



SECTION 96A OF THE PLANNING AND ENVIRONMENT ACT 1987

Appendix K Preliminary Risk Screen Assessment

PREPARED FOR 108 & 110 PARR STREET PTY LTD

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PLANNING

Information sheet for environmental audits and preliminary risk screen assessments (PRSAs)



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Victoria's audit system

An environmental audit system has operated in Victoria since 1989. The *Environment Protection Act 2017* (the Act) provides for the appointment of environmental auditors. It also provides for Environment Protection Authority (EPA or the Authority) to have a system of preliminary risk screen assessments (PRSAs) and environmental audits. These are used in the planning, approval, regulation and management of activities, and in protection of human health and the environment.

Under the Act, the functions of an environmental auditor include to:

- conduct PRSAs and environmental audits
- prepare and issue PRSA statements and reports, and environmental audit statements and reports.

The purpose of a PRSA is to:

- assess the likelihood of the presence of contaminated land
- determine if an environmental audit is required
- recommend a scope for the environmental audit if an environmental audit is required.

The purpose of an environmental audit is to:

- assess the nature and extent of the risk of harm to human health or the environment from contaminated land, waste, pollution, or any activity
- recommend measures to manage the risk of harm to human health or the environment from contaminated land, waste, pollution, or any activity
- make recommendations to manage any contaminated land, waste, pollution or activity.

Upon completion, all PRSAs and environmental audits require preparation of either a PRSA statement, accompanied by a PRSA report, or an environmental audit statement, accompanied by an environmental audit report.

A person may engage an environmental auditor to conduct a PRSA or an environmental audit.

EPA administers the environmental audit system and ensures an acceptable quality of environmental auditing is maintained. This is achieved by assessing auditor applications and conducting a quality assurance program. These measures ensure that PRSAs and environmental audits that environmental auditors undertake are completed in accordance with the relevant sections of the Act or any other Act, and with the guidelines the Authority or other government agencies have published.

Information sheet for environmental audits and preliminary risk screen assessments (PRSAs)

File structures

EPA stores digital statements and reports from PRSAs and environmental audits in three parts:

- Part A, the PRSA or environmental audit report
- Part B, report appendices
- Part C, the PRSA statement and executive summary or environmental audit statement and executive summary.

Report executive summaries, findings and recommendations should be read and relied upon only in the context of the whole document, including any appendices and the PRSA statement or environmental audit statement.

Currency of PRSAs and environmental audits

PRSAs and environmental audits are based on the conditions encountered and information reviewed at the time of preparation. They don't represent any changes that may have occurred since the completion date. As it's not possible for the PRSA or audit report to present all data that could be of interest to all readers, consideration should be made to any appendices or referenced documentation for further information.

When information about the site changes from what was available at the time the PRSA or environmental audit was completed, or where an administrative error is identified, an environmental auditor may amend or withdraw PRSA or environmental audit statements and/or reports. Users are advised to check EPA's website to ensure documents' currency.

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EPA can only provide PRSAs and environmental audit statements, reports and appendices that the environmental auditor provided to EPA via the EPA portal on the EPA website.

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Preliminary Risk Screen Assessment

108 and 110 Parr Street
Leongatha, Victoria

Prepared for:
Rural Subdivision
Specialists

Prepared by:



31 August 2023



Document Control

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Acronyms

AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment Conservation Council
AST	Aboveground Storage Tank
BTEX	Benzene, Toluene, Ethylbenzene, Xylene, Naphthalene
CEC	Cation Exchange Capacity
COPC	Contaminant of Potential Concern
EHS	Environmental, Health and Safety
EIL	Ecological Investigation Level
EPA	Environment Protection Authority
ERS	Environmental Reference Standard
ESA	Environmental Site Assessment
ESL	Ecological Screening Level
GQRUZ	Groundwater Quality Restricted Use Zone
HIL	Health Investigation Level
HSL	Health Screening Level
NHMRC	National Health and Medical Research Council
OCP	Organochlorine Pesticide
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
SGV DELWP	State Government Victoria – Department of Environment, Land, Water & Planning
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TRH	Total Recoverable Hydrocarbons
UST	Underground Storage Tank
VOC	Volatile Organic Compound

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Executive Summary

The following tables provide a summary of the findings from the Preliminary Risk Screen Assessment (PRSA), completed by Ken Mival of EHS Support Pty Ltd, who is an Environmental Auditor appointed pursuant to the *Environment Protection Act 2017*.

Table 1 – Summary of PRSA information

Auditor	Kenneth Mival	
Auditor Account Number	75563	
Name of person requesting PRSA	Daniel De Pasquale (Rural Subdivision Specialists)	
Relationship of person requesting PRSA to site	Development consultant and representative to site owners	
Name of Site owners	108 Parr Street Leongatha VIC 3953	108 Parr St Pty Ltd
	110 Parr Street Leongatha VIC 3953	Beval Pty Ltd and Lamb & Bell Pty Ltd
Date of Auditor engagement	2 June 2023	
Completion date of the PRSA	31 August 2023	
Reason for PRSA	To assess the potential for contamination associated with land which is subject to redevelopment to various land uses including low density residential landuse ¹ .	
Elements of the environment assessed	Land, water (surface water and groundwater)	
Planning permit number	Currently not applicable	
EPA region	South Gippsland	
Municipality	South Gippsland Shire Council	
Dominant – Lot on plan	Lot 1 on Title Plan 615766W	
Additional – Lot on plan(s)	Lot F on Plan of Subdivision 448885F	
Site/premises name	-	
Building/complex sub-unit No.	-	
Street/Lot – Lower No.	108	
Street/Lot – Upper No.	110	
Street Name	Parr	
Street type	Street	
Street suffix	-	
Suburb	Leongatha	
Postcode	3953	
Site area (m²)	225,900 m ²	
Plan of site/premises/location showing the audit site boundary attached	Figure 2 (appended)	
Members and categories of support team utilised	Dr. Tiffany Gourley (Contaminated Land and Hydrogeologist)	
Further work or requirements	None (refer to PRSA statement in Appendix A)	

¹ Low density residential landuse equates to 'conventional density' in planning terminology. Low Density landuse for the PRSA refers to land with gardens/accessible soils. The terms are considered to be of the same meaning, and therefore low density residential landuse has been used throughout this PRSA.



Nature and extent of continuing risk of harm	Review of site history information, soil sampling across the site (both grid and targeted) and a subsequent human health risk assessment (for metals cobalt and manganese in soil), found that the potential risks to human health are low and acceptable.
Outcome of the PRSA report	In the Auditor's opinion, the site does not require an Environmental Audit (refer to PRSA statement in Appendix A)

Table 2 – Physical Site information

Historical land use	Rural residential and open farmland (grazing, vineyard and cropping)
Current land use	Rural residential and open farmland (grazing and vineyard)
Proposed land use	Low-density residential development (i.e., conventional residential subdivision) with supporting drainage, road network and open space infrastructure.
Current land use zoning	Farming Zone (FZ)
Proposed land use zoning	General Residential Zone
Surrounding land use – north	Parr Street then farmland, general residential properties and a bus depot.
Surrounding land use – south	Land undergoing subdivision and development for low density residential use.
Surrounding land use – east	Coalition Creek then farmland.
Surrounding land use – west	General residential properties and public park and recreational land.
Has EPA been notified about the site under Section 40 of the Environment Protection Act 2017?	No
Nearest surface water receptor – name	Unnamed dams (on-site) and then Coalition Creek.
Nearest surface water receptor – direction	On-site (dams) and then Coalition Creek adjacent to the eastern boundary of the site.
Likely point of groundwater discharge	Coalition Creek
Site aquifer formation	Quaternary aged alluvium deposits
Groundwater segment	Segment A



1 Introduction

At the request of Rural Subdivision Specialists (RSS) acting on behalf of the landowners, Ken Mival of EHS Support completed a PRSA as an EPA appointed Environmental Auditor pursuant to the *Environment Protection Act 2017* (the Act), in accordance with Division 2, Part 8.3 of the Act, for an area of land located at 108-110 Parr Street, Leongatha, Victoria, referred to as ‘the site’. The location of the site is shown in **Figure 1** (appended).

The following properties are included in the area of land referred to as 108-110 Parr Street, Leongatha, Victoria and are subject to this PRSA:

- 108 Parr Street, Leongatha, VIC 3953 (Lot F on Plan of Subdivision 448885F)
- 110 Parr Street, Leongatha, VIC 3953 (Lot 1 on Title Plan 615766W)

We understand that RSS is in the process of compiling documentation for submission of a Precinct Structure Plan rezoning application to the South Gippsland Shire Council, and that in accordance with the Planning Practice Note 30 (July 2021), that a PRSA is to be conducted to consider whether the site is potentially contaminated, and if so, whether the site or parts of the site are recommended for an Environmental Audit to be undertaken.

The PRSA is required to assess whether there is potential for the presence of contamination that may affect the capacity of the site to support future sensitive uses as part of the proposed amendment. The assessment of potentially contaminated land is required in line with *Ministerial Direction Number 1 – Potentially Contaminated Land*, and Planning Practice Note 30 – *Potentially Contaminated Land* (July 2021).

1.1 Purpose and Objectives

Under Section 204(2) of the *Environment Protection Act 2017* (the Act), the purpose of a PRSA is:

- (a) To assess the likelihood of the presence of contaminated land; and
- (b) To determine if an environmental audit is required; and
- (c) If an environmental audit is required, to recommend a scope for the environmental audit.

The objective of this PRSA is to assess whether there is potential for the presence of any chemicals that may indicate the presence of contaminated land at the site and to consider whether or not an environmental audit is required, in order to assist the Planning Authority in making an assessment of the suitability of the site for the proposed land uses.

1.2 Scope of Services

The scope of works for the PRSA is in accordance with the methodology outlined in EPA Guideline 2021 (February 2022).

To meet the project objectives, the following scope of works has been undertaken for the PRSA:

- A site visit of the site and surrounds was conducted on 26 July 2023 by Dr. Tiffany Gourley of EHS Support, which included a briefing from Daniel De Pasquale of RSS (representative of site owners) regarding the planned development for the site and discussion with the current site tenant of 110 Parr Street, Leongatha.
- Limited interviews with current site owners were conducted by the Auditor. Where available, the Site Assessor and RSS had previously obtained information from the previous



and/or current owners, in addition, the Auditor's representative conducted site interviews with the current site tenant of the following properties:

- 110 Parr Street, Leongatha (Auditor limited interview with current resident conducted).
- Review of the following environmental assessment reports prepared by Atma Environmental Pty Ltd (Atma) and Environmental Risk Sciences Pty Ltd (Enrisks) including site history reviews, soil sampling and analytical results and risk assessment, included as **Appendix B**:
 - *Environmental Site Assessment, 108 and 110 Parr Street, Leongatha, Victoria, dated 12 May 2022*, prepared by Atma Environmental Pty Ltd.
 - *Human health risk assessment regarding cobalt and manganese present in soil at 108 and 110 Parr St, Leongatha, Victoria, dated 11 May 2022* and prepared by Environmental Risk Sciences Pty Ltd.
- Supplementary site history reviews (as required) such as review of Victoria Unearthed database, historical aerial photographs (Google Earth) or recent historical aerial photographs (Nearmap) for relevant site history information for the site and surrounds.
- Development of a Conceptual Site Model (CSM).
- Assessed the likelihood of the presence of contaminated land.
- Prepared this PRSA report and PRSA Statements, included in **Appendix A**.

The PRSA scope and key information is summarised in the following table.



Table 1-1 PRSA Scope and Key Information

Item	Description
Historical landuse	Farming, including sheep and cattle grazing, and cropping (including hay and pea farming), rural residential land use and winery and vineyard (with temporary worker accommodation)
Current landuse	Farming, including cattle grazing and horse agistment, rural residential and vineyard
Proposed landuse	Residential (including low density), open space and infrastructure such as roads
Elements of the environment assessed in the PRSA	☒ Land: all environmental values that apply to the land use category to be considered ☒ Water (surface water): all environmental values that apply to the applicable segment to be considered ☒ Water (groundwater): all environmental values that apply to the applicable segment to be considered
Elements of the environment excluded from the PRSA	Ambient air and ambient sound were excluded as they were not considered relevant to the assessment of land for the potential presence of contamination for this site
Standards and reference documents considered	Environment Protection Act 2017 Environment Protection Regulations 2021 Environment Reference Standard 2021 National Environment Protection Council, 1999. National Environment Protection (Assessment of Site Contamination) Measure (as amended 2013) Environmental Auditor Guidelines – Provision of statements and reports for environmental audits and preliminary risk screen assessments (EPA Publication 2022, August 2021) Guidelines for conducting preliminary risk screen assessments (EPA Publication 2021), February 2022 Standards Australia, 2005, AS4482.1-2005, Australian Standard: Guide to the Investigation and Sampling of Potentially Contaminated Soil. Part 1: Non-volatile and Semi-volatile Compounds. Standards Australia, 1999, AS4482.2-1999, Australian Standard: Guide to the Investigation and Sampling of Potentially Contaminated Soil. Part 2: Volatile Substances. Western Australian State Government, Department of Primary Industries and Regional Development, Chickens, eggs and organochlorines (https://www.agric.wa.gov.au/livestock-biosecurity/chickens-eggs-and-organochlorines)
Assumptions and limitations of the PRSA	None
Exclusions from the PRSA	None



1.3 Auditor's Support Team

The Auditor obtained input for the PRSA from the following professionals:

- Dr Tiffany Gourley is a qualified environmental scientist and hydrogeologist with over 16 years of experience in the contaminated land industry and as an auditor's assistant for the last 8 years. Tiffany was directly involved in reviewing previous environmental site assessment reports and historical site information to inform the PRSA and undertook the site inspection.



2 Site Description and Environmental Setting

2.1 Site Details

The site includes two separate properties which are currently owned by 108 Parr St Pty Ltd (108 Parr Street) and Beval Pty Ltd and Lamb & Bell Pty Ltd (110 Parr Street). 110 Parr St Pty Ltd is a Caveator on the Title for 110 Parr Street in regard to having a Purchasers' Contract with the current landowners. The current Certificates of Title are included in **Appendix C**.

A summary of important site information is presented in **Table 2-1** below. The location of the site is shown in **Figure 1** (appended).

Table 2-1 Site Details and Information

Items	Details
Site Address	108 Parr Street, Leongatha, VIC 3953 110 Parr Street, Leongatha, VIC 3953
Site Area	Approximately 225,900 m ² (~23 hectares)
Title Identification (Lot & DP)	108 Parr Street: Lot F on Plan of Subdivision 448885F 110 Parr Street: Lot 1 on Title Plan 615766W
Local Government Administration (LGA)	South Gippsland Shire Council
Zoning of Site and Surrounding Area	The site is zoned Farming Zone (FZ). The surrounding area is zoned Farming Zone (FZ), General Residential (GRZ), Low Density Residential (LDRZ), Public Conservation and Resource (PCRZ) and Public Park and Recreation Zone (PPRZ).
Site Overlays	Environmental Significance Overlay (Schedule 2 and 5) Design and Development Overlay Development Plan Overlay Land Subject to Inundation Overlay
Current Site Use	Rural residential and open farmland (grazing and vineyard)
Future Site Use	Low-density residential development (i.e., conventional residential subdivision) with supporting drainage, road network and open space infrastructure.
Adjacent Site Uses	North: Parr Street then farmland, general residential properties and a bus depot. South: Land undergoing subdivision and development for low density residential use. East: Coalition Creek then farmland. West: General residential properties and public park and recreational land.

2.2 Current Site Features

A summary of existing site features is presented in **Table 2-2**. The site features are based on the results of a site inspection completed by the Audit team on 26 July 2023 and the ESA conducted by Atma (2022). Key existing and historical site features are shown on **Figure 2 and 3** (appended).



Table 2-2 Summary of Existing and Historic Site Features

Property	Estimated Area (m ²) ¹	Existing and Historic Site Features
108 Parr Street	58,240	• The property comprises a winery (now unused), vineyard, vacant land and disused temporary accommodation for seasonal workers. • The winery comprised a small building with toilets (likely connected to a septic tank system) in the northwest corner of the property. An above ground storage tank previously used for wine making was also noted in this area. • There was a shipping container (potential tool shed) and disused portable accommodation for seasonal workers just to the southeast of the winery building. • There was an ornamental dam present along the eastern boundary of the property with a large piece of steel wine making equipment adjacent to it. • Potentially disturbed, hummocky and grass covered soil is evident in the vacant paddock in the southwestern corner of the property. A disused toilet and burn pile (with fragments of building and construction material such as concrete, metal wire, wood, and glass) were also identified in this area. No potential asbestos debris was observed during the site visit. • Historically the property was used as an operating winery, restaurant and organic vineyard (with temporary worker accommodation).
110 Parr Street	167,660	• The property comprised a residential dwelling and open paddocks elsewhere (currently used for horse agistment and cattle grazing). The residence comprises a house with a shed, a shipping container, a disused chicken coop and landscaped grounds. • One septic tank system is present on this property. • Some farm machinery and empty drums (including one unused above ground storage tank that was brought to the site but never used) were present in the southwestern corner of the property. • There were two organic burn piles observed in the southwestern corner of the property. No potential asbestos was observed during the site visit. • There is a horse enclosure, disused stock loading ramp and a disused stockyard adjacent to the driveway in the northwestern corner of the property. • Coalition Creek forms the eastern boundary of the property and a channelised tributary of this creek dissects the northeastern corner of the property. A dam is present along the southern boundary of the property (proposed drainage basin dam). • Historically the property has been used for farming, including sheep and cattle grazing, and cropping (including hay and pea farming).

Table Notes:

1. Estimated Area based on Victorian Government, Department of Land, Water and Planning, *VICPlan database*

2.3 Environmental Setting

2.3.1 Topography

Surface elevation at the site is approximately 58 to 36 mAHD. The site generally slopes from the west to east in the direction of Coalition Creek which lies adjacent to the eastern boundary of the site. The points of lowest elevation at the site, lie adjacent to Coalition Creek along the eastern boundary of the site and the dam along the southern boundary of the site. These areas are generally



covered by the 'land subject to inundation overlay' as noted in **Table 2-1**. It should be noted that this audit does not consider the potential for impacts due to flooding and makes no comment about the suitability of the land for the proposed development in relation to the flood potential.

2.3.2 Surface Conditions

The site is predominantly unsealed grass and earth. The exception to this is beneath the residential dwellings, the winery building and sheds (where present).

2.3.3 Vegetation

Vegetation at the site predominantly comprises trees, shrubs and grasses. Taller trees are typically only located near the residential and winery buildings, along fence lines and adjacent to surface water features within the site. It is understood that an ecological assessment was not commissioned for the site.

2.3.4 Hydrology

Surface water is likely to infiltrate directly into the subsurface in unsealed areas. During high rainfall surface water is likely to flow into low lying areas, including the dams, channels, gullies and creeks across the site with attendant flooding potential as indicated on the proposed development plan prepared by Rural Subdivision Specialists (version 14) attached to this report as shown by the 1 in 100 year flood extent line. The closest surface water bodies are the dams located in the southern area of the site, and the channelised tributary (unnamed) of Coalition Creek in the northeastern corner of the site.

The nearest surface water body located off-site is Coalition Creek, which lies adjacent to the eastern boundary of the site. Coalition Creek flows southwards and intersects the Tarwin River West Branch approximately 104 m to the southeast of the site.

2.3.5 Acid Sulfate Soils

The area is mapped on the Atlas of Acid Sulfate Soils (CSIRO) as being at an extremely low (1-5%) to low (6 – 70 %) probability of occurrence onsite.

2.3.6 Geology

According to data obtained from the Department of Environment, Land, Water & Planning (DELWP), the majority of the site is likely underlain by Quaternary aged gravel, sand and silts from alluvial deposits. Alluvial deposits are likely to be encountered in lower lying areas which is consistent with the geomorphological environment in which they formed. Tertiary aged basalt (Thorpdale Volcanic Group) may also be present in the northwest and southwest corners of the site. Historical mining activity is not recorded in the area. A summary of the lithology of this geological unit is summarised in **Table 2-3** below.

Table 2-3 Summary of Geology

Age	Formation/Unit	Area	Description
Pleistocene to Holocene	Alluvium	Majority of site	Gravel, sand, silt: variably sorted and rounded; generally unconsolidated; includes deposits of low terraces; alluvial floodplain deposits.



Age	Formation/Unit	Area	Description
Paleocene to Miocene	Thorpdale Volcanic Group	SE and SW corner of site	Tholeiitic and alkalic basalt; minor nephelinite, basanite, nepheline hawaiiite, hawaiiite, mugearite, nepheline mugearite, tuff, interbedded sandstone and silcrete.

2.3.7 Hydrogeology

A summary of the expected site hydrogeology is provided in **Table 2-4** below. Based on Statewide groundwater maps, groundwater is expected to be encountered at depths ranging between less than 5 m in low lying areas adjacent to the creek and dams, and up to 50 metres below ground level (m bgl) in the higher elevation areas of the site.

Groundwater is expected to exist within an aquifer of the Quaternary alluvium deposits. This aquifer is considered likely to be characteristic of an unconfined aquifer where the main transport and storage mechanisms is via primary porosity between gravels and sands within the aquifer matrix. Clay or silt rich lenses within these formations may also result in semi-confined conditions in some areas.

The direction of groundwater flow at the site is currently unknown however is considered most likely to be towards the east or southeast in the direction of Coalition Creek. However, local variations may exist influenced by surface topography, the underlying geology and surrounding water bodies.

According to the Statewide groundwater salinity map, groundwater salinity beneath the site is expected to range between 500 – 1,000 mg/L. Based on the expected salinity, groundwater beneath the site would be classified as Segment A2 groundwater in accordance with the Environmental Reference Standard, 2021 (ERS, 2021).

Table 2-4 Summary of Hydrogeology

Item	Details
Depth to water	Between <5 and 50 m bgl, with shallower groundwater in topographically low lying areas
Aquifer(s)	Alluvial Deposits
Groundwater flow direction	Unknown, likely towards the east to southeast
Groundwater salinity and segment ¹	Segment A2 (500 – 1,000 mg/L)
Environmental Values of groundwater to be protected (based on Segment A2) in accordance with the ERS, 2021	• Water dependent ecosystems and species • Potable water supply (acceptable) • Potable mineral water supply • Agricultural and irrigation (irrigation) • Agricultural and irrigation (stock watering) • Industrial and commercial use • Water-based recreation (primary contract recreation) • Traditional owner cultural values • Buildings and structures • Geothermal properties
Point of groundwater discharge	Likely Coalition Creek along the eastern boundary of the site and/or the two dams along the southern boundary of the site.



Item	Details
Surrounding groundwater bores (within a 2 km radius) ²	There are 15 registered bores within a 2km radius of the site. Information from these bores include: • No bores are registered on-site. • Lithology encountered during installation of bores included sandy clay, clay and silt.
Surrounding groundwater uses	Surrounding bores were registered for the following uses: • Domestic and Stock (2) • Groundwater investigation/observation bores (3) • Dairy, Stock (1) • Domestic, Dairy, Irrigation, Stock (1) • Stock (1) • Unknown (7)
Nearest extractive use	The closest bore to the site registered for an extractive use, was a Domestic and Stock bore (ID: WRK984485) located approximately 992 m to the north of the site. Assuming that groundwater is flowing eastwards in the direction of Coalition Creek, this bore would be located cross-gradient of the site.

Table Notes:

1. TDS based on the Statewide groundwater salinity map and categorised in accordance with the Environmental Reference Standard (2021).
2. Based on the groundwater bore search detailed in the Atma (2022) ESA report.



3 Site History and Site Inspection

A detailed site history review was completed as part of the previous assessment conducted for the site. A review of previous assessments for the site is outlined in **Section 4**. In addition, the Auditor undertook: a review of more recent aerial photographs; verification of publicly available information, including information on the Victoria Unearthed website²; and obtained additional site history information from the current tenant occupying 110 Parr Street.

Based on the information reviewed, the site has historically been used for farming, including sheep and cattle grazing, cropping (including hay and pea farming), rural residential land use and winery and vineyard (with temporary worker accommodation) by various private owners. As detailed in **Table 2-2** in **Section 2.2**, several sheds, a stock yard, farming/winery equipment and a chicken coop have been identified at the site associated with historical and current farming/winery activities. In addition, a septic tank, several burn piles (two organic and one building/construction materials) and some disturbed/hummocky soils in the southwest corner of the site were noted. A review of historical business directories, certificates of Title and aerial photographs does not suggest that the site was used for any other purposes, with only minor changes to site features observed overtime, including vegetation clearing, rotating of crops, addition of vineyard and construction or demolition of structures (residential dwelling, winery and sheds).

The Auditor's assistant undertook an inspection of the site on 26 July 2023. The objective of the site inspection was to identify areas that may indicate the potential for contamination of the land and confirm the findings of the site history assessment. The site was observed and photographed to document the conditions observed during the site walkover. Key site features observed are outlined in **Section 2**. In summary, the following key potentially contaminating features that were confirmed either by site inspection or during soil sampling activities undertaken by the Site Assessor (Atma) were identified on the site:

- 110 Parr Street: elevated chromium in soil identified adjacent to the shed and in one of the paddocks, potentially associated with historical pesticide use/storage.
- 110 Parr Street: elevated zinc and cobalt in soil identified adjacent to the shed and farm storage area, potentially associated with historical fertiliser or pesticide use/storage.
- 108 & 110 Parr Street: elevated manganese in soils across the site and potentially associated with historical crop farming and soil amendments used.

There were no areas of obvious contamination (e.g. asbestos scatter, waste burials, sheep dip, chemical or fuel spills etc.) identified onsite at the time of the site inspection and during the soil sampling.

The historical land use, based on the site history information, is presented on **Figure 2 and Figure 3** attached.

Photographs of key site features identified during the site inspection (dated 26 July 2023) are shown below:

² <https://www.vvg.org.au/>



108 Parr Street, Leongatha	
	
Photo 1: Winery building with disused above ground storage tank	Photo 2: Vineyard
	
Photo 3: Temporary workers accommodation and shipping container (potential tool/storage shed)	Photo 4: Burn pile on vacant hummocky land
	
Photo 5: Outside toilet and fence line	Photo 6: Ornamental Dam



110 Parr Street, Leongatha



Photo 7: Stock yard with paddock in background



Photo 8: Shed and farm storage area



Photo 9: Disused above ground storage tank with paddock in background



Photo 10: Organic burn pile



Photo 11: Residence



Photo 12: Disused chicken coop



4 Previous Site Assessments

4.1 Environmental Site Assessment (Atma, 2022)

Atma was engaged by RSS in 2022 to undertake an ESA at 108 and 110 Parr Street, Leongatha, Victoria.

A summary of key information relating to the assessment completed by Atma is provided in **Table 4-1** below and is further detailed in the following sections, including a review of the suitability of the assessment to inform the PRSA.

Table 4-1 Summary of ESA (Atma, 2022)

Report Title	Environmental Site Assessment, 108 and 110 Parr Street, Leongatha, VIC
Report Date	12/05/2022
Environmental Assessor	Atma Environmental Pty Ltd (Atma)
Type of Assessment	Environmental Site Assessment
Dates of Field Inspections / Investigations	13 April 2022
Scope of Works	• Site history review • Site inspection & soil sampling (grid and targeted) • Preparation of report outlining conclusions and recommendations
Analytical NATA Accredited Laboratories	Eurofins Environment Testing Pty Ltd ALS Environmental Pty Ltd

4.1.1 Scope and Methodology

The scope of the ESA conducted by Atma included:

- Site history review to assist in determining its potential for contamination, including review of the following:
 - Review of historical Certificates of Title
 - Historical aerial photographs, business directories and maps;
 - EPA records including licensed premises, works approvals, notices, priority sites, environmental audits and groundwater quality restricted use zones;
- Collection of geological and hydrogeological information about the site and its surrounds;
- An inspection of the site and interviews with persons with historical or operational knowledge of the site (where present);
- Soil sampling and analysis program including:
 - 21 grid samples across the site (SS01-SS21)
 - 10 targeted locations along the western boundary of the site (BH01 – BH10)
- Analysis of soil samples for potential contaminants of concern; and
- Preparation of report outlining key conclusions and recommendations.



4.1.2 Overview of Results and Conclusions

4.1.2.1 Site History Review

The site history review completed by Atma indicates that the site was not historically owned by industrial or commercial type entities that have a high potential for land contamination. The site appears to have only been used for residential, organic winery and vineyard and farming purposes, including cropping in some areas.

A review of historical business directories, certificates of title and aerial photographs does not suggest that the site was used for any other purposes, with only minor changes to site features observed since circa 1940s, including vegetation clearing, rotating of crops and construction of new structures such as a residential dwelling, winery, vineyard and sheds. A review of the historical aerial photographs suggests that the residence at 110 Parr St was established between 1972 and 1985 and the vineyard between 1985 and 2010.

A review of historical business directories and EPA records relating to the surrounding areas did not identify any significant potential historical off-site sources of contamination. There was one listing in 1991 for 'Eldred Bus Services' located on the northern side of Parr St. This assumed to be the location of the current bus depot observed at this location.

Based on the site history results, Atma concluded that the past agricultural use of the site did not present a high potential for contamination. However, they noted that farming activities do pose some localised potential for contamination arising from the use/maintenance and storage of machinery, deterioration and wash off from buildings, etc.

The Auditor also notes that the potential historical application of fertilizers, pesticides and herbicides for cropping, represents a potential risk of contamination. Such chemicals are unlikely to have been used at the vineyard where the grape vines are stated to have been organically grown.

4.1.2.2 Site Inspection and Interviews

A site inspection was completed by a representative of Atma on 13 April 2022. The site inspection identified site features as presented in **Figures 2 and 3**, attached. An interview with a person having historical knowledge of the site history (e.g. a current resident or previous owner) was reportedly unable to be conducted at the time of the site inspection. The site inspection identified current site uses, site coverage and the presence of potentially contaminating materials and features.

4.1.2.3 Contaminants of Potential Concern

The following potential sources of contamination and potential contaminants of concern were identified in the ESA:



Table 4-2 Sources and Contaminants of Potential Concern (Atma, 2022)

Site Address	Source and Contaminants of Potential Concern
108 and 110 Parr Street	Organochlorine pesticides – spraying fields; storage and handling spills Herbicides– spraying fields; storage and handling spills Metals – wash off from sheds, soil amendments and fertiliser impurities, fungicides Hydrocarbons – equipment maintenance and refuelling (from ASTs)

The Auditor also notes that a septic system could be a potential source of contamination, however, RSS have noted (pers. comm) that the septic system at 110 Parr St associated with the residence, was recently serviced and is in good working order.

4.1.2.4 Soil Sampling and Analysis Program

The soil sampling program comprised collation of both grid-based and targeted samples. A summary of the soil sampling completed, including the adopted analytical program, is provided in Error! Reference source not found. below. A site plan showing the location of soil samples collected as part of the 2022 ESA (Atma, 2022) is provided in attached **Figures 2 and 3**.

Table 4-3 Summary of Soil Sampling Completed by Atma (2022)

Sample/Location Type		Number of Sample Locations	Number of samples analysed per location	Analysis
Grid-based (across site)		21 (SS01-SS21)	1 (21 in total)	Metals (selected samples also cyanide and hexavalent chromium), TRH, BTEXN, PAHs, Phenols, OCPs, Herbicides, PCBs, CEC, pH
Targeted Locations	Driveway in front of dwelling at #110	1 (BH01)	1 in total	Metals, TRH, BTEXN, OCPs
	Interior on earth floor of farm shed at #110	1 (BH02)	1 in total	Metals, TRH, BTEXN, OCPs, Herbicides
	Exterior location of stored material (incl. AST) near shed at #110	1 (BH03)	1 in total	Metals, TRH, BTEXN, OCPs, Herbicides, pH
	Beside chicken shed on #110	1 (BH04)	1 in total	Metals
	Sea containers storage area on #108	2 (BH05 & BH06)	1 (2 in total)	Metals, TRH, BTEXN
	Winery on #108	1 (BH07)	1 in total	Metals, CEC, pH
	Vineyard tool shed and worker accommodation on #108	1 (BH08)	1 (2 in total)	Metals, TRH (including silica gel clean up), BTEXN, OCPs, Herbicides
	Vineyard tool shed and worker	1 (BH09)	1 in total	Metals



	accommodation on #108			
	Area of disturbed soil on #108	1 (BH10)	2 in total	Metals, TRH (including silica gel clean up)

Table Notes:

Metals = arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, mercury, manganese, molybdenum, nickel, lead, selenium, silver, tin and zinc

TRHs = total recoverable hydrocarbons

OCP = organochlorine pesticides

BTEXN = Benzene, Toluene, Ethylbenzene, Xylene, Naphthalene

PAHs = Polyaromatic Hydrocarbons

CEC = Cation Exchange Capacity

No fill material was identified at any of the grid-based sampling locations. Natural soils were generally classified as a low plasticity, brown, silty clay. Gravel has been used as a topping fill layer across driveways and some works areas up to a maximum depth of 0.4 m bgs (e.g. BH08). Some 'black inclusions' were noted in sample BH10/0.1 (possible char). Field testing for organic vapours using the PID, found generally negligible results with a maximum reading of 1.4 ppm (BH08/01). No buried waste, asbestos fragments, staining or odours were noted at any of the soil sampling locations.

Analytical results were compared to human health and ecological based criteria for a low-density residential land use, including the following guideline values:

- Human health investigation and screening levels (HILs and HSLs), ecological investigation and screening levels (EILs and ESLs), TPH management limits and aesthetics criteria, as per the ASC NEPM 2013.
- The Australian Standard AS2159-2009 Piling – Design and Installation.

Atma noted the following analytes exceeded the adopted criteria:

- Elevated **chromium** (up to 280 mg/kg) was identified in two samples (SS11, BH01/0.1) above the ecological assessment criteria. Given that the 95% Upper Confidence Limit (UCL) of the mean concentration was below the criterion for chromium, no further consideration was considered warranted.
- Elevated **zinc** (up to 530 mg/kg) was identified in one sample (BH03/0.1) above the ecological assessment criteria. Given that the 95% Upper Confidence Limit (UCL) of the mean concentration was below the criterion for zinc, no further consideration was considered warranted.
- Elevated **TRHs (>C₁₆-C₃₄ fraction)** (up to 400 mg/kg) was identified in one sample (BH08/0.1) above the ecological assessment criteria. Given that the 95% Upper Confidence Limit (UCL) of the mean concentration was below the criterion for TRHs (>C₁₆-C₃₄ fraction) and a non-detectable result was obtained for the sample following silica gel cleanup, the TRH was considered to be naturally occurring and no further follow-up was considered warranted.
- Elevated **cobalt** (up to 320 mg/kg) was identified in one sample (BH02/0.1) above the human health criteria, and it was recommended that further health risk assessment should be carried out by a qualified toxicologist. The manganese could be present due to natural enrichment or mineralisation but also could be from the addition of a soil amendment such as manganese sulphate.
- Elevated **manganese** (up to 13,000 mg/kg) was identified in the majority of samples above the human health criteria (also above what would be expected of background concentrations), and it was recommended that further health risk assessment should be



carried out by a qualified toxicologist. The cobalt could be from the addition of a fertiliser such as cobalt sulfate or a general trace element fertiliser that contains cobalt.

The Auditor completed a detailed review of the analytical results and noted the following:

- Elevated concentrations of **OCPs**, comprising **DDT+DDE+DDD³** (up to 0.16 mg/kg), were reported in two soil samples (SS14 and SS17) above the *Government of Western Australia – Department of Primary Industries and Regional Development* criteria of 0.06 mg/kg, which is protective of poultry and eggs for domestic consumption. These OCPs identified are likely to be associated with the historical crop farming undertaken at the site prior to the continuation as an organic farm.
- It is noted that for the soil samples collected from BH10, where some ‘black inclusions’ (possible char) were noted at 0.3 m depth, the samples were not analysed for PAHs. Given the limited extent of these inclusions in the work undertaken by Atma, the Auditor considers the scope of works acceptable for the purposes of the assessment.

Atma concluded that there was no impact to the environmental values of land dependant ecosystems and species and production of food, flora and fauna, however, the data indicated that cobalt and manganese did not meet the criteria for health-based levels for residential uses.

Based on the Auditor review of the grid-based and targeted soil sampling, the Auditor generally agrees with Atma’s conclusions, however, notes that OCPs also exceed the WA criterion for poultry and eggs for human consumption in areas where crop farming has occurred. Therefore, this potential source is considered to exist in areas of the site used for crop farming and is considered relevant for soil that could be used for future poultry and egg production in a residential setting.

4.1.2.5 Recommendations from the Atma ESA

Based on the results of the Atma ESA, further human health risk assessment was recommended for cobalt and manganese in soils, that did not meet the criteria for health-based levels for residential uses.

With regards to Planning Practice Note 30 (DELWP, June 2021), it was concluded by Atma that the past land uses were not consistent with those which present a high potential for contamination, and it was indicated in their report that an environmental audit was not the appropriate planning response.

4.1.3 *Auditor Comments and Review of Quality Assurance and Control*

Overall, the Auditor notes that the ESA was generally appropriate and formed a suitable basis to assess the potential for contamination to be present at the site.

A review of the ESA report indicates that it largely met the requirements outlined in schedule B2 of the ASC NEPM 2013, to the extent applicable based on the scope and objectives.

An evaluation of key requirements and QAQC procedures, including Auditor comments, is summarised in the tables below.

³ Dichlorodiphenyltrichloroethane, dichlorodiphenyldichloroethylene, dichlorodiphenyldichloroethane



Table 4-4 Evaluation of Preliminary Investigation and Conceptual Site Model (Atma, 2022)

Item	Auditor Comments	Suitable to Inform PRSA
Preliminary Investigation		
Site History Review	The site history review is documented in Sections 4 to 6 of the ESA report. The Auditor considers that the information included in the report was of sufficient quality on which to base the conclusions regarding the potential for contamination at the site, and included relevant available information for the site, as detailed in Schedule B2 of the ASC NEPM 2013.	Yes
Environmental Setting	The environmental setting is documented in Section 3 of the ESA report. The environmental setting provides key information relating to expected topography, geology and hydrogeological conditions at the site.	Yes
Site Inspection	A site inspection was completed as part of the ESA and is summarised in Section 5 of the ESA report. Details regarding the site inspection were brief although no interviews with previous site owners or occupants was conducted. The Auditor therefore also undertook a site inspection and interviewed the current tenant of 110 Parr St, in order to confirm the Atma findings and provide further context and details where necessary.	Yes
Conceptual Site Model (CSM)		
Potential Sources and Contaminants of Concern	A CSM was not included in the ESA report, however, Section 6 of the ESA report summarized the contamination potential of the site and detailed contaminants of potential concern. Potential receptors, affected media and exposure pathways were not detailed. A CSM is therefore included as part of this PRSA.	Partially
Potential Affected Media		
Potential Receptors and Exposure Pathways		

Table 4-5 Evaluation of Soil Investigation (Atma, 2022)

Item		Auditor Comments	Suitable to Inform PRSA
Soil Sampling Program			
Data Quality Objectives (DQOs)		DQOs were not stated, however, Section 8 of the ESA presents the Quality Assurance and Control procedures undertaken.	Yes
Sampling and Analysis Quality Plan (SAQP)		A SAQP was not provided for review, however, Section 7 and 8 of the ESA details the soil sampling, analysis and quality plan.	Yes
Soil Sampling Program	Grid-based locations	Soil samples were retrieved from a total of 21 grid-based sampling locations across the site. It is noted that the number of grid-based sampling locations was not in accordance with the recommended minimum number of sample locations outlined in AS 4482.1 2005. However, this is considered to be sufficient given that the site area is larger than 5 hectares and based on the scope and objectives of the soil sampling.	Yes
	Targeted Sampling Locations	Soil samples were generally considered to have been positioned appropriately to target key potential sources of contamination. It is noted that the limited minor areas of contamination identified at the site have not been further delineated (vertically or laterally)	Yes



Item		Auditor Comments	Suitable to Inform PRSA
	Sampling Procedures	Sampling procedures are outlined in Section 7.2 of the investigation report and were generally appropriate	Yes
	Field Records and Field Methods	Adopted field methods were documented in Section 7.2 of the investigation report and are generally considered appropriate. A copy of field records, including borelogs, was provided in the Appendices of the ESA report.	Yes
	Analytical Suite	The adopted analytical suite included potential contaminants of concern and was generally appropriate for the scope of the investigation.	Yes
	Adopted Criteria	HIL/HSLs, EIL/ESLs, TPH management limits and aesthetics criteria were adopted. AS2159-2009 Piling – Design and Installation criteria were also adopted. The WA criterion for poultry poisoning were not included in the ESA but have been referenced by the Auditor and included for consideration in this PRSA.	Partially
	Sample Preservation	Based on the documented field methods, sample preservation procedures adopted were generally considered to be appropriate. Samples were noted by the laboratory as having been provided with adequate time to commence analysis in accordance with the relevant holding times.	Yes
	QAQC – Field Duplicates and Triplicates	A total of 34 primary samples were analysed. Three duplicates and two triplicate sample pairs were analysed during the field program, which is in accordance with ASC NEPM 2013 which require 5% duplicate and triplicate samples be collected (1:20 primary samples). RPDs were generally reported below the acceptance criteria of 30%, with the one exception outlined in the report in Section 8.3. The Auditor agrees with the consultant discussion on the RPD exceedance and considers that this is unlikely to change the outcomes of the investigation.	Yes
	QAQC – Field Rinsate and Trip Blanks	One rinsate, one field blank and one trip blank sample were retrieved during the soil sampling program at an appropriate frequency (i.e., one per day etc.), however, as explained in the ESA report, none were analysed. The Auditor considers that a rinsate and trip blank sample should have been analysed as a minimum, but this is unlikely to change the outcomes of the investigation.	No
	QAQC – Internal Laboratory QAQC	No Laboratory Quality Control review was undertaken by the assessor. The Auditor has conducted a 10% review of the laboratory QC and considers that it is acceptable for the purposes of this PRSA.	No – conducted by Auditor

The targeted soil investigation was generally considered appropriate and formed a suitable basis to provide indicative and preliminary information regarding the contamination status near key potential sources of contamination including the sheds, buildings, chicken coop, farm storage areas, disturbed soil and historic crop farming.

A review of the investigation completed by Atma (2022) indicates that it largely met the requirements outlined in Schedule B2 of the ASC NEPM 2013 and AS 4482.1-2005 *Guide to the investigation and sampling of sites with potentially contaminated soil – Non-volatile and Semi-volatile compounds*, to the extent applicable based on the scope and objectives.



4.2 Human Health Risk Assessment Regarding Cobalt and Manganese Present in Soil (Enrisks, 2022)

Given the elevated cobalt and manganese concentrations identified in onsite soils that exceeded the health investigation level (HIL) for residential uses, Enrisks (toxicological specialists) were engaged by RSS to undertake a human health risk assessment (HHRA) at 108 and 110 Parr Street, Leongatha, Victoria.

The objective of the risk assessment included providing a more detailed evaluation of how the HIL can be adjusted for manganese (to develop a site specific guideline) and undertaking a limited human health risk assessment for manganese using a site-specific soil guideline that is more relevant for the site. It was noted that HILs do not imply unacceptable levels of exposure or risks to human health. Rather, exceedance of the HILs triggers the need to undertake a site-specific assessment, including a site-specific HHRA, as was undertaken.

A review of background concentrations of manganese and cobalt in Victorian soils, found that the manganese levels recorded in shallow soils at the site were in line with normally expected background levels and that excessive levels of cobalt are not a common issue in Victoria.

The results of the detailed risk assessment found that the HIL-A for manganese could be adjusted to 38,000 mg/kg from 3,800 mg/kg to allow for the difference in risk acceptance levels in Australia, and the HIL-A for cobalt could be adjusted to 200 mg/kg from 100 mg/kg. The adjusted HIL-A values were then used to assess the results for the site. It was found that all statistical results were within the parameters recommended by the ASC NEPM 2013, when adjusted for site-specific considerations regarding the sources of manganese and cobalt in the soil. Both manganese and cobalt were considered to be naturally occurring at the site, given that there have been no known industrial sources of manganese or cobalt used at this site.

It was concluded that the risks to human health for the proposed subdivision are considered to be low and acceptable with respect to the elevated manganese and cobalt concentrations detected in shallow soils at the site.

The Auditor considers that the methodology and findings of the HHRA are generally appropriate and acceptable and agrees with the outcome of the HHRA.

4.3 Auditor's Opinion on the Adequacy of Previous Assessments

In order to further consider the WA Poultry criteria used to assess the potential risk to receptors associated with DDT+DDE+DDD and OCPs, the Auditor conducted further assessment, including calculating risk-based soil screening levels using the on-line Risk Assessment Information System (RAIS) calculator developed by the Oak Ridge National Laboratory (<https://rais.ornl.gov>). Chemical-specific and route-specific inputs in the calculator were modified to determine a concentration in soil protective of the consumption of poultry by residents (adult and children). Risk-based concentrations were derived for both threshold and non-threshold endpoints using a target hazard quotient (HQ) of 1 and a cancer risk of one in one hundred thousand (1×10^{-5}). USEPA recommended food ingestion rates for poultry were used in the calculation since relevant Australian-specific poultry ingestion rates were not available. The risk based screening value calculated for **DDT+DDE+DDD was 24 mg/kg.**



The following is noted in relation to this risk based concentration that was derived:

- 108 Parr St: two soil samples (SS14 and SS17) exceeded the WA Poultry Criteria but did not exceed the risk based criteria derived by EHS Support.

Overall, the Auditor considers that the information included in the previous ESA and HHRA reports is sufficient on which to base the conclusions and recommendation of this PRSA.



5 Conceptual Site Model Summary

The Conceptual Site Model (CSM) represents site related information regarding the potential for contamination sources, migration pathways and receptors.

The requirement for the development of a conceptual site model (CSM) is provided in Schedule B2 and B4 of the NEPM (NEPC, 2013). The CSM represents site-related information regarding contamination sources, migration pathways and receptors.

The development of a CSM is a dynamic process and information and assessments relevant to the site model should be used to update and review the current CSM.

The essential elements of an initial CSM are:

- Known and potential sources of contamination and contaminants of concern;
- Potentially affected media (soil, sediment, groundwater, surface water, indoor and ambient air) and contaminant transport and migration mechanisms;
- Potential human and ecological receptors; and
- Potential exposure pathways.

5.1 Potential Sources of Contamination and Contaminants of Concern Source-Pathway-Receptor Summary

Based on the site history review and site inspection, the below table summaries existing and historical on or off-site sources or activities that may have the potential to result in contamination. The table also identifies potentially affected media and list contaminants of potential concern (COPC) associated with each existing or historical source/activity.

Table 5-1 Summary of Potential Sources of Contamination and Contaminants of Concern

Potential Source Considered	Media that could be impacted	Contaminants of Potential Concern	Relevance to site
Potential On-site Sources			
Historical Farming – Crop Farming (including hay and pea farming)	Soil, groundwater, surface water	Metals, OCPs and Herbicides	Concentrations of DDT+DDE+DDD and total organochlorine pesticides have been reported above the adopted criterion for poultry and eggs for human consumption in some areas where crop farming has occurred. Therefore, this potential source is considered to exist in areas of the site used for crop farming (particularly at 108 Parr St) and is considered relevant for soil that could be used for future poultry and egg production in a residential setting. The COPCs are not considered to present a risk to surface waters or groundwater, given the relatively low concentrations reported.
Historical Farming – storage and handling of fuels chemicals and use/ maintenance/ storage of machinery.	Soil, groundwater, surface water	Metals, TRHs, BTEXN, PAHs, OCPs and Herbicides	The site history review and site inspection identified several sheds and areas where farming equipment/ machinery and minor quantities of chemicals and fuels were being stored. Above ground storage tanks observed at the site were not in use at the time of the assessments. Targeted soil sampling and analysis has been completed in several of these areas (refer to Section 4.1), which has identified the presence of



Potential Source Considered	Media that could be impacted	Contaminants of Potential Concern	Relevance to site
			some metals which may pose a potential risk to ecological receptors. TRH identified at one location was proven to result from natural organic content of the soils. The COPCs are not considered to present a risk to surface waters or groundwater, given the minor concentrations of elevated metals detected.
Burn pile including building debris	Soil, groundwater, surface water	Metals, TRHs, BTEXN, PAHs, and asbestos	Inert waste and building debris was noted in one burn pile in the southwest corner of the site. Only limited soil assessment has been completed in this area. No potential asbestos was observed during the audit site visit. The COPCs are not considered to present a risk to surface waters or groundwater, given the nature and minor extent of the inert waste observed.
Septic tanks	Soil, groundwater, surface water	Nutrients, metals, E. coli	Two septic tanks are likely to be located at the site associated with the existing residential dwelling and the former winery. The Auditor considers that providing any such septic tanks are decommissioned in accordance with EPA Guideline 891.4, then a septic tank assessment is not required to form part of any Audit scope.
Potential Off-site Sources			
Bus Depot	Soil, groundwater, surface water	Metals, TRHs, BTEXN, PAHs, Phenols, CHCs and VOCs	A bus depot (currently known as Western Roadlines - Leongatha Depot, formerly known as Eldred Bus Services in 1991) is located on the northern side of Parr St at 131 Parr St. Historical aerial photographs indicate that the bus depot was established between 1972 and 1985. This depot is likely to have an underground storage tank (UST) for bus refuelling purposes. Assuming that groundwater flow across the site subject to this PRSA is in an easterly direction towards the creek, any groundwater contamination that may be present underlying the bus depot (cross-gradient of the site) is unlikely to impact on the site. At the time of the site inspection on 26 July 2023, a visual observation of the bus depot from the front gate suggested that the depot was being maintained in an orderly fashion with no obvious signs of spillage or staining indicating potential contamination. The COPCs are not considered to present a significant risk to onsite soil, groundwater or surface waters given the offsite and cross-gradient location of the depot.



5.2 Potential Receptors

5.2.1 Environmental Values – Soil

The ERS, 2021, details the environmental values of land (i.e., soil) to be protected under a number of different land use scenarios and also provides environmental quality objectives for the protection of these environmental values.

The site is proposed to be used for residential purposes and is therefore consistent with the sensitive land use scenario (i.e., low density residential) and some areas of open space and recreation.

The environmental values of land applicable for the site are:

- Maintenance of ecosystems (modified to highly modified ecosystems)
- Human health
- Aesthetics
- Buildings and Structures
- Production of food, flora, and fibre

5.2.2 Environmental Values – Water

The ERS, 2021, defines the environmental values of water, including surface water (and associated sediments) and groundwater which must be protected. The environmental values of groundwater which must be protected are based on the groundwater salinity and the groundwater segment applicable. Groundwater of higher quality (lower salinity) has more environmental values than low quality (more saline) groundwater.

Based on the expected TDS, the most conservative groundwater segment likely encountered at the site is **Segment A2**. Therefore, the environmental values of groundwater requiring protection are:

- Water dependent ecosystems and species
- Potable water supply (acceptable)
- Potable mineral water supply
- Agricultural and irrigation (irrigation)
- Agricultural and irrigation (stock watering)
- Industrial and commercial use
- Water-based recreation (primary contract recreation)
- Traditional owner cultural values
- Buildings and structures
- Geothermal properties

The environmental values of water dependent ecosystems are applicable at the point of groundwater discharge, which is inferred to be Coalition Creek lying adjacent to the eastern boundary of the site.

As the site and depth to water are not located in an area of geothermic importance (i.e., temperatures of groundwater are unlikely to be between 30-70 degrees Celsius), and the natural quality of the groundwater is unlikely to be effervescent, the environmental values of geothermal properties and potable mineral water supply is not considered relevant.



As no natural surface water bodies are present onsite, other than man-made dams and some low-lying areas adjacent to the creek which is likely to include periodic surface water flows and become inundated, the environmental values of surface water are not considered relevant on the site.

5.3 Summary of Potential Receptors and Migration Pathways

A summary of potential receptors based on the environmental values of the environment applicable at the site are summarised in **Table 5-2** and **Table 5-3** below. This includes potential contaminant migration and exposure pathways, and whether the environmental values are likely to be impacted based on the historical use of the site.



Table 5-2 Environmental Values of Land, Potential Receptors and Migration and Exposure Pathways

Environmental Value	Potential Existing and Future Receptors		Potentially Affected Media, Migration and Exposure Pathways	Environmental Value Potentially Impacted
	On-site	Off-site		
Maintenance of ecosystems (modified to highly modified ecosystem)	Yes – Ecological receptors such as vegetation (trees, grasses)	No – Although ecological receptors exist off-site, they are unlikely to be impacted by soil contamination (if present) on-site.	Exposure of ecological receptors to contaminants through direct contact in soil. Exposure of future site users to contaminants through direct dermal contact and ingestion of soils (in unsealed areas). Secondary exposure by future site users to contaminants via consumption of potentially contaminated produce (chickens, eggs, vegetables, fruit etc.) Exposure by construction and maintenance workers to contaminants through direct dermal contact ingestion of soil.	Unlikely – Potentially in areas of historical cropping and in the vicinity of equipment/tool sheds.
Human Health	Yes – receptors including future adult and child residents and users of open space and recreation	Yes – Receptors including surrounding members of the public, workers, and residents		Unlikely – Potentially in areas of historical cropping and in the vicinity of equipment/tool sheds.
Aesthetics	Yes – receptors including future adult and child residents and users of open space and recreation	Yes – Receptors including surrounding members of the public, workers, and residents		Unlikely – Potentially in minor areas of inert waste and building debris.
Building and Structures	Yes – receptors including future residential buildings	No – Although buildings and structures exist off-site, they are unlikely to be impacted by soil contamination (if present) on-site.		No
Production of food, flora, and fibre	Yes – future residents may potentially grow produce (i.e., chickens, eggs, vegetable gardens and fruit trees)	No - Although receptors exist off-site, they are unlikely to be impacted by soil contamination (if present) on-site.		Unlikely – Potentially in areas of historical cropping and in the vicinity of equipment/tool sheds.



Table 5-3 Environmental Value of Groundwater, Potential Receptors and Migration and Exposure Pathways

Environmental Value	Potential Existing and Future Receptors		Potential Migration and Exposure Pathways	Environmental Value Potentially Impacted
	On-site	Off-site		
Water dependent ecosystems	No – Surface water bodies located on-site include artificial waterways such as dams, therefore, this environmental value is unlikely to be applicable.	Yes – Coalition Creek lying adjacent to the eastern boundary of the site.	Potential sources of contamination identified on-site are unlikely to result in groundwater contamination therefore potential impacts to environmental values of groundwater are considered to be negligible	Unlikely – Groundwater is unlikely to be impacted due to the relatively low concentrations of metals and OCPs reported.
Potable water supply (acceptable)	Unlikely but possible – No groundwater bores are registered for this use on-site. Although unlikely, this environmental value may still be relevant in the future.	Yes – Several existing groundwater bores in the surrounding area are registered for domestic, dairy, stock and irrigation uses. Therefore, this environmental value is considered to be relevant.		Unlikely – Groundwater is unlikely to be impacted due to the relatively low concentrations of metals and OCPs reported.
Agriculture and Irrigation – Stock Watering	Unlikely but possible – No groundwater bores are registered for this use on-site. Although unlikely, this environmental value may still be relevant in the future.	Yes – Several existing groundwater bores in the surrounding area are registered for domestic, dairy and stock uses. Therefore, this environmental value is considered to be relevant.		Unlikely – Groundwater is unlikely to be impacted due to the relatively low concentrations of metals and OCPs reported.
Agricultural and irrigation – irrigation	Unlikely but possible – No groundwater bores are registered for this use on-site. Although unlikely, this environmental value may still be relevant in the future.	Yes – Several existing groundwater bores in the surrounding area are registered for domestic, stock, dairy and irrigation uses. Therefore, this environmental value is considered to be relevant.		Unlikely – Groundwater is unlikely to be impacted due to the relatively low concentrations of metals and OCPs reported.



Environmental Value	Potential Existing and Future Receptors		Potential Migration and Exposure Pathways	Environmental Value Potentially Impacted
	On-site	Off-site		
Industrial and Commercial Use	No – Based on the existing and proposed land use, this environmental value is unlikely to be realised.	Yes – One existing groundwater bores in the surrounding area is registered for dairy (a commercial) use. Therefore, this environmental value is considered to be relevant.		Unlikely – Groundwater is unlikely to be impacted due to the relatively low concentrations of metals and OCPs reported.
Water-based recreation (primary contract recreation)	Unlikely but possible - No groundwater bores are registered for this use on-site. Although unlikely, this environmental value may still be relevant in the future.	Yes – Several existing groundwater bores in the surrounding area are registered for domestic and stock uses. This may include domestic groundwater supply for filling of swimming pools. Therefore, this environmental value is considered to be relevant.		Unlikely – Groundwater is unlikely to be impacted due to the relatively low concentrations of metals and OCPs reported.
Traditional owners, cultural and spiritual values	No – groundwater is not expected to discharge to any surface water bodies on the site.	Yes – These environmental values may be applicable at Coalition Creek which lies adjacent to the eastern boundary of the site.		Unlikely – Groundwater is unlikely to be impacted due to the relatively low concentrations of metals and OCPs reported.
Buildings and structures	No – buildings and structures will be present on-site in the future but are unlikely to intercept groundwater.	No – buildings and structures are present off-site but are unlikely to intercept groundwater.		No

6 Summary and Findings

6.1 Land Classification

In accordance with the Planning Practice Note 30 (July 2021) and based on the site history reviewed as part of this PRSA, the site has a low potential for contamination and does not require an Audit.

It is noted that the soil results for organochlorine pesticides (in particular DDT+DDE+DDD), cobalt and manganese, which were reviewed as part of this PRSA, do not exceed the criteria for low density residential land use (where poultry is not kept), nor do they exceed the criteria for public open space such as parks or playgrounds.

6.2 Likelihood of Contamination

Based on the PRSA, inclusive of review of information included within previous environmental assessment and human health risk assessment reports and the Auditor's site inspection and consideration of the health risks from the minor concentrations of potential contaminants detected, it is considered unlikely that significant contamination is present at the site that may represent an environmental or health risk. Therefore, the environmental values of the site under the planned future land use scenarios are considered unlikely to be impacted. As such, an Audit is not recommended for the site, which is further detailed in the audit statement included in **Appendix A**.

6.3 Assessment of Possible Impacts on Environmental Values

The Auditor's assessment of possible impacts on the environmental values associated with the proposed use of the site are documented in the following tables.

Table 6-1 Assessment of Environmental Values of Land

Environmental Value	Auditor's Assessments
Land dependent ecosystems and species	Environmental value is considered unlikely to be impacted, but potentially impacted at low levels in areas of historical cropping and in the vicinity of equipment/tool sheds.
Human health	Environmental value is considered unlikely to be impacted, but potentially impacted at low levels in areas of historical cropping and in the vicinity of equipment/tool sheds.
Buildings and Structures	Environmental value is considered unlikely to be impacted.
Aesthetics	Environmental value is considered unlikely to be impacted, but potentially impacted in the minor areas of inert waste and building debris.
Production of Food, Fibre and Flora	Environmental value is considered unlikely to be impacted, but potentially impacted to low levels in areas of historical cropping and in the vicinity of equipment/tool sheds.



Table 6-2 Assessment of Environmental Values of Groundwater

Environmental Value	Auditors Assessments
Water dependent ecosystems and species	Environmental value is considered unlikely to be impacted.
Potable water supply (acceptable)	Environmental value is considered unlikely to be impacted and this environmental value is unlikely to apply at the site.
Potable mineral water supply	Environmental value is considered unlikely to be impacted.
Agriculture and irrigation (stock watering)	Environmental value is considered unlikely to be impacted.
Agriculture and irrigation (irrigation)	Environmental value is considered unlikely to be impacted
Industrial and commercial use	Environmental value is considered unlikely to be impacted.
Water based recreation (primary contact recreation)	Environmental value is considered unlikely to be impacted.
Traditional Owner cultural values	Environmental value is considered unlikely to be impacted.
Buildings and structures	Environmental value is considered unlikely to be impacted.
Geothermal properties	Environmental value is considered unlikely to be impacted and this environmental value is unlikely to apply at the site.

Two dams exist at the site. In accordance with the ERS (2021), environmental values of surface water do not apply at off-stream private dams. No permanent natural surface water features are present on the site, and the environmental values of surface water are unlikely to be impacted by the historical use of the site.

6.4 Determination of an Environmental Audit

Based on the results of the PRSA and supporting information, including the previous environmental site assessment and human health risk assessment included in **Appendix B**, the Auditor is of the opinion that an environmental audit (conducted in accordance with Section 208 of the *Environment Protection Act 2017*) is not required for the site for the proposed development which include low-density residential subdivisions and open space use.

A PRSA Statement outlining the results and conclusion of the PRSA has been prepared as detailed in the table below. A copy of the PRSA Statement is provided in **Appendix A**.

6.5 Assessment Exclusions

The PRSA did not include any exclusions relevant to the scope conducted.



7 Limitations

EHS Support has prepared this report in accordance with the usual care and thoroughness of the consulting profession for the use of Rural Subdivision Specialists. It is based on generally accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this report. It is prepared in accordance with the scope of work and for the purpose outlined in the Proposal dated 30 May 2023.

A PRSA is not an Environmental Audit in accordance with Section 208 of the Act. A PRSA, as defined by the EPA Guidelines and the Act, makes conclusions on the potential for contamination to be present at the site, and not the suitability of the site for the intended use. It also does not consider the potential impacts on the site from flooding events.

The methodology adopted and sources of information used by EHS Support are outlined in this report. No indications were found during our investigations that information contained in this report as provided to EHS Support was false.

This report was prepared in July to August 2023 and is based on the conditions encountered and information reviewed at the time of preparation. EHS Support disclaims responsibility for any changes that may have occurred after this time.

This report should be read in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties. This report does not purport to give legal advice. Legal advice can only be given by qualified legal practitioners.

This report contains information obtained by inspection, desktop site history investigation and review of previous environmental assessment reports completed by third parties. This information is directly relevant only to the information obtained at the time of the assessment.

Where conditions encountered at the site are subsequently found to differ significantly from those anticipated in this report, EHS Support must be notified of any such findings and be provided with an opportunity to review the recommendations of this report.

Whilst to the best of our knowledge information contained in this report is accurate at the date of issue, subsurface conditions, including groundwater levels can change in a limited time. Therefore, this document and the information contained herein should only be regarded as valid at the time of the investigation unless otherwise explicitly stated in this report.



8 References

Legislation

State of Victoria, Environment Protection Act 2017

State of Victoria, Environment Protection Regulations 2021, SR Number 47/2021 (25 May 2021)

State of Victoria, Environment Reference Standard, Victorian Government Gazette Number S245, 26 May 2021

Guidelines

Australian and New Zealand Environment and Conservation Council (ANZECC), 1992. *Guidelines for the Assessment and Remediation of Contaminated Sites*.

