6.2.3 Data Quality Objectives

The purpose of establishing Data Quality Objectives (DQO) is to ensure that the field investigations and subsequent analyses are undertaken in a way that enables the collection and reporting of reliable data on which to base the assessment.

A process for establishing DQOs for a site has been defined by the US EPA. That process has been adopted within the Australian Standard: AS 4572.1-2005 and referenced by the National Environment Protection (Assessment of Site Contamination) Measure (NEPC, 1999) and the Guidelines for the NSW Site Auditor Scheme, 3rd edition (NSW EPA, 2017).

The DQO process, involves the following seven steps:

Step 1 State the problem;

The site investigation is being undertaken in order to ascertain the current contamination status of the site; whether contamination present at the site may pose an unacceptable health and/or environmental risk under the current land use; and whether the site is suitable for the proposed residential development.

Step 2 Identify the decision;

The site investigation is to identify areas of environmental concerns which may be the source of potential contamination. To assess the suitability of the site for future residential use, decisions are to be made based on the following questions

- Is contamination present in soil at concentrations above the applicable approved guidelines?
- Where contamination has occurred, does it have the potential to adversely impact on human health and/or environmental receptors?
- Does the site appear suitable (from a contamination perspective) for the current and future proposed land use?

Step 3 Identify inputs to the decision;

Data to be inputted to the decision-making process will include:

- Information gained from a review of existing information.
- Soil sampling at nominated locations (where access is available) across the site.
- Laboratory analytical results for relevant to the area of environmental concerns.
- Appropriate screening-level criteria (investigation thresholds) for soil.
- Quantitative data gained via intrusive sampling and analytical works
- Assessment of the suitability of the data obtained from sampling and analysis as measured against data quality indicators (DQIs).
- Assessment of analytical results against site suitable human health criteria.

Step 4 Define the study boundaries;

The lateral boundary of the study area is the site referred to as Part Lot 3 DP 1201486 No 80 Silverdale Road in The Oaks as shown on Drawing No 1.

The vertical boundary with respect to soil shall be the depth of the deepest test pit.

The temporal boundary of the study is the 4th March 2024 being the date which the PSI was completed.

Step 5 Develop a decision rule;

Project analytical data will be compared to appropriate NSW EPA prepared or endorsed guidelines for residential land use. If the concentrations of contaminants in the soils exceed the adopted assessment criteria; an assessment of the need to further investigate, remediate and or manage the onsite impacts in relation to the proposed development will be undertaken.

On the basis of this initial comparison, plus an assessment of potential contaminant exposure pathways, a decision will be made as to whether or not the contamination may pose a potential risk, warranting management and/or remediation.

Step 6 Specify limits on decision errors; and

Guidance found in ASC NEPM (1999 amended 2013) Schedule B2 regarding 95% upper confidence limit (UCL) states that the 95% UCL of the arithmetic mean provides a 95% confidence level that the true population mean will be less than or equal to this value. Therefore, a decision can be made based on a probability that 95% of the data collected will satisfy the site acceptance criteria. A limit on decision error will be 5% that a conclusive statement may be incorrect.

Step 7 Optimise the design for obtaining data.

The sampling program was designed with reference to the desktop works completed for the, sites and the known layout of site infrastructure. The sampling program was designed to target, those areas of the site where potential contamination was identified as being most likely.

6.2.4 Data Quality Indicators

To minimise the potential for decision errors, Data Quality Indicators (DQIs) have been determined, for completeness, comparability, representativeness, precision and accuracy as detailed below.

The DQIs for sampling techniques and laboratory analysis of collected samples defines the acceptable level of error required for this investigation.

The data quality objectives will be assessed by reference to data quality indicators as follows:

- **Completeness** - defined as the percentage of measurements made which are judged to be valid measurements. To ensure data set completeness, the following is required:
  - Confirmation that all sampling was completed in accordance with GeoEnviro's quality assurance and control plan as provided in Appendix F.
  - Chain of Custody and receipt forms.
  - Results from all Laboratory QA/QC samples (Lab blanks, matrix spikes, lab duplicates).
  - NATA accreditation stamp on all laboratory reports
- **Comparability** - is the confidence that data may be considered to be equivalent for each sampling and analytical event. It provides a qualitative parameter expressing the confidence with which one data set can be compared with another. This is achieved through maintaining a level of consistency in techniques used to collect samples and ensuring analysing laboratories use consistent analysis techniques and reporting methods.

Data comparability is maintained by ensuring that:

- All site sampling events are undertaken following methodologies outlined in GeoEnviro Sampling Quality Assurance Plan and published guidelines.
- NATA accredited laboratory methodologies shall be followed on all laboratory testing.

- **Representativeness** - expresses the degree which sample data accurately and precisely represents a characteristic of a population or an environmental condition. Representativeness is achieved by collecting samples in an appropriate pattern across the site, and by using an adequate number of sample locations to characterise the site. Consistent and repeatable sampling techniques and methods are utilised throughout the sampling.

- **Precision** - measures the reproducibility of measurements under a given set of conditions. The precision of the data is assessed by calculating the Relative Percent Difference (RPD) between duplicate sample pairs.

$$RPD\ (\%) = [|C_0 - C_d| \ / \ C_0 + C_d)] \times 200$$

Where Co = Analyte concentration of the original sample
Cd = Analyte concentration of the duplicate sample

GeoEnviro adopts nominal acceptance criteria of 50% RPD for field duplicates and splits for inorganics and organics, however it is noted that this will not always be achieved, particularly in heterogenous soil or fill materials, or at low analyte concentrations

- **Accuracy** - measures the bias in a measurement system or a quantitative measure of the closeness of reported date to the true value. Accuracy can be undermined by such factors as field contamination of samples, poor preservation of samples, poor sample preparation techniques and poor selection of analysis techniques by the analysing laboratory. Accuracy is assessed by reference to the analytical results of laboratory control samples, laboratory spikes, laboratory blanks and analyses against reference standards.

  The nominal "acceptance limits" on laboratory control samples are defined as follows:

  – Laboratory spikes – 70-130% for metals / inorganics 60-140% for organics.

  – Laboratory duplicates – <30% for metals / inorganics, <50% for organics.

  – Laboratory blanks – <practical quantitation limit.

Accuracy of field works is assessed by examining the level of contamination detected in field and equipment blanks. Blanks should return concentrations of all organic analytes as being less than the practical quantitation limit of the testing laboratory.

6.3 Investigation and Analytical Methodology

6.3.1 Field Investigation

Field investigation included excavation of test pits using a 5-tonne excavator on the 4th March 2024. Twenty-one locations (identified as TP 1 to TP 21) were excavated across the site at accessible locations. Refer to Drawing No 6 for the test pit locations.

The test pits were excavated to depths varying from 0.7m to 2.8m below existing ground surface. To aid assessment of the strength of the subsurface profile, hand penetrometer tests were carried out in the test pits.

The test pits were observed for groundwater during and upon completion of the excavation. Field screening was conducted using a photoionisation detector (PID) device. The field results together with details of the strata encountered are presented in Table 1.

GeoEnviro Consultancy's standard procedures were used for sampling and more information on the procedures adopted is provided in Appendix F.

A Photoionisation Detector (PID) was used to identify the presence of volatile ionisable compounds in the samples collected during our investigation. More information on the procedures used and the PID are provided in Appendix G. The results of the screening measured in parts per million (ppm) are included in Table 1. The PID Calibration Certificate is attached in Appendix G.

6.3.2 Sampling Plan

A sampling plan was prepared based on grid-based sampling protocol. Soil sampling was conducted at all 21 sampling points (i.e., test pits) and a total of 26 soil samples were analysed. Surface and deeper soil samples were taken for laboratory testing as follows;

Area	Samples	Analytes	No of Samples
Building Envelopes	TP 12 (0.0-0.1m), TP 17 (0.5-0.6m), TP 21 (1.0-1.1m)	Heavy Metals, OCP, PCB, TRH, BTEX, PAH, Asbestos	3
	TP 11 (0.1-0.2m), TP 15 (0.0-0.1m), TP 17 (1.6-1.7m), TP 18 (0.5-0.6m), TP 20 (0.3-0.4m)	Heavy Metals, TRH, BTEX, PAH, Asbestos	5
	TP 10 (0.3-0.4m), TP 16 (0.0-0.1m), TP 21 (0.0-0.1m)	Heavy Metals	3
	TP 17 (frag)	Asbestos	1
Other Areas	TP 4 (0.0-0.1m), TP 8 (0.3-0.4m),	Heavy Metals, OCP, PCB, TRH, BTEX, PAH, Asbestos	2
	TP 1 (0.0-0.1m), TP 2 (0.3-0.4m), TP 5 (0.4-0.5m), TP 7 (0.6-0.7m), TP 9 (0.0-0.1m), TP 16 (0.3-0.4m),	Heavy Metals, TRH, BTEX, PAH, Asbestos	6
	TP 1 (0.4-0.5m), TP 2 (0.0-0.1m), TP 4 (0.4-0.6m), TP 5 (0.0-0.1m), TP 6 (0.0-0.1m), TP 7 (0.1-0.2m), TP 16 (1.3-1.4m),	Heavy Metals	7
	TP 8 (frag)	Asbestos	1

The laboratory results are summarised in Tables 3 to 8. The laboratory test results are detailed on the attached Laboratory Test Report in Appendix H.

Soil analysis was performed by Envirolab Services Pty Ltd, a laboratory accredited by the National Association of Testing Authorities (NATA) for the tests performed. The analytical results and methods employed are presented in the Laboratory Test Report in Appendix H.

6.3.3 Laboratory Analysis

As part of the soil sampling program, selected soil samples were submitted to the nominated contracted laboratory for analysis of contaminants of potential concern consisting of the following;

- Heavy Metals - Arsenic (As), Cadmium (Cd), Chromium (Cr), Copper (Cu), Mercury (Hg), Lead (Pb), Nickel (Ni) and Zinc (Zn)
- Organochlorine Pesticides (OCP).
- Polychlorinated Biphenyls (PCB)
- Total Recoverable Hydrocarbons (TRH)
- Benzene, Toluene, Ethyl Benzene and Xylene (BTEX)
- Polycyclic Aromatic Hydrocarbon (PAH)
- Asbestos
- pH

Asbestos analysis is based on 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.

Individual samples were taken for laboratory analysis. The soil analytical schedule completed is presented in Table 2. The following is a summary of analysis undertaken;

Analytes	**No of Samples**	**Samples**
Heavy Metals, OCP, PCB, TRH, BTEX, PAH, Asbestos	5	TP 4 (0.0-0.1m), TP 8 (0.3-0.4m), TP 12 (0.0-0.1m), TP 17 (0.5-0.6m), TP 21 (1.0-1.1m)
Heavy Metals, TRH, BTEX, PAH, Asbestos	11	TP 1 (0.0-0.1m), TP 2 (0.3-0.4m), TP 5 (0.4-0.5m), TP 7 (0.6-0.7m), TP 9 (0.0-0.1m), TP 11 (0.1-0.2m), TP 15 (0.0-0.1m), TP 16 (0.3-0.4m), TP 17 (1.6-1.7m), TP 18 (0.5-0.6m), TP 20 (0.3-0.4m)
Heavy Metals	10	TP 1 (0.4-0.5m), TP 2 (0.0-0.1m), TP 4 (0.4-0.6m), TP 5 (0.0-0.1m), TP 6 (0.0-0.1m), TP 7 (0.1-0.2m), TP 10 (0.3-0.4m), TP 16 (0.0-0.1m), TP 16 (1.3-1.4m), TP 21 (0.0-0.1m)
Asbestos	2	TP 8 (frag), TP 17 (frag)

6.4 Results of the Investigation

6.4.1 Subsurface Conditions

Reference should be made to the attached Table 1 for a summary of subsurface profiles encountered in each test pit locations. The following is a summary of subsurface conditions noted;Topsoil and Topsoil/Fill

Topsoil and Topsoil/Fill consisting of Gravelly Sandy Silt and Clayey Silt was encountered on the surface of all test pits or below the fill in TP 1, 4, 5, 8, 15 and 16 with thickness ranging from 100mm to 500mm.

Fill

Fill was encountered on the surface and below the topsoil/fill in all test pits except TP 6 and 15 comprising of Gravelly Clayey Sandy/Gravelly Sandy Clay, Gravelly Silty Clay, Silty Clay and Clayey Silt. Some foreign inclusions were encountered in TP 1, 8, 16 and 17 including asphalt, concrete, glass, metal, plastic, tile and Styrofoam fragments with fibre-cement fragments encountered in TP 8 and 17.

The fill was found to have thickness ranging from 0.2m to 2.1m below existing ground level and was generally assessed to be dry to moist.

Natural Soil

Natural soil was encountered below the topsoil, topsoil/fill and fill in all test pits generally of medium plasticity Silty Clay and Gravelly Silty Clay with varying amounts of ironstone gravel and bands.

Based on the hand penetrometer test results, the natural clay was generally assessed to be dry to moist (ie moisture content less than or equal to the plastic limit) and very stiff to hard.

Bedrock

Bedrock consisting of Shale was encountered in TP 3 to 9, 11, 12, 15 and 18 to 21 at depths ranging from 0.6m to 2.4m below existing ground level.

Groundwater

Groundwater was not encountered in any of the test pits during the investigation. The test pits were taken to a maximum depth of 2.8m below existing ground level, therefore, the depth to groundwater in the majority of the site is expected to exceed this depth.

6.4.2 Laboratory Test Results

Heavy Metals

Twenty-six primary soil samples were analysed for a range of heavy metals consisting of As, Cd, Cr, Cu, Pb, Hg, Ni and Zn. The reported concentrations of metals were below the laboratory's limit of reporting (LOR) and/or the assessment criteria except in TP 1 (0.4-0.5m) which encountered slightly elevated concentrations of Copper and Nickel of 110mg/kg and 20mg/kg respectively above the ESL Criteria of 70mg/kg and 15mg/kg. The results are summarised in Table 3.

Organochlorine Pesticides (OCP)

Five primary soil samples were analysed for a range of OCP. The reported concentrations of OCP were below the laboratory's LOR and/or the assessment criteria. The results are summarised in Table 4.

Polychlorinated Biphenyls (PCB)

Five primary soil samples were analysed for a range of PCBs. The reported concentrations of PCBs were below the laboratory's LOR and/or the assessment criteria. The results are summarised in Table 5.

Total Recoverable Hydrocarbons (TRH and BTEX)

Sixteen primary soil samples were analysed for TRH and BTEX. The reported concentrations of TRH and BTEX were below the laboratory's LOR and/or the assessment criteria. The results are summarised in Table 6.

Polycyclic Aromatic Hydrocarbons (PAH)

Sixteen primary soil samples were analysed for PAH. The reported concentrations of PAH were below the laboratory's LOR and/or the assessment criteria. Minor concentrations of Total PAH was encountered in some samples ranging from 0.17mg/kg to 4.7mg/kg below the HIL Criteria of 300mg/kg. The results are summarised in Table 7.

Asbestos

Sixteen primary soil samples and two material samples were analysed for the presence of asbestos. All soil samples analysed did not detect respirable asbestos fibres (ie Asbestos Fines [AF] or Fibrous Asbestos [FA]). The material samples in TP 8 and 17 confirm the presence of Chrysotile and Amosite Asbestos.

6.5 Quality Assurance/Quality Control (QA/QC)

6.5.1 Chain of Custody Forms and Preservation

The fieldwork for this investigation was carried out in accordance with GeoEnviro Consultancy's Standard procedures. This included collection of samples in new glass jars, preservation of samples in ice chests and transport of samples to the contract laboratory under chain of custody documentation. Refer to Appendix F for details.

6.5.2 Intra-laboratory Duplicates

An intra-laboratory duplicate is a QC sample that is used to determine the precision associated with all or part of the sample collection. Field duplicates are two independent samples that are collected to assess the homogeneity and reproducibility of the sampling technique. To measure the precision and/or homogeneity, a Relative Percentage Difference (RPD) value is calculated between the primary and duplicate sample. A zero RPD means perfect agreement of results between the primary and duplicate sample whilst an RPD above 200% indicates total disagreement in results.

Two duplicate samples (DUP A and B) were prepared from the primary samples (TP 4 and 18) respectively and analysed. This complies with the NEPM 2013 frequency requirement of 5% (i.e. 1 in 20 primary samples). Refer to Table 9 for details.

Duplicate	Primary Sample	Maximum RPD
DUP A	TP 4 (0.0-0.1m)	Chromium - 40%
DUP B	TP 18 (0.5-0.6m)	Zinc - 51.9%

The internal laboratory QA/QC results which are presented in the laboratory certificates in Appendix H are considered acceptable based on the duplicate and control samples analysed. The RPDs confirm the homogeneity and reproducibility of the sampling technique.

6.5.3 Inter-laboratory Triplicate

An inter-laboratory triplicate is a QC sample that is used to assess the precision and/or reproducibility of the results between individual laboratories and provides a degree of confidence that the analysis conducted by the main laboratory are acceptable. To measure the precision and/or homogeneity, a Relative Percentage Difference (RPD) value is calculated between the primary and duplicate sample. A zero RPD means perfect agreement of results between the primary and duplicate sample whilst an RPD above 200% indicates total disagreement in results.

Two triplicate samples (TRP A and B) were prepared from the primary samples (TP 4 and 18) respectively and analysed by an independent NATA accredited laboratory, Envirolab (Melbourne). Refer to Table 9 for details.

Triplicate	Primary Sample	Maximum RPD
TRP A	TP 4 (0.0-0.1m)	Lead - 155.6%
TRP B	TP 18 (0.5-0.6m)	Lead - 169.2%

The above RPD values exceed GeoEnviro's acceptance criteria of 50% although due to the low analyte concentrations and general heterogenous nature of the samples, these are considered acceptable.

The internal laboratory QA/QC results which are presented in the laboratory certificates in Appendix H are considered acceptable based on the duplicate and control samples analysed. The overall results suggest that the laboratory analysis carried out is reliable for this assessment.

6.5.4 Trip Blank

One trip blank sample was taken to the site during our investigation and kept in the same storage containers as the soil samples recovered from the site. The purpose of a trip blank is to detect any introduction of contaminants into the samples during the transportation to the laboratory. The trip blank together with the collected soil samples were sent to Envirolab and analysed for BTEX. Concentrations of BTEX in the trip blank sample was found to be below the laboratory detection limits. The results of the trip blank are summarized in Table 9.

6.5.5 Rinsate

One rinsate sample was collected during our investigation in order to identify possible cross contamination between sampling locations and analysed for Heavy Metals. All concentrations of heavy metals in the rinsate samples were found to be below the laboratory detection limits and this is considered acceptable. The results of the rinsate sample are summarized in Table 9.

6.5.6 Spike sample

A field spiked sample to assess effects of organic chemicals reaction within the soil matrix during sampling, extraction and analysis was not considered necessary due to the absence of volatile compounds present within the site. Therefore, a trip spike sample was not utilised.

6.5.7 Laboratory QA

Envirolab Services carried out internal QA/QC procedures which normally includes one or more of the following;

- Preparation and analysis of duplicate and triplicate samples to assess precision of laboratory results,
- A spike and duplicate spike is prepared for each sample batch. This involves spiking a sample with a known concentration of contaminant to verify the absence of matrix effects and to assess precision,
- Analysis of sample batch as reagent blanks to monitor reagent purity and as an over-all procedural blank. Reagent blank will also be run after samples with a high concentration to prevent carry over.
- A surrogate is added to all samples to monitor sample matrix effects throughout all analytical stages by calculating the % recovery at the completion of the analysis.

The laboratory control results are included in the laboratory test reports in Appendix H.

6.5.8 QA/QC Assessment

The QA/QC indicators either all complied with the required standards or showed variations that would have no significant effect on the quality or interpretation of the data. The results of the QA/QC data indicated all results for the method blanks were less than Practical Quantitation Limit (PQL) and most matrix spike recoveries were between 70% and 130%.

It is therefore assessed that for the purposes of this investigation, the QA/QC results are adequate and the quality of the data is acceptable for use in this contamination assessment.

7. CONCEPTUAL SITE MODEL

7.1 Site Characterisation

Based on historical information and aerial photographs, the Subject Site appears to have been vacant with no apparent land use except for drainage purposes for at least the last 30 years although there appeared to have been significant land disturbance over the years with a previous dam also being filled in and the swale being constructed. As part of these works, it is likely fill to have been placed throughout the site.

A site visit was carried out on the 4th March 2024 by an environmental scientist to observe existing site features and identify obvious or suspected areas of potential contamination. At the time of our site inspection, the site was largely vacant with grass cover and a large vegetated stockpile at the south-western portion of the site which may have been generated from construction of the swale within the property. There was a swale transecting the middle of the site in a north-south direction from the adjoining residential properties to the south to the dam to the north. There was also an access road along the northern boundary of the site. The eastern boundary of the site falls steeply to the east at angles of between 20and 40 degrees to the remainder of the property.

Soil sampling was carried out on the 4th March 2024 and involved excavation at twenty-one locations (TP 1 to TP 21) at accessible locations. Soil sampling was conducted at all twenty-one sampling points (i.e. test pits). The following is a summary of the subsurface profiles encountered;

- Topsoil and Topsoil/Fill consisting of Gravelly Sandy Silt and Clayey Silt was encountered on the surface of all test pits or below the fill in TP 1, 4, 5, 8, 15 and 16 with thickness ranging from 100mm to 500mm.

- Fill was encountered on the surface and below the topsoil/fill in all test pits except TP 6 and 15 comprising of Gravelly Clayey Sandy/Gravelly Sandy Clay, Gravelly Silty Clay, Silty Clay and Clayey Silt. Some foreign inclusions were encountered in TP 1, 8, 16 and 17 including asphalt, concrete, glass, metal, plastic, tile and Styrofoam fragments with fibre-cement fragments encountered in TP 8 and 17. The fill was found to have thickness ranging from 0.2m to 2.1m below existing ground level and was generally assessed to be dry to moist.

- Natural soil was encountered below the topsoil, topsoil/fill and fill in all test pits generally of medium plasticity Silty Clay and Gravelly Silty Clay with varying amounts of ironstone gravel and bands. Based on the hand penetrometer test results, the natural clay was generally assessed to be dry to moist (ie moisture content less than or equal to the plastic limit) and very stiff to hard.

- Bedrock consisting of Shale was encountered in TP 3 to 9, 11, 12, 15 and 18 to 21 at depths ranging from 0.6m to 2.4m below existing ground level.

Soil sampling was conducted at all 21 sampling points (i.e., test pits) and a total of 26 soil samples were analysed for a range of COPC including heavy metals (As, Cd, Cr, Cu, Hg, Pb, Ni and Zn), OCP, PCB, TRH, BTEX and asbestos.

The reported concentrations of COPC did not exceed the laboratory's LOR and/or assessment criteria except for the following;

- TP 1 (0.4-0.5m) which encountered slightly elevated concentrations of Copper and Nickel of 110mg/kg and 20mg/kg respectively above the ESL Criteria of 70mg/kg and 15mg/kg. These concentrations are not considered significant and therefore acceptable.

- The material samples in TP 8 and 17 confirm the presence of Chrysotile and Amosite Asbestos.

The absence of apparent widespread chemical contaminations within the soil indicates that the potential for groundwater contamination at the site is low and the potential off-site impacts of contaminants on groundwater and waterbodies are also negligible.

7.2 Identified Contamination

Based on the results of the investigation, the potential contamination on site is as defined below;

Location	Contaminant/Issues
TP 8	Uncontrolled Fill and asbestos
TP 17	Uncontrolled Fill and asbestos

7.3 Exposure Pathways

Taking into consideration the existing land use and the future site development activities, the contaminants identified above have the potential to be mobilised through dermal, inhalation and ingestion particularly to workers on site and adjacent land users during construction.

7.4 Sensitive Receptors

Based on the results of the investigation, the receptors of environmental impacts on the subject site include mainly construction and maintenance workers during construction site redevelopment, and land users in adjacent areas.

8. CONCLUSION AND RECOMMENDATIONS

We understand the proposed development will include subdivision of the site into 9 rural residential lots and construction of residential roads.

Within the context of the scope of work, we are of the opinion that the risk of gross chemical contamination within the Subject Site is generally considered to be low and therefore suitable for the proposed residential subdivision development subject to removal of the Asbestos impacted fill in TP 8 and 17 to an EPA approved landfill facility. The removal of the asbestos impacted material may be undertaken during earthworks and road construction. Following excavation of the impacted material, these areas should be validated by sampling and laboratory analysis to ensure all asbestos impacted material is removed from the areas.

The proposed residential development would need to take into consideration the following environmental issues;

- Fill was encountered over the majority of the site with traces of anthropogenic materials (ie asphalt, concrete, glass, metal, plastic, tile and Styrofoam fragments). Further assessment or validation of the insitu fill may be carried during earthworks/construction. Should contamination be present during development, remediation and validation will be required to ensure the site is made suitable for the proposed development.
- General fill soils removed from the property must first be formally classified as per the EPA NSW Waste Classification Guidelines - Part 1: Classifying Waste (Nov 2014) prior to disposal. It is recommended that the waste classification sample be collected from stored stockpiles during the excavation procedure.

- Any imported fill shall be sampled prior to importation and shall conform to VENM (virgin excavated natural material) as per EPA NSW Waste Classification Guidelines - Part 1: Classifying Waste (Nov 2014).
- Though our investigation did not encounter widespread contamination, it is still possible for localised contamination to occur in areas not investigated. Should contamination be encountered during construction, all works should cease and an "Unexpected Asbestos Finds Protocol" as outlined in Appendix F should be initiated.

9. LIMITATIONS

This report is solely for the use of the client or client's representative and relevant authorities and no responsibility is accepted for the use of this report or part by third parties. 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

We have used a degree of care, skill and diligence normally exercised by consulting engineers in similar circumstances and locality. The findings contained in this report are the results of Discrete/specific sampling methodologies used in accordance with normal practices and standards. There is no investigation which is thorough enough to preclude the presence of material which presently, or in future, may be considered hazardous to the site.

As regulatory evaluation criteria are constantly updated, concentrations of contaminants presently considered low, may in the future fall short of regulatory standards that require further investigation/redemption.

The statements presented in these documents are intended to advise you of what should be your realistic expectations of this report, and to present you with recommendations on how to minimise the risks associated with the ground works for this project. The document is not intended to reduce the level of responsibility accepted by GeoEnviro Consultancy Pty Ltd, but rather to ensure that all parties who may rely on this report are aware of the responsibilities each assumes in so doing. Attached in Appendix I are documents entitled "Important Information about Your Environmental Site Assessment" and Explanatory Notes in conjunction with which this report must be read, as it details important limitations regarding the investigation undertaken and this report. No other warranty expressed or implied is made or intended

Subject to payment of all fees due for the investigation, the client alone has a licence to use this report. Copyright is this report is the property of GeoEnviro Consultancy Pty Ltd.

This report shall not be reproduced except in full.

C:\\24JOB\471\A\JC24471A-r1(rev)

REFERENCES

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8. *Part 1 – Classifying Waste – 2015, NSW EPA*
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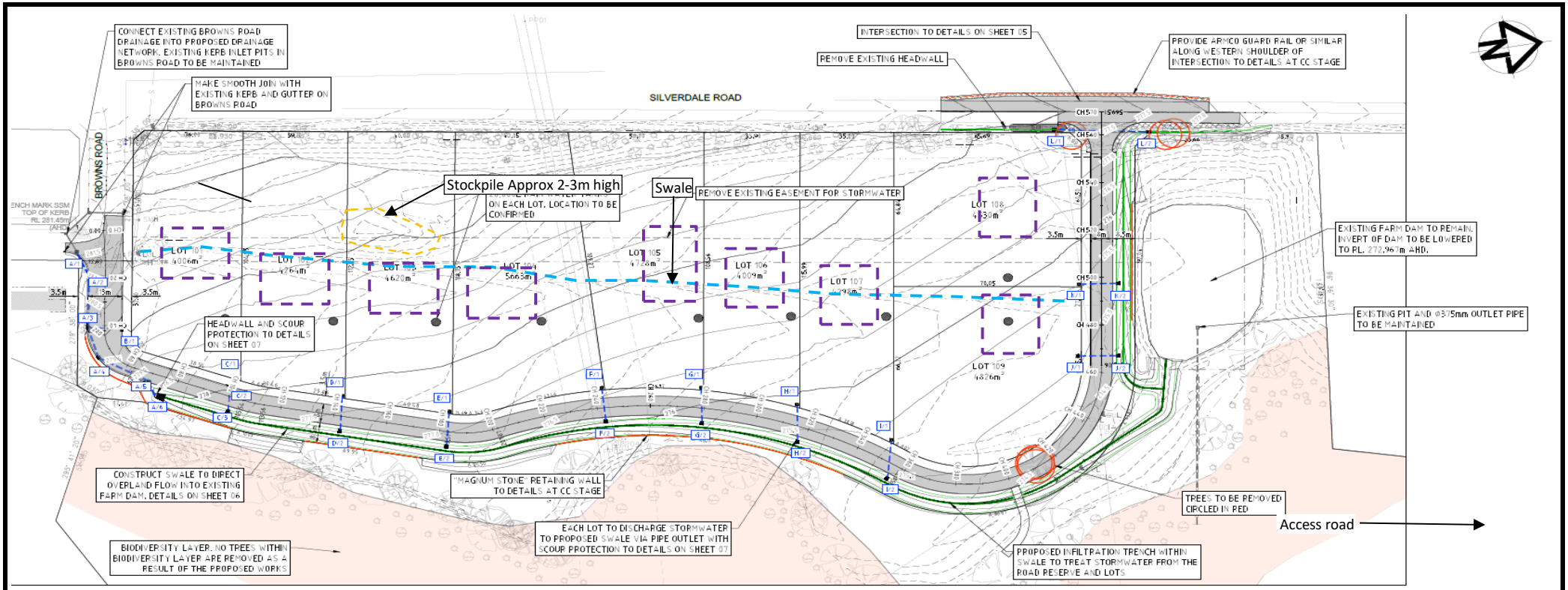
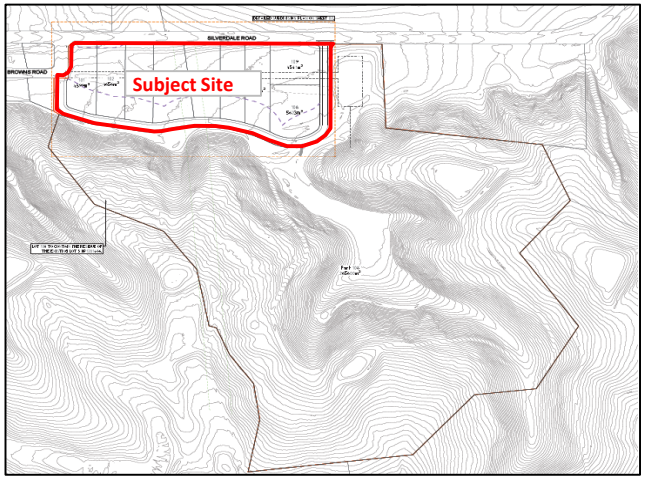
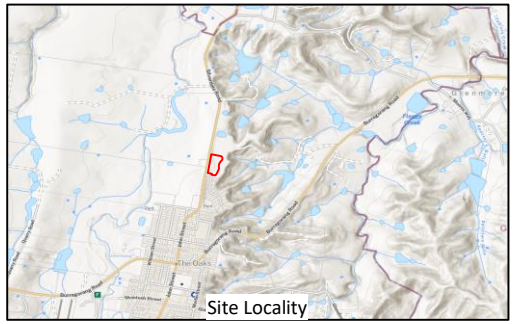






Legend

Subject Site

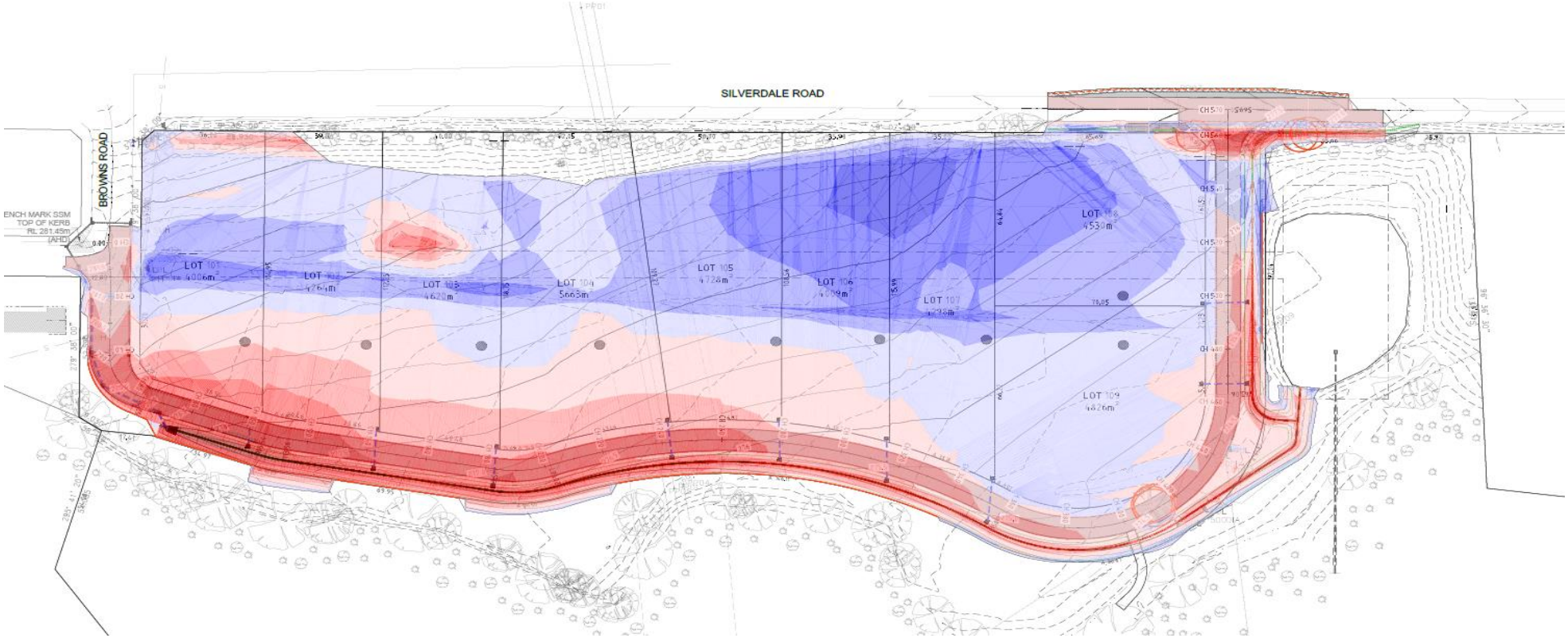
Proposed Building Envelope

GeoEnviro Consultancy Pty Ltd

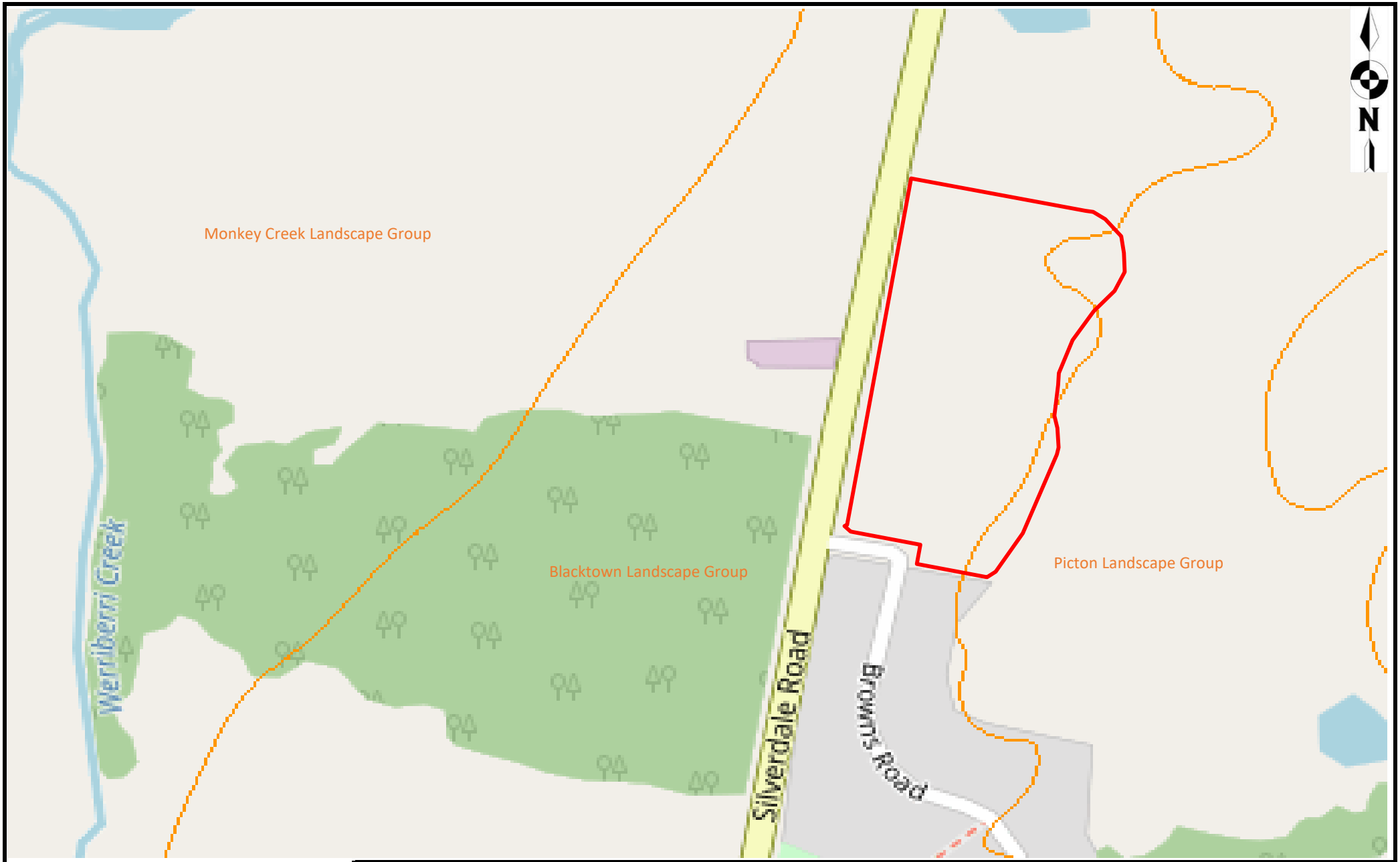
Unit 5, 39-41 Fourth Avenue, Blacktown NSW 2148, Australia

Tel: (02) 9679 8733 Fax: (02) 9679 8744

Drawn By: AT	Date: 18/3/24	**Proficient Constructions (Aust) Pty Ltd**	
Checked By: SL	Date: 18/3/24	**80 Silverdale Road The Oaks**	
Revision By:	Date:	**Site Locality and Proposed Development Plan**	
Scale: Not to Scale	A3	**Project No: JC24471A**	**Drawing No: 1**



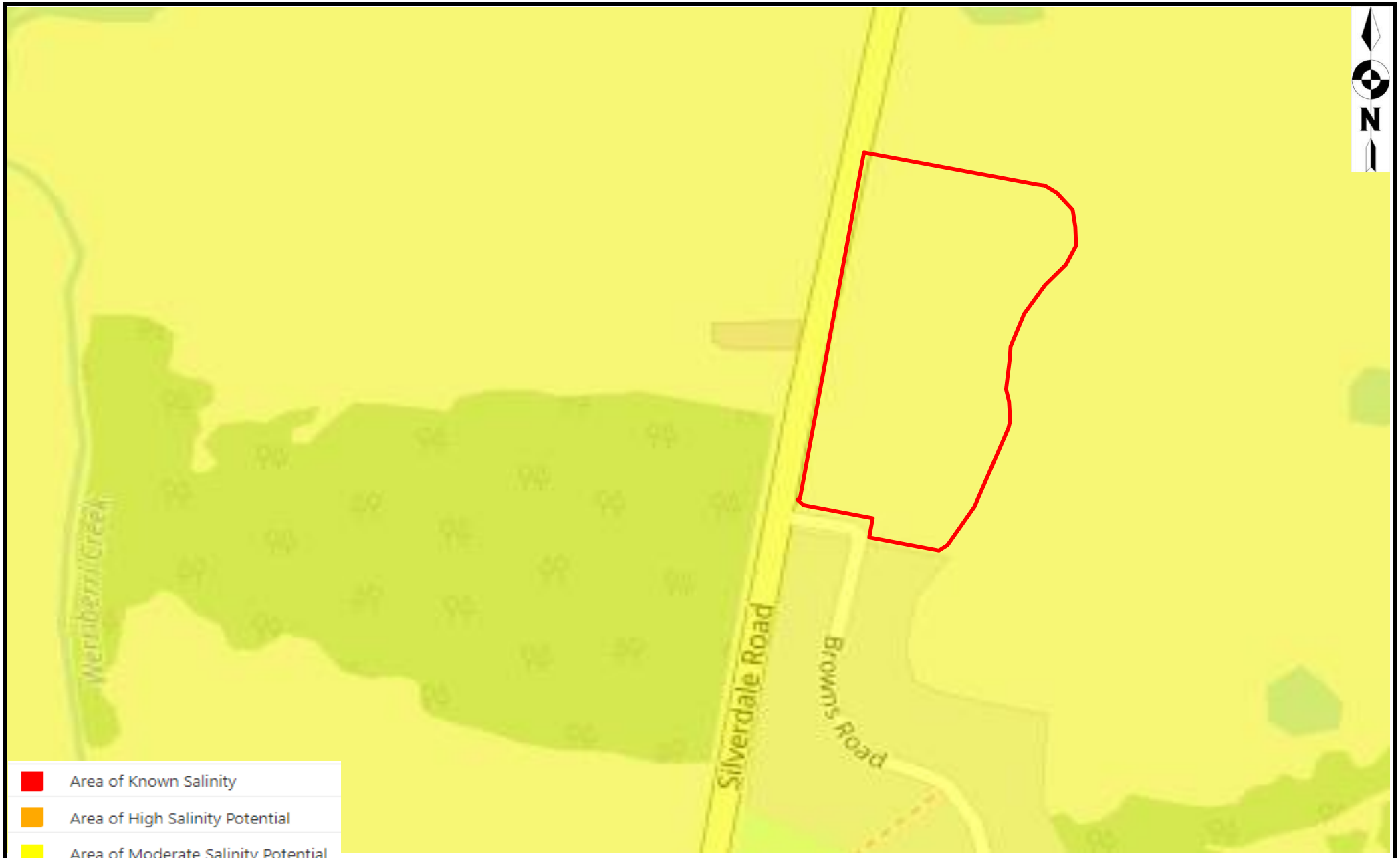
GeoEnviro Consultancy Pty Ltd Unit 5, 39-41 Fourth Avenue, Blacktown NSW 2148, Australia Tel: (02) 9679 8733 Fax: (02) 9679 8744	Drawn By: AT	Date: 18/3/24	**Proficient Constructions (Aust) Pty Ltd** **80 Silverdale Road The Oaks** **Proposed Cut Fill Plan**	
	Checked By: SL	Date: 18/3/24		
	Revision By:	Date:		
	Scale: Not to Scale	A3	Project No: JC24471A	Drawing No: 2



GeoEnviro Consultancy Pty Ltd
Unit 5, 39-41 Fourth Avenue, Blacktown NSW 2148, Australia
Tel: (02) 9679 8733 Fax: (02) 9679 8744

Drawn By: AT	Date: 18/3/24	Proficient Constructions (Aust) Pty Ltd	
Checked By: SL	Date: 18/3/24	80 Silverdale Road The Oaks	
Revision By:	Date:	Soil Landscape Map	
Scale: Not to Scale	A3	Project No: JC24471A	Drawing No: 3

GeoEnviro Consultancy Pty Ltd	Drawn By: AT	Date: 18/3/24	**Proficient Constructions (Aust) Pty Ltd**
Unit 5, 39-41 Fourth Avenue, Blacktown NSW 2148, Australia	Checked By: SL	Date: 18/3/24	**80 Silverdale Road The Oaks**
Tel: (02) 9679 8733 Fax: (02) 9679 8744	Revision By:	Date:	**Geological Map**
	Scale: Not to Scale	A3	**Project No: JC24471A** / **Drawing No: 4**



GeoEnviro Consultancy Pty Ltd
Unit 5, 39-41 Fourth Avenue, Blacktown NSW 2148, Australia
Tel: (02) 9679 8733 Fax: (02) 9679 8744

Drawn By: AT	Date: 18/3/24	Proficient Constructions (Aust) Pty Ltd 80 Silverdale Road The Oaks Salinity Potential Map	
Checked By: SL	Date: 18/3/24		
Revision By:	Date:		
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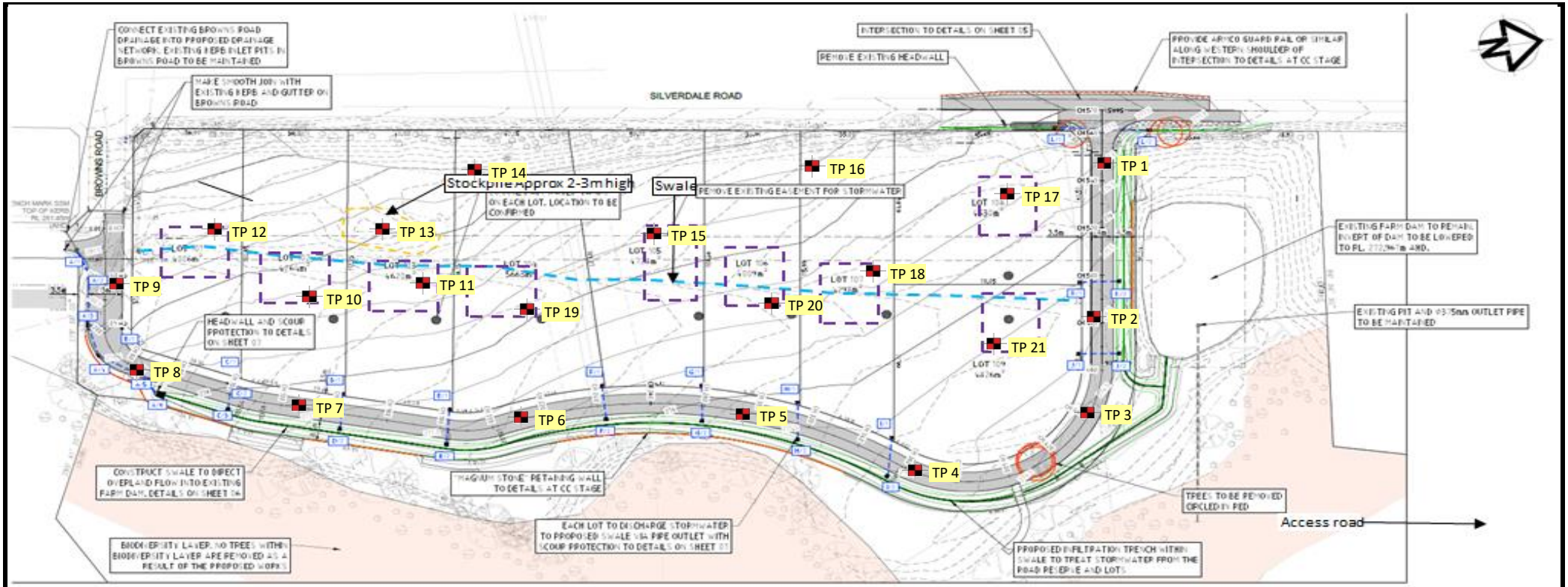

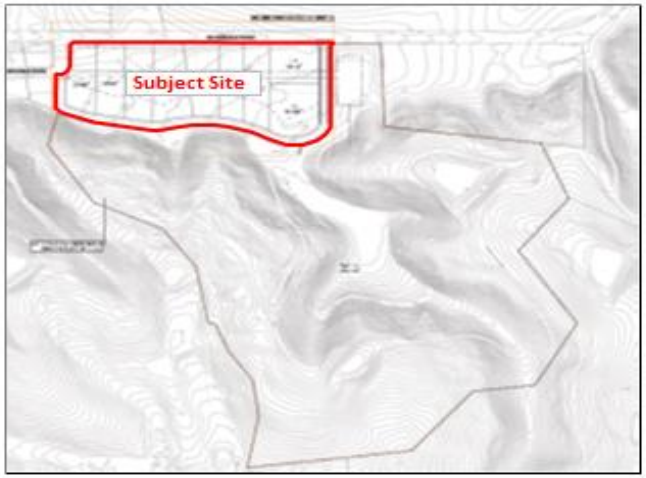

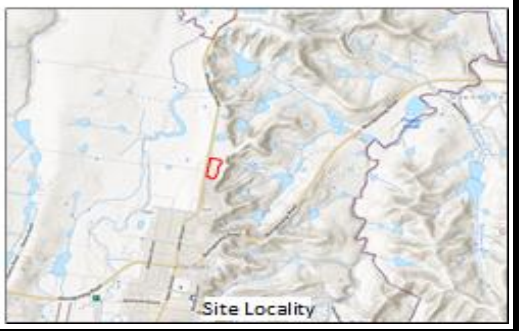

Legend

Test Pit

GeoEnviro Consultancy Pty Ltd

Unit 5, 39-41 Fourth Avenue, Blacktown NSW 2148, Australia

Tel: (02) 9679 8733 Fax: (02) 9679 8744

Drawn By: AT	Date: 18/3/24	Proficient Constructions (Aust) Pty Ltd
Checked By: SL	Date: 18/3/24	80 Silverdale Road The Oaks
Revision By:	Date:	Test Pit Location Plan
Scale: Not to Scale	A3	Project No: JC24471A / Drawing No: 6

Test Pit Number	Depth (m)	Profile Type	Description	PID (ppm)
1	0.00 - 0.15	Topsoil/Fill	Gravelly Sandy Silt: low liquid limit, brown, moist	2.7
	0.15 - 0.90	Fill	Gravelly Clayey Sand/Gravelly Sandy Clay: fine to coarse grained/low plasticity, dark brown with trace asphalt and concrete pieces, dry to moist	
	0.90 - 2.10	Natural	(CI) Gravelly Silty Clay: medium plasticity, grey red brown, dry to moist, hard PP=550kPa	
	2.10 - 2.20	Natural	As above with ironstone bands (refusal)	
2	0.00 - 0.30	Fill	Gravelly Silty Clay: medium plasticity, red brown grey, dry to moist	1.0
	0.30 - 0.60	Fill	As above but grey brown with shale gravel, dry	
	0.60 - 2.30	Natural	(CI) Gravelly Silty Clay: medium plasticity, grey red brown, dry, hard PP>600kPa	
	2.30 - 2.60	Natural	As above but grey brown with shale bands, dry	
3	0.00 - 0.70	Fill	Gravelly Silty Clay: medium plasticity, red brown grey, dry to moist	2.6
	0.70 - 1.10	Natural	(CI) Gravelly Silty Clay: medium plasticity, grey red brown, dry, hard PP=550-600kPa	
	1.10 - 1.30	Natural	As above but grey with shale and ironstone bands, dry	
	1.30 - 1.40	Bedrock	Shale: grey, low to medium strength, distinctly weathered (refusal)	
4	0.00 - 0.30	Topsoil/Fill	Clayey Silt: low liquid limit, brown, dry	1.9
	0.30 - 0.90	Fill	Silty Clay: medium plasticity, grey with gravel, dry	
	0.90 - 1.40	Natural	(CI) Silty Clay: medium plasticity, grey with ironstone gravel, dry	
	1.40 - 1.50	Bedrock	Shale: grey, low to medium strength, distinctly weathered (refusal)	
5	0.00 - 0.25	Topsoil/Fill	Clayey Silt: low liquid limit, brown with gravel, dry	0.9
	0.25 - 0.90	Fill	Gravelly Silty Clay: medium plasticity, brown grey, dry to moist, hard PP=480kPa	
	0.90 - 1.00	Topsoil	Clayey Silt: low liquid limit, pale brown, dry	
	1.00 - 1.50	Natural	(CI) Silty Clay: medium plasticity, grey brown red with gravel, dry, hard PP>600kPa	
	1.50 - 1.60	Bedrock	Shale: grey, low to medium strength, distinctly weathered (refusal)	
6	0.00 - 0.60	Natural	(CI) Gravelly Silty Clay: medium plasticity, brown, dry	1.1
	0.60 - 0.70	Natural	As above but grey with shale gravel, dry	
	0.70 - 0.80	Bedrock	Shale: grey, low to medium strength, distinctly weathered (refusal)	
7	0.00 - 0.60	Fill	Gravelly Silty Clay: medium plasticity, brown, dry to moist	1.3
	0.60 - 0.90	Fill	As above but grey, dry	
	0.90 - 1.40	Natural	(CI) Silty Clay: medium plasticity, brown grey with gravel, dry	
	1.40 - 1.60	Bedrock	Shale: grey, low to medium strength, distinctly weathered (refusal)	

Note:
PP = Pocket Penetrometer
MC = Moisture Content
PL = Plastic Limit

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TABLE 1 (Page 1 of 3)
SUMMARY OF SOIL PROFILE

Proficient Constructions (Aust) Pty Ltd
Proposed Residential Subdivision Development
No 80 Silverdale Road Silverdale

Test Pit Number	Depth (m)	Profile Type	Description	PID (ppm)
8	0.00 - 0.80	Fill	Clayey Silt: low liquid limit, brown with glass, metal and 2 fibre-cement fragments, dry	2.3
	0.80 - 1.00	Fill	Gravelly Silty Clay: medium plasticity, grey brown, dry	
	1.00 - 1.40	Topsoil	Clayey Silt: low liquid limit, brown, dry	
	1.40 - 1.80	Natural	(CI) Gravelly Silty Clay: medium plasticity, brown, dry	
	1.80 - 2.00	Bedrock	Shale: grey, low to medium strength, distinctly weathered (refusal)	
9	0.00 - 0.20	Fill	Gravelly Silty Clay: medium plasticity, brown, dry	2.9
	0.20 - 0.60	Natural	(CI) Gravelly Silty Clay: medium plasticity, grey brown, dry	
	0.60 - 0.70	Bedrock	Shale: grey, low to medium strength, distinctly weathered (refusal)	
10	0.00 - 1.20	Fill	Gravelly Silty Clay: medium plasticity, brown, dry	1.4
Building envelope	1.20 - 2.10	Natural	(CI) Gravelly Silty Clay: medium plasticity, grey brown with ironstone bands, dry to moist	
11	0.00 - 0.60	Fill	Gravelly Silty Clay: medium plasticity, brown, dry to moist	3.2
Building	0.60 - 0.80	Natural	(CI) Silty Clay: medium plasticity, brown, dry to moist	
envelope	0.80 - 1.30	Natural	(CI) Gravelly Silty Clay: medium plasticity, grey with ironstaining and ironstone bands, dry to moist	
	1.30 - 1.50	Bedrock	Shale: grey brown, low to medium strength, extremely weathered to distinctly weathered (refusal)	
12	0.00 - 0.20	Fill	Gravelly Silty Clay: medium plasticity, brown grey, dry to moist	1.7
Building	0.20 - 0.40	Natural	(CI) Gravelly Silty Clay: medium plasticity, brown, dry	
envelope	0.40 - 1.20	Natural	(CI) Gravelly Silty Clay: medium plasticity, grey with ironstone bands, dry	
	1.20 - 1.30	Bedrock	Shale: grey, low to medium strength, distinctly weathered (refusal)	
13	0.00 - 2.10	Fill	Clayey Silt: low liquid limit, brown with clay inclusions, dry to moist	0.4
Stockpile	2.10 - 2.70	Natural	(CI) Silty Clay: medium plasticity, brown with gravel, moist, very stiff PP=220kPa	
	2.70 - 2.80	Natural	As above but grey red with gravel, moist	
14	0.00 - 0.20	Fill	Silty Clay: medium plasticity, brown with gravel, dry	0.6
	0.20 - 0.40	Natural	(CI) Gravelly Silty Clay: medium plasticity, grey with ironstone bands, dry (refusal on hard ironstone band)	
15	0.00 - 0.50	Topsoil	Clayey Silt: low liquid limit, dark brown, dry to moist	1.2
Building	0.50 - 1.00	Natural	(CI) Gravelly Silty Clay: medium plasticity, brown, dry to moist, very stiff PP=310-330kPa	
envelope	1.00 - 1.80	Natural	(CI) Gravelly Silty Clay: medium plasticity, grey brown, dry to moist, very stiff PP=380-400kPa	
	1.80 - 1.90	Bedrock	Shale: grey, low to medium strength, distinctly weathered (refusal)	