Department of Environment, Land, Water and Planning (2021), Potentially Contaminated Land, Planning Practice Note 30, July 2021

EPA Victoria, 2021, Environmental Auditor Guidelines – Provision of statements and reports for environmental audits and preliminary risk screening assessments (EPA Publication 2022, August 2021)

EPA Victoria, 2022, Guidelines for conducting preliminary risk screen assessments (EPA Publication 2021), February 2022

Ministerial Direction No. 1 – Potentially Contaminated Land 2021

National Environment Protection Council, 1999. National Environment Protection (Assessment of Site Contamination) Measure (as amended 2013)

Standards Australia, 2009. Australian Standard AS 2159-2009: Piling – Design and installation.

Standards Australia, 2005, AS4482.1-2005, Australian Standard: Guide to the Investigation and Sampling of Potentially Contaminated Soil. Part 1: Non-volatile and Semi-volatile Compounds.

Standards Australia, 1999, AS4482.2-1999, Australian Standard: Guide to the Investigation and Sampling of Potentially Contaminated Soil. Part 2: Volatile Substances.

Western Australian State Government, Department of Primary Industries and Regional Development, Chickens, eggs and organochlorines (<https://www.agric.wa.gov.au/livestock-biosecurity/chickens-eggs-and-organochlorines>)

Site Specific References

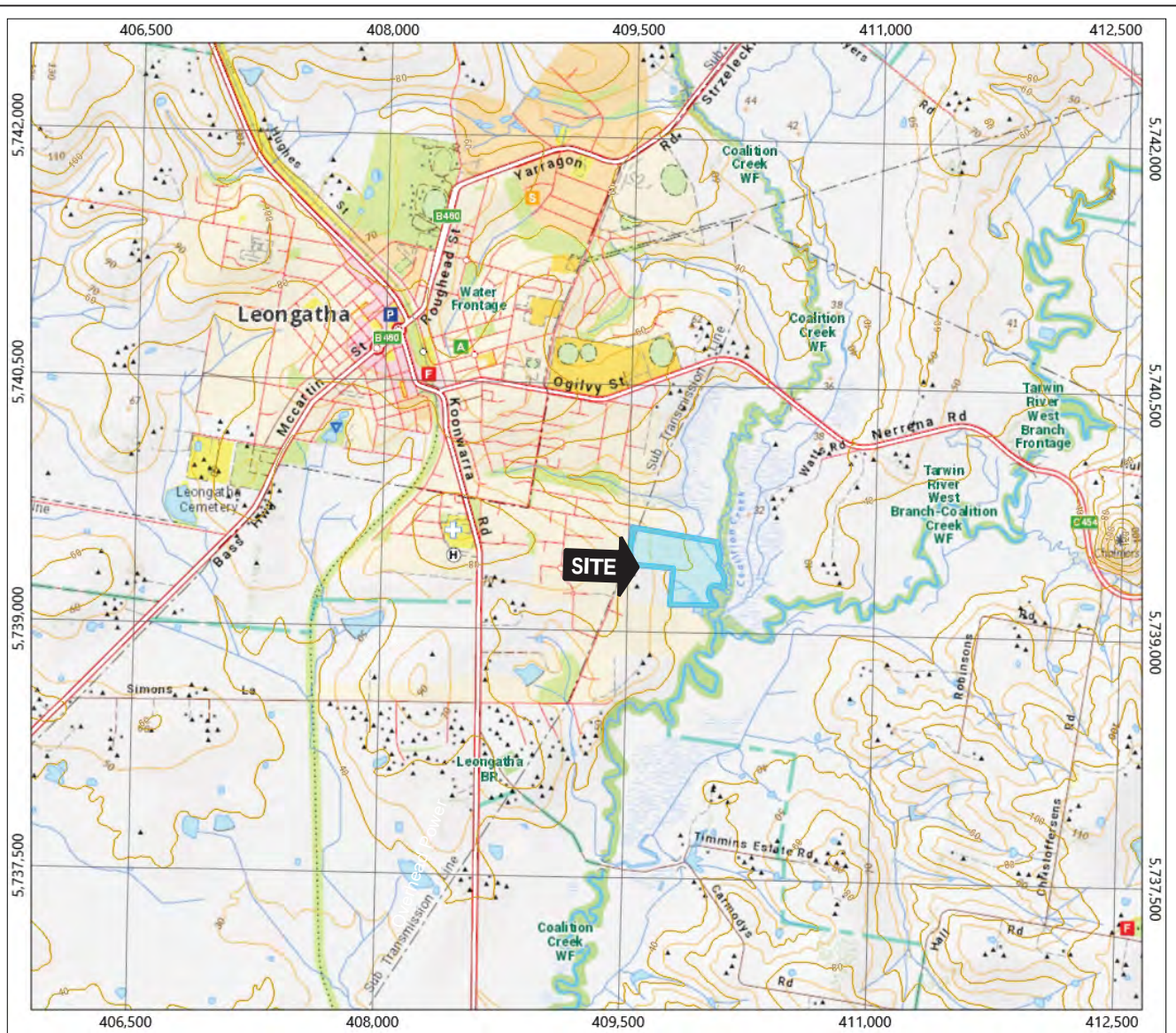
Atma Environmental Pty Ltd, 2022. Environmental Site Assessment, 108 and 110 Parr Street, Leongatha, Victoria. Prepared for Rural Subdivision Specialists and dated 12 May 2022.



Environmental Risk Sciences Pty Ltd, 2022. Human health risk assessment regarding cobalt and manganese present in soil at 108 and 110 Parr St, Leongatha, Victoria. Prepared for Rural Subdivision Specialists and dated 11 May 2022.



Figures



Atma Environmental

Client:
Rural Subdivision Specialists

Project: #2153 Leongatha - ESA

Drawn by: G.B. Dated: 09/05/2022 Revision: Final

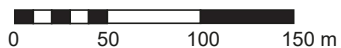
Figure 1 . Site Location Plan

LEGEND:

- Investigation Area
- Site Buildings
- Grid Sample Location



Approximate Scale:



Imagery: Nearmap 2021

Atma Environmental

Client:

Rural Subdivision Specialists

Project: #2153 Leongatha - ESA

Drawn by: GRB Dated: 29/04.2022 Status: Final

**Figure 2. Overall Site Plan
and Grid Sampling Locations**



LEGEND:

- Investigation Area
- Building
- Access Track
- Target Borehole



Approximate Scale:



Atma Environmental

Client:

Rural Subdivision Specialists

Project: #2153 Leongatha - ESA

Drawn by: G.B. Dated: 12/04/2022 Revision: Final

Figure 3. Built Areas & Target Sample Locations



Imagery: Nearmap 2021



Tables

Table 1. Results Summary vs NEPM Ecological Human Health Guidelines

Project: # 2153 Leongatha



	Metals																				TRIHS					BTEXN					PAHs			Phenols							
	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium (H+VI)	Chromium (Hexavalent)	Cobalt	Copper	Cyanide (Free)	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Tin	Zinc	T.B.H (C2-C13)	T.B.H (C13-C16)	T.B.H (C16-C18)	T.B.H (C18-C24)	T.B.H (C24-C40)	Naphthalene (BTEX)	Benzene	Toluene	Ethyl Benzene	Xylene	PhAs (Total)	Benzo-a-Pyrene	Benzo(a)pyrene TEQ (DQ)	Phenol	Pentachlorophenol	3,4-Methylenediphenol (Dip-Cresol)	2-Methylnaphenol (Cresol)					
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg			
NEPM EILs / ESLs - Residential / Public Open Space (Lowest ESLs)	100 ^{#1}					200 ^{#2}			200 ^{#3}		1,100 ^{#4}				170 ^{#5}				440 ^{#6}	180 ^{#7}	120 ^{#8}		300	2,800	170	50	85	70	45		0.7										
NEPM HILs / HSLs - 'A' Setting (Sand, <1 m)	100 ^{#9}	60	4,500	20		100	100	6,000	250	300 ^{#10}	3,800	40 ^{#11}		400	200				7,400	45 ^{#12}	110 ^{#13}		4,500 ^{#14}	6,300 ^{#15}	3	0.5	160	55	40	300 ^{#16}		3 ^{#14}	3,000	100							
Field ID	Date	Lab Name	Lab Report #																																						
BH010.1	13/04/2022	Eurofins	881033	2.3	140	<2	<10	<0.4	150	-	24	39	-	31	5,300	<0.1	<5	36	<2	<2	<10	52	<20	<50	<50	<100	<100	<0.5	<0.1	<0.1	<0.1	<0.3	-	-	-	-	-	-			
BH020.1	13/04/2022	Eurofins	881033	2.9	360	2.7	<10	<0.4	180	-	320	75	-	19	6,200	<0.1	<5	110	<2	<2	<10	120	<20	<50	<50	<100	<100	<0.5	<0.1	<0.1	<0.1	<0.3	-	-	-	-	-	-			
BH030.1	13/04/2022	Eurofins	881033	3.3	130	<2	<10	<0.4	250	-	46	70	-	33	6,200	<0.1	<5	58	<2	<2	<10	530	<20	<50	<50	<100	<100	<0.5	<0.1	<0.1	<0.1	<0.3	-	-	-	-	-	-			
BH040.1	13/04/2022	Eurofins	881033	<2	120	<2	<10	<0.4	130	-	17	33	-	25	4,600	<0.1	<5	28	<2	<2	<10	320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
BH050.1	13/04/2022	Eurofins	881033	<2	120	<2	<10	<0.4	170	-	18	29	-	20	4,500	<0.1	<5	22	<2	<2	<10	34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
BH060.1	13/04/2022	Eurofins	881033	<2	100	<2	<10	<0.4	140	-	15	27	-	17	3,700	<0.1	<5	20	<2	<2	<10	38	<20	<50	<50	<100	<100	<0.5	<0.1	<0.1	<0.1	<0.3	-	-	-	-	-	-			
BH070.1	13/04/2022	Eurofins	881033	<2	94	<2	<10	<0.4	130	-	13	21	-	18	3,600	<0.1	<5	15	<2	<2	<10	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
BH080.1	13/04/2022	Eurofins	881033	<2	<10	<2	<10	<0.4	13	-	<5	16	-	6.0	68	<0.1	<5	<5	<2	<2	<10	23	<20	<50	<50	400	110	<0.5	<0.1	<0.1	<0.1	<0.3	-	-	-	-	-	-			
BH080.1	13/04/2022	Eurofins	885491	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50 ^{#9}	<100 ^{#10}	<100 ^{#11}	<100 ^{#12}	<100 ^{#13}	<100 ^{#14}	<0.5	<0.1	<0.1	<0.1	<0.3	-	-	-	-	-	-			
BH080.5	13/04/2022	Eurofins	885491	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50 ^{#9}	<100 ^{#10}	<100 ^{#11}	<100 ^{#12}	<100 ^{#13}	<100 ^{#14}	<0.5	<0.1	<0.1	<0.1	<0.3	-	-	-	-	-	-			
BH090.1	13/04/2022	Eurofins	881033	3.1	110	<2	<10	<0.4	70	-	16	26	-	29	2,800	<0.1	<5	13	<2	<2	<10	45	-	<50 ^{#9}	<100 ^{#10}	<100 ^{#11}	<100 ^{#12}	<100 ^{#13}	<100 ^{#14}	<0.5	<0.1	<0.1	<0.1	<0.3	-	-	-	-	-	-	
BH100.1	13/04/2022	Eurofins	881033	4.0	230	<2	<10	<0.4	120	-	33	23	-	31	10,000	<0.1	<5	18	<2	<2	<10	22	-	<50 ^{#9}	<100 ^{#10}	<100 ^{#11}	<100 ^{#12}	<100 ^{#13}	<100 ^{#14}	<0.5	<0.1	<0.1	<0.1	<0.3	-	-	-	-	-	-	
BH100.1	13/04/2022	Eurofins	885491	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50 ^{#9}	<100 ^{#10}	<100 ^{#11}	<100 ^{#12}	<100 ^{#13}	<100 ^{#14}	<0.5	<0.1	<0.1	<0.1	<0.3	-	-	-	-	-	-			
BH100.5	13/04/2022	Eurofins	885491	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50 ^{#9}	<100 ^{#10}	<100 ^{#11}	<100 ^{#12}	<100 ^{#13}	<100 ^{#14}	<0.5	<0.1	<0.1	<0.1	<0.3	-	-	-	-	-	-			
SS01	13/04/2022	Eurofins	881033	2.3	230	<2	<10	<0.4	98	-	37	42	-	26	8,600	<0.1	<5	38	<2	<2	<10	31	-	<50 ^{#9}	<100 ^{#10}	<100 ^{#11}	<100 ^{#12}	<100 ^{#13}	<100 ^{#14}	<0.5	<0.1	<0.1	<0.1	<0.3	<0.5	<0.5	1.2	<0.5	<1	<0.4	<0.2
SS02	13/04/2022	Eurofins	881033	2.9	320	<2	<10	<0.4	87	-	64	53	-	30	13,000	<0.1	<5	48	<2	<2	<10	41	-	<50 ^{#9}	<100 ^{#10}	<100 ^{#11}	<100 ^{#12}	<100 ^{#13}	<100 ^{#14}	<0.5	<0.1	<0.1	<0.1	<0.3	-	-	-	-	-	-	
SS03	13/04/2022	Eurofins	881033	<2	320	<2	<10	<0.4	110	-	77	25	-	19	7,700	<0.1	<5	32	<2	<2	<10	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SS04	13/04/2022	Eurofins	881033	2.1	250	<2	<10	<0.4	140	-	79	23	-	19	6,600	<0.1	<5	48	<2	<2	<10	37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SS05	13/04/2022	Eurofins	881033	2.3	-	<2	<10	<0.4	110	<1	66	17	<5	13	3,500	<0.1	-	34	<2	-	-	38	<20	<50	<50	<100	<100	<0.5	<0.1	<0.1	<0.1	<0.3	<0.5	<0.5	1.2	<0.5	<1	<0.4	<0.2		
SS06	13/04/2022	Eurofins	881033	3.5	150	<2	<10	<0.4	20	-	17	17	-	16	1,200	<0.1	<5	16	<2	<2	<10	69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
SS07	13/04/2022	Eurofins	881033	<2	160	<2	<10	<0.4	150	-	23	42	-	20	5,000	<0.1	<5	45	<2	<2	<10	69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
SS08	13/04/2022	Eurofins	881033	2.0	180	<2	<10	<0.4	150	-	29	44	-	25	6,400	<0.1	<5	41	<2	<2	<10	36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
SS09	13/04/2022	Eurofins	881033	<2	180	<2	<10	<0.4	100	-	38	37	-	22	7,000	<0.1	<5	35	<2	<2	<10	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
SS10	13/04/2022	Eurofins	881033	<2	170	<2	<10	<0.4	180	-	37	25	-	17	3,900	<0.1	<5	32	<2	<2	<10	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
SS11	13/04/2022	Eurofins	881033	<2	280	<2	<10	<0.4	280	-	150	33	-	9.2	4,500	<0.1	<5	100	<2	<2	<10	93	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
SS12	13/04/2022	Eurofins	881033	2.5	76	<2	<10	<0.4	43	-	23	8.1	-	11	1,400	<0.1	<5	12	<2	<2	<10	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
SS13	13/04/2022	Eurofins	881033	<2	-	<2	<10	<0.4	150	<1	18	68	<5	19	4,200	<0.1	-	22	<2	-	-	33	<20	<50	<50	<100	<100	<0.5	<0.1	<0.1	<0.1	<0.3	<0.5	<0.5	1.2	<0.5	<1	<0.4	<0.2		
SS14	13/04/2022	Eurofins	881033	<2	140	<2	<10	<0.4	46	-	17	48	-	19	5,600	<0.1	<5	18	<2	<2	<10	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
SS15	13/04/2022	Eurofins	881033	<2	65	<2	<10	<0.4	27	-	17	8.1	-	11	1,500	<0.1	<5	9.2	<2	<2	<10	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
SS16	13/04/2022	Eurofins	881033	<2	58	<2	<10	<0.4	17	-	14	<5	-	12	1,900	<0.1	<5	<5	<2	<2	<10	9.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
SS17	13/04/2022	Eurofins	881033	2.8	190	<2	<10	<0.4	92	-	26	28	-	26	7,300	<0.1	<5	18	<2	<2	<10	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
SS18	13/04/2022	Eurofins	881033	<2	150	<2	<10	<0.4	120	-	22	50	-	23	5,100	<																									

Table 1. Results Summary vs NEPM Ecological Human Health Guidelines
Project: # 2153 Leongatha



	OCPs														Herbicides						PCBs	Other		Other OCPs		
	Aldrin and dieldrin	DDT+DDE+DDD	Chlordane	Heptachlor	Endosulfan I	Endosulfan II	Endrin	Heachlorobenzene	Methoxychlor	Mirex	Toxaphene	2,4,5-T	2,4-D	MCPA	MCPB	Meoprop	Picloram	PCBs (total)	Calon Exchange Capacity (mval/kg)	pH (1.5 soil:CaCl2 extract)	Atrazine	Bifenthrin	Chlorpyrifos			
EQI	mg/kg	mg/kg	mg/kg	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.1	meq/100g		0.1	0.2	0.05	0.2		
NEPM EILs / ESLs - Residential / Public Open Space (Lowest ESLs)																										
NEPM HILs / HSLs - 'A' Setting (Sand, <1 m)																										
	6	240	50	6			10	10	300	10	20	600	900	600	600	600	4,500	1 ¹⁰⁵			320	600	160			
Field ID	Date	Lab Name	Lab Report #																							
BH010.1	13/04/2022	Eurofins	881033	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	-	<0.5	-	-	-	<0.5	<0.5	-	-	-	-	-	-			
BH020.1	13/04/2022	Eurofins	881033	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-			
BH030.1	13/04/2022	Eurofins	881033	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	6.1	-	-	-			
BH040.1	13/04/2022	Eurofins	881033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
BH050.1	13/04/2022	Eurofins	881033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
BH060.1	13/04/2022	Eurofins	881033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
BH070.1	13/04/2022	Eurofins	881033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.5	5.2	-	-			
BH080.1	13/04/2022	Eurofins	881033	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-			
BH080.1	13/04/2022	Eurofins	885491	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
BH080.5	13/04/2022	Eurofins	885491	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
BH090.1	13/04/2022	Eurofins	881033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
BH100.1	13/04/2022	Eurofins	881033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
BH100.1	13/04/2022	Eurofins	885491	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
BH100.5	13/04/2022	Eurofins	885491	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
SS01	13/04/2022	Eurofins	881033	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	7.0	-	-	-			
SS02	13/04/2022	Eurofins	881033	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	-	-	-	<0.5	<0.5	-	-	-	-	-	-			
SS03	13/04/2022	Eurofins	881033	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-			
SS04	13/04/2022	Eurofins	881033	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	-	-	-	-	-	-	-	-	-	-	-			
SS05	13/04/2022	Eurofins	881033	-	-	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	-	6.8	<0.2	<0.05	<0.2		
SS06	13/04/2022	Eurofins	881033	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	-	-	-	-	-	-	-	-	-	-	-			
SS07	13/04/2022	Eurofins	881033	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	-	-	-	-	-	-	-	-	-	-	-			
SS08	13/04/2022	Eurofins	881033	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	6.1	-	-	-			
SS09	13/04/2022	Eurofins	881033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
SS10	13/04/2022	Eurofins	881033	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	-	-	-	-	-	-	-	6.2	-	-	-			
SS11	13/04/2022	Eurofins	881033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	-	-	-	-			
SS12	13/04/2022	Eurofins	881033	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-			
SS13	13/04/2022	Eurofins	881033	-	-	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	-	6.0	<0.2	<0.05	<0.2		
SS14	13/04/2022	Eurofins	881033	<0.05	0.12	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	-	-	-	-	-	-	-	7.0	-	-	-			
SS15	13/04/2022	Eurofins	881033	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-			
SS16	13/04/2022	Eurofins	881033	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	-	-	-	-	-	-	-	-	-	-	-			
SS17	13/04/2022	Eurofins	881033	<0.05	0.16	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	-	-	-	-	-	-	-	-	-	-	-			
SS18	13/04/2022	Eurofins	881033	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-			
SS19	13/04/2022	Eurofins	881033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.1	-	-	-			
SS20	13/04/2022	Eurofins	881033	-	-	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	-	<0.2	<0.05	<0.2			
SS21	13/04/2022	Eurofins	881033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.2	-	-	-			
Statistics																										
Number of Results	12	12	15	15	15	15	15	15	15	3	15	12	12	12	12	12	3	3	2	10	3	3	3			
Maximum Concentration	<0.05	0.16	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	11	7	<0.2	<0.05	<0.2			
Average Concentration *	0.025	0.044	0.05	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.05	9.2	6	0.1	0.025	0.1			
Standard Deviation *	0	0.046	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.5	0.92	0	0	0			
95% UCL (Student's-t) *	0.025	0.0678	0.05	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.05	20.3	6.502	0.1	0.025	0.1			
% of Detects	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	100	0	0	0			
% of Non-Detects	100	83	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	0	0	100	100	100			

* A Non Detect Multiplier of 0.5 has been applied.

Table 2. RPD Results
Project: # 2153 Leongatha

			Metals																	
			Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium (III+VI)	Cobalt	Copper	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Tin	Vanadium	Zinc
EQL			mg/kg 2	mg/kg 10	mg/kg 1	mg/kg 10	mg/kg 0.4	mg/kg 2	mg/kg 2	mg/kg 5	mg/kg 5	mg/kg 5	mg/kg 0.1	mg/kg 5	mg/kg 2	mg/kg 2	mg/kg 2	mg/kg 10	mg/kg 5	mg/kg 5
Field ID	Date	Lab Report #																		
BH06/0.1	13/04/2022	881033	<2	100	<2	<10	<0.4	140	15	27	17	3,700	<0.1	<5	20	<2	<2	<10	-	38
DUP-13422A	13/04/2022	881033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPDs:			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH06/0.1	13/04/2022	881033	<2	100	<2	<10	<0.4	140	15	27	17	3,700	<0.1	<5	20	<2	<2	<10	-	38
SPLIT-13422A	13/04/2022	EM2207191	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPDs:			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS02	13/04/2022	881033	2.9	320	<2	<10	<0.4	87	64	53	30	13,000	<0.1	<5	48	<2	<2	<10	-	41
DUP-13422B	13/04/2022	881033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPDs:			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS19	13/04/2022	881033	<2	57	<2	<10	<0.4	30	13	8.0	14	1,400	<0.1	<5	5.9	<2	<2	<10	-	8.8
DUP-13422C	13/04/2022	881033	<2	57	<2	<10	<0.4	26	12	6.8	14	1,200	<0.1	<5	<5	<2	<2	<10	-	8.0
RPDs:			0	0	0	0	0	14	8	16	0	15	0	0	17	0	0	0	-	10
SS19	13/04/2022	881033	<2	57	<2	<10	<0.4	30	13	8.0	14	1,400	<0.1	<5	5.9	<2	<2	<10	-	8.8
SPLIT-13422C	13/04/2022	EM2207191	<5	50	<1	<50	<1	23	9	6	12	942	<0.1	-	5	<5	-	-	43	6
RPDs:			0	13	0	0	0	26	36	29	15	39	0	-	17	0	-	-	-	38

*RPDs have only been considered where a concentration is greater than 1 times the EQL.

**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 81 (1 - 10 x EQL); 50 (10 - 30 x EQL); 30 (> 30 x EQL))

***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

Table 2. RPD Results
Project: # 2153 Leongatha



			TRHs					BTEXN					OCPs									
			TRH (C6-C10)	TRH (>C10-C16)	TRH (>C10-C16N)	TRH (>C16-C34)	TRH (>C34-C40)	Naphthalene (BTEX)	Benzene	Toluene	Ethyl Benzene	Xylene	Aldrin and dieldrin	DDT+DDE+DDD	Chlordane	Heptachlor	Endosulfan I	Endosulfan II	Endrin	Hexachlorobenzene	Methoxychlor	Toxaphene
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL			10	50	50	100	100	0.5	0.1	0.1	0.1	0.3	0.05	0.05	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.5
Field ID	Date	Lab Report #																				
BH06/0.1	13/04/2022	881033	<20	<50	<50	<100	<100	<0.5	<0.1	<0.1	<0.1	<0.3	-	-	-	-	-	-	-	-	-	-
DUP-13422A	13/04/2022	881033	<20	<50	<50	<100	<100	<0.5	<0.1	<0.1	<0.1	<0.3	-	-	-	-	-	-	-	-	-	-
RPDs:			0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-
BH06/0.1	13/04/2022	881033	<20	<50	<50	<100	<100	<0.5	<0.1	<0.1	<0.1	<0.3	-	-	-	-	-	-	-	-	-	-
SPLIT-13422A	13/04/2022	EM2207191	<10	<50	<50	110	<100	-	<0.2	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-
RPDs:			0	0	0	10	0	-	0	0	0	0	-	-	-	-	-	-	-	-	-	-
SS02	13/04/2022	881033	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
DUP-13422B	13/04/2022	881033	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
RPDs:			-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0
SS19	13/04/2022	881033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DUP-13422C	13/04/2022	881033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPDs:			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS19	13/04/2022	881033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SPLIT-13422C	13/04/2022	EM2207191	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPDs:			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Appendix A – Preliminary Risk Screen Assessment Statement

Preliminary risk screen assessment statement

Under Part 8.3 of the *Environment Protection Act 2017*

Publication F1031.1 published February 2022



The purpose of a preliminary risk screen assessment is:

- (a) to assess the likelihood of the presence of contaminated land; and
- (b) to determine if an environmental audit is required; and
- (c) if an environmental audit is required, to recommend a scope for the environmental audit.

It is important to note that a PRSA statement is not an environmental audit statement or an environmental audit report. It should not be construed as an environmental audit conducted to assess the suitability of land use.

This statement is a summary of the findings of a preliminary risk screen assessment conducted under Part 8.3 of the *Environment Protection Act 2017* for:

108 and 110 Parr St, Leongatha, Victoria 3953

(Lot 1 on Title Plan 615766W and Lot F on Plan of Subdivision 448885F)

Further details are provided in the preliminary risk screen assessment report that accompanies this statement.

Section 1: Preliminary risk screen assessment overview

Environmental auditor details

Name:	Ken Mival
Company:	EHS Support Pty Ltd
Address:	Level 14, 440 Collins Street, Melbourne, VIC
Phone:	+61 408 060 045
Email:	ken.mival@ehs-support.com

Site owner/occupant

Name:	108 Parr St Pty Ltd (108 Parr St, Leongatha) Beval Pty Ltd and Lamb & Bell Pty Ltd (110 Parr St, Leongatha) The area of the site subject to this Statement is provided in the attached PRSA Statement Figure 2.
Company:	See above

Environmental auditor engaged by

Name:	Daniel De Pasquale
Company:	Rural Subdivision Specialists
Relationship to site owner:	Development consultant and representative to site owners

Preliminary risk screen assessment statement

Reason for preliminary risk screen assessment

Planning scheme:	Not applicable. PRSA is to support Design and Development Overlay and later subdivision for residential and open space recreation use.
Permit details (if applicable):	Not applicable
Other:	
☐ Permit is attached (if applicable):	

Section 2: Assessment scope

Site details

Address:	108 and 110 Parr St, Leongatha, Victoria 3953
Title details:	Lot 1 on Title Plan 615766W (110 Parr St, Leongatha) Lot F on Plan of Subdivision 448885F (108 Parr St, Leongatha)
Area (m ²):	108 Parr St, Leongatha: 58,240 m ² 110 Parr St, Leongatha: 167,660 m ² Entire PRSA site: 225,900 m ²
☒ a plan of the site is attached	

Use or proposed use assessed

The below section details which land uses (current and proposed) the PRSA has assessed. Note, this is not a suitability of land use audit, rather an assessment to determine if an environmental audit is required for the land uses that apply to the specific PRSA.

Sensitive land use categories

Note that sensitive land uses in the *Environment Reference Standard 2021* (ERS 2021) are categorised as lower and high density. Lower density is where there is generally substantial access to soil and high density is restricted to developments that make maximum use of available land space, and there is minimal access to soil. For planning purposes, the *Ministerial Direction No. 1* (MD No.1) considers secondary schools and children's playgrounds to be sensitive land uses.

☐ High density	☒ Residential land use
	☐ Child care centre
☒ Other (lower density)	☐ Pre-school
	☐ Primary school
	☐ Secondary school
☐ Children's playground (indoor)	
☐ Children's playground (outdoor)	

Other land use categories

- ☒ Recreation/open space
- ☐ Parks and reserves
- ☐ Agricultural
- ☐ Commercial
- ☐ Industrial
- ☐ Other land uses not captured by the above as described here:

Preliminary risk screen assessment statement

Environmental elements assessed

- ☒ Land
- ☒ all environmental values that apply to the land use category were considered **OR**
- ☐ all environmental values that apply to the land use category, other than the following, were considered:

- ☒ Water
- ☒ Surface water
- ☒ all environmental values that apply to the applicable segment were considered **OR**
- ☐ all environmental values that apply to the applicable segment, other than the following, were considered:

- ☒ Groundwater
- ☒ all environmental values that apply to the applicable segment were considered **OR**
- ☐ all environmental values that apply to the applicable segment, other than the following, were considered:

Standards considered

- Environment Reference Standard, Victorian Government Gazette Number S245, 26 May 2021.
- Standards Australia, 2005, AS4482.1-2005, Australian Standard: Guide to the Investigation and Sampling of Potentially Contaminated Soil. Part 1: Non-volatile and Semi-volatile Compounds.
- Standards Australia, 1999, AS4482.2-1999, Australian Standard: Guide to the Investigation and Sampling of Potentially Contaminated Soil. Part 2: Volatile Substances.
- National Environment Protection Council, 1999. National Environment Protection (Assessment of Site Contamination) Measure (as amended 2013).

Assumptions made during the assessment or any limitations

None

Exclusions from the assessment and the rationale for these

None

Ambient air and ambient sound environmental values are not considered, because they are not relevant to the assessment of contaminated land.

This statement is accompanied by the following preliminary risk screen assessment report

Title:	Preliminary Risk Screen Assessment – 108 and 110 Parr Street Leongatha, Victoria
Report no:	AUS_4589_Parr St Leongatha _PRSA Report_R0
Date:	31 August 2023

Preliminary risk screen assessment statement

Section 3: Assessment outcome

Based on my assessment, I am of the opinion that **an environmental audit is not required** for the following land uses, **including** the use or proposed use for which the site has been assessed:

Sensitive land use categories

Note that sensitive land uses in the ERS 2021 are categorised as lower and high density. Lower density is where there is generally substantial access to soil and high density is restricted to developments that make maximum use of available land space, and there is minimal access to soil. For planning purposes, the MD No.1 considers secondary schools and children's playgrounds to be sensitive land uses.

☐ High density	☒ Residential land use
	☐ Child care centre
☒ Other (lower density)	☐ Pre-school
	☐ Primary school
	☐ Secondary school
☐ Children's playground (indoor)	
☐ Children's playground (outdoor)	

Other land use categories

- ☒ Recreation/open space
- ☐ Parks and reserves
- ☐ Agricultural
- ☐ Commercial
- ☐ Industrial
- ☐ Other land uses not captured by the above as described here:

Other information

Note: the proposed use of the site is primarily low density residential with some recreation/open space included. Although the other landuses noted above are not currently proposed at the site, these landuses may require an Environmental Audit to be completed and therefore the Auditor has no opinion on whether an audit is required at this time based on the proposed use indicated by the client.

Preliminary risk screen assessment statement

Section 4: Environmental auditor's declaration

I state that:

- I am appointed as an environmental auditor by the Environment Protection Authority Victoria under the *Environment Protection Act 2017*.
- The findings contained in this statement represents a true and accurate summary of the findings of the preliminary risk screen assessment that I have completed.

Date: 31 August 2023

Signed:



Name: Ken Mival

Environmental Auditor



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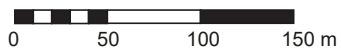
If you need assistance because of a hearing or speech impairment, please visit relayservice.gov.au

LEGEND:

- Investigation Area
- Site Buildings
- Grid Sample Location



Approximate Scale:



Imagery: Nearmap 2021

Atma Environmental

Client:

Rural Subdivision Specialists

Project: #2153 Leongatha - ESA

Drawn by: GRB Dated: 29/04/2022 Status: Final

**Figure 2. Overall Site Plan
and Grid Sampling Locations**





Appendix B – Previous Environmental Assessment Reports



Appendix B1 – Atma ESA Report



ENVIRONMENTAL SITE ASSESSMENT: 108 and 110 PARR STREET, LEONGATHA, VIC.

Prepared for:

*Rural Subdivision Specialists
1/17 Moodie Street
Caulfield East, Vic 3145*

*Project Ref: 2153 Leongatha
Date: 12 May 2022*



MEMBER: Australian
Contaminated Land
Consultants Association

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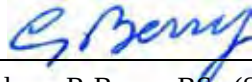
Report Finalisation & Distribution

PROJECT REFERENCE: #2153 Leongatha

REPORT TITLE: Environmental Site Assessment:
108 and 110 Parr Street, Leongatha, Vic.

DATE: 12 May 2022

PREPARED BY:



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Acronyms & Units

ABC	Ambient Background Concentration	meq	Milliequivalents
ACL	Added Contaminant Limits	mg	Milligram
ACM	Asbestos Containing Materials	mg/kg	Milligram per Kilogram
ADWG	Australian Drinking Water Guidelines	mg/L	Milligram per Litre
agl	Above Ground Level	mg/m³	Milligram per cubic meter
AHD	Australian Height Datum	MGA	Map Grid of Australia
ANZECC	Australian and New Zealand Environment Conservation Council	mm	Millimetre
ARMC	Agriculture and Resource Management Council of Australia and New Zealand	MMBW	Melbourne Metropolitan Board of Works
ANZ		MW	Monitoring well
AS	Australian Standard	N	Nitrogen
ASLP	Australian Standard Leaching Procedure	N/A	Not Applicable
ASS	Acid Sulphate Soil	NAPL	Non-Aqueous Phase Liquid
AST	Aboveground Storage Tank	NATA	National Association of Testing Authorities
B(a)P	Benzo(a)Pyrene	ND	Non-Detectable
bgl	Below ground level	NDD	Non-Destructive Digging
BH	Borehole	NEPC	National Environment Protection Council
BPEM	Best Practice Environmental Management Siting, Design, Operation and Rehabilitation of Landfills	NEPM	National Environment Protection Measure
BTEX	Benzene, toluene, ethylbenzene, xylenes	NHMRC	National Health and Medical Research Council
BTEXN	Benzene, toluene, ethylbenzene, xylenes, naphthalene	OCP	Organochlorine Pesticides
btoc	Below top of casing	OPP	Organophosphate Pesticides
CCME	Canadian Council of Ministers for the Environment	PAH	Polycyclic Aromatic Hydrocarbon
CEC	Cation Exchange Capacity	PAN	Pollution Abatement Notice
CHC	Chlorinated Hydrocarbons	PASS	Potential Acid Sulphate Soil
COC	Chain of Custody	PCB	Polychlorinated Biphenyls
COPC	Contaminant of Potential Concern		

CRC CARE	Cooperative Research Centre for Contamination Assessment and Remediation of the Environment	PCE	Tetrachloroethylene
CSM	Conceptual Site Model	PCPAN	Post Closure Pollution Abatement Notice
CUN	Clean up Notice	PESA	Preliminary Environmental Site Assessment
CUTEP	Clean up to the Extent Practicable	pH	Potential Hydrogen
DELWP	Department of Environment, Land, Water and Planning	PID	Photo-ionisation Detector
DNAPL	Dense Non-Aqueous Phase Liquid	PIW	Prescribed Industrial Waste
DO	Dissolved Oxygen	ppm	Parts per million
DQO	Data Quality Objectives	PSI	Preliminary Site Investigation
DSE	Department of Sustainability and Environment	PSR	Priority Sites Register
DSI	Detailed Site Investigation	QA/QC	Quality Assurance / Quality Control
EC	Electrical Conductivity	RL	Reduced Level
EIL	Ecological Investigation Level	RPD	Relative Percentage Difference
EMP	Environmental Management Plan	SAQP	Sampling, Analysis & Quality Plan
EPA	Environment Protection Authority	SCMP	Site Contamination Management Plan
ESA	Environmental Site Assessment	SEPP	State Environment Protection Policy.
ESL	Ecological Screening Level	SRW	Southern Rural Water
GIL	Groundwater Investigation Levels	SVOC	Semi-Volatile Organic Compounds
GME	Groundwater Monitoring Event	SWL	Static Water Level
GQRUZ	Groundwater Quality Restricted Use Zone	TCE	Trichloroethylene
GSV	Gas Screening Value	TDS	Total Dissolved Solids
GW	Groundwater	TEQ	Toxic Equivalence Quotient
Ha	Hectares	TIT	Triple Intercept Trap
HHRA	Human Health Risk Assessment	TOC	Top of Casing
HIL	Health Investigation Level	TP	Test Pit
HSL	Health Screening Level	TPH	Total Petroleum Hydrocarbons
IWRG	Industrial Waste Resource Guidelines	TRH	Total Recoverable Hydrocarbons
kg	Kilogram	UCL	Upper Confidence Limit
km	Kilometre	µg/m³	Micrograms per cubic meter
L	Litre	UPSS	Underground Petroleum Storage Systems
LFG	Landfill Gas	USEPA	United States Environmental Protection Agency
LNAPL	Light Non-Aqueous Phase Liquid	UST	Underground Storage Tank
LOR	Limit of Reporting	Vic	Victoria
m	Metre	VOC	Volatile Organic Compound
MAH	Monocyclic Aromatic Hydrocarbons	VVG	Visualising Victoria's Groundwater
mbgl	Metres Below Ground Level	WHO	World Health Organisation

EXECUTIVE SUMMARY

The site comprises 22.59 ha of land used for pea farming and the Lucinda Estate vineyard and winery. It is proposed to be rezoned (from existing Farm Zone) and developed into a 164-lot residential subdivision.

The environmental site assessment has included a detailed historical-environmental records review, an environmental site inspection and a soil sampling and analysis program to assess it against the proposed future sensitive land use. The field investigation included sampling of the entire site on a regularly spaced grid pattern of 21 locations and at ten targeted sampling near buildings and locations of environmental interest (31 loci total) to ensure any unacceptable contamination was confidently identified.

The site slopes down towards the eastern boundary (Coalition Creek). A channelised tributary of Coalition Creek bisects the eastern part of the site. A private dam straddles the southern boundary (proposed drainage basin). Unconsolidated alluvial floodplain deposits mainly underly the site, with portions underlain by basalt. Groundwater is mapped at <5 m bgl over a majority of the site, but somewhat deeper on higher Site elevations. There are no registered bores onsite.

The site does not appear in any publicly available environmental databases.

The Site has been agricultural land since at least 1947. The dwelling and sheds at #110 were not established until sometime after 1972; the vineyard was established in 1990. Aside from the winery and relocatable sheds for temporary farm workers, additional site developments have been light. Close review of aerial photos did not identify any areas of site filling or made ground, nor significant past farm structures or other areas previously developed.

The environmental site inspection indicated no areas of overt contamination, asbestos scatter, waste burials, or chemical handling and storage areas were identified. No areas of physical (inert) waste were found. Use of the Site was observed to be a vineyard and pea farm. Primary contaminants of potential concern and possible sources were considered to be organochlorine pesticides and herbicides (spraying fields; storage and handling spills), metals (wash off from sheds, soil amendments and fertiliser impurities, fungicides), and hydrocarbons (equipment maintenance and refuelling).

The field investigation found brown silty-clay soils underlain by harder red-brown clayey-silt to 0.6 m (the maximum depth of investigation) typified the Site. Elevated field PID readings were absent at all locations, so tested.

Analysis of 34 soil samples determined that cobalt, chromium, manganese and zinc exceeded adopted ecological, or human health-based guideline levels in one or more samples. An initial TRH result above the ecological level is shown by further analysis to be non-petroleum related and not a contaminant of potential concern. In accordance with NEPM guidance on the evaluation of these exceedances the elevated chromium and zinc concentrations in samples do

not dictate that further consideration is needed and it may be concluded that the '*maintenance of land dependant ecosystems & species*' and '*production of food, flora and fauna*' environmental values are not precluded by chromium and zinc.

However, cobalt and manganese did **not** meet the health-based level for residential uses and so a human health risk assessment was recommended and subsequently carried out by toxicological specialists Environmental Risk Sciences Pty Ltd (EnRisk). Based on the data generated from this assessment EnRisk conclude that risks to human health for this proposed subdivision are considered to be low and acceptable.

There were no results or observations which would indicate that other environmental values are (namely, '*buildings and structures*' and '*aesthetics*') are precluded.

With regards to Planning Practice Note 30 (DELWP, June 2021) it is concluded that the past land uses are not consistent with those which present a high potential for contamination and that an environmental audit is not the appropriate planning response. The environmental site assessment identified several elevated metals that exceeded either ecological or human health-based investigation levels. Based on a statistical evaluation of chromium and zinc concentrations, their concentrations are (on average) concluded to be acceptable viz. potential ecological risks. Specialist input on the toxicology of cobalt and manganese similarly concludes that the human health risks are low and acceptable and thus, it is concluded that the site is suitable for sensitive uses, including the proposed residential subdivision.

1 INTRODUCTION

The site at 108 and 110 Parr Street, Leongatha comprises 22.59 ha of land used for pea farming and the Lucinda Estate vineyard and winery. The site falls within the South Gippsland local government area and is proposed to be rezoned (from existing Farm Zone) and developed into a 164-lot residential subdivision with drainage basin and internal roadways.

To inform the rezoning and subdivision application before Council, Atma Environmental was engaged to complete this environmental site assessment (ESA) for the site.

2 OBJECTIVES & SCOPE OF ASSESSMENT

2.1 Assessment Objective

The ESA process involves a detailed review of physical and environmental records and the current and historical uses of a site and immediate surrounding area, with specific consideration as to the implications for contaminated land and groundwater with an initial field investigation program of soil sampling and analysis.

The objective of this work was to identify the potential for soil and groundwater contamination to exist (including the likely nature, type and distribution of contamination) as a result of current and past land uses, both on and surrounding the site and to complete initial site investigations considered sufficient to either conclude the land is suitable for the proposed use or, alternatively identify if contamination which requires further assessment or remediation, is present.

2.2 Scope of Work

Rural Subdivision Specialists ('the client') commissioned this limited ESA, which comprised the following scope of work:

- Reviewing planning background information, the site's physical setting (geology, hydrogeology, etc), publicly available environmental records (EPA Victoria and other authorities), site historical information (aerial photos, maps, past ownership, etc), and pertinent previous environmental investigation reports;
- An environmental site inspection by a qualified environmental scientist;
- Soil sampling at a statistically significant number of unbiased regularly spaced grid locations (21^{no}) and at ten (10) targeted locations considered possibly contaminated based on the records review and site observations;
- Preparation of this report, detailing the various findings and conclusions as to the suitability of the land for the proposed future uses.

Physical site setting, planning, environmental records searches and historical aerial photos are predominantly provided by the appended third party 'Enviropro' report by Lotsearch (Appendix A).

Additional records searches (completed by Atma Environmental) are found in Appendix B; with site photographs presented in Appendix C.

3 SITE IDENTIFICATION AND REGIONAL SETTING

3.1 Site Identification

The site is situated in Leongatha, Vic. approximately 110 kilometres south-east of the Melbourne CBD (refer to Figure 1). Details relating to the formal identification and main features of the site are outlined in Table A and a detailed plan of the site is presented on Figure 2.

Maps showing the planning zones and overlays affecting the site and surrounding area are provided on pages 59 to 62 of the Lotsearch Report provided in Appendix A.

Table A. Site Identification & Setting

Site Address	108 and 110 Parr Street, Leongatha, Vic. 3953
Size of Site	22.59 ha
Lot/Plan No.	108 Parr St -- Lot 1/PS44885 110 Parr St -- Lot 1/ TP615766
Volume / Folio	108 Parr St – Vol 10635 Fol 158 110 Parr St – Vol 8988 Fol 043
Local Government Area	South Gippsland
Planning Zone on Site	Farming Zone (FZ)
Planning Overlays on Site	Environmental Significance Overlay (ESO) Environmental Significance Overlay - Schedule 5 (ESO5) Environmental Significance Overlay - Schedule 2 (ESO5) Land Subject to Inundation (LSIO)
Current Site Use & Features	Winery (cellar, tastings, restaurant), vineyard (~3,5 ha), dwelling, worker accommodations, maintenance and storage sheds, gravelled driveway.
Adjacent Land Uses	North – Farm Zone with two dwellings and a bus depot opposite the site, then undeveloped land. South – Rural Residential Zone undergoing subdivision West – General Residential zone, newly subdivided and estate under construction. East – Coalition Creek, then undeveloped farmland

3.2 Topography & Surface Water Receptors

Broadly, the town centre of Leongatha (located 1.5 km north-west of the site) sits upon the highest point in the surrounding district. The site itself slopes downwards from a high point of ~60 m AHD on the western boundary to the Coalition Creek, running along the eastern site boundary. The lowest point on site is the far south-eastern corner, located on the creek line at ~32 m AHD. Elevation contours are presented in the Lotsearch report on page 6.

A channelised tributary of Coalition Creek bisects the eastern part of the site with the terrace located between the tributary and Coalition Creek also used for pea farming. Surface water receptors are the Coalition Creek, which meets the Tarwin River West Branch approximately 500 m to the south (part of the South Gippsland water catchment area).

Onsite, there is a small ornamental dam at the foot of the vineyard. A larger dam is mapped straddling the south-east site boundary at the location of the proposed drainage basin dam.

3.3 Geology & Regional Hydrogeology

The site and area bordering Coalition Creek is predominantly situated on Quaternary-aged alluvium, consisting of unconsolidated sand and silt floodplain deposits. Portions of the site (north-west and south-west corners) and areas further west of the site are situated on Paleocene to Miocene-aged Thorpdale Volcanic Group deposits (extrusive alkali and tholeiitic basalts). See pages 41-43 of the Lotsearch report provided in Appendix A for geology details.

Historical mining activity is not recorded in the area (Lotsearch page 40).

Mapping of estimated groundwater depths (Lotsearch page 35) indicates the likelihood of groundwater depths ranging at between <5 m bgl (57 % of site area) in low lying areas to up to 50 m bgl on the higher site elevations (2 % of site area) with salinity of 500 to 1,000 mg/L total dissolved solids. Groundwater occurrence appears to be related to surface topography, with the depth to groundwater being shallower in areas of lower topography.

3.4 Groundwater Bore Database Search

The groundwater database search identified 15 registered groundwater bores within a 2 km radius of the site, with no registered bores completed onsite.

Registered groundwater uses include domestic and stock, investigation, observation, dairy stock, and irrigation. Well completion depths ranging between 3.04 and 124.66 m.

See pages 37-39 of the Lotsearch report provided in Appendix A for groundwater bore database details.

3.5 Anticipated Groundwater Flow Direction

Based on site topography, the local groundwater flow direction is anticipated to be eastwards towards Coalition Creek.

4 RECORDS REVIEW

4.1 Previous Reports

No previous reports were made available to Atma Environmental as a part of this review.

4.2 Environmental Records

In conducting the environmental site assessment, multiple record sources were reviewed by Lotsearch to identify potential contamination sources and environmental conditions pertaining to both the site and surrounding areas within a 1 km buffer surrounding the site. In addition to the Lotsearch database report, additional searches were conducted directly with various data-holders by Atma Environmental. The following sources relevant to contamination were reviewed.

EPA Vic Priority Sites Register and Pollution Notices –

The Lotsearch report (page 7) included current and former Priority Sites and Notices. The site is not listed on the EPA's Priority Sites Register. No current or former Pollution Clean Up and Abatement Notices were identified for the site, or adjacent sites within 1 km of the site.

PFAS / Dept of Defence Investigation and Management Programs –

No records were found within the 1 km buffer area (Lotsearch page 8).

Issued Certificates and Statements of Environmental Audit –

Certificates and Statements of Environmental Audit are statutory documents that are issued after an environmental audit of a property has been conducted. One completed audit was found within 1 km of the site (CARMS 62140-1).

CARMS 62140-1 for 29 Steele St, Leongatha was a 53X environmental audit completed in 2007 due to an environmental audit overlay affecting it (past use: airplane hanger used for aerial pesticide and herbicide spraying). The outcome was a Certificate of Environmental Audit (allowing for unrestricted uses). This offsite use is unlikely to affect the site.

Groundwater Quality Restricted Use Zones (GQRUZs) –

A GQRUZ is an area where, following an environmental audit, groundwater pollution remains, usually as a result of previous industrial activity. A GQRUZ is implemented when attempts have been made to clean up the groundwater and EPA determines that restrictions should remain on how the water can be used without further treatment. No records were found within the 1 km buffer area (Lotsearch page 12).

EPA Victoria Licensed Activities & Works –

No EPA licences and work approvals are issued to the site, or to any properties within 1 km of the site. Refer to Lotsearch, page 13 for further details on EPA licenses and works approvals within 1 km of the site.

Waste Management Records (includes EPA Prescribed Industrial Waste treaters, disposers and permitted transporters and the Victorian Landfill Register) –

No EPA licensed waste transporters, treaters, disposers or landfill areas were identified within 1 km of the site (Lot search page 14-15)

Preliminary Risk Screen Assessments -

Preliminary risk screen assessments (PRSAs) look for possible land contamination in relation to a site's existing or proposed future use and determine if an environmental audit is required. As of 06 May 2022, no completed PRSAs were listed on the EPA website.

Register of Permissions (& Exemptions) -

EPA permission (such as a licence, permit or registration) is required to perform activities that may cause harm. As of 06 May 2022, no permission exemptions were listed on the EPA website within 500 m of the site.

Site Management Orders -

Site management orders (SMOs) are placed on sites by EPA to protect against harm to health and the environment. SMOs may be given to owners or occupiers of land that needs long-term management or restoration. This is because the land may be contaminated or could cause harm from pollution or waste. As of 06 May 2022, no completed SMOs were listed on the EPA website.

Gas Works and Liquid Fuel Facilities –

No records were within the dataset buffer (Lotsearch page 16).

Acid Sulphate Soil -

According to the Atlas of Australian Acid Sulphate Soils (CSIRO), the site is not located in an area of probable acid sulphate soils and listed as extremely low probability (1 – 5 %) to low probability (6-70%). Refer to the Lotsearch Report (pages 48-50) provided in Appendix A.

Google Search -

A Google search found the website for Lucinda Estate winery (<https://lucindaestate.com.au/>). The 'About Us' page indicated (emphasis added):

My husband Andrew and I brought the vineyard in 2002 from our current neighbour Bob who planted the vine's in 1990. Andrew's passion to own a vineyard started before I met him 22 years ago but I only found this out after we got married in December 2000.

So with mixed emotions we left Melbourne and moved to Leongatha in 2005 – which is now very much our home town where we are raising our 2 children – Amelia 10 and Thomas 7. Life on the vineyard is very much about being part of rural community; it provides for our livelihood; it is the community where we live and how we live our life.

4.3 Historical Records

Included in Appendix A is the following historical information and plans:

Heritage Registers

There are no registered heritage places on the site. One location identified within the search buffer was Leongatha Secondary College. Refer to Lotsearch report pages 55-56.

1:100,000 Topographic Map c.1972 -

The Geoscience Australia map shows developed parts of Leongatha only extends up to a line about 750 m west of the site. No roads are shown. Refer to page 31 of the Lotsearch report in Appendix A for a copy of the map.

1:63,360 Military Topographic Map c.1931 -

This map shows Parr St extending through to the Coalition Creek and stopping. No onsite structures are indicated. The eastern boundary area is depicted as marshy. Refer to page 32 of the report in Appendix A for the map.

Historical Business Directories Search -

The search of historical business listings (Lotsearch pages 17 to 21) found one record within the search buffer of 2 km. The listing was for Eldred Bus Services (1991) located north of the site on Parr St.

Historical Aerial Photographs -

As part of the site history review, historical aerial photographs from 1947 to 2021 were reviewed. Table B presents details of the aerial photo review conducted by Atma Environmental. Refer to Appendix A (report pages 22 - 30) for copies of the images.

Table B. Aerial Photograph Observations

Date	Notes
1947	Site: The site is a large farming property, with multiple cultivated paddocks. A dam is observed in the south-eastern part of the site with Coalition Creek traversing north-south on east boundary. The inferred site use is farming. Surrounding Area: Parr St is unmade adjacent the site. Surrounding land is agricultural crops and largely undeveloped, with the exception of a farmyard ~150 m west of the Site.
1965	Site: The dam at the base of the (now) vineyard is visible. The terrace has been cleared and is also being cultivated. Inferred use: cultivation. Surrounding Area: Surrounding land still remains agricultural and largely undeveloped.
1972	Onsite: The tributary to the creek has been channelised. No other changes are evident. Paddocks appear to be utilised for cultivation. Surrounding Area: Few notable changes are evident.
1985	Onsite: 108 and 110 Parr St appear to be separated as properties. The house and a large shed to the south of it are established with smaller chook shed east of the shed. A small shed is visible near entrance and on the east paddock. Use remains farming. Surrounding Area: Parr St extended as an unsealed road. Bus Depot visible to north side of Parr St.
1990	Onsite: Little change excepting some internal fencing, Land is cultivated. Surrounding Area: A house is built west of the bus depot.
2010	Onsite: The vineyard is planted and winery are constructed on 108 Parr St along with a separate shed to the south of winery. The existing area of disturbed ground near the worker accommodation shed is visible. On 110 Parr St the internal fencing has been removed and the use appears used for pea farming. Shed near entrance and in the eastern paddock is removed. Surrounding Area: Residential use is encroaching from west and south-west. A further dwelling is constructed on the north side of Parr St and the bus depot buildings have expanded in size.
2014	Onsite: The planting fields at 110 Parr St are fallow. Vines on 108 Parr St appear to be more mature. Some sea containers are added to shed areas south of the winery. Surrounding Area: Few notable changes are evident.
2017	Onsite: There are now two more shelters or sheds north of winery along the row of trees. Inferred uses: vineyard and pea farm. Surrounding Area: Further houses built north of Parr St
2021	Onsite: Few notable changes are evident. Surrounding Area: Further residential encroachment from west.

Aerial photos confirm that the site was initially vacant agricultural land used for cropping. Between 1972 and 1985 the house and garage at 110 Parr St are established on the site. Between 1985 and 2010 the vineyard is established along with winery and a shed area on 108 Parr St. The larger land use appears to be for pea farming at this time. There are no significant changes noted after 1985.

Land Titles -

Examination of the plan of subdivision shows there to be a number of easements affecting the land, one being for electricity transmission.

Review of the historical land title ownership for the site (refer to Appendix B for copies) is summarised in Table C.

Table C. Land Title Ownership

108 Parr Street (Vol 10635 / Fol 158)	
<u>Year</u>	<u>Proprietor from:</u>
09/09/2002	Lucinda M Thompson
07/03/2002	Robert J Campbell
110 Parr Street (Vol 8988 / Fol 043)	
10/09/2007	Beval Pty Ltd / Lamb & Bell Pty Ltd
8/11/2002	Phillip R Jones / Josephine N Jones
10/02/1981	Keith Whiteman (Farmer) / Isobel Wightman (Married Woman)
16/08/1973	Dudley J Baker Holdings Pty Ltd
6/09/1973	Reginald E Cashin (Farmer)

Based on the land title review, the area of the site was not recently owned by industrial or commercial type entities which may pose a high potential for land contamination.

5 SITE RECONNAISSANCE

Atma Environmental conducted an inspection of the site on 13th April 2022 with observations summarised below. Refer to Figure 2 and Figure 3 for site details and to Appendix C for photos of the site inspection. Observation from the site visit are given below.

108 Parr St:

- 108 Parr St is occupied by the Lucinda Estate Winery and vineyard. The winery conducts cellar door sales and has an onsite restaurant. Vinification using Site-sourced grapes occurs in the same building as the restaurant and cellar door sales.
- Vineyard equipment is stored in sea containers located south of the winery building and under a row of trees to the north of the winery building.
- Adjoining the sea containers located south of the winery there is a shed used as temporary vineyard labour accommodation.
- An outdoor toilet shack is observed to the south of the equipment shed within an area noted to have previously been an area of disturbed soil.
- The site slopes down towards the east boundary.
- On the eastern boundary there is an overgrown dam area.
- Stored equipment consists pallets, grape processing gears and the like.
- At one location there was a concrete block said to have come from nearby residential

works.

- There were no areas of overt soil impacts, stunted vegetation, odours, etc.

110 Parr St:

- 110 Parr St is residentially occupied and is used for pea farming.
- There is a galvanised iron garage with earthen floor used for miscellaneous storage of home goods, motorbikes, tools, etc.
- A pile of brush waste (for burning?) was located in front of the garage.
- An out-of-service an above ground fuel tank on a stand and other equipment was stored near the garage.
- Located ~20 m east of the garage was a galvanised iron chicken shed.
- A horse enclosure was located on west side of the driveway north of the house.
- There were no areas of overt soil impacts, stunted vegetation, odours, etc.
- The site slopes down towards the east boundary.
- There was a pea crop in at the time of inspection.

There were no indications of previous site investigation and no observations of asbestos scatter.

Interview -

An interview with a person having historical knowledge of the site history did not avail itself during the site inspection.

6 CONTAMINATION POTENTIAL

6.1 Past, Current and Proposed Use of the Site

The site history information indicates that the land has been used as a farm since at least 1947 (earliest aerial photo). Pea farming and vineyard uses are inferred to have commenced only after 1990 – uses which continue to the present.

The proposed development plan entails residential subdivision and the creation of 169 lots, typically of ~700 m², but ranging between 646 m² to 10,516 m² in size.

6.2 Potential for Site-Sourced Contamination

The past agricultural uses do not present a high potential for contamination. However, farming activities do pose some localised potential for contamination arising from the use/maintenance and storage of machinery, deterioration and wash off from buildings, etc.

6.3 Contaminants of Potential Concern

Based on the historical review and site inspection, the primary contaminants of potential concern and possible sources identified were considered to be

- Organochlorine pesticides – spraying fields; storage and handling spills
- Herbicides – spraying fields; storage and handling spills
- Metals – wash off from sheds, soil amendments and fertiliser impurities, fungicides
- Hydrocarbons – equipment maintenance and refuelling

7 SOIL INVESTIGATION

7.1 Soil Assessment Criteria

The primary criteria used for assessment of future site uses are the ecological and human health-based guidelines found in the National Environment Protection Council *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013* (No. 1) (NEPM).

The guideline criteria are not clean-up levels, response levels, or desirable soil quality criteria. They are intended to assess for potential human health and ecological risks associated with existing contamination and to trigger consideration of an appropriate site-specific risk-based approach or appropriate risk management options, when they are exceeded. The following sections outline the assessment guidelines used to assess the sites condition with respect to the proposed sensitive (residential) and other less sensitive uses of land.

Land Dependent Ecosystems & Species

For the protection of ecology, contaminant concentrations in soil are compared to the Ecological Investigation and Screening Levels found in the NEPM including the errata update of 30 April 2014.

Ecological Investigation Levels (EILs):

Ecological Investigation Levels (EILs) have been developed for selected metals and organic substances and are applicable for assessing risk to terrestrial ecosystems. EILs depend on specific soil physicochemical properties and land use scenarios, and generally apply to the top 2 m of soil.

The derivation of site-specific EILs for chromium, copper, nickel and zinc was completed using the EIL calculation aids provided in the NEPM toolbox. The EILs adopted for this investigation were derived using the Australian standard reference soil value for pH of 6.0 units and the CEC value of 10 cmolc/kg. Actual values for onsite soils approximate these adopted values.

EILs used are those based on aged contaminant values, relevant for contamination which has been present in soil for at least two years and ambient background concentrations for low traffic areas in Victoria have been adopted. Clay content was not laboratory measured, therefore as a conservative screening method a clay content of 1% is used in the calculations. This value may underestimate actual clay content conditions at some sites.

Ecological Screening Levels (ESLs):

The NEPM also provides Ecological Screening Levels (ESLs) which have been developed for selected petroleum hydrocarbon compounds and total petroleum hydrocarbon (TPH) fractions, and which are applicable for assessing risk to terrestrial ecosystems. ESLs broadly apply to coarse and fine-grained soils and to various land uses and they are generally applicable to the top 2 m of soil. ESLs for sand-grained soils have been adopted given the alluvial deposits present.

Land Use Scenarios:

EILs and ESLs have been developed for three generic land use settings:

- Areas of Ecological Significance
- Urban Residential/Public Open Spaces, and
- Commercial and industrial land uses

An area of ecological significance is one where the planning provisions or land use designation is for the primary intention of conserving and protecting the natural environment (e.g. national parks, state parks, wilderness areas and designated conservation areas). This land use setting is not relevant for the site and is not considered further.

For purposes of this assessment, the land use scenario considered relevant for assessment of the site (including for drainage purposes) is 'Urban Residential/Public Open Space', which is designed to provide protection for 80% of species. All relevant assessment criteria are listed on the analytical summary table (Table 1).

Human Health

Soil sample results are compared to Health-based Investigation and Screening Levels found in the NEPM including the errata update of 30 April 2014.

Health Investigation Levels (HILs):

Health-based Investigation Levels (HILs) have been developed for a broad range of metals and organic substances. The HILs are applicable for assessing human health risk via all relevant pathways of exposure. The HILs are generic to all soil types but vary for different land use scenarios.

Health Screening Levels (HSLs):

Health Screening Levels (HSLs) for selected petroleum compounds and fractions are applicable for assessing human health risk by the inhalation pathway. The HSLs depend on specific soil physicochemical properties, land use scenarios, and the characteristics of building structures.

They apply to different soil types, and depth below surface to greater than 4 m.

As a conservative screening method, the results are initially compared against the HSLs for sandy soils at <1 m depth, with further assessment triggered if results exceed these levels.

The NEPM does not provide guidelines for assessment of human health risk from petroleum compounds and fractions by the direct contact pathway; therefore, soil HSLs for direct contact found in the CRC CARE Technical Report No. 10 (*'Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater'* Friebel & Nadebaum, 2011) are used.

The NEPM also provides guidance for the assessment of asbestos in soils, which requires no visible asbestos to be present in the near surface soils (i.e. top 0.1 m depth), with qualitative HSLs available for the assessment of visible asbestos (where present) and non-visible asbestos (where suspected) in deeper soils.

Land Use Scenarios:

There are four predominant exposure settings that are used when assessing the use or proposed use of a site:

- 'A' - for standard residential with garden/accessible soil, childcare centres, preschools and primary schools;
- 'B' - for high-density residential with minimal garden/accessible soil such as high-rise buildings and apartments;
- 'C' - for parks, recreational open space and playing fields, also includes secondary schools and footpaths; and
- 'D' - for commercial/industrial use including shops, offices, factories and industrial sites

In terms of health-based criteria, the 'A' Setting guidelines are considered most relevant for assessment of site suitability for the proposed residential subdivision. All relevant assessment criteria are listed on the analytical summary Table 1.

Buildings and Structures

The Environmental Value "Buildings and Structures" may be assessed by a review of soil parameters such as pH, sulphate concentration, redox potential, salinity, or any chemical substance or waste that may have a detrimental effect on the structural integrity of buildings or structures.