Note:
PP = Pocket Penetrometer
MC = Moisture Content
PL = Plastic Limit

GeoEnviro Consultancy

TABLE 1 (Page 2 of 3)
SUMMARY OF SOIL PROFILE

Proficient Constructions (Aust) Pty Ltd
Proposed Residential Subdivision Development
No 80 Silverdale Road Silverdale

Prepared By: ST Date: 15/04/2024
Checked By: SL Date: 15/04/2024

Test Pit Number	Depth (m)	Profile Type	Description	PID (ppm)
16	0.00 - 0.30	Topsoil/Fill	Gravelly Clayey Silt: low liquid limit, brown, dry	3.0
	0.30 - 0.80	Fill	Gravelly Silty Clay: medium plasticity, brown with a terracotta piece and plastic and tile fragments, dry	
	0.80 - 1.80	Fill	Gravelly Silty Clay: medium plasticity, grey brown, dry	
	1.80 - 2.40	Natural	(CI) Silty Clay: medium plasticity, grey with ironstone bands, dry (refusal on ironstone)	
17	0.00 - 1.60	Fill	Gravelly Silty Clay: low plasticity, brown dark grey with tile, glass fragments, styrofoam and 1 fibre-cement fragment, dry	0.8
Building	1.60 - 2.10	Fill	Silty Clay: low plasticity, brown with gravel, dry	
envelope	2.10 - 2.50	Natural	(CI) Silty Clay: medium plasticity, grey brown, dry to moist (refusal on ironstone bands)	
18	0.00 - 1.20	Fill	Silty Clay: medium plasticity, grey brown with gravel, dry to moist	1.0
Building	1.20 - 2.00	Natural	(CI) Gravelly Silty Clay: medium plasticity, grey brown, dry to moist	
envelope	2.00 - 2.40	Natural	As above but grey with ironstone bands, dry	
	2.40 - 2.50	Bedrock	Shale: grey, low to medium strength, distinctly weathered (refusal)	
19	0.00 - 0.80	Fill	Gravelly Silty Clay: medium plasticity, brown, dry to moist	2.9
Building	0.80 - 0.90	Natural	(CI) Gravelly Silty Clay: medium plasticity, grey brown with shale bands, dry	
envelope	0.90 - 1.00	Bedrock	Shale: grey brown, low strength, extremely weathered to distinctly weathered (refusal)	
20	0.00 - 1.20	Fill	Gravelly Silty Clay: medium plasticity, brown, dry to moist	0.5
Building	1.20 - 1.50	Natural	(CI) Silty Clay: medium plasticity, brown with gravel, dry to moist	
envelope	1.50 - 2.10	Natural	As above but grey brown, moist	
	2.10 - 2.20	Bedrock	Shale: grey brown, low strength, extremely weathered to distinctly weathered (refusal)	
21	0.00 - 1.70	Fill	Gravelly Silty Clay: medium plasticity, brown, dry to moist	2.5
Building	1.70 - 2.40	Natural	(CI) Gravelly Silty Clay: medium plasticity, grey, dry	
envelope	2.40 - 2.50	Bedrock	Shale: grey brown, low strength, extremely weathered to distinctly weathered (refusal)	

Note:
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MC = Moisture Content
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TABLE 1 (Page 3 of 3)
SUMMARY OF SOIL PROFILE

Proficient Constructions (Aust) Pty Ltd
Proposed Residential Subdivision Development
No 80 Silverdale Road Silverdale

Prepared By: ST Date: 15/04/2024
Checked By: SL Date: 15/04/2024

Sample	Depths (m)	Sample Date	Sample Type	Analysis														
				pH	Heavy Metals								OCP	PCB	TRH	BTEX	PAH	Asbestos
					As	Cd	Cr	Cu	Pb	Hg	Ni	Zn						
TP 1	0.0-0.1	04/03/2024	Soil		o	o	o	o	o	o	o	o			o	o	o	o
TP 1	0.4-0.5	04/03/2024	Soil	o	o	o	o	o	o	o	o	o						
TP 2	0.0-0.1	04/03/2024	Soil		o	o	o	o	o	o	o	o						
TP 2	0.3-0.4	04/03/2024	Soil		o	o	o	o	o	o	o	o			o	o	o	o
TP 4	0.0-0.1	04/03/2024	Soil		o	o	o	o	o	o	o	o	o	o	o	o	o	o
TP 4	0.4-0.6	04/03/2024	Soil		o	o	o	o	o	o	o	o						
TP 5	0.0-0.1	04/03/2024	Soil		o	o	o	o	o	o	o	o						
TP 5	0.4-0.5	04/03/2024	Soil	o	o	o	o	o	o	o	o	o			o	o	o	o
TP 6	0.0-0.1	04/03/2024	Soil		o	o	o	o	o	o	o	o						
TP 7	0.1-0.2	04/03/2024	Soil		o	o	o	o	o	o	o	o						
TP 7	0.6-0.7	04/03/2024	Soil		o	o	o	o	o	o	o	o			o	o	o	o
TP 8 (frag)	0.3-0.4	04/03/2024	Soil															o
TP 8	0.3-0.4	04/03/2024	Soil		o	o	o	o	o	o	o	o	o	o	o	o	o	o
TP 9	0.0-0.1	04/03/2024	Soil		o	o	o	o	o	o	o	o			o	o	o	o

Note: O denotes tested

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TABLE 2 (Page 1 of 3)
Analytical Program

Proficient Constructions (Aust) Pty Ltd

Proposed Residential Subdivision Development

No 80 Silverdale Road Silverdale

Sample	Depths (m)	Sample Date	Sample Type	Analysis														
				pH	Heavy Metals								OCP	PCB	TRH	BTEX	PAH	Asbestos
					As	Cd	Cr	Cu	Pb	Hg	Ni	Zn						
TP 10	0.3-0.4	04/03/2024	Soil		o	o	o	o	o	o	o	o						
TP 11	0.1-0.2	04/03/2024	Soil		o	o	o	o	o	o	o	o			o	o	o	o
TP 12	0.0-0.1	04/03/2024	Soil		o	o	o	o	o	o	o	o	o	o	o	o	o	o
TP 15	0.0-0.1	04/03/2024	Soil		o	o	o	o	o	o	o	o			o	o	o	o
TP 16	0.0-0.1	04/03/2024	Soil		o	o	o	o	o	o	o	o						
TP 16	0.3-0.4	04/03/2024	Soil		o	o	o	o	o	o	o	o			o	o	o	o
TP 16	1.3-1.4	04/03/2024	Soil		o	o	o	o	o	o	o	o						
TP 17	0.5-0.6	04/03/2024	Soil		o	o	o	o	o	o	o	o	o	o	o	o	o	o
TP 17 (frag)	0.5-0.6	04/03/2024	Soil															o
TP 17	1.6-1.7	04/03/2024	Soil	o	o	o	o	o	o	o	o	o			o	o	o	o
TP 18	0.5-0.6	04/03/2024	Soil		o	o	o	o	o	o	o	o			o	o	o	o

Note: O denotes tested

GeoEnviro Consultancy

TABLE 2 (Page 2 of 3)
Analytical Program

Proficient Constructions (Aust) Pty Ltd

Proposed Residential Subdivision Development

No 80 Silverdale Road Silverdale

Sample	Depths (m)	Sample Date	Sample Type	Analysis														
				pH	Heavy Metals								OCP	PCB	TRH	BTEX	PAH	Asbestos
					As	Cd	Cr	Cu	Pb	Hg	Ni	Zn						
TP 20	0.3-0.4	04/03/2024	Soil		o	o	o	o	o	o	o	o			o	o	o	o
TP 21	0.0-0.1	04/03/2024	Soil		o	o	o	o	o	o	o	o						
TP 21	1.0-1.1	04/03/2024	Soil		o	o	o	o	o	o	o	o	o	o	o	o	o	o
DUP A	-	04/03/2024	Soil		o	o	o	o	o	o	o	o	o	o	o	o	o	
DUP B	-	04/03/2024	Soil		o	o	o	o	o	o	o	o	o	o	o	o	o	
Blank 04/03/2	-	04/03/2024	Soil													o		
nsate 04/03/20	-	04/03/2024	Water		o	o	o	o	o	o	o	o						
TRP A	-	04/03/2024	Soil		o	o	o	o	o	o	o	o						
TRP B	-	04/03/2024	Soil		o	o	o	o	o	o	o	o						

Note: O denotes tested

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TABLE 2 (Page 3 of 3)
Analytical Program

Proficient Constructions (Aust) Pty Ltd

Proposed Residential Subdivision Development

No 80 Silverdale Road Silverdale

Sample	Depths (m)	pH	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
TP 1	0.0-0.1		<4	<0.4	8	28	100	<0.1	5	94
TP 1	0.4-0.5	0.3	7	<0.4	30	***110***	60	0.1	***20***	71
TP 2	0.0-0.1		8	<0.4	29	7	11	<0.1	4	10
TP 2	0.3-0.4		6	<0.4	7	30	15	<0.1	7	54
TP 4	0.0-0.1		16	<0.4	45	4	16	<0.1	4	10
TP 4	0.4-0.6		5	<0.4	6	11	11	<0.1	2	6
TP 5	0.0-0.1		9	<0.4	23	17	22	<0.1	6	34
TP 5	0.4-0.5	0.3	4	<0.4	20	5	9	<0.1	2	5
TP 6	0.0-0.1		8	<0.4	44	5	14	<0.1	4	8
TP 7	0.1-0.2		12	<0.4	36	6	14	<0.1	3	7
TP 7	0.6-0.7		9	<0.4	36	4	13	<0.1	3	8
TP 8	0.3-0.4		8	<0.4	44	6	21	<0.1	7	180
TP 9	0.0-0.1		6	<0.4	11	14	13	<0.1	6	25
TP 10	0.3-0.4		9	<0.4	27	8	13	<0.1	4	11
TP 11	0.1-0.2		9	<0.4	36	6	14	<0.1	3	8
TP 12	0.0-0.1		13	<0.4	33	14	22	<0.1	4	17
TP 15	0.0-0.1		9	<0.4	31	11	26	<0.1	8	35
TP 16	0.0-0.1		5	<0.4	17	21	24	<0.1	11	35
TP 16	0.3-0.4		4	<0.4	13	14	35	<0.1	8	51
TP 16	1.3-1.4		13	<0.4	20	8	15	<0.1	3	13
TP 17	0.5-0.6		4	<0.4	13	39	60	0.1	8	97
TP 17	1.6-1.7	0.3	10	<0.4	27	9	17	<0.1	5	12
TP 18	0.5-0.6		9	<0.4	26	7	12	<0.1	4	10
TP 20	0.3-0.4		8	<0.4	18	6	13	<0.1	2	4
TP 21	0.0-0.1		9	<0.4	30	16	14	<0.1	8	50
TP 21	1.0-1.1		8	<0.4	23	10	12	<0.1	5	19
DUP A	-		20	<0.4	30	5	14	<0.1	5	12
DUP B	-		8	<0.4	23	10	12	<0.1	5	17
TRP A	-		16	<0.4	31	6	2	<0.1	4	16
TRP B	-		7	<0.4	20	8	1	<0.1	3	10
HILs 'A' Criteria			**100**	**20**	**100 (VI)**	**6000**	**300**	**40**	**400**	**7400**
EIL Criteria*			**100**	**NA**	**260**	**70**	**1100**	**NA**	**15**	**200**

Notes:

1) All results are expressed as mg/kg and except pH.

2) Figures in bold italics exceed the EIL Criteria.

3) Figures in bold italics and underlined exceed the HIL Criteria.

*) EIL has been calculated using NEPC EIL Calculation Spreadsheet December 2010

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TABLE 3
Summary of Analytical Results - Heavy Metals

Proficient Constructions (Aust) Pty Ltd

Proposed Residential Subdivision Development

No 80 Silverdale Road Silverdale

Sample	Depths (m)	HCB	alpha-BHC	gamma-BHC	beta-BHC	Heptachlor	delta-BHC	Heptachlor Epoxide	gamma-Chlordane	alpha-chlordane	Endosulfan I	Aldrin	Dieldrin	Endrin	pp-DDD	pp-DDE	pp-DDT	Endosulfan II	Endrin Aldehyde	Endosulfan Sulphate	Methoxychlor	Mirex	Total OCP
TP 4	0.0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	ND
TP 8	0.3-0.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	ND
TP 12	0.0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	ND
TP 17	0.5-0.6	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	ND
TP 21	1.0-1.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	ND
DUP A	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	ND
DUP B	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	ND
HILs 'A' Criteria		**10**			**6**			**50**		**270**	**6***		**10**	**240 #**					**300**	**10**			

Notes:

1) All results are expressed as mg/kg.

2) Figures in bold italics exceed the HIL Criteria.

* HIL Criteria for total sum of Aldrin + Dieldrin

HIL Criteria for Total Sum of DDE + DDD + DDT

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TABLE 3

Summary of Analytical Results - OCP

Proficient Constructions (Aust) Pty Ltd

Proposed Residential Subdivision Development

No 80 Silverdale Road Silverdale

Prepared By: AT Date: 15/04/2024
Checked By: SL Date: 15/04/2024

Sample	Depths (m)	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Total PCB
TP 4	0.0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	ND
TP 8	0.3-0.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	ND
TP 12	0.0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	ND
TP 17	0.5-0.6	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	ND
TP 21	1.0-1.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	ND
DUP A	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	ND
DUP B	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	ND
HILs 'A' Criteria									**1**

Notes:

1) All results are expressed as mg/kg.

2) Figures in bold italics exceed the HILs Criteria.

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TABLE 4
Summary of Analytical Results - PCB

Proficient Constructions (Aust) Pty Ltd

Proposed Residential Subdivision Development

No 80 Silverdale Road Silverdale

Sample	Depths (m)	C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	C_{10}-C_{36}	F1 [4] C_6-C_{10}	F2 [5] $>C_{10}$-C_{16}	F3 C_{16}-C_{34}	F4 C_{34}-C_{40}	Volatile Organic Compounds (VOC)					
											Benzene	Toluene	Ethylbenzene	m+p-xylene	o-Xylene	Naphthalene
TP 1	0.0-0.1	<25	<50	<100	<100	<250	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<1
TP 2	0.3-0.4	<25	<50	<100	<100	<250	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<1
TP 4	0.0-0.1	<25	<50	<100	<100	<250	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<1
TP 5	0.4-0.5	<25	<50	<100	<100	<250	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<1
TP 7	0.6-0.7	<25	<50	<100	<100	<250	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<1
TP 8	0.3-0.4	<25	<50	<100	<100	<250	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<1
TP 9	0.0-0.1	<25	<50	<100	<100	<250	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<1
TP 11	0.1-0.2	<25	<50	<100	<100	<250	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<1
TP 12	0.0-0.1	<25	<50	<100	<100	<250	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<1
TP 15	0.0-0.1	<25	<50	<100	<100	<250	<25	<50	160	<100	<0.2	<0.5	<1	<2	<1	<1
TP 16	0.3-0.4	<25	<50	<100	<100	<250	<25	<50	110	<100	<0.2	<0.5	<1	<2	<1	<1
TP 17	0.5-0.6	<25	<50	<100	<100	<250	<25	<50	140	<100	<0.2	<0.5	<1	<2	<1	<1
TP 17	1.6-1.7	<25	<50	<100	<100	<250	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<1
TP 18	0.5-0.6	<25	<50	<100	<100	<250	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<1
TP 20	0.3-0.4	<25	<50	<100	<100	<250	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<1
TP 21	1.0-1.1	<25	<50	<100	<100	<250	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<1
DUP A	-	<25	<50	<100	<100	<250	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<1
DUP B	-	<25	<50	<100	<100	<250	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<1
HSL 'A and B' Criteria (CLAY)	**0m to <1m**						***50***	***280***			**0.7**	**480**	**480**	**110**		***5***
	1m to <2m						***90***				**1**			**310**		
	2m to < 4m						***150***				**2**					
	4m+						***290***				**3**					
HSL 'A and B' Criteria (SILT)	**0m to <1m**						***40***	***230***			**0.6**	**390**		**95**		***4***
	1m to <2m						***65***				**0.7**					
	2m to < 4m						***100***				**1**					
	4m+						***190***				**2**					
HSLs 'A and B' Criteria (SAND)	**0m to <1m**						***45***	***110***			**0.5**	**160**	**55**	**40**		***3***
	1m to <2m						***70***	***240***			**0.5**	**220**		**60**		
	2m to < 4m						***110***	***440***			**0.5**	**310**		**95**		
	4m+						***200***				**0.5**	**540**		**170**		
HSL - A Residential (Low Density) Soil Health Sceening Levels for Direct Contact CRC Care 2011							***4400***	***3300***	***4500***	***6300***	**100**	**14000**	**4500**	**12000**		***1400***
ESL Criteria (Fine)							***180***	***120***	***1300***	***5600***	**65**	**105**	**125**	**45**		
ESL Criteria (Coarse)							***180***	***120***	***300***	***2800***	**50**	**85**	**70**	**105**		

Notes:

1) All results are expressed as mg/kg unless otherwise specified.

2) ND = Not detected.

3) F1 is C_6-C_{10} minus the sum of the BTEX concentrations.

4) F2 is $>C_{10}$-C_{16} Minus Napthalene.

5) Figures in bold italics exceed the ESL Criteria.

6) Figures in bold italics that have been underlined exceed the HSL Criteria.

7) HSL - A Residential (Low Density) derived from CRC Care 2011 for Direct Contact.

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TABLE 5

Summary of Analytical Results - TRH and VOC

Proficient Constructions (Aust) Pty Ltd

Proposed Residential Subdivision Development

No 80 Silverdale Road Silverdale

Prepared By: AT Date: 15/04/2024
Checked By: SL Date: 15/04/2024

Sample	Depths (m)	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b+k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-c,d)pyrene	Dibenzo(a,h)anthracene	Benzo(g,h,i)perylene	Benzo(a)pyrene TEQ	Total PAHs
TP 1	0.0-0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	0.3	0.4	0.2	0.2	0.4	0.3	0.2	<0.1	0.2	<0.5	2.3
TP 2	0.3-0.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1	<0.5	ND
TP 4	0.0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1	<0.5	ND
TP 5	0.4-0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1	<0.5	ND
TP 7	0.6-0.7	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1	<0.5	ND
TP 8	0.3-0.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1	<0.5	ND
TP 9	0.0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1	<0.5	ND
TP 11	0.1-0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1	<0.5	ND
TP 12	0.0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1	<0.5	ND
TP 15	0.0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1	<0.5	ND
TP 16	0.3-0.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.2	<0.1	<0.1	<0.2	0.1	<0.1	<0.1	<0.1	<0.5	0.4
TP 17	0.5-0.6	<0.1	<0.1	<0.1	<0.1	0.3	<0.1	0.7	0.8	0.4	0.3	0.7	0.4	0.2	<0.1	0.3	0.6	4.7
TP 17	1.6-1.7	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.2	0.07	<0.1	<0.1	<0.1	<0.5	0.17
TP 18	0.5-0.6	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1	<0.5	ND
TP 20	0.3-0.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1	<0.5	ND
TP 21	1.0-1.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1	<0.5	ND
DUP A	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1	<0.5	ND
DUP B	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1	<0.5	ND
HILs 'A' Criteria		**3**															**3***	**300**
HSL 'A and B' Criteria for Sand/Silt/Clay		**3 / 4 / 5**																
ESL Criteria													**0.7**					

Notes:

1) All results are expressed as mg/kg.

2) Figures in bold italics exceed the ESL Criteria.

3) Figures in bold italics that have been underlined exceed the HIL Criteria.

* B(a)P TEQ is calculated by multiplying the concentration of each carcinogenic PAH in the sample by its B(a)P TEF, given below, and summing these products.

PAH Species	TEF
Benzo(a)anthracene	0.1
Benzo(a)pyrene	1
Benzo(b+j)fluoranthene	0.1
Benzo(k)fluoranthene	0.1
Benzo(g,h,i)perylene	0.01
Chrysene	0.01
Dibenzo(a,h)anthracene	1
Indeno(1,2,3-c,d)pyrene	0.1

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TABLE 6
Summary of Analytical Results - PAH

Proficient Constructions (Aust) Pty Ltd

Proposed Residential Subdivision Development

No 80 Silverdale Road Silverdale

Prepared By: AT Date: 15/04/2024
Checked By: SL Date: 15/04/2024

Sample	Depths (m)	Sample Type	Asbestos ID in Soil and Materials
TP 1	0.0-0.1	Soil	No asbestos detected
TP 2	0.3-0.4	Soil	No asbestos detected
TP 4	0.0-0.1	Soil	No asbestos detected
TP 5	0.4-0.5	Soil	No asbestos detected
TP 7	0.6-0.7	Soil	No asbestos detected
TP 8 (frag)	0.3-0.4	Material	Chrysotile and Amosite Asbestos
TP 8	0.3-0.4	Soil	No asbestos detected
TP 9	0.0-0.1	Soil	No asbestos detected
TP 11	0.1-0.2	Soil	No asbestos detected
TP 12	0.0-0.1	Soil	No asbestos detected
TP 15	0.0-0.1	Soil	No asbestos detected
TP 16	0.3-0.4	Soil	No asbestos detected
TP 17	0.5-0.6	Soil	No asbestos detected
TP 17 (frag)	0.5-0.6	Material	Chrysotile Asbestos
TP 17	1.6-1.7	Soil	No asbestos detected
TP 18	0.5-0.6	Soil	No asbestos detected
TP 20	0.3-0.4	Soil	No asbestos detected
TP 21	1.0-1.1	Soil	No asbestos detected
HSLs 'A' Criteria			**No visible asbestos for surface soil**

Notes:

ND = Not Detected

Measured in %w/w

1) Bonded Asbestos Containing Material (Bonded ACM) / Fiberous Asbestos (FA) and Asbestos Fines (AF).

2) Figures in bold italics exceed the HSLs Criteria.

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TABLE 7
Summary of Analytical Results - Asbestos

Proficient Constructions (Aust) Pty Ltd

Proposed Residential Subdivision Development

No 80 Silverdale Road Silverdale

Sample	Depths (m)	Metals							
		Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
TP 4	0.0-0.1	16	<0.4	45	4	16	<0.1	4	10
DUP A	-	20	<0.4	30	5	14	<0.1	5	12
Relative Percentage Difference (RPD)		22.2	NA	40.0	22.2	13.3	NA	22.2	18.2
TP 4	0.0-0.1	16	<0.4	45	4	16	<0.1	4	10
TRP A		16	<0.4	31	6	2	<0.1	4	16
Relative Percentage Difference (RPD)		0.0	NA	36.8	40.0	155.6	NA	0.0	46.2

Sample	Depths (m)	Metals							
		Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
TP 18	0.5-0.6	9	<0.4	26	7	12	<0.1	4	10
DUP B	-	8	<0.4	23	10	12	<0.1	5	17
Relative Percentage Difference (RPD)		11.8	NA	12.2	35.3	0.0	NA	22.2	51.9
TP 18	0.5-0.6	9	<0.4	26	7	12	<0.1	4	10
TRP B		7	<0.4	20	8	1	<0.1	3	10
Relative Percentage Difference (RPD)		25.0	NA	26.1	13.3	169.2	NA	28.6	0.0

Sample	Depths (m)	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
Rinsate		<0.05	<0.01	<0.01	<0.01	<0.03	<0.0005	<0.02	<0.02

Sample	Depths (m)	Volatile Organic Compounds				
		Benzene	Toulene	Ethylbenzene	m+p-xylene	O-Xylene
Trip Blank		<0.2	<0.5	<1	<2	<1

Notes:

1) All results are expressed as mg/kg .

2) ND = Not Detected

3) NA = Not Applicable

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TABLE 8
Summary of Analytical Results - Quality Assurance

Proficient Constructions (Aust) Pty Ltd

Proposed Residential Subdivision Development

No 80 Silverdale Road Silverdale

Prepared By: AT Date: 15/04/2024
Checked By: SL Date: 15/04/2024

APPENDIX A

Site Photographs

Northern end of the site facing south. Residential dwelling in the background.

Southern end of the site facing north-west with the swale in the middle ground.