The site is not located on an area of probable acid sulphate soil or mapped area of dryland salinity, though further investigation may be required where pH is less than 4.0 (per Victoria EPA Publication 655), or where analysis indicates potential acid sulphate soil conditions.

The Australian Standard AS2159-2009 Piling – Design and Installation, provides data on the

severity of soil sulphate and pH on concrete structures, with a pH >5.5 being considered non-aggressive to all soils above the groundwater.

The minimum reported soil pH was 4.1 units (SS19) at the site. This result is, however, derived by the CaCl_2 method which typically yields results of 1 to 1.5 pH units lower than pH by 1:5 soil:water extract method on which the criteria are premised, suggesting subsurface structures would be exposed to non-aggressive conditions.

Aesthetics

In general, the criteria for aesthetics relate to the presence of low-concern or non-hazardous inert foreign material (refuse) in soil or fill resulting from human activity. This may include general wastes, industrial, construction and demolition wastes, soil discoloration, or residual odours.

With reference to Schedule B1, Section 3.6 of the NEPM, circumstances which would trigger a further assessment of aesthetics include: highly malodorous soils or extracted groundwater, hydrocarbon sheen on surface water, significant soil staining (associated with otherwise inert chemical waste), monolithic deposits of low-risk materials, putrescible refuse (potentially generating hazardous levels of methane), and animal burials.

Numerical criteria are not available for assessing aesthetics and its assessment requires a balanced consideration of the quantity, type and distribution of foreign material or odours in relation to the specific land use.

Production of Food Flora & Fibre

This Environmental Value is assessed with reference to the same criteria as per Land Dependent Ecosystems & Species as those guideline values are set to be protective of plant (among other) species. However, it is recognised that these criteria may not necessarily be applicable for some contaminants (such as organochlorine pesticides, or OCPs).

Alternative criteria may be adopted for the assessment of OCPs in relation to the Environmental Value Production of Food, Flora & Fibre, where OCPs are detected above laboratory limit of reporting at the site.

7.2 Soil Investigation Methodology

Atma Environmental's field procedures for soil sampling, quality assurance and equipment decontamination are comparable with those found in the Australian Standard AS4482 – 2005, 'Guide to the sampling and investigation of potentially contaminated soil'.

New latex gloves were used for the collection of each sample and all sampling equipment was appropriately decontaminated between locations. The samples obtained were placed directly into new, single use glass containers supplied by the laboratory, stored on ice and submitted to

Eurofins Environment Testing Pty Ltd, or ALS (the secondary check laboratory), both NATA-accredited laboratories.

Soil sampling was carried out on 13 April 2022 at 21 surface sampling locations (SS01 to SS21) on a regularly spaced grid across site to assess the overall site suitability. Sampling was also completed at ten hand augured boreholes (BH01 to BH10) targeting off-grid areas of potentially localised contamination (generally two locations per building)

Surface soil sampling was completed using a spade to a maximum depth of 0.15 m bgl. Borehole locations were completed using a decontaminated hand auger to maximum depth of 0.6 m. Refer to attached Figure 2 for the surface soil sample locations and to Figure 3 for the borehole locations.

Sampling locations corresponding to specific areas of environmental interest were as follows:

- BH01 – driveway in front of dwelling at #110
- BH02 – interior on earth floor of farm shed at #110
- BH03 – exterior location of stored material (incl. AST) near shed at #110
- BH04 – beside chicken shed on #110
- BH05 – sea containers storage area on #108
- BH06 – sea containers storage area on #108
- BH07 – winery on #108
- BH08 – vineyard tool shed and worker accommodation on #108
- BH09 – vineyard tool shed and worker accommodation on #108
- BH10 – area of disturbed soil on #108

Soil samples collected during the field investigation and submitted to the receiving laboratory are identified by their location identifier with a slash separator then their relevant depth (e.g. sample 'BH03/0.5' is the sample obtained at 0.5 m bgl at location BH03).

7.3 Soil Investigation Observations

Drafted table of soil descriptions (SS01 to SS21) and bore logs for BH01 to BH10 may be found in Appendix D. The generalised soil type is a low plasticity brown silty-clay over the length of the site. Gravel toppings are used as a topping fill layer in driveways and some work areas (e.g. BH08).

No site filling was identified at any of the 21 grid-based sampling locations. Two selected samples (SS01 and SS08) field-tested for organic vapour using a calibrated photo-ionisation detector (PID) yielded readings of 0.2 and 0.4 ppm (approximately background).

At boreholes BH01 to BH10 brown silty clays (A Horizon) gave way to hard red-brown clayey-silt (B Horizon) at approximately 0.2 m depths.

A gravelly-clay fill surface layer is logged at BH02, BH07a, BH08 up to a maximum thickness

of 0.4 m (in BH08). Some 'black inclusions' were noted in BH10 (possibly char?). All targeted sampling locations were field-tested for organic vapour using a calibrated PID yielding readings of up to a maximum 1.4 ppm (BH08/0.1).

No overt evidence of suspected land contamination (e.g., buried wastes, staining or odours) were identified during sampling. Suspect asbestos containing material was not found during the field investigation. Waste burning near the shed on #110 was limited to wood and brush wastes (i.e. no plastic, etc).

7.4 Sample Analysis

National Association of Testing Authorities (NATA) accredited laboratories Eurofins Environment Testing and ALS were used for soil sample analysis. Chain of Custody documentation used for the delivery of the samples to the laboratory and full NATA certified laboratory reports are attached (Appendix E). The soil analytical program for this site investigation included testing of 34 primary soil samples and three quality control samples as summarised per Tables 1 and 2.

Analysis performed include metals, organo-chlorine pesticides, herbicides and hydrocarbons with a subset of three samples tested for a comprehensive screen of all the contaminants for which the NEPM provides EIL / HILs for.

Owing to the low concentration of TRHs ($>C_{16}-C_{34}$) above the adopted EIL as detected in sample BH08/0.1, follow up analysis on this sample and testing of two additional samples where 'black inclusions' were noted (BH10) using a silica gel clean-up to remove sources of non-petrogenic hydrocarbons (such as eucalypt oil) was conducted to confirm the result.

Further analysis on sample BH08/0.1 and check testing on samples from BH10 using silica gel clean up (Eurofins report #885491), indicated that all hydrocarbon fraction were less the lab's limit of reporting in three samples. TRH contamination was determined to be absent and the initial result a false positive.

7.5 Soil Analysis Results & Discussion

The following sections provide a discussion on the implication of the results with respect to the protected Environmental Values at the land. A comparison of the laboratory analysis results against ecological and human health assessment guidelines is provided on Table 1.

7.5.1 Land Dependant Ecosystems & Species / Production of Food, Flora, Fibre

Concentrations of total chromium in two samples (SS11, BH03/0.1) to a maximum of 280 mg/kg, exceeded the adopted ecological criterion of 200 mg/kg Cr.

The concentrations of zinc in sample BH03/0.1 (530 mg/kg) also exceeded the adopted ecological criterion of 440 mg/kg Zn.

As noted previously, EILs are intended as triggers for further assessment, not inflexible threshold levels. The NEPM provides methodology for the evaluation of discrete exceedances. Where concentrations exceed investigation levels, the 95% upper confidence limit of the mean concentration (95% UCL) should be compared to the criterion. Providing that the maximum reported concentration is less than 250%; and the standard deviation of the data set is less than 50% of the criterion; then the site may be said to meet the investigation level (i.e. not require further assessment), so long as the 95% UCL is less than the criterion.

On this basis the elevated chromium and zinc concentrations in samples does not dictate that further consideration is needed and it may be concluded that the 'maintenance of land dependant ecosystems & species' and 'production of food, flora and fauna' environmental values are not precluded by chromium and zinc.

A similar statistical argument may be made for the TRHs ($>C_{16}-C_{34}$ fraction) identified in sample BH08/0.1 (400 mg/kg) - even if not shown to be a false positive. With respect to TRH exceedance as BH08/0.1, a silica gel cleanup was completed on this sample to assess the potential for the exceedance to be naturally occurring. The reported silica gel cleanup concentration was below LOR and hence does not exceed the EIL criteria. T.R.H ($>C_{16}-C_{34}$) at BH08/0.1 is considered naturally occurring.

All other analytes, including BTEXN, chlorinated hydrocarbons (CHCs), PAHs, phenols, polychlorinated biphenyls (PCBs), organochlorine pesticides (OCPs) and acid herbicides reported results either below the adopted ecological assessment criteria, or at non-detectable concentrations. Trace only levels of DDD+DDE+DDT were quantified in two grid samples (SS14 and SS17), potentially remnant of farming practices from decades past.

NEPM has not set ecological investigation levels for cobalt and manganese (refer to next section).

7.5.2 Human Health

Concentrations of total manganese in a majority samples to a maximum of 13,000 mg/kg, exceeded the adopted health investigation level criterion of 3,800 mg/kg Mn.

The concentrations of cobalt in sample BH02/0.1 (320 mg/kg) also exceeded the adopted health investigation level criterion of 100 mg/kg Co.

Applying the NEPM assessment methodology for these exceedances it can be concluded that there exists a potential human health risk in respect to sensitive land uses ('A Setting' exposures) due to the maximum concentrations of cobalt and manganese and that further health risk assessment should be carried out by a qualified toxicologist.

Manganese exceedances are widely distributed across the site which is typically indicative of natural enrichment or mineralisation, however, the reported concentrations are also

significantly above expected higher background concentrations which probably top out at 1,500 mg/kg in surface soils (<https://soilexplorer.org.au/>). Manganese is an essential plant nutrient and its deficiency in vegetables is frequently controlled by addition of amendments such as manganese sulphate.

Similarly, <http://plantprobs.net> describes “Cobalt is a trace element in plants (it has not been proven to be essential for plant life). It is a component of a number of enzymes and increases the drought resistance of seeds. In legumes, cobalt is important for nitrogen fixation by the bacteria that associate with legumes.” The article goes on to describe how treatment of cobalt deficiency may be managed via application of “cobalt containing fertiliser such as cobalt sulfate or a general trace element fertiliser that contains cobalt.”

The further human health risk was subsequently carried out by toxicological specialists Environmental Risk Sciences Pty Ltd (EnRisk). Based on the data generated from this assessment EnRisk concluded that risks to human health due to elevated cobalt and manganese for this proposed subdivision are considered to be low and acceptable. Their report is provided in Appendix E.

No other contaminants are noted to exceed human health guidelines for sensitive use sites.

7.5.3 Buildings & Structures

Guidance on Table 6.4.2-C in Australian Standard AS2159-2009 (*Piling – Design and Installation*) indicates the severity of soil sulphate concentrations and pH on concrete piles. Lab-measured pH (CaCl₂ extract) ranged between 4.1 to 7.0 with a mean of 6.0 units. Considering the CaCl₂ method under reports the measured pH (relative to pH_{1:5}) and the mean of ten analysis conducted, the Exposure Condition for concrete structures in unsaturated soils would be ‘non-aggressive’. The site is not located in an area of probable acid sulphate soils and the results do not preclude this beneficial use.

Although, this report does not constitute a corrosivity assessment, there are no site conditions identified which would suggest further assessment or special management is required to protect buildings and structures.

7.5.4 Aesthetics

No notable soil odours or staining or areas of inert waste were observed at any location on the Site which would trigger a further investigation, or a finding that this environmental value was precluded. The land is assessed as meeting of this value.

8 QUALITY ASSURANCE AND CONTROL

8.1 Investigation Procedures

All fieldworks were completed in accordance with Atma Environmental Pty Ltd’s standard

operating procedures for soil sampling, quality assurance and equipment decontamination.

Eurofins carried out analysis on primary soil samples which uses comparable, National Association of Testing Authorities (NATA) certified laboratory methods.

Atma Environmental recorded all samples on a Sample Master List, in the order of collection to enable tracking of any suspected incidence of cross contamination if necessary. Soil characteristics were logged at the completion of each borehole on proforma field logging sheets to ensure consistency.

Samples were then transported under a Chain of Custody document listing all samples collected, analysis required for each sample and signatures of the persons responsible for the transport of the samples.

8.2 Decontamination, Trip and Field Blanks

Equipment rinsate blanks should be collected where cross-contamination of samples is likely to impact on the validity of the sampling and assessment process and tested for contaminants of concern. The potential for cross-contamination is somewhat removed where certain sampling methods are used. The potential for sample cross-contamination using the spade sampling technique is largely removed as any soil touching the spade is trimmed prior to placement in, and excluded from, the sample container. As field equipment decontamination procedures were followed the risk of cross contamination between sampling location was considered to be effectively managed. The equipment decontamination blank, DECON-13.4.22 was collected, but held at the lab.

Field and Rinsate Blanks are for the purpose of providing a control against contamination potentially introduced to samples during field and sampling works. Site conditions during the field program did not include any adverse conditions, such as dust, mud, etc. that might affect the sampling integrity, so the field sample (FB-13.4.22) was collected, but not tested.

A Trip Blank is for the purpose of providing a control sample against contamination potentially introduced during transport of samples from the field to the laboratory. One trip blank sample (TB-13.4.22) was collected. There were no circumstances where contamination might be introduced during transport (e.g. broken containers in transporting esky), so the trip blank was held at the lab for future analysis if required.

8.3 Blind QC Replicate Testing

Replicate samples, comprising two containers of the same media (sample) are created in the field and submitted to the primary laboratory or to a secondary laboratory in a blind test of reporting accuracy. The results of the check (replicate) sample are assessed against the primary sample in terms of the Relative Percent Difference, or 'RPD' (difference in results divided by the mean of the results, x 100).

The permitted RPD deviance between samples is ‘unlimited’ for results that are less than 10 times the Limit of Reporting (LOR) 0% - 50% RPD for results between 10 and 20 times the LOR and 0% - 20% RPD for results greater than 20 times the LOR.

A total of 34 primary soil samples were analysed during this investigation, with three primary-duplicate pairs and two primary-split replicate sample analysed for metals, OCPs, TRHs and BTEXN (refer to Table 2).

There was one exceedance (SPLIT-13422C for Mn) out of 60 paired analysis conducted, or a total of 1.7% of all RPD results that exceeded criteria. Taking into consideration the QC replicate testing results indicates an acceptable data set.

9 CONCLUSIONS

The site comprises 22.59 ha of land used for pea farming and the Lucinda Estate vineyard and winery. It is proposed to be rezoned (from existing Farm Zone) and developed into a 164-lot residential subdivision.

The site slopes downwards from a high point of ~60 m AHD on the western boundary to the Coalition Creek, running along the eastern site boundary. A channelised tributary of Coalition Creek bisects the eastern part of the site. A private dam straddles the southern boundary (proposed drainage basin).

Quaternary-aged alluvium (unconsolidated sand and silt floodplain deposits) mainly underly the site, with portions of the site also underlain by Thorpdale Volcanic Group basalts. Groundwater (500 – 1,000 ml/l TDS) is mapped at <5 m bgl over a majority of the site, but somewhat deeper on higher Site elevations. There are no registered bores onsite.

The site does not appear in any publicly available environmental databases.

Historical site review indicates that the site was agricultural land since at least 1947 at which time the Site appeared to be used for pastoral purposes, or hay cropping. The dwelling and sheds at #110 were not established until sometime after 1972. Online information indicates the vineyard was then planted in 1990 by a previous owner. Aside from the winery and relocatable sheds for temporary farm workers, additional site developments have been light. Close review of aerial photos did not identify any areas of site filling or made ground nor significant past farm structures or other areas previously developed.

The environmental site inspection confirmed the desktop findings. No areas of overt contamination, asbestos scatter, waste burials, or chemical handling and storage areas were identified. No areas of physical (inert) waste were found. Use of the Site was observed to be a vineyard and pea farm.

Primary contaminants of potential concern and possible sources were considered to be:

- Organochlorine pesticides – spraying fields; storage and handling spills
- Herbicides– spraying fields; storage and handling spills
- Metals – wash off from sheds, soil amendments and fertiliser impurities, fungicides
- Hydrocarbons – equipment maintenance and refuelling

The field investigation included grid-based sampling (21 loci) over the entirety of the site and targeted sampling (10 loci) at locations of environmental interest. Brown silty-clay soils typified the Site to a depth of about 0.3 m. The B Horizon soils were red-brown clayey-silt, hard to auger below 0.6 m (the maximum depth of investigation). Elevated field PID readings were absent at all locations, so tested.

Analysis of 34 samples was conducted and determined that cobalt, chromium, manganese and zinc exceeded adopted ecological, or human health-based guideline levels in one or more samples.

In accordance with NEPM guidance on the evaluation of these exceedances the elevated chromium and zinc concentrations in samples do not dictate that further consideration is needed and it may be concluded that the ‘*maintenance of land dependant ecosystems & species*’ and ‘*production of food, flora and fauna*’ environmental values are not precluded by chromium, zinc and TRHs.

However, cobalt and manganese do **not** meet the criteria for health-based levels per residential uses and a further human health risk assessment is recommended. This was completed by toxicological specialists Environmental Risk Sciences Pty Ltd (EnRisk). Based on the data generated from this assessment EnRisk concluded that risks to human health for this proposed subdivision are considered to be low and acceptable.

There were no results or observations which would indicate that other environmental values are (namely, ‘*buildings and structures*’ and ‘*aesthetics*’) are precluded.

With regards to Planning Practice Note 30 (DELWP, June 2021) it is concluded that the past land uses are not consistent with those which present a high potential for contamination and that an environmental audit is not the appropriate planning response. The environmental site assessment identified several elevated metals that exceeded either ecological or human health-based investigation levels. Based on a statistical evaluation of chromium and zinc concentrations, their concentrations are (on average) concluded to be acceptable viz. potential ecological risks. Specialist input on the toxicology of cobalt and manganese similarly concludes that the human health risks are low and acceptable and thus, it is concluded that the site is suitable for sensitive uses, including the proposed residential subdivision.

10 LIMITATIONS AND EXCEPTIONS OF ASSESSMENT

The report consists of the scope of work outlined previously. This report describes the work undertaken and has been compiled for the use of Rural Subdivision Specialists only. Its

conclusions are only valid for the purpose for which it was requested. This report is not a 'preliminary risk screening assessment', or an 'environmental audit' within the meaning of the Environment Protection Act 2017 (Vic).

It is valid only when it is in original and complete form, and any person or company other than Rural Subdivision Specialists who rely on the report without specific reference to and permission from Atma Environmental Pty Ltd does so at their own risk. While every care has been taken in the compilation of this report, to the extent that its conclusions are based on the analysis of the data made available by your organisation or by a third party, no responsibility or liability is accepted for consequences arising from either errors or omissions in that data, or from factors or data which were not made available to Atma Environmental Pty Ltd or which Atma Environmental Pty Ltd did not ascertain by reasonable inquiry in the ordinary course of its investigation, nor for any commercial decisions taken as a result of the report findings.

This report has not included soil sampling in accordance with AS4482.1 for circular hotspot, however, a statistically defensible approach was employed. The site assessment has not specifically considered above ground issues such as lead-based paint and installed asbestos containing building products.

Environmental site assessments document property conditions at the time they are conducted. These conditions may change over time. In addition, contamination (potentially of greater or lesser severity than as reported) may exist at other locations, which have not been identified. The results of additional site testing and future changes in assessment guidelines, criteria or legislative requirements may alter the conclusions of this report and any recommendations flowing therefrom.

11 REFERENCES

Environmental Risk Sciences Pty Ltd, 'Human health risk assessment regarding manganese present in soil at 108 and 110 Parr St, Leongatha, Victoria', 6 May 2022.

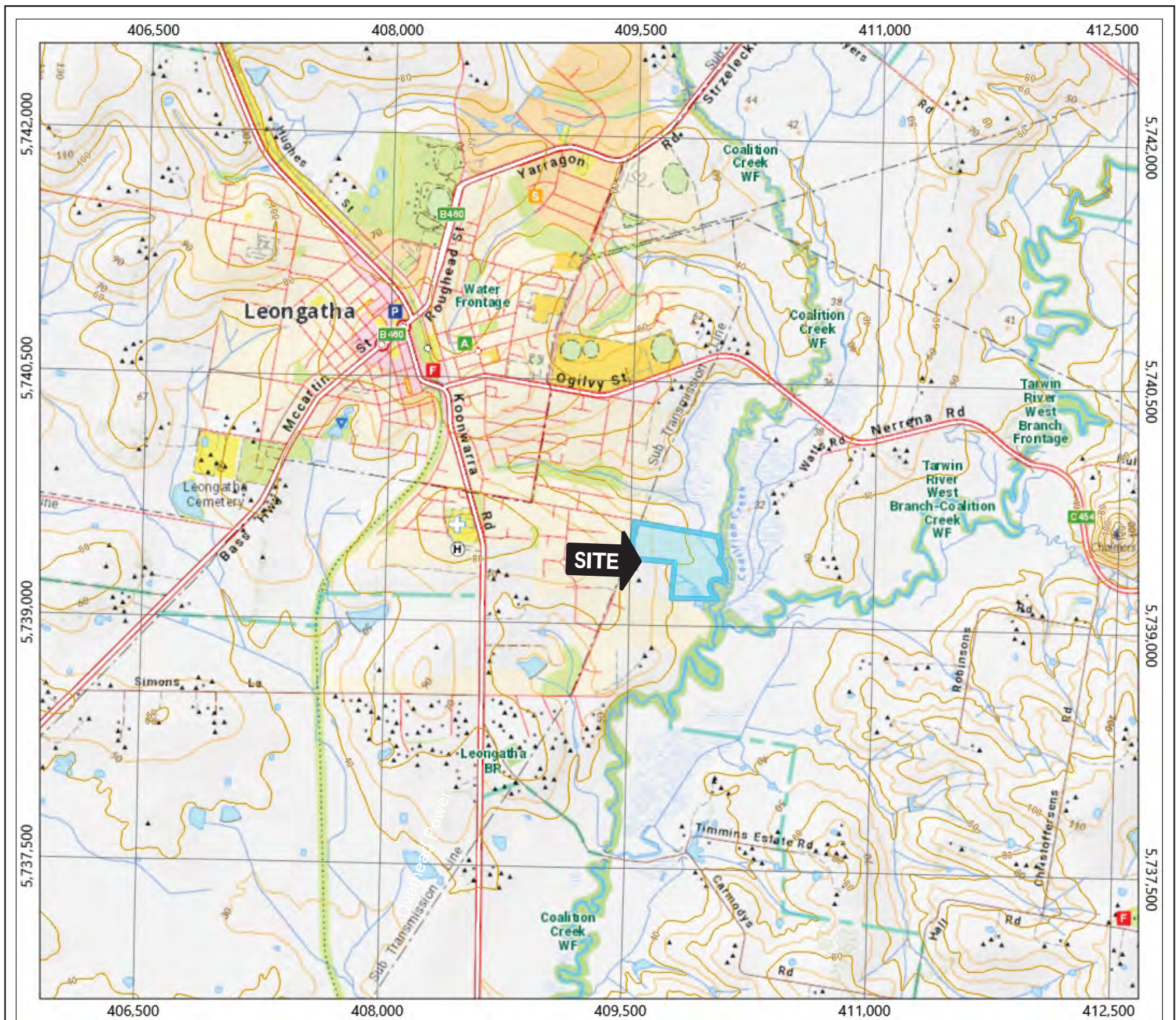
Environment Protection Act 2017 (Vic)

Lotsearch Pty Ltd, 'EnviroPro Report: 108 and 110 Parr Street, Leongatha, VIC 3064', Reference LS0030518 EP, 25 March 2022.

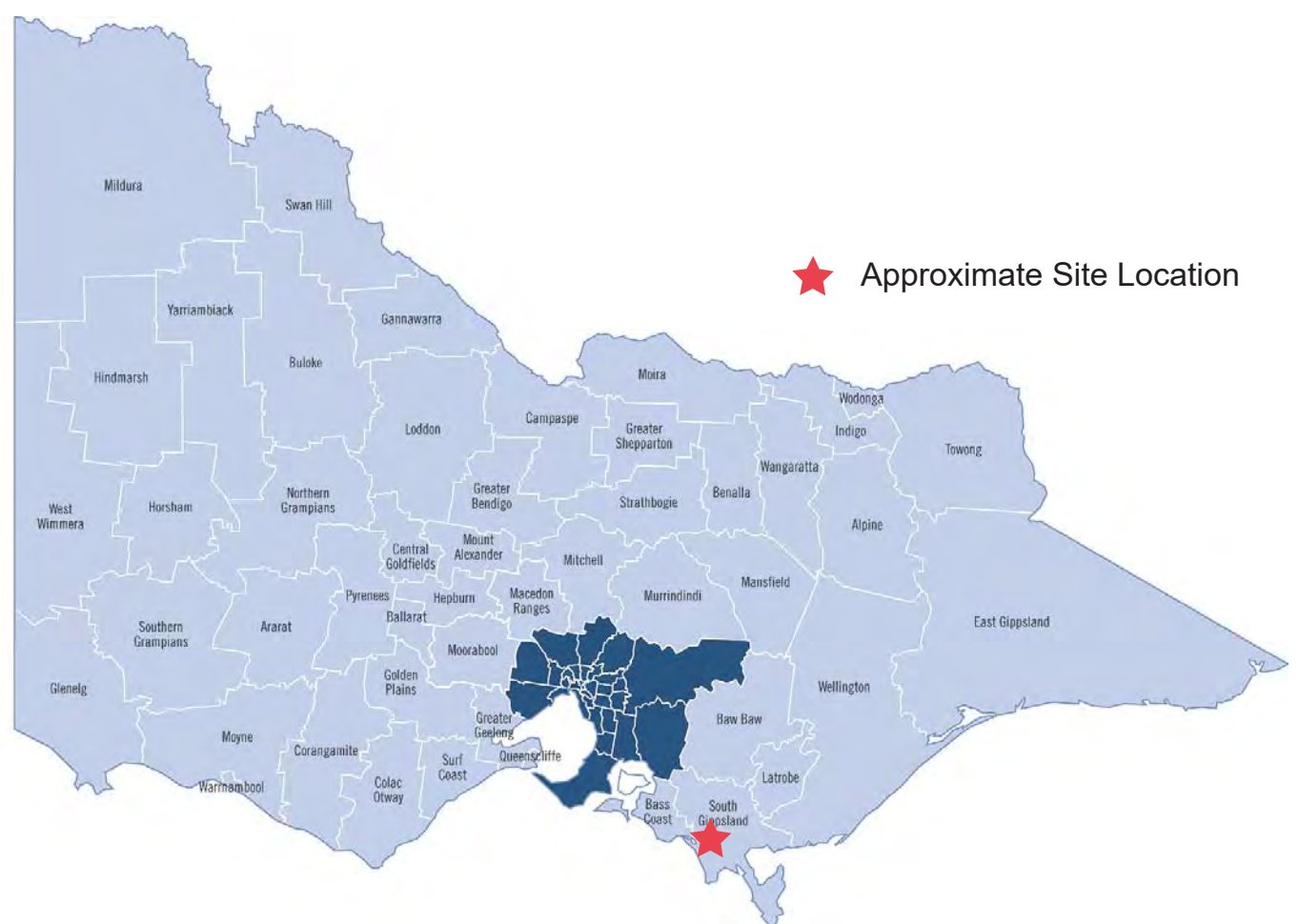
National Environment Protection Council (NEPC), 'National Environment Protection (Assessment of Site Contamination) (NEPM) Amendment Measure (No. 1)', 2013.

Soil Explorer Website.

Victoria Department of Environment, Land, Water and Planning "Potentially Contaminated Land", General Practice Note 30, July 2021.



★ Approximate Site Location



Atma Environmental



Client:

Rural Subdivision Specialists

Project: #2153 Leongatha - ESA

Drawn by: G.B. Dated: 09-/05/2022 Revision: Final

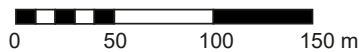
Figure 1 . Site Location Plan

LEGEND:

-  Investigation Area
-  Site Buildings
-  Grid Sample Location



Approximate Scale:



Imagery: Nearmap 2021

Atma Environmental



Client:

Rural Subdivision Specialists

Project: #2153 Leongatha - ESA

Drawn by: GRB Dated: 29/04.2022 Status: Final

**Figure 2. Overall Site Plan
and Grid Sampling Locations**

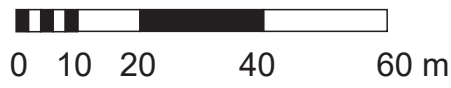


LEGEND:

-  Investigation Area
-  Building
-  Access Track
-  Target Borehole



Approximate Scale:



Client:
Rural Subdivision Specialists

Project: #2153 Leongatha - ESA

Drawn by: G.B. Dated: 12/04/2022 Revision: Final

Figure 3. Built Areas & Target Sample Locations



Project: # 2153 Leongatha



				Metals																TRHs						BTEXN						PAHs			Phenols						
				Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium (III+VI)	Chromium (hexavalent)	Cobalt	Copper	Cyanide (Free)	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Tin	Zinc	T.R.H. (<C6-CU)	T.R.H. (>C10-C16)	T.R.H. (>C16-C16N)	T.R.H. (>C16-C34)	T.R.H. (>C34-C40)	Naphthalene (BTEX)	Benzene	Toluene	Ethyl Benzene	Xylene	PAHs (Total)	Benzo-a-Pyrene	Benzo(a)pyrene TEQ (LOF)	Phenol	Pentachlorophenol	3&4-Methylphenol (m&p-Cresol)	2-Methylphenol (o-Cresol)		
				mg/kg 2	mg/kg 10	mg/kg 2	mg/kg 10	mg/kg 0.4	mg/kg 5	mg/kg 1	mg/kg 5	mg/kg 5	mg/kg 5	mg/kg 5	mg/kg 5	mg/kg 0.1	mg/kg 5	mg/kg 5	mg/kg 2	mg/kg 2	mg/kg 10	mg/kg 5	mg/kg 20	mg/kg 50	mg/kg 50	mg/kg 100	mg/kg 100	mg/kg 0.5	mg/kg 0.1	mg/kg 0.1	mg/kg 0.1	mg/kg 0.3	mg/kg 0.5	mg/kg 0.5	mg/kg 0.5	mg/kg 0.5	mg/kg 1	mg/kg 0.4	mg/kg 0.2		
EQL				100 ^{#1}					200 ^{#2}			200 ^{#3}		1,100 ^{#4}				170 ^{#5}				440 ^{#6}	180 ^{#7}	120 ^{#8}		300	2,800	170	50	85	70	45		0.7							
NEPM EILs / ESLs - Residential / Public Open Space (Lowest ESLs)				100 ^{#9}		60	4,500	20		100	100	6,000	250	300 ^{#10}	3,800	40 ^{#11}		400	200			7,400	45 ^{#7}	110 ^{#8}		4,500 ^{#12}	6,300 ^{#12}	3	0.5	160	55	40	300 ^{#13}		3 ^{#14}	3,000	100				
Field ID	Date	Lab Name	Lab Report #	2.3	140	<2	<10	<0.4	150	-	24	39	-	31	5,300	<0.1	<5	36	<2	<2	<10	52	<20	<50	<50	<100	<100	<0.5	<0.1	<0.1	<0.1	<0.3	-	-	-	-	-	-	-		
BH01/0.1	13/04/2022	Eurofins	881033	2.9	360	2.7	<10	<0.4	180	-	320	75	-	19	6,200	<0.1	<5	110	<2	<2	<10	120	<20	<50	<50	<100	<100	<0.5	<0.1	<0.1	<0.1	<0.3	-	-	-	-	-	-	-		
BH03/0.1	13/04/2022	Eurofins	881033	3.3	130	<2	<10	<0.4	250	-	46	70	-	33	6,200	<0.1	<5	58	<2	<2	<10	530	<20	<50	<50	<100	<100	<0.5	<0.1	<0.1	<0.1	<0.3	-	-	-	-	-	-	-		
BH04/0.1	13/04/2022	Eurofins	881033	<2	120	<2	<10	<0.4	130	-	17	33	-	25	4,600	<0.1	<5	28	<2	<2	<10	320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH05/0.1	13/04/2022	Eurofins	881033	<2	120	<2	<10	<0.4	170	-	18	29	-	20	4,500	<0.1	<5	22	<2	<2	<10	34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH06/0.1	13/04/2022	Eurofins	881033	<2	100	<2	<10	<0.4	140	-	15	27	-	17	3,700	<0.1	<5	20	<2	<2	<10	38	<20	<50	<50	<100	<100	<0.5	<0.1	<0.1	<0.1	<0.3	-	-	-	-	-	-	-		
BH07/0.1	13/04/2022	Eurofins	881033	<2	94	<2	<10	<0.4	130	-	13	21	-	18	3,600	<0.1	<5	15	<2	<2	<10	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH08/0.1	13/04/2022	Eurofins	881033	<2	<10	<2	<10	<0.4	13	-	<5	16	-	6.0	68	<0.1	<5	<5	<2	<2	<10	23	<20	<50	<50	400	110	<0.5	<0.1	<0.1	<0.1	<0.3	-	-	-	-	-	-	-	-	-
BH08/0.1	13/04/2022	Eurofins	885491	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50 ^{SG}	<100 ^{SG}	<100 ^{SG}	<100 ^{SG}	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH08/0.5	13/04/2022	Eurofins	885491	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50 ^{SG}	<100 ^{SG}	<100 ^{SG}	<100 ^{SG}	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH09/0.1	13/04/2022	Eurofins	881033	3.1	110	<2	<10	<0.4	79	-	16	26	-	29	2,800	<0.1	<5	13	<2	<2	<10	45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH10/0.1	13/04/2022	Eurofins	881033	4.0	230	<2	<10	<0.4	120	-	33	23	-	31	10,000	<0.1	<5	18	<2	<2	<10	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH10/0.1	13/04/2022	Eurofins	885491	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50 ^{SG}	<100 ^{SG}	<100 ^{SG}	<100 ^{SG}	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH10/0.5	13/04/2022	Eurofins	885491	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50 ^{SG}	<100 ^{SG}	<100 ^{SG}	<100 ^{SG}	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SS01	13/04/2022	Eurofins	881033	2.3	230	<2	<10	<0.4	98	-	37	42	-	26	8,600	<0.1	<5	38	<2	<2	<10	31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SS02	13/04/2022	Eurofins	881033	2.9	320	<2	<10	<0.4	87	-	64	53	-	30	13,000	<0.1	<5	48	<2	<2	<10	41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SS03	13/04/2022	Eurofins	881033	<2	320	<2	<10	<0.4	110	-	77	25	-	19	7,700	<0.1	<5	32	<2	<2	<10	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SS04	13/04/2022	Eurofins	881033	2.1	250	<2	<10	<0.4	140	-	79	23	-	19	6,600	<0.1	<5	48	<2	<2	<10	37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SS05	13/04/2022	Eurofins	881033	2.3	-	<2	<10	<0.4	110	<1	66	17	<5	13	3,500	<0.1	-	34	<2	-	-	38	<20	<50	<50	<100	<100	<0.5	<0.1	<0.1	<0.1	<0.3	<0.5	<0.5	1.2	<0.5	<1	<0.4	<0.2	-	
SS06	13/04/2022	Eurofins	881033	3.5	150	<2	<10	<0.4	20	-	17	17	-	16	1,200	<0.1	<5	16	<2	<2	<10	69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SS07	13/04/2022	Eurofins	881033	<2	160	<2	<10	<0.4	150	-	23	42	-	20	5,000	<0.1	<5	45	<2	<2	<10	69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SS08	13/04/2022	Eurofins	881033	2.0	180	<2	<10	<0.4	150	-	29	44	-	25	6,400	<0.1	<5	41	<2	<2	<10	36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SS09	13/04/2022	Eurofins	881033	<2	180	<2	<10	<0.4	100	-	38	37	-	22	7,000	<0.1	<5	35	<2	<2	<10	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SS10	13/04/2022	Eurofins	881033	<2	170	<2	<10	<0.4	180	-	37	25	-	17	3,900	<0.1	<5	32	<2	<2	<10	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SS11	13/04/2022	Eurofins	881033	<2	280	<2	<10	<0.4	280	-	150	33	-	9.2	4,500	<0.1	<5	100	<2	<2	<10	93	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SS12	13/04/2022	Eurofins	881033	2.5	76	<2	<10	<0.4	43	-	23	8.1	-	11	1,400	<0.1	<5	12	<2	<2	<10	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SS13	13/04/2022	Eurofins	881033	<2	-	<2	<10	<0.4	150	<1	18	68	<5	19	4,200	<0.1	-	22	<2	-	-	33	<20	<50	<50	<100	<100	<0.5	<0.1	<0.1	<0.1	<0.3	<0.5	<0.5	1.2	<0.5	<1	<0.4	<0.2	-	
SS14	13/04/2022	Eurofins	881033	<2	140	<2	<10	<0.4	46	-	17	48	-	19	5,600	<0.1	<5	18	<2	<2	<10	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SS15	13/04/2022	Eurofins	881033	<2	65	<2	<10	<0.4	27	-	17	8.1	-	11	1,500	<0.1	<5	9.2	<2	<2	<10	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SS16	13/04/2022	Eurofins	881033	<2	58	<2	<10	<0.4	17	-	14	<5	-	12	1,900	<0.1	<5	<5	<2	<2	<10	9.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SS17	13/04/2022	Eurofins	881033	2.8	190	<2	<10	<0.4	92	-	26	28	-	26	7,300	<0.1	<5	18	<2	<2	<10	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SS18	13/04/2022	Eurofins	881033	<2	150	<2	<10	<0.4	120	-	22	50	-	23	5,100	<0.1	<5	27	<2	<2	<10	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SS19	13/04/2022	Eurofins	881033	<2	57	<2	<10	<0.4	30	-	13	8.0	-	14	1,400	<0.1	<5	5.9	<2	<2	<10	8.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SS20	13/04/2022	Eurofins	881033	<2	-	<2	<10	<0.4	19	<1	15	<5	<5	14	1,700	<0.1	-	<5	<2	-	-	8.4	<20	<50	<50	<100	<100	<0.5	<0.1	<0.1	<0.1	<0.3	<0.5	<0.5	1.2	<0.5	<1	<0.4	<0.2	-	
SS21	13/04/2022	Eurofins	881033	2.2	100	<2	<10	<0.4	15	-	10	11	-	14	690	<0.1	<5	9.1	<2	<2	<10	41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Statistics																																									
Number of Results				31	28	31	31	31	31	3	31	31	3	31	31	31	28	31	31	28	28	31	8	8	8	8	8	8	8	8	8	8	3	3	3	3	3	3	3	3	
Maximum Concentration				4	360	2.7	<10	<0.4	280	<1	320	75	<5	33	13,000	<0.1	<5	110	<2	<2	<10	530	<20	<50	<50	400	110	<0.5	<0.1	<0.1	<0										

* A Non Detect Multiplier of 0.5 has been applied.

Comments

- #1 Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B5c for < 2 years.
- #2 EIL is for aged Cr+3 using 10% clay content in low traffic area with no known ABC.
- #3 EIL is for aged Cu using CEC of 10 meq/100g and pH of 6 in low traffic area with no known ABC.
- #4 EIL is for aged Pb with no known ABC.
- #5 EIL is for aged Ni using CEC of 10 meq/100g in low traffic area with no known ABC.
- #6 EIL is for aged Zn using CEC of 10 meq/100g and pH of 6 in low traffic area with no known ABC.
- #7 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
- #8 To obtain F2 subtract naphthalene from the >C10 - C16 fraction.
- #9 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability may be important and should be considered where appropriate (refer Schedule B7).
- #10 Lead: HILs A,B,C based on blood lead models (IEUBK & HIL on adult lead model for where 50% bioavailability considered. Site-specific bioavailability should be considered where appropriate.
- #11 Elemental mercury: HIL does not address elemental mercury: a site specific assessment should be considered if elemental mercury is present, or suspected to be present.
- #12 CRC Care HSLA Residential (Low Density)
- #13 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application should consider presence of carcinogenic PAHs (should meet BaP TEQ HIL) & naphthalene (should meet relevant HSL).
- #14 Carcinogenic PAHs: HIL based on 8 car. PAHs & their TEFs (ref to BaP ref Schedule 7) BaP TEQ calc by multiplying the concn of each car. PAH in sample by its BaP TEF (ref Table 1A(1)) & summing
- #15 PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is known, or suspected at a site, a site-specific assessment of exposure to all PCBs (inc dioxin like PCBs) should be undertaken
- SG - Means analysis after silica gel cleanup.

Table 1. Results Summary vs NEPM Ecological Human Health Guidelines
Project: # 2153 Leongatha



				OCPs										Herbicides							PCBs	Other		Other OCPs			
				Aldrin and dieldrin	DDT+DDE+DDD	Chlordane	Heptachlor	Endosulfan I	Endosulfan II	Endrin	Hexachlorobenzene	Methoxychlor	Mirex	Toxaphene	2,4,5-T	2,4-D	MCPA	MCPB	Meoprop	picloram	PCBs (total)	Cation Exchange Capacity (cmolc/kg)	pH (1:5 soil:CaCl2 extract)	Atrazine	Bifenthrin	Chlorpyrifos	
				mg/kg 0.05	mg/kg 0.05	mg/kg 0.1	mg/kg 0.05	mg/kg 0.05	mg/kg 0.05	mg/kg 0.05	mg/kg 0.05	mg/kg 0.05	mg/kg 0.05	mg/kg 0.5	mg/kg 0.5	mg/kg 0.5	mg/kg 0.5	mg/kg 0.5	mg/kg 0.5	mg/kg 0.5	mg/kg 0.5	mg/kg 0.1	meq/100g 0.05	- 0.1	mg/kg 0.2	mg/kg 0.05	mg/kg 0.2
EQL																											
NEPM EILs / ESLs - Residential / Public Open Space (Lowest ESLs)																											
NEPM HILs / HSLs - 'A' Setting (Sand, <1 m)				6	240	50	6			10	10	300	10	20	600	900	600	600	600	4,500	1 ^{†15}				320	600	160
Field ID	Date	Lab Name	Lab Report #																								
BH01/0.1	13/04/2022	Eurofins	881033	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	
BH02/0.1	13/04/2022	Eurofins	881033	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	
BH03/0.1	13/04/2022	Eurofins	881033	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	6.1	-	-	-	
BH04/0.1	13/04/2022	Eurofins	881033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH05/0.1	13/04/2022	Eurofins	881033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH06/0.1	13/04/2022	Eurofins	881033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH07/0.1	13/04/2022	Eurofins	881033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.5	5.2	-	-	-	
BH08/0.1	13/04/2022	Eurofins	881033	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	
BH08/0.1	13/04/2022	Eurofins	885491	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH08/0.5	13/04/2022	Eurofins	885491	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH09/0.1	13/04/2022	Eurofins	881033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH10/0.1	13/04/2022	Eurofins	881033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH10/0.1	13/04/2022	Eurofins	885491	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH10/0.5	13/04/2022	Eurofins	885491	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SS01	13/04/2022	Eurofins	881033	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	7.0	-	-	-	
SS02	13/04/2022	Eurofins	881033	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	
SS03	13/04/2022	Eurofins	881033	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	
SS04	13/04/2022	Eurofins	881033	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	
SS05	13/04/2022	Eurofins	881033	-	-	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	-	6.8	<0.2	<0.05	<0.2	
SS06	13/04/2022	Eurofins	881033	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	
SS07	13/04/2022	Eurofins	881033	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	
SS08	13/04/2022	Eurofins	881033	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	6.1	-	-	-	
SS09	13/04/2022	Eurofins	881033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SS10	13/04/2022	Eurofins	881033	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.5	-	-	-	-	-	-	-	-	6.2	-	-	-	
SS11	13/04/2022	Eurofins	881033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	-	-	-	-	
SS12	13/04/2022	Eurofins	881033	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	
SS13	13/04/2022	Eurofins	881033	-	-	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	-	6.0	<0.2	<0.05	<0.2	
SS14	13/04/2022	Eurofins	881033	<0.05	0.12	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.5	-	-	-	-	-	-	-	-	7.0	-	-	-	
SS15	13/04/2022	Eurofins	881033	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	
SS16	13/04/2022	Eurofins	881033	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	
SS17	13/04/2022	Eurofins	881033	<0.05	0.16	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	
SS18	13/04/2022	Eurofins	881033	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	
SS19	13/04/2022	Eurofins	881033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.1	-	-	-	
SS20	13/04/2022	Eurofins	881033	-	-	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	-	-	<0.2	<0.05	<0.2	
SS21	13/04/2022	Eurofins	881033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.2	-	-	-	
Statistics																											
Number of Results				12	12	15	15	15	15	15	15	15	3	15	12	12	12	12	12	3	3	2	10	3	3	3	
Maximum Concentration				<0.05	0.16	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	11	7	<0.2	<0.05	<0.2	
Average Concentration *				0.025	0.044	0.05	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.05	9.2	6	0.1	0.025	0.1	
Standard Deviation *				0	0.046	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.5	0.92	0	0	0	
95% UCL (Student's-t) *				0.025	0.0678	0.05	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.05	20.3	6.502	0.1	0.025	0.1	
% of Detects				0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	100	0	0	0	
% of Non-Detects				100	83	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	0	0	100	100	100	
* A Non Detect Multiplier of 0.5 has been applied.																											

Table 2. RPD Results
Project: # 2153 Leongatha



			Metals																	
			Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium (III+VI)	Cobalt	Copper	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Tin	Vanadium	Zinc
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL			2	10	1	10	0.4	2	2	5	5	5	0.1	5	2	2	2	10	5	5
Field ID	Date	Lab Report #																		
BH06/0.1	13/04/2022	881033	<2	100	<2	<10	<0.4	140	15	27	17	3,700	<0.1	<5	20	<2	<2	<10	-	38
DUP-13422A	13/04/2022	881033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPDs:			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH06/0.1	13/04/2022	881033	<2	100	<2	<10	<0.4	140	15	27	17	3,700	<0.1	<5	20	<2	<2	<10	-	38
SPLIT-13422A	13/04/2022	EM2207191	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPDs:			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS02	13/04/2022	881033	2.9	320	<2	<10	<0.4	87	64	53	30	13,000	<0.1	<5	48	<2	<2	<10	-	41
DUP-13422B	13/04/2022	881033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPDs:			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS19	13/04/2022	881033	<2	57	<2	<10	<0.4	30	13	8.0	14	1,400	<0.1	<5	5.9	<2	<2	<10	-	8.8
DUP-13422C	13/04/2022	881033	<2	57	<2	<10	<0.4	26	12	6.8	14	1,200	<0.1	<5	<5	<2	<2	<10	-	8.0
RPDs:			0	0	0	0	0	14	8	16	0	15	0	0	17	0	0	0	-	10
SS19	13/04/2022	881033	<2	57	<2	<10	<0.4	30	13	8.0	14	1,400	<0.1	<5	5.9	<2	<2	<10	-	8.8
SPLIT-13422C	13/04/2022	EM2207191	<5	50	<1	<50	<1	23	9	6	12	942	<0.1	-	5	<5	-	-	43	6
RPDs:			0	13	0	0	0	26	36	29	15	39	0	-	17	0	-	-	-	38

*RPDs have only been considered where a concentration is greater than 1 times the EQL.
**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 81 (1 - 10 x EQL); 50 (10 - 30 x EQL); 30 (> 30 x EQL))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

Table 2. RPD Results
Project: # 2153 Leongatha



			TRHs					BTEXN					OCPs									
			T.R.H (C6-C10)	T.R.H (>C10-C16)	T.R.H (>C10-C16N)	T.R.H (>C16-C34)	T.R.H (>C34-C40)	Naphthalene (BTEX)	Benzene	Toluene	Ethyl Benzene	Xylene	Aldrin and dieldrin	DDT+DDE+DDD	Chlordane	Heptachlor	Endosulfan I	Endosulfan II	Endrin	Hexachlorobenzene	Methoxychlor	Toxaphene
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL			10	50	50	100	100	0.5	0.1	0.1	0.1	0.3	0.05	0.05	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.5
Field ID	Date	Lab Report #																				
BH06/0.1	13/04/2022	881033	<20	<50	<50	<100	<100	<0.5	<0.1	<0.1	<0.1	<0.3	-	-	-	-	-	-	-	-	-	-
DUP-13422A	13/04/2022	881033	<20	<50	<50	<100	<100	<0.5	<0.1	<0.1	<0.1	<0.3	-	-	-	-	-	-	-	-	-	-
RPDs:			0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-
BH06/0.1	13/04/2022	881033	<20	<50	<50	<100	<100	<0.5	<0.1	<0.1	<0.1	<0.3	-	-	-	-	-	-	-	-	-	-
SPLIT-13422A	13/04/2022	EM2207191	<10	<50	<50	110	<100	-	<0.2	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-
RPDs:			0	0	0	10	0	-	0	0	0	0	-	-	-	-	-	-	-	-	-	-
SS02	13/04/2022	881033	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
DUP-13422B	13/04/2022	881033	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
RPDs:			-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0
SS19	13/04/2022	881033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DUP-13422C	13/04/2022	881033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPDs:			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS19	13/04/2022	881033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SPLIT-13422C	13/04/2022	EM2207191	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPDs:			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

APPENDIX A

Lotsearch EnviroPro Report



LOTSEARCH

LOTSEARCH ENVIRO PROFESSIONAL

Date: 25 Mar 2022 09:52:30

Reference: LS030518 EP

Address: 108-110 Parr Street, Leongatha, VIC 3953

Disclaimer:

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

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

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

Dataset Listing

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

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features On-site	No. Features within 100m	No. Features within Buffer
Topographic and Cadastre data	State Government Victoria - Department of Environment, Land, Water & Planning	28/01/2022	28/01/2022	Monthly	-	-	-	-
Current EPA Priority Sites	Environment Protection Authority (Vic)	16/03/2022	28/02/2022	Monthly	1000m	0	0	0
Former EPA Priority Sites & other Remedial Notices	Environment Protection Authority (Vic)	04/10/2021	01/09/2021	Monthly	1000m	0	0	0
EPA PFAS Site Investigations	Environment Protection Authority (Vic)	28/09/2021	18/09/2020	Monthly	2000m	0	0	0
Defence PFAS Investigation & Management Program - Investigation Sites	Department of Defence	03/03/2022	03/03/2022	Monthly	2000m	0	0	0
Defence PFAS Investigation & Management Program - Management Sites	Department of Defence	03/03/2022	03/03/2022	Monthly	2000m	0	0	0
Airservices Australia National PFAS Management Program	Airservices Australia	02/03/2022	02/03/2022	Monthly	2000m	0	0	0
Defence 3 Year Regional Contamination Investigation Program	Department of Defence	03/03/2022	03/03/2022	Quarterly	2000m	0	0	0
EPA Environmental Audit Reports	Environment Protection Authority (Vic)	21/03/2022	21/03/2022	Monthly	1000m	0	0	1
EPA Groundwater Zones with Restricted Uses	Environment Protection Authority (Vic)	23/03/2022	23/03/2022	Monthly	1000m	0	0	0
Current EPA Licensed Activities	Environment Protection Authority (Vic)	21/03/2022	22/07/2021	Monthly	1000m	0	0	0
Former EPA Licensed Activities	Environment Protection Authority (Vic)	21/03/2022	26/11/2021	Monthly	1000m	0	0	0
EPA Works Approvals	Environment Protection Authority (Vic)	31/01/2022	31/01/2022	Monthly	1000m	0	0	0
National Waste Management Facilities Database	Geoscience Australia	12/05/2021	07/03/2017	Annually	1000m	0	0	0
Statewide Waste and Resource Recovery Infrastructure Plan Facilities	State Government Victoria - Department of Sustainability	27/11/2014	31/12/2012	None planned	1000m	0	0	0
EPA Prescribed Industrial Waste	Environment Protection Authority (Vic)	12/08/2020	12/08/2020	Quarterly	1000m	0	0	0
EPA Victorian Landfill Register	Environment Protection Authority (Vic)	31/01/2022	25/08/2020	Quarterly	1000m	0	0	0
Former Gasworks	Various historical sources collated by Lotsearch	15/08/2017	15/08/2017	Not required	1000m	0	0	0
National Liquid Fuel Facilities	Geoscience Australia	15/02/2021	15/03/2012	Annually	1000m	0	0	0
Historical Business Directories (Premise & Intersection Matches)	Hardie Grant; Sands & McDougall, State Library Victoria			Not required	150m	0	0	0
Historical Business Directories (Road & Area Matches)	Hardie Grant; Sands & McDougall, State Library Victoria			Not required	150m	-	2	2
Historical Business Directory Dry Cleaners & Motor Garages/Service Stations (Premise & Intersection Matches)	Hardie Grant; Sands & McDougall, State Library Victoria			Not required	500m	0	0	0
Historical Business Directory Dry Cleaners & Motor Garages/Service Stations (Road & Area Matches)	Hardie Grant; Sands & McDougall, State Library Victoria			Not required	500m	-	0	0
Features of Interest	State Government Victoria - Department of Environment, Land, Water & Planning	29/09/2021	29/09/2021	Quarterly	1000m	1	1	18
Hydrogeology Map of Australia	Commonwealth of Australia (Geoscience Australia)	08/10/2014	17/03/2000	As required	1000m	1	1	1
Groundwater Salinity	State Government Victoria - Department of Environment, Land, Water & Planning	14/08/2015	29/08/2012	Unknown	0m	1	-	-
Depth to Watertable	State Government Victoria - Department of Environment, Land, Water & Planning	14/08/2015	29/08/2012	Unknown	0m	4	-	-
Surface Elevation	State Government Victoria - Department of Environment, Land, Water & Planning	14/08/2015	23/09/2013	Unknown	0m	1	-	-

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features On-site	No. Features within 100m	No. Features within Buffer
Basement Elevation	State Government Victoria - Department of Environment, Land, Water & Planning	14/08/2015	23/09/2013	Unknown	0m	1	-	-
Groundwater Boreholes WMIS	State Government Victoria - Department of Environment, Land, Water & Planning	23/08/2021	23/08/2021	Quarterly	2000m	0	0	10
Groundwater Boreholes Earth Resources Database	State Government Victoria - Department of Economic Development, Jobs, Transport and Resources	20/05/2021	17/02/2010	Annually	2000m	0	0	5
Groundwater Boreholes Fed Uni	Federation University Australia	21/12/2017	07/01/2014	As required	2000m	0	0	0
Historical Mining Activity - Shafts	State Government Victoria - Department of Economic Development, Jobs, Transport and Resources	11/05/2021	11/05/2021	Annually	1000m	0	0	0
Geological Units 1:250,000	State Government Victoria - Department of Economic Development, Jobs, Transport and Resources	13/01/2015	24/06/2014	Unknown	1000m	2	2	3
Geological Structures 1:250,000	State Government Victoria - Department of Economic Development, Jobs, Transport and Resources	13/01/2015	24/06/2014	Unknown	1000m	0	0	0
Shear zones 250k	State Government Victoria - Department of Economic Development, Jobs, Transport and Resources	13/01/2015	24/06/2014	Unknown	1000m	0	0	0
Atlas of Australian Soils	ABARES	19/05/2017	17/02/2011	As required	1000m	2	2	2
Victorian Soil Type Mapping	State Government Victoria - Department of Economic Development, Jobs, Transport and Resources	24/08/2017	21/03/2016	Unknown	1000m	2	2	4
Atlas of Australian Acid Sulfate Soils	CSIRO	19/01/2017	21/02/2013	As required	1000m	2	2	2
Coastal Acid Sulfate Soils	State Government Victoria - Department of Economic Development, Jobs, Transport and Resources	28/03/2017	30/03/2011	None planned	1000m	0	0	0
Planning Scheme Zones	State Government Victoria - Department of Environment, Land, Water & Planning	10/02/2022	02/02/2022	Monthly	1000m	1	5	21
Planning Scheme Overlay	State Government Victoria - Department of Environment, Land, Water & Planning	10/02/2022	02/02/2022	Monthly	1000m	3	3	7
Commonwealth Heritage List	Australian Government Department of Agriculture, Water and the Environment	18/05/2021	20/11/2019	Annually	1000m	0	0	0
National Heritage List	Australian Government Department of Agriculture, Water and the Environment	18/05/2021	20/11/2019	Annually	1000m	0	0	0
Victorian Heritage Register	State Government Victoria - Department of Environment, Land, Water & Planning	05/08/2021	05/08/2021	Quarterly	1000m	0	0	1
Cultural Heritage Sensitivity	State Government Victoria - Department of Premier and Cabinet	29/09/2021	29/09/2021	Quarterly	1000m	3	4	4
Bushfire Prone Area	State Government Victoria - Department of Transport, Planning and Local Infrastructure	05/08/2021	06/07/2021	Quarterly	1000m	1	1	1
Fire History	State Government Victoria - Department of Environment, Land, Water & Planning	15/11/2021	15/11/2021	Quarterly	1000m	0	0	0
Flood - 1 in 100 Year Modelled Flood Extent	State Government Victoria - Department of Environment, Land, Water & Planning	11/08/2021	05/02/2018	Quarterly	1000m	1	1	1
Victorian Coastal Inundation Sea Level Rise	State Government Victoria - Department of Environment, Land, Water & Planning	10/04/2018	24/10/2017	Unknown	1000m	0	0	0
Native Vegetation (Modelled 2005 Ecological Vegetation Classes)	State Government Victoria - Department of Environment, Land, Water & Planning	13/01/2015	31/12/2005	None planned	1000m	2	2	4
Ramsar Wetland Areas in Victoria	State Government Victoria - Department of Environment, Land, Water & Planning	25/02/2021	13/03/2019	Annually	1000m	0	0	0
Groundwater Dependent Ecosystems Atlas	Bureau of Meteorology	14/08/2017	15/05/2017	Unknown	1000m	4	5	9
Inflow Dependent Ecosystems Likelihood	Bureau of Meteorology	14/08/2017	15/05/2017	Unknown	1000m	4	8	17

Site Diagram

108-110 Parr Street, Leongatha, VIC 3953



Legend

- █ Site Boundary
- ▭ Internal Parcel Boundaries

Total Area: 225680m²

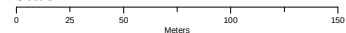
Total Perimeter: 2.03km

Disclaimers:

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

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

Scale:



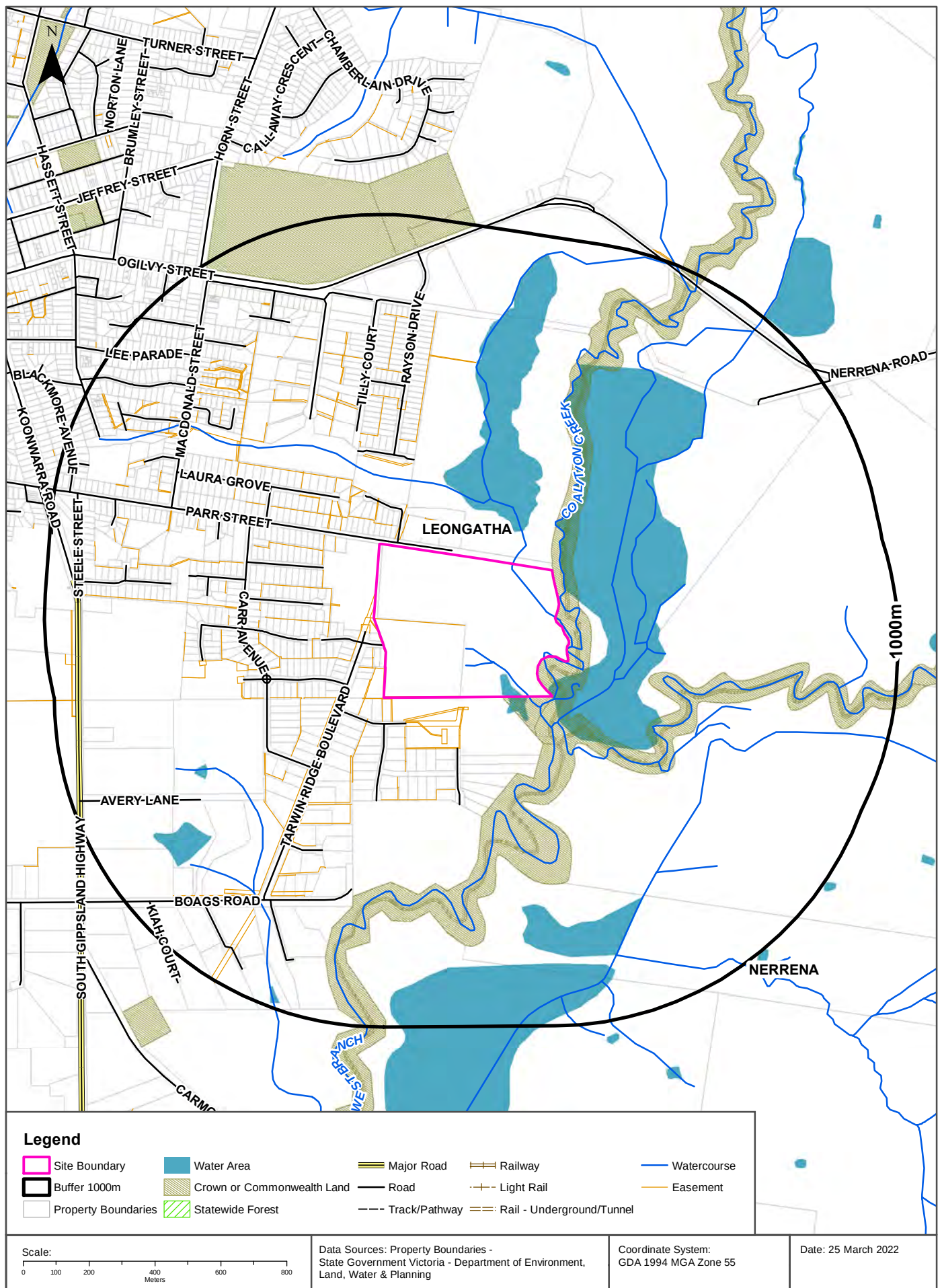
Data Source Aerial Imagery:
© Aerometrex Pty Ltd

Coordinate System:
GDA 1994 MGA Zone 55

Date: 25 March 2022

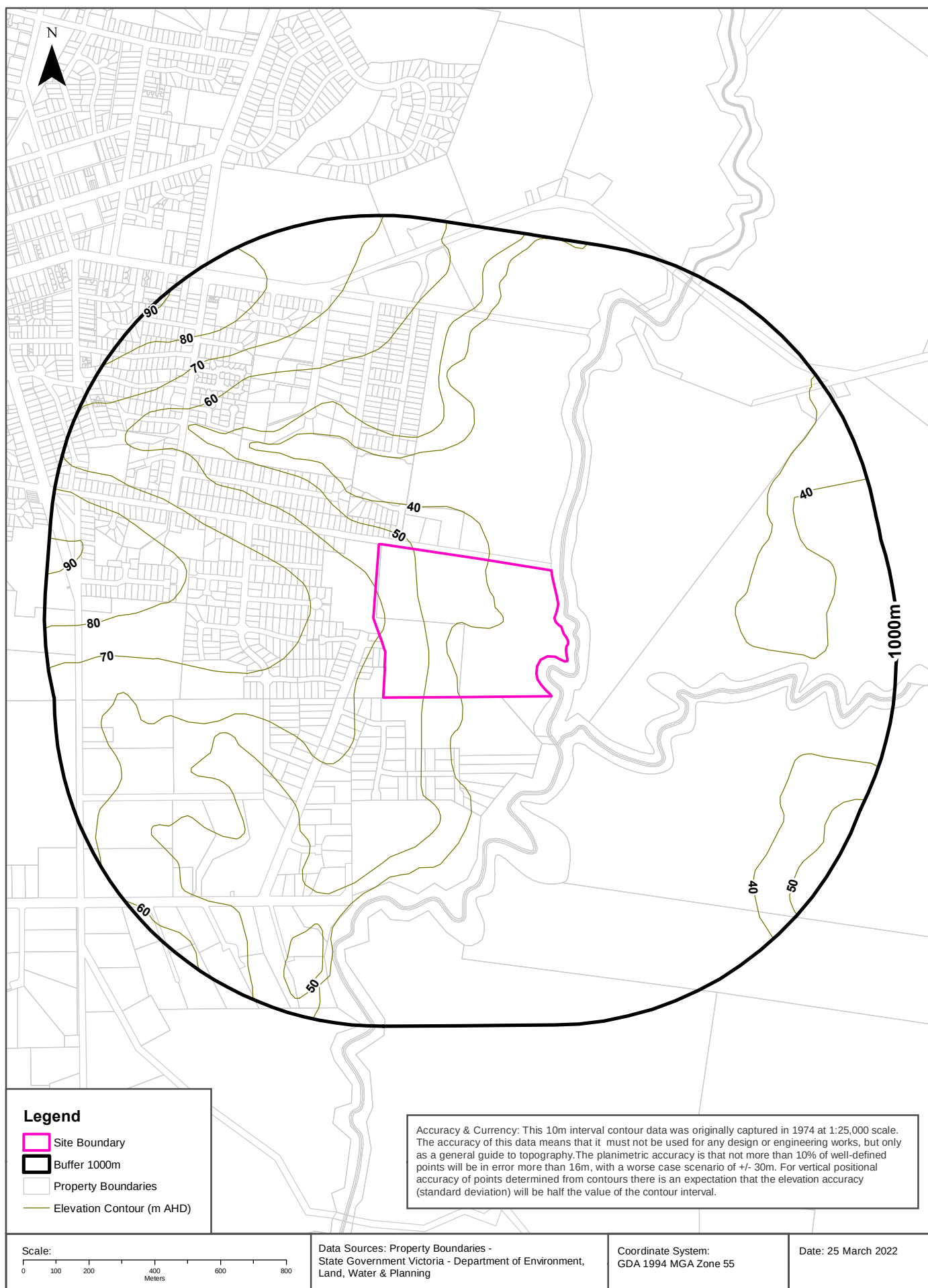
Topographic Data

108-110 Parr Street, Leongatha, VIC 3953



Elevation Contours (m AHD)

108-110 Parr Street, Leongatha, VIC 3953



EPA Priority Sites & Pollution Notices

108-110 Parr Street, Leongatha, VIC 3953

Current EPA Priority Sites Register

Sites on the current EPA priority sites register that exist within the dataset buffer:

Notice No	Address	Suburb	Issue	Loc Conf	Dist (m)	Direction
N/A	No records in buffer					

Priority Sites Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

Former EPA Priority Sites & Other Pollution Notices

Sites within the dataset buffer that have been issued a Pollution Notice:

Note. Due to pollution notices being revoked and removed from published lists this is not an exhaustive list of all past pollution notices.

Notice No	Notice Type	Company	Address	Suburb	Status	Issue	Date Issued	Loc Conf	Dist	Dir
N/A	No records in buffer									

Pollution Notice Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

PFAS Investigation & Management Programs

108-110 Parr Street, Leongatha, VIC 3953

EPA PFAS Site Investigations

Sites being investigated by the EPA for PFAS contamination within the dataset buffer:

Map ID	Site Name	Address	Location Confidence	Distance	Direction
N/A	No records in buffer				

EPA PFAS Site Investigations Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

Defence PFAS Investigation & Management Program Investigation Sites

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

Map ID	Base Name	Address	Location Confidence	Distance	Direction
N/A	No records in buffer				

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

Defence PFAS Investigation & Management Program Management Sites

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

Map ID	Base Name	Address	Location Confidence	Distance	Direction
N/A	No records in buffer				

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

Airservices Australia National PFAS Management Program

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

Map ID	Site Name	Impacts	Location Confidence	Distance	Direction
N/A	No records in buffer				

Airservices Australia National PFAS Management Program Data Custodian: Airservices Australia

Defence Sites

108-110 Parr Street, Leongatha, VIC 3953

Defence 3 Year Regional Contamination Investigation Program

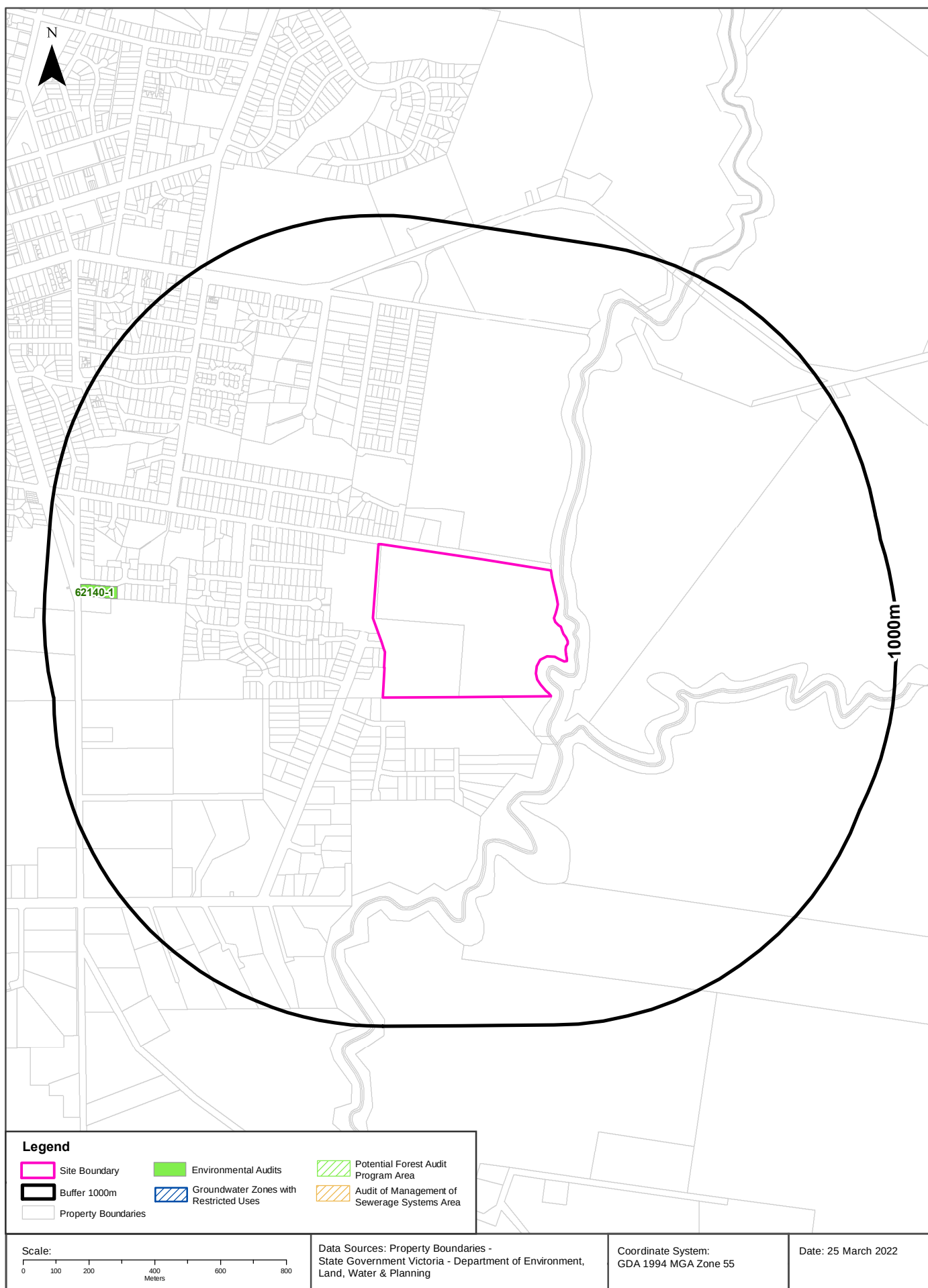
Sites which have been assessed as part of the Defence 3 Year Regional Contamination Investigation Program within the dataset buffer:

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

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

EPA Records - Audit Reports & GQRUZ

108-110 Parr Street, Leongatha, VIC 3953



EPA Records

108-110 Parr Street, Leongatha, VIC 3953

EPA Environmental Audits

EPA environmental audit records that exist within the dataset buffer:

Note. Please click on CARMS No. to activate a hyperlink to online documentation. If link does not work, documentation may still be accessible via the EPA Interaction Portal.

CARMS No	Transaction No	Site	Address	Suburb	Date Complete	Audit Category	Loc Conf	Distance	Direction
62140-1	8002409	1 ,29 STEELE ST	1 ,29 STEELE ST	LEONGATHA	13/03/2007	53X Certificate	Premise Match	779m	West

Environmental Audit Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

EPA Records

108-110 Parr Street, Leongatha, VIC 3953

EPA Groundwater Zones with Restricted Uses

EPA GQRUZ records that exist within the dataset buffer:

Note. Please click on CARMS No. to activate a hyperlink to online documentation.

CARMS No	EPA Id	Site History	Site Address	Restricted Uses	Status	Loc Conf	Distance	Direction
N/A	No records in buffer							

Environmental GQRUZ Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

EPA Activities

108-110 Parr Street, Leongatha, VIC 3953

EPA Licensed Activities

EPA licensed activities that exist within the dataset buffer:

Trans No	Licence No	Licence Type	Organisation	Premise Ref	Premise Address 1	Premise Address 2	Activities	Loc Conf	Dist (m)	Direction
N/A	No records in buffer									

Licensed Activity Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

Former EPA Licensed Activities

Former EPA licensed activities that exist within the dataset buffer:

Licence No	Organisation	Premise Address	Suburb	Activities	Loc Conf	Dist (m)	Direction
N/A	No records in buffer						

Former Licensed Activity Data Custodian: State Government Victoria - Environmental Protection Authority (EPA)

EPA Works Approvals

EPA works approvals that exist within the dataset buffer:

Transaction No	Status	Approval No	Organisation	Premise Address	Suburb	Scheduled Categories	Loc Conf	Dist (m)	Direction
N/A	No records in buffer								

Works Approvals Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

Waste Management Facilities & Landfills

108-110 Parr Street, Leongatha, VIC 3953

National Waste Management Site Database

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

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

Waste Management Facilities Data Source: Australian Government Geoscience Australia
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Statewide Waste and Resource Recovery Infrastructure Plan Facilities

Statewide Waste and Resource Recovery Infrastructure Plan Facilities within the dataset buffer:

Map Id	Owner	Site Name	Address	Suburb	Category	Sub Category	Loc Conf	Distance	Direction
N/A	No records in buffer								

SWRRIPF Data Source: State Government Victoria - Department of Sustainability

EPA Prescribed Industrial Waste

EPA Prescribed Industrial Waste treaters, disposers and permitted transporters within the dataset buffer:

Map Id	Company Name	Address	Suburb	Treatment /Disposal	Transport	Accredited Agent	EPA List Status	Loc Conf	Dist (m)	Dir
N/A	No records in buffer									

Prescribed Industrial Waste Data Source: State Government Victoria - Environment Protection Authority (EPA)

Waste Management Facilities & Landfills

108-110 Parr Street, Leongatha, VIC 3953

EPA Victorian Landfill Register

EPA Victorian Landfill Register sites within the dataset buffer:

Landfill Register No.	Site	Address	Operating Status	Est. Year Of Closure	Waste type	Loc Conf	Dist (m)	Direction
N/A	No records in buffer							

EPA Victorian Landfill Register Data Source: State Government Victoria - Environment Protection Authority (EPA)

Former Gasworks and Liquid Fuel Facilities

108-110 Parr Street, Leongatha, VIC 3953

Former Gasworks

Former Gasworks identified from various historical sources within the dataset buffer:

Note - As this is a dataset collated from various historical sources, it is not an exhaustive list of all former Gasworks

Map Id	Site Name	Date Opened	Year Closed	Location Confidence	Distance	Direction
N/A	No records in buffer					

Former Gasworks Data Source: Collated from various historical sources

National Liquid Fuel Facilities

National Liquid Fuel Facilities within the dataset buffer:

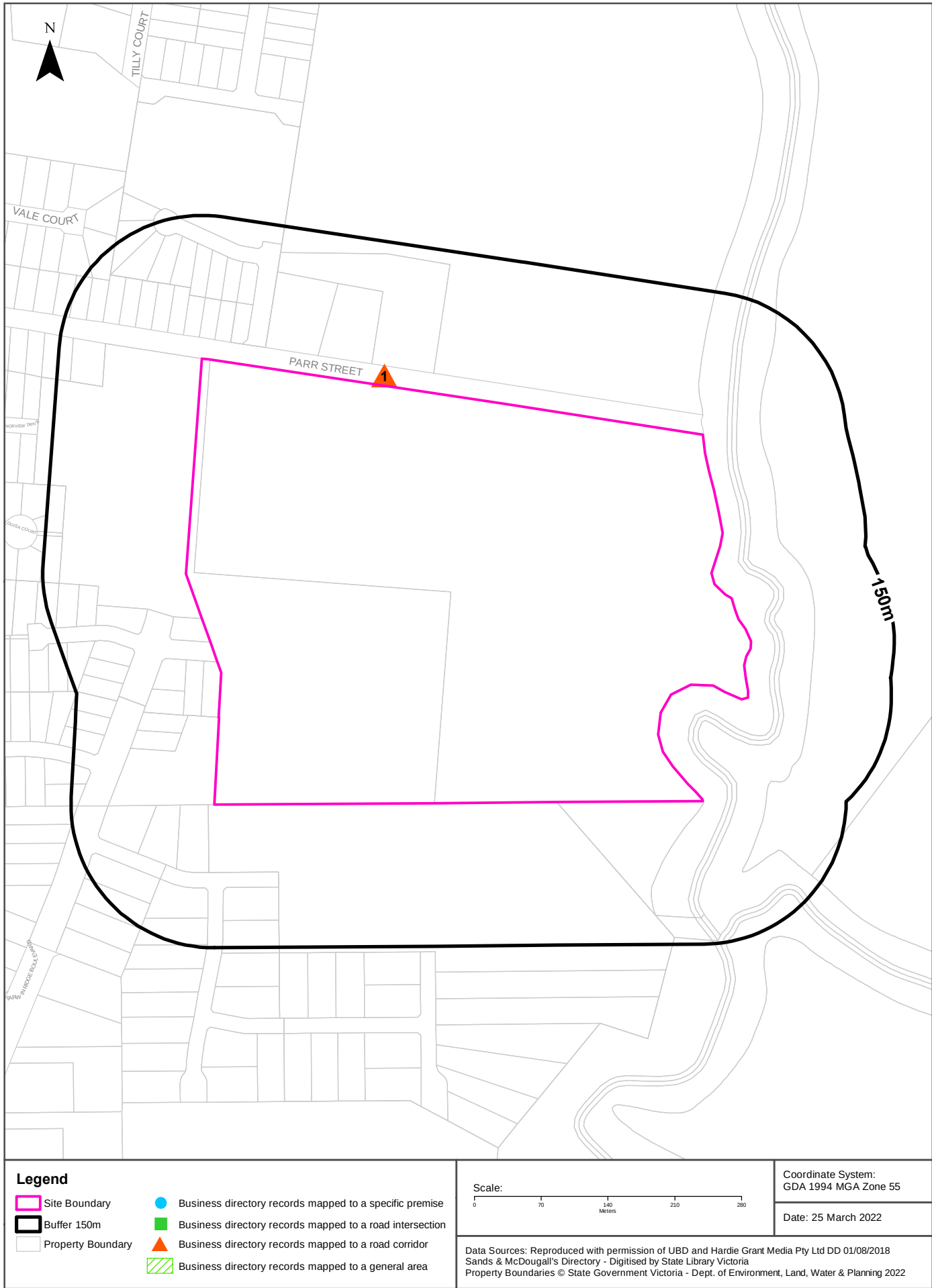
Map Id	Owner	Name	Address	Suburb	Class	Operational Status	Operator	Revision Date	Loc Conf	Dist (m)	Direction
N/A	No records in buffer										

National Liquid Fuel Facilities Data Source: Geoscience Australia

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Historical Business Directories

108-110 Parr Street, Leongatha, VIC 3953



Historical Business Directories

108-110 Parr Street, Leongatha, VIC 3953

Business Directory Records 1905-1991 Premise or Road Intersection Matches

Universal Business Directory and Sands & McDougall Directory records, from years 1991, 1980, 1970, 1960, 1950, 1945, 1925 & 1905, mapped to a premise or road intersection within the dataset buffer:

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

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Business Directory Records 1905-1991

Road or Area Matches

Universal Business Directory and Sands & McDougall Directory records, from years 1991, 1980, 1970, 1960, 1950, 1945, 1925 & 1905, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Road Corridor or Area
1	Bus Operators.	Eldred'S Coach Tours, Parr St, Leongatha. 3953	90498	1991	Road Match	0m
	Bus Services - Charter & Tours.	Eldred'S Coach Tours, Parr St. Leongatha. 3953	90500	1991	Road Match	0m

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Historical Business Directories

108-110 Parr Street, Leongatha, VIC 3953

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

Dry Cleaners, Motor Garages & Service Stations from Sands & McDougall's Directories and UBD Business Directories, mapped to a premise or road intersection within the dataset buffer.

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

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

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

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

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Scale: 0 60 120 180 240 Meters	Data Source Aerial Imagery: © Aerometrex Pty Ltd	Coordinate System: GDA 1994 MGA Zone 55	Date: 25 March 2022

Aerial Imagery 2017

108-110 Parr Street, Leongatha, VIC 3953



Aerial Imagery 2014

108-110 Parr Street, Leongatha, VIC 3953



Aerial Imagery 2010

108-110 Parr Street, Leongatha, VIC 3953

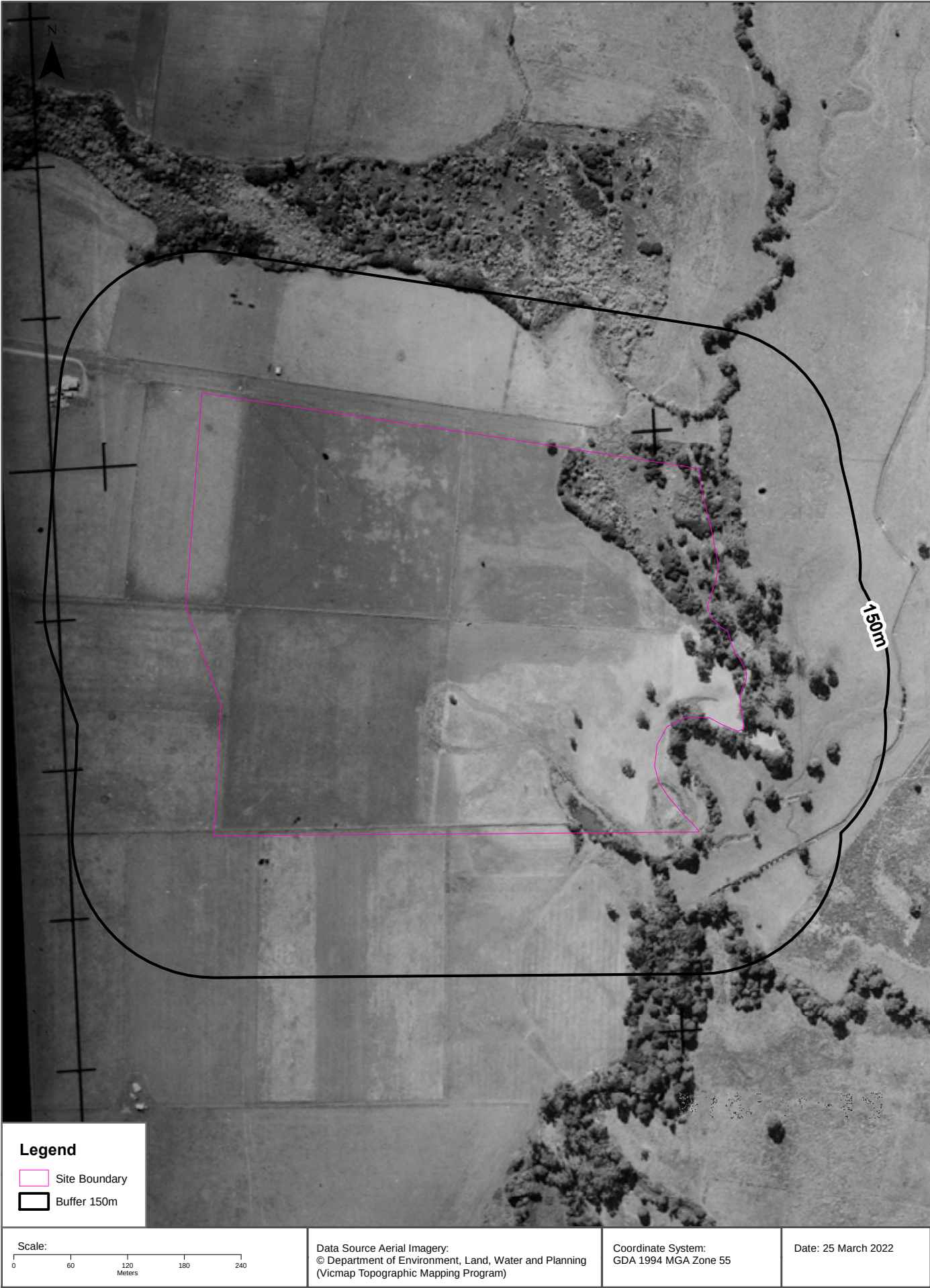






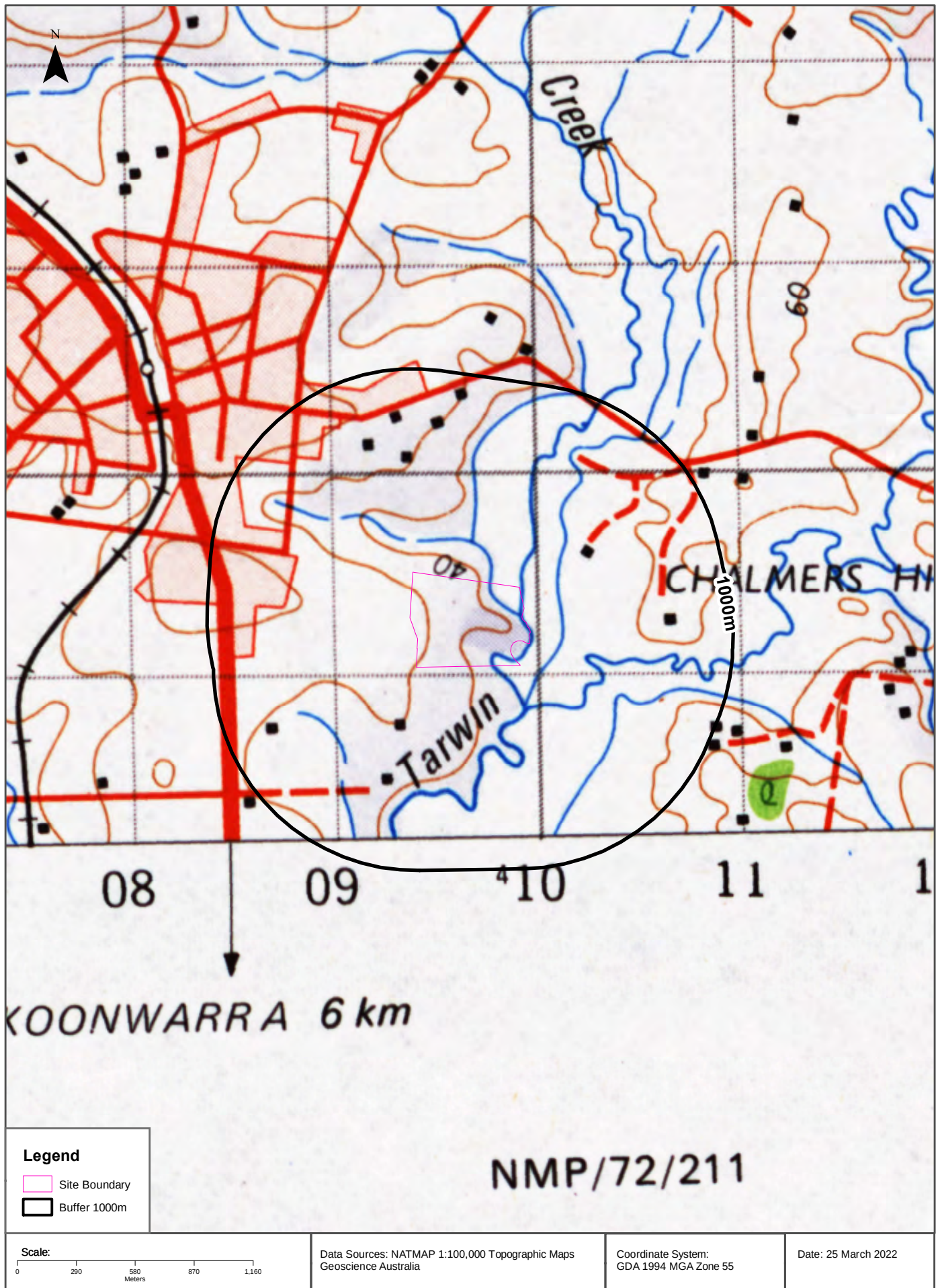






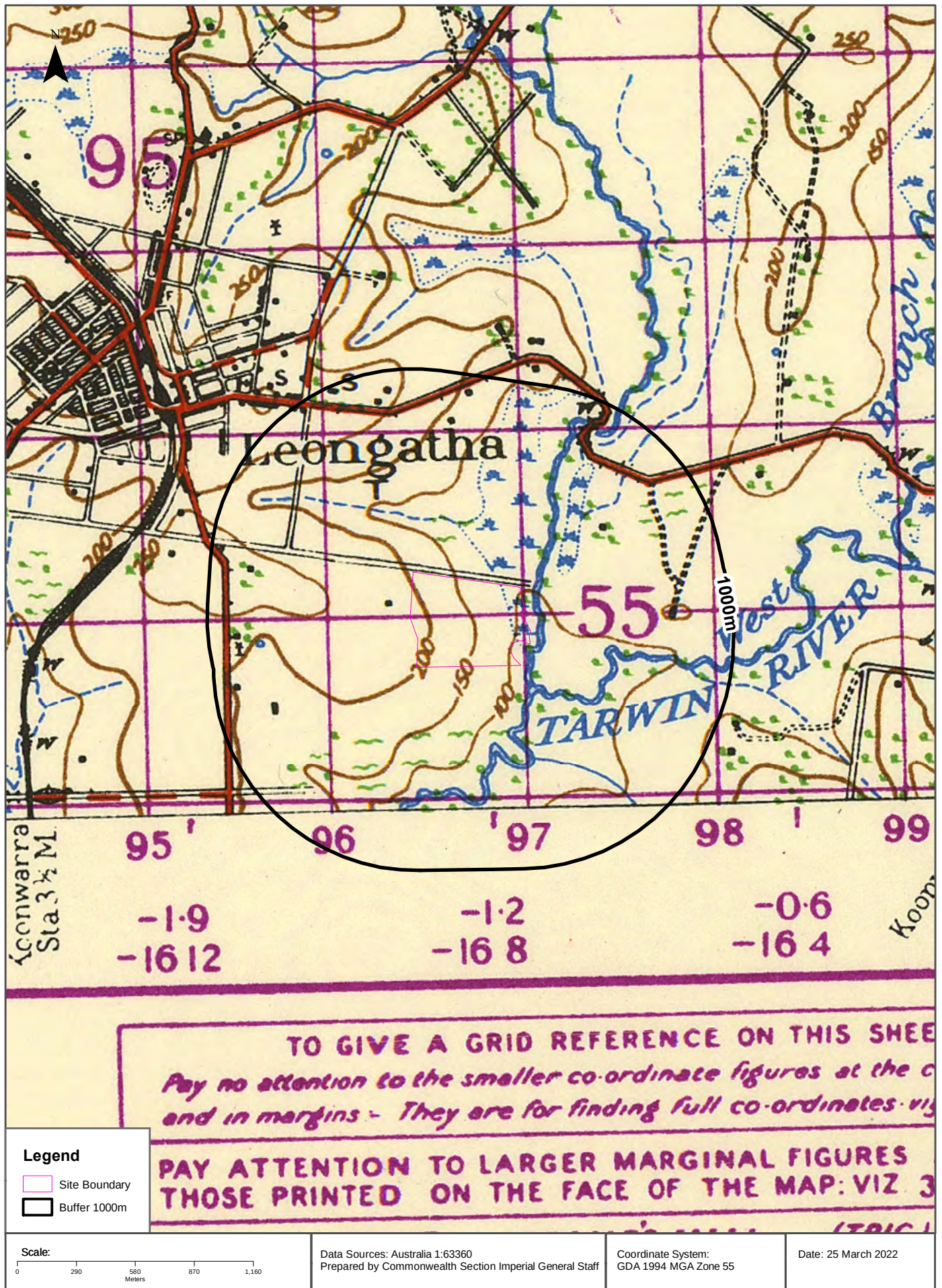
Historical Map 1972

108-110 Parr Street, Leongatha, VIC 3953



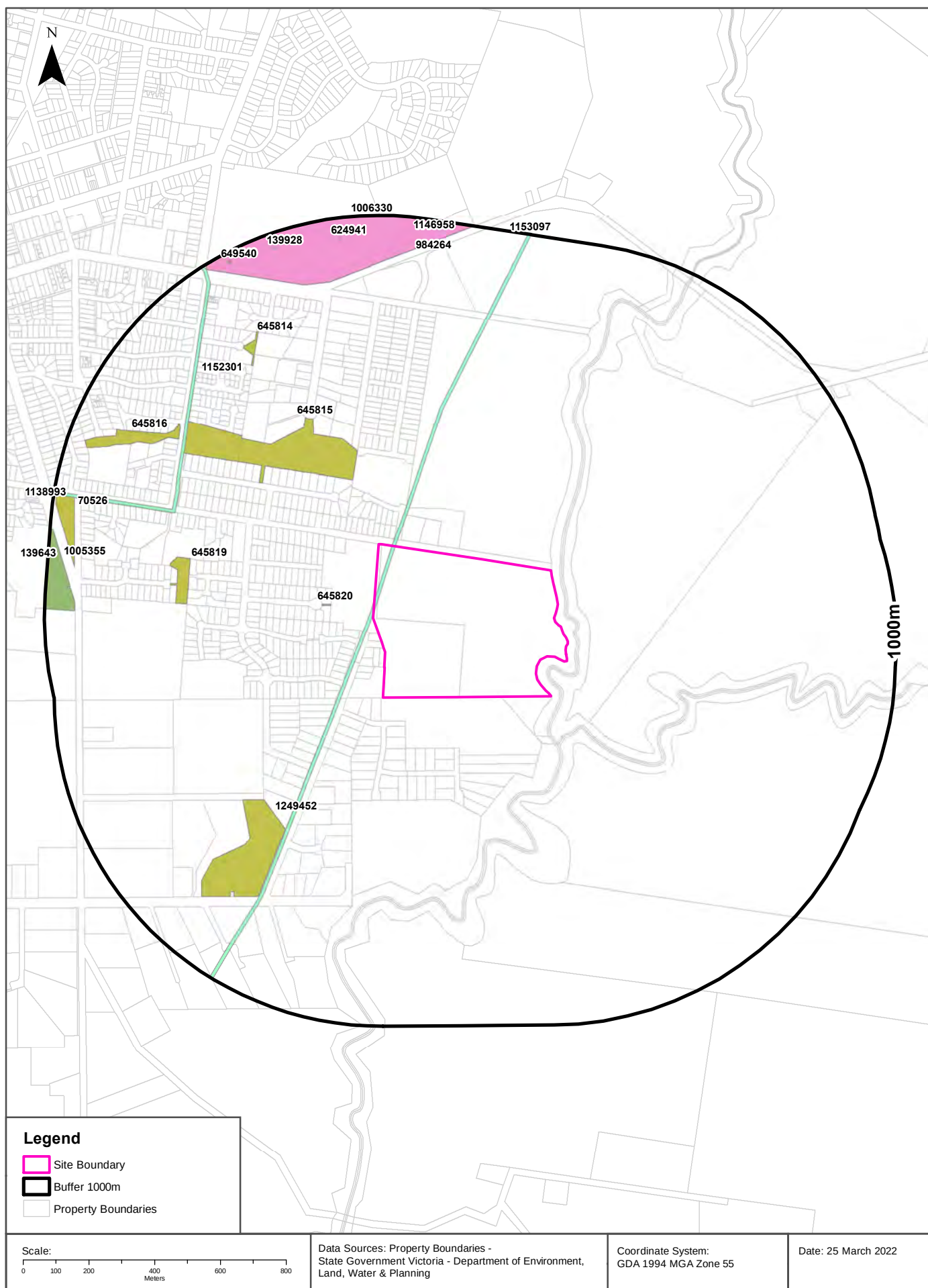
Historical Map c.1931

108-110 Parr Street, Leongatha, VIC 3953



Features of Interest

108-110 Parr Street, Leongatha, VIC 3953



Features of Interest

108-110 Parr Street, Leongatha, VIC 3953

Features of Interest

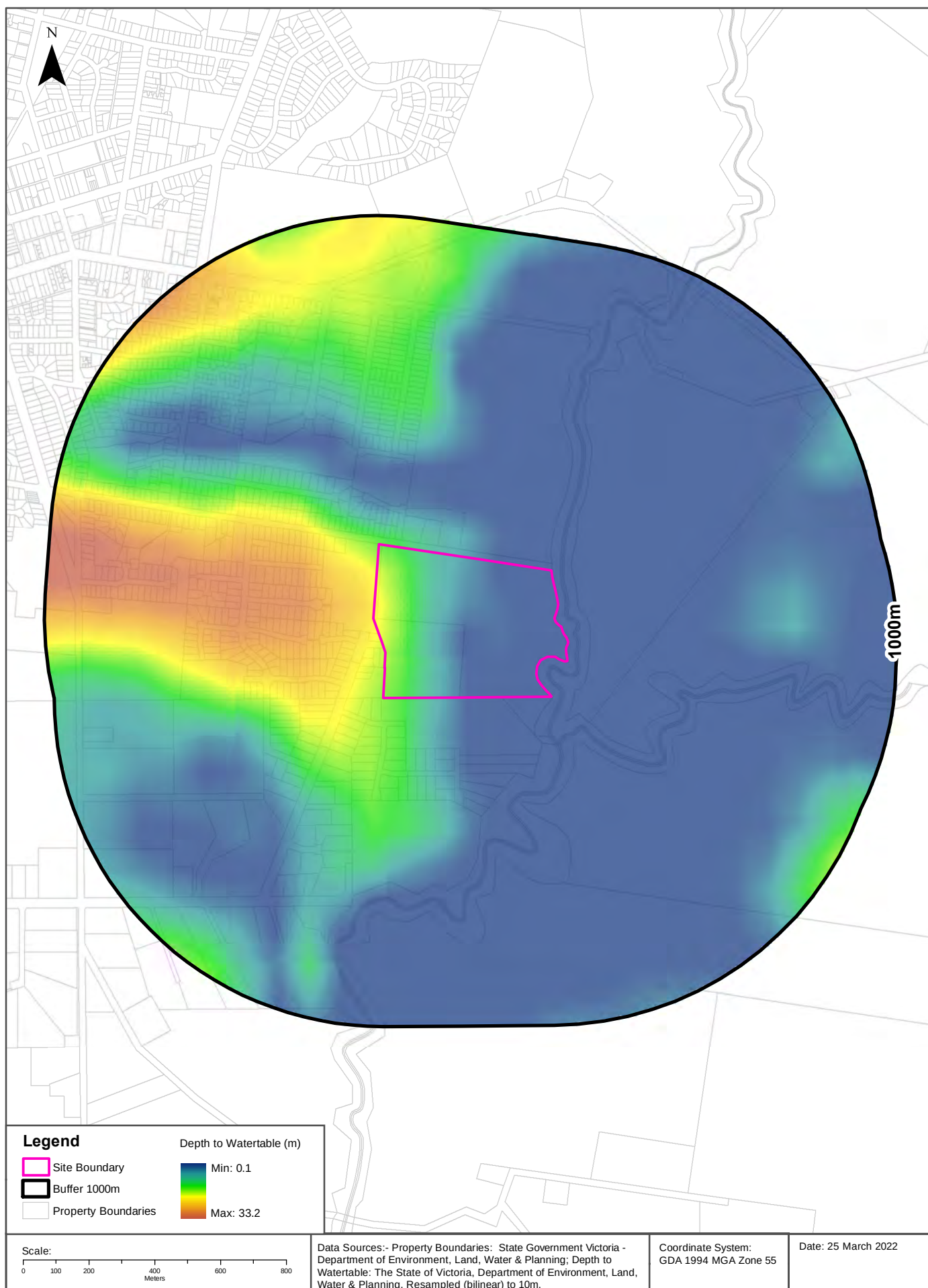
Features of Interest within the dataset buffer:

Feature Id	Feature Type	Feature Sub Type	Name	Distance	Direction
1153097	power line	power sub transmission		0m	On-site
645820	reserve	park		132m	West
645815	reserve	park		211m	North West
1249452	reserve	park		477m	South West
645819	reserve	park		569m	West
1152301	power line	power sub transmission		627m	North West
645814	reserve	park		664m	North West
645816	reserve	park		688m	North West
1006330	education centre	education complex		812m	North
1005355	hospital	hospital complex		908m	West
70526	reserve	park	Ellen Lyndon Park	917m	West
624941	education centre	secondary school	Leongatha Secondary College	930m	North
139928	education centre	primary school	Leongatha Primary School	947m	North West
984264	education centre	tertiary institution	Federation Training - Leongatha Campus	947m	North
1146958	education centre	tertiary institution	Federation Training	947m	North
1138993	recreational resource	playground		949m	West
139643	care facility	aged care	Koorooman House Nursing Home	959m	West
649540	community venue	hall	Mesley Hall	965m	North West

Features of Interest Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
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Depth to Watertable

108-110 Parr Street, Leongatha, VIC 3953



Hydrogeology & Groundwater

108-110 Parr Street, Leongatha, VIC 3953

Hydrogeology

Description of aquifers within the dataset buffer:

Description	Distance	Direction
Fractured or fissured, extensive highly productive aquifers	0m	On-site

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

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Groundwater Salinity

On-site Groundwater Salinity:

Groundwater Salinity	Percent Of Site Area
500 - 1,000 mg/l	100

Depth to Watertable

On-site Depth to Watertable:

Depth to Watertable	Percent Of Site Area
Less than 5 metres	57
10 to 20 metres	21
5 to 10 metres	20
20 to 50 metres	2

Surface Elevation

Approximate on-site Surface Elevation:

Surface Elevation
33 AHDm to 61 AHDm

Basement Elevation

Approximate on-site Basement Elevation:

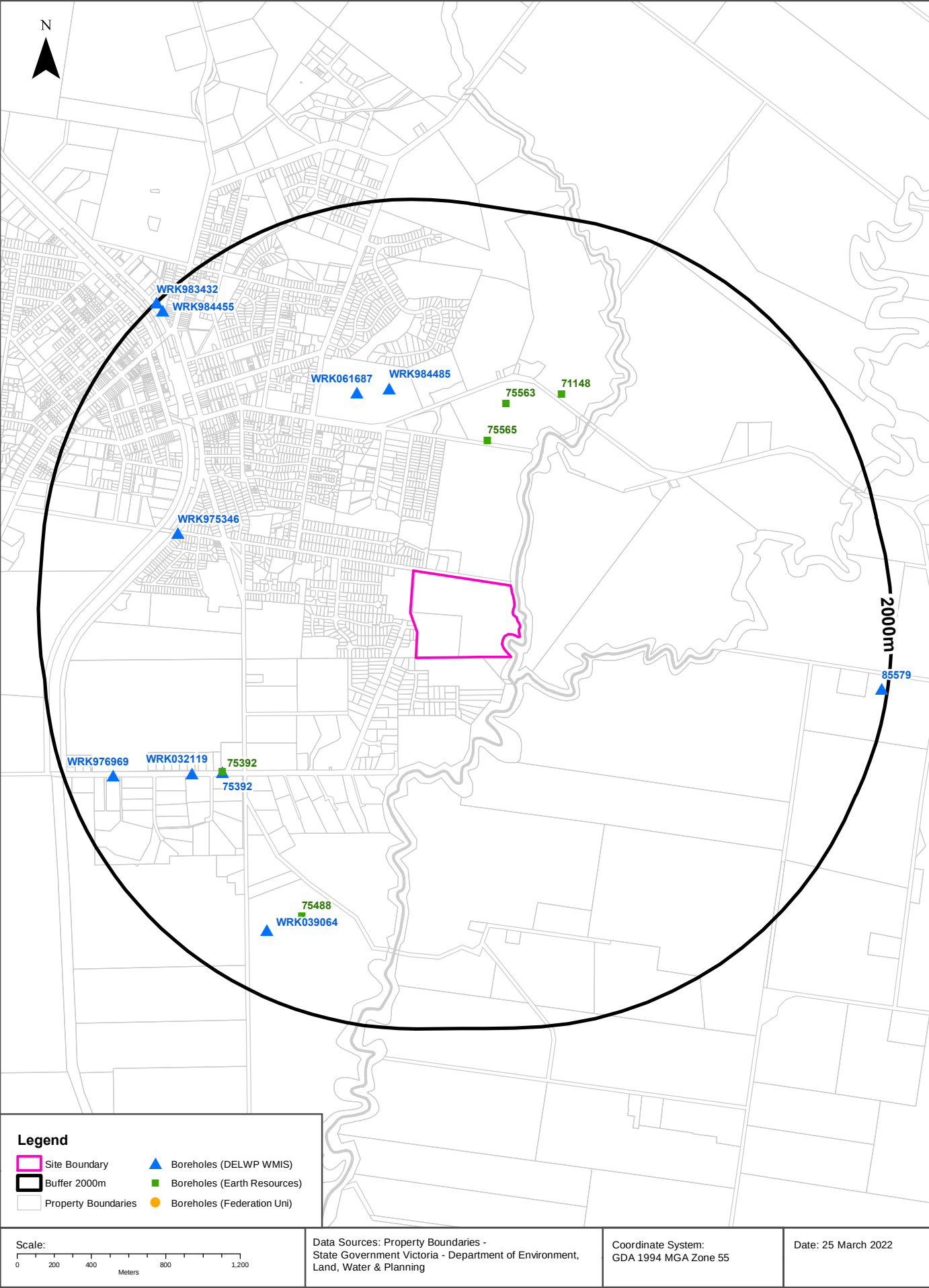
Basement Elevation - Basement Rocks comprise Lower Palaeozoic basement rocks that form the highlands and the crystalline basement; and Mesozoic rocks of the Otway and Gippsland basins both outcropping and subsurface
-59 AHDm to -10 AHDm

Groundwater Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning

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Groundwater Boreholes

108-110 Parr Street, Leongatha, VIC 3953



Groundwater Boreholes

108-110 Parr Street, Leongatha, VIC 3953

Boreholes (DELWP WMIS)

Boreholes from the Department of Environment, Land, Water & Planning's Water Measurement Information System, within the dataset buffer:

Bore Id	Use Type	Drillers Log	Construction	Latest Water Levels	Geology	Completed Date	Dist (m)	Dir
WRK984485	Domestic & Stock	0.00m-6.00m SANDY CLAY 6.00m-21.00m CLAY	15.00m-21.00m INNER LINING - SCREEN = Pvc 0.00m-0.30m OUTER LINING - GRAVEL = Cement 0.30m-13.00m OUTER LINING - GRAVEL = Bentonite 13.00m-14.00m OUTER LINING - GRAVEL = Bentonite 14.00m-21.00m OUTER LINING - GRAVEL = Gravel			23/05/2008	992m	North
WRK061687	Observation	0.00m-8.00m CLAY 8.00m-15.00m SILT 15.00m-25.00m CLAY	0.00m-13.00m INNER LINING - CASING = Pvc 13.00m-25.00m INNER LINING - SLOT = Pvc 0.00m-11.70m OUTER LINING - GRAVEL = Cement 11.70m-12.20m OUTER LINING - GRAVEL = Bentonite 12.20m-25.00m OUTER LINING - GRAVEL = Gravel		13.00m-25.00m Clay	15/04/2011	1007 m	North West
75392	Groundwater Investigation		0.00m-124.66m INNER LINING - CASESCRN = Not Known		0.00m-124.66m	31/12/1966	1208 m	South West
WRK975346							1284 m	West
WRK032119	Dairy, Stock					01/01/1800	1354 m	South West
WRK039064	Domestic, Dairy, Irrigation, Stock					10/12/1972	1672 m	South West
WRK976969						01/11/2007	1747 m	South West
WRK984455							1943 m	North West
85579	Stock					01/01/1988	1968 m	East
WRK983432							1997 m	North West

Boreholes WMIS Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
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Groundwater Boreholes

108-110 Parr Street, Leongatha, VIC 3953

Boreholes (Earth Resources Database)

Boreholes from the Earth Resources dataset, within the dataset buffer:

Bore Id	Bore Type	Company	Usage	Method	Status	Drill Date	Depth	Elevation	Accuracy (m)	Dist (m)	Dir
75565		Unknown (or Not Specified)				04/06/1991	93.00	82.45		752m	North
75563		Unknown (or Not Specified)				08/05/1991	36.00	67.47		965m	North
71148		Unknown (or Not Specified)		Cable tool drilling		08/04/1991	108.00			1066 m	North East
75392		Department of Manufacturing & Industry Development	Groundwater Investigation			31/12/1966	124.66		300	1209 m	South West
75488		Private Individual/Corporation	Domestic & Stock water supply			16/12/1972	3.04		300	1523 m	South West

Boreholes Earth Resources Data Source: © The State of Victoria, Department of Economic Development, Jobs, Transport and Resources 2015. Creative Commons Attribution 3.0 Australia

Boreholes (Federation University)

Boreholes from the Federation University Australia dataset, within the dataset buffer:

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Dir
N/A	No records in buffer						

Boreholes FedUni Data Source: © Federation University Australia

Historical Mining Activity - Shafts

108-110 Parr Street, Leongatha, VIC 3953

Historical Mining Activity - Shafts

Mine Shaft Locations were collected by a variety of methods from 1869 in some areas of the state, mainly concentrating in Ballarat and Bendigo. In places a shaft may be recorded multiple times with a different source. In cases where several shaft locations are shown close together (generally with separations less than stated position errors) and they have different sources, it is possible that one shaft has been mapped several times. In cases where several shaft locations are shown close together but they have the same information source, it is possible that each shaft location represents a different shaft on the ground.

Historical Mine Shafts within the dataset buffer:

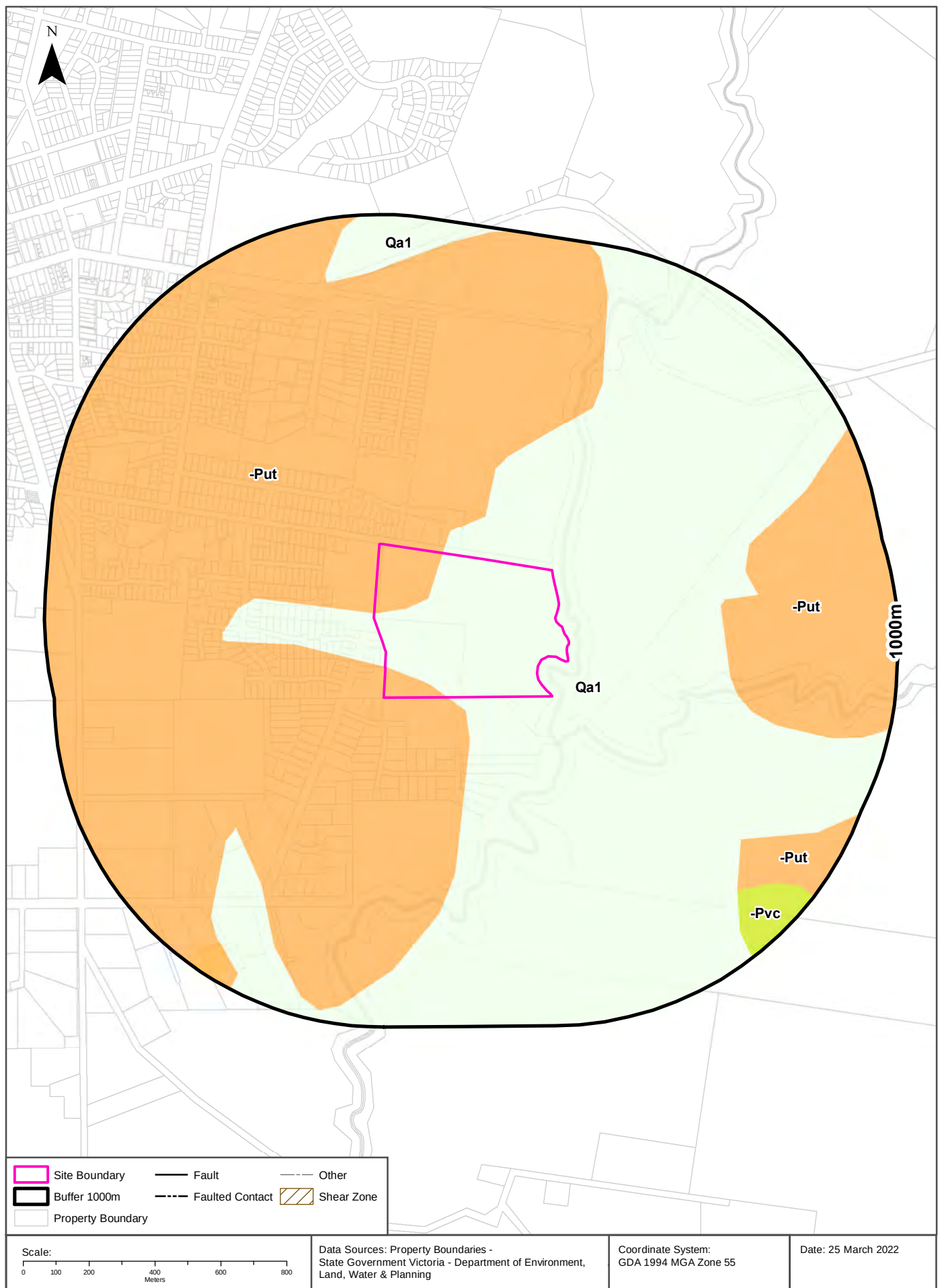
Map Id	Name	Source	Depth (m)	Collar (ft)	Fill/Cap Method	Location Desc	Location Accuracy	Distance	Direction
N/A	No records in buffer								

Historical Mining Activity Data Custodian: State Government Victoria - Dept of Economic Development, Jobs, Transport & Resources

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Geology

108-110 Parr Street, Leongatha, VIC 3953



Geology

108-110 Parr Street, Leongatha, VIC 3953

Geological Units 1:250,000

What are the Geological Units within the dataset buffer?

Symbol	Name	Description	Geological Age	Lithology	Distance	Direction
Qa1	alluvium(Qa1): generic	Gravel, sand, silt: variably sorted and rounded; generally unconsolidated; includes deposits of low terraces; alluvial floodplain deposits	Pleistocene to Holocene	gravel material (significant); sand (significant); silt material (significant)	0m	On-site
-Put	Thorpdale Volcanic Group (-Put): Generic	Tholeiitic and alkalic basalt; minor nephelinite, basanite, nepheline hawaiite, hawaiite, mugearite, nepheline mugearite, tuff, interbedded sandstone and silcrete.	Paleocene to Miocene	tholeiitic basalt (significant); alkali basalt (significant); nephelinite (minor proportion); basanite (minor proportion)	0m	On-site
-Pvc	Childers Formation (-Pvc): Childers Formation	Sandstone, conglomerate, clay, sand, gravel; fluvial deposits	Eocene to Eocene	sandstone (significant); conglomerate (significant); clay lithology (significant); sand (significant)	812m	South East

Geology Data Custodian: State Government Victoria - Dept of Economic Development, Jobs, Transport & Resources
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Geology

108-110 Parr Street, Leongatha, VIC 3953

Geological Structures 1:250,000

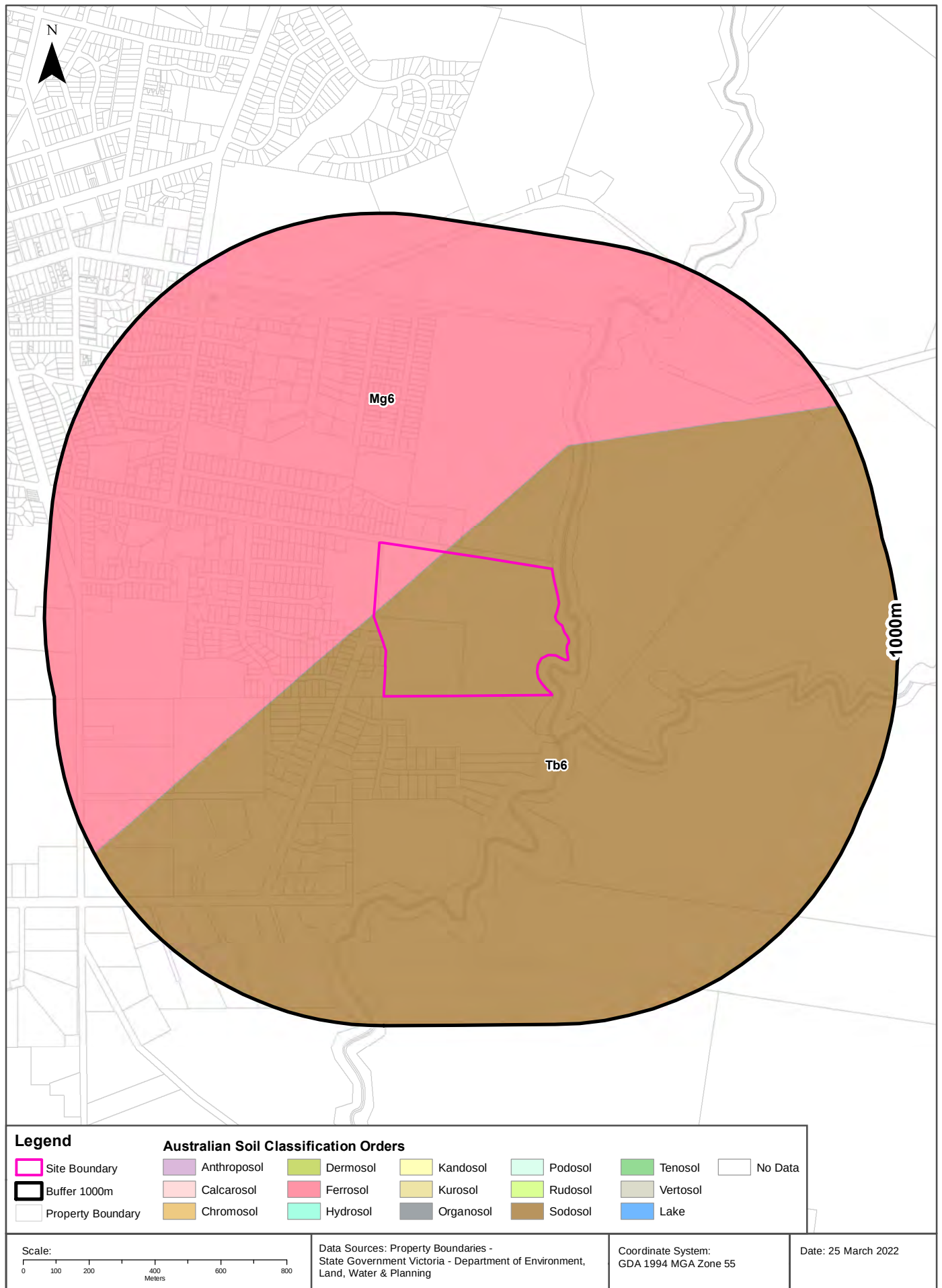
What are the Geological Faults or Faulted Contacts within the dataset buffer?

Map Id	Type	Name	Contact	Positional Accuracy	Distance	Direction
N/A	No records in buffer					

What are the Shear Zones within the dataset buffer?