APPENDIX B

Aerial Photographs

1969

1978

1989

1993

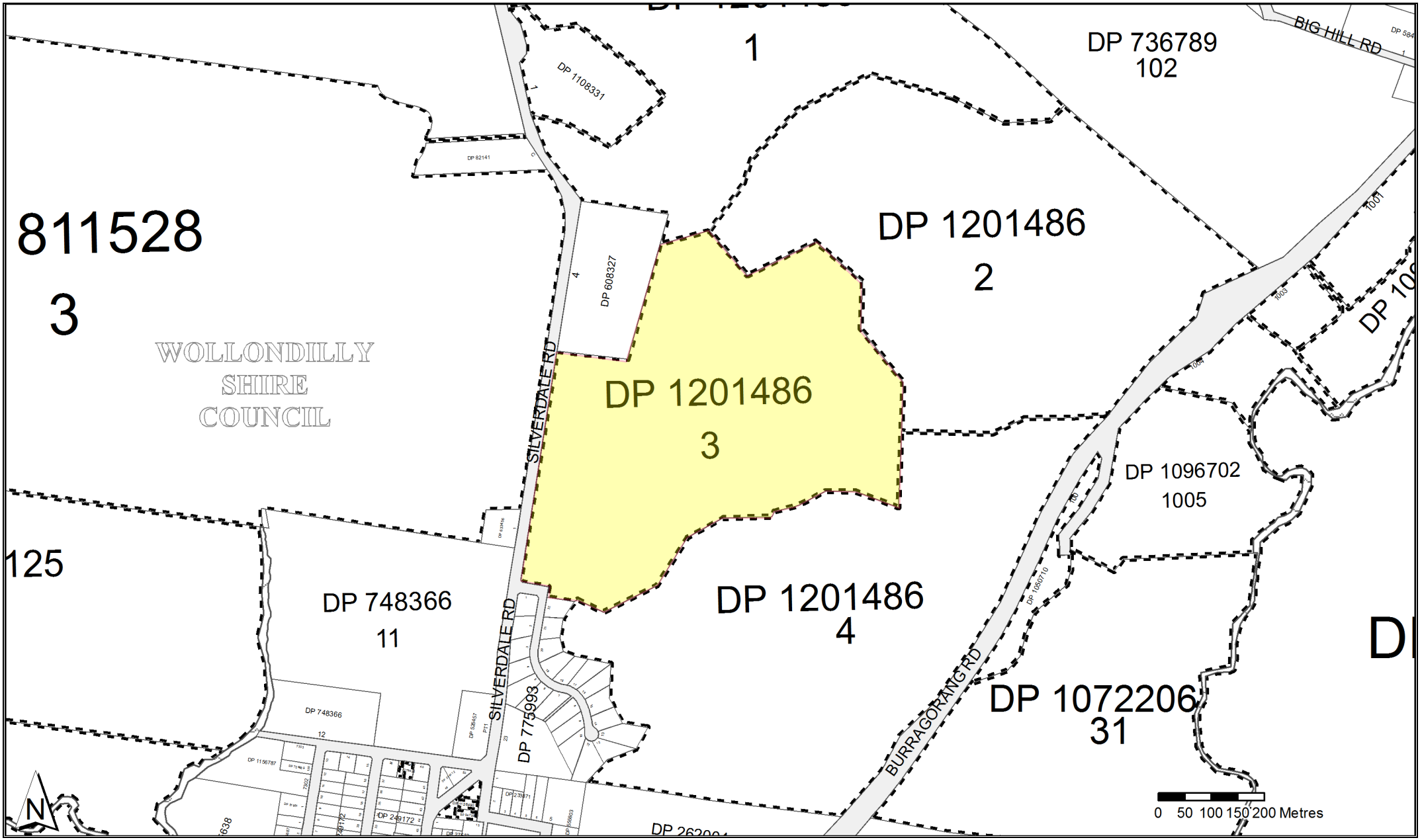
2005

APPENDIX C

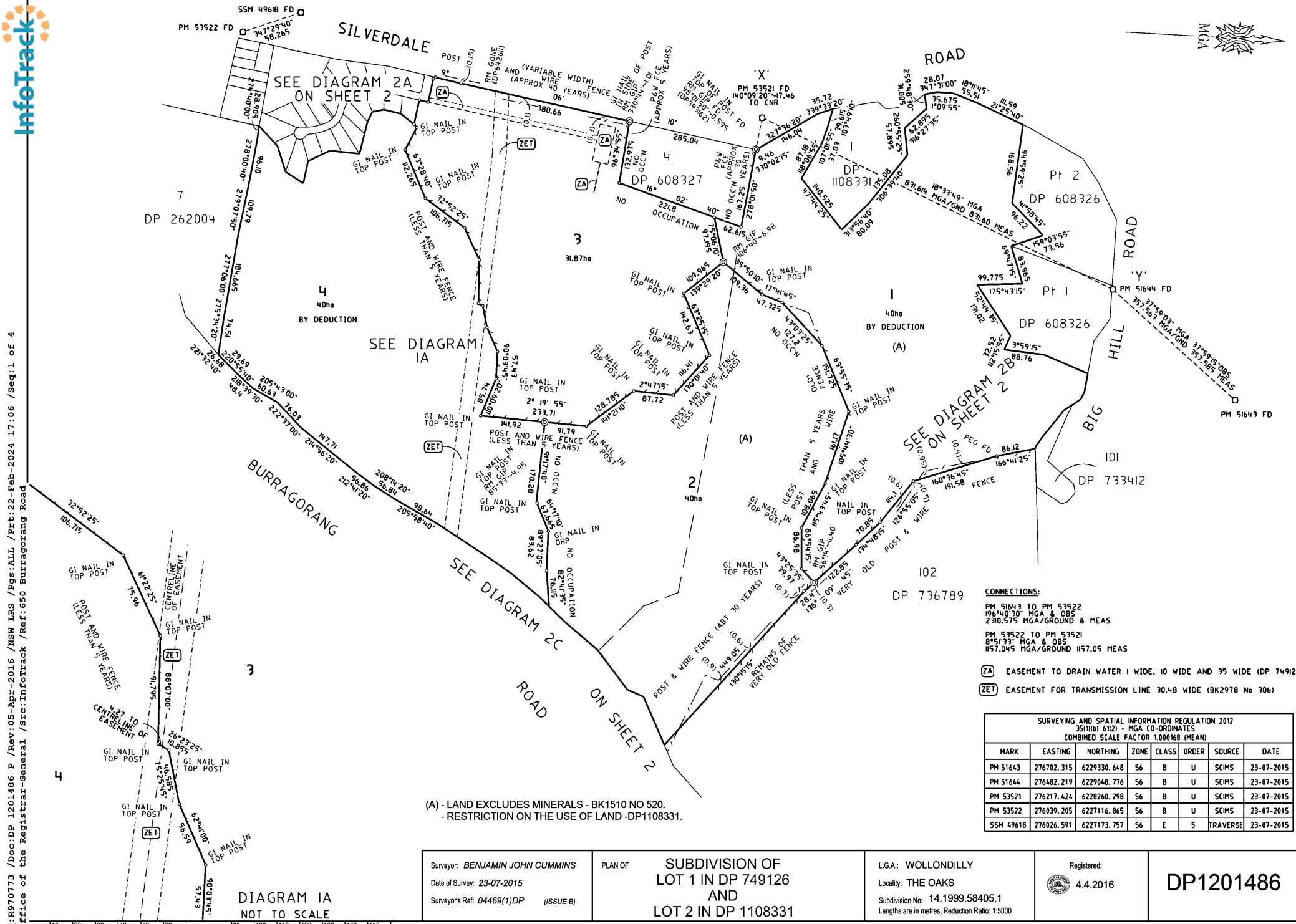
Land Title Searches

Cadastral Records Enquiry Report : Lot 3 DP 1201486

Locality : THE OAKS
Parish : WEROMBA
LGA : WOLLONDILLY
County : CAMDEN



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



(A) - LAND EXCLUDES MINERALS - BK1510 NO 520.
- RESTRICTION ON THE USE OF LAND -DP1108331.

CONNECTIONS:

PM 51643 TO PM 53522
196°40'30" MGA & OBS
2310.575 MGA/GROUND & MEAS

PM 53522 TO PM 53521
8°51'33" MGA & OBS
1157.045 MGA/GROUND 1157.05 MEAS

ZA EASEMENT TO DRAIN WATER 1 WIDE, 10 WIDE AND 35 WIDE (DP 749126)

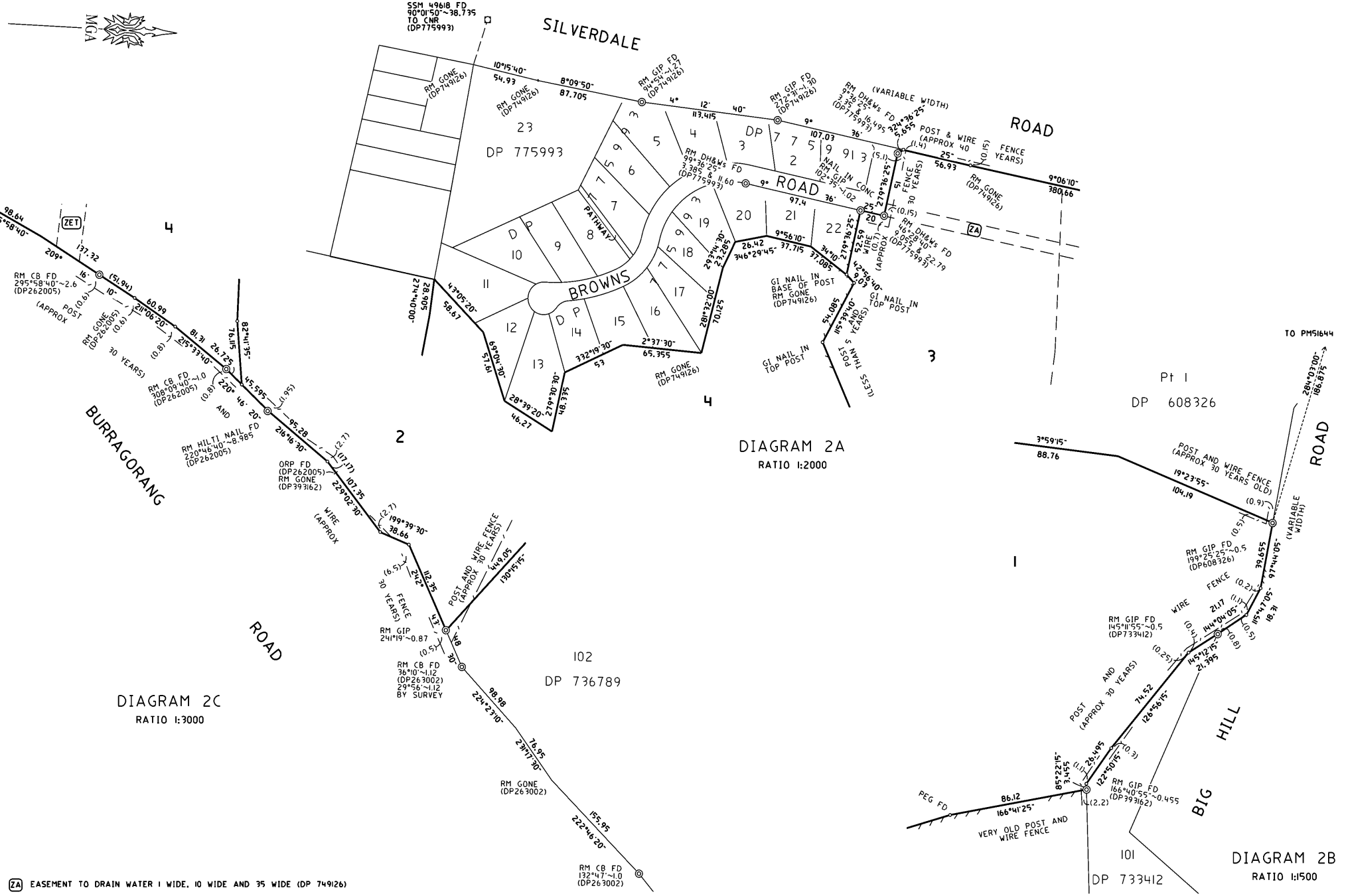
ZET EASEMENT FOR TRANSMISSION LINE 30.48 WIDE (BK2978 No 306)

SURVEYING AND SPATIAL INFORMATION REGULATION 2012
35(1)(b) 61(2) - MGA CO-ORDINATES
COMBINED SCALE FACTOR 1.000168 (MEAN)

MARK	EASTING	NORTHING	ZONE	CLASS	ORDER	SOURCE	DATE
PM 51643	276702.315	6229330.648	56	B	U	SCIMS	23-07-2015
PM 51644	276482.219	6229048.776	56	B	U	SCIMS	23-07-2015
PM 53521	276217.424	6228260.298	56	B	U	SCIMS	23-07-2015
PM 53522	276039.205	6227116.865	56	B	U	SCIMS	23-07-2015
SSM 49618	276026.591	6227173.757	56	E	5	TRAVERSE	23-07-2015

DIAGRAM 1A
NOT TO SCALE

Surveyor: *BENJAMIN JOHN CUMMINS* Date of Survey: *23-07-2015* Surveyor's Ref: *04469(1)DP* *(ISSUE B)*	PLAN OF SUBDIVISION OF LOT 1 IN DP 749126 AND LOT 2 IN DP 1108331	L.G.A.: WOLLONDILLY Locality: THE OAKS Subdivision No: 14.1999.58405.1 Lengths are in metres, Reduction Ratio: 1:5000	Registered: 4.4.2016	DP1201486



ZA EASEMENT TO DRAIN WATER 1 WIDE, 10 WIDE AND 35 WIDE (DP 749126)

ZET EASEMENT FOR TRANSMISSION LINE 30.48 WIDE (BK2978 No 306)

Surveyor: *BENJAMIN JOHN CUMMINS* Date of Survey: *23-07-2015* Surveyor's Ref: *04469(1)DP* *(ISSUE B)*	PLAN OF SUBDIVISION OF LOT 1 IN DP 749126 AND LOT 2 IN DP 1108331	L.G.A.: WOLLONDILLY Locality: THE OAKS Subdivision No: 14.1999.58405.1 Lengths are in metres, Reduction Ratio: 1:2000	Registered: 4.4.2016	DP1201486

10 20 30 40 50 60 Table of mm 90 100 110 120 130 140 150

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

DEPOSITED PLAN ADMINISTRATION SHEET

Office Use Only

Registered: 4.4.2016

Title System: TORRENS

Purpose: SUBDIVISION

Office Use Only

DP1201486 S

PLAN OF SUBDIVISION OF LOT 1 IN DP 749126 AND LOT 2 IN DP 1108331

L.G.A.: WOLLONDILLY

Locality: THE OAKS

Parish: WEROMBA

County: CAMDEN

Crown Lands NSW/Western Lands Office Approval

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

Signature: .....

Date: .....

File Number: .....

Office: .....

Subdivision Certificate

I Michael Kelly

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

Signature: .....

Accreditation number: -

Consent Authority: Wollondilly Shire Council

Date of endorsement: 9 February 2016

Subdivision Certificate number.: 14.1999.58405.1

File number: D701/99

* Strike through if inapplicable.

Survey Certificate

I BENJAMIN JOHN CUMMINS

of JOHN M. DALY & ASSOC. PTY LTD P.O. BOX 25 CAMPBELLTOWN

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

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

*(b) The part of the land in the plan (~~being~~/*excluding ^ PART OF LOT 1 AND 4) was surveyed in accordance with the *Surveying and Spatial Information Regulation 2012*, is accurate and the survey was completed on 23-07-2015, the part not surveyed was compiled in accordance with that Regulation.

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

Signature Beal Dated: 04-08-2015

Surveyor ID: 3301

Datum Line: 'X' -'Y'

Type: Urban/~~Rural~~

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

* Strike through if inapplicable.

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

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

Plans used in the preparation of survey/compilation

R33378-1603	DP 749126
DP 262004	DP 775993
DP 262005	DP 1108331
DP 263002	
DP 608326	
DP 733412	
DP 736789	

If space is insufficient continue on PLAN FORM 6A

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

Surveyor's Reference: 04469(1)DP *(ISSUE B)*

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

DEPOSITED PLAN ADMINISTRATION SHEET Sheet 2 of 2 sheet(s)

Office Use Only

Registered: 4.4.2016

ffice Use Only

DP1201486

PLAN OF SUBDIVISION OF
LOT 1 IN DP 749126
AND
LOT 2 IN DP 1108331

Subdivision Certificate Number: 14.1999.58405.1

Date of Endorsement: 9 February 2016

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

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

PURSUANT TO SECTION 88B OF THE CONVEYANCING ACT 1919, IT IS INTENDED TO CREATE :

1. RESTRICTION ON THE USE OF LAND

THE STREET ADDRESSES OF ALL LOTS ARE NOT AVAILABLE

Execution by Registered Proprietor

A.H. CLINCH INVESTMENTS PTY LIMITED (ACN 000 858 864)

A.H. CLINCH INVESTMENTS PTY. LIMITED A.C.N. 000 858 864
Common Seal

W.I. Clinch
DIRECTOR
W. I. CLINCH

Joan S. Clinch
SECRETARY / DIRECTOR
J.S. CLINCH

If space is insufficient use additional annexure sheet

Surveyor's Reference: 04469(1)DP (ISSUE B)

Historical Title

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
22/2/2024 9:52AM

FOLIO: 1/749126

First Title(s): OLD SYSTEM
Prior Title(s): CA23990

Recorded	Number	Type of Instrument	C.T. Issue
30/9/1987	CA23990	CONVERSION ACTION	FOLIO CREATED EDITION 1
19/9/1989	DP642611	DEPOSITED PLAN	
13/12/2011	AG620966	REQUEST	EDITION 2
4/4/2016	DP1201486	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***

650 Burragorang Road PRINTED ON 22/2/2024

Historical Search

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
22/2/2024 9:52AM

FOLIO: 3/1201486

First Title(s): OLD SYSTEM
Prior Title(s): 1/749126

Recorded	Number	Type of Instrument	C.T. Issue
4/4/2016	DP1201486	DEPOSITED PLAN	FOLIO CREATED EDITION 1
16/2/2023	AS857411	CAVEAT	EDITION 2
1/2/2024	AT804733	WITHDRAWAL OF CAVEAT	
1/2/2024	AT804734	TRANSFER	EDITION 3

*** END OF SEARCH ***

650 Burragorang Road PRINTED ON 22/2/2024

LAND REGISTRY SERVICES

Title Search

InfoTrack

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 3/1201486

SEARCH DATE	TIME	EDITION NO	DATE
22/2/2024	9:52 AM	3	1/2/2024

LAND

LOT 3 IN DEPOSITED PLAN 1201486
AT THE OAKS
LOCAL GOVERNMENT AREA WOLLONDILLY
PARISH OF WEROMBA COUNTY OF CAMDEN
TITLE DIAGRAM DP1201486

FIRST SCHEDULE

MARYANN NOCERA
DOMENICO NOCERA
AS JOINT TENANTS (T AT804734)

SECOND SCHEDULE (4 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 DP749126 EASEMENT TO DRAIN WATER 1 WIDE ,10 WIDE & 35 METRE(S) WIDE AFFECTING THE PART SHOWN SO BURDENED IN THE TITLE DIAGRAM
3 BK 2978 NO 306 EASEMENT FOR TRANSMISSION LINE 30.48 WIDE AFFECTING THE PART SHOWN SO BURDENED IN THE TITLE DIAGRAM
4 DP1201486 RESTRICTION(S) ON THE USE OF LAND

NOTATIONS

DP642611 NOTE: PLAN OF PROPOSED EASEMENT FOR TRANSMISSION LINE

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

650 Burragorang Road PRINTED ON 22/2/2024

Received: 22/02/2024 09:52:27

APPENDIX D

NSW EPA and POEO, and Groundwater Borehole Search

Search results

Your search for: **General Search** with the following criteria

Suburb - The Oaks

returned 10 results

Export to excel

1 of 1 Pages

Search Again

Number	Name	Location	Type	Status	Issued date
1554310	Civilworx NSW Group Pty Ltd	760 Montpellier Drive, THE OAKS, NSW 2570	s.91 Clean Up Notice	Issued	07 Aug 2017
1568996	EDDIE KHOUZAME	760 Montpellier Drive, THE OAKS, NSW 2570	s.91 Clean Up Notice	Issued	16 Oct 2018
1572671	EDDIE KHOUZAME	760 Montpellier Drive, THE OAKS, NSW 2570	s.110 Variation of Clean Up Notice	Issued	20 Nov 2018
3173526777	EDDIE KHOUZAME	760 Montpellier Drive, THE OAKS, NSW 2570	Penalty Notice	Issued	07 Dec 2018
1527548	JIM KURYLUK	815 Montpelier Drive, THE OAKS, NSW 2570	s.91 Clean Up Notice	Issued	09 Jan 2015
1553556	Multilink Earth Works Pty Ltd	105 Waterfall Creek Road, THE OAKS, NSW 2570	s.91 Clean Up Notice	Issued	29 May 2018
3173525989	Multilink Earth Works Pty Ltd	105 Waterfall Creek Road, THE OAKS, NSW 2570	Penalty Notice	Issued	24 Jul 2018
3173527107	Multilink Earth Works Pty Ltd	105 Waterfall Creek Road, THE OAKS, NSW 2570	Penalty Notice	Issued	19 Mar 2019
1526569	SAVIER CUTAJAR	34 Quarry Road, THE OAKS, NSW 2570	s.91 Clean Up Notice	Issued	25 Nov 2014
1598706	WEI PING CAO	20 LUGARNO PLACE, THE OAKS, NSW 2570	s.91 Clean Up Notice	Issued	27 Aug 2020

20 March 2024

For business and industry

For local government

Contact us

131 555 (tel:131555)

Online (https://www.epa.nsw.gov.au/about-us/contact-us/feedback)

info@epa.nsw.gov.au (mailto:info@epa.nsw.gov.au)

EPA Office Locations (https://www.epa.nsw.gov.au/about-us/contact-us/locations)

Search results

Your search for:LGA: WOLLONDILLY SHIRE COUNCIL

Matched 1 notice relating to 1 site.

Search Again

Refine Search

Suburb	Address	Site Name	Notices related to this site
MALDON	Lot 2 Wilton Park ROAD	Maldon Works	1 current

Page 1 of 1

20 March 2024

APPENDIX E

Council's S10.7 Certificates

Frank McKay Building 62-64 Menangle Street, Picton NSW 2571
All Correspondance to PO Box 21, Picton NSW 2571
Telephone: 02 4677 1100 Fax: 02 4677 2339
Email: council@wollondilly.nsw.gov.au Web: www.wollondilly.nsw.gov.au
ABN: 93 723 245 808

PLANNING CERTIFICATE UNDER SECTION 10.7(2)

ENVIRONMENTAL PLANNING & ASSESSMENT ACT, 1979

APPLICANT:	Steven Mark Goss
Planning Certificate No.:	00065061
Receipt No.:	RT52416936
Issue Date:	*21/02/2024*
Applicant's Reference:	JC24471A
Property No.:	25041

DESCRIPTION OF PROPERTY

Address:	80 Silverdale Road, THE OAKS, NSW, 2570 (P)
Land Description:	Lot: 3 DP: 1201486

Notes:
The following prescribed matters may apply to the land to which this certificate relates and is supplied in good faith. This certificate was generated automatically under the delegated authority of the Manager Sustainable Growth.

Where this certificate refers to a specific allotment (or allotments) within a strata plan, the certificate is issued for the whole of the land within the strata plan, not just the specific allotment(s) referred to, and any information contained in the certificate may relate to the whole, or any part, of the strata plan.

If the land straddles a local government area boundary, the information in this certificate only applies to the portion of land that is located within Wollondilly Shire Council Local Government Area.

The following information is provided pursuant to Section 10.7(2) of the Environmental Planning and Assessment Act 1979 as prescribed by Schedule 2 of the Environmental Planning and Assessment Regulation 2021 and is applicable as at the date of this certificate. Note that instruments applying to this land purporting to restrict or prohibit certain development may be inconsistent.

Information provided in this certificate should be interpreted in conjunction with the relevant plans, policies and documents held at Council. In order to obtain copies of these documents you may purchase them from Council's Administration Centre at 62-64 Menangle Street, Picton or view free of charge on Council's Website www.wollondilly.nsw.gov.au.

---

1. NAMES OF RELEVANT PLANNING INSTRUMENTS AND DEVELOPMENT CONTROL PLANS

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

(2) The name of each proposed environmental planning instrument and draft development control plan, which is or has been subject to community consultation or public exhibition under the Act, that will apply to the carrying out of development on the land.

(3) Subsection (2) does not apply in relation to a proposed environmental planning instrument or draft development control plan if-

(a) it has been more than 3 years since the end of the public exhibition period for the proposed instrument or draft plan, or

(b) for a proposed environmental planning instrument – the Planning Secretary has notified the council that the making of the proposed instrument has been deferred indefinitely or has not been approved.

(4) In this section-
proposed environmental planning instrument means a draft environmental planning instrument and includes a planning proposal for a local environmental plan.

ENVIRONMENTAL PLANNING INSTRUMENTS

Wollondilly Local Environmental Plan 2011

State Environmental Planning Policy (Sustainable Buildings) 2022

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

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

State Environmental Planning Policy (Housing) 2021

State Environmental Planning Policy (Planning Systems) 2021

State Environmental Planning Policy (Biodiversity & Conservation) 2021

State Environmental Planning Policy (Resilience & Hazards) 2021

State Environmental Planning Policy (Transport & Infrastructure) 2021

State Environmental Planning Policy (Industry & Employment) 2021

State Environmental Planning Policy (Resources & Energy) 2021

State Environmental Planning Policy (Primary Production) 2021

State Environmental Planning Policy (Precincts Western Parkland City) 2021

State Environmental Planning Policy (Precincts Regional) 2021

State Environmental Planning Policy (Housing and Productivity Contributions) 2023

DEVELOPMENT CONTROL PLANS

Wollondilly Development Control Plan 2016 applies to all land covered by Wollondilly Local Environmental Plan 2011.

PROPOSED ENVIRONMENTAL PLANNING INSTRUMENTS

Explanation of Intended Effect (Building Business Back Better) – proposed amendments to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 (Codes SEPP) and other legislation

Explanation of Intended Effect (Outdoor dining & fun experiences) – proposed amendments to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 (Codes SEPP)

Explanation of Intended Effect for a Regional Infrastructure Contributions Proposed State Environmental Planning Policy

Explanation of Intended Effect (In-fill affordable housing, group homes, supportive accommodation and other provisions) – proposed amendments to State Environmental Planning Policy (Housing) 2021 (Housing SEPP)

Explanation of Intended Effect (Manufactured Home Estates, Caravan Parks and Camping Grounds) 2023 – proposed amendments to State Environmental Planning Policy (Housing) 2021 (Housing SEPP) and other legislation

Explanation of Intended Effect (Changes to create low and mid-rise housing) – proposed introduction of a state environmental planning policy

DRAFT DEVELOPMENT CONTROL PLANS

There are no Draft Development Control Plans that apply to the land.

---

2. ZONING AND LAND USE UNDER RELEVANT PLANNING INSTRUMENTS

The following matters for each environmental planning instrument or draft environmental planning instrument that includes the land in a zone, however described-

WOLLONDILLY LOCAL ENVIRONMENTAL PLAN 2011

a. the identity of the zone, whether by reference to-
    i. a name, such as “Residential Zone” or “Heritage Area”, or
    ii. a number, such as “Zone No 2 (a)”,

Zone RU2 Rural Landscape

b. the purpose for which development in the zone-

    i. may be carried out without development consent:

    Extensive agriculture; Home occupations and development listed in Schedule 2 of Wollondilly Local Environmental Plan 2011 provided it meets the criteria in that Schedule.

    ii. may not be carried out except with development consent:

    Agriculture; Airports; Animal boarding or training establishments; Artisan food and drink industries; Aquaculture; Boat building and repair facilities; Boat launching ramps; Boat sheds; Camping grounds; Caravan parks; Cellar door premises; Cemeteries; Charter and tourism boating facilities; Community facilities; Crematoria; Depots; Dual occupancies (attached); Dwelling houses; Eco-tourism facilities; Educational establishments; Environmental facilities; Environmental protection works; Extractive industries; Farm buildings; Flood mitigation works; Forestry; Freight transport facilities; Function centres; Funeral homes; Group homes; Helipads; Home-based child care; Home businesses; Home industries; Home occupations (sex services); Hospitals; Information and education facilities; Landscaping material supplies; Markets; Mortuaries; Neighbourhood shops; Places of public worship; Plant nurseries; Recreation areas; Recreation facilities (indoor); Recreation facilities (outdoor); Restaurants or cafes; Research stations; Roads; Roadside stalls; Rural industries; Rural supplies; Rural workers’ dwellings; Secondary dwellings; Signage; Timber yards; Tourist and visitor accommodation; Transport depots; Veterinary hospitals; Water recreation structures; Water supply systems.

    iii. is prohibited:

    Stock and sale yards; Turf farming; Any development not specified in item (i) or (ii).

c. whether additional permitted uses apply to the land,

There are no additional permitted uses which apply to the land.

d. whether development standards applying to the land fix minimum land dimensions for the erection of a dwelling house on the land and, if so, the fixed minimum land dimensions,

Yes, there are development standards applying to the land that fix minimum land dimensions for the erection of a dwelling house. Refer to the Development Standards Information below for more details.

e. whether the land is in an area of outstanding biodiversity value under the *Biodiversity Conservation Act 2016*,

The land is not in an area of outstanding biodiversity value under the Biodiversity Conservation Act 2016.

f. whether the land is in a conservation area, however described,

The land is not located in a conservation area.

g. whether an item of environmental heritage, however described, is located on the land

The land does not contain an item of environmental heritage.

Development Standards Information

Yes, if the lot is less than the minimum subdivision lot size and was created for the purpose of primary production under clause 4.2 of the Wollondilly Local Environmental Plan 2011 a dwelling cannot be erected.
Refer to clause 4.2 of the Wollondilly Local Environment Plan 2011 and the Lot Size Map for further information.

Yes, Clause 4.2A of the Wollondilly Local Environmental Plan 2011 sets the minimum land dimensions for the erection of a dwelling house on the lot and whether there is a dwelling entitlement.

Development consent for the erection of a dwelling house (if no dwelling house has been erected) may only be granted in one of the following circumstances:

- to replace an existing lawfully erected dwelling house; or
- where the lot was not created for the purpose of primary production under clause 4.2 of Wollondilly Local Environmental Plan 2011; or
- the lot was created before the commencement of Wollondilly Local Environmental Plan 2011 (i.e. before 23 February 2011) and a dwelling house was permissible immediately before that commencement; or
- the lot resulted from a subdivision and the development consent (or equivalent) was granted before the commencement of Wollondilly Local Environmental Plan 2011 (i.e. 23 February

2011) and a dwelling house would have been permissible if the plan of subdivision had been registered before that commencement; or
- the lot is at least the minimum subdivision lot size specified for the land on the Lot Size Map.

The minimum lot size for the RU2 Rural Landscape zoned land is 40ha.

---

3. CONTRIBUTIONS PLANS

(1) The name of each contributions plan under the Act, Division 7.1 applying to the land, including draft contributions plans,

CONTRIBUTIONS PLANS

Wollondilly Development Contributions Plan 2020 applies to the land.

DRAFT CONTRIBUTIONS PLANS

There are currently no Draft Contributions Plans that apply to the land.

(2) If the land is in a region within the meaning of the Act, Division 7.1, Subdivision 4-

(a) The name of the region, and

(b) The name of the Ministerial planning order in which the region is identified.

The land is within the Greater Sydney Region within the meaning of the Act, Division 7.1, Subdivision 4.

The Environmental Planning and Assessment (Housing and Productivity Contribution) Order 2023 is the Ministerial Planning Order in which the Region is identified.

(3) If the land is in a special contributions area to which a continued 7.23 determination applies, the name of the area.

The land is not located in a Special Contributions Area to which a continued 7.23 determination applies.

(4) In this section-

continued 7.23 determination means a 7.23 determination that-

(a) has been continued in force by the Act, Schedule 4, Part 1, and

(b) has not been repealed as provided by that part.

Note-
The Act, Schedule 4, Part 1 contains other definitions that affect the interpretation of this section.

---

4. COMPLYING DEVELOPMENT

(1) If the land is land on which complying development may be carried out under each of the complying development codes under State Environmental Planning Policy (Exempt and Complying Development Codes) 2008, because of that Policy, clause 1.17A(1)(c)-(e), (2), (3) or (4), 1.18(1)(c3) or 1.19.

(2) If complying development may not be carried out on the land because of 1 of those clauses, the reasons why it may not be carried out under the clause.

(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) a restriction applies to the land, but it may not apply to all of the land, and

(b) 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.

(4) If the complying development codes are varied, under that Policy, clause 1.12, in relation to the land.

THE HOUSING CODE

Complying development MAY be carried out on the land under the Housing Code in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

THE RURAL HOUSING CODE

Complying development MAY be carried out on the land under the Rural Housing Code in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

THE GREENFIELD HOUSING CODE

Complying development MAY be carried out on the land under the Greenfield Housing Code in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

THE LOW RISE HOUSING DIVERSITY CODE

Complying development MAY be carried out on the land under the Low Rise Housing Diversity Code in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

THE HOUSING ALTERATIONS CODE

Complying development MAY be carried out on the land under the Housing Alterations Code in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

THE GENERAL DEVELOPMENT CODE

Complying development MAY be carried out on the land under the General Development Code in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

THE INDUSTRIAL AND BUSINESS ALTERATIONS CODE

Complying development MAY be carried out on the land under the Industrial and Business Alterations Code in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

THE INDUSTRIAL AND BUSINESS BUILDINGS CODE

Complying development MAY be carried out on the land under the Industrial and Business Buildings Code in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

THE CONTAINER RECYCLING FACILITIES CODE

Complying development MAY be carried out on the land under the Container Recycling Facilities Code in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

THE SUBDIVISIONS CODE

Complying development MAY be carried out on the land under the Subdivisions Code in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

THE DEMOLITION CODE

Complying development MAY be carried out on the land under the Demolition Code in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

THE FIRE SAFETY CODE

Complying development MAY be carried out on the land under the Fire Safety Code in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

THE AGRITOURISM AND FARM STAY ACCOMMODATION CODE

Complying development MAY be carried out on the land under the Agritourism And Farm Stay Accommodation Code in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

---

5. EXEMPT DEVELOPMENT

(1) If the land is land on which exempt development may be carried out under each of the exempt development codes under State Environmental Planning Policy (Exempt and Complying Development Codes) 2008, because of that Policy, clause 1.16(1)(b1)-(d) or 1.16A.

(2) If exempt development may not be carried out on the land because of 1 of those clauses, the reasons why it may not be carried out under the clause.

(3) If the council does not have sufficient information to ascertain the extent to which exempt development may or may not be carried out on the land, a statement that-

(a) a restriction applies to the land, but it may not apply to all of the land, and

(b) the council does not have sufficient information to ascertain the extent to which exempt development may or may not be carried out on the land.

(4) If the exempt development codes are varied, under that Policy, clause 1.12, in relation to the land.

Exempt development MAY be carried out on the land under the State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

---

6. AFFECTED BUILDING NOTICES AND BUILDING PRODUCT RECTIFICATION ORDERS

(1) Whether the council is aware that-

(a) An affected building notice is in force in relation to the land, or

Council is NOT aware of any affected building notice in respect of the land.

(b) A building product rectification order is in force in relation to the land that has not been fully complied with, or

Council is NOT aware of any building product rectification order as detailed above.

(c) A notice of intention to make a building product rectification order given in relation to the land is outstanding.

Council is NOT aware of any notice of intention as detailed above.

(2) In this section-

affected building notice has the same meaning as in the Building Products (Safety) Act 2017, Part 4.

building product rectification order has the same meaning as in the Building Products (Safety) Act 2017.

---

7. LAND RESERVED FOR ACQUISITION

Whether an environmental planning instrument or proposed environmental planning instrument referred to in section 1 makes provision in relation to the acquisition of the land by an authority of the State, as referred to in the Act, section 3.15.

There are no Environmental Planning Instruments referred to in Clause 1 that make provision for the acquisition of the land by a public authority as referred to under section 3.15 of the Act.

There are no proposed Environmental Planning Instruments referred to in Clause 1 that make provision for the acquisition of land by a public authority as referred to under section 3.15 of the Act.

---

8. ROAD WIDENING AND ROAD REALIGNMENT

Whether the land is affected by road widening or road realignment under-

(a) The Roads Act 1993, Part 3, Division 2, or

(b) An environmental planning instrument, or

(c) A resolution of the council.

No

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9. FLOOD RELATED DEVELOPMENT CONTROLS INFORMATION

(1) If the land or part of the land is within the flood planning area and subject to flood related development controls.

(2) If 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.

(3) In this section-

flood planning area *has the same meaning as in the Flood Risk Management Manual.*

Flood Risk Management Manual *means the Flood Risk Management Manual, ISBN 978-1-923076-17-4, published by the NSW Government in June 2023.*

probable maximum flood *has the same meaning as in the Flood Risk Management Manual.*

No Flood Study has been undertaken in accordance with the requirements of the NSW Floodplain Development Manual for this land. It is therefore unknown whether any flood related development controls would apply to the land. Any person acting on this Certificate should make their own enquiries on this matter.

---

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

(1) Whether any of the land is affected by an adopted policy that restricts the development of the land because of the likelihood of land slip, bush fire, tidal inundations, subsidence, acid sulfate soils, contamination, aircraft noise, salinity, coastal hazards, sea level rise or another risk, other than flooding.

(2) **In this section-**

adopted policy means a policy adopted-
(a) by the council, or
(b) by another public authority, if the public authority has notified the council that the policy will be included in a planning certificate issued by the council.

Yes. The Contaminated Land Policy adopted by Wollondilly Shire Council applies and provides a framework to manage land contamination through the land use planning process.

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11. BUSH FIRE PRONE LAND

(1) If any of the land is bush fire prone land, designated by the Commissioner of the NSW Rural Fire Service under the Act, section 10.3, a statement that all or some of the land is bush fire prone land.

(2) If none of the land is bush fire prone land, a statement to that effect.

The land is wholly bush fire prone land, designated by the Commissioner of the NSW Rural Fire Service under Section 10.3 of the Act.

---

12. LOOSE-FILL ASBESTOS INSULATION

If the land includes residential premises, within the meaning of the Home Building Act 1989, Part 8, Division 1A, that are listed on the Register kept under that Division, a statement to that effect.

Council has not been notified by NSW Fair Trading of any residential premises on this land

being identified in the Loose-Fill Asbestos Insulation Register.

---

13. MINE SUBSIDENCE

Whether the land is declared to be a mine subsidence district, within the meaning of the Coal Mine Subsidence Compensation Act 2017.

The land IS NOT WITHIN a declared Mine Subsidence District under section 20 of the Coal Mine Subsidence Compensation Act 2017.

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14. PAPER SUBDIVISION INFORMATION

(1) The name of a development plan adopted by a relevant authority that-

(a) applies to the land, or
(b) is proposed to be subject to a ballot.

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

(3) Words and expressions used in this section have the same meaning as in this Regulation, Part 10 and the Act, Schedule 7.

None.

---

15. PROPERTY VEGETATION PLANS

If the land is land in relation to which a property vegetation plan is approved and in force under the Native Vegetation Act 2003, Part 4, a statement to that effect, but only if council has been notified of the existence of the plan by the person or body that approved the plan under that Act.

Council has not been notified of any such plan that affects this land.

16. BIODIVERSITY STEWARDHIP SITES

If the land is a biodiversity stewardship site under a biodiversity stewardship agreement under the Biodiversity Conservation Act 2016, Part 5, a statement to that effect, but only if the council has been notified of the existence of the agreement by the Biodiversity Conservation Trust.

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

Council has not been notified by the Biodiversity Conservation Trust that the land is a biodiversity stewardship site under a biodiversity stewardship agreement under Part 5 of the Biodiversity Conservation Act 2016.

17. BIODIVERSITY CERTIFIED LAND

If the land is biodiversity certified land under the Biodiversity Conservation Act 2016, Part 8, a statement to that effect.

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

The land is not biodiversity certified land under Part 8 of the Biodiversity Conservation Act 2016.

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

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

No

---

19. ANNUAL CHARGES UNDER LOCAL GOVERNMENT ACT 1993 FOR COASTAL PROTECTION SERVICES THAT RELATE TO EXISTING COASTAL PROTECTION WORKS

(1) If the Coastal Management Act 2016 applies to the council, whether the owner, or a previous owner, of the land has given written consent to the land being subject to annual charges under the Local Government Act 1993, section 496B, for coastal protection services that relate to existing coastal protectiontection works.

(2) In this section-

Existing coastal protection works has the same meaning as in the Local Government Act 1993, section 553B.

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 1 January 2011.

This clause is not applicable to the Wollondilly Local Government Area.

---

20. WESTERN SYDNEY AEROTROPOLIS

Whether under State Environmental Planning Policy (Precincts - Western Parkland City) 2021, Chapter 4 the land is-

(a) In an ANEF or ANEC contour of 20 or greater, as referred to in that Policy, clause 19, or

No. The land IS NOT identified as being within an ANEF or ANEC contour of 20 or greater.

(b) Shown on the Lighting Intensity and Wind Shear Map, or

No. The land IS NOT identified on the Lighting Intensity and Wind Shear Map.

(c) Shown on the Obstacle Limitation Surface Map, or

No. The land IS NOT identified on the Obstacle Limitation Surface Map.

(d) In the 'public safety area" on the Public Safety Area Map, or

No. The land IS NOT identified as being within the "public safety area" on the Public Safety Map.

(e) In the '3 kilometre wildlife buffer zone" or the '13 kilometre wildlife buffer zone" on the Wildlife Buffer Zone Map.

No. The land IS NOT identified as being within a wildlife buffer zone on the Wildlife Buffer Zone Map.

---

21. DEVELOPMENT CONSENT CONDITIONS FOR SENIORS HOUSING

If State Planning Policy (Housing) 2021, Chapter 3, Part 5 applies to the land, any conditions of a development consent granted after 11 October 2007 in relation to the land that are of the kind set out in that Policy, clause 88(2).

There are currently no conditions of consent relating to a development application for seniors housing that apply to the land.

---

22. SITE COMPATIBILITY CERTIFICATES AND DEVELOPMENT CONSENT CONDITIONS FOR AFFORDABLE RENTAL HOUSING

(1) Whether there is a current site compatibility certificate under State Environmental Planning Policy (Housing) 2021, or a former site compatibility certificate, of which the council is aware, in relation to proposed development on the land and, if there is a certificate-

(a) The period for which the certificate is current, and
(b) That a copy may be obtained from the Department.

(2) If State Environmental Planning Policy (Housing) 2021, Chapter 2, Part 2, Division 1 or 5 applies to the land, any conditions of a development consent in relation to the land that are of a kind referred to in that Policy, section 21(1) or 40(1).

(3) Any conditions of development consent in relation to land that are of a kind referred to in State Environmental Planning Policy (Affordable Rental Housing) 2009, clause 17(1) or 38(1).

(4) In this section-

former site compatibility certificate means a site compatibility certificate issued under State Environmental Planning Policy (Affordable Rental Housing) 2009.

There is not a current site compatibility certificate (affordable rental housing) as described that applies to this land.

There are currently no conditions of consent relating to a development application for affordable rental housing that apply to the land.

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

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

No.

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

No.

(c) that the land to which the certificate relates is the subject of an approved voluntary

management proposal within the meaning of that Act – if it is the subject of such an approved proposal at the date when the certificate is issued,

No.

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

No.

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

No.

In respect of matters beyond the control and/or responsibility of Council, information provided is provided only to the extent that Council has been so notified by the relevant Authorities or Departments, which have responsibility for the administration of the particular status referred to. Note that instruments applying to this land purporting to restrict or prohibit certain development may be inconsistent.

This certificate was generated automatically under the delegated authority of the Manager Sustainable Growth

WOLLONDILLY SHIRE COUNCIL

The information contained in this certificate can be discussed with Council's Duty Planner by appointment, Monday to Friday between the hours of 8:30am and 3:00pm, by telephoning (02) 4677 1100 or by making a booking via the online Duty Planner booking system - **https://dutyroster.wollondilly.nsw.gov.au/.** Please note that appointments are limited to 15 minutes.

Notice to Purchasers of Rural Land

Wollondilly Shire Council supports the rights of persons in rural areas of the Shire to undertake and pursue agricultural production activities that are consistent with land capability and use reasonable and practical measures to avoid environmental harm and minimise impact to adjoining land users.
Intending purchasers are advised that agricultural production can include the following activities that may have implications for occupiers and prospective purchasers of rural land:

Use of agricultural machinery (tractors, chainsaws, motorbikes)

Use of bird-scare devices

Intensive livestock production (cattle feedlots, poultry farms, piggeries, restricted dairies)

Operation of rural industries (packing sheds, abattoirs, stock and sale yards, sawmills)

Vegetation clearing

Grazing of livestock

Crop and fodder production

Soil cultivation

Crop harvesting

Use of firearms

Bushfire hazard reduction burning

Construction of firebreaks

Earthworks (construction of dams, drains, contour banks, access roads and tracks)

Fencing

Pumping and irrigation

Use of pesticides and herbicides

Spreading of manure, compost and treated effluent

Fertiliser usage

Slashing and mowing of grass

Production of silage

Re-vegetation activities (planting trees and shrubs)

Agroforestry

Livestock droving on roads

This is not an exhaustive list and intending purchasers of rural land should assess surrounding agricultural land uses and the impact these activities may have when being pursued in close proximity their proposed purchase. If you think these types of activities will affect your ability to live in a rural locality then intending purchasers are advised to reconsider their purchase and seek independent advice.This notice is not intended to affect the rights of individuals to take action under the common law or legislation and is provided for information purposes only.

APPENDIX F

Quality Assurance and Control Plan

QUALITY ASSURANCE AND CONTROL

A detailed Quality Assurance/Quality Control (QA/QC) assessment, including the collection and analysis of quality control samples, was completed for the data arising from the analysis of soil samples, in order to determine the suitability of the data for use in the assessment of site conditions. This included the collection of lab duplicates

Field Investigation Procedure

All fieldwork was conducted in general accordance with GeoEnviro's standard field operating procedures, which are aimed at collecting environmental samples using uniform and systematic methods, as required by GeoEnviro's Quality Assurance system. Key requirements of these procedures are as follows:

- Field staff - all field investigations were conducted by staff with sufficient and appropriate site specific training with the experience to assess and document field conditions and undertake the investigation tasks in accordance with relevant procedures. Soil types shall be recorded in accordance with the geotechnical classifications detailed in AS1726-1993 Geotechnical Site Investigations. A field log shall record the following but not limited to the following information;
    - Profile type – fill, natural, bedrock etc
    - Depths of profile type
    - Soil classification including composition, properties and characteristics.
    - Groundwater conditions.
    - Depths of samples collected.
    - Unusual or unexpected conditions including odour, colour etc.
- Field Documentation - included photographs, a field logbook to record an account of daily works and events including works start/end time, weather, presence of odours and/or dust, calibration results and checks and sample details.
- A visual and olfactory assessment was made on samples for the potential presence of contamination indicators or asbestos. Field screened for volatile organic compounds may also be undertaken using a Photo-Ionisation Detector (PID).

- Notes are collected included the location and extent of fill and features such as seepage, moisture, water bearing zones, depth of groundwater tables, discolouration, staining, odours and other indications of contamination. This information was recorded on the field borehole logs.
- Decontamination procedures - included the use of new disposable gloves for the collection of each sample, decontamination of the sampling equipment between each sampling location (using DECON90 where required) and the use of dedicated sampling containers provided by the laboratory.
- Sample procedures - collected samples were immediately transferred into laboratory supplied jars of appropriate composition and preservation for the required analysis. The sample containers were transferred to a chilled cooler for sample preservation prior to and during shipment to the testing laboratory.
- Duplicate samples were collected included blind duplicates. These were coded duplicate samples submitted to the primary laboratory for analysis as individual samples without any indication to the laboratory that they have been duplicated.
- Each sample was assigned an individual sample identification number that began with a location code and site number designation for the specific sample type and sample location number. The sampling depth or interval indicates the discrete depth or interval at which the sample was taken below the surface to the nearest 0.1 metre.

Sample Custody

A Laboratory Test Request & Chain of Custody (COC) form shall be completed for each sample set collected. The form is maintained as a record of sample collection, transfer, shipment and receipt by the laboratory. When physical possession of samples is transferred, both the individual relinquishing the samples and the individual receiving them shall sign, date and record the time on the COC.

Any samples damage shall be reported to the field personnel so that resampling could take place.

Laboratory Program

The contracted laboratory used their internal procedures and NATA accredited methods in accordance with their quality assurance system. GeoEnviro reviewed the laboratory reports to ensure that the laboratory analytical methods and limits of reporting are acceptable for the analysis required. Laboratory quality control procedures used during the project include:

- **Laboratory duplicate samples**: Duplicate sub samples collected by the laboratory from one sample submitted for analytical testing at a rate equivalent to one in twenty samples per analytical batch, or one sample per batch if less than twenty samples are analysed in a batch. A laboratory duplicate provides data on the analytical precision and reproducibility of the test result.
- **Certified reference standards**: A reference standard of known (certified) concentration is analysed along with a batch of samples. The Certified Reference Standard (CRS) or Laboratory Control Spike provides an indication of the analytical accuracy and the precision of the test method and is used for inorganic analyses.
- **Spiked samples**: An authentic field sample is spiked by adding an aliquot of known concentration of the target analyte(s) prior to sample extraction and analysis. A spike documents the effect of the sample matrix on the extraction and analytical techniques. Spiked samples will be analysed for each batch where samples are analysed for organic chemicals of concern.
- **Surrogate standard/spikes**: These are organic compounds which are similar to the analyte of interest in terms of chemical composition, extractability, and chromatographic conditions (retention time), but which are not normally found in environmental samples. These surrogate compounds are spiked into blanks, standards and samples submitted for organic analyses by gas-chromatographic techniques prior to sample extraction. Surrogate Standard/Spikes provide a means of checking that no gross errors have occurred during any stage of the test method leading to significant analyte loss.

- **Laboratory blank**: Usually an organic or aqueous solution that is as free as possible of analytes of interest to which is added all the reagents, in the same volume, as used in the preparation and subsequent analysis of the samples. The reagent blank is carried through the complete sample preparation procedure and contains the same reagent concentrations in the final solution as in the sample solution used for analysis. The reagent blank is used to correct for possible contamination resulting from the preparation or processing of the sample.

The contracted laboratory conducted an assessment of the laboratory QC program internally; however the results were independently reviewed and assessed by GeoEnviro

APPENDIX G

PID – Calibration Certificates and Screening

HEADSPACE SCREENING USING THE PHOTOIONISATION DETECTOR (PID)

GENERAL PRINCIPLES

The photoionisation detector (PID) is used to detect the presence of volatile compounds especially hydrocarbons and chlorinated solvents which are commonly encountered as contaminants.

Although the PID is useful in detecting 'hot spots' and provides qualitative information on the potential for contamination with volatile compounds, the technique has the following limitations:

- The PID works on the principle of ionisation of a compound using an ultraviolet lamp. It is important for the lamp to have an energy higher than the ionisation potential of the compound to be detected. The ionisation potential of a compound is the minimum energy that the compound needs to be ionised. Hence if the PID is fitted with a lamp with an energy of 10.6 eV, it will ionise compounds with ionisation potentials less than this value. Therefore, it is important to have some prior indication of the contaminants of concern on the site to interpret the PID readings.
- The PID will respond cumulatively to several compounds simultaneously which means that the reading is the additive concentrations of all the compounds present. Hence even if the PID reading is relatively high, the concentrations of the several individual compounds which have contributed to the reading may be relatively low.
- Each compound will have what is termed a 'response factor' which is the response obtained per mole of the compound being detected. Depending upon the degree of ionisation, the number of ions produced and hence the response of the PID will vary for different compounds. The PID used on this site was calibrated with isobutylene at 92 ppm.
- The geology of the soil is an important factor in the process of partitioning the contaminant between the soil matrix and the headspace. For example, the concentration of a contaminant in the headspace will be much higher in a sample of contaminated sand from which the contaminant is easily released compared with the concentration of the contaminant in a clay to which the contaminant may be more strongly adsorbed.
- The method of screening varies and there is currently no standard established. The method used for the present assessment is presented below and has been found to provide results that are appropriate for the information required from screening.

INSTRUMENT AND METHODOLOGY

The PID instrument used was a ProCheck Tiger T-113989 fitted with a 10.6 eV lamp. Prior to use the instrument was calibrated.

The soil sample was collected in a 250 ml glass jar to half its capacity. The jar was immediately covered with aluminium foil and capped. The jar was then shaken and was allowed to stand for at least 15 minutes. The lid of the jar was unscrewed and the inlet of the PID nose tube introduced through a small hole made in the aluminium foil. The maximum reading on the display was then recorded

PID Calibration Certificate

Instrument PhoCheck Tiger
Serial No. T-105511

airmet
Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments			
Battery	Charge Condition	✓				
	Fuses	✓				
	Capacity	✓				
	Recharge OK?	✓				
Switch/keypad	Operation	✓				
Display	Intensity	✓				
	Operation (segments)	✓				
Grill Filter	Condition	✓				
	Seal	✓				
Pump	Operation	✓				
	Filter	✓				
	Flow	✓				
	Valves, Diaphragm	✓				
PCB	Condition	✓				
Connectors	Condition	✓				
Sensor	PID	✓	10.6 ev			
Alarms	Beeper	✓	**Low**	**High**	**TWA**	**STEL**
	Settings	✓	50ppm	100ppm		
Software	Version	✓				
Data logger	Operation	✓				
Download	Operation	✓				
Other tests:						

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Diffusion mode Aspirated mode

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No		Instrument Reading
PID Lamp		100ppm Isobutylene	NATA	SY532		100.6ppm

Calibrated by: Olivia Hadley

Calibration date: 08/01/2024

Next calibration due: 7/07/2024

APPENDIX H

Laboratory Test Reports

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

SAMPLE RECEIPT ADVICE

Client Details

Client	Geoenviro Consultancy Pty Ltd
Attention	Steven Goss

Sample Login Details

Your reference	JC24471A, Proposed Rural Residential Subdivision
Envirolab Reference	345910
Date Sample Received	07/03/2024
Date Instructions Received	07/03/2024
Date Results Expected to be Reported	15/03/2024

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	62 Soil, 2 Material, 1 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	24
Cooling Method	None
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

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

Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	PCBs in Soil	Acid Extractable metalsin soil	Misc Inorg - Soil	ESP/CEC	Asbestos ID - soils	Asbestos ID - materials	Metals in Waters -Acid extractable
TP 1-0-0.1	✓	✓	✓			✓	✓		✓		
TP 1-0.4-0.5						✓	✓	✓			
TP 1-1-1.2							✓				
TP 2-0-0.1						✓	✓				
TP 2-0.3-0.4	✓	✓	✓			✓	✓		✓		
TP 2-0.6-0.7							✓				
TP 2-1.3-1.4							✓	✓			
TP 2-2.3-2.4							✓				
TP 3-0.2-0.3							✓				
TP 3-0.7-0.4							✓				
TP 3-1.2-1.3							✓	✓			
TP 4-0-0.1	✓	✓	✓	✓	✓	✓	✓		✓		
TP 4-0.4-0.6						✓	✓				
TP 4-1.2-1.3							✓				
TP 5-0-0.1						✓	✓				
TP 5-0.4-0.5	✓	✓	✓			✓	✓	✓	✓		
TP 5-1.2-1.3							✓				
TP 6-0-0.1						✓	✓				
TP 6-0.3-0.4							✓				
TP 7-0.1-0.2						✓	✓				
TP 7-0.6-0.7	✓	✓	✓			✓	✓		✓		
TP 7-1.1-1.2							✓	✓			
TP 8 (frag)-0.3-0.4										✓	
TP 8-0.3-0.4	✓	✓	✓	✓	✓	✓	✓		✓		
TP 8-0.8-0.9							✓				
TP 8-1.4-1.5							✓	✓			
TP 9-0-0.1	✓	✓	✓			✓	✓		✓		
TP 9-0.3-0.5							✓				
TP 10-0.3-0.4						✓	✓				
TP 10-1.2-1.3							✓				
TP 11-0.1-0.2	✓	✓	✓			✓	✓		✓		
TP 11-0.6-0.7							✓	✓			

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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	PCBs in Soil	Acid Extractable metalsin soil	Misc Inorg - Soil	ESP/CEC	Asbestos ID - soils	Asbestos ID - materials	Metals in Waters -Acid extractable
TP 11-1.2-1.3							✓				
TP 12-0-0.1	✓	✓	✓	✓	✓	✓	✓		✓		
TP 12-0.2-0.3							✓				
TP 12-1-1.1							✓				
TP 13-0.4-0.5							✓				
TP 13-2.1-2.2							✓	✓			
TP 14-0-0.1							✓				
TP 15-0-0.1	✓	✓	✓			✓	✓		✓		
TP 15-0.3-0.4							✓				
TP 15-1.3-1.4							✓	✓			
TP 16-0-0.1						✓	✓				
TP 16-0.3-0.4	✓	✓	✓			✓	✓		✓		
TP 16-1.3-1.4						✓	✓				
TP 16-2.3-2.4							✓				
TP 17-0.5-0.6	✓	✓	✓	✓	✓	✓	✓		✓		
TP 17 (frag)-0.5-0.6										✓	
TP 17-1.6-1.7	✓	✓	✓			✓	✓	✓	✓		
TP 17-2.3-2.4							✓				
TP 18-0.5-0.6	✓	✓	✓			✓	✓		✓		
TP 18-1.5-1.6							✓				
TP 18-2.2-2.3							✓	✓			
TP 19-0.3-0.4							✓				
TP 19-0.8-0.9							✓				
TP 20-0.3-0.4	✓	✓	✓			✓	✓		✓		
TP 20-1.3-1.4							✓	✓			
TP 20-1.9-2							✓				
TP 21-0-0.1						✓	✓				
TP 21-1-1.1	✓	✓	✓	✓	✓	✓	✓		✓		
TP 21-2.1-2.2							✓				
TP DUP A	✓	✓	✓	✓	✓	✓					
TP DUP B	✓	✓	✓	✓	✓	✓					
Trip Blank 04/03/2024	✓										

Envirolab Services Pty Ltd
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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	PCBs in Soil	Acid Extractable metalsin soil	Misc Inorg - Soil	ESP/CEC	Asbestos ID - soils	Asbestos ID - materials	Metals in Waters -Acid extractable
Rinsate 04/03/2024											✓

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.