Map Id	Type	Name	Description	Positional Accuracy	Distance	Direction
N/A	No records in buffer					

Geology Data Custodian: State Government Victoria - Dept of Economic Development, Jobs, Transport & Resources
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Soils

108-110 Parr Street, Leongatha, VIC 3953

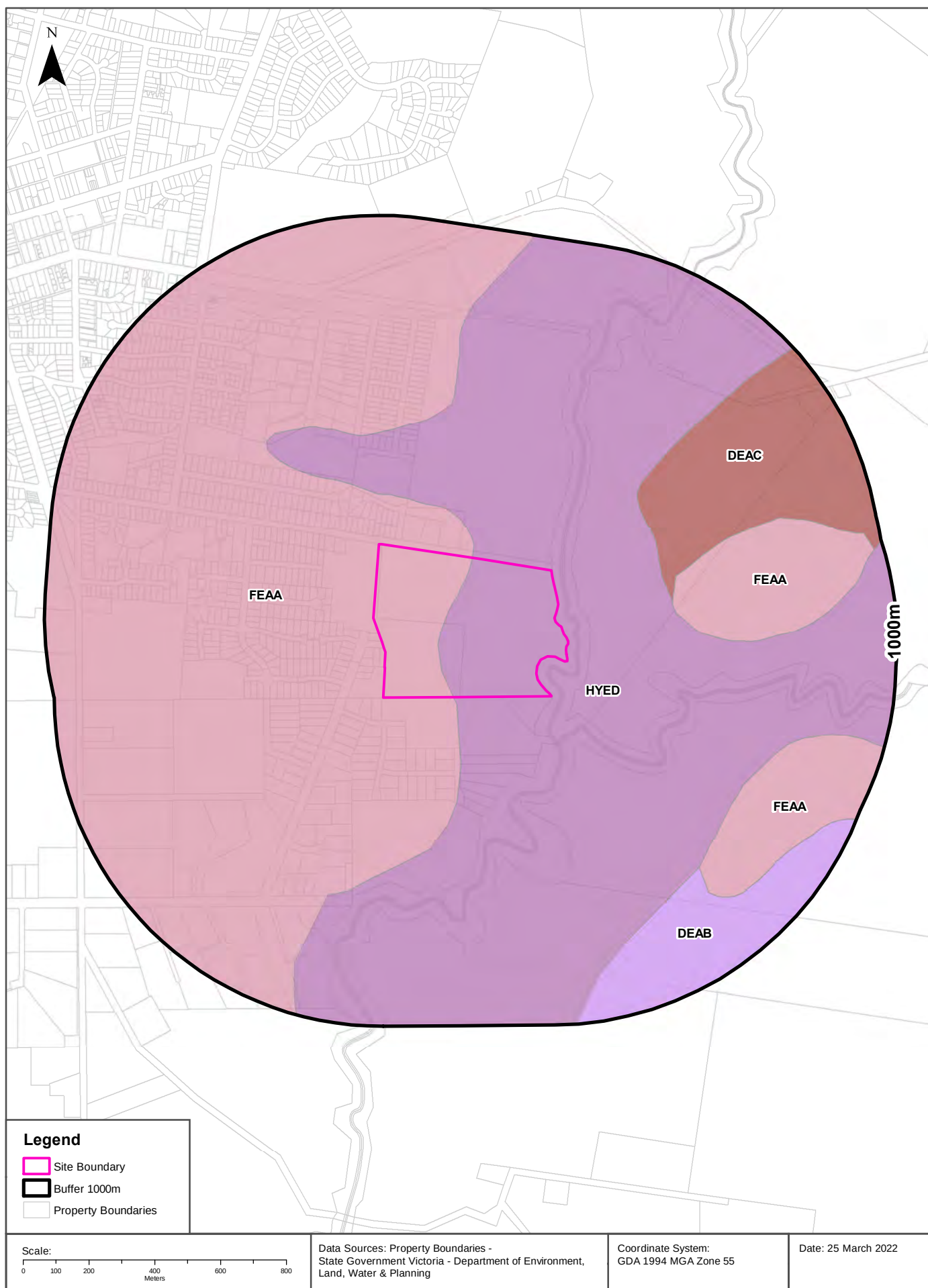
Atlas of Australian Soils

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

Map Unit Code	Soil Order	Map Unit Description	Distance	Direction
Tb6	Sodosol	Hilly areas of hard acidic yellow mottled soils (Dy3.41, Dy3.61) with various kinds of leached sands (Uc2.3) and other undescribed soils in the stream valleys; small areas of unit A5 along the coast.	0m	On-site
Mg6	Ferrosol	Low, rolling and rounded hills separated by numerous small valley plains: hills and hill slopes of red friable porous earths (Gn4.11), possibly with small areas of other undescribed soils; small valley plains of various yellow mottled soils (Dy5) and possibly (Dy3) and with other undescribed soils adjacent to the creeks, high seasonal water-table in the valley plains.	0m	On-site

Atlas of Australian Soils Data Source: CSIRO

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Soils

108-110 Parr Street, Leongatha, VIC 3953

Victorian Soil Type Mapping

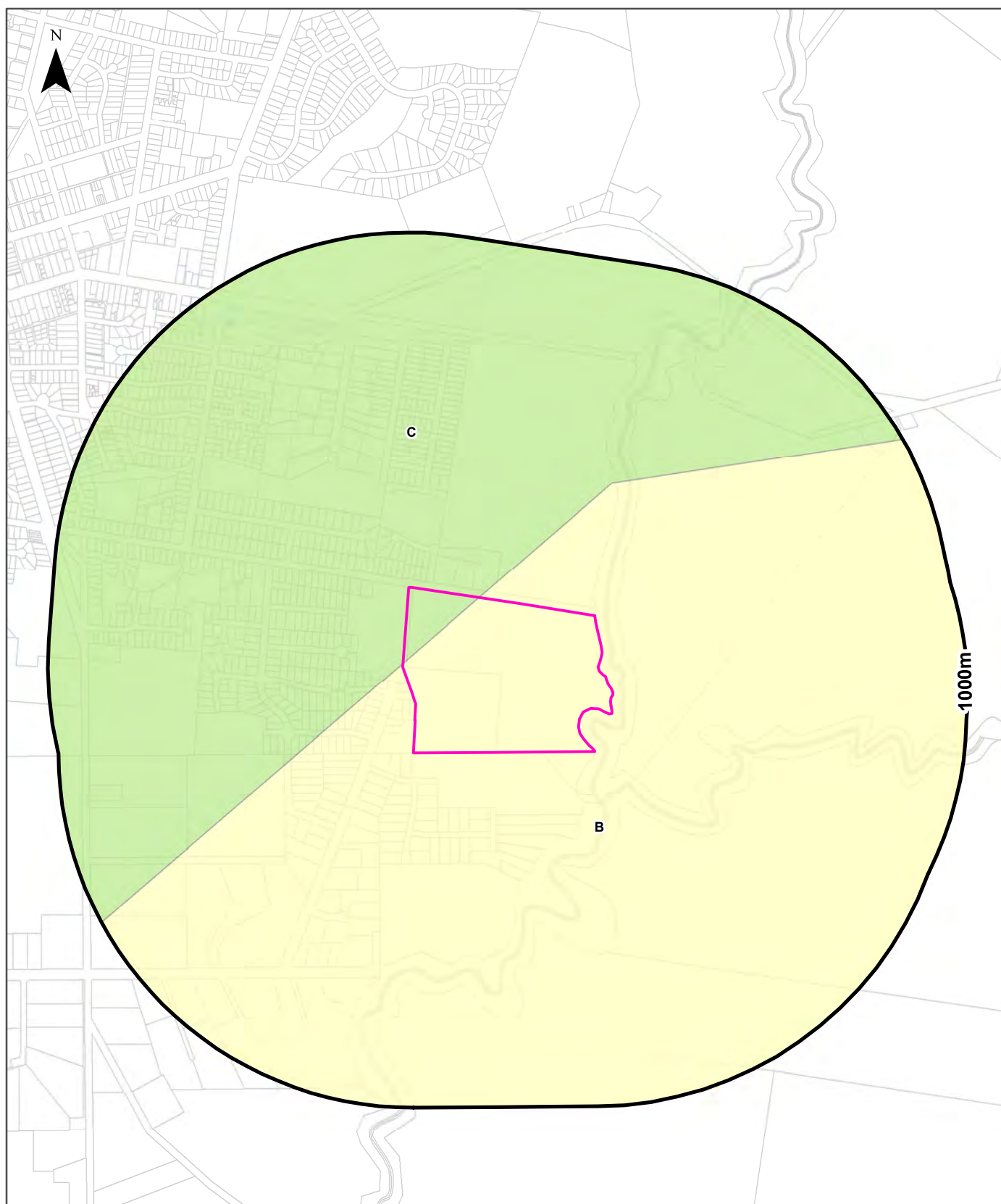
Victorian Soil Types within the dataset buffer:

Symbol	Description	Distance	Direction
HYED	Redoxic Hydrosols	0m	On-site
FEAA	Red Ferrosols	0m	On-site
DEAC	Yellow Dermosols	321m	North East
DEAB	Brown Dermosols	685m	South East

Victorian Soil Type Mapping Data Source: Department of Economic Development, Jobs, Transport and Resources
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Atlas of Australian Acid Sulfate Soils

108-110 Parr Street, Leongatha, VIC 3953



Legend

 Site Boundary

 Buffer 1000m

 Property Boundary

Probability of occurrence of Acid Sulfate Soils

 A. High (>70%)

 B. Low (6-70%)

 C. Extremely Low (1-5%)

 D. No Chance (0%)

 No Data

Scale:

0 100 200 400 600 800
Meters

Data Sources: Property Boundaries & Topographic Data:
State of Victoria - Department of Environment and Primary
Industries

Coordinate System:
GDA 1994 MGA Zone 55

Date: 25 March 2022

Acid Sulfate Soils

108-110 Parr Street, Leongatha, VIC 3953

Atlas of Australian Acid Sulfate Soils

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

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

Atlas of Australian Acid Sulfate Soils Data Source: CSIRO

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Acid Sulfate Soils

108-110 Parr Street, Leongatha, VIC 3953

Coastal Acid Sulfate Soils

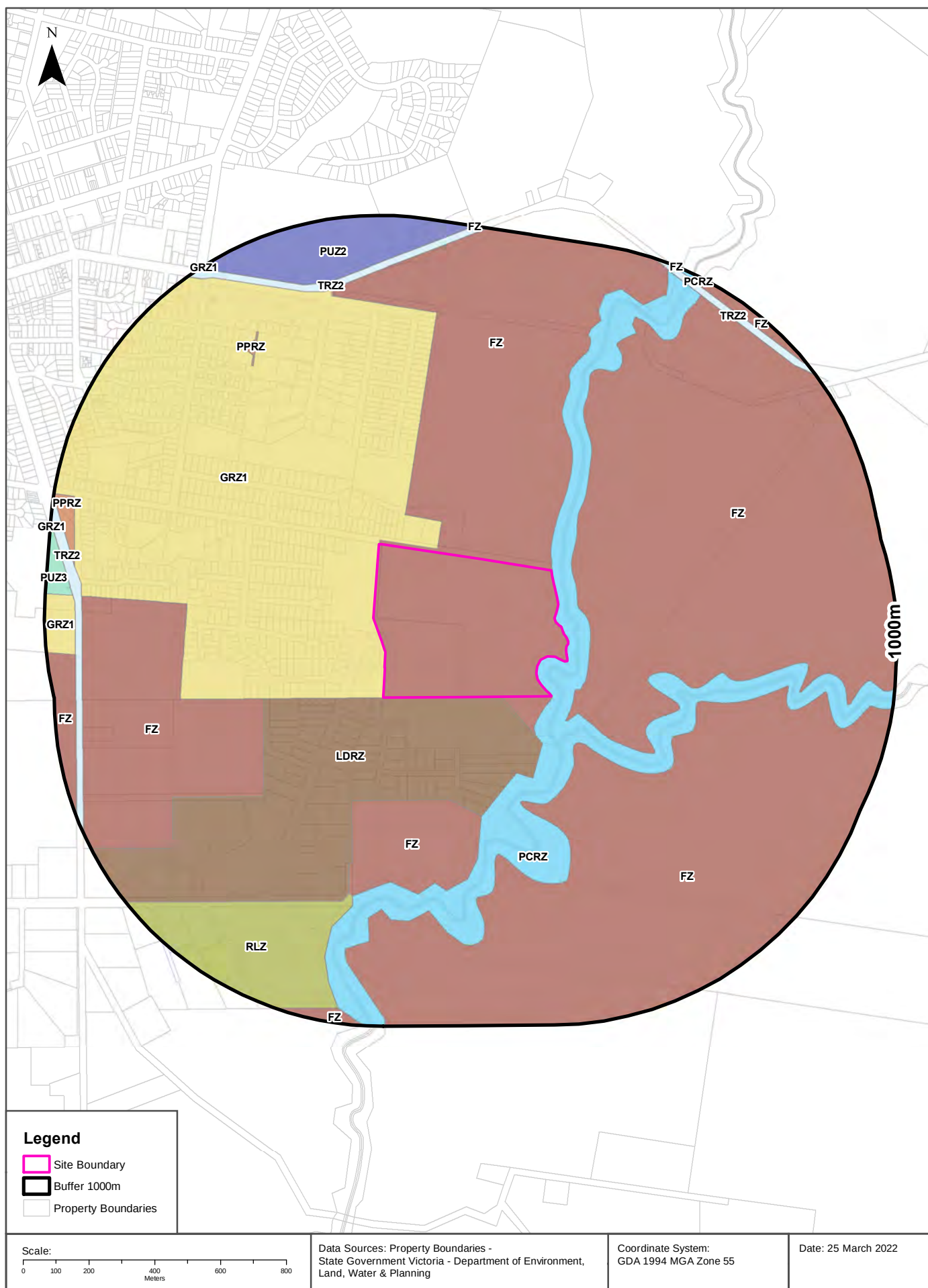
Coastal Acid Sulfate Soil types within the dataset buffer:

Coastal Acid Sulfate Soil Types	Distance	Direction
No records in buffer		

Coastal Acid Sulfate Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
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Planning Zones

108-110 Parr Street, Leongatha, VIC 3953



Planning

108-110 Parr Street, Leongatha, VIC 3953

Planning Zones

Planning zones within the dataset buffer:

Zone Code	Description	Distance	Direction
FZ	FARMING ZONE	0m	On-site
LDRZ	LOW DENSITY RESIDENTIAL ZONE	0m	South West
PCRZ	PUBLIC CONSERVATION AND RESOURCE ZONE	0m	South East
GRZ1	GENERAL RESIDENTIAL ZONE - SCHEDULE 1	0m	North West
FZ	FARMING ZONE	58m	East
FZ	FARMING ZONE	161m	South East
FZ	FARMING ZONE	312m	South
FZ	FARMING ZONE	365m	West
RLZ	RURAL LIVING ZONE	603m	South West
PPRZ	PUBLIC PARK AND RECREATION ZONE	664m	North West
TRZ2	TRANSPORT ZONE 2 - PRINCIPAL ROAD NETWORK	786m	North West
PUZ2	PUBLIC USE ZONE - EDUCATION	812m	North
GRZ1	GENERAL RESIDENTIAL ZONE - SCHEDULE 1	907m	West
FZ	FARMING ZONE	913m	West
PPRZ	PUBLIC PARK AND RECREATION ZONE	917m	West
PUZ3	PUBLIC USE ZONE - HEALTH AND COMMUNITY	917m	West
FZ	FARMING ZONE	954m	South
FZ	FARMING ZONE	963m	North East
PCRZ	PUBLIC CONSERVATION AND RESOURCE ZONE	976m	North East
GRZ1	GENERAL RESIDENTIAL ZONE - SCHEDULE 1	987m	North West
FZ	FARMING ZONE	990m	North East

Planning Zone Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
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Planning Overlays

108-110 Parr Street, Leongatha, VIC 3953



Planning

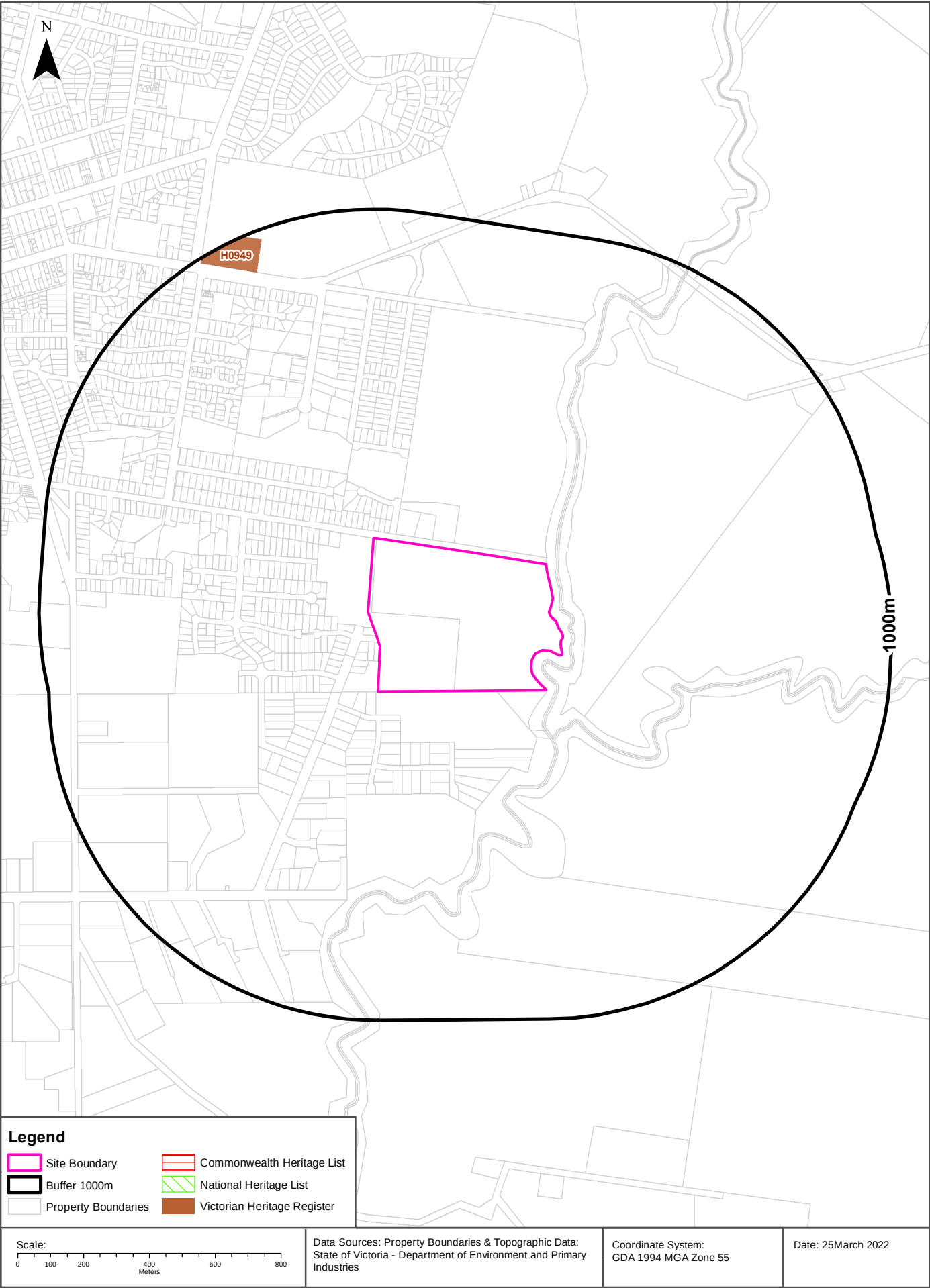
108-110 Parr Street, Leongatha, VIC 3953

Planning Overlays

Planning overlays within the dataset buffer:

Zone Code	Description	Distance	Direction
ESO5	ENVIRONMENTAL SIGNIFICANCE OVERLAY - SCHEDULE 5	0m	On-site
ESO2	ENVIRONMENTAL SIGNIFICANCE OVERLAY - SCHEDULE 2	0m	On-site
LSIO	LAND SUBJECT TO INUNDATION OVERLAY	0m	On-site
ESO5	ENVIRONMENTAL SIGNIFICANCE OVERLAY - SCHEDULE 5	101m	North West
DDO9	DESIGN AND DEVELOPMENT OVERLAY - SCHEDULE 9	569m	West
HO72	HERITAGE OVERLAY (HO72)	884m	North West
DDO8	DESIGN AND DEVELOPMENT OVERLAY - SCHEDULE 8	907m	West

Planning Overlay Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
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Heritage

108-110 Parr Street, Leongatha, VIC 3953

Commonwealth Heritage List

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

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

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

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

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

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

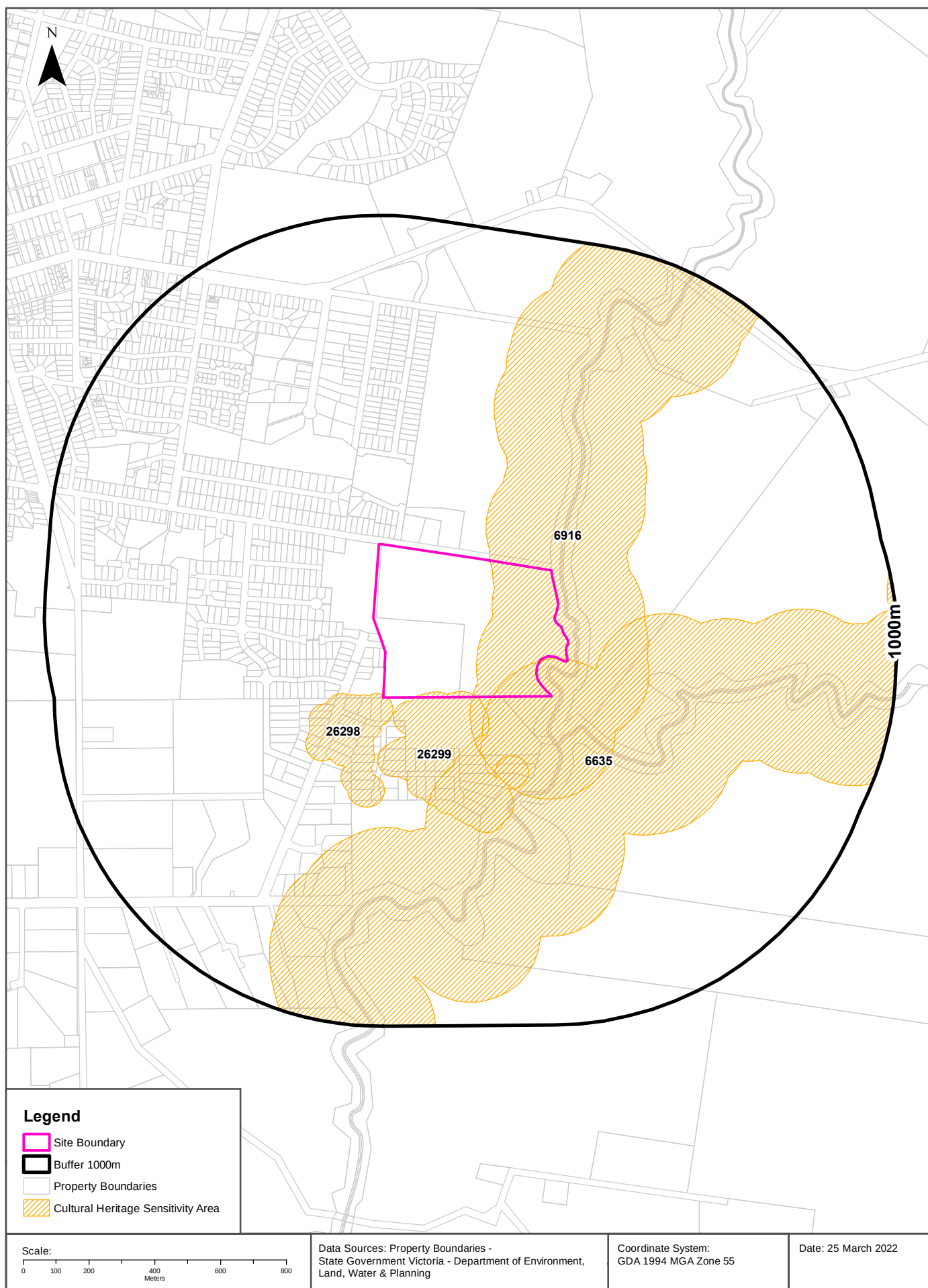
Heritage Data Source: Australian Government Department of the Environment and Energy - Heritage Branch
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Victorian Heritage Register

What are the Victorian Heritage Register items located within the dataset buffer?:

VHR Number	Description	Distance	Direction
H0949	LEONGATHA SECONDARY COLLEGE	884m	North West

Victorian Heritage Register Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
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Heritage

108-110 Parr Street, Leongatha, VIC 3953

Cultural Heritage Sensitivity

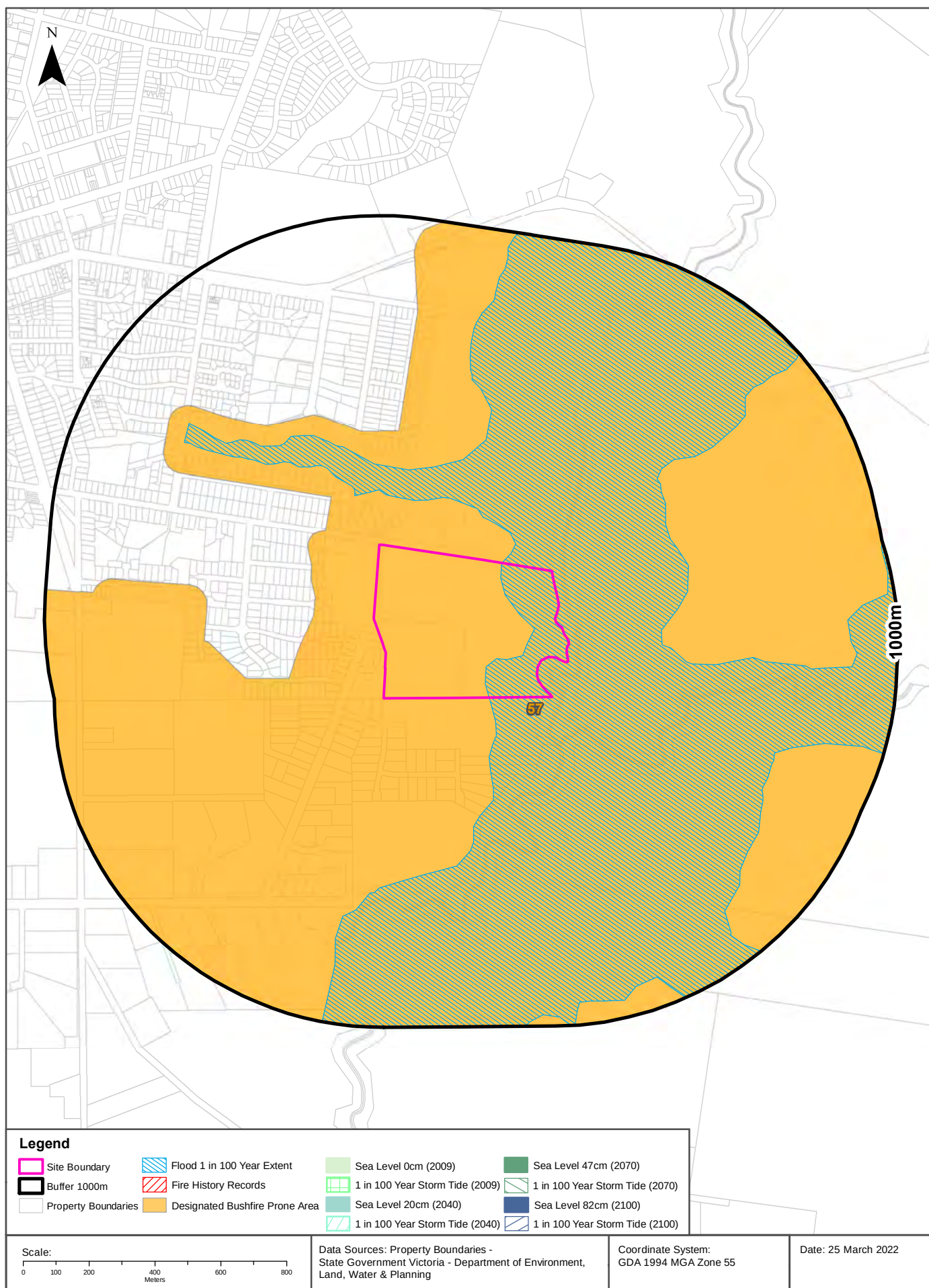
Areas of Cultural Heritage Sensitivity as specified in Division 3 of Part 2 in the Victorian Aboriginal Heritage Regulations 2018, within the dataset buffer:

Map Id	Distance	Direction
6916	0m	On-site
6635	0m	On-site
26299	0m	On-site
26298	0m	South West

Cultural Heritage Sensitivity Data Custodian: State Government Victoria - Department of Premier and Cabinet
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Natural Hazards

108-110 Parr Street, Leongatha, VIC 3953



Natural Hazards

108-110 Parr Street, Leongatha, VIC 3953

Bushfire Prone Areas

What are the designated bushfire prone areas within the dataset buffer?

Map ID	Feature	Plan No	LGA	Gazetted Date	Distance	Direction
57	Designated Bushfire Prone Area	LEGL./19-222	SOUTH GIPPSLAND	10/09/2019	0m	On-site

Bushfire Prone Area Data Custodian: State Government Victoria - Dept of Transport, Planning & Local Infrastructure
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Fire History

What are the fire history records of fires primarily on public land, within the dataset buffer?

Map Id	Fire Type	Fire Key	Season	Fire No	Fire Name	Treatment	Fire Cover	Start Date	Dist (m)	Direction
N/A	No records in buffer									

Fire History Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
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Flood - 1 in 100 year modelled flood extent

What 1 in 100 year flood extent features exist within the dataset buffer?

Feature	Source	Method	Scale	Modified Date	Distance	Direction
100 Year Flood Outline	West Gippsland CMA	Reasonable contour info and some flood info	15840	01/03/2012	0m	On-site

Flood Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
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Natural Hazards

108-110 Parr Street, Leongatha, VIC 3953

Victorian Coastal Inundation Sea Level Rise

What coastal inundation sea level rise features exist within the dataset buffer?

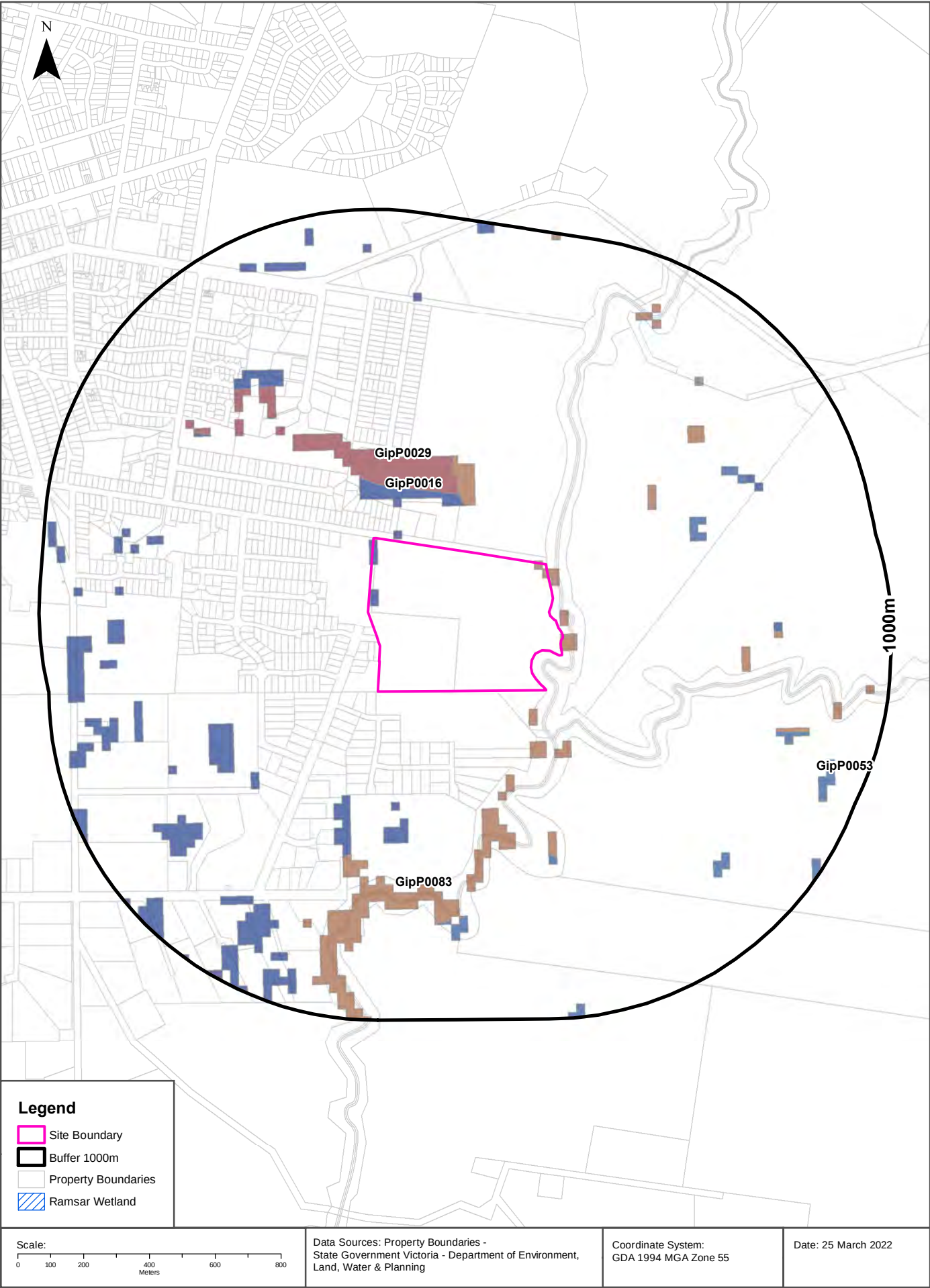
Description	Distance	Direction
No records in buffer		

Victorian Coastal Inundation Sea Level Rise Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning

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Ecological Constraints - Native Vegetation 2005 & Ramsar Wetlands

108-110 Parr Street, Leongatha, VIC 3953



Ecological Constraints

108-110 Parr Street, Leongatha, VIC 3953

Native Vegetation (Modelled 2005 Ecological Vegetation Classes)

What native vegetation exists within the dataset buffer?

Veg Code	EVC Name	EVCCode	Group	Subgroup	Bioregion	Conservation Status	Geographic Occurance	Dist	Dir
GipP0016	Lowland Forest	0016	Lowland Forests		Gippsland Plain	Vulnerable	Common	0m	On-site
GipP0083	Swampy Riparian Woodland	0083	Riparian Scrubs or Swampy Scrubs and Woodlands		Gippsland Plain	Endangered	Common	0m	On-site
GipP0029	Damp Forest	0029	Wet or Damp Forests	Damp	Gippsland Plain	Endangered	Minor	163m	North West
GipP0053	Swamp Scrub	0053	Riparian Scrubs or Swampy Scrubs and Woodlands		Gippsland Plain	Endangered	Common	441m	East

Native Vegetation Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
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Ramsar Wetlands

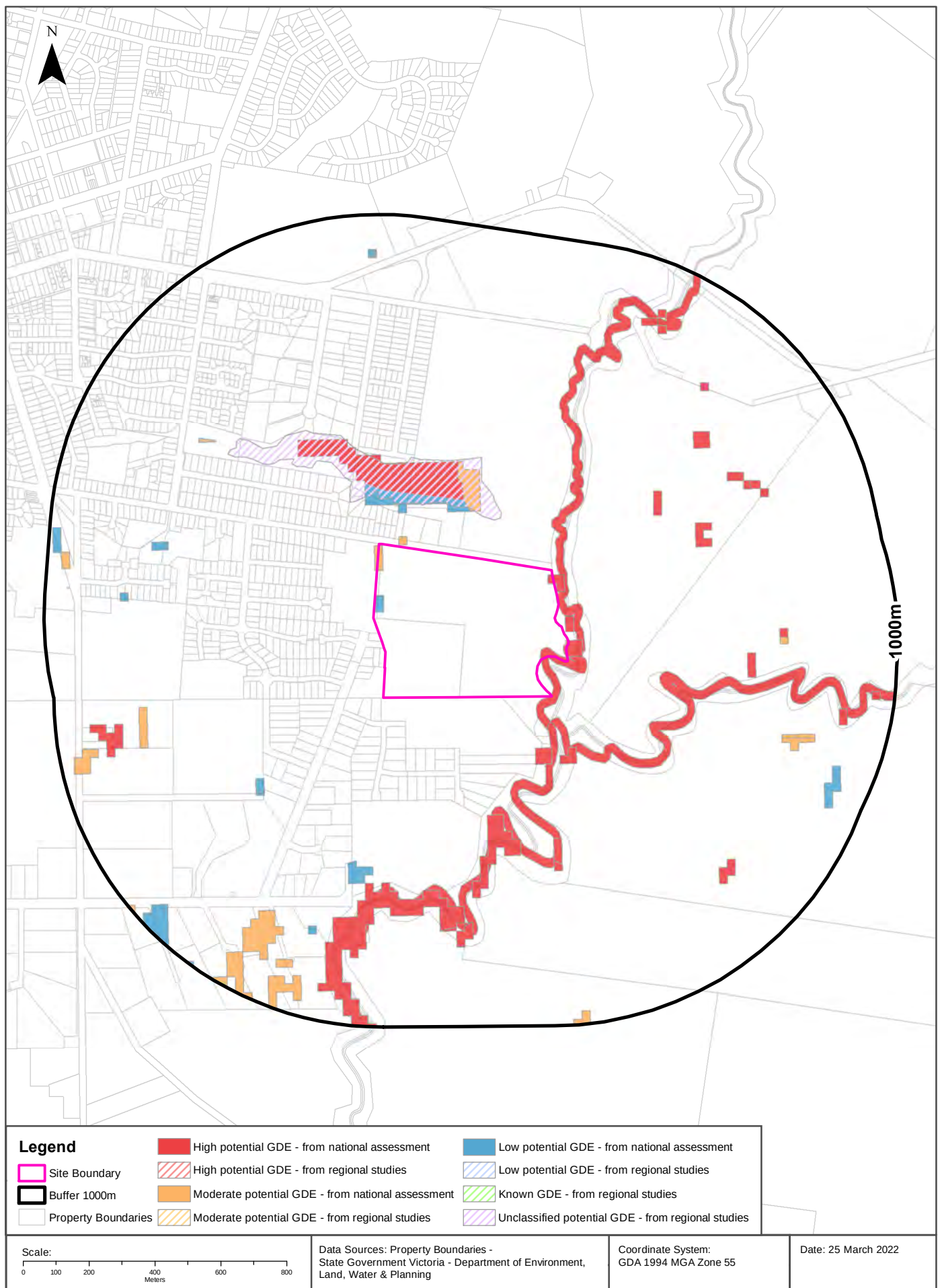
What Ramsar wetland areas exist within the dataset buffer?

Map ID	Site Name	Lake Name	Distance	Direction
N/A	No records in buffer			

Ramsar Wetland Area Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
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Ecological Constraints - Groundwater Dependent Ecosystems Atlas

108-110 Parr Street, Leongatha, VIC 3953



Ecological Constraints

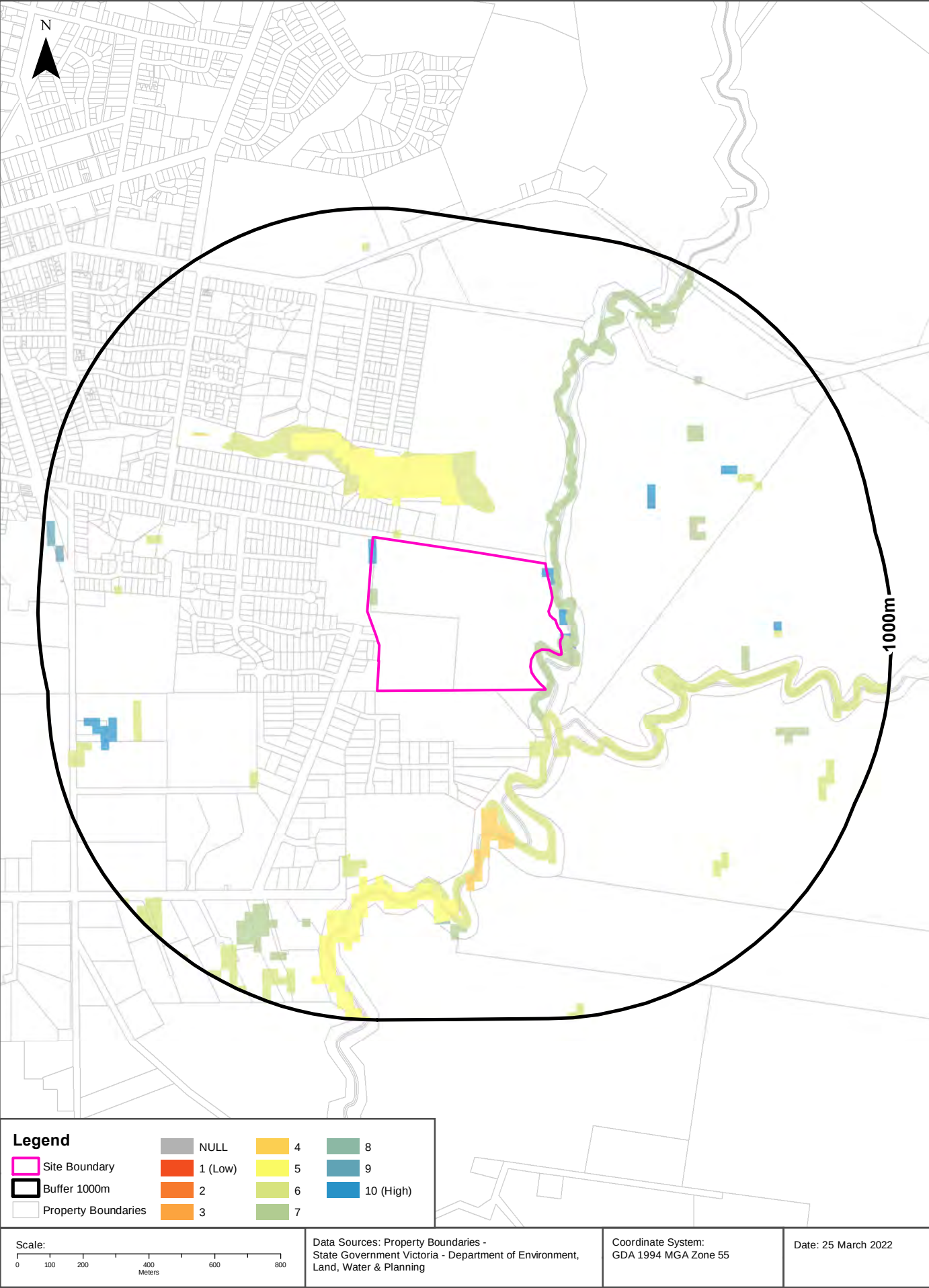
108-110 Parr Street, Leongatha, VIC 3953

Groundwater Dependent Ecosystems Atlas

Type	Name	GDE Potential	Geomorphology	Ecosystem Type	Aquifer Geology	Distance	Direction
Aquatic	COALITION CREEK	High potential GDE - from national assessment	Low fault blocks, mainly of tilted and dissected sandstone; granite hills and islands, in two parts either side of Port Phillip Bay.	River	Unconsolidated sedimentary	0m	On-site
Terrestrial		Low potential GDE - from national assessment	Low fault blocks, mainly of tilted and dissected sandstone; granite hills and islands, in two parts either side of Port Phillip Bay.	Vegetation	Fractured rock	0m	On-site
Terrestrial		Moderate potential GDE - from national assessment	Low fault blocks, mainly of tilted and dissected sandstone; granite hills and islands, in two parts either side of Port Phillip Bay.	Vegetation	Fractured rock	0m	On-site
Terrestrial		High potential GDE - from national assessment	Low fault blocks, mainly of tilted and dissected sandstone; granite hills and islands, in two parts either side of Port Phillip Bay.	Vegetation	Unconsolidated sedimentary	0m	On-site
Aquatic	TARWIN RIVER WEST BRANCH	High potential GDE - from national assessment	Low fault blocks, mainly of tilted and dissected sandstone; granite hills and islands, in two parts either side of Port Phillip Bay.	River	Unconsolidated sedimentary	65m	East
Aquatic		Unclassified potential GDE - from regional studies	Low fault blocks, mainly of tilted and dissected sandstone; granite hills and islands, in two parts either side of Port Phillip Bay.	Wetland		124m	North West
Terrestrial		High potential GDE - from national assessment	Low fault blocks, mainly of tilted and dissected sandstone; granite hills and islands, in two parts either side of Port Phillip Bay.	Vegetation	Fractured rock	163m	North West
Terrestrial		Moderate potential GDE - from national assessment	Low fault blocks, mainly of tilted and dissected sandstone; granite hills and islands, in two parts either side of Port Phillip Bay.	Vegetation	Unconsolidated sedimentary	688m	East
Terrestrial		Low potential GDE - from national assessment	Low fault blocks, mainly of tilted and dissected sandstone; granite hills and islands, in two parts either side of Port Phillip Bay.	Vegetation	Unconsolidated sedimentary	863m	South East

Groundwater Dependent Ecosystems Atlas Data Source: The Bureau of Meteorology

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Ecological Constraints

108-110 Parr Street, Leongatha, VIC 3953

Inflow Dependent Ecosystems Likelihood

Type	Name	IDE Likelihood	Geomorphology	Ecosystem Type	Aquifer Geology	Distance	Direction
Aquatic	COALITION CREEK	7	Low fault blocks, mainly of tilted and dissected sandstone; granite hills and islands, in two parts either side of Port Phillip Bay.	River	Unconsolidated sedimentary	0m	On-site
Terrestrial		7	Low fault blocks, mainly of tilted and dissected sandstone; granite hills and islands, in two parts either side of Port Phillip Bay.	Vegetation	Fractured rock	0m	On-site
Terrestrial		10	Low fault blocks, mainly of tilted and dissected sandstone; granite hills and islands, in two parts either side of Port Phillip Bay.	Vegetation	Fractured rock	0m	On-site
Terrestrial		10	Low fault blocks, mainly of tilted and dissected sandstone; granite hills and islands, in two parts either side of Port Phillip Bay.	Vegetation	Unconsolidated sedimentary	0m	On-site
Terrestrial		6	Low fault blocks, mainly of tilted and dissected sandstone; granite hills and islands, in two parts either side of Port Phillip Bay.	Vegetation	Fractured rock	4m	North West
Aquatic	TARWIN RIVER WEST BRANCH	6	Low fault blocks, mainly of tilted and dissected sandstone; granite hills and islands, in two parts either side of Port Phillip Bay.	River	Unconsolidated sedimentary	65m	East
Aquatic	TARWIN RIVER WEST BRANCH	5	Low fault blocks, mainly of tilted and dissected sandstone; granite hills and islands, in two parts either side of Port Phillip Bay.	River	Unconsolidated sedimentary	73m	South East
Aquatic	TARWIN RIVER WEST BRANCH	10	Low fault blocks, mainly of tilted and dissected sandstone; granite hills and islands, in two parts either side of Port Phillip Bay.	River	Unconsolidated sedimentary	94m	South East
Terrestrial		5	Low fault blocks, mainly of tilted and dissected sandstone; granite hills and islands, in two parts either side of Port Phillip Bay.	Vegetation	Fractured rock	102m	North West
Aquatic		6	Low fault blocks, mainly of tilted and dissected sandstone; granite hills and islands, in two parts either side of Port Phillip Bay.	Wetland		124m	North West
Terrestrial		6	Low fault blocks, mainly of tilted and dissected sandstone; granite hills and islands, in two parts either side of Port Phillip Bay.	Vegetation	Unconsolidated sedimentary	156m	South East
Terrestrial		4	Low fault blocks, mainly of tilted and dissected sandstone; granite hills and islands, in two parts either side of Port Phillip Bay.	Vegetation	Unconsolidated sedimentary	358m	South
Terrestrial		7	Low fault blocks, mainly of tilted and dissected sandstone; granite hills and islands, in two parts either side of Port Phillip Bay.	Vegetation	Unconsolidated sedimentary	441m	East
Terrestrial		4	Low fault blocks, mainly of tilted and dissected sandstone; granite hills and islands, in two parts either side of Port Phillip Bay.	Vegetation	Fractured rock	584m	North West
Terrestrial		5	Low fault blocks, mainly of tilted and dissected sandstone; granite hills and islands, in two parts either side of Port Phillip Bay.	Vegetation	Unconsolidated sedimentary	684m	South
Terrestrial		8	Low fault blocks, mainly of tilted and dissected sandstone; granite hills and islands, in two parts either side of Port Phillip Bay.	Vegetation	Unconsolidated sedimentary	698m	South
Terrestrial		9	Low fault blocks, mainly of tilted and dissected sandstone; granite hills and islands, in two parts either side of Port Phillip Bay.	Vegetation	Fractured rock	929m	West

Inflow Dependent Ecosystems Likelihood Data Source: The Bureau of Meteorology
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LC Code	Location Confidence
Premise Match	Georeferenced to the site location / premise or part of site
Area Match	Georeferenced to an approximate or general area
Road Match	Georeferenced to a road or rail corridor
Road Intersection	Georeferenced to a road intersection
Buffered Point	A point feature buffered to x metres
Adjacent Match	Land adjacent to a georeferenced feature
Network of Features	Georeferenced to a network of features
Suburb Match	Georeferenced to a suburb boundary
As Supplied	Spatial data supplied by provider

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APPENDIX B

Other Records Reviewed

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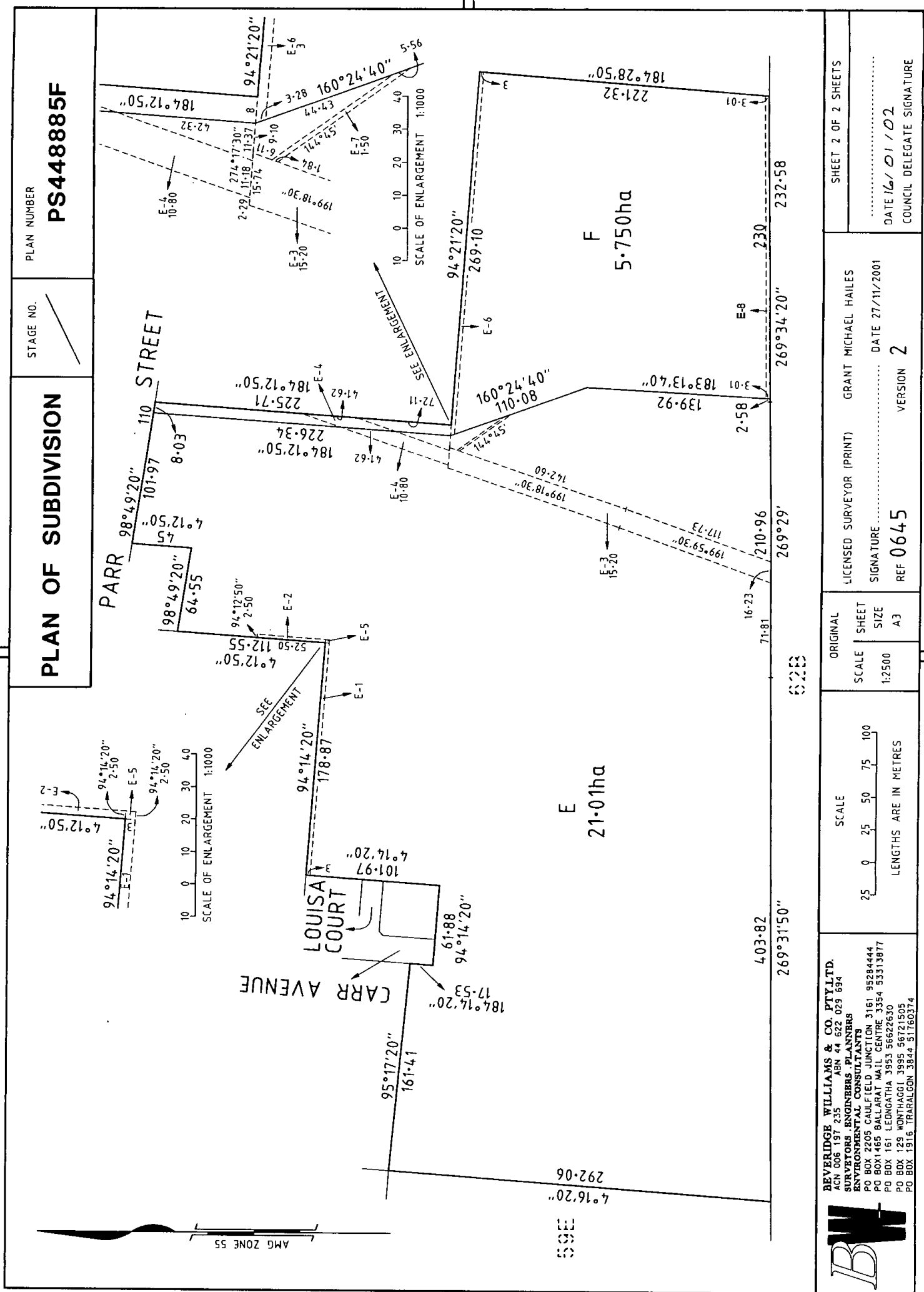
Document Type	Plan
Document Identification	PS448885F
Number of Pages (excluding this cover sheet)	3
Document Assembled	06/05/2022 23:47

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PLAN OF SUBDIVISION			STAGE NO. 	LTO use only EDITION 2	Plan Number PS448885F
Location of Land Parish: LEONGATHA Township: _____ Section: _____ Part of Crown Allotments: 598, 59D Crown Portion: _____ LTO Base Record: D.C.M.B.(RURAL) Title Reference: Vol.10601 Fol.698 Vol.10601 Fol.699 Last Plan Reference: PS439063C Lots C & D Postal Address: CARR AVENUE (at time of subdivision) LEONGATHA, 3953. AMG Co-ordinates E 409 200 ZONE: 55 (of approx. centre of land in plan) N 5 739 150			Council Certification and Endorsement Council Name: South Gippsland Shire Council Ref: 2001/267 1. This plan is certified under section 6 of the Subdivision Act 1988. ~~2. This plan is certified under section 11(7) of the Subdivision Act 1988.~~ ~~Date of original certification under section 6 / /~~ ~~3. This is a statement of compliance issued under section 21 of the Subdivision Act 1988.~~ <u>OPEN SPACE</u> (i) A requirement for public open space under section 18 of the Subdivision Act 1988 has/has not been made. (iii) The requirement has been satisfied. ~~(iii) The requirement is to be satisfied in Stage.....~~ Council Delegate Council Seal Date 16 / 01 / 2002 ~~Re-certified under section 11(7) of the Subdivision Act 1988.~~ ~~Council Delegate~~ ~~Council Seal~~ ~~Date / /~~		
Vesting of Roads and / or Reserves			Notations		
Identifier	Council/Body/Person		Staging This is not a staged subdivision Planning Permit No. 01267 Depth Limitation 15.24 METRES BELOW THE SURFACE APPLIES TO ALL THE LAND IN THIS PLAN. The land being subdivided is enclosed within thick continuous lines. Lots A, B, C and D have been omitted from this plan.		
NIL	NIL				
Easement Information			LTO use only		
Legend: E - Encumbering Easement or Condition in Crown Grant in the Nature of an Easement A - Appurtenant Easement R - Encumbering Easement (Road)			Statement of Compliance/Exemption Statement		
Subject Land	Purpose	Width (Metres)	Origin	Land Benefited/In Favour Of	Received ☒ Date 11 / 02 / 02
E-1	DRAINAGE	3	PS428086B	SOUTH GIPPSLAND SHIRE COUNCIL	
	SEWERAGE	3	PS428086B	SOUTH GIPPSLAND REGION WATER AUTHORITY	
E-2	SEWERAGE	2.5	PS439063C	SOUTH GIPPSLAND REGION WATER AUTHORITY	
E-3	TRANSMISSION OF ELECTRICITY	15.20	INST.F967819	S.E.C.V.	
E-4	TRANSMISSION OF ELECTRICITY	10.80	INST.G15615	S.E.C.V.	
E-5	DRAINAGE	3	PS439063C	SOUTH GIPPSLAND SHIRE COUNCIL	
	SEWERAGE	3	PS439063C	SOUTH GIPPSLAND REGION WATER AUTHORITY	
E-6 & E-8	DRAINAGE	3	THIS PLAN	LOT E	
E-7	POWER LINE	1.50	THIS PLAN - SECTION 88 OF THE ELECTRICITY ACT 2000	TXU ELECTRICITY LIMITED	
E-8	DRAINAGE	3	C/E AK015177S	SOUTH GIPPSLAND SHIRE COUNCIL	
BEVERIDGE WILLIAMS & CO. PTY.LTD. ACN 006 197 235 ABN 44 622 029 694 SURVEYORS ENGINEERS PLANNERS ENVIRONMENTAL CONSULTANTS PO BOX 2205 CAULFIELD JUNCTION 3161 95284444 PO BOX1465 BALLARAT MAIL CENTRE 3354 53313877 PO BOX 161 LEONGATHA 3953 56622630 PO BOX 129 WORTHAGGI 3995 56721505 PO BOX 1916 TRARALGON 3844 51760374			LICENSED SURVEYOR GRANT MICHAEL HAILES (PRINT) SIGNATURE DATE 27/11/2001 REF. 0645 VERSION 2		LTO use only PLAN REGISTERED Time 12.41 pm Date 7 / 03 / 02 Assistant Registrar of Titles Sheet 1 of 2 Sheets DATE 16 / 01 / 02 COUNCIL DELEGATE SIGNATURE Original sheet size A3



HISTORICAL SEARCH STATEMENT

Land Use Victoria

Page 1 of 3

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108 Parr St

Volume 10635 Folio 158

Folio Creation: Created as a computer folio

Parent titles :

Volume 10601 Folio 698 to Volume 10601 Folio 699

RECORD OF HISTORICAL DEALINGS

Date Lodged for Registration	Date Recorded on Register	Dealing	Imaged	Dealing Type and Details

RECORD OF VOTS DEALINGS

Date Lodged for Registration	Date Recorded on Register	Dealing	Imaged

09/09/2002	09/09/2002	AB544525W	Y

DISCHARGE OF MORTGAGE
MORTGAGE(S) REMOVED
S640320F
U655052S

09/09/2002	09/09/2002	AB544526U	Y

TRANSFER OF LAND BY ENDORSEMENT

FROM:
ROBERT JAMES CAMPBELL
TO:

LUCINDA MARGARET THOMPSON

RESULTING PROPRIETORSHIP:
Estate Fee Simple
Sole Proprietor

LUCINDA MARGARET THOMPSON of 132 WELLINGTON STREET EAST MELBOURNE
VIC 3002
AB544526U 09/09/2002

09/09/2002	09/09/2002	AB544527S	Y

MORTGAGE OF LAND
MORTGAGE AB544527S 09/09/2002
COMMONWEALTH BANK OF AUSTRALIA

09/11/2012	28/11/2012	AK015177S	Y

PLAN OF CREATION OF EASEMENT

05/02/2021	05/02/2021	AU021706U (E)	N

CAVEAT

CAVEAT AU021706U 05/02/2021
Caveator
JUSTIN ARDEN JENKINS
LISA LYN JENKINS

HISTORICAL SEARCH STATEMENT

Land Use Victoria

Page 2 of 3

Grounds of Claim

LEASE WITH THE FOLLOWING PARTIES AND DATE.

Parties

THE REGISTERED PROPRIETOR(S)

Date

01/07/2020

Estate or Interest

LEASEHOLD ESTATE

Prohibition

TRANSFER OF LAND

Lodged by

WRP LEGAL & ADVISORY

Notices to

ANTHEA PAZIOS of LEVEL 9 182 VICTORIA SQUARE ADELAIDE SA 5000

10/03/2022

10/03/2022

AV412847M (E)

N

CAVEAT

CAVEAT AV412847M 10/03/2022

Caveator

108 PARR ST PTY LTD

Grounds of Claim

PURCHASERS' CONTRACT WITH THE FOLLOWING PARTIES AND DATE.

Parties

THE REGISTERED PROPRIETOR(S)

Date

23/02/2022

Estate or Interest

FREEHOLD ESTATE

Prohibition

ABSOLUTELY

Lodged by

KOORNANG LEGAL SERVICES

Notices to

DANIEL DE PASQUALE of 21 HUME DRIVE LYSTERFIELD VIC 3156

STATEMENT END

VOTS Snapshot

Volume 10635 Folio 158

124000762047R

Produced 07/03/2002 12:41 am

LAND DESCRIPTION

Lot F on Plan of Subdivision 448885F.

PARENT TITLES :

Volume 10601 Folio 698 to Volume 10601 Folio 699

Created by instrument PS448885F 07/03/2002

REGISTERED PROPRIETOR

Estate Fee Simple

Sole Proprietor

ROBERT JAMES CAMPBELL of PARR STREET LEONGATHA 3953

PS448885F 07/03/2002

HISTORICAL SEARCH STATEMENT

Land Use Victoria

Page 3 of 3

ENCUMBRANCES, CAVEATS AND NOTICES

MORTGAGE S640320F 18/08/1993
COMMONWEALTH BANK OF AUSTRALIA

MORTGAGE U655052S 26/02/1997
COMMONWEALTH BANK OF AUSTRALIA

Any encumbrances created by Section 98 Transfer of Land Act 1958 or Section 24 Subdivision Act 1988 and any other encumbrances shown or entered on the plan set out under DIAGRAM LOCATION below.

DIAGRAM LOCATION

SEE PS448885F FOR FURTHER DETAILS AND BOUNDARIES

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The document is invalid if this cover sheet is removed or altered.

TITLE PLAN		EDITION 2	TP 615766W						
Location of Land Parish: LEONGATHA Township: Section: Crown Allotment: Crown Portion: Last Plan Reference: LP 98405 Derived From: VOL 8988 FOL 043 Depth Limitation: 50 FEET (CA 59B)		Notations WATERWAY NOTATION: LAND IN THIS PLAN MAY ABUT CROWN LAND THAT MAY BE SUBJECT TO A CROWN LICENCE TO USE ANY REFERENCE TO MAP IN THE TEXT MEANS THE DIAGRAM SHOWN ON THIS TITLE PLAN							
Description of Land / Easement Information ENCUMBRANCES REFERRED TO As to <u>any</u> land coloured blue <u>THE EASEMENT</u> to SHIRE OF WOORAYL created by Instrument E.448673 ---- E-1 = EASEMENT TO SEC CREATED BY C/E K25929 E-2 = DRAINAGE IN FAVOUR OF SOUTH GIPPSLAND SHIRE COUNCIL VIDE C/E AK015183X		THIS PLAN HAS BEEN PREPARED FOR THE LAND REGISTRY, LAND VICTORIA, FOR TITLE DIAGRAM PURPOSES AS PART OF THE LAND TITLES AUTOMATION PROJECT COMPILED: 27/11/2003 VERIFIED: AH							
GOVERNMENT ROAD COLOUR CODE BL = BLUE									
<table><tr><th colspan="2">TABLE OF PARCEL IDENTIFIERS</th></tr><tr><td colspan="2">WARNING: Where multiple parcels are referred to or shown on this Title Plan this does not imply separately disposable parcels under Section 8A of the Sale of Land Act 1962</td></tr><tr><td colspan="2">PARCEL 1 = LOT 2 ON LP 98406</td></tr></table>				TABLE OF PARCEL IDENTIFIERS		WARNING: Where multiple parcels are referred to or shown on this Title Plan this does not imply separately disposable parcels under Section 8A of the Sale of Land Act 1962		PARCEL 1 = LOT 2 ON LP 98406	
TABLE OF PARCEL IDENTIFIERS									
WARNING: Where multiple parcels are referred to or shown on this Title Plan this does not imply separately disposable parcels under Section 8A of the Sale of Land Act 1962									
PARCEL 1 = LOT 2 ON LP 98406									
LENGTHS ARE IN LINKS		Metres = 0.3048 x Feet Metres = 0.201168 x Links	Sheet 1 of 1 sheets						

HISTORICAL SEARCH STATEMENT

Land Use Victoria

Page 1 of 7

Produced 06/05/2022 11:27 PM

Volume 8988 Folio 043

Folio Creation: Created as paper folio continued as computer folio

Parent title Volume 08076 Folio 559

THE IMAGE OF THE FOLIO CEASED TO BE THE DIAGRAM LOCATION ON 05/12/2003 02:25:38 PM

RECORD OF HISTORICAL DEALINGS

Date Lodged for Registration	Date Recorded on Register	Dealing	Imaged	Dealing Type and Details

RECORD OF VOTS DEALINGS

Date Lodged for Registration	Date Recorded on Register	Dealing	Imaged

08/11/2002	08/11/2002	AB682886P	Y

TRANSFER OF LAND BY ENDORSEMENT

FROM:

KEITH ERNEST MITCHELL WIGHTMAN

ISOBEL MILDRED WIGHTMAN

TO:

PHILIP RAYMOND JONES

JOSEPHINE NICOLE JONES

RESULTING PROPRIETORSHIP:

Estate Fee Simple

Joint Proprietors

PHILIP RAYMOND JONES

JOSEPHINE NICOLE JONES both of "AROONA" 110 PARR STREET LEONGATHA

VIC 3953

AB682886P 08/11/2002

08/11/2002	08/11/2002	AB682887M	Y

MORTGAGE OF LAND

MORTGAGE AB682887M 08/11/2002

NATIONAL AUSTRALIA BANK LIMITED

21/02/2006	21/02/2006	AE195923A	Y

CAVEAT

CAVEAT AE195923A 21/02/2006

Caveator

BEVAL PROPRIETARY LIMITED

LAMB & BELL PTY LTD

Capacity PURCHASER/FEE SIMPLE

Lodged by

OAKLEYS

Notices to

OAKLEYS WHITE of 65 MAIN STREET FOSTER VIC 3960

10/09/2007	10/09/2007	AF327619P	Y

HISTORICAL SEARCH STATEMENT

Land Use Victoria

Page 2 of 7

DISCHARGE OF MORTGAGE
MORTGAGE(S) REMOVED
AB682887M

10/09/2007	10/09/2007	AF327620F	Y

TRANSFER OF LAND BY ENDORSEMENT

FROM:
PHILIP RAYMOND JONES
JOSEPHINE NICOLE JONES

TO:
BEVAL PROPRIETARY LIMITED
LAMB & BELL PTY LTD

RESULTING PROPRIETORSHIP:
Estate Fee Simple
TENANTS IN COMMON
As to 1 of a total of 2 equal undivided shares
Sole Proprietor
BEVAL PROPRIETARY LIMITED of 3 MARTHA STREET SEAFORD VIC 3198
As to 1 of a total of 2 equal undivided shares
Sole Proprietor
LAMB & BELL PTY LTD of 3 MARTHA STREET SEAFORD VIC 3198
AF327620F 10/09/2007
AND LAPSING OF CAVEAT AE195923A

09/11/2012	28/11/2012	AK015183X	Y

PLAN OF CREATION OF EASEMENT

10/03/2022	10/03/2022	AV414308J (E)	N

CAVEAT

CAVEAT AV414308J 10/03/2022
Caveator
110 PARR ST PTY LTD
Grounds of Claim
PURCHASERS' CONTRACT WITH THE FOLLOWING PARTIES AND DATE.
Parties
THE REGISTERED PROPRIETOR(S)
Date
11/11/2021
Estate or Interest
FREEHOLD ESTATE
Prohibition
ABSOLUTELY
Lodged by
KOORNANG LEGAL SERVICES
Notices to
DANIEL DE PASQUALE of 21 HUME DRIVE Lysterfield VIC 3156

STATEMENT END

VOTS Snapshot

Volume 08988 Folio 043
124003756328N
Produced 08/11/2002 12:08 pm

LAND DESCRIPTION

HISTORICAL SEARCH STATEMENT

Land Use Victoria

Page 3 of 7

Lot 1 on Title Plan 615766W (formerly known as Lot 2 on Plan of Subdivision 098406).

PARENT TITLE Volume 08076 Folio 559

Created by instrument LP098406 06/09/1973

REGISTERED PROPRIETOR

Estate Fee Simple

Joint Proprietors

KEITH ERNEST MITCHELL WIGHTMAN

ISOBEL MILDRED WIGHTMAN both of 1 HOWARD STREET LEONGATHA

J336598 10/02/1981

ENCUMBRANCES, CAVEATS AND NOTICES

Any encumbrances created by Section 98 Transfer of Land Act 1958 or Section 24 Subdivision Act 1988 and any other encumbrances shown or entered on the plan set out under DIAGRAM LOCATION below.