GeoEnviro Consultancy Pty Ltd
Unit 5, 39-41 Fourth Avenue, Blacktown NSW 2148, Australia
Tel: (02) 96798733 Fax: (02) 96798744

Laboratory Test Request/Chain of Custody Record

Job Details
Job Number: JC24471A
Client:
Project: Proposed Rural Residential Subdivision Development
Location: No 80 Silverdale Road, The Oaks

Sample Date: 04/03/2024
Sampled By: SG
Project Manager: SL
Store Location:

External Laboratory Details:
Laboratory name: Envirolab Services Pty Ltd
Address: 12 Ashley Street
Chatswood
Contact: Tania Notaris

Sampling Details			Sample Type		Test Required (\) / Test Performed(X)																						
Location	Depth (m) From	Depth (m) To	Soil	Water	Combination 3a	Combination 5a	Combination 5	Metals (As Cd Cr Cu Pb Zn Ni Hg)	OCP	PCB	TRH	BTEX	PAH	ASBESTOS	pH	CEC/ESP	Aggressivity (pH, EC, Cl, SO4)	Resistivity	Turbidity	Dissolved Oxygen	Total Suspended Solids	Total N & Total P - Low Level	Faecal Coliforms	Faecal Enterococci	E.Coli	Hardness	Keep Sample
TP 1 1	0-0.1		DG		X												X										
TP 1 2	0.4-0.5		DG					X								X	x	X									
TP 1 3	1-1.2		DG														x	X									
TP 2 4	0-0.1		DG					X									X										
TP 2 5	0.3-0.4		DG		X												x	X									
TP 2 6	0.6-0.7		DG														x	X									
TP 2 7	1.3-1.4		DG													X	x	X									
TP 2 8	2.3-2.4		DG														x	X									
TP 3 9	0.2-0.3		DG														X										
TP 3 10	0.7-0.4		DG														x	X									
TP 3 11	1.2-1.3		DG													X	x	X									
TP 4 12	0-0.1		DG			X											X										
TP 4 13	0.4-0.6		DG					X									x	X									
TP 4 14	1.2-1.3		DG														x	X									
TP 5 15	0-0.1		DG					X									X										
TP 5 16	0.4-0.5		DG		X											X	x	X									
TP 5 17	1.2-1.3		DG														x	X									
TP 6 18	0-0.1		DG					X									X										

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

Job No: 345910
Date Received: 7/3/24
Time Received: 16:00
Received By: [illegible]
Temp: Cool/Ambient 24°C
Cooling: Ice/Icepack
Security: Intact/Broken/None

Relinquished by				Received By			
Laboratory	Name	Signature	Date	Laboratory	Name	Signature	Date
GeoEnviro Consultancy	Steven Goss	SMGoss					

Legend

DB Disturbed Sample (Bulk, Plastic bag)
DS Disturbed Sample (Small, Plastic bag)
DG Disturbed Sample (Glass Jar)
STP Standard Penetration Test Sample
U50 Undisturbed Sample, 50mm Tube
U75 Undisturbed Sample, 75mm Tube
WG Water Sample, Amber Glass Jar
WP Water Sample, Plastic Bottle
Y Keep Sample
N Discard Sample

GeoEnviro Consultancy Pty Ltd
Unit 5, 39-41 Fourth Avenue, Blacktown NSW 2148, Australia
Tel: (02) 96798733 Fax: (02) 96798744

345910

Laboratory Test Request/Chain of Custody Record

Job Details
Job Number: JC24471A
Client:
Project: Proposed Rural Residential Subdivision Development
Location: No 80 Silverdale Road, The Oaks

Sample Date: 04/03/2024
Sampled By: SG
Project Manager: SL
Store Location:

External Laboratory Details:
Laboratory name: Envirolab Services Pty Ltd
Address: 12 Ashley Street
Chatswood
Contact: Tania Notaris

Sampling Details			Sample Type		Test Required (\) / Test Performed(X)																						
Location	Depth (m) From	To	Soil	Water	Combination 3a	Combination 5a	Combination 5	Metals (As Cd Cr Cu Pb Zn Ni Hg)	OCP	PCB	TRH	BTEX	PAH	ASBESTOS	pH	CEC/ESP	Aggressivity (pH, EC, Cl, SO4)	Resistivity	Turbidity	Dissolved Oxygen	Total Suspended Solids	Total N & Total P - Low Level	Faecal Coliforms	Faecal Enterococci	E.Coli	Hardness	Keep Sample
TP 6 19	0.3-0.4		DG														X	X									
TP 7 20	0.1-0.2		DG					X									X										
TP 7 21	0.6-0.7		DG		X												X	X									
TP 7 22	1.1-1.2		DG													X	X	X									
TP 8 (frag) 23	0.3-0.4		DG											X													
TP 8 24	0.3-0.4		DG			X											X										
TP 8 25	0.8-0.9		DG														X	X									
TP 8 26	1.4-1.5		DG													X	X	X									
TP 9 27	0-0.1		DG		X												X										
TP 9 28	0.3-0.5		DG														X	X									
TP 10 29	0.3-0.4		DG					X									X										
TP 10 30	1.2-1.3		DG														X	X									
TP 11 31	0.1-0.2		DG		X												X										
TP 11 32	0.6-0.7		DG													X	X	X									
TP 11 33	1.2-1.3		DG														X	X									
TP 12 34	0-0.1		DG			X											X										
TP 12 35	0.2-0.3		DG														X	X									
TP 12 36	1-1.1		DG														X	X									

Relinquished by				Received By			
Laboratory	Name	Signature	Date	Laboratory	Name	Signature	Date
GeoEnviro Consultancy	Steven Goss	SMGoss					

Legend

DB Disturbed Sample (Bulk, Plastic bag)
DS Disturbed Sample (Small, Plastic bag)
DG Disturbed Sample (Glass Jar)
STP Standard Penetration Test Sample
U50 Undisturbed Sample, 50mm Tube
U75 Undisturbed Sample, 75mm Tube
WG Water Sample, Amber Glass Jar
WP Water Sample, Plastic Bottle
Y Keep Sample
N Discard Sample

GeoEnviro Consultancy Pty Ltd
Unit 5, 39-41 Fourth Avenue, Blacktown NSW 2148, Australia
Tel: (02) 96798733 Fax: (02) 96798744

345910

Laboratory Test Request/Chain of Custody Record

Job Details
Job Number: JC24471A
Client:
Project: Proposed Rural Residential Subdivision Development
Location: No 80 Silverdale Road, The Oaks

Sample Date: 04/03/2024
Sampled By: SG
Project Manager: SL
Store Location:

External Laboratory Details:
Laboratory name: Envirolab Services Pty Ltd
Address: 12 Ashley Street
Chatswood
Contact: Tania Notaris

Sampling Details			Sample Type		Test Required (\) / Test Performed(X)																						
Location	Depth (m) From	To	Soil	Water	Combination 3a	Combination 5a	Combination 5	Metals (As Cd Cr Cu Pb Zn Ni Hg)	OCP	PCB	TRH	BTEX	PAH	ASBESTOS	pH	CEC/ESP	Aggressivity (pH, EC, Cl, SO4)	Resistivity	Turbidity	Dissolved Oxygen	Total Suspended Solids	Total N & Total P - Low Level	Faecal Coliforms	Faecal Enterococci	E.Coli	Hardness	Keep Sample
TP 13 37	0.4-0.5		DG														X										
TP 13 38	2.1-2.2		DG													X	X	X									
TP 14 39	0-0.1		DG														X										
TP 15 40	0-0.1		DG		X												X										
TP 15 41	0.3-0.4		DG														X	X									
TP 15 42	1.3-1.4		DG													X	X	X									
TP 16 43	0-0.1		DG					X									X										
TP 16 44	0.3-0.4		DG		X												X	X									
TP 16 45	1.3-1.4		DG					X									X	X									
TP 16 46	2.3-2.4		DG														X	X									
TP 17 47	0.5-0.6		DG			X											X										
TP 17 (frag) 48	0.5-0.6		DG											X													
TP 17 49	1.6-1.7		DG		X											X	X	X									
TP 17 50	2.3-2.4		DG														X	X									
TP 18 51	0.5-0.6		DG		X												X										
TP 18 52	1.5-1.6		DG														X	X									
TP 18 53	2.2-2.3		DG													X	X	X									
TP 19 54	0.3-0.4		DG														X										

Relinquished by				Received By			
Laboratory	Name	Signature	Date	Laboratory	Name	Signature	Date
GeoEnviro Consultancy	Steven Goss	SMGoss					

Legend

DB Disturbed Sample (Bulk, Plastic bag)
DS Disturbed Sample (Small, Plastic bag)
DG Disturbed Sample (Glass Jar)
STP Standard Penetration Test Sample
U50 Undisturbed Sample, 50mm Tube
U75 Undisturbed Sample, 75mm Tube
WG Water Sample, Amber Glass Jar
WP Water Sample, Plastic Bottle
Y Keep Sample
N Discard Sample

345910

GeoEnviro Consultancy Pty Ltd

Unit 5, 39-41 Fourth Avenue, Blacktown NSW 2148, Australia
Tel: (02) 96798733 Fax: (02) 96798744

Laboratory Test Request/Chain of Custody Record

Job Details
Job Number: JC24471A
Client:
Project: Proposed Rural Residential Subdivision Development
Location: No 80 Silverdale Road, The Oaks

Sample Date: 04/03/2024
Sampled By: SG
Project Manager: SL
Store Location:

External Laboratory Details:
Laboratory name: Envirolab Services Pty Ltd
Address: 12 Ashley Street
Chatswood
Contact: Tania Notaris

Sampling Details — Test Required (\) — Test Performed(X)

OW	Location	Depth (m) From-To	Sample Type Soil	Sample Type Water	Combination 3a	Combination 5a	Combination 5	Metals (As Cd Cr Cu Pb Zn Ni Hg)	OCP	PCB	TRH	BTEX	PAH	ASBESTOS	pH	CEC/ESP	Aggressivity (pH, EC, Cl, SO4)	Resistivity	Turbidity	Dissolved Oxygen	Total Suspended Solids	Total N & Total P - Low Level	Faecal Coliforms	Faecal Enterococci	E.Coli	Hardness	Keep Sample
1	TP 19 55	0.8-0.9	DG														X	X									
2	TP 20 56	0.3-0.4	DG		X												X										
3	TP 20 57	1.3-1.4	DG													X	X	X									
4	TP 20 58	1.9-2	DG														X	X									
5	TP 21 59	0-0.1	DG					X									X										
6	TP 21 60	1-1.1	DG			X											X	X									
7	TP 21 61	2.1-2.2	DG														X										
8	TP DUP A 62	-	DG				X																				
9	TP DUP B 63	-	DG				X																				
10	Trip Blank 04/03/2024 64	-	DG									X															
11	Rinsate 04/03/2024 65	-	WP					X																			

ENVIROLAB
Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
Job No: 345910
Date Received: 7/3/24
Time Received: 16:20
Received By: OW
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Relinquished by				Received By			
Laboratory	Name	Signature	Date	Laboratory	Name	Signature	Date
GeoEnviro Consultancy	Steven Goss	SMGoss			O. WILLIAM	O-W	7/3/24

Legend
DB Disturbed Sample (Bulk, Plastic bag)
DS Disturbed Sample (Small, Plastic bag)
DG Disturbed Sample (Glass Jar)
STP Standard Penetration Test Sample
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U75 Undisturbed Sample, 75mm Tube
WG Water Sample, Amber Glass Jar
WP Water Sample, Plastic Bottle
Y Keep Sample
N Discard Sample

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

CERTIFICATE OF ANALYSIS 345910

Client Details

Client	Geoenviro Consultancy Pty Ltd
Attention	Steven Goss
Address	PO Box 1543, Macquarie Centre, North Ryde, NSW, 2113

Sample Details

Your Reference	**JC24471A, Proposed Rural Residential Subdivision**
Number of Samples	62 Soil, 2 Material, 1 Water
Date samples received	07/03/2024
Date completed instructions received	07/03/2024

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	15/03/2024
Date of Issue	15/03/2024

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

Results Approved By
Diego Bigolin, Inorganics Supervisor
Dragana Tomas, Senior Chemist
Hannah Nguyen, Metals Supervisor
Loren Bardwell, Development Chemist
Lucy Zhu, Asbestos Supervisor
Timothy Toll, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		345910-1	345910-5	345910-12	345910-16	345910-21
Your Reference	UNITS	TP 1	TP 2	TP 4	TP 5	TP 7
Depth		0-0.1	0.3-0.4	0-0.1	0.4-0.5	0.6-0.7
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/03/2024	11/03/2024	11/03/2024	11/03/2024	11/03/2024
Date analysed	-	14/03/2024	14/03/2024	14/03/2024	14/03/2024	14/03/2024
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTRH 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	%	76	72	74	75	75

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		345910-24	345910-27	345910-31	345910-34	345910-40
Your Reference	UNITS	TP 8	TP 9	TP 11	TP 12	TP 15
Depth		0.3-0.4	0-0.1	0.1-0.2	0-0.1	0-0.1
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/03/2024	11/03/2024	11/03/2024	11/03/2024	11/03/2024
Date analysed	-	14/03/2024	14/03/2024	14/03/2024	14/03/2024	14/03/2024
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	91	71	77	80	79

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		345910-44	345910-47	345910-49	345910-51	345910-56
Your Reference	UNITS	TP 16	TP 17	TP 17	TP 18	TP 20
Depth		0.3-0.4	0.5-0.6	1.6-1.7	0.5-0.6	0.3-0.4
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/03/2024	11/03/2024	11/03/2024	11/03/2024	11/03/2024
Date analysed	-	14/03/2024	14/03/2024	14/03/2024	14/03/2024	14/03/2024
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTRH 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	%	74	82	85	90	83

vTRH(C6-C10)/BTEXN in Soil					
Our Reference		345910-60	345910-62	345910-63	345910-64
Your Reference	UNITS	TP 21	TP DUP A	TP DUP B	Trip Blank 04/03/2024
Depth		1-1.1	-	-	-
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	11/03/2024	11/03/2024	11/03/2024	11/03/2024
Date analysed	-	14/03/2024	14/03/2024	14/03/2024	14/03/2024
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25
vTRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	78	86	93	93

svTRH (C10-C40) in Soil						
Our Reference		345910-1	345910-5	345910-12	345910-16	345910-21
Your Reference	UNITS	TP 1	TP 2	TP 4	TP 5	TP 7
Depth		0-0.1	0.3-0.4	0-0.1	0.4-0.5	0.6-0.7
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/03/2024	11/03/2024	11/03/2024	11/03/2024	11/03/2024
Date analysed	-	12/03/2024	12/03/2024	12/03/2024	12/03/2024	13/03/2024
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	%	84	83	80	80	81

svTRH (C10-C40) in Soil						
Our Reference		345910-24	345910-27	345910-31	345910-34	345910-40
Your Reference	UNITS	TP 8	TP 9	TP 11	TP 12	TP 15
Depth		0.3-0.4	0-0.1	0.1-0.2	0-0.1	0-0.1
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/03/2024	11/03/2024	11/03/2024	11/03/2024	11/03/2024
Date analysed	-	13/03/2024	13/03/2024	13/03/2024	13/03/2024	13/03/2024
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	160
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	160
Surrogate o-Terphenyl	%	82	79	82	83	85

svTRH (C10-C40) in Soil						
Our Reference		345910-44	345910-47	345910-49	345910-51	345910-56
Your Reference	UNITS	TP 16	TP 17	TP 17	TP 18	TP 20
Depth		0.3-0.4	0.5-0.6	1.6-1.7	0.5-0.6	0.3-0.4
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/03/2024	11/03/2024	11/03/2024	11/03/2024	11/03/2024
Date analysed	-	13/03/2024	13/03/2024	13/03/2024	13/03/2024	13/03/2024
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	110	140	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	110	140	<50	<50	<50
Surrogate o-Terphenyl	%	81	82	81	81	88

svTRH (C10-C40) in Soil				
Our Reference		345910-60	345910-62	345910-63
Your Reference	UNITS	TP 21	TP DUP A	TP DUP B
Depth		1-1.1	-	-
Date Sampled		04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil
Date extracted	-	11/03/2024	11/03/2024	11/03/2024
Date analysed	-	13/03/2024	13/03/2024	13/03/2024
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	79	80

PAHs in Soil						
Our Reference		345910-1	345910-5	345910-12	345910-16	345910-21
Your Reference	UNITS	TP 1	TP 2	TP 4	TP 5	TP 7
Depth		0-0.1	0.3-0.4	0-0.1	0.4-0.5	0.6-0.7
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/03/2024	11/03/2024	11/03/2024	11/03/2024	11/03/2024
Date analysed	-	13/03/2024	13/03/2024	13/03/2024	13/03/2024	13/03/2024
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.3	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.4	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	0.4	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.3	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	2.3	<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	%	106	107	98	104	114

PAHs in Soil						
Our Reference		345910-24	345910-27	345910-31	345910-34	345910-40
Your Reference	UNITS	TP 8	TP 9	TP 11	TP 12	TP 15
Depth		0.3-0.4	0-0.1	0.1-0.2	0-0.1	0-0.1
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/03/2024	11/03/2024	11/03/2024	11/03/2024	11/03/2024
Date analysed	-	13/03/2024	13/03/2024	13/03/2024	13/03/2024	13/03/2024
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	%	94	106	106	95	104

PAHs in Soil						
Our Reference		345910-44	345910-47	345910-49	345910-51	345910-56
Your Reference	UNITS	TP 16	TP 17	TP 17	TP 18	TP 20
Depth		0.3-0.4	0.5-0.6	1.6-1.7	0.5-0.6	0.3-0.4
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/03/2024	11/03/2024	11/03/2024	11/03/2024	11/03/2024
Date analysed	-	13/03/2024	14/03/2024	13/03/2024	13/03/2024	13/03/2024
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	0.3	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	0.7	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.2	0.8	0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	0.4	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	0.3	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	0.7	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.1	0.4	0.07	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.2	<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	0.3	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	0.4	4.0	0.2	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	0.6	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	0.6	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	0.7	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	100	122	102	105	104

PAHs in Soil				
Our Reference		345910-60	345910-62	345910-63
Your Reference	UNITS	TP 21	TP DUP A	TP DUP B
Depth		1-1.1	-	-
Date Sampled		04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil
Date extracted	-	11/03/2024	11/03/2024	11/03/2024
Date analysed	-	13/03/2024	13/03/2024	13/03/2024
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 p-Terphenyl-d14	%	91	96	93

Organochlorine Pesticides in soil						
Our Reference		345910-12	345910-24	345910-34	345910-47	345910-60
Your Reference	UNITS	TP 4	TP 8	TP 12	TP 17	TP 21
Depth		0-0.1	0.3-0.4	0-0.1	0.5-0.6	1-1.1
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/03/2024	11/03/2024	11/03/2024	11/03/2024	11/03/2024
Date analysed	-	13/03/2024	13/03/2024	13/03/2024	13/03/2024	13/03/2024
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
Mirex	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 4-Chloro-3-NBTF	%	88	89	92	90	88

Organochlorine Pesticides in soil			
Our Reference		345910-62	345910-63
Your Reference	UNITS	TP DUP A	TP DUP B
Depth		-	-
Date Sampled		04/03/2024	04/03/2024
Type of sample		Soil	Soil
Date extracted	-	11/03/2024	11/03/2024
Date analysed	-	13/03/2024	13/03/2024
alpha-BHC	mg/kg	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1
Mirex	mg/kg	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1
Surrogate 4-Chloro-3-NBTF	%	87	88

PCBs in Soil						
Our Reference		345910-12	345910-24	345910-34	345910-47	345910-60
Your Reference	UNITS	TP 4	TP 8	TP 12	TP 17	TP 21
Depth		0-0.1	0.3-0.4	0-0.1	0.5-0.6	1-1.1
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/03/2024	11/03/2024	11/03/2024	11/03/2024	11/03/2024
Date analysed	-	13/03/2024	13/03/2024	13/03/2024	13/03/2024	13/03/2024
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 2-Fluorobiphenyl	%	95	95	94	91	90

PCBs in Soil			
Our Reference		345910-62	345910-63
Your Reference	UNITS	TP DUP A	TP DUP B
Depth		-	-
Date Sampled		04/03/2024	04/03/2024
Type of sample		Soil	Soil
Date extracted	-	11/03/2024	11/03/2024
Date analysed	-	13/03/2024	13/03/2024
Aroclor 1016	mg/kg	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1
Surrogate 2-Fluorobiphenyl	%	92	91

Acid Extractable metals in soil						
Our Reference		345910-1	345910-2	345910-4	345910-5	345910-12
Your Reference	UNITS	TP 1	TP 1	TP 2	TP 2	TP 4
Depth		0-0.1	0.4-0.5	0-0.1	0.3-0.4	0-0.1
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	12/03/2024	12/03/2024	12/03/2024	12/03/2024	12/03/2024
Date analysed	-	12/03/2024	12/03/2024	12/03/2024	12/03/2024	12/03/2024
Arsenic	mg/kg	<4	7	8	6	16
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	8	30	29	7	45
Copper	mg/kg	28	110	7	30	4
Lead	mg/kg	100	60	11	15	16
Mercury	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	5	20	4	7	4
Zinc	mg/kg	94	71	10	54	10

Acid Extractable metals in soil						
Our Reference		345910-13	345910-15	345910-16	345910-18	345910-20
Your Reference	UNITS	TP 4	TP 5	TP 5	TP 6	TP 7
Depth		0.4-0.6	0-0.1	0.4-0.5	0-0.1	0.1-0.2
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	12/03/2024	12/03/2024	12/03/2024	12/03/2024	12/03/2024
Date analysed	-	12/03/2024	12/03/2024	12/03/2024	12/03/2024	12/03/2024
Arsenic	mg/kg	5	9	4	8	12
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	6	23	20	44	36
Copper	mg/kg	11	17	5	5	6
Lead	mg/kg	11	22	9	14	14
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	2	6	2	4	3
Zinc	mg/kg	6	34	5	8	7

Acid Extractable metals in soil						
Our Reference		345910-21	345910-24	345910-27	345910-29	345910-31
Your Reference	UNITS	TP 7	TP 8	TP 9	TP 10	TP 11
Depth		0.6-0.7	0.3-0.4	0-0.1	0.3-0.4	0.1-0.2
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	12/03/2024	12/03/2024	12/03/2024	12/03/2024	12/03/2024
Date analysed	-	12/03/2024	12/03/2024	12/03/2024	12/03/2024	12/03/2024
Arsenic	mg/kg	9	8	6	9	9
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	36	44	11	27	36
Copper	mg/kg	4	6	14	8	6
Lead	mg/kg	13	21	13	13	14
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	3	7	6	4	3
Zinc	mg/kg	8	180	25	11	8

Acid Extractable metals in soil						
Our Reference		345910-34	345910-40	345910-43	345910-44	345910-45
Your Reference	UNITS	TP 12	TP 15	TP 16	TP 16	TP 16
Depth		0-0.1	0-0.1	0-0.1	0.3-0.4	1.3-1.4
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	12/03/2024	12/03/2024	12/03/2024	12/03/2024	12/03/2024
Date analysed	-	12/03/2024	12/03/2024	12/03/2024	12/03/2024	12/03/2024
Arsenic	mg/kg	13	9	5	4	13
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	33	31	17	13	20
Copper	mg/kg	14	11	21	14	8
Lead	mg/kg	22	26	24	35	15
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	4	8	11	8	3
Zinc	mg/kg	17	35	35	51	13

Acid Extractable metals in soil						
Our Reference		345910-47	345910-49	345910-51	345910-56	345910-59
Your Reference	UNITS	TP 17	TP 17	TP 18	TP 20	TP 21
Depth		0.5-0.6	1.6-1.7	0.5-0.6	0.3-0.4	0-0.1
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	12/03/2024	12/03/2024	12/03/2024	12/03/2024	12/03/2024
Date analysed	-	12/03/2024	12/03/2024	12/03/2024	12/03/2024	12/03/2024
Arsenic	mg/kg	4	10	9	8	9
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	13	27	26	18	30
Copper	mg/kg	39	9	7	6	16
Lead	mg/kg	60	17	12	13	14
Mercury	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	8	5	4	2	8
Zinc	mg/kg	97	12	10	4	50

Acid Extractable metals in soil					
Our Reference		345910-60	345910-62	345910-63	345910-66
Your Reference	UNITS	TP 21	TP DUP A	TP DUP B	TP DUP A - [TRIPLICATE]
Depth		1-1.1	-	-	-
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	12/03/2024	12/03/2024	12/03/2024	12/03/2024
Date analysed	-	12/03/2024	12/03/2024	12/03/2024	12/03/2024
Arsenic	mg/kg	8	20	8	18
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	23	30	23	35
Copper	mg/kg	10	5	10	5
Lead	mg/kg	12	14	12	18
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	5	5	5	5
Zinc	mg/kg	19	12	17	13

Misc Inorg - Soil						
Our Reference		345910-1	345910-2	345910-3	345910-4	345910-5
Your Reference	UNITS	TP 1	TP 1	TP 1	TP 2	TP 2
Depth		0-0.1	0.4-0.5	1-1.2	0-0.1	0.3-0.4
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	07/03/2024	07/03/2024	07/03/2024	07/03/2024	07/03/2024
Date analysed	-	14/03/2024	14/03/2024	14/03/2024	14/03/2024	14/03/2024
pH 1:5 soil:water	pH Units	7.3	8.6	4.9	4.9	5.3
Electrical Conductivity 1:5 soil:water	µS/cm	41	120	40	62	37
Chloride, Cl 1:5 soil:water	mg/kg	<10	<10	22	10	<10
Sulphate, SO4 1:5 soil:water	mg/kg	<10	28	10	26	10
Resistivity in soil*	ohm m	[NA]	83	250	[NA]	270

Misc Inorg - Soil						
Our Reference		345910-6	345910-7	345910-8	345910-9	345910-10
Your Reference	UNITS	TP 2	TP 2	TP 2	TP 3	TP 3
Depth		0.6-0.7	1.3-1.4	2.3-2.4	0.2-0.3	0.7-0.4
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	07/03/2024	07/03/2024	07/03/2024	07/03/2024	07/03/2024
Date analysed	-	14/03/2024	14/03/2024	14/03/2024	14/03/2024	14/03/2024
pH 1:5 soil:water	pH Units	5.0	4.9	5.0	4.6	4.7
Electrical Conductivity 1:5 soil:water	µS/cm	140	140	130	62	110
Chloride, Cl 1:5 soil:water	mg/kg	49	130	120	10	79
Sulphate, SO4 1:5 soil:water	mg/kg	130	34	23	24	32
Resistivity in soil*	ohm m	74	73	78	[NA]	89

Misc Inorg - Soil						
Our Reference		345910-11	345910-12	345910-13	345910-14	345910-15
Your Reference	UNITS	TP 3	TP 4	TP 4	TP 4	TP 5
Depth		1.2-1.3	0-0.1	0.4-0.6	1.2-1.3	0-0.1
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	07/03/2024	07/03/2024	07/03/2024	07/03/2024	07/03/2024
Date analysed	-	14/03/2024	14/03/2024	14/03/2024	14/03/2024	14/03/2024
pH 1:5 soil:water	pH Units	5.1	5.1	5.2	4.8	4.8
Electrical Conductivity 1:5 soil:water	µS/cm	92	68	75	240	41
Chloride, Cl 1:5 soil:water	mg/kg	66	10	31	260	<10
Sulphate, SO4 1:5 soil:water	mg/kg	55	48	46	89	30
Resistivity in soil*	ohm m	110	[NA]	130	41	[NA]

Misc Inorg - Soil						
Our Reference		345910-16	345910-17	345910-18	345910-19	345910-20
Your Reference	UNITS	TP 5	TP 5	TP 6	TP 6	TP 7
Depth		0.4-0.5	1.2-1.3	0-0.1	0.3-0.4	0.1-0.2
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	07/03/2024	07/03/2024	07/03/2024	07/03/2024	07/03/2024
Date analysed	-	14/03/2024	14/03/2024	14/03/2024	14/03/2024	14/03/2024
pH 1:5 soil:water	pH Units	4.6	5.3	4.9	5.0	4.7
Electrical Conductivity 1:5 soil:water	µS/cm	45	59	45	48	51
Chloride, Cl 1:5 soil:water	mg/kg	<10	47	10	10	10
Sulphate, SO4 1:5 soil:water	mg/kg	27	28	28	30	28
Resistivity in soil*	ohm m	220	170	[NA]	210	[NA]