DIAGRAM LOCATION

SEE DIAGRAM ON IMAGED FOLIO VOLUME 8988 FOLIO 043 FOR FURTHER DETAILS AND BOUNDARIES

Paper Title Images

8988/043 - Version 0, Date 04/03/2000

ORIGINAL

NOT TO BE TAKEN FROM THE OFFICE
OF TITLES



VICTORIA

REGISTER BOOK

VOL. 8988 FOL. 043

Certificate of Title

UNDER THE "TRANSFER OF LAND ACT"

REGINALD EDWARD CASHIN of Leongatha Farmer is the proprietor of an estate in fee simple subject to the encumbrances notified hereunder in ALL THAT piece of land coloured on the map hereon (any land coloured purple or blue being limited to so much as lies above the depth of Fifty feet below the surface) - being Lot 2 on Plan of Subdivision No.98406 Parish of Leongatha County of Buln Buln

Issued under Regulation 12
on the approval of the
above Plan of Subdivision-

E. Harris



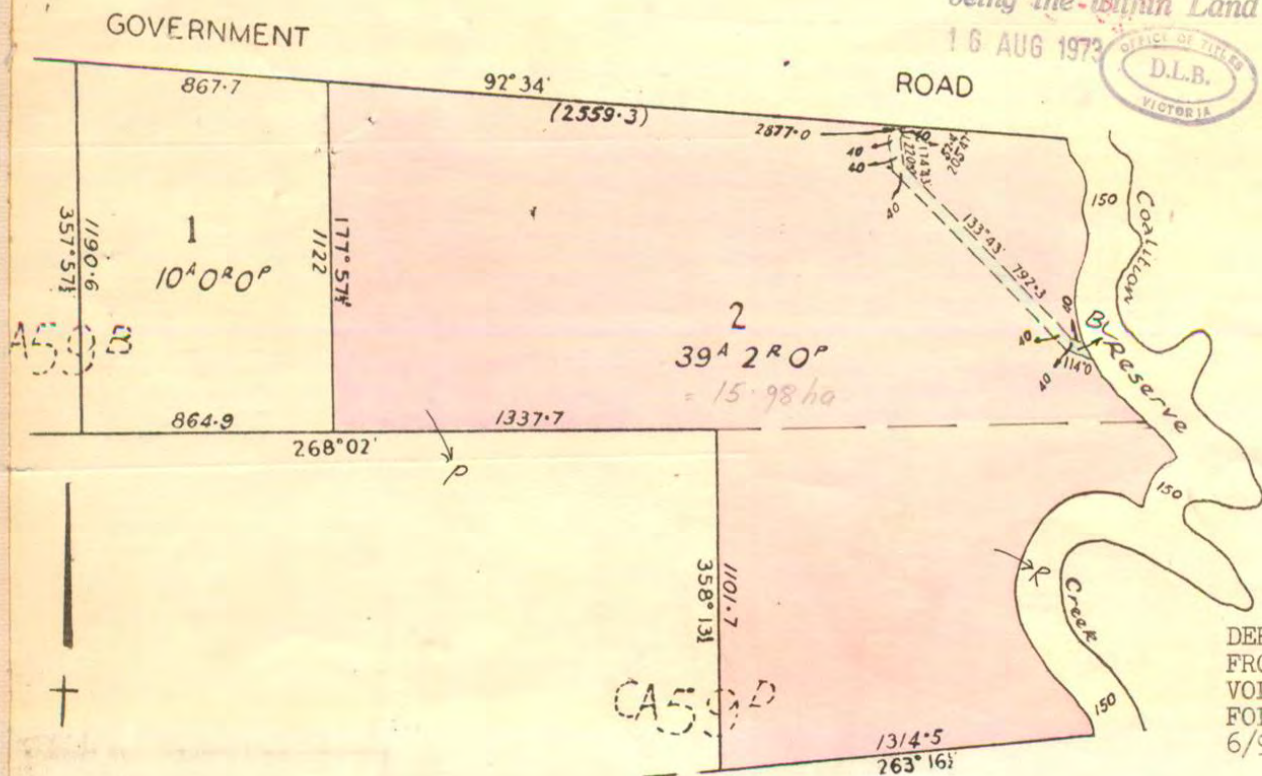
Assistant Registrar of Titles

ENCUMBRANCES REFERRED TO

MORTGAGE D.792580 -----
As to any land coloured blue
THE EASEMENT to SHIRE OF WOORAYL created ---
by Instrument E.448673 -----

The above mortgage is
discharged as to part
being the within Land

16 AUG 1973



DERIVED
FROM
VOL.8076
FOL.559
6/9/73.

MEASUREMENTS ARE IN LINKS

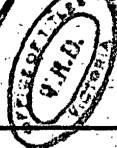
CA59^D
CA62^B

MORTGAGE to DUDLEY J. BAKER HOLDINGS PTY. LTD. of
48 Victoria Street Warragul is now
the proprietor
Registered 16th August 1973
No.E949971



MORTGAGE to HARVEY RONALD HAWKEN
Registered 16th August 1973
No.E949972

DISCHARGED
20 NOV 73



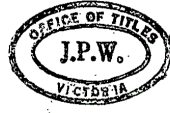
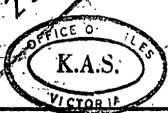
MORTGAGE to CLIENTS INVESTMENTS
PROPRIETARY LIMITED
Registered 22nd March 1974
No.F244644

DISCHARGED
25 JUL 75



MORTGAGE to KEITH LEWIS MCGOWN
Registered in March 1975
No.F633363

DISCHARGED
25 JUL 75



MORTGAGE to ALAN MCGREGOR HARRIS
MARGARET LILLIAN HARRIS LIONEL KINGSTON
CROCKFORD and BRENDA GERTRUDE CROCKFORD
Registered 19th April 1977
No.G591501



MORTGAGE to THE COMMISSIONERS OF
THE STATE SAVINGS BANK OF VICTORIA
Registered 10th January 1980
No.H823581

DISCHARGED
10 FEB 1981

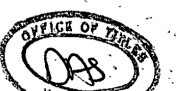


KEITH ERNEST MITCHELL WIGHTMAN Farmer and
ISOBEL MILDRED WIGHTMAN Married Woman both
of 1 Howard Street Leongatha are now
JOINT PROPRIETORS
Registered 10th February 1981
No.J336598



MORTGAGE to THE COMMISSIONERS OF
THE STATE BANK OF VICTORIA
Registered 10th February 1981
No.J336599

DISCHARGED
7 JUL 1981



CREATION OF EASEMENT
Registered 29th July 1982
No.K25929



STATE ELECTRICITY COMMISSION
has pursuant to section 57 of the Transfer of Land Act
served a Notification relating to the compulsory acquisition
of an easement over land herein.
Dated 29 JUL 1975
Entered 15 JUL 1975
No. F 759819

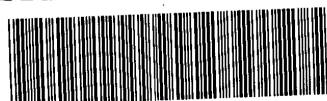


(Plan with letter)

DISCHARGED
16 MAR 1984



to THE COMMISSIONERS
OF THE STATE SAVINGS BANK OF VICTORIA
Registered 25th July 1975
No.F787609



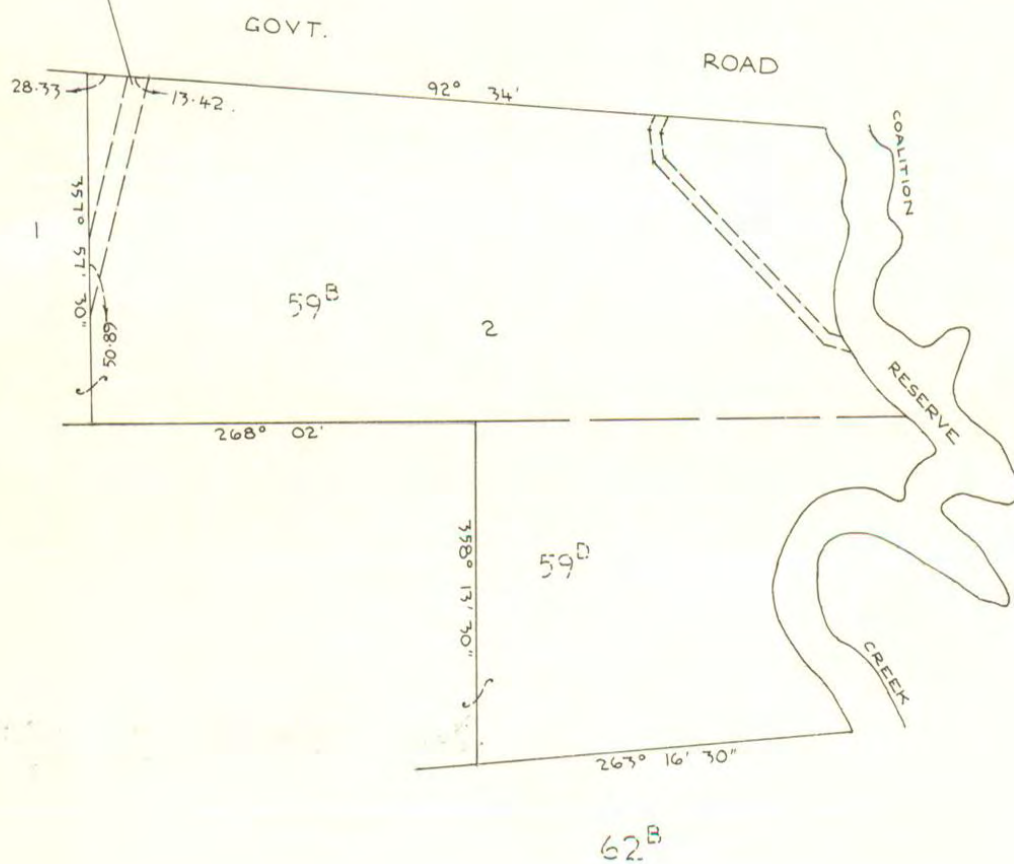
T08988-043-1-3

V.8988 F.043

LENGTHS ARE IN METRES

C/E K25929

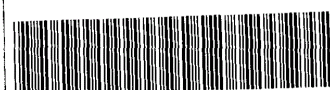
TO S.E.C.



ANNEXED SHEET REFERRED TO IN
CERTIFICATE OF TITLE VOL.

FOL

ASSISTANT REGISTRAR OF TITLES



T08988-043-2-1

APPENDIX C

Site Photos



View of worker accommodation to the NW



Typical surface soil in vineyard



Typical surface soil in paddock



Toilet in paddock



Temp accommodation



Stored material near garage



Soil in the shed



Proposed drainage basin area



Organic waste pile near garage



Natural soil at BH 08



Looking eastwards along northern boundary



Looking east across the pea farm from garage area



Interior of the garage -note earthen floor



Horse enclosure west of driveway looking north



Gravel sand at BH 08



Garage area looking SW with out-of-service AST



Front of chook shed looking SW



Chicken shed near house

APPENDIX D

Field Investigation Records

FOR-40. Grid/Grab Sample Field Log



Revision No: 1 / Date of Last Revision: 04/02/2022

Project: #2153 Leongatha

Sampler's Initials: **T.B.**

Date: 13/04/2022

Sampling Method: **Spade**

PID: **Rae 3000**

[illegible]

Soil Bore: BH01

Project Ref. No: 2153
Project Name: Leongatha
Bore Diameter (mm): 50
PID Type: MiniRae Lite

Date: 13/04/2022
Page Number: 1 of 1
Logged By: TB
Easting: N/A **Northing:** N/A
Datum: N/A

Location Description: Refer to Figure

Depth (m bgl)	Soil Description	Graphic Symbol	Depth (m)	Sample Type	Sample ID	PID (ppm)	Additional Observations
	Ground Surface		0.0				
0.2	NATURAL Silty CLAY: medium plasticity, red, brown, low organic matter, stiff, damp		0.1		BH01/0.1	0.6	
	Clayey SILT: medium plasticity, brown, red, hard, moist		0.2				
			0.3				
			0.4				
			0.5		BH01/0.1	0.3	
	End of Log		0.6				
			0.7				
			0.8				
			0.9				
			1.0				
			1.1				

Sample Type
 Hand Auger
  Solid Stem Auger
  Push Tube
  Split Spoon
  Testpit Wall

Soil Bore: BH02

Project Ref. No: 2153**Project Name:** Leongatha**Bore Diameter (mm):** 50**PID Type:** MiniRae Lite**Date:** 13/04/2022**Page Number:** 1 of 1**Logged By:** TB**Easting:** N/A **Northing:** N/A**Datum:** N/A**Location Description:** Refer to Figure

Depth (m bgl)	Soil Description	Graphic Symbol	Depth (m)	Sample Type	Sample ID	PID (ppm)	Additional Observations
	Ground Surface		0.0				
0.15	FILL Gravelly CLAY: low plasticity, grey, brown, very dense, dry, medium to coarse grained gravel		0.1		BH02/0.1	0.2	
	NATURAL Silty CLAY: low plasticity, brown, red, very stiff, dry		0.2				
			0.3				
			0.4				
			0.5		BH02/0.5	0.3	
			0.6				
	End of Log		0.7				
			0.8				
			0.9				
			1.0				
			1.1				

Sample Type



Hand Auger



Solid Stem Auger



Push Tube



Split Spoon



Testpit Wall

Soil Bore: BH03

Project Ref. No: 2153
Project Name: Leongatha
Bore Diameter (mm): 50
PID Type: MiniRae Lite

Date: 13/04/2022
Page Number: 1 of 1
Logged By: TB
Easting: N/A **Northing:** N/A
Datum: N/A

Location Description: Refer to Figure

Depth (m bgl)	Soil Description	Graphic Symbol	Depth (m)	Sample Type	Sample ID	PID (ppm)	Additional Observations
	Ground Surface		0.0				
	NATURAL CLAY: medium plasticity, brown, red, stiff, moist		0.1		BH03/0.1	0.5	in shed, very hard clay
0.15	hard, damp		0.2				
			0.3				
			0.4				
			0.5		BH03/0.5	0.7	
	End of Log		0.6				
			0.7				
			0.8				
			0.9				
			1.0				
			1.1				

Sample Type
 Hand Auger
  Solid Stem Auger
  Push Tube
  Split Spoon
  Testpit Wall

Soil Bore: BH04

Project Ref. No: 2153
Project Name: Leongatha
Bore Diameter (mm): 50
PID Type: MiniRae Lite

Date: 13/04/2022
Page Number: 1 of 1
Logged By: TB
Easting: N/A **Northing:** N/A
Datum: N/A

Location Description: Refer to Figure

Depth (m bgl)	Soil Description	Graphic Symbol	Depth (m)	Sample Type	Sample ID	PID (ppm)	Additional Observations
	Ground Surface		0.0				
	NATURAL Silty CLAY: low plasticity, brown, high organic matter, soft, dry		0.1		BH04/0.1	0.3	
0.45	CLAY: medium plasticity, brown, very stiff, dry, with Silt		0.5		BH04/0.5	0.5	
	End of Log		0.6				
			0.7				
			0.8				
			0.9				
			1.0				
			1.1				

Sample Type
 Hand Auger
  Solid Stem Auger
  Push Tube
  Split Spoon
  Testpit Wall

Soil Bore: BH05

Project Ref. No: 2153
Project Name: Leongatha
Bore Diameter (mm): 50
PID Type: MiniRae Lite

Date: 13/04/2022
Page Number: 1 of 1
Logged By: TB
Easting: N/A **Northing:** N/A
Datum: N/A

Location Description: Refer to Figure

Depth (m bgl)	Soil Description	Graphic Symbol	Depth (m)	Sample Type	Sample ID	PID (ppm)	Additional Observations
	Ground Surface		0.0				
0.3	NATURAL Silty CLAY: low plasticity, brown, medium organic matter, firm, dry		0.1		BH05/0.1	0.6	
	CLAY: medium plasticity, brown, red, low organic matter, very soft, dry		0.3				
			0.4				
			0.5		BH05/0.5	0.5	
	End of Log		0.6				
			0.7				
			0.8				
			0.9				
			1.0				
			1.1				

Sample Type
 Hand Auger
  Solid Stem Auger
  Push Tube
  Split Spoon
  Testpit Wall

Soil Bore: BH06

Project Ref. No: 2153
Project Name: Leongatha
Bore Diameter (mm): 50
PID Type: MiniRae Lite

Date: 13/04/2022
Page Number: 1 of 1
Logged By: TB
Easting: N/A **Northing:** N/A
Datum: N/A

Location Description: Refer to Figure

Depth (m bgl)	Soil Description	Graphic Symbol	Depth (m)	Sample Type	Sample ID	PID (ppm)	Additional Observations
	Ground Surface		0.0				
0.2	NATURAL Silty CLAY: low plasticity, brown, low organic matter, firm, medium dense, dry		0.1		BH06/0.1	0.4	
	CLAY: medium plasticity, brown, red, very soft, damp		0.2				
			0.3				
			0.4				
			0.5		BH06/0.5	0.5	
	End of Log		0.6				
			0.7				
			0.8				
			0.9				
			1.0				
			1.1				

Sample Type
 Hand Auger
  Solid Stem Auger
  Push Tube
  Split Spoon
  Testpit Wall

Soil Bore: BH07

Project Ref. No: 2153
Project Name: Leongatha
Bore Diameter (mm): 50
PID Type: MiniRae Lite

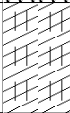
Date: 13/04/2022
Page Number: 1 of 1
Logged By: TB
Easting: N/A **Northing:** N/A
Datum: N/A

Location Description: Refer to Figure

Depth (m bgl)	Soil Description	Graphic Symbol	Depth (m)	Sample Type	Sample ID	PID (ppm)	Additional Observations
	Ground Surface		0.0				
0.2	NATURAL Silty CLAY: low plasticity, brown, low organic matter, firm, medium dense, dry		0.1		BH07/0.1	0.1	
	CLAY: medium plasticity, brown, red, very soft, damp		0.2				
			0.3				
			0.4				
			0.5		BH07/0.5	0.3	
			0.6				
	End of Log		0.7				
			0.8				
			0.9				
			1.0				
			1.1				

Sample Type
 Hand Auger
  Solid Stem Auger
  Push Tube
  Split Spoon
  Testpit Wall

Project Ref. No: 2153**Project Name:** Leongatha**Bore Diameter (mm):** 50**PID Type:** MiniRae Lite**Date:** 13/04/2022**Page Number:** 1 of 1**Logged By:** TB**Easting:** N/A **Northing:** N/A**Datum:** N/A**Location Description:** Refer to Figure

Depth (m bgl)	Soil Description	Graphic Symbol	Depth (m)	Sample Type	Sample ID	PID (ppm)	Additional Observations
	Ground Surface		0.0				
0.15	FILL TOPSOIL: mulch, brown, black, high organic matter, soft, very loose, damp		0.1				weed mat @ 0.1m
	DISTURBED NATURAL Silty CLAY: low plasticity, brown, medium organic matter, firm, medium dense, damp		0.2				Hole above water pipe, move ~5m SE
	End of Log		0.3				
			0.4				
			0.5				
			0.6				
			0.7				
			0.8				
			0.9				
			1.0				
			1.1				

Sample Type
 Hand Auger
  Solid Stem Auger
  Push Tube
  Split Spoon
  Testpit Wall

Project Ref. No: 2153**Project Name:** Leongatha**Bore Diameter (mm):** 50**PID Type:** MiniRae Lite**Date:** 13/04/2022**Page Number:** 1 of 1**Logged By:** TB**Easting:** N/A **Northing:** N/A**Datum:** N/A**Location Description:** Refer to Figure

Depth (m bgl)	Soil Description	Graphic Symbol	Depth (m)	Sample Type	Sample ID	PID (ppm)	Additional Observations
	Ground Surface		0.0				
	FILL Gravelly SILT: fine to coarse grained, yellow, orange, very dense, damp		0.1		BH08/0.1	1.4	
0.3	NATURAL Silty CLAY: low plasticity, brown, red, very soft, dry		0.3				
0.45	CLAY: medium plasticity, brown, red, very soft, moist		0.5		BH08/0.5	1.1	Refusal @ 0.55m, very hard Clay
	End of Log		0.6				
			0.7				
			0.8				
			0.9				
			1.0				
			1.1				

Sample Type

Hand Auger



Solid Stem Auger



Push Tube



Split Spoon



Testpit Wall

Soil Bore: BH09

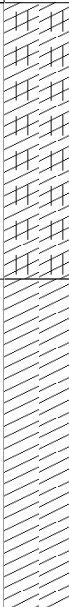
Project Ref. No: 2153
Project Name: Leongatha
Bore Diameter (mm): 50
PID Type: MiniRae Lite

Page Number: 1 of 1

Easting: N/A **Northing:** N/A

Datum: N/A

Location Description: Refer to Figure

Depth (m bgl)	Soil Description	Graphic Symbol	Depth (m)	Sample Type	Sample ID	PID (ppm)	Additional Observations
	Ground Surface		0.0				
0.25	NATURAL Silty CLAY: medium plasticity, brown, red, medium organic matter, firm, medium dense, damp		0.1		BH09/0.1	0.5	
	0.25		CLAY: high plasticity, brown, red, soft, dense, moist	0.5		BH09/0.5	
	End of Log		0.6				
			0.7				
			0.8				
			0.9				
			1.0				
			1.1				

 Hand Auger

 Solid Stem Auger

 Push Tube

 Split Spoon

 Testpit Wall

Soil Bore: BH10

Project Ref. No: 2153
Project Name: Leongatha
Bore Diameter (mm): 50
PID Type: MiniRae Lite

Date: 13/04/2022
Page Number: 1 of 1
Logged By: TB
Easting: N/A **Northing:** N/A
Datum: N/A

Location Description: Refer to Figure

Depth (m bgl)	Soil Description	Graphic Symbol	Depth (m)	Sample Type	Sample ID	PID (ppm)	Additional Observations
	Ground Surface		0.0				
	NATURAL Silty CLAY: low plasticity, brown, firm, medium dense, dry		0.1		BH10/0.1	0.5	some black inclusions @ 0.3m
0.2	CLAY: medium plasticity, brown, orange, low organic matter, moist		0.2				
			0.3				
			0.4				
0.5	brown, stiff, dense		0.5		BH10/0.5	0.2	
	End of Log		0.6				
			0.7				
			0.8				
			0.9				
			1.0				
			1.1				

Sample Type

 Hand Auger
  Solid Stem Auger
  Push Tube
  Split Spoon
  Testpit Wall

APPENDIX E

COCs and Laboratory Reports



CHAIN OF CUSTODY RECORD

Company: Atma Environmental		Project ID: 2153		Project Manager: Glenn Berry		Sample ID: T Bellitt	
Address: 56 William Street, ABBOTSFORD, Vic 3067 Australia		Project Name: Leongatha		Client Name: Glenn Berry		Contact Name: T Bellitt	
Contact Name: GLENN BERRY		Project Status: Completed		Client Address: Leongatha		Email for Results: aberry@atmaenvironmental.com	
Phone No: 03-9429 6355		Project Location: Leongatha		Client Phone: 03-9429 6355		Email for Samples: aberry@atmaenvironmental.com	
Special Directions:		Project Details:		Client Details:		Client Details:	
Purchase Order:		Project Details:		Client Details:		Client Details:	
Order ID No:		Project Details:		Client Details:		Client Details:	
No	Client Sample ID	Sample Date/Time	Matrix	Analysis	Analysis	Analysis	Analysis
1	BH01/0.1	13/04/22	Soil	X	X	X	X
2	BH01/0.5	13/04/22	Soil	X	X	X	X
3	BH02/0.1	13/04/22	Soil	X	X	X	X
4	BH02/0.5	13/04/22	Soil	X	X	X	X
5	BH03/0.1	13/04/22	Soil	X	X	X	X
6	BH03/0.5	13/04/22	Soil	X	X	X	X
7	BH04/0.1	13/04/22	Soil	X	X	X	X
8	BH04/0.5	13/04/22	Soil	X	X	X	X
9	BH05/0.1	13/04/22	Soil	X	X	X	X
10	BH05/0.5	13/04/22	Soil	X	X	X	X
11	BH06/0.1	13/04/22	Soil	X	X	X	X
12	BH06/0.5	13/04/22	Soil	X	X	X	X
13	BH07/0.1	13/04/22	Soil	X	X	X	X
14	BH07/0.5	13/04/22	Soil	X	X	X	X
15	BH08/0.1	13/04/22	Soil	X	X	X	X
16	BH08/0.5	13/04/22	Soil	X	X	X	X
17	BH09/0.1	13/04/22	Soil	X	X	X	X
18	BH09/0.5	13/04/22	Soil	X	X	X	X
19	BH10/0.1	13/04/22	Soil	X	X	X	X
20	BH10/0.5	13/04/22	Soil	X	X	X	X
21	SS01	13/04/22	Soil	X	X	X	X
22	SS02	13/04/22	Soil	X	X	X	X
23	SS03	13/04/22	Soil	X	X	X	X
24	SS04	13/04/22	Soil	X	X	X	X
25	SS05	13/04/22	Soil	X	X	X	X
26	SS06	13/04/22	Soil	X	X	X	X
27	SS07	13/04/22	Soil	X	X	X	X
28	SS08	13/04/22	Soil	X	X	X	X
29	SS09	13/04/22	Soil	X	X	X	X
30	SS10	13/04/22	Soil	X	X	X	X
31	SS11	13/04/22	Soil	X	X	X	X
32	SS12	13/04/22	Soil	X	X	X	X
33	SS13	13/04/22	Soil	X	X	X	X
34	SS14	13/04/22	Soil	X	X	X	X
35	SS15	13/04/22	Soil	X	X	X	X
36	SS16	13/04/22	Soil	X	X	X	X
37	SS17	13/04/22	Soil	X	X	X	X
38	SS18	13/04/22	Soil	X	X	X	X
39	SS19	13/04/22	Soil	X	X	X	X
40	SS20	13/04/22	Soil	X	X	X	X
41	SS21	13/04/22	Soil	X	X	X	X
42	SS22	13/04/22	Soil	X	X	X	X
43	DUP-13422A	13/04/22	Soil	X	X	X	X
44	DUP-13422B	13/04/22	Soil	X	X	X	X
45	DUP-13422C	13/04/22	Soil	X	X	X	X
46	SPLIT-13422A	13/04/22	Soil	X	X	X	X
47	SPLIT-13422B	13/04/22	Soil	X	X	X	X
48	SPLIT-13422C	13/04/22	Soil	X	X	X	X
49	DECON-13422	13/4/22	Water	X	X	X	X
50	TB-13422	13/4/22	Water	X	X	X	X
51	FB-13422	13/4/22	Water	X	X	X	X
Add Rows		Total Rows: 51		Total Samples: 51		Total Results: 51	
Client Signature: T Bellitt		Date: 13/04/22		Signature: T Bellitt		Date: 13/04/22	
Laboratory Use Only		Received By: T Bellitt		Signature: T Bellitt		Date: 13/04/22	
		Received By: T Bellitt		Signature: T Bellitt		Date: 13/04/22	

881033
Joke

FOR-29. Chain of Custody Record

Revision No.: 1 / Date of Last Revision: 04/02/2022

Sheet No. 1 of 1

Atma Environmental

PROJECT

NAME: **LEONGATHA**

Sampler's

Signature: *TB BELFITT*

Sampler's

Name: **TOBE BELFITT**

Project

Ref. No.: **2153**

DATE: 13 APR 2022

Time:

8

SAMPLE IDs:	SAMPLE MATRIX:			ANALYSIS FOR:										NO. of CONTAINERS	HIGH CONTAM EXPECTED	COMPOSITING INSTRUCTIONS:
	DISCRETE	COMPOSITE	GRAB	SOIL	WATER	BLANK /	OCPs	METALS - 15	TRH/BTEX							
SPLIT -13422A	X			X					X						1	
SPLIT-13422B	X			X									X		1	
SPLIT-13422C	X			X				X							1	
TOTAL:	3			3			0	1	1					1	3	

DISPATCHED BY: (sign)

(DATE/TIME)

RECEIVED BY: (sign)

(DATE/TIME)

EUROFINS ENVIRONMENT TESTING

COURIERED BY: (sign)

(DATE/TIME)

LAB NAME: **ALS**

INITIAL RESULTS REQUESTED WITHIN:

24Hrs

48Hrs

3-4 DAYS

NORMAL

REMARKS:

Please email completed COC. Sample Receipt Notification results and invoices to:

> gberry@atmaenvironmental.com

>

COPY

NOTE: ☐ Must be completed by Atma Environmental

☐ Must be completed with date and time by laboratory.

#AU_CAU001_EnviroSampleVic

From: Glenn Berry <gberry@atmaenvironmental.com>
Sent: Thursday, 14 April 2022 5:35 PM
To: Savini Suduweli Kondage; Tobe Belfitt
Cc: #AU_CAU001_EnviroSampleVic
Subject: RE: CoC for 2153 - Leongatha samples collected today
Attachments: 2153_eRegCoC - Soils2 - FOR ANALYSIS.xlsm; 2153 LEONGATHA Chain of Custody - ALS.pdf

CAUTION: EXTERNAL EMAIL - Sent from an email domain that is not formally trusted by Eurofins.

Do not click on links or open attachments unless you recognise the sender and are certain that the content is safe.

Hi ;

Please refer to attached COCs

Glenn Berry, *CEnvP*
Director | Principal Environmental Consultant

Atma Environmental

Professionalism | Value | Service

56 William Street, ABBOTSFORD, Vic 3067 Australia
Tel: +61-3-9429 6955 | Mob: +61-412 000 445

Email: gberry@atmaenvironmental.com Web: www.atmaenvironmental.com

At Atma Environmental we value and respect flexible work arrangements. If I am sending this email outside of normal business hours, it is because it suits me to do so. Please do not feel any pressure to respond outside of your own work schedule.

From: Savini Suduweli Kondage <SaviniSuduweli@eurofins.com>
Sent: Thursday, 14 April 2022 3:33 PM
To: Tobe Belfitt <tbelfitt@atmaenvironmental.com>
Cc: Glenn Berry <gberry@atmaenvironmental.com>; #AU_CAU001_EnviroSampleVic <EnviroSampleVic@eurofins.com>
Subject: RE: CoC for 2153 - Leongatha samples collected today

Hi Tobe,

Thanks for sending that through.

SR – Please see attached for analysis on incoming samples.

Kind Regards,
Savini Suduweli

Phone : +61 3 8564 5051
Mobile : +61 447 222 760
Email : SaviniSuduweli@eurofins.com

From: Tobe Belfitt <tbelfitt@atmaenvironmental.com>
Sent: Thursday, 14 April 2022 3:26 PM

To: Savini Suduweli Kondage <SaviniSuduweli@eurofins.com>

Cc: Glenn Berry <gberry@atmaenvironmental.com>

Subject: CoC for 2153 - Leongatha samples collected today

CAUTION: EXTERNAL EMAIL - Sent from an email domain that is not formally trusted by Eurofins.

Do not click on links or open attachments unless you recognise the sender and are certain that the content is safe.

Hi Savini,

Attached is the CoC for samples collected today from the Atma office.

CoC with the required analysis to follow.

Cheers!

Regards,

Tobe Belfitt
Environmental Consultant

Atma Environmental



25 YR
1996 - 2021

56 William Street, ABBOTSFORD, Vic 3067 Australia

Tel: +61-3-9429 6955 Mob: +61-420 985 285

E-mail: tbelfitt@atmaenvironmental.com Web: www.atmaenvironmental.com



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Environment Testing

PROJECT INFORMATION

Date Received:

14/4/22 4:15pm

Company:

ATMA

Contact person:

Contact Number:

Contact E-mail:

Project Name/site:

Project Number:

2153

COC: Attached ☐

E-mailed ☐

Not received ☐

YES/NO

10-5-0-4

10.1

2 esky

Last modified on: 16 October 2019	Approved on: 16 October 2019	Version: QS1039_R2
Last modified by: H. Le	Approver: M. Makarios	Page 1 of 1
Editorial Committee: T. Lakeland, F. Sanjaya, H. Le, M. Makarios		Next required review date: 16 October 2022

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IANZ # 1290

Sample Receipt Advice

Company name: Atma Environmental
Contact name: Glenn Berry
Project name: LONGATHA
Project ID: 2153
Turnaround time: 5 Day
Date/Time received: Apr 14, 2022 5:35 PM
Eurofins reference: 881033

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 10.1 degrees Celsius.
- ✓ All samples have been received as described on the above COC.
- ✓ COC has been completed correctly.
- ✓ Attempt to chill was evident.
- ✓ Appropriately preserved sample containers have been used.
- ✓ All samples were received in good condition.
- ✓ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ✓ Appropriate sample containers have been used.
- ✓ Sample containers for volatile analysis received with zero headspace.
- ✓ Split sample sent to requested external lab.
- ✗ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

Samples received by the laboratory after 5.30pm are deemed to have been received the following working day.

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Savini Suduweli on phone : or by email: SaviniSuduweli@eurofins.com

Results will be delivered electronically via email to Glenn Berry - gberry@atmaenvironmental.com.

Atma Environmental
56 William St
Abbotsford
VIC 3067



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Accreditation Number 1261
Site Number 1254

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NATA is a signatory to the ILAC Mutual Recognition
Arrangement for the mutual recognition of the
equivalence of testing, medical testing, calibration,
inspection, proficiency testing scheme providers and
reference materials producers reports and certificates.

Attention: Glenn Berry

Report 881033-S
Project name LONGATHA
Project ID 2153
Received Date Apr 14, 2022

Client Sample ID			BH01/0.1	BH02/0.1	BH03/0.1	BH04/0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22- Ap0038145	M22- Ap0038146	M22- Ap0038147	M22- Ap0038148
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	-
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	-
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	-
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	-
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	-
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	-
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	< 20	-
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	-
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	< 50	-
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	-
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	66	87	95	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
4,4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
4,4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
4,4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
a-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
b-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
d-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-

Client Sample ID			BH01/0.1	BH02/0.1	BH03/0.1	BH04/0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22- Ap0038145	M22- Ap0038146	M22- Ap0038147	M22- Ap0038148
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
g-HCH (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Toxaphene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Dibutylchlorendate (surr.)	1	%	73	82	71	-
Tetrachloro-m-xylene (surr.)	1	%	90	92	86	-
Heavy Metals						
Arsenic	2	mg/kg	2.3	2.9	3.3	< 2
Barium	10	mg/kg	140	360	130	120
Beryllium	2	mg/kg	< 2	2.7	< 2	< 2
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	150	180	250	130
Cobalt	5	mg/kg	24	320	46	17
Copper	5	mg/kg	39	75	70	33
Lead	5	mg/kg	31	19	33	25
Manganese	5	mg/kg	5300	6200	6200	4600
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum	5	mg/kg	< 5	< 5	< 5	< 5
Nickel	5	mg/kg	36	110	58	28
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Silver	2	mg/kg	< 2	< 2	< 2	< 2
Tin	10	mg/kg	< 10	< 10	< 10	< 10
Zinc	5	mg/kg	52	120	530	320
% Moisture	1	%	24	18	29	29
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	0.1	pH Units	-	-	6.1	-
Acid Herbicides						
2,4-D	0.5	mg/kg	-	< 0.5	< 0.5	-
2,4-DB	0.5	mg/kg	-	< 0.5	< 0.5	-
2,4,5-T	0.5	mg/kg	-	< 0.5	< 0.5	-
2,4,5-TP	0.5	mg/kg	-	< 0.5	< 0.5	-
Actril (loxylin)	0.5	mg/kg	-	< 0.5	< 0.5	-
Dicamba	0.5	mg/kg	-	< 0.5	< 0.5	-
Dichlorprop	0.5	mg/kg	-	< 0.5	< 0.5	-
Dinitro-o-cresol	0.5	mg/kg	-	< 0.5	< 0.5	-
Dinoseb	0.5	mg/kg	-	< 0.5	< 0.5	-
MCPA	0.5	mg/kg	-	< 0.5	< 0.5	-
MCPB	0.5	mg/kg	-	< 0.5	< 0.5	-
Mecoprop	0.5	mg/kg	-	< 0.5	< 0.5	-
Warfarin (surr.)	1	%	-	142	109	-

Client Sample ID			BH05/0.1	BH06/0.1	BH07/0.1	BH08/0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22- Ap0038149	M22- Ap0038150	M22- Ap0038151	M22- Ap0038152
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	-	< 20	-	< 20
TRH C10-C14	20	mg/kg	-	< 20	-	< 20
TRH C15-C28	50	mg/kg	-	< 50	-	200
TRH C29-C36	50	mg/kg	-	< 50	-	250
TRH C10-C36 (Total)	50	mg/kg	-	< 50	-	450
Naphthalene ^{N02}	0.5	mg/kg	-	< 0.5	-	< 0.5
TRH C6-C10	20	mg/kg	-	< 20	-	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	-	< 20	-	< 20
TRH >C10-C16	50	mg/kg	-	< 50	-	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	-	< 50	-	< 50
TRH >C16-C34	100	mg/kg	-	< 100	-	400
TRH >C34-C40	100	mg/kg	-	< 100	-	110
TRH >C10-C40 (total)*	100	mg/kg	-	< 100	-	510
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	-	< 0.1
Toluene	0.1	mg/kg	-	< 0.1	-	< 0.1
Ethylbenzene	0.1	mg/kg	-	< 0.1	-	< 0.1
m&p-Xylenes	0.2	mg/kg	-	< 0.2	-	< 0.2
o-Xylene	0.1	mg/kg	-	< 0.1	-	< 0.1
Xylenes - Total*	0.3	mg/kg	-	< 0.3	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	50	-	94
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	-	< 0.1
4,4'-DDD	0.05	mg/kg	-	-	-	< 0.05
4,4'-DDE	0.05	mg/kg	-	-	-	< 0.05
4,4'-DDT	0.05	mg/kg	-	-	-	< 0.05
a-HCH	0.05	mg/kg	-	-	-	< 0.05
Aldrin	0.05	mg/kg	-	-	-	< 0.05
b-HCH	0.05	mg/kg	-	-	-	< 0.05
d-HCH	0.05	mg/kg	-	-	-	< 0.05
Dieldrin	0.05	mg/kg	-	-	-	< 0.05
Endosulfan I	0.05	mg/kg	-	-	-	< 0.05
Endosulfan II	0.05	mg/kg	-	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	-	< 0.05
Endrin	0.05	mg/kg	-	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	-	< 0.05
Endrin ketone	0.05	mg/kg	-	-	-	< 0.05
g-HCH (Lindane)	0.05	mg/kg	-	-	-	< 0.05
Heptachlor	0.05	mg/kg	-	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	-	-	< 0.05
Methoxychlor	0.05	mg/kg	-	-	-	< 0.05
Toxaphene	0.5	mg/kg	-	-	-	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	-	< 0.1
Dibutylchlorendate (surr.)	1	%	-	-	-	88
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	73

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	BH05/0.1 Soil M22- Ap0038149 Apr 13, 2022	BH06/0.1 Soil M22- Ap0038150 Apr 13, 2022	BH07/0.1 Soil M22- Ap0038151 Apr 13, 2022	BH08/0.1 Soil M22- Ap0038152 Apr 13, 2022
Heavy Metals						
Arsenic	2	mg/kg	< 2	< 2	< 2	< 2
Barium	10	mg/kg	120	100	94	< 10
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	170	140	130	13
Cobalt	5	mg/kg	18	15	13	< 5
Copper	5	mg/kg	29	27	21	16
Lead	5	mg/kg	20	17	18	6.0
Manganese	5	mg/kg	4500	3700	3600	68
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum	5	mg/kg	< 5	< 5	< 5	< 5
Nickel	5	mg/kg	22	20	15	< 5
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Silver	2	mg/kg	< 2	< 2	< 2	< 2
Tin	10	mg/kg	< 10	< 10	< 10	< 10
Zinc	5	mg/kg	34	38	20	23
% Moisture	1	%	24	27	20	7.5
pH (units)(1:5 soil:CaCl ₂ extract at 25°C as rec.)	0.1	pH Units	-	-	5.2	-
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	-	-	13	-
Acid Herbicides						
2,4-D	0.5	mg/kg	-	-	-	< 0.5
2,4-DB	0.5	mg/kg	-	-	-	< 0.5
2,4,5-T	0.5	mg/kg	-	-	-	< 0.5
2,4,5-TP	0.5	mg/kg	-	-	-	< 0.5
Actril (loxylin)	0.5	mg/kg	-	-	-	< 0.5
Dicamba	0.5	mg/kg	-	-	-	< 0.5
Dichlorprop	0.5	mg/kg	-	-	-	< 0.5
Dinitro-o-cresol	0.5	mg/kg	-	-	-	< 0.5
Dinoseb	0.5	mg/kg	-	-	-	< 0.5
MCPA	0.5	mg/kg	-	-	-	< 0.5
MCPB	0.5	mg/kg	-	-	-	< 0.5
Mecoprop	0.5	mg/kg	-	-	-	< 0.5
Warfarin (surr.)	1	%	-	-	-	115
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	-	-	7.5	-

Client Sample ID			BH09/0.1	BH10/0.1	SS01	SS02
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22-Ap0038153	M22-Ap0038154	M22-Ap0038155	M22-Ap0038156
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	-	< 0.1
4,4'-DDD	0.05	mg/kg	-	-	-	< 0.05
4,4'-DDE	0.05	mg/kg	-	-	-	< 0.05
4,4'-DDT	0.05	mg/kg	-	-	-	< 0.05
a-HCH	0.05	mg/kg	-	-	-	< 0.05
Aldrin	0.05	mg/kg	-	-	-	< 0.05
b-HCH	0.05	mg/kg	-	-	-	< 0.05
d-HCH	0.05	mg/kg	-	-	-	< 0.05
Dieldrin	0.05	mg/kg	-	-	-	< 0.05
Endosulfan I	0.05	mg/kg	-	-	-	< 0.05
Endosulfan II	0.05	mg/kg	-	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	-	< 0.05
Endrin	0.05	mg/kg	-	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	-	< 0.05
Endrin ketone	0.05	mg/kg	-	-	-	< 0.05
g-HCH (Lindane)	0.05	mg/kg	-	-	-	< 0.05
Heptachlor	0.05	mg/kg	-	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	-	-	< 0.05
Methoxychlor	0.05	mg/kg	-	-	-	< 0.05
Toxaphene	0.5	mg/kg	-	-	-	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	-	< 0.1
Dibutylchloride (surr.)	1	%	-	-	-	122
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	127
Heavy Metals						
Arsenic	2	mg/kg	3.1	4.0	2.3	2.9
Barium	10	mg/kg	110	230	230	320
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	79	120	98	87
Cobalt	5	mg/kg	16	33	37	64
Copper	5	mg/kg	26	23	42	53
Lead	5	mg/kg	29	31	26	30
Manganese	5	mg/kg	2800	10000	8600	13000
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum	5	mg/kg	< 5	< 5	< 5	< 5
Nickel	5	mg/kg	13	18	38	48
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Silver	2	mg/kg	< 2	< 2	< 2	< 2
Tin	10	mg/kg	< 10	< 10	< 10	< 10
Zinc	5	mg/kg	45	22	31	41
% Moisture	1	%	24	22	33	15
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	0.1	pH Units	-	-	7.0	-

Client Sample ID			BH09/0.1	BH10/0.1	SS01	SS02
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22- Ap0038153	M22- Ap0038154	M22- Ap0038155	M22- Ap0038156
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Acid Herbicides						
2,4-D	0.5	mg/kg	-	-	< 0.5	-
2,4-DB	0.5	mg/kg	-	-	< 0.5	-
2,4,5-T	0.5	mg/kg	-	-	< 0.5	-
2,4,5-TP	0.5	mg/kg	-	-	< 0.5	-
Actril (loxynil)	0.5	mg/kg	-	-	< 0.5	-
Dicamba	0.5	mg/kg	-	-	< 0.5	-
Dichlorprop	0.5	mg/kg	-	-	< 0.5	-
Dinitro-o-cresol	0.5	mg/kg	-	-	< 0.5	-
Dinoseb	0.5	mg/kg	-	-	< 0.5	-
MCPA	0.5	mg/kg	-	-	< 0.5	-
MCPB	0.5	mg/kg	-	-	< 0.5	-
Mecoprop	0.5	mg/kg	-	-	< 0.5	-
Warfarin (surr.)	1	%	-	-	117	-

Client Sample ID			SS03	SS04	SS05	SS06
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22- Ap0038157	M22- Ap0038158	M22- Ap0038159	M22- Ap0038160
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	-	-	< 20	-
TRH C10-C14	20	mg/kg	-	-	< 20	-
TRH C15-C28	50	mg/kg	-	-	< 50	-
TRH C29-C36	50	mg/kg	-	-	< 50	-
TRH C10-C36 (Total)	50	mg/kg	-	-	< 50	-
Naphthalene ^{N02}	0.5	mg/kg	-	-	< 0.5	-
TRH C6-C10	20	mg/kg	-	-	< 20	-
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	-	-	< 20	-
TRH >C10-C16	50	mg/kg	-	-	< 50	-
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	-	-	< 50	-
TRH >C16-C34	100	mg/kg	-	-	< 100	-
TRH >C34-C40	100	mg/kg	-	-	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	-	-	< 100	-
BTEX						
Benzene	0.1	mg/kg	-	-	< 0.1	-
Toluene	0.1	mg/kg	-	-	< 0.1	-
Ethylbenzene	0.1	mg/kg	-	-	< 0.1	-
m&p-Xylenes	0.2	mg/kg	-	-	< 0.2	-
o-Xylene	0.1	mg/kg	-	-	< 0.1	-
Xylenes - Total*	0.3	mg/kg	-	-	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	-	-	80	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	< 0.1
4,4'-DDD	0.05	mg/kg	-	< 0.05	-	< 0.05
4,4'-DDE	0.05	mg/kg	-	< 0.05	-	< 0.05
4,4'-DDT	0.05	mg/kg	-	< 0.05	-	< 0.05
a-HCH	0.05	mg/kg	-	< 0.05	-	< 0.05

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	SS03 Soil M22- Ap0038157 Apr 13, 2022	SS04 Soil M22- Ap0038158 Apr 13, 2022	SS05 Soil M22- Ap0038159 Apr 13, 2022	SS06 Soil M22- Ap0038160 Apr 13, 2022
Organochlorine Pesticides						
Aldrin	0.05	mg/kg	-	< 0.05	-	< 0.05
b-HCH	0.05	mg/kg	-	< 0.05	-	< 0.05
d-HCH	0.05	mg/kg	-	< 0.05	-	< 0.05
Dieldrin	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan I	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan II	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin ketone	0.05	mg/kg	-	< 0.05	-	< 0.05
g-HCH (Lindane)	0.05	mg/kg	-	< 0.05	-	< 0.05
Heptachlor	0.05	mg/kg	-	< 0.05	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	< 0.05
Methoxychlor	0.05	mg/kg	-	< 0.05	-	< 0.05
Toxaphene	0.5	mg/kg	-	< 0.5	-	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	-	< 0.1
Dibutylchloroendate (surr.)	1	%	-	134	-	121
Tetrachloro-m-xylene (surr.)	1	%	-	150	-	100
Bifenthrin	0.05	mg/kg	-	-	< 0.05	-
Heavy Metals						
Arsenic	2	mg/kg	< 2	2.1	2.3	3.5
Barium	10	mg/kg	320	250	-	150
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	110	140	110	20
Cobalt	5	mg/kg	77	79	66	17
Copper	5	mg/kg	25	23	17	17
Lead	5	mg/kg	19	19	13	16
Manganese	5	mg/kg	7700	6600	3500	1200
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum	5	mg/kg	< 5	< 5	-	< 5
Nickel	5	mg/kg	32	48	34	16
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Silver	2	mg/kg	< 2	< 2	-	< 2
Tin	10	mg/kg	< 10	< 10	-	< 10
Zinc	5	mg/kg	27	37	38	69
% Moisture	1	%	15	19	21	27
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	0.1	pH Units	-	-	6.8	-
Chromium (hexavalent)	1	mg/kg	-	-	< 1	-
Cyanide (free)	5	mg/kg	-	-	< 5	-

Client Sample ID			SS03	SS04	SS05	SS06
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22- Ap0038157	M22- Ap0038158	M22- Ap0038159	M22- Ap0038160
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Acid Herbicides						
2,4-D	0.5	mg/kg	< 0.5	-	-	-
2,4-DB	0.5	mg/kg	< 0.5	-	-	-
2,4,5-T	0.5	mg/kg	< 0.5	-	-	-
2,4,5-TP	0.5	mg/kg	< 0.5	-	-	-
Actril (loxynil)	0.5	mg/kg	< 0.5	-	-	-
Dicamba	0.5	mg/kg	< 0.5	-	-	-
Dichlorprop	0.5	mg/kg	< 0.5	-	-	-
Dinitro-o-cresol	0.5	mg/kg	< 0.5	-	-	-
Dinoseb	0.5	mg/kg	< 0.5	-	-	-
MCPA	0.5	mg/kg	< 0.5	-	-	-
MCPB	0.5	mg/kg	< 0.5	-	-	-
Mecoprop	0.5	mg/kg	< 0.5	-	-	-
Warfarin (surr.)	1	%	127	-	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	-	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	-	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	-	1.2	-
Acenaphthene	0.5	mg/kg	-	-	< 0.5	-
Acenaphthylene	0.5	mg/kg	-	-	< 0.5	-
Anthracene	0.5	mg/kg	-	-	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	-	-	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	-	-	< 0.5	-
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	-	-	< 0.5	-
Benzo(g,h,i)perylene	0.5	mg/kg	-	-	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	-	-	< 0.5	-
Chrysene	0.5	mg/kg	-	-	< 0.5	-
Dibenz(a,h)anthracene	0.5	mg/kg	-	-	< 0.5	-
Fluoranthene	0.5	mg/kg	-	-	< 0.5	-
Fluorene	0.5	mg/kg	-	-	< 0.5	-
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	-	-	< 0.5	-
Naphthalene	0.5	mg/kg	-	-	< 0.5	-
Phenanthrene	0.5	mg/kg	-	-	< 0.5	-
Pyrene	0.5	mg/kg	-	-	< 0.5	-
Total PAH*	0.5	mg/kg	-	-	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	-	-	80	-
p-Terphenyl-d14 (surr.)	1	%	-	-	82	-
Organophosphorus Pesticides						
Chlorpyrifos	0.2	mg/kg	-	-	< 0.2	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1221	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1232	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1242	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1248	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1254	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1260	0.1	mg/kg	-	-	< 0.1	-
Total PCB*	0.1	mg/kg	-	-	< 0.1	-
Dibutylchlorendate (surr.)	1	%	-	-	129	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	123	-

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	SS03 Soil M22- Ap0038157 Apr 13, 2022	SS04 Soil M22- Ap0038158 Apr 13, 2022	SS05 Soil M22- Ap0038159 Apr 13, 2022	SS06 Soil M22- Ap0038160 Apr 13, 2022
Triazines						
Atrazine	0.2	mg/kg	-	-	< 0.2	-
NEPM 2013 Acid Herbicides						
Picloram	0.5	mg/kg	-	-	< 0.5	-
2,4-D	0.5	mg/kg	-	-	< 0.5	-
2,4,5-T	0.5	mg/kg	-	-	< 0.5	-
MCPA	0.5	mg/kg	-	-	< 0.5	-
MCPB	0.5	mg/kg	-	-	< 0.5	-
Mecoprop	0.5	mg/kg	-	-	< 0.5	-
Warfarin (surr.)	1	%	-	-	116	-
NEPM 2013 Organochlorine Pesticides						
Endosulfan sulphate	0.05	mg/kg	-	-	< 0.05	-
Mirex	0.05	mg/kg	-	-	< 0.05	-
4,4'-DDD	0.05	mg/kg	-	-	< 0.05	-
4,4'-DDE	0.05	mg/kg	-	-	< 0.05	-
4,4'-DDT	0.05	mg/kg	-	-	< 0.05	-
Aldrin	0.05	mg/kg	-	-	< 0.05	-
Chlordanes - Total	0.1	mg/kg	-	-	< 0.1	-
Dieldrin	0.05	mg/kg	-	-	< 0.05	-
Endosulfan I	0.05	mg/kg	-	-	< 0.05	-
Endosulfan II	0.05	mg/kg	-	-	< 0.05	-
Endrin	0.05	mg/kg	-	-	< 0.05	-
Heptachlor	0.05	mg/kg	-	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	-	-	< 0.05	-
Methoxychlor	0.05	mg/kg	-	-	< 0.05	-
Toxaphene	0.5	mg/kg	-	-	< 0.5	-
Dibutylchlorendate (surr.)	1	%	-	-	129	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	123	-
NEPM 2013 Phenols						
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	-	< 0.2	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	-	< 0.4	-
Pentachlorophenol	1	mg/kg	-	-	< 1	-
Phenol	0.5	mg/kg	-	-	< 0.5	-
Phenol-d6 (surr.)	1	%	-	-	39	-

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	SS07 Soil M22- Ap0038161 Apr 13, 2022	SS08 Soil M22- Ap0038162 Apr 13, 2022	SS09 Soil M22- Ap0038163 Apr 13, 2022	SS10 Soil M22- Ap0038164 Apr 13, 2022
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	< 0.1
4,4'-DDD	0.05	mg/kg	< 0.05	-	-	< 0.05
4,4'-DDE	0.05	mg/kg	< 0.05	-	-	< 0.05
4,4'-DDT	0.05	mg/kg	< 0.05	-	-	< 0.05
a-HCH	0.05	mg/kg	< 0.05	-	-	< 0.05
Aldrin	0.05	mg/kg	< 0.05	-	-	< 0.05
b-HCH	0.05	mg/kg	< 0.05	-	-	< 0.05

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	SS07 Soil M22- Ap0038161 Apr 13, 2022	SS08 Soil M22- Ap0038162 Apr 13, 2022	SS09 Soil M22- Ap0038163 Apr 13, 2022	SS10 Soil M22- Ap0038164 Apr 13, 2022
Organochlorine Pesticides						
d-HCH	0.05	mg/kg	< 0.05	-	-	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	-	-	< 0.05
g-HCH (Lindane)	0.05	mg/kg	< 0.05	-	-	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	-	-	< 0.05
Toxaphene	0.5	mg/kg	< 0.5	-	-	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	-	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	-	-	< 0.1
Dibutylchloroendate (surr.)	1	%	110	-	-	128
Tetrachloro-m-xylene (surr.)	1	%	134	-	-	143
Heavy Metals						
Arsenic	2	mg/kg	< 2	2.0	< 2	< 2
Barium	10	mg/kg	160	180	180	170
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	150	150	100	180
Cobalt	5	mg/kg	23	29	38	37
Copper	5	mg/kg	42	44	37	25
Lead	5	mg/kg	20	25	22	17
Manganese	5	mg/kg	5000	6400	7000	3900
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum	5	mg/kg	< 5	< 5	< 5	< 5
Nickel	5	mg/kg	45	41	35	32
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Silver	2	mg/kg	< 2	< 2	< 2	< 2
Tin	10	mg/kg	< 10	< 10	< 10	< 10
Zinc	5	mg/kg	69	36	28	27
% Moisture	1	%	15	17	18	20
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	0.1	pH Units	-	6.1	-	6.2
Acid Herbicides						
2,4-D	0.5	mg/kg	-	< 0.5	-	-
2,4-DB	0.5	mg/kg	-	< 0.5	-	-
2,4,5-T	0.5	mg/kg	-	< 0.5	-	-
2,4,5-TP	0.5	mg/kg	-	< 0.5	-	-
Actril (loxylin)	0.5	mg/kg	-	< 0.5	-	-
Dicamba	0.5	mg/kg	-	< 0.5	-	-
Dichlorprop	0.5	mg/kg	-	< 0.5	-	-

Client Sample ID			SS07	SS08	SS09	SS10
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22- Ap0038161	M22- Ap0038162	M22- Ap0038163	M22- Ap0038164
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Acid Herbicides						
Dinitro-o-cresol	0.5	mg/kg	-	< 0.5	-	-
Dinoseb	0.5	mg/kg	-	< 0.5	-	-
MCPA	0.5	mg/kg	-	< 0.5	-	-
MCPB	0.5	mg/kg	-	< 0.5	-	-
Mecoprop	0.5	mg/kg	-	< 0.5	-	-
Warfarin (surr.)	1	%	-	135	-	-

Client Sample ID			SS11	SS12	SS13	SS14
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22- Ap0038165	M22- Ap0038166	M22- Ap0038167	M22- Ap0038168
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	-	-	< 20	-
TRH C10-C14	20	mg/kg	-	-	< 20	-
TRH C15-C28	50	mg/kg	-	-	< 50	-
TRH C29-C36	50	mg/kg	-	-	< 50	-
TRH C10-C36 (Total)	50	mg/kg	-	-	< 50	-
Naphthalene ^{N02}	0.5	mg/kg	-	-	< 0.5	-
TRH C6-C10	20	mg/kg	-	-	< 20	-
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	-	-	< 20	-
TRH >C10-C16	50	mg/kg	-	-	< 50	-
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	-	-	< 50	-
TRH >C16-C34	100	mg/kg	-	-	< 100	-
TRH >C34-C40	100	mg/kg	-	-	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	-	-	< 100	-
BTEX						
Benzene	0.1	mg/kg	-	-	< 0.1	-
Toluene	0.1	mg/kg	-	-	< 0.1	-
Ethylbenzene	0.1	mg/kg	-	-	< 0.1	-
m&p-Xylenes	0.2	mg/kg	-	-	< 0.2	-
o-Xylene	0.1	mg/kg	-	-	< 0.1	-
Xylenes - Total*	0.3	mg/kg	-	-	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	-	-	83	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	-	< 0.1
4,4'-DDD	0.05	mg/kg	-	-	-	< 0.05
4,4'-DDE	0.05	mg/kg	-	-	-	0.12
4,4'-DDT	0.05	mg/kg	-	-	-	< 0.05
a-HCH	0.05	mg/kg	-	-	-	< 0.05
Aldrin	0.05	mg/kg	-	-	-	< 0.05
b-HCH	0.05	mg/kg	-	-	-	< 0.05
d-HCH	0.05	mg/kg	-	-	-	< 0.05
Dieldrin	0.05	mg/kg	-	-	-	< 0.05
Endosulfan I	0.05	mg/kg	-	-	-	< 0.05
Endosulfan II	0.05	mg/kg	-	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	-	< 0.05

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	SS11 Soil M22- Ap0038165 Apr 13, 2022	SS12 Soil M22- Ap0038166 Apr 13, 2022	SS13 Soil M22- Ap0038167 Apr 13, 2022	SS14 Soil M22- Ap0038168 Apr 13, 2022
Organochlorine Pesticides						
Endrin	0.05	mg/kg	-	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	-	< 0.05
Endrin ketone	0.05	mg/kg	-	-	-	< 0.05
g-HCH (Lindane)	0.05	mg/kg	-	-	-	< 0.05
Heptachlor	0.05	mg/kg	-	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	-	-	< 0.05
Methoxychlor	0.05	mg/kg	-	-	-	< 0.05
Toxaphene	0.5	mg/kg	-	-	-	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	-	0.12
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	-	0.12
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	-	< 0.1
Dibutylchlorobenzene (surr.)	1	%	-	-	-	133
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	136
Bifenthrin	0.05	mg/kg	-	-	< 0.05	-
Heavy Metals						
Arsenic	2	mg/kg	< 2	2.5	< 2	< 2
Barium	10	mg/kg	280	76	-	140
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	280	43	150	46
Cobalt	5	mg/kg	150	23	18	17
Copper	5	mg/kg	33	8.1	68	48
Lead	5	mg/kg	9.2	11	19	19
Manganese	5	mg/kg	4500	1400	4200	5600
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum	5	mg/kg	< 5	< 5	-	< 5
Nickel	5	mg/kg	100	12	22	18
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Silver	2	mg/kg	< 2	< 2	-	< 2
Tin	10	mg/kg	< 10	< 10	-	< 10
Zinc	5	mg/kg	93	24	33	32
% Moisture	1	%	21	15	20	17
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	0.1	pH Units	-	-	6.0	7.0
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	26	-	-	-
Chromium (hexavalent)	1	mg/kg	-	-	< 1	-
Cyanide (free)	5	mg/kg	-	-	< 5	-
Acid Herbicides						
2,4-D	0.5	mg/kg	-	< 0.5	-	-
2,4-DB	0.5	mg/kg	-	< 0.5	-	-
2,4,5-T	0.5	mg/kg	-	< 0.5	-	-
2,4,5-TP	0.5	mg/kg	-	< 0.5	-	-
Actril (loxylin)	0.5	mg/kg	-	< 0.5	-	-
Dicamba	0.5	mg/kg	-	< 0.5	-	-
Dichlorprop	0.5	mg/kg	-	< 0.5	-	-
Dinitro-o-cresol	0.5	mg/kg	-	< 0.5	-	-

Client Sample ID			SS11	SS12	SS13	SS14
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22- Ap0038165	M22- Ap0038166	M22- Ap0038167	M22- Ap0038168
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Acid Herbicides						
Dinoseb	0.5	mg/kg	-	< 0.5	-	-
MCPA	0.5	mg/kg	-	< 0.5	-	-
MCPB	0.5	mg/kg	-	< 0.5	-	-
Mecoprop	0.5	mg/kg	-	< 0.5	-	-
Warfarin (surr.)	1	%	-	115	-	-
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	11	-	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	-	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	-	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	-	1.2	-
Acenaphthene	0.5	mg/kg	-	-	< 0.5	-
Acenaphthylene	0.5	mg/kg	-	-	< 0.5	-
Anthracene	0.5	mg/kg	-	-	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	-	-	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	-	-	< 0.5	-
Benzo(b,j)fluoranthene ^{N07}	0.5	mg/kg	-	-	< 0.5	-
Benzo(g,h,i)perylene	0.5	mg/kg	-	-	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	-	-	< 0.5	-
Chrysene	0.5	mg/kg	-	-	< 0.5	-
Dibenz(a,h)anthracene	0.5	mg/kg	-	-	< 0.5	-
Fluoranthene	0.5	mg/kg	-	-	< 0.5	-
Fluorene	0.5	mg/kg	-	-	< 0.5	-
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	-	-	< 0.5	-
Naphthalene	0.5	mg/kg	-	-	< 0.5	-
Phenanthrene	0.5	mg/kg	-	-	< 0.5	-
Pyrene	0.5	mg/kg	-	-	< 0.5	-
Total PAH*	0.5	mg/kg	-	-	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	-	-	85	-
p-Terphenyl-d14 (surr.)	1	%	-	-	89	-
Organophosphorus Pesticides						
Chlorpyrifos	0.2	mg/kg	-	-	< 0.2	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1221	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1232	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1242	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1248	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1254	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1260	0.1	mg/kg	-	-	< 0.1	-
Total PCB*	0.1	mg/kg	-	-	< 0.1	-
Dibutylchloroendate (surr.)	1	%	-	-	144	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	150	-
Triazines						
Atrazine	0.2	mg/kg	-	-	< 0.2	-