Misc Inorg - Soil						
Our Reference		345910-21	345910-22	345910-24	345910-25	345910-26
Your Reference	UNITS	TP 7	TP 7	TP 8	TP 8	TP 8
Depth		0.6-0.7	1.1-1.2	0.3-0.4	0.8-0.9	1.4-1.5
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	07/03/2024	07/03/2024	07/03/2024	07/03/2024	07/03/2024
Date analysed	-	14/03/2024	14/03/2024	14/03/2024	14/03/2024	14/03/2024
pH 1:5 soil:water	pH Units	5.0	4.9	6.0	5.5	5.7
Electrical Conductivity 1:5 soil:water	µS/cm	63	220	87	86	46
Chloride, Cl 1:5 soil:water	mg/kg	<10	220	37	20	<10
Sulphate, SO4 1:5 soil:water	mg/kg	20	69	24	52	20
Resistivity in soil*	ohm m	160	45	[NA]	120	220

Misc Inorg - Soil						
Our Reference		345910-27	345910-28	345910-29	345910-30	345910-31
Your Reference	UNITS	TP 9	TP 9	TP 10	TP 10	TP 11
Depth		0-0.1	0.3-0.5	0.3-0.4	1.2-1.3	0.1-0.2
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	07/03/2024	07/03/2024	07/03/2024	07/03/2024	07/03/2024
Date analysed	-	14/03/2024	14/03/2024	14/03/2024	14/03/2024	14/03/2024
pH 1:5 soil:water	pH Units	5.4	5.1	5.0	5.3	4.8
Electrical Conductivity 1:5 soil:water	µS/cm	76	140	54	92	110
Chloride, Cl 1:5 soil:water	mg/kg	20	78	<10	46	79
Sulphate, SO4 1:5 soil:water	mg/kg	41	84	24	44	29
Resistivity in soil*	ohm m	[NA]	72	[NA]	110	[NA]

Misc Inorg - Soil						
Our Reference		345910-32	345910-33	345910-34	345910-35	345910-36
Your Reference	UNITS	TP 11	TP 11	TP 12	TP 12	TP 12
Depth		0.6-0.7	1.2-1.3	0-0.1	0.2-0.3	1-1.1
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	07/03/2024	07/03/2024	07/03/2024	07/03/2024	07/03/2024
Date analysed	-	14/03/2024	14/03/2024	14/03/2024	14/03/2024	14/03/2024
pH 1:5 soil:water	pH Units	4.7	5.1	5.2	5.2	5.6
Electrical Conductivity 1:5 soil:water	µS/cm	240	270	56	35	58
Chloride, Cl 1:5 soil:water	mg/kg	300	310	<10	<10	29
Sulphate, SO4 1:5 soil:water	mg/kg	20	53	20	33	23
Resistivity in soil*	ohm m	41	38	[NA]	280	170

Misc Inorg - Soil						
Our Reference		345910-37	345910-38	345910-39	345910-40	345910-41
Your Reference	UNITS	TP 13	TP 13	TP 14	TP 15	TP 15
Depth		0.4-0.5	2.1-2.2	0-0.1	0-0.1	0.3-0.4
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	07/03/2024	07/03/2024	07/03/2024	07/03/2024	07/03/2024
Date analysed	-	14/03/2024	14/03/2024	14/03/2024	14/03/2024	14/03/2024
pH 1:5 soil:water	pH Units	5.2	5.1	5.1	5.9	5.0
Electrical Conductivity 1:5 soil:water	µS/cm	42	58	62	83	49
Chloride, Cl 1:5 soil:water	mg/kg	<10	<10	25	10	<10
Sulphate, SO4 1:5 soil:water	mg/kg	21	28	37	22	31
Resistivity in soil*	ohm m	[NA]	170	[NA]	[NA]	200

Misc Inorg - Soil						
Our Reference		345910-42	345910-43	345910-44	345910-45	345910-46
Your Reference	UNITS	TP 15	TP 16	TP 16	TP 16	TP 16
Depth		1.3-1.4	0-0.1	0.3-0.4	1.3-1.4	2.3-2.4
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	07/03/2024	07/03/2024	07/03/2024	07/03/2024	07/03/2024
Date analysed	-	14/03/2024	14/03/2024	14/03/2024	14/03/2024	14/03/2024
pH 1:5 soil:water	pH Units	5.1	7.4	8.2	7.3	5.3
Electrical Conductivity 1:5 soil:water	µS/cm	78	160	410	390	80
Chloride, Cl 1:5 soil:water	mg/kg	37	<10	21	57	56
Sulphate, SO4 1:5 soil:water	mg/kg	65	41	640	320	25
Resistivity in soil*	ohm m	130	[NA]	25	25	130

Misc Inorg - Soil						
Our Reference		345910-47	345910-49	345910-50	345910-51	345910-52
Your Reference	UNITS	TP 17	TP 17	TP 17	TP 18	TP 18
Depth		0.5-0.6	1.6-1.7	2.3-2.4	0.5-0.6	1.5-1.6
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	07/03/2024	07/03/2024	07/03/2024	07/03/2024	07/03/2024
Date analysed	-	14/03/2024	14/03/2024	14/03/2024	14/03/2024	14/03/2024
pH 1:5 soil:water	pH Units	8.1	7.8	5.3	5.0	5.2
Electrical Conductivity 1:5 soil:water	µS/cm	1,300	510	110	67	65
Chloride, Cl 1:5 soil:water	mg/kg	37	68	84	21	26
Sulphate, SO4 1:5 soil:water	mg/kg	3,200	820	44	30	29
Resistivity in soil*	ohm m	[NA]	20	88	[NA]	150

Misc Inorg - Soil						
Our Reference		345910-53	345910-54	345910-55	345910-56	345910-57
Your Reference	UNITS	TP 18	TP 19	TP 19	TP 20	TP 20
Depth		2.2-2.3	0.3-0.4	0.8-0.9	0.3-0.4	1.3-1.4
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	07/03/2024	07/03/2024	07/03/2024	07/03/2024	07/03/2024
Date analysed	-	14/03/2024	14/03/2024	14/03/2024	14/03/2024	14/03/2024
pH 1:5 soil:water	pH Units	5.5	5.1	5.3	4.8	5.1
Electrical Conductivity 1:5 soil:water	µS/cm	60	56	140	51	72
Chloride, Cl 1:5 soil:water	mg/kg	31	<10	66	<10	36
Sulphate, SO4 1:5 soil:water	mg/kg	20	21	37	22	10
Resistivity in soil*	ohm m	170	[NA]	73	[NA]	140

Misc Inorg - Soil					
Our Reference		345910-58	345910-59	345910-60	345910-61
Your Reference	UNITS	TP 20	TP 21	TP 21	TP 21
Depth		1.9-2	0-0.1	1-1.1	2.1-2.2
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	07/03/2024	07/03/2024	07/03/2024	07/03/2024
Date analysed	-	14/03/2024	14/03/2024	14/03/2024	14/03/2024
pH 1:5 soil:water	pH Units	5.2	4.9	5.0	5.3
Electrical Conductivity 1:5 soil:water	µS/cm	42	110	96	63
Chloride, Cl 1:5 soil:water	mg/kg	10	10	10	<10
Sulphate, SO4 1:5 soil:water	mg/kg	20	45	43	30
Resistivity in soil*	ohm m	240	[NA]	100	[NA]

ESP/CEC						
Our Reference		345910-2	345910-7	345910-11	345910-16	345910-22
Your Reference	UNITS	TP 1	TP 2	TP 3	TP 5	TP 7
Depth		0.4-0.5	1.3-1.4	1.2-1.3	0.4-0.5	1.1-1.2
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/03/2024	15/03/2024	15/03/2024	15/03/2024	15/03/2024
Date analysed	-	15/03/2024	15/03/2024	15/03/2024	15/03/2024	15/03/2024
Exchangeable Ca	meq/100g	24	0.9	0.2	0.7	0.2
Exchangeable K	meq/100g	0.3	0.1	0.2	0.3	0.1
Exchangeable Mg	meq/100g	0.8	3.6	3.9	3.9	2.5
Exchangeable Na	meq/100g	<0.1	0.6	1.1	<0.1	1.3
Cation Exchange Capacity	meq/100g	25	5.2	5.4	5.0	4.1
ESP	%	<1	11	20	[NT]	31

ESP/CEC						
Our Reference		345910-26	345910-32	345910-38	345910-42	345910-49
Your Reference	UNITS	TP 8	TP 11	TP 13	TP 15	TP 17
Depth		1.4-1.5	0.6-0.7	2.1-2.2	1.3-1.4	1.6-1.7
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/03/2024	15/03/2024	15/03/2024	15/03/2024	15/03/2024
Date analysed	-	15/03/2024	15/03/2024	15/03/2024	15/03/2024	15/03/2024
Exchangeable Ca	meq/100g	1.1	0.2	1.3	0.2	17
Exchangeable K	meq/100g	0.3	<0.1	<0.1	0.1	0.3
Exchangeable Mg	meq/100g	2.9	1.4	2.9	2.8	3.7
Exchangeable Na	meq/100g	0.7	0.5	0.2	1.1	0.3
Cation Exchange Capacity	meq/100g	5.0	2.1	4.5	4.2	21
ESP	%	13	23	5	27	2

ESP/CEC			
Our Reference		345910-53	345910-57
Your Reference	UNITS	TP 18	TP 20
Depth		2.2-2.3	1.3-1.4
Date Sampled		04/03/2024	04/03/2024
Type of sample		Soil	Soil
Date prepared	-	15/03/2024	15/03/2024
Date analysed	-	15/03/2024	15/03/2024
Exchangeable Ca	meq/100g	0.4	0.6
Exchangeable K	meq/100g	0.1	<0.1
Exchangeable Mg	meq/100g	2.0	3.2
Exchangeable Na	meq/100g	0.7	0.3
Cation Exchange Capacity	meq/100g	3.3	4.2
ESP	%	22	7

Moisture						
Our Reference		345910-1	345910-2	345910-4	345910-5	345910-12
Your Reference	UNITS	TP 1	TP 1	TP 2	TP 2	TP 4
Depth		0-0.1	0.4-0.5	0-0.1	0.3-0.4	0-0.1
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	11/03/2024	11/03/2024	11/03/2024	11/03/2024	11/03/2024
Date analysed	-	12/03/2024	12/03/2024	12/03/2024	12/03/2024	12/03/2024
Moisture	%	10	9.0	20	11	17

Moisture						
Our Reference		345910-13	345910-15	345910-16	345910-18	345910-20
Your Reference	UNITS	TP 4	TP 5	TP 5	TP 6	TP 7
Depth		0.4-0.6	0-0.1	0.4-0.5	0-0.1	0.1-0.2
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	11/03/2024	11/03/2024	11/03/2024	11/03/2024	11/03/2024
Date analysed	-	12/03/2024	12/03/2024	12/03/2024	12/03/2024	12/03/2024
Moisture	%	20	19	14	16	15

Moisture						
Our Reference		345910-21	345910-24	345910-27	345910-29	345910-31
Your Reference	UNITS	TP 7	TP 8	TP 9	TP 10	TP 11
Depth		0.6-0.7	0.3-0.4	0-0.1	0.3-0.4	0.1-0.2
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	11/03/2024	11/03/2024	11/03/2024	11/03/2024	11/03/2024
Date analysed	-	12/03/2024	12/03/2024	12/03/2024	12/03/2024	12/03/2024
Moisture	%	19	11	14	18	18

Moisture						
Our Reference		345910-34	345910-40	345910-43	345910-44	345910-45
Your Reference	UNITS	TP 12	TP 15	TP 16	TP 16	TP 16
Depth		0-0.1	0-0.1	0-0.1	0.3-0.4	1.3-1.4
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	11/03/2024	11/03/2024	11/03/2024	11/03/2024	11/03/2024
Date analysed	-	12/03/2024	12/03/2024	12/03/2024	12/03/2024	12/03/2024
Moisture	%	19	22	12	8.7	21

Moisture						
Our Reference		345910-47	345910-49	345910-51	345910-56	345910-59
Your Reference	UNITS	TP 17	TP 17	TP 18	TP 20	TP 21
Depth		0.5-0.6	1.6-1.7	0.5-0.6	0.3-0.4	0-0.1
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	11/03/2024	11/03/2024	11/03/2024	11/03/2024	11/03/2024
Date analysed	-	12/03/2024	12/03/2024	12/03/2024	12/03/2024	12/03/2024
Moisture	%	13	16	16	13	18

Moisture				
Our Reference		345910-60	345910-62	345910-63
Your Reference	UNITS	TP 21	TP DUP A	TP DUP B
Depth		1-1.1	-	-
Date Sampled		04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil
Date prepared	-	11/03/2024	11/03/2024	11/03/2024
Date analysed	-	12/03/2024	12/03/2024	12/03/2024
Moisture	%	15	17	14

Asbestos ID - soils						
Our Reference		345910-1	345910-5	345910-12	345910-16	345910-21
Your Reference	UNITS	TP 1	TP 2	TP 4	TP 5	TP 7
Depth		0-0.1	0.3-0.4	0-0.1	0.4-0.5	0.6-0.7
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	13/03/2024	13/03/2024	13/03/2024	13/03/2024	13/03/2024
Sample mass tested	g	Approx. 15g	Approx. 15g	Approx. 15g	Approx. 20g	Approx. 15g
Sample Description	-	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Asbestos comments	-	NO	NO	NO	NO	NO
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils						
Our Reference		345910-24	345910-27	345910-31	345910-34	345910-40
Your Reference	UNITS	TP 8	TP 9	TP 11	TP 12	TP 15
Depth		0.3-0.4	0-0.1	0.1-0.2	0-0.1	0-0.1
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	13/03/2024	13/03/2024	13/03/2024	13/03/2024	13/03/2024
Sample mass tested	g	Approx. 20g	Approx. 15g	Approx. 20g	Approx. 20g	Approx. 20g
Sample Description	-	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Asbestos comments	-	NO	NO	NO	NO	NO
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils						
Our Reference		345910-44	345910-47	345910-49	345910-51	345910-56
Your Reference	UNITS	TP 16	TP 17	TP 17	TP 18	TP 20
Depth		0.3-0.4	0.5-0.6	1.6-1.7	0.5-0.6	0.3-0.4
Date Sampled		04/03/2024	04/03/2024	04/03/2024	04/03/2024	04/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	13/03/2024	13/03/2024	13/03/2024	13/03/2024	13/03/2024
Sample mass tested	g	Approx. 25g	Approx. 25g	Approx. 20g	Approx. 20g	Approx. 25g
Sample Description	-	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Asbestos comments	-	NO	NO	NO	NO	NO
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils		
Our Reference		345910-60
Your Reference	UNITS	TP 21
Depth		1-1.1
Date Sampled		04/03/2024
Type of sample		Soil
Date analysed	-	13/03/2024
Sample mass tested	g	Approx. 25g
Sample Description	-	Brown clayey soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Asbestos comments	-	NO
Trace Analysis	-	No asbestos detected

Asbestos ID - materials			
Our Reference	UNITS	345910-23	345910-48
Your Reference		TP 8 (frag)	TP 17 (frag)
Depth		0.3-0.4	0.5-0.6
Date Sampled		04/03/2024	04/03/2024
Type of sample		Material	Material
Date analysed	-	12/03/2024	12/03/2024
Mass / Dimension of Sample	-	85x75x5mm	55x50x5mm
Sample Description	-	Brown fibrous sheet	Orange fibre cement material
Asbestos ID in materials	-	Chrysotile asbestos detected Amosite asbestos detected	Chrysotile asbestos detected
Trace Analysis	-	[NT]	[NT]

Metals in Waters - Acid extractable		
Our Reference		345910-65
Your Reference	UNITS	Rinsate 04/03/2024
Depth		-
Date Sampled		04/03/2024
Type of sample		Water
Date prepared	-	12/03/2024
Date analysed	-	13/03/2024
Arsenic - Total	mg/L	<0.05
Cadmium - Total	mg/L	<0.01
Chromium - Total	mg/L	<0.01
Copper - Total	mg/L	<0.01
Lead - Total	mg/L	<0.03
Mercury - Total	mg/L	<0.0005
Nickel - Total	mg/L	<0.02
Zinc - Total	mg/L	<0.02

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-001	pH - Measured using pH meter and electrode. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25oC in accordance with APHA 22nd ED 2510 and Rayment & Lyons. Resistivity is calculated from Conductivity (non NATA). Resistivity (calculated) may not correlate with results otherwise obtained using Resistivity-Current method, depending on the nature of the soil being analysed.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
Metals-020	Determination of various metals by ICP-AES.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-OES analytical finish.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021/022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD and/or GC-MS/GC-MSMS. 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-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.

Method ID	Methodology Summary
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)-BTEX 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)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-17	345910-24
Date extracted	-			11/03/2024	12	11/03/2024	11/03/2024		11/03/2024	11/03/2024
Date analysed	-			14/03/2024	12	14/03/2024	14/03/2024		14/03/2024	14/03/2024
TRH C_6 - C_9	mg/kg	25	Org-023	<25	12	<25	<25	0	104	99
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	12	<25	<25	0	104	99
Benzene	mg/kg	0.2	Org-023	<0.2	12	<0.2	<0.2	0	101	96
Toluene	mg/kg	0.5	Org-023	<0.5	12	<0.5	<0.5	0	103	97
Ethylbenzene	mg/kg	1	Org-023	<1	12	<1	<1	0	98	93
m+p-xylene	mg/kg	2	Org-023	<2	12	<2	<2	0	110	104
o-Xylene	mg/kg	1	Org-023	<1	12	<1	<1	0	111	104
Naphthalene	mg/kg	1	Org-023	<1	12	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	98	12	74	80	8	101	88

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	47	11/03/2024	11/03/2024		[NT]	[NT]
Date analysed	-			[NT]	47	14/03/2024	14/03/2024		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	47	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	47	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	47	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	47	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	47	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	47	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	47	<1	<1	0	[NT]	[NT]
Naphthalene	mg/kg	1	Org-023	[NT]	47	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	47	82	71	14	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-17	345910-24
Date extracted	-			11/03/2024	12	11/03/2024	11/03/2024		11/03/2024	11/03/2024
Date analysed	-			12/03/2024	12	12/03/2024	12/03/2024		12/03/2024	13/03/2024
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	12	<50	<50	0	115	122
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	12	<100	<100	0	108	120
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	12	<100	<100	0	114	86
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	12	<50	<50	0	115	122
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	12	<100	<100	0	108	120
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	12	<100	<100	0	114	86
Surrogate o-Terphenyl	%		Org-020	84	12	80	84	5	88	82

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	47	11/03/2024	11/03/2024		[NT]	[NT]
Date analysed	-			[NT]	47	13/03/2024	13/03/2024		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	47	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	47	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	47	<100	<100	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	47	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	47	140	150	7	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	47	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	47	82	83	1	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-17	345910-24
Date extracted	-			11/03/2024	12	11/03/2024	11/03/2024		11/03/2024	11/03/2024
Date analysed	-			13/03/2024	12	13/03/2024	13/03/2024		13/03/2024	13/03/2024
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	94	86
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	88	88
Fluorene	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	86	84
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	102	84
Anthracene	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	96	82
Pyrene	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	100	78
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	80	84
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	12	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	12	<0.05	<0.05	0	106	92
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	105	12	98	97	1	99	87

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	47	11/03/2024	11/03/2024		[NT]	[NT]
Date analysed	-			[NT]	47	14/03/2024	14/03/2024		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	47	0.3	0.3	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	47	0.7	0.7	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	47	0.8	0.8	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	47	0.4	0.4	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	47	0.3	0.4	29	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	47	0.7	0.7	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	47	0.4	0.4	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	47	0.2	0.2	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	47	0.3	0.3	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	47	122	122	0	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-17	345910-24
Date extracted	-			11/03/2024	12	11/03/2024	11/03/2024		11/03/2024	11/03/2024
Date analysed	-			13/03/2024	12	13/03/2024	13/03/2024		13/03/2024	13/03/2024
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	130	112
HCB	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	128	108
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	126	104
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	132	116
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	128	124
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	120	120
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	130	126
Endrin	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	112	108
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	110	106
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	110	102
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	<0.1	12	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	82	12	88	89	1	87	83

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	47	11/03/2024	11/03/2024		[NT]	[NT]
Date analysed	-			[NT]	47	13/03/2024	13/03/2024		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	[NT]	47	90	88	2	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-17	345910-24
Date extracted	-			11/03/2024	12	11/03/2024	11/03/2024		11/03/2024	11/03/2024
Date analysed	-			13/03/2024	12	13/03/2024	13/03/2024		13/03/2024	13/03/2024
Aroclor 1016	mg/kg	0.1	Org-021/022/025	<0.1	12	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021/022/025	<0.1	12	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021/022/025	<0.1	12	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021/022/025	<0.1	12	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021/022/025	<0.1	12	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021/022/025	<0.1	12	<0.1	<0.1	0	89	80
Aroclor 1260	mg/kg	0.1	Org-021/022/025	<0.1	12	<0.1	<0.1	0	[NT]	[NT]
Surrogate 2-Fluorobiphenyl	%		Org-021/022/025	97	12	95	95	0	95	90

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	47	11/03/2024	11/03/2024		[NT]	[NT]
Date analysed	-			[NT]	47	13/03/2024	13/03/2024		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-021/022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021/022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021/022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021/022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021/022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021/022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-021/022/025	[NT]	47	<0.1	<0.1	0	[NT]	[NT]
Surrogate 2-Fluorobiphenyl	%		Org-021/022/025	[NT]	47	91	93	2	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-17	345910-24
Date prepared	-			12/03/2024	12	12/03/2024	12/03/2024		12/03/2024	12/03/2024
Date analysed	-			12/03/2024	12	12/03/2024	12/03/2024		12/03/2024	12/03/2024
Arsenic	mg/kg	4	Metals-020	<4	12	16	16	0	101	87
Cadmium	mg/kg	0.4	Metals-020	<0.4	12	<0.4	<0.4	0	107	89
Chromium	mg/kg	1	Metals-020	<1	12	45	34	28	102	111
Copper	mg/kg	1	Metals-020	<1	12	4	4	0	103	100
Lead	mg/kg	1	Metals-020	<1	12	16	17	6	110	96
Mercury	mg/kg	0.1	Metals-021	<0.1	12	<0.1	<0.1	0	108	93
Nickel	mg/kg	1	Metals-020	<1	12	4	5	22	102	88
Zinc	mg/kg	1	Metals-020	<1	12	10	12	18	108	114

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-18	345910-63
Date prepared	-			[NT]	47	12/03/2024	12/03/2024		12/03/2024	12/03/2024
Date analysed	-			[NT]	47	12/03/2024	12/03/2024		12/03/2024	12/03/2024
Arsenic	mg/kg	4	Metals-020	[NT]	47	4	5	22	105	91
Cadmium	mg/kg	0.4	Metals-020	[NT]	47	<0.4	<0.4	0	110	97
Chromium	mg/kg	1	Metals-020	[NT]	47	13	14	7	107	96
Copper	mg/kg	1	Metals-020	[NT]	47	39	27	36	106	100
Lead	mg/kg	1	Metals-020	[NT]	47	60	78	26	116	98
Mercury	mg/kg	0.1	Metals-021	[NT]	47	0.1	0.1	0	109	93
Nickel	mg/kg	1	Metals-020	[NT]	47	8	8	0	105	93
Zinc	mg/kg	1	Metals-020	[NT]	47	97	110	13	111	93

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	62	12/03/2024	12/03/2024		[NT]	[NT]
Date analysed	-			[NT]	62	12/03/2024	12/03/2024		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	62	20	17	16	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	62	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	62	30	45	40	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	62	5	4	22	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	62	14	17	19	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	62	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	62	5	5	0	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	62	12	13	8	[NT]	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	345910-3
Date prepared	-			07/03/2024	1	07/03/2024	07/03/2024		07/03/2024	07/03/2024
Date analysed	-			14/03/2024	1	14/03/2024	14/03/2024		14/03/2024	14/03/2024
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	1	7.3	7.2	1	101	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	1	41	50	20	104	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	<10	1	<10	<10	0	101	90
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	<10	1	<10	<10	0	102	119
Resistivity in soil*	ohm m	1	Inorg-002	<1	21	160	160	0	[NT]	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-17	345910-24
Date prepared	-			[NT]	12	07/03/2024	07/03/2024		07/03/2024	07/03/2024
Date analysed	-			[NT]	12	14/03/2024	14/03/2024		14/03/2024	14/03/2024
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	12	5.1	5.1	0	100	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	[NT]	12	68	64	6	104	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	[NT]	12	10	10	0	98	70
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	[NT]	12	48	39	21	100	77
Resistivity in soil*	ohm m	1	Inorg-002	[NT]	41	200	210	5	[NT]	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-18	345910-43
Date prepared	-			[NT]	21	07/03/2024	07/03/2024		07/03/2024	07/03/2024
Date analysed	-			[NT]	21	14/03/2024	14/03/2024		14/03/2024	14/03/2024
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	21	5.0	5.0	0	100	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	[NT]	21	63	61	3	104	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	[NT]	21	<10	<10	0	99	100
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	[NT]	21	20	20	0	100	90
Resistivity in soil*	ohm m	1	Inorg-002	[NT]	52	150	130	14	[NT]	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	31	07/03/2024	07/03/2024		[NT]	[NT]
Date analysed	-			[NT]	31	14/03/2024	14/03/2024		[NT]	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	31	4.8	4.8	0	[NT]	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	[NT]	31	110	130	17	[NT]	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	[NT]	31	79	100	23	[NT]	[NT]
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	[NT]	31	29	34	16	[NT]	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	41	07/03/2024	07/03/2024		[NT]	[NT]
Date analysed	-			[NT]	41	14/03/2024	14/03/2024		[NT]	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	41	5.0	5.0	0	[NT]	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	[NT]	41	49	47	4	[NT]	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	[NT]	41	<10	<10	0	[NT]	[NT]
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	[NT]	41	31	28	10	[NT]	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	52	07/03/2024	07/03/2024		[NT]	[NT]
Date analysed	-			[NT]	52	14/03/2024	14/03/2024		[NT]	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	52	5.2	5.2	0	[NT]	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	[NT]	52	65	75	14	[NT]	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	[NT]	52	26	27	4	[NT]	[NT]
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	[NT]	52	29	29	0	[NT]	[NT]

QUALITY CONTROL: ESP/CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	345910-26
Date prepared	-			15/03/2024	22	15/03/2024	15/03/2024		15/03/2024	15/03/2024
Date analysed	-			15/03/2024	22	15/03/2024	15/03/2024		15/03/2024	15/03/2024
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	22	0.2	0.3	40	103	100
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	22	0.1	0.2	67	106	98
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	22	2.5	3.7	39	93	88
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	22	1.3	1.6	21	115	107
ESP	%	1	Metals-020	[NT]	22	31	28	10	[NT]	[NT]

QUALITY CONTROL: Metals in Waters - Acid extractable					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			12/03/2024	[NT]	[NT]	[NT]	[NT]	12/03/2024	[NT]
Date analysed	-			13/03/2024	[NT]	[NT]	[NT]	[NT]	13/03/2024	[NT]
Arsenic - Total	mg/L	0.05	Metals-020	<0.05	[NT]	[NT]	[NT]	[NT]	99	[NT]
Cadmium - Total	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	103	[NT]
Chromium - Total	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	96	[NT]
Copper - Total	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	99	[NT]
Lead - Total	mg/L	0.03	Metals-020	<0.03	[NT]	[NT]	[NT]	[NT]	95	[NT]
Mercury - Total	mg/L	0.0005	Metals-021	<0.0005	[NT]	[NT]	[NT]	[NT]	102	[NT]
Nickel - Total	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	103	[NT]
Zinc - Total	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	96	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

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

Asbestos: A portion of the supplied sample was sub-sampled for asbestos according to ASB-001 asbestos subsampling procedure. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab/MPL recommends supplying 40-60g or 500ml of sample in its own container.
Note: Samples requested for asbestos testing were sub-sampled from jars provided by the client.

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 345910-62 for Cr. Therefore a triplicate result has been issued as laboratory sample number 345910-66.

ESP: Where the exchangeable Sodium is less than the PQL and CEC is less than 10meq/100g, the ESP cannot be calculated.