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	SS11 Soil M22- Ap0038165 Apr 13, 2022	SS12 Soil M22- Ap0038166 Apr 13, 2022	SS13 Soil M22- Ap0038167 Apr 13, 2022	SS14 Soil M22- Ap0038168 Apr 13, 2022
NEPM 2013 Acid Herbicides						
Picloram	0.5	mg/kg	-	-	< 0.5	-
2,4-D	0.5	mg/kg	-	-	< 0.5	-
2,4,5-T	0.5	mg/kg	-	-	< 0.5	-
MCPA	0.5	mg/kg	-	-	< 0.5	-
MCPB	0.5	mg/kg	-	-	< 0.5	-
Mecoprop	0.5	mg/kg	-	-	< 0.5	-
Warfarin (surr.)	1	%	-	-	111	-
NEPM 2013 Organochlorine Pesticides						
Endosulfan sulphate	0.05	mg/kg	-	-	< 0.05	-
Mirex	0.05	mg/kg	-	-	< 0.05	-
4,4'-DDD	0.05	mg/kg	-	-	< 0.05	-
4,4'-DDE	0.05	mg/kg	-	-	0.15	-
4,4'-DDT	0.05	mg/kg	-	-	< 0.05	-
Aldrin	0.05	mg/kg	-	-	< 0.05	-
Chlordanes - Total	0.1	mg/kg	-	-	< 0.1	-
Dieldrin	0.05	mg/kg	-	-	< 0.05	-
Endosulfan I	0.05	mg/kg	-	-	< 0.05	-
Endosulfan II	0.05	mg/kg	-	-	< 0.05	-
Endrin	0.05	mg/kg	-	-	< 0.05	-
Heptachlor	0.05	mg/kg	-	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	-	-	< 0.05	-
Methoxychlor	0.05	mg/kg	-	-	< 0.05	-
Toxaphene	0.5	mg/kg	-	-	< 0.5	-
Dibutylchloredate (surr.)	1	%	-	-	144	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	150	-
NEPM 2013 Phenols						
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	-	< 0.2	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	-	< 0.4	-
Pentachlorophenol	1	mg/kg	-	-	< 1	-
Phenol	0.5	mg/kg	-	-	< 0.5	-
Phenol-d6 (surr.)	1	%	-	-	51	-

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	SS15 Soil M22- Ap0038169 Apr 13, 2022	SS16 Soil M22- Ap0038170 Apr 13, 2022	SS17 Soil M22- Ap0038171 Apr 13, 2022	SS18 Soil M22- Ap0038172 Apr 13, 2022
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	< 0.1	-
4,4'-DDD	0.05	mg/kg	-	< 0.05	< 0.05	-
4,4'-DDE	0.05	mg/kg	-	< 0.05	0.16	-
4,4'-DDT	0.05	mg/kg	-	< 0.05	< 0.05	-
a-HCH	0.05	mg/kg	-	< 0.05	< 0.05	-
Aldrin	0.05	mg/kg	-	< 0.05	< 0.05	-
b-HCH	0.05	mg/kg	-	< 0.05	< 0.05	-
d-HCH	0.05	mg/kg	-	< 0.05	< 0.05	-
Dieldrin	0.05	mg/kg	-	< 0.05	< 0.05	-

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	SS15 Soil M22- Ap0038169 Apr 13, 2022	SS16 Soil M22- Ap0038170 Apr 13, 2022	SS17 Soil M22- Ap0038171 Apr 13, 2022	SS18 Soil M22- Ap0038172 Apr 13, 2022
Organochlorine Pesticides						
Endosulfan I	0.05	mg/kg	-	< 0.05	< 0.05	-
Endosulfan II	0.05	mg/kg	-	< 0.05	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin aldehyde	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin ketone	0.05	mg/kg	-	< 0.05	< 0.05	-
g-HCH (Lindane)	0.05	mg/kg	-	< 0.05	< 0.05	-
Heptachlor	0.05	mg/kg	-	< 0.05	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	< 0.05	-
Methoxychlor	0.05	mg/kg	-	< 0.05	< 0.05	-
Toxaphene	0.5	mg/kg	-	< 0.5	< 0.5	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	0.16	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	0.16	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	< 0.1	-
Dibutylchloroendate (surr.)	1	%	-	128	138	-
Tetrachloro-m-xylene (surr.)	1	%	-	135	97	-
Heavy Metals						
Arsenic	2	mg/kg	< 2	< 2	2.8	< 2
Barium	10	mg/kg	65	58	190	150
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	27	17	92	120
Cobalt	5	mg/kg	17	14	26	22
Copper	5	mg/kg	8.1	< 5	28	50
Lead	5	mg/kg	11	12	26	23
Manganese	5	mg/kg	1500	1900	7300	5100
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum	5	mg/kg	< 5	< 5	< 5	< 5
Nickel	5	mg/kg	9.2	< 5	18	27
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Silver	2	mg/kg	< 2	< 2	< 2	< 2
Tin	10	mg/kg	< 10	< 10	< 10	< 10
Zinc	5	mg/kg	11	9.8	29	26
% Moisture	1	%	16	18	20	16
Acid Herbicides						
2,4-D	0.5	mg/kg	< 0.5	-	-	< 0.5
2,4-DB	0.5	mg/kg	< 0.5	-	-	< 0.5
2,4,5-T	0.5	mg/kg	< 0.5	-	-	< 0.5
2,4,5-TP	0.5	mg/kg	< 0.5	-	-	< 0.5
Actril (loxynil)	0.5	mg/kg	< 0.5	-	-	< 0.5
Dicamba	0.5	mg/kg	< 0.5	-	-	< 0.5
Dichlorprop	0.5	mg/kg	< 0.5	-	-	< 0.5
Dinitro-o-cresol	0.5	mg/kg	< 0.5	-	-	< 0.5
Dinoseb	0.5	mg/kg	< 0.5	-	-	< 0.5
MCPA	0.5	mg/kg	< 0.5	-	-	< 0.5

Client Sample ID			SS15	SS16	SS17	SS18
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22- Ap0038169	M22- Ap0038170	M22- Ap0038171	M22- Ap0038172
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Acid Herbicides						
MCPB	0.5	mg/kg	< 0.5	-	-	< 0.5
Mecoprop	0.5	mg/kg	< 0.5	-	-	< 0.5
Warfarin (surr.)	1	%	114	-	-	108

Client Sample ID			SS19	SS20	SS21	DUP-13422A
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22- Ap0038173	M22- Ap0038174	M22- Ap0038175	M22- Ap0038176
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	-	< 20	-	< 20
TRH C10-C14	20	mg/kg	-	< 20	-	< 20
TRH C15-C28	50	mg/kg	-	< 50	-	< 50
TRH C29-C36	50	mg/kg	-	< 50	-	< 50
TRH C10-C36 (Total)	50	mg/kg	-	< 50	-	< 50
Naphthalene ^{N02}	0.5	mg/kg	-	< 0.5	-	< 0.5
TRH C6-C10	20	mg/kg	-	< 20	-	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	-	< 20	-	< 20
TRH >C10-C16	50	mg/kg	-	< 50	-	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	-	< 50	-	< 50
TRH >C16-C34	100	mg/kg	-	< 100	-	< 100
TRH >C34-C40	100	mg/kg	-	< 100	-	< 100
TRH >C10-C40 (total)*	100	mg/kg	-	< 100	-	< 100
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	-	< 0.1
Toluene	0.1	mg/kg	-	< 0.1	-	< 0.1
Ethylbenzene	0.1	mg/kg	-	< 0.1	-	< 0.1
m&p-Xylenes	0.2	mg/kg	-	< 0.2	-	< 0.2
o-Xylene	0.1	mg/kg	-	< 0.1	-	< 0.1
Xylenes - Total*	0.3	mg/kg	-	< 0.3	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	91	-	93
Organochlorine Pesticides						
Bifenthrin	0.05	mg/kg	-	< 0.05	-	-
Heavy Metals						
Arsenic	2	mg/kg	< 2	< 2	2.2	-
Barium	10	mg/kg	57	-	100	-
Beryllium	2	mg/kg	< 2	< 2	< 2	-
Boron	10	mg/kg	< 10	< 10	< 10	-
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	-
Chromium	5	mg/kg	30	19	15	-
Cobalt	5	mg/kg	13	15	10	-
Copper	5	mg/kg	8.0	< 5	11	-
Lead	5	mg/kg	14	14	14	-
Manganese	5	mg/kg	1400	1700	690	-
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Molybdenum	5	mg/kg	< 5	-	< 5	-
Nickel	5	mg/kg	5.9	< 5	9.1	-

Client Sample ID			SS19	SS20	SS21	DUP-13422A
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22- Ap0038173	M22- Ap0038174	M22- Ap0038175	M22- Ap0038176
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Heavy Metals						
Selenium	2	mg/kg	< 2	< 2	< 2	-
Silver	2	mg/kg	< 2	-	< 2	-
Tin	10	mg/kg	< 10	-	< 10	-
Zinc	5	mg/kg	8.8	8.4	41	-
% Moisture	1	%	14	7.7	21	27
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	0.1	pH Units	4.1	-	5.2	-
Chromium (hexavalent)	1	mg/kg	-	< 1	-	-
Cyanide (free)	5	mg/kg	-	< 5	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5	-	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6	-	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2	-	-
Acenaphthene	0.5	mg/kg	-	< 0.5	-	-
Acenaphthylene	0.5	mg/kg	-	< 0.5	-	-
Anthracene	0.5	mg/kg	-	< 0.5	-	-
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	-	-
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	-	-
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	-	< 0.5	-	-
Benzo(g,h,i)perylene	0.5	mg/kg	-	< 0.5	-	-
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	-	-
Chrysene	0.5	mg/kg	-	< 0.5	-	-
Dibenz(a,h)anthracene	0.5	mg/kg	-	< 0.5	-	-
Fluoranthene	0.5	mg/kg	-	< 0.5	-	-
Fluorene	0.5	mg/kg	-	< 0.5	-	-
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	-	< 0.5	-	-
Naphthalene	0.5	mg/kg	-	< 0.5	-	-
Phenanthrene	0.5	mg/kg	-	< 0.5	-	-
Pyrene	0.5	mg/kg	-	< 0.5	-	-
Total PAH*	0.5	mg/kg	-	< 0.5	-	-
2-Fluorobiphenyl (surr.)	1	%	-	80	-	-
p-Terphenyl-d14 (surr.)	1	%	-	88	-	-
Organophosphorus Pesticides						
Chlorpyrifos	0.2	mg/kg	-	< 0.2	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1221	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1232	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1242	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1248	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1254	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1260	0.1	mg/kg	-	< 0.1	-	-
Total PCB*	0.1	mg/kg	-	< 0.1	-	-
Dibutylchloroendate (surr.)	1	%	-	126	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	139	-	-
Triazines						
Atrazine	0.2	mg/kg	-	< 0.2	-	-

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	SS19 Soil M22- Ap0038173 Apr 13, 2022	SS20 Soil M22- Ap0038174 Apr 13, 2022	SS21 Soil M22- Ap0038175 Apr 13, 2022	DUP-13422A Soil M22- Ap0038176 Apr 13, 2022
NEPM 2013 Acid Herbicides						
Picloram	0.5	mg/kg	-	< 0.5	-	-
2,4-D	0.5	mg/kg	-	< 0.5	-	-
2,4,5-T	0.5	mg/kg	-	< 0.5	-	-
MCPA	0.5	mg/kg	-	< 0.5	-	-
MCPB	0.5	mg/kg	-	< 0.5	-	-
Mecoprop	0.5	mg/kg	-	< 0.5	-	-
Warfarin (surr.)	1	%	-	122	-	-
NEPM 2013 Organochlorine Pesticides						
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	-
Mirex	0.05	mg/kg	-	< 0.05	-	-
4,4'-DDD	0.05	mg/kg	-	< 0.05	-	-
4,4'-DDE	0.05	mg/kg	-	< 0.05	-	-
4,4'-DDT	0.05	mg/kg	-	< 0.05	-	-
Aldrin	0.05	mg/kg	-	< 0.05	-	-
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	-
Dieldrin	0.05	mg/kg	-	< 0.05	-	-
Endosulfan I	0.05	mg/kg	-	< 0.05	-	-
Endosulfan II	0.05	mg/kg	-	< 0.05	-	-
Endrin	0.05	mg/kg	-	< 0.05	-	-
Heptachlor	0.05	mg/kg	-	< 0.05	-	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	-
Methoxychlor	0.05	mg/kg	-	< 0.05	-	-
Toxaphene	0.5	mg/kg	-	< 0.5	-	-
Dibutylchloredate (surr.)	1	%	-	126	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	139	-	-
NEPM 2013 Phenols						
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	< 0.2	-	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	< 0.4	-	-
Pentachlorophenol	1	mg/kg	-	< 1	-	-
Phenol	0.5	mg/kg	-	< 0.5	-	-
Phenol-d6 (surr.)	1	%	-	51	-	-

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	DUP-13422B Soil M22- Ap0038177 Apr 13, 2022	DUP-13422C Soil M22- Ap0038178 Apr 13, 2022
Organochlorine Pesticides				
Chlordanes - Total	0.1	mg/kg	< 0.1	-
4,4'-DDD	0.05	mg/kg	< 0.05	-
4,4'-DDE	0.05	mg/kg	< 0.05	-
4,4'-DDT	0.05	mg/kg	< 0.05	-
a-HCH	0.05	mg/kg	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-
b-HCH	0.05	mg/kg	< 0.05	-
d-HCH	0.05	mg/kg	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-

Client Sample ID			DUP-13422B	DUP-13422C
Sample Matrix			Soil	Soil
Eurofins Sample No.			M22-Ap0038177	M22-Ap0038178
Date Sampled			Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit		
Organochlorine Pesticides				
Endosulfan I	0.05	mg/kg	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-
g-HCH (Lindane)	0.05	mg/kg	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-
Methoxychlor	0.05	mg/kg	< 0.05	-
Toxaphene	0.5	mg/kg	< 0.5	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	-
Dibutylchloroendate (surr.)	1	%	83	-
Tetrachloro-m-xylene (surr.)	1	%	88	-
Heavy Metals				
Arsenic	2	mg/kg	-	< 2
Barium	10	mg/kg	-	57
Beryllium	2	mg/kg	-	< 2
Boron	10	mg/kg	-	< 10
Cadmium	0.4	mg/kg	-	< 0.4
Chromium	5	mg/kg	-	26
Cobalt	5	mg/kg	-	12
Copper	5	mg/kg	-	6.8
Lead	5	mg/kg	-	14
Manganese	5	mg/kg	-	1200
Mercury	0.1	mg/kg	-	< 0.1
Molybdenum	5	mg/kg	-	< 5
Nickel	5	mg/kg	-	< 5
Selenium	2	mg/kg	-	< 2
Silver	2	mg/kg	-	< 2
Tin	10	mg/kg	-	< 10
Zinc	5	mg/kg	-	8.0
% Moisture	1	%	20	14

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins Suite B1			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Apr 21, 2022	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Apr 21, 2022	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Apr 21, 2022	14 Days
BTEX - Method: LTM-ORG-2010 BTEX and Volatile TRH	Melbourne	Apr 21, 2022	14 Days
Organochlorine Pesticides - Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8270)	Melbourne	Apr 21, 2022	14 Days
VIC EPA Metals : Metals M17 - Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)	Melbourne	Apr 21, 2022	180 Days
pH (units)(1:5 soil:CaCl ₂ extract at 25°C as rec.) - Method: LTM-GEN-7090 pH in soil by ISE	Melbourne	Apr 21, 2022	7 Days
Acid Herbicides - Method: LTM-ORG-2180 Phenoxy Acid Herbicides	Melbourne	Apr 21, 2022	14 Days
NEPM Screen Table 1(A) HIL's for Soil Contaminants - Basic Suite - Excluding Methyl Mercury/PBDE			
NEPM 2013 Metals : Metals M12 - Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)	Melbourne	Apr 21, 2022	28 Days
Heavy Metals - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Apr 21, 2022	28 Days
Chromium (hexavalent) - Method: LTM-INO-4100 Hexavalent Chromium by Spectrometric detection	Melbourne	Apr 21, 2022	28 Days
Cyanide (free) - Method: LTM-INO-4020 Total Free WAD Cyanide by CFA	Melbourne	Apr 21, 2022	14 Days
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Melbourne	Apr 21, 2022	14 Days
Organophosphorus Pesticides - Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS (USEPA 8270)	Melbourne	Apr 21, 2022	14 Days
Polychlorinated Biphenyls - Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8082)	Melbourne	Apr 21, 2022	28 Days
Triazines - Method: LTM-ORG-2210 Triazine Herbicides in Soil and Water by GC-MS/MS	Melbourne	Apr 21, 2022	14 Days
NEPM 2013 Acid Herbicides - Method: MGT 530	Melbourne	Apr 21, 2022	14 Days
NEPM 2013 Organochlorine Pesticides - Method: USEPA 8081 Organochlorine Pesticides	Melbourne	Apr 21, 2022	14 Days
NEPM 2013 Phenols - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Melbourne	Apr 21, 2022	14 Days
% Moisture - Method: LTM-GEN-7080 Moisture	Melbourne	Apr 20, 2022	14 Days
Conductivity (1:5 aqueous extract at 25°C as rec.) - Method: LTM-INO-4030 Conductivity	Melbourne	Apr 21, 2022	7 Days
Cation Exchange Capacity - Method: LTM-MET-3060 Cation Exchange Capacity by bases & Exchangeable Sodium Percentage	Melbourne	Apr 26, 2022	28 Days

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VIC 3067
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Project ID: 2153

Order No.:
Report #: 881033
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Fax: 9429 5911

Received: Apr 14, 2022 5:35 PM
Due: Apr 27, 2022
Priority: 5 Day
Contact Name: Glenn Berry

Eurofins Analytical Services Manager : Savini Suduweli

Sample Detail						HOLD	pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	Organochlorine Pesticides	Acid Herbicides	VIC EPA Metals : Metals M17	Moisture Set	Cation Exchange Capacity	NEPM Screen Table 1(A) HIL's for Soil Contaminants - Basic Suite - Excluding	Total Recoverable Hydrocarbons	Eurofins Suite B1
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217															
Brisbane Laboratory - NATA # 1261 Site # 20794															
Mayfield Laboratory - NATA # 1261 Site # 25079															
Perth Laboratory - NATA # 2377 Site # 2370															
External Laboratory															
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID										
1	BH01/0.1	Apr 13, 2022		Soil	M22-Ap0038145			X		X	X				X
2	BH02/0.1	Apr 13, 2022		Soil	M22-Ap0038146			X	X	X	X				X
3	BH03/0.1	Apr 13, 2022		Soil	M22-Ap0038147		X	X	X	X	X			X	X
4	BH04/0.1	Apr 13, 2022		Soil	M22-Ap0038148					X	X				
5	BH05/0.1	Apr 13, 2022		Soil	M22-Ap0038149					X	X				
6	BH06/0.1	Apr 13, 2022		Soil	M22-					X	X				X

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Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217															
Brisbane Laboratory - NATA # 1261 Site # 20794															
Mayfield Laboratory - NATA # 1261 Site # 25079															
Perth Laboratory - NATA # 2377 Site # 2370															
External Laboratory															
					Ap0038150										
7	BH07/0.1	Apr 13, 2022		Soil	M22-Ap0038151		X			X	X	X			
8	BH08/0.1	Apr 13, 2022		Soil	M22-Ap0038152			X	X	X	X				X
9	BH09/0.1	Apr 13, 2022		Soil	M22-Ap0038153					X	X				
10	BH10/0.1	Apr 13, 2022		Soil	M22-Ap0038154					X	X				
11	SS01	Apr 13, 2022		Soil	M22-Ap0038155		X		X	X	X				
12	SS02	Apr 13, 2022		Soil	M22-Ap0038156			X		X	X				

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Sample Detail						HOLD	pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	Organochlorine Pesticides	Acid Herbicides	VIC EPA Metals : Metals M17	Moisture Set	Cation Exchange Capacity	NEPM Screen Table 1(A) HIL's for Soil Contaminants - Basic Suite - Excluding	Total Recoverable Hydrocarbons	Eurofins Suite B1
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217															
Brisbane Laboratory - NATA # 1261 Site # 20794															
Mayfield Laboratory - NATA # 1261 Site # 25079															
Perth Laboratory - NATA # 2377 Site # 2370															
External Laboratory															
13	SS03	Apr 13, 2022		Soil	M22-Ap0038157				X	X	X				
14	SS04	Apr 13, 2022		Soil	M22-Ap0038158			X		X	X				
15	SS05	Apr 13, 2022		Soil	M22-Ap0038159		X				X		X		
16	SS06	Apr 13, 2022		Soil	M22-Ap0038160			X		X	X				
17	SS07	Apr 13, 2022		Soil	M22-Ap0038161			X		X	X				
18	SS08	Apr 13, 2022		Soil	M22-Ap0038162		X		X	X	X				
19	SS09	Apr 13, 2022		Soil	M22-					X	X				

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Sample Detail						HOLD	pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	Organochlorine Pesticides	Acid Herbicides	VIC EPA Metals : Metals M17	Moisture Set	Cation Exchange Capacity	NEPM Screen Table 1(A) HIL's for Soil Contaminants - Basic Suite - Excluding	Total Recoverable Hydrocarbons	Eurofins Suite B1
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217															
Brisbane Laboratory - NATA # 1261 Site # 20794															
Mayfield Laboratory - NATA # 1261 Site # 25079															
Perth Laboratory - NATA # 2377 Site # 2370															
External Laboratory															
					Ap0038163										
20	SS10	Apr 13, 2022		Soil	M22-Ap0038164		X	X		X	X				
21	SS11	Apr 13, 2022		Soil	M22-Ap0038165					X	X	X			
22	SS12	Apr 13, 2022		Soil	M22-Ap0038166				X	X	X				
23	SS13	Apr 13, 2022		Soil	M22-Ap0038167		X				X		X		
24	SS14	Apr 13, 2022		Soil	M22-Ap0038168		X	X		X	X				
25	SS15	Apr 13, 2022		Soil	M22-Ap0038169				X	X	X				

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Sample Detail						HOLD	pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	Organochlorine Pesticides	Acid Herbicides	VIC EPA Metals : Metals M17	Moisture Set	Cation Exchange Capacity	NEPM Screen Table 1(A) HIL's for Soil Contaminants - Basic Suite - Excluding	Total Recoverable Hydrocarbons	Eurofins Suite B1
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217															
Brisbane Laboratory - NATA # 1261 Site # 20794															
Mayfield Laboratory - NATA # 1261 Site # 25079															
Perth Laboratory - NATA # 2377 Site # 2370															
External Laboratory															
26	SS16	Apr 13, 2022		Soil	M22-Ap0038170			X		X	X				
27	SS17	Apr 13, 2022		Soil	M22-Ap0038171			X		X	X				
28	SS18	Apr 13, 2022		Soil	M22-Ap0038172				X	X	X				
29	SS19	Apr 13, 2022		Soil	M22-Ap0038173		X			X	X				
30	SS20	Apr 13, 2022		Soil	M22-Ap0038174						X		X		
31	SS21	Apr 13, 2022		Soil	M22-Ap0038175		X			X	X				
32	DUP-13422A	Apr 13, 2022		Soil	M22-						X				X

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Sample Detail						HOLD	pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	Organochlorine Pesticides	Acid Herbicides	VIC EPA Metals : Metals M17	Moisture Set	Cation Exchange Capacity	NEPM Screen Table 1(A) HIL's for Soil Contaminants - Basic Suite - Excluding	Total Recoverable Hydrocarbons	Eurofins Suite B1
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217															
Brisbane Laboratory - NATA # 1261 Site # 20794															
Mayfield Laboratory - NATA # 1261 Site # 25079															
Perth Laboratory - NATA # 2377 Site # 2370															
External Laboratory															
					Ap0038176										
33	DUP-13422B	Apr 13, 2022		Soil	M22-Ap0038177			X			X				
34	DUP-13422C	Apr 13, 2022		Soil	M22-Ap0038178					X	X				
35	BH01/0.5	Apr 13, 2022		Soil	M22-Ap0038179	X									
36	BH02/0.5	Apr 13, 2022		Soil	M22-Ap0038180	X									
37	BH03/0.5	Apr 13, 2022		Soil	M22-Ap0038181	X									
38	BH04/0.5	Apr 13, 2022		Soil	M22-Ap0038182	X									

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Sample Detail						HOLD	pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	Organochlorine Pesticides	Acid Herbicides	VIC EPA Metals : Metals M17	Moisture Set	Cation Exchange Capacity	NEPM Screen Table 1(A) HIL's for Soil Contaminants - Basic Suite - Excluding	Total Recoverable Hydrocarbons	Eurofins Suite B1
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217															
Brisbane Laboratory - NATA # 1261 Site # 20794															
Mayfield Laboratory - NATA # 1261 Site # 25079															
Perth Laboratory - NATA # 2377 Site # 2370															
External Laboratory															
39	BH05/0.5	Apr 13, 2022		Soil	M22-Ap0038183	X									
40	BH06/0.5	Apr 13, 2022		Soil	M22-Ap0038184	X									
41	BH07/0.5	Apr 13, 2022		Soil	M22-Ap0038185	X									
42	BH08/0.5	Apr 13, 2022		Soil	M22-Ap0038186	X									
43	BH09/0.5	Apr 13, 2022		Soil	M22-Ap0038187	X									
44	BH10/0.5	Apr 13, 2022		Soil	M22-Ap0038188	X									
45	SS22	Apr 13, 2022		Soil	M22-	X									

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Sample Detail						HOLD	pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	Organochlorine Pesticides	Acid Herbicides	VIC EPA Metals : Metals M17	Moisture Set	Cation Exchange Capacity	NEPM Screen Table 1(A) HIL's for Soil Contaminants - Basic Suite - Excluding	Total Recoverable Hydrocarbons	Eurofins Suite B1
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217															
Brisbane Laboratory - NATA # 1261 Site # 20794															
Mayfield Laboratory - NATA # 1261 Site # 25079															
Perth Laboratory - NATA # 2377 Site # 2370															
External Laboratory															
					Ap0038189										
46	DECON-13422	Apr 13, 2022		Water	M22-Ap0038190	X									
47	TB-13422	Apr 13, 2022		Water	M22-Ap0038191	X									
48	FB-13422	Apr 13, 2022		Water	M22-Ap0038192	X									
Test Counts						14	10	13	9	29	34	2	3	1	6

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	µg/L: micrograms per litre
ppm: parts per million	ppb: parts per billion	%: Percentage
org/100 mL: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units	MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4,4'-DDD	mg/kg	< 0.05			0.05	Pass	
4,4'-DDE	mg/kg	< 0.05			0.05	Pass	
4,4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-HCH	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-HCH	mg/kg	< 0.05			0.05	Pass	
d-HCH	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-HCH (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 0.5			0.5	Pass	
Bifenthrin	mg/kg	< 0.05			0.05	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Barium	mg/kg	< 10			10	Pass	
Beryllium	mg/kg	< 2			2	Pass	
Boron	mg/kg	< 10			10	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Cobalt	mg/kg	< 5			5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Manganese	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Molybdenum	mg/kg	< 5			5	Pass	
Nickel	mg/kg	< 5			5	Pass	
Selenium	mg/kg	< 2			2	Pass	
Silver	mg/kg	< 2			2	Pass	
Tin	mg/kg	< 10			10	Pass	
Zinc	mg/kg	< 5			5	Pass	
Method Blank							
Chromium (hexavalent)	mg/kg	< 1			1	Pass	
Cyanide (free)	mg/kg	< 5			5	Pass	
Method Blank							
Acid Herbicides							
2,4-D	mg/kg	< 0.5			0.5	Pass	
2,4-DB	mg/kg	< 0.5			0.5	Pass	
2,4,5-T	mg/kg	< 0.5			0.5	Pass	
2,4,5-TP	mg/kg	< 0.5			0.5	Pass	
Actril (loxynil)	mg/kg	< 0.5			0.5	Pass	
Dicamba	mg/kg	< 0.5			0.5	Pass	
Dichlorprop	mg/kg	< 0.5			0.5	Pass	
Dinitro-o-cresol	mg/kg	< 0.5			0.5	Pass	
Dinoseb	mg/kg	< 0.5			0.5	Pass	
MCPA	mg/kg	< 0.5			0.5	Pass	
MCPB	mg/kg	< 0.5			0.5	Pass	
Mecoprop	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Cation Exchange Capacity							
Cation Exchange Capacity	meq/100g	< 0.05			0.05	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g,h,i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a,h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organophosphorus Pesticides							
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.1			0.1	Pass	
Aroclor-1242	mg/kg	< 0.1			0.1	Pass	
Aroclor-1248	mg/kg	< 0.1			0.1	Pass	
Aroclor-1254	mg/kg	< 0.1			0.1	Pass	
Aroclor-1260	mg/kg	< 0.1			0.1	Pass	
Total PCB*	mg/kg	< 0.1			0.1	Pass	
Method Blank							
Triazines							
Atrazine	mg/kg	< 0.2			0.2	Pass	
Method Blank							
NEPM 2013 Acid Herbicides							
Picloram	mg/kg	< 0.5			0.5	Pass	
2,4-D	mg/kg	< 0.5			0.5	Pass	
2,4,5-T	mg/kg	< 0.5			0.5	Pass	
MCPA	mg/kg	< 0.5			0.5	Pass	
MCPB	mg/kg	< 0.5			0.5	Pass	
Mecoprop	mg/kg	< 0.5			0.5	Pass	
Method Blank							
NEPM 2013 Organochlorine Pesticides							
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Mirex	mg/kg	< 0.05			0.05	Pass	
4,4'-DDD	mg/kg	< 0.05			0.05	Pass	
4,4'-DDE	mg/kg	< 0.05			0.05	Pass	
4,4'-DDT	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
NEPM 2013 Phenols							
2-Methylphenol (o-Cresol)	mg/kg	< 0.2			0.2	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 0.4			0.4	Pass	
Pentachlorophenol	mg/kg	< 1			1	Pass	
Phenol	mg/kg	< 0.5			0.5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	76			70-130	Pass	
TRH C10-C14	%	98			70-130	Pass	
Naphthalene	%	73			70-130	Pass	
TRH C6-C10	%	74			70-130	Pass	
TRH >C10-C16	%	105			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	74			70-130	Pass	
Toluene	%	119			70-130	Pass	
Ethylbenzene	%	78			70-130	Pass	
m&p-Xylenes	%	83			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Xylenes - Total*	%	82			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	97			70-130	Pass	
4.4'-DDD	%	102			70-130	Pass	
4.4'-DDE	%	104			70-130	Pass	
4.4'-DDT	%	102			70-130	Pass	
a-HCH	%	97			70-130	Pass	
Aldrin	%	83			70-130	Pass	
b-HCH	%	103			70-130	Pass	
d-HCH	%	105			70-130	Pass	
Dieldrin	%	74			70-130	Pass	
Endosulfan I	%	105			70-130	Pass	
Endosulfan II	%	103			70-130	Pass	
Endosulfan sulphate	%	102			70-130	Pass	
Endrin	%	74			70-130	Pass	
Endrin aldehyde	%	71			70-130	Pass	
Endrin ketone	%	79			70-130	Pass	
g-HCH (Lindane)	%	80			70-130	Pass	
Heptachlor	%	102			70-130	Pass	
Heptachlor epoxide	%	86			70-130	Pass	
Hexachlorobenzene	%	104			70-130	Pass	
Methoxychlor	%	100			70-130	Pass	
Bifenthrin	%	89			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	108			80-120	Pass	
Barium	%	113			80-120	Pass	
Beryllium	%	103			80-120	Pass	
Boron	%	94			80-120	Pass	
Cadmium	%	110			80-120	Pass	
Chromium	%	108			80-120	Pass	
Cobalt	%	107			80-120	Pass	
Copper	%	109			80-120	Pass	
Lead	%	108			80-120	Pass	
Manganese	%	109			80-120	Pass	
Mercury	%	97			80-120	Pass	
Molybdenum	%	110			80-120	Pass	
Nickel	%	104			80-120	Pass	
Selenium	%	107			80-120	Pass	
Silver	%	111			80-120	Pass	
Tin	%	108			80-120	Pass	
Zinc	%	109			80-120	Pass	
LCS - % Recovery							
Chromium (hexavalent)	%	97			70-130	Pass	
LCS - % Recovery							
Acid Herbicides							
2.4-D	%	93			70-130	Pass	
2.4-DB	%	130			70-130	Pass	
2.4.5-T	%	124			70-130	Pass	
2.4.5-TP	%	127			70-130	Pass	
Actril (loxynil)	%	122			70-130	Pass	
Dicamba	%	102			70-130	Pass	
Dichlorprop	%	117			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Dinitro-o-cresol	%	104			70-130	Pass	
Dinoseb	%	109			70-130	Pass	
MCPA	%	105			70-130	Pass	
MCPB	%	104			70-130	Pass	
Mecoprop	%	121			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	117			70-130	Pass	
Acenaphthylene	%	86			70-130	Pass	
Anthracene	%	115			70-130	Pass	
Benz(a)anthracene	%	75			70-130	Pass	
Benzo(a)pyrene	%	127			70-130	Pass	
Benzo(b&j)fluoranthene	%	81			70-130	Pass	
Benzo(g,h,i)perylene	%	115			70-130	Pass	
Benzo(k)fluoranthene	%	83			70-130	Pass	
Chrysene	%	86			70-130	Pass	
Dibenz(a,h)anthracene	%	118			70-130	Pass	
Fluoranthene	%	113			70-130	Pass	
Fluorene	%	127			70-130	Pass	
Indeno(1,2,3-cd)pyrene	%	115			70-130	Pass	
Naphthalene	%	116			70-130	Pass	
Phenanthrene	%	105			70-130	Pass	
Pyrene	%	118			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	78			70-130	Pass	
LCS - % Recovery							
NEPM 2013 Acid Herbicides							
Picloram	%	127			70-130	Pass	
2,4-D	%	100			70-130	Pass	
2,4,5-T	%	125			70-130	Pass	
MCPA	%	104			70-130	Pass	
MCPB	%	118			70-130	Pass	
Mecoprop	%	121			70-130	Pass	
LCS - % Recovery							
NEPM 2013 Organochlorine Pesticides							
Endosulfan sulphate	%	91			70-130	Pass	
Mirex	%	80			70-130	Pass	
4,4'-DDD	%	101			70-130	Pass	
4,4'-DDE	%	86			70-130	Pass	
4,4'-DDT	%	103			70-130	Pass	
Aldrin	%	80			70-130	Pass	
Chlordanes - Total	%	80			70-130	Pass	
Dieldrin	%	76			70-130	Pass	
Endosulfan I	%	73			70-130	Pass	
Endosulfan II	%	77			70-130	Pass	
Endrin	%	85			70-130	Pass	
Heptachlor	%	88			70-130	Pass	
Hexachlorobenzene	%	93			70-130	Pass	
Methoxychlor	%	122			70-130	Pass	
LCS - % Recovery							
NEPM 2013 Phenols							
2-Methylphenol (o-Cresol)	%	86			25-140	Pass	
3&4-Methylphenol (m&p-Cresol)	%	43			25-140	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Pentachlorophenol			%	51			25-140	Pass	
Phenol			%	109			25-140	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH C6-C9	M22-Ap0043086	NCP	%	108			70-130	Pass	
TRH C10-C14	M22-Ap0035286	NCP	%	108			70-130	Pass	
Naphthalene	M22-Ap0043086	NCP	%	76			70-130	Pass	
TRH C6-C10	M22-Ap0043086	NCP	%	100			70-130	Pass	
TRH >C10-C16	M22-Ap0035286	NCP	%	115			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M22-Ap0043086	NCP	%	76			70-130	Pass	
Toluene	M22-Ap0043086	NCP	%	80			70-130	Pass	
Ethylbenzene	M22-Ap0043086	NCP	%	81			70-130	Pass	
m&p-Xylenes	M22-Ap0043086	NCP	%	92			70-130	Pass	
o-Xylene	M22-Ap0043086	NCP	%	74			70-130	Pass	
Xylenes - Total*	M22-Ap0043086	NCP	%	86			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Manganese	M22-Ap0041475	NCP	%	104			75-125	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	M22-Ap0043514	NCP	%	85			70-130	Pass	
4,4'-DDD	M22-Ap0043514	NCP	%	85			70-130	Pass	
4,4'-DDE	M22-Ap0043514	NCP	%	92			70-130	Pass	
4,4'-DDT	M22-Ap0043514	NCP	%	123			70-130	Pass	
a-HCH	M22-Ap0043514	NCP	%	106			70-130	Pass	
Aldrin	M22-Ap0043514	NCP	%	84			70-130	Pass	
b-HCH	M22-Ap0043514	NCP	%	72			70-130	Pass	
d-HCH	M22-Ap0043514	NCP	%	104			70-130	Pass	
Dieldrin	M22-Ap0043514	NCP	%	79			70-130	Pass	
Endosulfan I	M22-Ap0043514	NCP	%	83			70-130	Pass	
Endosulfan II	M22-Ap0043514	NCP	%	78			70-130	Pass	
Endosulfan sulphate	M22-Ap0043514	NCP	%	101			70-130	Pass	
Endrin	M22-Ap0043514	NCP	%	92			70-130	Pass	
Endrin aldehyde	M22-Ap0043514	NCP	%	76			70-130	Pass	
Endrin ketone	M22-Ap0043514	NCP	%	103			70-130	Pass	
g-HCH (Lindane)	M22-Ap0043514	NCP	%	126			70-130	Pass	
Heptachlor	M22-Ap0043514	NCP	%	99			70-130	Pass	
Heptachlor epoxide	M22-Ap0043514	NCP	%	81			70-130	Pass	
Hexachlorobenzene	M22-Ap0043514	NCP	%	99			70-130	Pass	
Methoxychlor	M22-Ap0043514	NCP	%	97			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M22-Ap0038156	CP	%	78			75-125	Pass	
Beryllium	M22-Ap0038156	CP	%	97			75-125	Pass	
Boron	M22-Ap0038156	CP	%	91			75-125	Pass	
Cadmium	M22-Ap0038156	CP	%	109			75-125	Pass	
Chromium	M22-Ap0038156	CP	%	82			75-125	Pass	
Cobalt	M22-Ap0038156	CP	%	105			75-125	Pass	
Copper	M22-Ap0038156	CP	%	99			75-125	Pass	
Lead	M22-Ap0038156	CP	%	103			75-125	Pass	
Mercury	M22-Ap0038156	CP	%	103			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Molybdenum	M22-Ap0038156	CP	%	105			75-125	Pass	
Nickel	M22-Ap0038156	CP	%	99			75-125	Pass	
Selenium	M22-Ap0038156	CP	%	89			75-125	Pass	
Silver	M22-Ap0038156	CP	%	111			75-125	Pass	
Tin	M22-Ap0038156	CP	%	109			75-125	Pass	
Zinc	M22-Ap0038156	CP	%	96			75-125	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Bifenthrin	M22-Ap0031223	NCP	%	97			70-130	Pass	
Spike - % Recovery									
				Result 1					
Chromium (hexavalent)	M22-Ap0038456	NCP	%	60			70-130	Fail	Q08
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M22-Ap0034145	NCP	%	84			70-130	Pass	
Acenaphthylene	M22-Ap0034145	NCP	%	89			70-130	Pass	
Anthracene	M22-Ap0034145	NCP	%	87			70-130	Pass	
Benz(a)anthracene	M22-Ap0034145	NCP	%	82			70-130	Pass	
Benzo(a)pyrene	M22-Ap0034145	NCP	%	87			70-130	Pass	
Benzo(b&j)fluoranthene	M22-Ap0034145	NCP	%	71			70-130	Pass	
Benzo(g,h,i)perylene	M22-Ap0034145	NCP	%	82			70-130	Pass	
Benzo(k)fluoranthene	M22-Ap0034145	NCP	%	119			70-130	Pass	
Chrysene	M22-Ap0034145	NCP	%	102			70-130	Pass	
Dibenz(a,h)anthracene	M22-Ap0034145	NCP	%	79			70-130	Pass	
Fluoranthene	M22-Ap0034145	NCP	%	75			70-130	Pass	
Fluorene	M22-Ap0034145	NCP	%	85			70-130	Pass	
Indeno(1,2,3-cd)pyrene	M22-Ap0034145	NCP	%	78			70-130	Pass	
Naphthalene	M22-Ap0034145	NCP	%	82			70-130	Pass	
Phenanthrene	M22-Ap0034145	NCP	%	80			70-130	Pass	
Pyrene	M22-Ap0034145	NCP	%	78			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1016	M22-Ap0035793	NCP	%	100			70-130	Pass	
Aroclor-1260	M22-Ap0035793	NCP	%	117			70-130	Pass	
Spike - % Recovery									
NEPM 2013 Organochlorine Pesticides				Result 1					
Mirex	M22-Ap0031223	NCP	%	84			70-130	Pass	
Spike - % Recovery									
NEPM 2013 Phenols				Result 1					
2-Methylphenol (o-Cresol)	M22-Ap0034145	NCP	%	66			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	M22-Ap0034145	NCP	%	99			30-130	Pass	
Pentachlorophenol	M22-Ap0034145	NCP	%	44			30-130	Pass	
Phenol	M22-Ap0034145	NCP	%	74			30-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M22-Ap0038166	CP	%	101			75-125	Pass	
Beryllium	M22-Ap0038166	CP	%	102			75-125	Pass	
Boron	M22-Ap0038166	CP	%	93			75-125	Pass	
Cadmium	M22-Ap0038166	CP	%	113			75-125	Pass	
Chromium	M22-Ap0038166	CP	%	84			75-125	Pass	
Cobalt	M22-Ap0038166	CP	%	101			75-125	Pass	
Copper	M22-Ap0038166	CP	%	105			75-125	Pass	
Lead	M22-Ap0038166	CP	%	111			75-125	Pass	
Mercury	M22-Ap0038166	CP	%	105			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Molybdenum	M22-Ap0038166	CP	%	111			75-125	Pass	
Nickel	M22-Ap0038166	CP	%	100			75-125	Pass	
Selenium	M22-Ap0038166	CP	%	94			75-125	Pass	
Silver	M22-Ap0038166	CP	%	112			75-125	Pass	
Tin	M22-Ap0038166	CP	%	110			75-125	Pass	
Zinc	M22-Ap0038166	CP	%	106			75-125	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M22-Ap0038178	CP	%	96			75-125	Pass	
Barium	M22-Ap0038178	CP	%	101			75-125	Pass	
Beryllium	M22-Ap0038178	CP	%	83			75-125	Pass	
Boron	M22-Ap0038178	CP	%	93			75-125	Pass	
Cadmium	M22-Ap0038178	CP	%	122			75-125	Pass	
Chromium	M22-Ap0038178	CP	%	118			75-125	Pass	
Cobalt	M22-Ap0038178	CP	%	103			75-125	Pass	
Copper	M22-Ap0038178	CP	%	94			75-125	Pass	
Lead	M22-Ap0038178	CP	%	97			75-125	Pass	
Mercury	M22-Ap0038178	CP	%	116			75-125	Pass	
Molybdenum	M22-Ap0038178	CP	%	94			75-125	Pass	
Nickel	M22-Ap0038178	CP	%	92			75-125	Pass	
Selenium	M22-Ap0038178	CP	%	78			75-125	Pass	
Silver	M22-Ap0038178	CP	%	121			75-125	Pass	
Tin	M22-Ap0038178	CP	%	94			75-125	Pass	
Zinc	M22-Ap0038178	CP	%	97			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C10-C14	M22-Ap0035285	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M22-Ap0035285	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M22-Ap0035285	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C10-C16	M22-Ap0035285	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M22-Ap0035285	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M22-Ap0035285	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	L22-Ap0039404	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4,4'-DDD	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4,4'-DDE	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4,4'-DDT	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-HCH	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-HCH	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-HCH	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-HCH (Lindane)	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate								
Organochlorine Pesticides				Result 1	Result 2	RPD		
Methoxychlor	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Toxaphene	L22-Ap0039404	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	M22-Ap0038145	CP	%	24	23	3.0	30%	Pass
Duplicate								
Cation Exchange Capacity				Result 1	Result 2	RPD		
Cation Exchange Capacity	B22-Ap0018967	NCP	meq/100g	25	23	8.0	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	M22-Ap0038155	CP	mg/kg	2.3	2.2	3.0	30%	Pass
Barium	M22-Ap0038155	CP	mg/kg	230	200	16	30%	Pass
Beryllium	M22-Ap0038155	CP	mg/kg	< 2	< 2	<1	30%	Pass
Boron	M22-Ap0038155	CP	mg/kg	< 10	< 10	<1	30%	Pass
Cadmium	M22-Ap0038155	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	M22-Ap0038155	CP	mg/kg	98	90	8.0	30%	Pass
Cobalt	M22-Ap0038155	CP	mg/kg	37	32	14	30%	Pass
Copper	M22-Ap0038155	CP	mg/kg	42	36	15	30%	Pass
Lead	M22-Ap0038155	CP	mg/kg	26	23	14	30%	Pass
Manganese	M22-Ap0038155	CP	mg/kg	8600	7500	13	30%	Pass
Mercury	M22-Ap0038155	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Molybdenum	M22-Ap0038155	CP	mg/kg	< 5	< 5	<1	30%	Pass
Nickel	M22-Ap0038155	CP	mg/kg	38	32	17	30%	Pass
Selenium	M22-Ap0038155	CP	mg/kg	< 2	< 2	<1	30%	Pass
Silver	M22-Ap0038155	CP	mg/kg	< 2	< 2	<1	30%	Pass
Tin	M22-Ap0038155	CP	mg/kg	< 10	< 10	<1	30%	Pass
Zinc	M22-Ap0038155	CP	mg/kg	31	25	19	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	M22-Ap0038155	CP	%	33	34	3.0	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	M22-Ap0038156	CP	mg/kg	2.9	2.8	2.0	30%	Pass
Barium	M22-Ap0038156	CP	mg/kg	320	320	1.0	30%	Pass
Beryllium	M22-Ap0038156	CP	mg/kg	< 2	< 2	<1	30%	Pass
Boron	M22-Ap0038156	CP	mg/kg	< 10	< 10	<1	30%	Pass
Cadmium	M22-Ap0038156	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	M22-Ap0038156	CP	mg/kg	87	89	2.0	30%	Pass
Cobalt	M22-Ap0038156	CP	mg/kg	64	64	1.0	30%	Pass
Copper	M22-Ap0038156	CP	mg/kg	53	53	1.0	30%	Pass
Lead	M22-Ap0038156	CP	mg/kg	30	30	1.0	30%	Pass
Manganese	M22-Ap0038156	CP	mg/kg	13000	13000	2.0	30%	Pass
Mercury	M22-Ap0038156	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Molybdenum	M22-Ap0038156	CP	mg/kg	< 5	< 5	<1	30%	Pass
Nickel	M22-Ap0038156	CP	mg/kg	48	48	<1	30%	Pass
Selenium	M22-Ap0038156	CP	mg/kg	< 2	< 2	<1	30%	Pass
Silver	M22-Ap0038156	CP	mg/kg	< 2	< 2	<1	30%	Pass
Tin	M22-Ap0038156	CP	mg/kg	< 10	< 10	<1	30%	Pass
Zinc	M22-Ap0038156	CP	mg/kg	41	42	2.0	30%	Pass

Duplicate								
Acid Herbicides				Result 1	Result 2	RPD		
2.4-D	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
2.4-DB	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
2.4.5-T	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
2.4.5-TP	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Actril (loxynil)	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dicamba	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dichlorprop	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dinitro-o-cresol	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dinoseb	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
MCPA	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
MCPB	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Mecoprop	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
NEPM 2013 Acid Herbicides				Result 1	Result 2	RPD		
Picloram	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Organochlorine Pesticides				Result 1	Result 2	RPD		
Bifenthrin	M22-Ap0038470	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
Chromium (hexavalent)	M22-Ap0046078	NCP	mg/kg	< 1	< 1	<1	30%	Pass
Duplicate								
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD		
Acenaphthene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Acenaphthylene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Anthracene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benz(a)anthracene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(a)pyrene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(b&j)fluoranthene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(g,h,i)perylene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(k)fluoranthene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Chrysene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dibenz(a,h)anthracene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluoranthene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluorene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Indeno(1,2,3-cd)pyrene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Naphthalene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Phenanthrene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Pyrene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Organophosphorus Pesticides				Result 1	Result 2	RPD		
Chlorpyrifos	M22-Ap0038470	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Duplicate								
Polychlorinated Biphenyls				Result 1	Result 2	RPD		
Aroclor-1016	M22-Ap0038470	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1221	M22-Ap0038470	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1232	M22-Ap0038470	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1242	M22-Ap0038470	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1248	M22-Ap0038470	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1254	M22-Ap0038459	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1260	M22-Ap0038459	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Total PCB*	M22-Ap0038459	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Duplicate								
Triazines				Result 1	Result 2	RPD		
Atrazine	M22-Ap0038470	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass

Duplicate								
NEPM 2013 Acid Herbicides				Result 1	Result 2	RPD		
Picloram	M22-Ap0035284	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
NEPM 2013 Organochlorine Pesticides				Result 1	Result 2	RPD		
Mirex	M22-Ap0038470	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Duplicate								
NEPM 2013 Phenols				Result 1	Result 2	RPD		
2-Methylphenol (o-Cresol)	M22-Ap0038470	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
3&4-Methylphenol (m&p-Cresol)	M22-Ap0038470	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Pentachlorophenol	M22-Ap0038470	NCP	mg/kg	< 1	< 1	<1	30%	Pass
Phenol	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	M22-Ap0038165	CP	mg/kg	< 2	2.2	16	30%	Pass
Barium	M22-Ap0038165	CP	mg/kg	280	320	11	30%	Pass
Beryllium	M22-Ap0038165	CP	mg/kg	< 2	< 2	<1	30%	Pass
Boron	M22-Ap0038165	CP	mg/kg	< 10	< 10	<1	30%	Pass
Cadmium	M22-Ap0038165	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	M22-Ap0038165	CP	mg/kg	280	250	13	30%	Pass
Cobalt	M22-Ap0038165	CP	mg/kg	150	170	14	30%	Pass
Copper	M22-Ap0038165	CP	mg/kg	33	32	3.0	30%	Pass
Lead	M22-Ap0038165	CP	mg/kg	9.2	9.4	2.0	30%	Pass
Manganese	M22-Ap0038165	CP	mg/kg	4500	5500	22	30%	Pass
Mercury	M22-Ap0038165	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Molybdenum	M22-Ap0038165	CP	mg/kg	< 5	< 5	<1	30%	Pass
Nickel	M22-Ap0038165	CP	mg/kg	100	110	6.0	30%	Pass
Selenium	M22-Ap0038165	CP	mg/kg	< 2	< 2	<1	30%	Pass
Silver	M22-Ap0038165	CP	mg/kg	< 2	< 2	<1	30%	Pass
Tin	M22-Ap0038165	CP	mg/kg	< 10	< 10	<1	30%	Pass
Zinc	M22-Ap0038165	CP	mg/kg	93	92	1.0	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	M22-Ap0038165	CP	%	21	18	16	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	M22-Ap0038166	CP	mg/kg	2.5	2.6	2.0	30%	Pass
Barium	M22-Ap0038166	CP	mg/kg	76	76	1.0	30%	Pass
Beryllium	M22-Ap0038166	CP	mg/kg	< 2	< 2	<1	30%	Pass
Boron	M22-Ap0038166	CP	mg/kg	< 10	< 10	<1	30%	Pass
Cadmium	M22-Ap0038166	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	M22-Ap0038166	CP	mg/kg	43	43	<1	30%	Pass
Cobalt	M22-Ap0038166	CP	mg/kg	23	24	1.0	30%	Pass
Copper	M22-Ap0038166	CP	mg/kg	8.1	8.2	1.0	30%	Pass
Lead	M22-Ap0038166	CP	mg/kg	11	11	1.0	30%	Pass
Manganese	M22-Ap0038166	CP	mg/kg	1400	1500	1.0	30%	Pass
Mercury	M22-Ap0038166	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Molybdenum	M22-Ap0038166	CP	mg/kg	< 5	< 5	<1	30%	Pass
Nickel	M22-Ap0038166	CP	mg/kg	12	12	1.0	30%	Pass
Selenium	M22-Ap0038166	CP	mg/kg	< 2	< 2	<1	30%	Pass
Silver	M22-Ap0038166	CP	mg/kg	< 2	< 2	<1	30%	Pass
Tin	M22-Ap0038166	CP	mg/kg	< 10	< 10	<1	30%	Pass
Zinc	M22-Ap0038166	CP	mg/kg	24	24	3.0	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	M22-Ap0043089	NCP	pH Units	6.7	6.8	pass	30%	Pass

Duplicate								
				Result 1	Result 2	RPD		
Conductivity (1:5 aqueous extract at 25°C as rec.)	M22-Ap0038168	CP	uS/cm	43	43	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	M22-Ap0038172	CP	mg/kg	< 2	< 2	<1	30%	Pass
Barium	M22-Ap0038172	CP	mg/kg	150	140	7.0	30%	Pass
Beryllium	M22-Ap0038172	CP	mg/kg	< 2	< 2	<1	30%	Pass
Boron	M22-Ap0038172	CP	mg/kg	< 10	< 10	<1	30%	Pass
Cadmium	M22-Ap0038172	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	M22-Ap0038172	CP	mg/kg	120	110	8.0	30%	Pass
Cobalt	M22-Ap0038172	CP	mg/kg	22	20	7.0	30%	Pass
Copper	M22-Ap0038172	CP	mg/kg	50	45	10	30%	Pass
Lead	M22-Ap0038172	CP	mg/kg	23	21	8.0	30%	Pass
Manganese	M22-Ap0038172	CP	mg/kg	5100	4700	8.0	30%	Pass
Mercury	M22-Ap0038172	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Molybdenum	M22-Ap0038172	CP	mg/kg	< 5	< 5	<1	30%	Pass
Nickel	M22-Ap0038172	CP	mg/kg	27	24	11	30%	Pass
Selenium	M22-Ap0038172	CP	mg/kg	< 2	< 2	<1	30%	Pass
Silver	M22-Ap0038172	CP	mg/kg	< 2	< 2	<1	30%	Pass
Tin	M22-Ap0038172	CP	mg/kg	< 10	< 10	<1	30%	Pass
Zinc	M22-Ap0038172	CP	mg/kg	26	23	11	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	M22-Ap0038175	CP	%	21	20	3.0	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD		
TRH C6-C9	M22-Ap0038176	CP	mg/kg	< 20	< 20	<1	30%	Pass
Naphthalene	M22-Ap0038176	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
TRH C6-C10	M22-Ap0038176	CP	mg/kg	< 20	< 20	<1	30%	Pass
Duplicate								
BTEX				Result 1	Result 2	RPD		
Benzene	M22-Ap0038176	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Toluene	M22-Ap0038176	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Ethylbenzene	M22-Ap0038176	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
m&p-Xylenes	M22-Ap0038176	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
o-Xylene	M22-Ap0038176	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Xylenes - Total*	M22-Ap0038176	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	M22-Ap0038178	CP	mg/kg	< 2	< 2	<1	30%	Pass
Barium	M22-Ap0038178	CP	mg/kg	57	58	2.0	30%	Pass
Beryllium	M22-Ap0038178	CP	mg/kg	< 2	< 2	<1	30%	Pass
Boron	M22-Ap0038178	CP	mg/kg	< 10	< 10	<1	30%	Pass
Cadmium	M22-Ap0038178	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	M22-Ap0038178	CP	mg/kg	26	26	1.0	30%	Pass
Cobalt	M22-Ap0038178	CP	mg/kg	12	12	1.0	30%	Pass
Copper	M22-Ap0038178	CP	mg/kg	6.8	6.9	2.0	30%	Pass
Lead	M22-Ap0038178	CP	mg/kg	14	15	<1	30%	Pass
Manganese	M22-Ap0038178	CP	mg/kg	1200	1200	<1	30%	Pass
Mercury	M22-Ap0038178	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Molybdenum	M22-Ap0038178	CP	mg/kg	< 5	< 5	<1	30%	Pass
Nickel	M22-Ap0038178	CP	mg/kg	< 5	< 5	<1	30%	Pass
Selenium	M22-Ap0038178	CP	mg/kg	< 2	< 2	<1	30%	Pass
Silver	M22-Ap0038178	CP	mg/kg	< 2	< 2	<1	30%	Pass

Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Tin	M22-Ap0038178	CP	mg/kg	< 10	< 10	<1	30%	Pass
Zinc	M22-Ap0038178	CP	mg/kg	8.0	7.9	1.0	30%	Pass

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.

Authorised by:

Harry Bacalis	Analytical Services Manager
Scott Beddoes	Senior Analyst (NSW)
Mary Makarios	Senior Analyst (NSW)
Carroll Lee	Senior Analyst (NSW)
Joseph Edouard	Senior Analyst (VIC)
Edward Lee	Senior Analyst (VIC)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

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#AU_CAU001_EnviroSampleVic

From: Harry Bacalis
Sent: Thursday, 5 May 2022 11:32 AM
To: Glenn Berry; Savini Suduweli Kondage
Cc: #AU_CAU001_EnviroSampleVic
Subject: RE: Eurofins Test Results - Report 881033 : Site LONGATHA (2153) - FURTHER SAMPLE ANALYSIS REQUEST

INFO: INTERNAL EMAIL - Sent from your own Eurofins email domain.

Thanks Glenn

Canh - 3 DAY TAT

Kind regards,

Harry Bacalis

Phone: +61 3 8564 5064

Mobile: +61 438 858 924

Email: HarryBacalis@eurofins.com

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From: Glenn Berry <gberry@atmaenvironmental.com>
Sent: Thursday, 5 May 2022 11:31 AM
To: Harry Bacalis <HarryBacalis@eurofins.com>; Savini Suduweli Kondage <SaviniSuduweli@eurofins.com>
Subject: RE: Eurofins Test Results - Report 881033 : Site LONGATHA (2153) - FURTHER SAMPLE ANALYSIS REQUEST

CAUTION: EXTERNAL EMAIL - Sent from an email domain that is not formally trusted by Eurofins.

Do not click on links or open attachments unless you recognise the sender and are certain that the content is safe.

Hi

Thanks for your report.

On perusal of the results the following further analysis on this batch is requested:

8/0.1, 8/0.5, 10/0.1, 10/0.5 - TRHs with silica gel clean up (4th).
3-4 day TAT

Regards,
Glenn Berry, CEnvP
Director | Principal Environmental Consultant

Atma Environmental

Professionalism | Value | Service

56 William Street, ABBOTSFORD, Vic 3067 Australia
Tel: +61-3-9429 6955 | Mob: +61-412 000 445

Email: gberry@atmaenvironmental.com Web: www.atmaenvironmental.com

AP0038152-471365-FE101
AP0038186-HT474-A401
AP0038154-471365-FE101
AP0038188-HT474-A401

885491
JaKe

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne 6 Monterey Road Dandenong South VIC 3175 Phone : +61 3 8564 5000 NATA # 1261 Site # 1254	Sydney 179 Magowar Road Girraween NSW 2066 Phone : +61 2 9900 8400 NATA # 1261 Site # 18217	Brisbane 1/21 Smallwood Place Murarrie QLD 4172 Phone : +61 7 3902 4600 NATA # 1261 Site # 20794	Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293 Phone : +61 2 4968 8448 NATA # 1261 Site # 25079	Perth 46-48 Banksia Road Welshpool WA 6106 Phone : +61 8 6253 4444 NATA # 2377 Site # 2370	Auckland 35 O'Rorke Road Penrose, Auckland 1061 Phone : +64 9 526 45 51 IANZ # 1327	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Phone : 0800 856 450 IANZ # 1290

Eurofins ARL Pty Ltd

ABN: 91 05 0159 898

Eurofins Environment Testing NZ Limited

NZBN: 9429046024954

Sample Receipt Advice

Company name:	Atma Environmental
Contact name:	Glenn Berry
Project name:	LONGATHA
Project ID:	2153
Turnaround time:	3 Day
Date/Time received	May 5, 2022 11:31 AM
Eurofins reference	885491

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ All samples have been received as described on the above COC.
- ✓ COC has been completed correctly.
- ✓ Attempt to chill was evident.
- ✓ Appropriately preserved sample containers have been used.
- ✓ All samples were received in good condition.
- ✓ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ✓ Appropriate sample containers have been used.
- ✓ Sample containers for volatile analysis received with zero headspace.
- ✗ Split sample sent to requested external lab.
- ✗ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Savini Suduweli on phone : or by email: SaviniSuduweli@eurofins.com

Results will be delivered electronically via email to Glenn Berry - gberry@atmaenvironmental.com.

Atma Environmental
56 William St
Abbotsford
VIC 3067



NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
 NATA is a signatory to the ILAC Mutual Recognition
 Arrangement for the mutual recognition of the
 equivalence of testing, medical testing, calibration,
 inspection, proficiency testing scheme providers and
 reference materials producers reports and certificates.

Attention: **Glenn Berry**

Report **885491-S**
Project name **LONGATHA**
Project ID **2153**
Received Date **May 05, 2022**

Client Sample ID			BH08/0.1	BH08/0.5	BH10/0.1	BH10/0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22-My0011324	M22-My0011325	M22-My0011326	M22-My0011327
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
TRH - 2013 NEPM Fractions (after silica gel clean-up)						
TRH >C10-C16 (after silica gel clean-up)	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34 (after silica gel clean-up)	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40 (after silica gel clean-up)	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total) (after silica-gel clean up)*	100	mg/kg	< 100	< 100	< 100	< 100
TRH - 1999 NEPM Fractions (after silica gel clean-up)						
TRH C10-C14 (after silica gel clean-up)	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28 (after silica gel clean-up)	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36 (after silica gel clean-up)	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total) (after silica gel clean-up)	100	mg/kg	< 50	< 50	< 50	< 50
% Moisture	1	%	7.2	20	22	24

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
TRH - 2013 NEPM Fractions (after silica gel clean-up) - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	May 05, 2022	14 Days
TRH - 1999 NEPM Fractions (after silica gel clean-up) - Method: TRH C6-C36 (Silica Gel Cleanup) - MGT 100A	Melbourne	May 05, 2022	14 Days
% Moisture - Method: LTM-GEN-7080 Moisture	Melbourne	May 05, 2022	14 Days

Company Name:	Atma Environmental	Order No.:		Received:	May 5, 2022 11:31 AM
Address:	56 William St Abbotsford VIC 3067	Report #:	885491	Due:	May 10, 2022
Project Name:	LONGATHA	Phone:	9429 6955	Priority:	3 Day
Project ID:	2153	Fax:	9429 5911	Contact Name:	Glenn Berry

Eurofins Analytical Services Manager : Savini Suduweli

Sample Detail						TRH (after Silica Gel cleanup)	Moisture Set
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
Perth Laboratory - NATA # 2377 Site # 2370							
External Laboratory							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	BH08/0.1	Apr 13, 2022		Soil	M22-My0011324	X	X
2	BH08/0.5	Apr 13, 2022		Soil	M22-My0011325	X	X
3	BH10/0.1	Apr 13, 2022		Soil	M22-My0011326	X	X
4	BH10/0.5	Apr 13, 2022		Soil	M22-My0011327	X	X
Test Counts						4	4

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	µg/L: micrograms per litre
ppm: parts per million	ppb: parts per billion	%: Percentage
org/100 mL: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units	MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
TRH - 2013 NEPM Fractions (after silica gel clean-up)									
TRH >C34-C40 (after silica gel clean-up)			mg/kg	< 100			100	Pass	
Method Blank									
TRH - 1999 NEPM Fractions (after silica gel clean-up)									
TRH C29-C36 (after silica gel clean-up)			mg/kg	< 50			50	Pass	
LCS - % Recovery									
TRH - 2013 NEPM Fractions (after silica gel clean-up)									
TRH >C10-C16 (after silica gel clean-up)			%	126			70-130	Pass	
LCS - % Recovery									
TRH - 1999 NEPM Fractions (after silica gel clean-up)									
TRH C10-C14 (after silica gel clean-up)			%	125			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M22-My0010988	NCP	%	2.0	2.1	4.0	30%	Pass	

Comments
Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised by:

Savini Suduweli	Analytical Services Manager
Scott Beddoes	Senior Analyst (NSW)
Joseph Edouard	Senior Analyst (VIC)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

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Revision No.: 1 / Date of Last Revision: 04/02/2022

Sheet No. 1 of 1



PROJECT NAME: LEONGATHA	Sampler's Signature: <i>TB BELFITT</i>	
Project Ref. No.: 2153	Sampler's Name: TOBE BELFITT	
	DATE: 13 APR 2022	
	Time:	

[illegible]

TOTAL:		3		3		0	1	1					1	3	
DISPATCHED BY: (sign)		(DATE/TIME)													
EUROFINS ENVIRONMENT TESTING		☒ RECEIVED BY: (sign)													
△		Received: 20/4 10:08 C/note: Carier...													
COURIERED BY: (sign)		(DATE/TIME)													
		Temp: 17.4 Seal: Y... LAB NAME: ALS fee / Icebricks / NA													

INITIAL RESULTS REQUESTED WITHIN:	24Hrs	48Hrs	3-4 DAYS	NORMAL
REMARKS:				

COPIES REQUESTED WITHIN:	24hrs	48hrs	3-4 DAYS	NORMAL
REMARKS:	Please email completed COC, Sample Receipt Notification, results and invoices to: > gberry@atmaenvironmental.com >			

relinquished
Emily D
20/4/22 8:

NOTE: Δ Must be completed by Atma Environmental

Must be completed with date and time by laboratory.