#345910
7/3/24

GeoEnviro Consultancy Pty Ltd
Unit 5, 39-41 Fourth Avenue, Blacktown NSW 2148, Australia
Tel: (02) 9679 8733 Fax: (02) 9679 8744

ELS Melbourne

Laboratory Test Request/Chain of Custody Record

Job Details
Job Number: JC24471A
Client:
Project: Proposed Rural Residential Subdivision Development
Location: No 80 Silverdale Road, The Oaks

Sample Date: 04/03/2024
Sampled By: SG
Project Manager: SL
Store Location:

External Laboratory Details:
Laboratory name: Envirolab Services Pty Ltd
Address: 25 Research Drive Croydon South VIC 3136

Location	Depth (m) From	Depth (m) To	Soil	Water	Combination 5	Combination 5a	Combination 12a		Heavy Metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)	OCP	PCB	TRH	BTEX	PAH	Asbestos		Aggressivity (pH, EC, Cl, SO4)	pH	EC	Cl / SO4	Resistivity	CEC / ESP	Faecal Coliforms	Faecal Enterococci	E. Coli	Keep Sample
1 TRP A	-	-	DG						/																	
2 TRP B	-	-	DG						/																	

Sample Type; Test Required (\); Test Performed(X)

Envirolab Services
25 Research Drive
Croydon South VIC 3136
Ph: (03) 9763 2500
Job No: 42476
Date Received: 12/3/24
Time Received: 1pm
Received By: GS
Temp: Cool/Ambient 20.1
Cooling: Ice/Icepack
Security: Intact/Broken/None

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
Job No: 345910
Date Received: 7/3/24
Time Received: 1620
Received By: OW
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Relinquished by Laboratory	Name	Signature	Date	Received By Laboratory	Name	Signature	Date
GeoEnviro Consultancy	Steven Goss	SMGoss	7/03/2024	ELS SYD	O-WILLIAM	O.W	7/3/24 1620.
ELS SYD	Emily Woodward	EW	11/3/24 1155				

Legend
DB Disturbed Sample (Bulk, Plastic bag)
DS Disturbed Sample (Small, Plastic bag)
DG Disturbed Sample (Glass Jar)
STP Standard Penetration Test Sample
U50 Undisturbed Sample, 50mm Tube
U75 Undisturbed Sample, 75mm Tube
WG Water Sample, Amber Glass Jar
WP Water Sample, Plastic Bottle
Y Keep Sample
N Discard Sample

Envirolab Services Pty Ltd
ABN 37 112 535 645 - 002
25 Research Drive Croydon South VIC 3136
ph 03 9763 2500 fax 03 9763 2633
melbourne@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	GeoEnviro Consultancy Pty Ltd
Attention	Solern Liew

Sample Login Details

Your reference	JC24471A
Envirolab Reference	42476
Date Sample Received	12/03/2024
Date Instructions Received	12/03/2024
Date Results Expected to be Reported	18/03/2024

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	2 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	20.1
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Pamela Adams	Chris De Luca
Phone: 03 9763 2500	**Phone: 03 9763 2500**
Fax: 03 9763 2633	**Fax: 03 9763 2633**
Email: padams@envirolab.com.au	**Email: cdeluca@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
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Sample ID	Acid Extractable metalsin soil
TRPA	✓
TRPB	✓

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.

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CERTIFICATE OF ANALYSIS 42476

Client Details

Client	GeoEnviro Consultancy Pty Ltd
Attention	Solern Liew
Address	PO Box 1543, Macquarie Centre, NORTH RYDE, NSW, 2113

Sample Details

Your Reference	**JC24471A**
Number of Samples	2 Soil
Date samples received	12/03/2024
Date completed instructions received	12/03/2024

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	18/03/2024
Date of Issue	14/03/2024

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
Tara White, Metals Supervisor

Authorised By
Pamela Adams, Laboratory Manager

Acid Extractable metals in soil			
Our Reference		42476-1	42476-2
Your Reference	UNITS	TRPA	TRPB
Date Sampled		04/03/2024	04/03/2024
Type of sample		Soil	Soil
Date digested	-	13/03/2024	13/03/2024
Date analysed	-	13/03/2024	13/03/2024
Arsenic	mg/kg	16	7
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	31	20
Copper	mg/kg	6	8
Lead	mg/kg	2	1
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	4	3
Zinc	mg/kg	16	10

Moisture			
Our Reference		42476-1	42476-2
Your Reference	UNITS	TRPA	TRPB
Date Sampled		04/03/2024	04/03/2024
Type of sample		Soil	Soil
Date prepared	-	13/03/2024	13/03/2024
Date analysed	-	14/03/2024	14/03/2024
Moisture	%	16	10

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.

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date digested	-			13/03/2024	[NT]	[NT]	[NT]	[NT]	13/03/2024	[NT]
Date analysed	-			13/03/2024	[NT]	[NT]	[NT]	[NT]	13/03/2024	[NT]
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	[NT]	[NT]	105	[NT]
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	[NT]	[NT]	[NT]	[NT]	106	[NT]
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	99	[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.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

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.

APPENDIX I

Important Information about your Environmental Site Assessment
Explanatory Notes

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IMPORTANT INFORMATION REGARDING YOUR ENVIRONMENTAL SITE ASSESSMENT

This Environmental Assessment Report was performed in general conformance with our understanding of the guidelines by the Australian and New Zealand Conservation Council (ANZECC), the Office of Environment and Heritage (OEH) and the National Environmental Protection (Assessment of Site Contamination) Measure 1999 (amended 2013).

These accompanying notes have been prepared by GeoEnviro Consultancy Pty Ltd, using guidelines prepared by ASFE; The Association of Engineering Firms Practising in the Geosciences. The notes are offered as an aid in the interpretation of your environmental site assessment report.

REASONS FOR AN ENVIRONMENTAL SITE ASSESSMENT

Environmental site assessments are typically, though not exclusively, performed in the following circumstances:

- As a pre- acquisition assessment on behalf of either a purchaser or a vendor, when a property is to be sold
- As a pre-development assessment, when a property or area of land is to be redeveloped, or the land use has change, eg from a factory to a residential subdivision
- As a pre-development assessment of greenfield sites, to establish baseline conditions and assess environmental, geological and hydrological constraints to the development of, eg, a landfill
- As an audit of the environmental effects of previous and present site usage

Each circumstance requires a specific approach to the assessment of soil and groundwater contamination. In all cases the objective is to identify and if possible, quantify the risks which unrecognised contamination poses to the ongoing or proposed activity. Such risk may be both financial (clean-up costs or limitations in site use) and physical (health risks to site users or the public).

ENVIRONMENTAL SITE ASSESSMENT LIMITATIONS

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

AN ENVIRONMANTAL SITE ASSESSMENT REPORT IS BASED ON A UNIQUE SET OF PROJECT SPECIFIC FACTORS

Your environmental assessment report should not be used;

- When the nature of the proposed development is changed, eg, if a residential development is proposed, rather than a commercial development
- When the size or configuration of the proposed development is altered, eg, if a basement is added
- When the location or orientation of the proposed structure is modified
- When there is a change of land ownership, or
- For application to an adjacent site

In order to avoid costly problems, you should ask your consultant to assess any changes in the project since the assessment and the implications, if any, to recommendations made in the assessment.

ENVIRONMENTAL SITE ASSESSMENT FINDINGS ARE PROFESSIONAL ESTIMATES

Site assessment identifies actual sub-surface conditions only at those points where samples are taken, when they are taken. Data obtained from the sampling and subsequent laboratory analyses are interpreted by geologists, engineers or scientist and opinions are drawn about the overall subsurface conditions, the nature and extent of contamination, the likely impact on any proposed development and appropriate remediation measures. Actual conditions may differ from those inferred, because no professional, no matter how qualified and no sub-surface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than an assessment indicates. Actual conditions in areas not sampled may differ from predictions. Nothing can be done to prevent the unanticipated, however, steps can be taken to help minimise the impact. For this reason, site owner should retain the services of their consultants throughout the development stage of the project in order to identify variances, conduct additional tests which may be necessary and to recommend solutions to problems encountered on site.

Soil and groundwater contamination is a field in which legislation and interpretation of legislation by government departments is changing rapidly. Whilst every attempt is made by GeoEnviro Consultancy Pty Ltd to be familiar with current policy, our interpretation of the investigation findings should not be taken to be that of the relevant authority. When approval from a statutory authority is required for a project, that approval should be directly sought.

STABILITY OF SUB-SURFACE CONDITIONS

Sub-surface conditions can change by natural processes and site activities. As an environmental site assessment is based on conditions existing at the time of the investigation, project decisions should not be based on environmental site assessment data which may have been affected by time. The consultant should be requested to advise if additional tests are required.

ENVIRONMENTAL SITE ASSESSMENTS ARE PERFORMED FOR SPECIFIC PURPOSES AND CLIENTS

Environmental site assessments are prepared in response to a specific scope of work required to meet the specific needs or specific individuals. An assessment prepared for a consulting civil engineer may not be adequate to a construction contractor or another civil engineer.

An assessment should not be used by other persons for any purpose, or by the client for a different purposes. No individual, other than the client, should apply an assessment, even for its intended purposes, without first conferring with the consultant. No person should apply an assessment for any purposes other than that originally contemplated, without first conferring with the consultant.

MISINTERPRETATION OF ENVIRONMENTAL SITE ASSESSMENTS

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

LOGS SHOULD NOT BE SEPARATED FORM THE REPORT

Borehole and test pit logs are prepared by environmental scientists, engineers or geologist, based upon interpretation of field conditions and laboratory evaluation of field samples. Field logs normally provided in our reports and these should not be redrawn 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 test of the assessment. Should this occur, delays and disputes , or unanticipated costs may result.

To reduce the likelihood of boreholes and test pit logs misinterpretation, the complete assessment should be available to persons or organisations involved in the project, such as contractors, for their use. Denial of such access and disclaiming responsibility for the accuracy of sub-surface 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

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

EXPLANATORY NOTES

Introduction

These notes have been provided to amplify the geotechnical report with regard to investigation procedures, classification methods and certain matters relating to the Discussion and Comments sections. Not all notes are necessarily relevant to all reports.

Geotechnical reports are based on information gained from finite sub-surface probing, excavation, boring, sampling or other means of investigation, supplemented by experience and knowledge of local geology. For this reason they must be regarded as interpretative rather than factual documents, limited to some extent by the scope of information on which they rely.

Description and Classification Methods
The methods the description and classification of soils and rocks used in this report are based on Australian standard 1726, the SSA Site investigation Code, in general descriptions cover the following properties - strength or density, colour, structure, soil or rock type and inclusions. Identification and classification of soil and rock involves to a large extent, judgement within the acceptable level commonly adopted by current geotechnical practices.

Soil types are described according to the predominating particle size, qualified by the grading or other particles present (eg sandy clay) on the following bases:

Soil Classification	Particle Size
Clay	Less than 0.002mm
Silt	0.002 to 0.6mm
Sand	0.6 to 2.00mm
Gravel	2.00m to 60.00mm

Soil Classification	Particle size
Clay	less than 0.002mm
Silt	0.002 to 0.06mm
Sand	0.06 to 2.00mm
Gravel	2.00mm to 60.00mm

Cohesive soils are classified on the basis of strength, either by laboratory testing or engineering examination. The strength terms are defined as follows:

Classification	Undrained Shear Strength kPa
Very Soft	Less than 12
Soft	12 - 25
Firm	25 - 50
Stiff	50 - 100
Very Stiff	100 - 200
Hard	Greater than 200

Non-cohesive soils are classified on the basis of relative density, generally from the results of standard penetration tests (SPT) or Dutch cone penetrometer test (CPT), as below:

Relative Dense	SPT 'N' Value (blows/300mm)	CPT Cone Value (q_c-Mpa)
Very Loose	Less than 5	Less than 2
Loose	5 - 10	2 - 5
Medium Dense	10 - 30	5 - 15
Dense	30 - 50	15 - 25
Very Dense	> 50	> 25

Rock types are classified by their geological names, together with descriptive terms on degrees of weathering strength, defects and other minor components. Where relevant, further information regarding rock classification, is given on the following sheet.

Sampling
Sampling is carried out during drilling to allow engineering examination (and laboratory testing where required) of the soil or rock.

Disturbed samples taken during drilling provided information on plasticity, grained size, colour, type, moisture content, inclusions and depending upon the degree of disturbance, some information on strength and structure.

Undisturbed samples are taken by pushing a thin walled sample tube (normally know as U_{50}) into the soil and withdrawing a sample of the soil in a relatively undisturbed state. Such Samples yield information on structure and strength and are necessary for laboratory determination of shear strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils. Details of the type and method of sampling are given in the report.

Field Investigation Methods
The following is a brief summary of investigation methods currently carried out by this company and comments on their use and application.

Hand Auger Drilling
The borehole is advanced by manually operated equipment. The diameter of the borehole ranges from 50mm to 100mm. Penetration depth of hand augered boreholes may be limited by premature refusal on a variety of materials, such as hard clay, gravels or ironstone.

Test Pits
These are excavated with a tractor-mounted backhoe or a tracked excavator, allowing close examination of the insitu soils if it is safe to descend into the pit. The depth of penetration is limited to about 3.0m for a backhoe and up to 6.0m for an excavator. A potential disadvantage is the disturbance caused by the excavation.

Care must be taken if construction is to be carried out near, or within the test pit locations, to either adequately recompact the backfill during construction, or to design the structure or accommodate the poorly compacted backfill.

Large Diameter Auger (eg Pengo)
The hole is advanced by a rotating plate or short spiral auger generally 300mm or larger in diameter. The cuttings are returned to the surface at intervals (generally of not more than 05m) and are disturbed, but usually unchanged in moisture content. Identification of soil strata is generally much more reliable than with continuous spiral flight augers and is usually supplemented by occasional undisturbed tube sampling.

Continuous Spiral Flight Augers
The hole is advanced by using 90mm - 115mm diameter continuous spiral flight augers, which are withdrawn at intervals to allow sampling or 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, or may be collected after withdrawal of the augers flights, but they are very disturbed and may be highly mixed with soil of other stratum.

Information from the drilling (as distinct from specific sampling by SPT or undisturbed samples) is of relatively low reliability due to remoulding, mixing or softening of samples by ground water, resulting in uncertainties of the original sample depth.

Continuous Spiral Flight Augers (continued)
The spiral augers are usually advanced by using a V - bit through the soil profile refusal, followed by Tungsten Carbide (TC) bit, to penetrate into bedrock. The quality and continuity of the bedrock may be assessed by examination of the recovered rock fragments and through observation of the drilling penetration resistance.

Non - core Rotary Drilling (Wash Boring)
The hole is advanced by a rotary bit, with water being pumped down the drill rod and returned up the annulus, carrying the cuttings, together with some information from the "feel" and rate of penetration.

Rotary Mud Stabilised Drilling
This is similar to rotary drilling, but uses drilling mud as a circulating fluid, which may consist of a range of products, from bentonite to polymers such as Revert or Biogel. The mud tends to mask the cuttings and reliable identification is again only possible from separate intact sampling (eg SPT and U_{50} samples).

Continuous Core Drilling
A continuous core sample is obtained using a diamond tipped core barrel. Providing full core recovery is achieved (which is not always possible in very weak rock and granular soils) this technique provides a very reliable (but relatively expensive) method of investigation. In rocks an NMLC triple tube core barrel which gives a core of about 50mm diameter, is usually used with water flush.

Portable Proline Drilling
This is manually operated equipment and is only used in sites which require bedrock core sampling and there is restricted site access to truck mounted drill rigs. The boreholes are usually advanced initially using a tricone roller bit and water circulation to penetrate the upper soil profile. In some instances a hand auger may be used to penetrate the soil profile. Subsequent drilling into bedrock involves the use of NMLC triple tube equipment, using water as a lubricant.

Standard Penetration Tests
Standard penetration tests are used mainly in non-cohesive soils, but occasionally also in cohesive soils, as a means of determining density or strength and of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289 "Methods of testing Soils for Engineering Purpose"- Test F31.

The test is carried out in a borehole by driving a 50mm diameter split sample tube under the impact of a 63Kg hammer with a free fall of 769mm. 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 rocks, the full 450mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form:

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

  as 4, 6, 7
  N = 13

- 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 15,30/40mm

The results of the tests can be related empirically to the engineering properties of the soil. Occasionally the test methods is used to obtain samples in 50mm diameter thin walled samples tubes in clays. In these circumstances, the best results are shown on the bore logs in brackets.

Dynamic Cone Penetration Test
A modification to the SPT test is where the same driving system is used with a solid 60^0 tipped steel cone of the same diameter as the SPT hollow sampler. The cone can be continuously driven into the borehole and is normally used in areas with thick layers of soft clays or loose sand. The results of this test are shown as 'N_c' on the bore logs, together with the number of blows per 150mm penetration.

Cone Penetrometer Testing and Interpretation
Cone penetrometer testing (sometimes referred to as Dutch Cone-CPT) described in this report, has been carried out using an electrical friction cone penetrometer and the test is described in Australian Standard 1289 test F5.1.

In the test, a 35mm diameter rod with cone tipped end is pushed continuously into the soil, the reaction being provided by a specially designed truck or rig, which is fitted with a hydraulic ram system. Measurements are made of the end bearing resistance on the cone and the friction resistance on a separate 130mm long sleeve, immediately behind the cone. Transducer in the tip of the assembly are connected by electrical wires passing through the centre of the push rods to an amplifier and recorder unit mounted on the control truck.

As penetration occurs (at a rate of approximately 20mm per second) the information is output on continuous chart recorders. The plotted results in this report have been traced from the original records. The information provided on the charts comprises:

- Cone resistance - the actual end bearing force divided by the cross sectional area of the cone, expressed in Mpa.
- Sleeve friction - the frictional force on the sleeve divided by the surface area, expressed in kPa.
- Friction ratio - the ratio of sleeve friction to cone resistance, expressed in percentage.

There are two scales available for measurement of cone resistance. The lower "A" scale (0-5Mpa) is used in very soft soils where increased sensitivity is required and is shown in the graphs as a dotted line. The main "B" scale (0-50Mpa) is less sensitive and is shown as a full line.

The ratios of the sleeve resistance to cone resistance will vary with the type of soil encountered, with higher relative frictions in clays than in sands. Friction ratios of 1% to 2% are commonly encountered in sands and very soft clays, rising to 4% to 10% in stiff clays.

In sands, the relationship between cone resistance and SPT value is commonly in the range:

$$q_c \text{ (Mpa)} = (0.4 \text{ to } 0.6)\ N \text{ (blows per 300mm)}$$

In clays the relationship between undrained shear strength and cone resistance is commonly in the range:

$$q_c = (12 \text{ to} 18)\ C_u$$

Interpretation of CPT values can also be made to allow estimate of modulus or compressibility values to allow calculation of foundation settlements. Inferred stratification, as shown on the attached report, is assessed from the cone and friction traces, from experience and information from nearby boreholes etc.

Cone Penetrometer Testing and Interpretation continued
This information is presented for general guidance, but must be regarded as being to some extent interpretive. The test method provides a continuous profile of engineering properties and where precise information or soil classification is required, direct drilling and sampling may be preferable.

Portable Dynamic Cone Penetrometer (AS1289)
Portable dynamic cone penetrometer tests are carried out by driving a rod in to the ground with a falling weight hammer and measuring the blows per successive 100mm increments of penetration.

There are two similar tests, Cone Penetrometer (commonly known as Scala Penetrometer) and the Perth Sand Penetrometer. Scala Penetrometer is commonly adopted by this company and consists of a 16mm rod with a 20mm diameter cone end, driven with a 9kg hammer, dropping 510mm (AS 1289 Test F3.2).

Laboratory Testing
Laboratory testing is carried out in accordance with Australian Standard 1289 "Methods of Testing Soil for Engineering Purposes". Details of the test procedures are given on the individual report forms.

Engineering Logs
The engineering logs presented herein are an engineering and/or geological interpretation of the sub-surface conditions and their reliability will depend to some extent on frequency of sampling and the method of drilling. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, however, this is not always practicable or possible to justify economically. As it is, the boreholes represent only a small sample of the total sub-surface profile. Interpretation of the information and its application to design and construction should take into account the spacing of boreholes, frequency of sampling and the possibility of other than "straight line" variations between the boreholes.

Ground water
Where ground water levels are measured in boreholes, there are several potential problems:

- In low permeability soils, ground water although present, may enter the hole slowly, or perhaps not at all, during the investigation period.
- A localised perched water table may lead to a erroneous indication of the true water table.
- Water table levels will vary from time to time, due to the seasons or recent weather changes. They may not be the same at the time of construction as indicated in the report.
- The use of water or mud as a drilling fluid will mask any ground water inflow. Water has to be blown out of the hole and drilling mud must be washed out of the hole if any water observations are to be made.

More reliable measurements can be made by installing stand pipes, which are read at intervals over several days, or weeks for low permeability soils. Piezometers sealed in a particular stratum may be interference from a perched water table or surface water.

Engineering Reports
Engineering reports are prepared by qualified personnel and are based on the information obtained and on current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal is changed, say to a twenty storey building. If this occurs, the company will be pleased to review the report and sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of sub-surface conditions, discussions of geotechnical aspects and recommendations or suggestions for design and construction. However, the company cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on bore spacing and sampling frequency.
- Changes in policy or interpretation of policy by statutory authorities.
- The actions of contractors responding to commercial pressures.

If these occur, the company will be pleased to assist with investigation or advice to resolve the matter.

Site Anomalies
In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, the company request immediate notification. Most problems are much more readily resolved when conditions are exposed than at some later stage, well after the event.

Reproduction of Information for Contractual Purposes
Attention is drawn to the document “Guidelines for the Provision of Geotechnical Information trader Documents”, published by the Institute of Engineers Australia. Where information obtained for this investigation is provided for tender purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. The Company would be pleased to assist in this regard and/or make additional copies of the report available for contract purpose, at a nominal charge.

Site Inspection

The Company will always be pleased to provide engineering inspection services for geotechnical aspect of work to which this report is related. This could range from a site visit to confirm that the conditions exposed are as expected, to full time engineering presence on site

Review of Design
Where major civil or structural developments are proposed, or where only a limited investigation has been completed, or where the geotechnical conditions are complex, it is prudent to have the design reviewed by a Senior Geotechnical Engineer.

Graphic Symbols For Soil and Rock

SOIL


Fill


Topsoil


Gravel (GW , GP)


Sand (SP, SW)


Silt (ML, MH)


Clay (CL, CH)


Clayey Gravel (GC)


Silty Sand (SM)


Clayey Sand (SC)


Sandy Silt (ML)


Gravelly Clay (CL, CH)


Silty Clay (CL, CH)


Sandy Clay (CL, CH)


Peat or Organic Soil

ROCK


Shale


Sandstone


Siltstone,Mudstone,Claystone


Granite, Gabbro


Dolerite, Diorite


Basalt, Andesite

Other Materials


Concrete


Bitumen, Asphaltic Concrete, Coal


Ironstone Gravel


Organic Material

APPENDIX J

Unexpected Finds Protocol

GeoEnviro Consultancy Pty Ltd
Unit 5, 39-41 Fourth Avenue, Blacktown, NSW 2148, Australia
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Fax : (02) 9679 8744

UNEXPECTED FINDS PROTOCOL

<table>
<tr><th>ITEM</th><th colspan="2">REQUIREMENTS</th></tr>
<tr><td>DEFINITION</td><td colspan="2">An unexpected find may be identified as a result of site activity, for example through earthworks and movement of plant on site including preparatory site works.</td></tr>
<tr><td>SITE SUPERVISOR</td><td colspan="2">On being notified of an Unexpected Find, the Principal Contractor must:
Stop work & notify the site manager/HSE coordinator as soon as practically possible.
Ensure the find is not further disturbed.
Ensure all personnel are removed from the area with the exception of personnel required to isolate or make safe the area.
Establish an “unexpected find” isolation zone as required to prevent or minimise exposure risks for site personnel, members of the public, fauna or flora. Note: Persons are not to expose themselves to further risk whilst establishing isolation zone.
Assess the requirement to evacuate areas or the entire site.
Co-ordinate site or area evacuation as assessed. Note: It is preferable to evacuate the whole site if there is any doubt as to the safety of personnel or the environment.
As soon as the safety of personnel, environment & the site is secured the Site Manager/Supervisor should notify their relevant HSE Manager, Project Manager & Construction Manager.
As soon as practically possible record the events associated with the unexpected find.</td></tr>
<tr><td rowspan="2">PROJECT MANAGER</td><td colspan="2">The Project Manager and/or HSE Manager in consultation with the relevant General Manager notify regulatory authorities as required.
Establish a risk based process for managing clearance of the unexpected find & establishing incident investigation.</td></tr>
<tr><td colspan="2">The Project Manager or HSE Manager must also ensure that the find is reported to the Principal.
This may be by verbal communication.</td></tr>
<tr><td>UNEXPLODED ORDNANCE</td><td colspan="2">Do not touch or disturb.
Contact Police immediately.</td></tr>
<tr><td>UNEXPECTED SERVICES
(LIVE OR DISUSED)</td><td colspan="2">This may include power, gas or fuel.
Do not touch or further disturb.
The area must be immediately designated a non-smoking and “no naked flames” area.
All nearby machinery should be turned off.
Contact relevant governing authority.
Contact appropriate trade supervisor.</td></tr>
<tr><td rowspan="2">ASBESTOS</td><td colspan="2">Products made from asbestos cement not only include fibro sheeting (flat and corrugated), but items such as water, drainage and flue pipes, roofing shingles and gutters.
Do not touch or further disturb.
Isolate area (10 metre isolation zone required for asbestos).
Contact hygienist.
Implement hygienist’s recommendations.
If persons have been exposed arrange medical advice/consultation i.e. possible asbestos fibre exposure will require lung function test & chest x-ray. Note: This applies more specifically to friable type asbestos rather than non friable asbestos containing material however if any doubt exists treat as friable.
Obtain clearance from hygienist prior to re-entering area.</td></tr>
<tr><td>Non-Friable Asbestos
Over 97% of the products in Australia were non-friable material in which the Asbestos fibres were bonded by cement, vinyl, resin or other similar material.</td><td>Friable Asbestos
The hazardous friable asbestos is material which can be crumbled, pulverised, or reduced to powder by hand pressure. This may also include previously non-friable material which becomes broken or damaged by mechanical force.</td></tr>
</table>

ITEM	REQUIREMENTS
OTHER CONTAMINANTS OF CONCERN	The possibility exists for additional contamination other than those previously identified to be present within the site. Ground conditions between sampling points may vary, and further hazards may arise from unexpected sources and/or in unexpected locations. The nature of any additional contamination which may be present at the site are generally detectable through visual or olfactory means, for example: • Drums or underground storage tanks; • Chemical bottles; and • Odorous or stained soils. As a precautionary measure to ensure the protection of the site personnel and surrounding community, should any of the abovementioned substances be identified (or any other contamination), the following procedure should be undertaken: • Cease work. • Isolate area around the unexpected find. • Client to be contacted and environmental consultant to inspect unexpected find. • Environmental consultant to undertake detailed inspection including sampling and analysis. • Where substance is assessed as presenting an unacceptable risk to human health; remediation and validation to be undertaken. • Exclusion zone and environmental controls to be removed. • Continue work. Should any unexpected finds require remediation and validation, the works will be conducted in general accordance with relevant NSW EPA guidance, and with appropriate measures based on the nature of the unexpected find. The sampling strategy for each 'unexpected finds' shall be determined by a suitably qualified environmental consultant, in accordance with NSW EPA sampling guidelines.
HUMAN REMAINS	• Do not touch or disturb. • Contact Police immediately. • Please note that aboriginal burial objects (such as bark coffins) are defined by legislation as human remains.
HERITAGE ITEMS	• Do not touch or disturb. • Contact Heritage Office or relevant State or Local Government Authority.
OBJECTS OF POSSIBLE CULTURAL SIGNIFICANCE	• Do not touch or disturb. • Contact Department of Indigenous Affairs or relevant State or Local Government Authority.
UNEXPECTED FIND PROCESS