CERTIFICATE OF ANALYSIS

Work Order : **EM2207191**
Client : **ATMA ENVIRONMENTAL P/L**
Contact : **MR GLEN BERRY**
Address : **56 William Street**
ABBOTSFORD VIC, AUSTRALIA 3067
Telephone : **+61 94296955**
Project : **2153**
Order number : **----**
C-O-C number : **----**
Sampler : **TOBE BELFITT**
Site : **----**
Quote number : **EN/333/21 Seconday work only**
No. of samples received : **3**
No. of samples analysed : **2**

Page : 1 of 5
Laboratory : Environmental Division Melbourne
Contact : Customer Services EM
Address : 4 Westall Rd Springvale VIC Australia 3171
Telephone : +61-3-8549 9600
Date Samples Received : 20-Apr-2022 10:00
Date Analysis Commenced : 26-Apr-2022
Issue Date : 28-Apr-2022 15:25



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Jarwis Nheu	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EG005-T : EM2207051 #37 Poor spike recovery for chromium due to sample matrix. Confirmed by re-digestion and re-analysis.
- EP071: EM2206916_074 Poor duplicate precision due to sample heterogeneity. Confirmed by re-extraction and re-analysis.



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				SPLIT-13422A	SPLIT-13422C	----	----	----
Sampling date / time				13-Apr-2022 00:00	13-Apr-2022 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EM2207191-001	EM2207191-003	-----	-----	-----
				Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	24.6	----	----	----	----
Moisture Content	----	1.0	%	----	13.7	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	----	<5	----	----	----
Barium	7440-39-3	10	mg/kg	----	50	----	----	----
Beryllium	7440-41-7	1	mg/kg	----	<1	----	----	----
Boron	7440-42-8	50	mg/kg	----	<50	----	----	----
Cadmium	7440-43-9	1	mg/kg	----	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	----	23	----	----	----
Cobalt	7440-48-4	2	mg/kg	----	9	----	----	----
Copper	7440-50-8	5	mg/kg	----	6	----	----	----
Lead	7439-92-1	5	mg/kg	----	12	----	----	----
Manganese	7439-96-5	5	mg/kg	----	942	----	----	----
Nickel	7440-02-0	2	mg/kg	----	5	----	----	----
Selenium	7782-49-2	5	mg/kg	----	<5	----	----	----
Vanadium	7440-62-2	5	mg/kg	----	43	----	----	----
Zinc	7440-66-6	5	mg/kg	----	6	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	<0.1	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg	<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	110	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	110	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	SPLIT-13422A	SPLIT-13422C	----	----	----
Sampling date / time					13-Apr-2022 00:00	13-Apr-2022 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EM2207191-001	EM2207191-003	-----	-----	-----
				Result	Result		----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ >C10 - C16 Fraction minus Naphthalene (F2)		----	50	mg/kg	<50	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg	<0.2	----	----	----	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	----	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	----	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	----	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	----	----	----	----
^ Sum of BTEX		----	0.2	mg/kg	<0.2	----	----	----	----
^ Total Xylenes		----	0.5	mg/kg	<0.5	----	----	----	----
Naphthalene		91-20-3	1	mg/kg	<1	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	65.6	----	----	----	----	----
Toluene-D8	2037-26-5	0.2	%	72.2	----	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	78.4	----	----	----	----	----

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Work Order : EM2207191
Client : ATMA ENVIRONMENTAL P/L
Project : 2153



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	51	125
Toluene-D8	2037-26-5	55	125
4-Bromofluorobenzene	460-00-4	56	124

QUALITY CONTROL REPORT

Work Order	: EM2207191	Page	: 1 of 7
Client	: ATMA ENVIRONMENTAL P/L	Laboratory	: Environmental Division Melbourne
Contact	: MR GLEN BERRY	Contact	: Customer Services EM
Address	: 56 William Street ABBOTSFORD VIC, AUSTRALIA 3067	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: +61 94296955	Telephone	: +61-3-8549 9600
Project	: 2153	Date Samples Received	: 20-Apr-2022
Order number	: ----	Date Analysis Commenced	: 26-Apr-2022
C-O-C number	: ----	Issue Date	: 28-Apr-2022
Sampler	: TOBE BELFITT		
Site	:		
Quote number	: EN/333/21 Seconday work only		
No. of samples received	: 3		
No. of samples analysed	: 2		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Jarvis Nheu	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 4302589)									
EM2207051-033	Anonymous	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	<10	<10	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Cobalt	7440-48-4	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	5	<5	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.0	No Limit
EM2207051-054	Anonymous	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	70	40	42.2	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	15	14	8.4	No Limit
		EG005T: Cobalt	7440-48-4	2	mg/kg	10	10	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	38	38	0.0	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	5	5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	20	20	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	45	27	49.5	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	244	258	5.5	0% - 20%



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 4302589) - continued									
EM2207051-054	Anonymous	EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	19	19	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	82	65	22.7	0% - 50%
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.0	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4302879)									
EM2207126-006	Anonymous	EA055: Moisture Content	----	0.1	%	32.9	31.9	3.0	0% - 20%
EM2207207-001	Anonymous	EA055: Moisture Content	----	0.1	%	3.0	2.9	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 4302590)									
EM2207051-033	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EM2207051-054	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4302128)									
EM2207191-001	SPLIT-13422A	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EM2207204-018	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4302177)									
EM2206916-074	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	2730	# 3620	28.2	0% - 20%
		EP071: C29 - C36 Fraction	----	100	mg/kg	1290	# 2000	43.5	0% - 20%
		EP071: C10 - C14 Fraction	----	50	mg/kg	70	80	25.1	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	4090	# 5700	32.9	0% - 20%
EM2207207-035	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4302128)									
EM2207191-001	SPLIT-13422A	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EM2207204-018	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4302177)									
EM2206916-074	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	3740	# 5260	33.9	0% - 20%
		EP071: >C34 - C40 Fraction	----	100	mg/kg	380	570	39.8	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	190	220	16.2	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	4310	# 6050	33.6	0% - 20%
EM2207207-035	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEXN (QC Lot: 4302128)									
EM2207191-001	SPLIT-13422A	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

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 Work Order : EM2207191
 Client : ATMA ENVIRONMENTAL P/L
 Project : 2153



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP080: BTEXN (QC Lot: 4302128) - continued									
EM2207191-001	SPLIT-13422A	EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
EM2207204-018	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit



Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 4302589)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	123 mg/kg	100	70.0	130
EG005T: Barium	7440-39-3	10	mg/kg	<10	99.3 mg/kg	99.9	70.0	130
EG005T: Beryllium	7440-41-7	1	mg/kg	<1	0.67 mg/kg	105	70.0	130
EG005T: Boron	7440-42-8	50	mg/kg	<50	----	----	----	----
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	1.23 mg/kg	57.0	50.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	20.2 mg/kg	105	70.0	130
EG005T: Cobalt	7440-48-4	2	mg/kg	<2	11.2 mg/kg	88.5	70.0	130
EG005T: Copper	7440-50-8	5	mg/kg	<5	55.9 mg/kg	94.6	70.0	130
EG005T: Lead	7439-92-1	5	mg/kg	<5	62.4 mg/kg	94.8	70.0	130
EG005T: Manganese	7439-96-5	5	mg/kg	<5	590 mg/kg	91.6	70.0	130
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.4 mg/kg	96.9	70.0	130
EG005T: Selenium	7782-49-2	5	mg/kg	<5	----	----	----	----
EG005T: Vanadium	7440-62-2	5	mg/kg	<5	61.3 mg/kg	98.7	70.0	130
EG005T: Zinc	7440-66-6	5	mg/kg	<5	162 mg/kg	75.8	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4302590)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.64 mg/kg	88.3	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4302128)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	94.2	58.6	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4302177)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	700 mg/kg	107	75.0	128
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	2930 mg/kg	111	82.0	123
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1380 mg/kg	114	82.4	121
EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	5010 mg/kg	111	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4302128)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	90.8	59.3	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4302177)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	1030 mg/kg	104	77.0	130
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	3680 mg/kg	119	81.5	120
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	270 mg/kg	110	73.3	137
EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	4980 mg/kg	116	70.0	130
EP080: BTEXN (QCLot: 4302128)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	91.1	61.6	117
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	96.9	65.8	125



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result			Low	High
EP080: BTEXN (QCLot: 4302128) - continued								
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	93.6	65.8	124
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	4 mg/kg	98.8	64.8	134
	106-42-3							
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	95.9	68.7	132
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	86.2	61.8	123

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 4302589)							
EM2207051-037	Anonymous	EG005T: Chromium	7440-47-3	50 mg/kg	# 47.7	79.0	121
EM2207051-037	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	103	78.0	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	97.3	79.7	116
		EG005T: Copper	7440-50-8	250 mg/kg	101	80.0	120
		EG005T: Lead	7439-92-1	250 mg/kg	98.6	80.0	120
		EG005T: Nickel	7440-02-0	50 mg/kg	104	78.0	120
		EG005T: Zinc	7440-66-6	250 mg/kg	110	80.0	120
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4302590)							
EM2207051-037	Anonymous	EG035T: Mercury	7439-97-6	0.5 mg/kg	101	76.0	116
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4302128)							
EM2207204-002	Anonymous	EP080: C6 - C9 Fraction	----	28 mg/kg	80.3	33.4	124
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4302177)							
EM2206916-079	Anonymous	EP071: C10 - C14 Fraction	----	700 mg/kg	101	71.2	125
		EP071: C15 - C28 Fraction	----	2930 mg/kg	104	75.6	122
		EP071: C29 - C36 Fraction	----	1380 mg/kg	108	78.0	120
		EP071: C10 - C36 Fraction (sum)	----	5010 mg/kg	107	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4302128)							
EM2207204-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	76.0	30.8	120
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4302177)							
EM2206916-079	Anonymous	EP071: >C10 - C16 Fraction	----	1030 mg/kg	97.9	72.2	128
		EP071: >C16 - C34 Fraction	----	3680 mg/kg	112	76.5	119
		EP071: >C34 - C40 Fraction	----	270 mg/kg	105	66.8	138
		EP071: >C10 - C40 Fraction (sum)	----	4980 mg/kg	109	70.0	130



Sub-Matrix: SOIL

Laboratory sample IDSample IDMethod: CompoundCAS Number				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
				Concentration	MS	Low	High
EP080: BTEXN (QCLot: 4302128)							
EM2207204-002	Anonymous	EP080: Benzene	71-43-2	2 mg/kg	86.1	54.4	127
		EP080: Toluene	108-88-3	2 mg/kg	99.7	57.1	131

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EM2207191	Page	: 1 of 5
Client	: ATMA ENVIRONMENTAL P/L	Laboratory	: Environmental Division Melbourne
Contact	: MR GLEN BERRY	Telephone	: +61-3-8549 9600
Project	: 2153	Date Samples Received	: 20-Apr-2022
Site	:	Issue Date	: 28-Apr-2022
Sampler	: TOBE BELFITT	No. of samples received	: 3
Order number	: ----	No. of samples analysed	: 2

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Laboratory Control outliers occur.
- Duplicate outliers exist - please see following pages for full details.
- Matrix Spike outliers exist - please see following pages for full details.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- **NO** Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP080/071: Total Petroleum Hydrocarbons	EM2206916--074	Anonymous	C15 - C28 Fraction	----	28.2 %	0% - 20%	RPD exceeds LOR based limits
EP080/071: Total Petroleum Hydrocarbons	EM2206916--074	Anonymous	C29 - C36 Fraction	----	43.5 %	0% - 20%	RPD exceeds LOR based limits
EP080/071: Total Petroleum Hydrocarbons	EM2206916--074	Anonymous	C10 - C36 Fraction (sum)	----	32.9 %	0% - 20%	RPD exceeds LOR based limits
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	EM2206916--074	Anonymous	>C16 - C34 Fraction	----	33.9 %	0% - 20%	RPD exceeds LOR based limits
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	EM2206916--074	Anonymous	>C10 - C40 Fraction (sum)	----	33.6 %	0% - 20%	RPD exceeds LOR based limits
Matrix Spike (MS) Recoveries							
EG005(ED093)T: Total Metals by ICP-AES	EM2207051--037	Anonymous	Chromium	7440-47-3	47.7 %	79.0-121%	Recovery less than lower data quality objective

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) SPLIT-13422A, SPLIT-13422C	13-Apr-2022	----	----	----	26-Apr-2022	27-Apr-2022	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) SPLIT-13422C	13-Apr-2022	26-Apr-2022	10-Oct-2022	✓	26-Apr-2022	10-Oct-2022	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) SPLIT-13422C	13-Apr-2022	26-Apr-2022	11-May-2022	✓	26-Apr-2022	11-May-2022	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080) SPLIT-13422A	13-Apr-2022	26-Apr-2022	27-Apr-2022	✓	26-Apr-2022	27-Apr-2022	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080) SPLIT-13422A	13-Apr-2022	26-Apr-2022	27-Apr-2022	✓	26-Apr-2022	27-Apr-2022	✓



Matrix: SOIL

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080) SPLIT-13422A	13-Apr-2022	26-Apr-2022	27-Apr-2022	✓	26-Apr-2022	27-Apr-2022	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Total Mercury by FIMS	EG035T	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Total Mercury by FIMS	EG035T	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Total Mercury by FIMS	EG035T	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl ₂) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM Schedule B(3).
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.
Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na ₂ SO ₄ and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

APPENDIX F

EnRisk - Human Health Risk Assessment



11 May 2022

Rural Subdivision Specialists
<https://www.ruralsubdivisionspecialists.com.au/>

Attn: Saxil Tuxen, Daniel De Pasquale

Environmental Risk Sciences Pty Ltd
P.O. Box 2537
Carlingford Court, NSW 2118

Phone: +61 2 9614 0297
Fax: +61 2 8215 0657
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www.enrisks.com.au

Human health risk assessment regarding cobalt and manganese present in soil at 108 and 110 Parr St, Leongatha, Victoria

1 Background

Environmental Risk Sciences Pty Ltd (enRiskS) has been engaged to conduct a human health risk assessment (HHRA) in relation to the presence of elevated concentrations of manganese and other metals (where relevant) in soil at 108 and 110 Parr Street, Leongatha, Victoria ("the site").

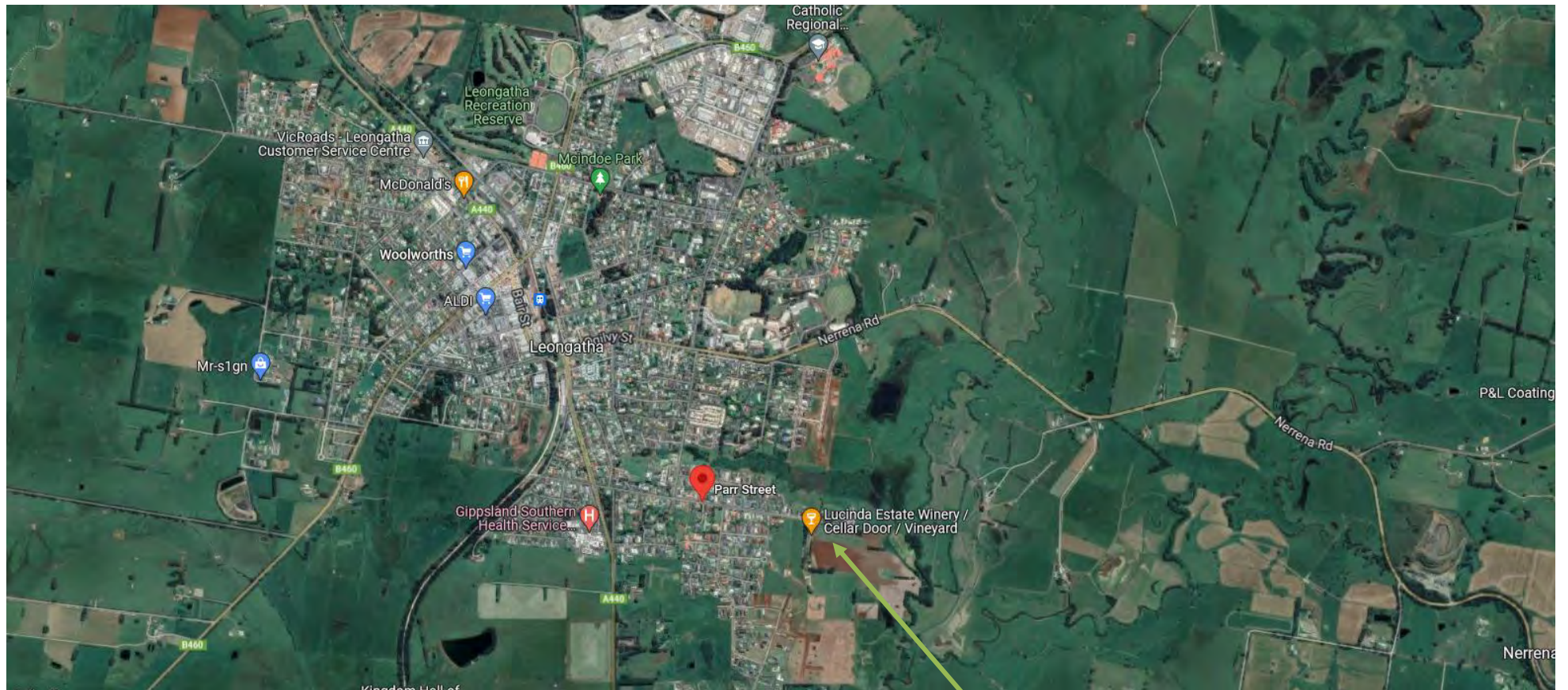
Site investigations have been undertaken by Atma Environmental. Soil samples have been collected across the properties and analysed for the list of potential contaminants commonly required under the National Environmental Protection (Assessment of Site Contamination) Measure (ASC NEPM). The sampling reported that manganese and cobalt were present at concentrations above the relevant Health Investigation level (HIL) in soil at one or more locations.

Both manganese and cobalt are elements commonly present in most soils. Some soil can contain higher levels in the form of minerals (i.e. ore bodies). It appears these properties are in a location in Victoria known to have higher levels of manganese and perhaps cobalt. Both manganese and cobalt are essential micronutrients for plants, animals and people meaning they are essential for life.

The HILs make a range of conservative assumptions about the potential for people to be exposed to chemicals in soil at a site including those that are naturally occurring like minerals. These conservative assumptions ensure that the potential for contamination can be confidently excluded when concentrations are below the relevant HIL. However, concentrations above the HIL do not mean that levels are of concern, rather such situations trigger a more detailed site-specific assessment to check that risks remain low if some of those conservative assumptions are adjusted based on the actual situation.

These properties have been used for farming activities including cropping and as a vineyard. The site location is shown in **Figure 1** and the layout for the blocks in the proposed residential subdivision is shown in **Figure 2**.

This letter report outlines how these more site specific assessments can be undertaken for both manganese and cobalt.



108-110 Parr Street

Figure 1: Site location



**RURAL SUBDIVISION
SPECIALISTS**

POTENTIAL SUBDIVISION DESIGN LAYOUT
108 & 110 PARR STREET LEONGATHA
PREPARED BY SAXIL TUXEN
Ph. 0428 858 060 e: saxil.jnr@ruralsubs.com.au
(Not to be reproduced or used without express permission)

- LSIO (OLD FLOOD EXTENT)
- NEW 1 in 100 FLOOD EXTENT - WG CMA
- WATER BODY
- BUILDING ENVELOPE



2 Objectives

The objectives of this assessment are:

- review the available data for metals in the soil samples taken at the site
- provide a background description of the calculation of the existing HIL
- provide a more detailed evaluation of how the HIL can be adjusted for manganese (to develop a site-specific guideline) especially given the proposed development at the site and the locations of the elevated concentrations and statistical analysis of the data
- undertake a limited human health risk assessment for manganese using a site-specific soil guideline that are more relevant for the site.

The assessment has considered use of the properties for low density residential land uses but has not addressed the potential for environmental risks. The assessment has focused only on metals. All other chemicals assessed in the soil samples will be addressed in the report by Atma Environmental.

3 Methodology and scope of works

The methodology adopted for the conduct of this review will be in accordance with the relevant National protocols/ guidelines including:

- enHealth, Environmental Health Risk Assessment, Guidelines for Assessing Human Health Risks from Environmental Hazards (enHealth 2012a)
- enHealth, Australian Exposure Factor Guide (enHealth 2012b)
- NEPM (1999 amended 2013) National Environmental Protection Measure – Assessment of Site Contamination including (the “NEPM 2013”):
 - Schedule B1 Investigation Levels for Soil and Groundwater (NEPC 1999 amended 2013a)
 - Schedule B4 Guideline on Health Risk Assessment Methodology (NEPC 1999 amended 2013b)
 - Schedule B7 Guideline on Health-Based Investigation Levels (NEPC 1999 amended 2013c)
- Toolbox Note – Key principles for the remediation and management of contaminated sites (NEPC 2013)

4 Site information

A site investigation has been conducted by Atma Environmental to determine the nature and extent of any soil contamination that may be present on these properties as part of the process for considering the subdivision.

In order to prepare this letter report, the following information was provided to enRiskS by Atma Environmental and Rural Subdivision Specialists:

- Lotsearch report (now included as **Appendix A** of the Atma Environmental report)
- Figures showing sampling locations and layout for the proposed subdivision
- Laboratory reports for the soil samples and summary information re QA/QC for analytical results (included as **Appendix E** of the Atma Environmental report and **Appendix A** of this letter report).

The site is located on the south eastern edge of the township of Leongatha in south eastern Victoria. **Figure 1** shows the location. General aspects of the site are described in **Table 1**. The land uses adjoining the site are summarised in **Table 2**.



Table 1: Site Details

Site Details	
Location	108 and 110 Parr Street, Leongatha, VIC
Local Government Area	South Gippsland Shire
Site Area	225,680 m ² (i.e. 225 ha)
Current zoning	Farming zone

Table 2: Surrounding Land Uses

Direction (Relative to site)	Description
North	Agricultural
South	Residential
East	Creek
West	Agricultural then residential

Aerial imagery provided in the Lotsearch report indicates that the site was undeveloped or was used for agriculture since 1947. A house appears to have been constructed on the site (nw corner) between 1972 and 1985. Additional buildings, which appear to be sheds, were constructed after 1990 but before 2010. All these buildings remain in place according to imagery from 2021.

Depth to groundwater for the eastern half of the site is quite shallow (<5 m below ground level) while the western half of the site is indicated as having a depth to groundwater between 5 and 20 m below ground level. The local topography has a slope toward the creek to the east and the surface elevation varies from 33 to 61 m AHD (i.e. site has a 30 m change in vertical height from east to west) (Lotsearch 2022).

The geology for the site is mostly alluvium (gravel, sand and silt) with underlying basalt in some areas (Lotsearch 2022).

The site is subject to a number of planning overlays including that it is land within a water catchment (i.e. close to the creek), that it is land that is subject to erosion and that it is land subject to inundation. These overlays have requirements that will need to be addressed for the subdivision, where relevant (Lotsearch 2022).

5 Soil results

Details of the sampling design and methodologies will be provided in the report from Atma Environmental. It is presumed, for the purposes of this HHRA, that the approach taken is in line with the following:

- Samples were collected from surface soil, which is representative of soil that future users of the site may come into direct contact with when the site is redeveloped (some locations were in and around the buildings and other work areas along the western boundary (BH01-BH10) and grid sampling across the rest of the site (SS01-SS21)) with soil from 0.1 m depth analysed for all locations.
- The sample collection methods were appropriate
- Analysis of the samples was undertaken by a NATA accredited laboratory, with appropriate levels of quality control samples collected and analysed
- Assessment of quality assurance and quality control parameters associated with the data showed that the data were reliable and suitable for interpretative use.

Table 3 presents a summary of the metal concentrations reported in soil at the site, with **Figures 3 and 4** showing the locations from which the soil samples were collected. The laboratory reports are included in **Appendix A**.

Analysis included all the metal/metalloids listed in the ASC NEPM:

- As = Arsenic



- Be = Beryllium
- B = Boron
- Cd = Cadmium
- Cr = Chromium
- Co = Cobalt
- Cu = Copper
- Pb = Lead
- Mn = Manganese
- Hg = Mercury
- Ni = Nickel
- Se = Selenium
- Zn = Zinc

Mercury, selenium, cadmium and boron were not detected above the limit of reporting for any samples at this site. Beryllium was detected around the limit of reporting in one sample location only.

Arsenic, chromium, cobalt, copper, lead, manganese, nickel and zinc were detected above the limit of reporting in most, if not all, sampling locations. These are metals/metalloids that are commonly present in soils around Australia (and globally) as they are present in many rocks and other geological materials (i.e. minerals that make up these geological materials). It is noted that some geologies are considered “mineralised” which means they have higher than average concentrations of one or more metals because ore bodies are present.

The limit of reporting is the lowest concentration the laboratory can measure with confidence. The limits of reporting used in this work were in line with standard practice for measuring metals/metalloids in soil samples for contaminated site investigations and are well below the ASC NEPM guideline values, so these limits of reporting are appropriate for this investigation.

The ASC NEPM health investigation levels are included in **Table 3**. Where a soil concentration at this site is above a HIL value, the cell is shaded.

Table 3: Metal Concentrations in Surface Soil

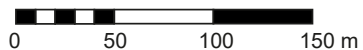
Sample Locations	Concentration (mg/kg)												
	As	Be	B	Cd	Cr	Co	Cu	Pb	Mn	Hg	Ni	Se	Zn
BH01	2.3	<2	<10	<0.4	150	24	39	31	5,300	<0.1	36	<2	52
BH02	2.9	2.7	<10	<0.4	180	320	75	19	6,200	<0.1	110	<2	120
BH03	3.3	<2	<10	<0.4	250	46	70	33	6,200	<0.1	58	<2	530
BH04	<2	<2	<10	<0.4	130	17	33	25	4,600	<0.1	28	<2	320
BH05	<2	<2	<10	<0.4	170	18	29	20	4,500	<0.1	22	<2	34
BH06	<2	<2	<10	<0.4	140	15	27	17	3,700	<0.1	20	<2	38
BH07	<2	<2	<10	<0.4	130	13	21	18	3,600	<0.1	15	<2	20
BH08	<2	<2	<10	<0.4	13	<5	16	6	68	<0.1	<5	<2	23
BH09	3.1	<2	<10	<0.4	79	16	26	29	2,800	<0.1	13	<2	45
BH10	4	<2	<10	<0.4	120	33	23	31	10,000	<0.1	18	<2	22
SS01	2.3	<2	<10	<0.4	98	37	42	26	8,600	<0.1	38	<2	31
SS02	2.9	<2	<10	<0.4	87	64	53	30	13,000	<0.1	48	<2	41
SS03	<2	<2	<10	<0.4	110	77	25	19	7,700	<0.1	32	<2	27
SS04	2.1	<2	<10	<0.4	140	79	23	19	6,600	<0.1	48	<2	37
SS05	2.3	<2	<10	<0.4	110	66	17	13	3,500	<0.1	34	<2	38
SS06	3.5	<2	<10	<0.4	20	17	17	16	1,200	<0.1	16	<2	69
SS07	<2	<2	<10	<0.4	150	23	42	20	5,000	<0.1	45	<2	69
SS08	2	<2	<10	<0.4	150	29	44	25	6,400	<0.1	41	<2	36
SS09	<2	<2	<10	<0.4	100	38	37	22	7,000	<0.1	35	<2	28
SS010	<2	<2	<10	<0.4	180	37	25	17	3,900	<0.1	32	<2	27
SS011	<2	<2	<10	<0.4	280	150	33	9.2	4,500	<0.1	100	<2	93
SS012	2.5	<2	<10	<0.4	43	23	8.1	11	1,400	<0.1	12	<2	24
SS013	<2	<2	<10	<0.4	150	18	68	19	4,200	<0.1	22	<2	33
SS014	<2	<2	<10	<0.4	46	17	48	19	5,600	<0.1	18	<2	32
SS015	<2	<2	<10	<0.4	27	17	8.1	11	1,500	<0.1	9.2	<2	11
SS016	<2	<2	<10	<0.4	17	14	<5	12	1,900	<0.1	<5	<2	9.8
SS017	2.8	<2	<10	<0.4	92	26	28	26	7,300	<0.1	18	<2	29
SS018	<2	<2	<10	<0.4	120	22	50	23	5,100	<0.1	27	<2	26
SS019	<2	<2	<10	<0.4	30	13	8	14	1,400	<0.1	5.9	<2	8.8
SS020	<2	<2	<10	<0.4	19	15	<5	14	1,700	<0.1	<5	<2	8.4
SS021	2.2	<2	<10	<0.4	15	10	11	14	690	<0.1	9.1	<2	41
HIL-A	100	60	4,500	20	100	100	6,000	300	3,800	40	400	200	7,400
HIL-B	500	90	40,000	150	500	600	30,000	1,200	14,000	120	1,200	1,400	60,000

LEGEND:

-  Investigation Area
-  Site Buildings
-  Grid Sample Location



Approximate Scale:



Imagery: Nearmap 2021

Atma Environmental



Client:

Rural Subdivision Specialists

Project: #2153 Leongatha - ESA

Drawn by: GRB Dated: 29/04.2022 Status: Final

**Figure 2. Overall Site Plan
and Grid Sampling Locations**





LEGEND:

-  Investigation Area
-  Target Borehole
-  Building



Imagery: Nearmap 2021



Client:

Rural Subdivision Specialists

Project: 2153 - Leongatha - PSI

Drawn by: G.B. Dated: 12/04/2022 Revision: Draft

Figure 3. Built Areas & Target Sample Locations



No metals/metalloids were present at levels above the guideline value for high density residential sites, but chromium, cobalt and manganese were above the guideline value relevant for low density residential sites.

Levels in excess of the HILs do not imply unacceptable levels of exposure or risks to human health. Rather exceedance of the HILs triggers the need to undertake a site-specific assessment, including a site-specific HHRA, which is presented in this assessment.

Chromium

It is noted that the HILs for chromium apply to one form of chromium only – chromium VI. Given that the site has only been used for agricultural purposes, there is no specific industrial source of chromium VI at this site. Naturally occurring chromium in soils is generally in the form of chromium III. Consequently, it is unlikely that chromium VI levels will be in excess of HIL-A where the total chromium concentrations range from 15-280 mg/kg.

6 Background soil – metals

A critical component for understanding the potential for health risks due to metal levels in soil is determining what levels might be naturally occurring in the area. Metals such as manganese and cobalt are routinely present in most soils, so it is important to understand what concentrations are likely in a particularly location.

6.1 Manganese

Manganese is present at the site primarily due to natural occurrence but the if manganese fertilisers were applied when the site was used for agricultural purposes this would add to the levels at the site.

Hosking et al. provides information about the presence of trace elements including manganese in soils in Victoria (Hosking et al. 1986).

In regard to manganese, Hosking et al. indicates:

- Manganese is required for the healthy growth of plants and animals
- Not enough manganese can cause impacts as well as too much manganese
- Manganese deficiency is not common in Victoria – in particular, acid soils are likely to have higher levels of manganese
- There are areas in Victoria where naturally occurring levels of manganese are high and soil treatment to limit the availability of manganese may be required
- Liming of soils to increase soil pH limits the availability of manganese to plants and animals.

Other public information indicates that manganese can be present in soils at levels ranging from 0.02% to 13% - i.e. 200 mg/kg to 130,000 mg/kg (these higher levels are for some volcanic soils). This site has levels ranging from 690 to 13,000 mg/kg – these levels are in line with normally expected levels.

In addition, manganese can be tightly bound in soil especially for neutral or alkaline soils or when organic matter is high. This limits how people can be exposed.

When manganese is low in soil, farmers use a manganese fertiliser to ensure sufficient levels of this essential nutrient for healthy growth of crops or livestock – i.e. they add manganese into the soil.

6.2 Cobalt

In regard to cobalt, Hosking et al. indicates:

- Cobalt is required for healthy growth of animals and some plants – in particular, to allow the formation of Vitamin B12
- Not enough cobalt can cause impacts as well as too much cobalt



- Parts of Victoria have low levels of cobalt in soil and supplementation may be required in agricultural situations
- Availability of cobalt can also be affected if acidic soils are treated with lime
- Excessive levels of cobalt are not a common issue in Victoria (Hosking et al. 1986).

7 Detailed assessment

7.1 General

The results for cobalt, chromium and manganese can be analysed in a number of ways to further understand the potential risks in line with the national guidelines. Statistical analysis of the data can be undertaken in line with guidance in the ASC NEPM. In addition, consideration of what is included in the calculations to determine the national guidelines to assess if adjustments can be made.

7.2 Statistical analysis

The ASC NEPM allows the use of a statistical test to determine if a dataset is in compliance with the relevant HIL. The test requires the following:

- 95%UCL concentration (i.e. 95% upper confidence limit of the mean) is less than the relevant HIL
- standard deviation for the dataset is less than half of the relevant HIL to show that the data are not too variable for the 95%UCL to be relevant
- no single sample can be greater than 250% of the relevant HIL also to show that the data are not too variable for the 95%UCL to be relevant.

ProUCL 5 is a program prepared by the USEPA to allow the calculation of the 95% UCL (USEPA 2013). Using this program, the statistics relevant to the ASC NEPM test have been calculated for the data set for this site from chromium, cobalt and manganese.

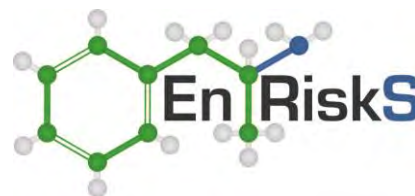
For those locations where levels were not detected, the limit of reporting was used in the statistical analysis which is a conservative approach.

Input and output pages are included in **Appendix B**.

Using ProUCL5, the statistics relevant to the ASC NEPM test have been calculated with the results shown in **Table 4**.

Table 4: Statistical Evaluation

Statistic	Value (mg/kg)	ASC NEPM Statistical Test – HIL-A
Cobalt		
Minimum	5	--
Maximum	320	250 (250% HIL-A)
Mean	42	--
Median	23	--
Standard Deviation	59	50 (50% HIL-A)
95% UCL	54	100 (HIL-A)
Total number of observations	31	--
Manganese		
Minimum	68	--
Maximum	13,000	9,500 (250% HIL-A)
Mean	4,680	--
Median	4,500	--
Standard Deviation	2,900	1,900 (50% HIL-A)
95% UCL	5,500	3,800 (HIL-A)
Total number of observations	31	--



This analysis indicates that:

- Cobalt
 - while the 95%UCL concentration for cobalt is definitely in compliance with the relevant national guideline, there are still aspects of the dataset that do not comply with the ASC NEPM test
- Manganese
 - dataset requires further consideration.

Further consideration of the national guidelines and how they are calculated is provided in **Section 7.3**.

7.3 Guideline calculations

The process used to calculate the ASC NEPM health investigation levels is documented in Schedule B7 of the ASC NEPM (NEPC 1999 amended 2013c).

The scenario for calculating the health investigation levels for low density residential land use (HIL-A) involves assuming people are exposed to the contaminants in soil through:

- Incidental ingestion of 50 mg soil per day for adults and 100 mg per day for children every day of the year for 29 years for adults and 6 years for children
- Soil coming into contact with 1/3 of the skin surface area for adults and almost half of the skin surface area for children every day of the year for 29 years for adults and 6 years for children – the calculations assume the soil stays on the skin until the next shower
- Consumption of homegrown fruit and vegetables (10% of daily intake)
- Inhalation of dust while outside for 4 hours every day of the year for 29 years for adults and 6 years for children.

The scenario for calculating the health investigation levels for high density residential land use (HIL-B) involves assuming people are exposed to the contaminants in soil through:

- Incidental ingestion of 12.5 mg soil per day for adults and 25 mg per day for children every day of the year for 29 years for adults and 6 years for children
- Soil coming into contact with 1/3 of the skin surface area for adults and almost half of the skin surface area for children every day of the year for 29 years for adults and 6 years for children – the calculations assume the soil stays on the skin until the next shower
- Inhalation of dust while outside for 1 hour every day of the year for 29 years for adults and 6 years for children.

All of these calculations assume 100% of the manganese and cobalt present in soil will be sufficiently available to be absorbed into the body for people who may be exposed. This assumption is made in the calculations to ensure the national guidelines are sufficiently conservative and are likely to appropriately highlight situations needing more detailed assessment.

7.4 Adjustment to guideline calculations

7.4.1 Manganese

It is well established that manganese, in particular, is tightly bound into the soil and is not particularly available.

The World Health Organisation (WHO) indicates that only around 3% of manganese in water or food is absorbed into the body (WHO 1999). For soil, the manganese has to dissolve from the soil into the fluids in the stomach. Once present in those fluids, the manganese could then be absorbed into the body but as WHO indicate only around 3% of that manganese would be likely to be absorbed.



In addition to a low fraction of actual absorption of manganese, WHO also notes that, because manganese is an essential nutrient required for good health, human bodies have systems to manage the amount of manganese we take up from our food and water. This means, if levels in the blood and other tissues increase due to the presence of higher manganese levels in food, water or via incidental ingestion of soil, bodies will react and begin excreting more of this metal to make sure levels inside the body do not reach high levels. This is an additional protective factor (WHO 1999).

If it is assumed that 100% of the manganese present in soil at this site is able to dissolve from the soil into the stomach fluids and that only 10% of that manganese present in the fluids gets absorbed into the body (based on the fraction absorbed discussed in WHO guidance of 3% rounded up to 10% to be conservative), then the overall bioavailability is 10% (WHO 1999).

The HIL-A guideline can then be adjusted using this change in bioavailability. If only 10% of the manganese can reach inside the body instead of 100%, then there can be 10 times the concentration in soil to reach the same exposure concentration inside the body. This means the adjusted HIL-A can then be 38,000 mg/kg instead of 3,800 mg/kg. This adjusted guideline still considers potential exposure of a young child in line with the scenario outlined in **Section 7.3** – i.e. includes incidental ingestion of soil, dermal contact with soil, inhalation of dust and consumption of home grown fruit and vegetables.

7.4.2 Cobalt

The availability of cobalt for absorption into the body is quite variable depending on the nature of the source of the cobalt (WHO 2006).

Given that this site has not been used for industrial purposes and the source of the cobalt is likely to be naturally occurring minerals, it is likely that the cobalt present in the 2 affected locations on the site is a more insoluble form. This means it is not likely to be 100% available when soil is incidentally ingested (WHO 2006).

WHO indicate that 10-30% of the cobalt in the stomach can be absorbed for more soluble salts while 1-3% is absorbed for more insoluble salts in laboratory animals. For people, studies showed 20-80% absorption depending on the form of cobalt and the dose (WHO 2006).

If it is assumed that 100% of the cobalt present in soil at this site is able to dissolve from the soil into the stomach fluids and that only 50% of that cobalt present in those fluids gets absorbed into the body (based on the fraction absorbed discussed in WHO guidance indicating 1-3% absorbed for insoluble forms in laboratory animals and 20-40% absorbed in more limited data available for absorption in people for insoluble forms rounded up to 50% to be conservative), then the overall bioavailability is 50%.

The HIL-A guideline can then be adjusted using this change in bioavailability. If only 50% of the cobalt can reach inside the body instead of 100%, then there can be 2 times the concentration in soil to reach the same exposure concentration inside the body. This means the adjusted HIL-A can then be 200 mg/kg instead of 100 mg/kg. This adjusted guideline still considers potential exposure of a young child in line with the scenario outlined in **Section 7.3** – i.e. includes incidental ingestion of soil, dermal contact with soil, inhalation of dust and consumption of home grown fruit and vegetables.

7.5 Adjusted screening assessment

The adjusted HIL-A values can then be used to assess the results for this site. Using ProUCL5, the statistics relevant to the ASC NEPM test have been calculated with the results shown in **Table 5**.

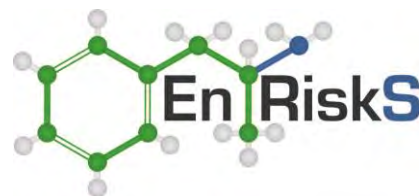


Table 5: Statistical Evaluation with adjusted guidelines

Statistic	Value (mg/kg)	ASC NEPM Statistical Test – HIL-A
Cobalt		
Minimum	5	--
Maximum	320	500 (250% adjusted HIL-A)
Mean	42	--
Median	23	--
Standard Deviation	59	100 (50% adjusted HIL-A)
95% UCL	54	200 (adjusted HIL-A)
Total number of observations	31	--
Manganese		
Minimum	68	--
Maximum	13,000	95,000 (250% adjusted HIL-A)
Mean	4,680	--
Median	4,500	--
Standard Deviation	2,900	19,000 (50% adjusted HIL-A)
95% UCL	5,500	38,000 (adjusted HIL-A)
Total number of observations	31	--

This analysis indicates that all results for this site are within the parameters recommended by the ASC NEPM when adjusted for site-specific considerations regarding the sources of manganese and cobalt in the soil.

As there have been no industrial sources of manganese or cobalt used at this site, it is relevant to consider that these metals are present due to naturally occurring minerals containing these metals present in the soil. As a result, it is appropriate to adjust the national guidelines for low density residential land uses based on guidance from the World Health Organisation regarding how easily these metals are absorbed into the body. In addition to the fact that not all of the manganese or cobalt present in the fluids in the stomach are absorbed into the body, given the mineralised sources of these metals, it is also unlikely that 100% of what is present in the soil will dissolve into the fluids in the stomach which provides further conservatism to the assumptions in this assessment.

8 Uncertainties

Uncertainty in any assessment refers to a lack of knowledge (that could be better refined through the collection of additional data or conducting additional studies) and is an important aspect of the risk assessment process. An assessment of uncertainty is a qualitative process relating to the selection and rejection of specific data, estimates or scenarios within the risk assessment. In general, to compensate for uncertainty, conservative assumptions are often made that result in an overestimate rather than an underestimate of risk.

This assessment has focused on the maximum concentrations for metals measured in soil and the 95%UCL (worst case estimate of the average concentration) for manganese and cobalt, in particular. The

The quantification of exposure in developing the national guidelines has adopted a number of conservative assumptions as recommended by the ASC NEPM (NEPC 1999 amended 2013a, 1999 amended 2013b). Many of the parameters adopted for reasonable maximally exposed person (RME) are considered to be an overestimate of actual exposures for young children. The values adopted for the purpose of quantifying exposure are point values that are derived from a wide range of physiological or behavioural values that are better defined using a distribution. It is overly complex to present the assessment based on distributions hence the point values identified provide a reasonable approximation of the RME. Potential exposure and chemical intake by older children and adults will be lower than considered for young children. The overall approach, however, is expected to result in an overestimate of actual exposure.



For this assessment, adjustments to the national guidelines have been adopted based on bioavailability information from the World Health Organisation. For both manganese and cobalt, conservative assumptions were made based on the available information (i.e. values rounded up to 10% and 50% respectively).

These results show there is no difference in the conclusions for this assessment whether the 95%UCL or the maximum concentrations are considered for comparison with the adjusted national guidelines.

9 Conclusions

Environmental Risk Sciences Pty Ltd (enRiskS) has undertaken a human health risk assessment (HHRA) in relation to the presence of elevated concentrations of manganese in soil at 108 and 110 Parr Street, Leongatha, Victoria ("the site"). These properties have been used for farming activities including cropping and as a vineyard and are now proposed for a residential sub-division.

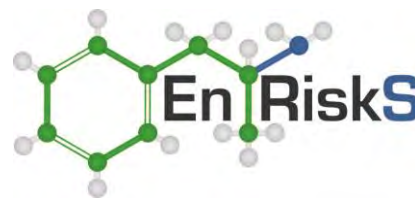
Atma Environmental undertook relevant sampling of soil at the site in line with national requirements for understanding potential contamination at sites being redeveloped. The results indicated that some metals were present at concentrations above relevant national guidelines for low density residential land use resulting in the need for a human health risk assessment to further evaluate potential risks.

The assessment outlined in this letter report has considered potential risks in line with national guidance as outlined in **Section 3**.

Based on the assessment presented and the uncertainties discussed, risks to human health for this proposed subdivision are considered to be low and acceptable.

10 References

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- NEPC 1999 amended 2013a, *Schedule B1, Guideline on Investigation Levels For Soil and Groundwater, National Environment Protection (Assessment of Site Contamination) Measure*, National Environment Protection Council.
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<<http://www.inchem.org/documents/cicads/cicads/cicad12.htm>>.

WHO 2006, *Cobalt and Inorganic Cobalt Compounds*. Concise International Chemical Assessment Document No. 69.

<<http://www.inchem.org/documents/cicads/cicads/cicad69.htm>>.

11 Limitations

Environmental Risk Sciences has prepared this report for the use of Rural Subdivision Specialists Pty Ltd in accordance with the usual care and thoroughness of the consulting profession. It is based on generally accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this report.

It is prepared in accordance with the scope of work and for the purpose outlined in the **Section 2** of this report.

The methodology adopted, and sources of information used are outlined in this report. Environmental Risk Sciences has made no independent verification of this information beyond the agreed scope of works and assumes no responsibility for any inaccuracies or omissions. No indications were found that information contained in the reports provided for use in this assessment was false.

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12 Closure

If you require any additional information or if you wish to discuss any aspect, please do not hesitate to contact Therese on (02) 9614 0297 or 0487 622 551.

Yours sincerely,

Dr Jackie Wright (Fellow ACTRA)
Principal/Director
Environmental Risk Sciences Pty Ltd



Appendix A: Laboratory reports



881033
Jekke

Revision No.: 1 / Date of Last Revision: 04/02/2022

Sheet No. 1 of 1

Atma Environmental

NAME: LEONGATHA

Signature: _____

Name: TOBE BELFITT

Ref. No.: **2153**

DATE: 13 APR 2022

Time:

COMPOSITING INSTRUCTIONS:

TOTAL:

DISPATCHED BY: (sign)

(DATE/TIME)

RECEIVED BY: (sign)

(DATE/TIME)

EUROFINS ENVIRONMENT TESTING

COURIERED BY: (sign)

(DATE/TIME)

LAB NAME: **ALS**

INITIAL RESULTS REQUESTED WITHIN:

24Hrs

48Hrs

~~3-4 DAYS~~

NORMAL

REMARKS:

Please email completed COC, Sample Receipt Notification results and invoices to:

> gberry@atmaenvironmental.com

✓

NOTE: Δ Must be completed by Atma Environmental

Must be completed with date and time by laboratory.

COPY

#AU_CAU001_EnviroSampleVic

From: Glenn Berry <gberry@atmaenvironmental.com>
Sent: Thursday, 14 April 2022 5:35 PM
To: Savini Suduweli Kondage; Tobe Belfitt
Cc: #AU_CAU001_EnviroSampleVic
Subject: RE: CoC for 2153 - Leongatha samples collected today
Attachments: 2153_eRegCoC - Soils2 - FOR ANALYSIS.xlsm; 2153 LEONGATHA Chain of Custody - ALS.pdf

CAUTION: EXTERNAL EMAIL - Sent from an email domain that is not formally trusted by Eurofins.

Do not click on links or open attachments unless you recognise the sender and are certain that the content is safe.

Hi ;

Please refer to attached COCs

Glenn Berry, *CEnvP*
Director | Principal Environmental Consultant

Atma Environmental

Professionalism | Value | Service

56 William Street, ABBOTSFORD, Vic 3067 Australia
Tel: +61-3-9429 6955 | Mob: +61-412 000 445

Email: gberry@atmaenvironmental.com Web: www.atmaenvironmental.com

At Atma Environmental we value and respect flexible work arrangements. If I am sending this email outside of normal business hours, it is because it suits me to do so. Please do not feel any pressure to respond outside of your own work schedule.

From: Savini Suduweli Kondage <SaviniSuduweli@eurofins.com>
Sent: Thursday, 14 April 2022 3:33 PM
To: Tobe Belfitt <tbelfitt@atmaenvironmental.com>
Cc: Glenn Berry <gberry@atmaenvironmental.com>; #AU_CAU001_EnviroSampleVic <EnviroSampleVic@eurofins.com>
Subject: RE: CoC for 2153 - Leongatha samples collected today

Hi Tobe,

Thanks for sending that through.

SR – Please see attached for analysis on incoming samples.

Kind Regards,
Savini Suduweli

Phone : +61 3 8564 5051
Mobile : +61 447 222 760
Email : SaviniSuduweli@eurofins.com

From: Tobe Belfitt <tbelfitt@atmaenvironmental.com>
Sent: Thursday, 14 April 2022 3:26 PM

To: Savini Suduweli Kondage <SaviniSuduweli@eurofins.com>

Cc: Glenn Berry <gberry@atmaenvironmental.com>

Subject: CoC for 2153 - Leongatha samples collected today

CAUTION: EXTERNAL EMAIL - Sent from an email domain that is not formally trusted by Eurofins.

Do not click on links or open attachments unless you recognise the sender and are certain that the content is safe.

Hi Savini,

Attached is the CoC for samples collected today from the Atma office.

CoC with the required analysis to follow.

Cheers!

Regards,

Tobe Belfitt
Environmental Consultant

Atma Environmental



25 YR
1996 - 2021

56 William Street, ABBOTSFORD, Vic 3067 Australia

Tel: +61-3-9429 6955 Mob: +61-420 985 285

E-mail: tbelfitt@atmaenvironmental.com Web: www.atmaenvironmental.com



Follow us on

Linked in



Environment Testing

PROJECT INFORMATION

Date Received:

14/4/22 4:15 pm

Company:

ATMA

Contact person:

Contact Number:

Contact E-mail:

Project Name/site:

Project Number:

2153

COC: Attached ☐

E-mailed ☐

Not received ☐

YES/NO

10-5-0-4

10.1

2 esky

Last modified on: 16 October 2019	Approved on: 16 October 2019	Version: QS1039_R2
Last modified by: H. Le	Approver: M. Makarios	Page 1 of 1
Editorial Committee: T. Lakeland, F. Sanjaya, H. Le, M. Makarios		Next required review date: 16 October 2022

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne 6 Monterey Road Dandenong South VIC 3175 Phone : +61 3 8564 5000 NATA # 1261 Site # 1254	Sydney 179 Magowar Road Girraween NSW 2066 Phone : +61 2 9900 8400 NATA # 1261 Site # 18217	Brisbane 1/21 Smallwood Place Murarrie QLD 4172 Phone : +61 7 3902 4600 NATA # 1261 Site # 20794	Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293 Phone : +61 2 4968 8448 NATA # 1261 Site # 25079	Perth 46-48 Banksia Road Welshpool WA 6106 Phone : +61 8 6253 4444 NATA # 2377 Site # 2370	Auckland 35 O'Rorke Road Penrose, Auckland 1061 Phone : +64 9 526 45 51 IANZ # 1327	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Phone : 0800 856 450 IANZ # 1290

Eurofins ARL Pty Ltd

ABN: 91 05 0159 898

Eurofins Environment Testing NZ Limited

NZBN: 9429046024954

Sample Receipt Advice

Company name:	Atma Environmental
Contact name:	Glenn Berry
Project name:	LONGATHA
Project ID:	2153
Turnaround time:	5 Day
Date/Time received	Apr 14, 2022 5:35 PM
Eurofins reference	881033

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 10.1 degrees Celsius.
- ✓ All samples have been received as described on the above COC.
- ✓ COC has been completed correctly.
- ✓ Attempt to chill was evident.
- ✓ Appropriately preserved sample containers have been used.
- ✓ All samples were received in good condition.
- ✓ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ✓ Appropriate sample containers have been used.
- ✓ Sample containers for volatile analysis received with zero headspace.
- ✓ Split sample sent to requested external lab.
- ✗ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

Samples received by the laboratory after 5.30pm are deemed to have been received the following working day.

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Savini Suduweli on phone : or by email: SaviniSuduveli@eurofins.com

Results will be delivered electronically via email to Glenn Berry - gberry@atmaenvironmental.com.

Atma Environmental
56 William St
Abbotsford
VIC 3067



NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
 NATA is a signatory to the ILAC Mutual Recognition
 Arrangement for the mutual recognition of the
 equivalence of testing, medical testing, calibration,
 inspection, proficiency testing scheme providers and
 reference materials producers reports and certificates.

Attention: **Glenn Berry**

Report **881033-S**
Project name **LONGATHA**
Project ID **2153**
Received Date **Apr 14, 2022**

Client Sample ID			BH01/0.1	BH02/0.1	BH03/0.1	BH04/0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22- Ap0038145	M22- Ap0038146	M22- Ap0038147	M22- Ap0038148
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	-
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	-
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	-
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	-
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	-
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	-
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	< 20	-
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	-
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	< 50	-
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	-
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	66	87	95	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
4,4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
4,4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
4,4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
a-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
b-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
d-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-

Client Sample ID			BH01/0.1	BH02/0.1	BH03/0.1	BH04/0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22- Ap0038145	M22- Ap0038146	M22- Ap0038147	M22- Ap0038148
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
g-HCH (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Toxaphene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Dibutylchlorendate (surr.)	1	%	73	82	71	-
Tetrachloro-m-xylene (surr.)	1	%	90	92	86	-
Heavy Metals						
Arsenic	2	mg/kg	2.3	2.9	3.3	< 2
Barium	10	mg/kg	140	360	130	120
Beryllium	2	mg/kg	< 2	2.7	< 2	< 2
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	150	180	250	130
Cobalt	5	mg/kg	24	320	46	17
Copper	5	mg/kg	39	75	70	33
Lead	5	mg/kg	31	19	33	25
Manganese	5	mg/kg	5300	6200	6200	4600
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum	5	mg/kg	< 5	< 5	< 5	< 5
Nickel	5	mg/kg	36	110	58	28
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Silver	2	mg/kg	< 2	< 2	< 2	< 2
Tin	10	mg/kg	< 10	< 10	< 10	< 10
Zinc	5	mg/kg	52	120	530	320
% Moisture	1	%	24	18	29	29
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	0.1	pH Units	-	-	6.1	-
Acid Herbicides						
2,4-D	0.5	mg/kg	-	< 0.5	< 0.5	-
2,4-DB	0.5	mg/kg	-	< 0.5	< 0.5	-
2,4,5-T	0.5	mg/kg	-	< 0.5	< 0.5	-
2,4,5-TP	0.5	mg/kg	-	< 0.5	< 0.5	-
Actril (loxylin)	0.5	mg/kg	-	< 0.5	< 0.5	-
Dicamba	0.5	mg/kg	-	< 0.5	< 0.5	-
Dichlorprop	0.5	mg/kg	-	< 0.5	< 0.5	-
Dinitro-o-cresol	0.5	mg/kg	-	< 0.5	< 0.5	-
Dinoseb	0.5	mg/kg	-	< 0.5	< 0.5	-
MCPA	0.5	mg/kg	-	< 0.5	< 0.5	-
MCPB	0.5	mg/kg	-	< 0.5	< 0.5	-
Mecoprop	0.5	mg/kg	-	< 0.5	< 0.5	-
Warfarin (surr.)	1	%	-	142	109	-

Client Sample ID			BH05/0.1	BH06/0.1	BH07/0.1	BH08/0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22- Ap0038149	M22- Ap0038150	M22- Ap0038151	M22- Ap0038152
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	-	< 20	-	< 20
TRH C10-C14	20	mg/kg	-	< 20	-	< 20
TRH C15-C28	50	mg/kg	-	< 50	-	200
TRH C29-C36	50	mg/kg	-	< 50	-	250
TRH C10-C36 (Total)	50	mg/kg	-	< 50	-	450
Naphthalene ^{N02}	0.5	mg/kg	-	< 0.5	-	< 0.5
TRH C6-C10	20	mg/kg	-	< 20	-	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	-	< 20	-	< 20
TRH >C10-C16	50	mg/kg	-	< 50	-	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	-	< 50	-	< 50
TRH >C16-C34	100	mg/kg	-	< 100	-	400
TRH >C34-C40	100	mg/kg	-	< 100	-	110
TRH >C10-C40 (total)*	100	mg/kg	-	< 100	-	510
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	-	< 0.1
Toluene	0.1	mg/kg	-	< 0.1	-	< 0.1
Ethylbenzene	0.1	mg/kg	-	< 0.1	-	< 0.1
m&p-Xylenes	0.2	mg/kg	-	< 0.2	-	< 0.2
o-Xylene	0.1	mg/kg	-	< 0.1	-	< 0.1
Xylenes - Total*	0.3	mg/kg	-	< 0.3	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	50	-	94
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	-	< 0.1
4,4'-DDD	0.05	mg/kg	-	-	-	< 0.05
4,4'-DDE	0.05	mg/kg	-	-	-	< 0.05
4,4'-DDT	0.05	mg/kg	-	-	-	< 0.05
a-HCH	0.05	mg/kg	-	-	-	< 0.05
Aldrin	0.05	mg/kg	-	-	-	< 0.05
b-HCH	0.05	mg/kg	-	-	-	< 0.05
d-HCH	0.05	mg/kg	-	-	-	< 0.05
Dieldrin	0.05	mg/kg	-	-	-	< 0.05
Endosulfan I	0.05	mg/kg	-	-	-	< 0.05
Endosulfan II	0.05	mg/kg	-	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	-	< 0.05
Endrin	0.05	mg/kg	-	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	-	< 0.05
Endrin ketone	0.05	mg/kg	-	-	-	< 0.05
g-HCH (Lindane)	0.05	mg/kg	-	-	-	< 0.05
Heptachlor	0.05	mg/kg	-	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	-	-	< 0.05
Methoxychlor	0.05	mg/kg	-	-	-	< 0.05
Toxaphene	0.5	mg/kg	-	-	-	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	-	< 0.1
Dibutylchlorendate (surr.)	1	%	-	-	-	88
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	73

Client Sample ID			BH05/0.1	BH06/0.1	BH07/0.1	BH08/0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22- Ap0038149	M22- Ap0038150	M22- Ap0038151	M22- Ap0038152
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	< 2	< 2	< 2	< 2
Barium	10	mg/kg	120	100	94	< 10
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	170	140	130	13
Cobalt	5	mg/kg	18	15	13	< 5
Copper	5	mg/kg	29	27	21	16
Lead	5	mg/kg	20	17	18	6.0
Manganese	5	mg/kg	4500	3700	3600	68
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum	5	mg/kg	< 5	< 5	< 5	< 5
Nickel	5	mg/kg	22	20	15	< 5
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Silver	2	mg/kg	< 2	< 2	< 2	< 2
Tin	10	mg/kg	< 10	< 10	< 10	< 10
Zinc	5	mg/kg	34	38	20	23
% Moisture	1	%	24	27	20	7.5
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	0.1	pH Units	-	-	5.2	-
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	-	-	13	-
Acid Herbicides						
2,4-D	0.5	mg/kg	-	-	-	< 0.5
2,4-DB	0.5	mg/kg	-	-	-	< 0.5
2,4,5-T	0.5	mg/kg	-	-	-	< 0.5
2,4,5-TP	0.5	mg/kg	-	-	-	< 0.5
Actril (loxylin)	0.5	mg/kg	-	-	-	< 0.5
Dicamba	0.5	mg/kg	-	-	-	< 0.5
Dichlorprop	0.5	mg/kg	-	-	-	< 0.5
Dinitro-o-cresol	0.5	mg/kg	-	-	-	< 0.5
Dinoseb	0.5	mg/kg	-	-	-	< 0.5
MCPA	0.5	mg/kg	-	-	-	< 0.5
MCPB	0.5	mg/kg	-	-	-	< 0.5
Mecoprop	0.5	mg/kg	-	-	-	< 0.5
Warfarin (surr.)	1	%	-	-	-	115
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	-	-	7.5	-

Client Sample ID			BH09/0.1	BH10/0.1	SS01	SS02
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22- Ap0038153	M22- Ap0038154	M22- Ap0038155	M22- Ap0038156
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	-	< 0.1
4,4'-DDD	0.05	mg/kg	-	-	-	< 0.05
4,4'-DDE	0.05	mg/kg	-	-	-	< 0.05
4,4'-DDT	0.05	mg/kg	-	-	-	< 0.05
a-HCH	0.05	mg/kg	-	-	-	< 0.05
Aldrin	0.05	mg/kg	-	-	-	< 0.05
b-HCH	0.05	mg/kg	-	-	-	< 0.05
d-HCH	0.05	mg/kg	-	-	-	< 0.05
Dieldrin	0.05	mg/kg	-	-	-	< 0.05
Endosulfan I	0.05	mg/kg	-	-	-	< 0.05
Endosulfan II	0.05	mg/kg	-	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	-	< 0.05
Endrin	0.05	mg/kg	-	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	-	< 0.05
Endrin ketone	0.05	mg/kg	-	-	-	< 0.05
g-HCH (Lindane)	0.05	mg/kg	-	-	-	< 0.05
Heptachlor	0.05	mg/kg	-	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	-	-	< 0.05
Methoxychlor	0.05	mg/kg	-	-	-	< 0.05
Toxaphene	0.5	mg/kg	-	-	-	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	-	< 0.1
Dibutylchloroendate (surr.)	1	%	-	-	-	122
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	127
Heavy Metals						
Arsenic	2	mg/kg	3.1	4.0	2.3	2.9
Barium	10	mg/kg	110	230	230	320
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	79	120	98	87
Cobalt	5	mg/kg	16	33	37	64
Copper	5	mg/kg	26	23	42	53
Lead	5	mg/kg	29	31	26	30
Manganese	5	mg/kg	2800	10000	8600	13000
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum	5	mg/kg	< 5	< 5	< 5	< 5
Nickel	5	mg/kg	13	18	38	48
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Silver	2	mg/kg	< 2	< 2	< 2	< 2
Tin	10	mg/kg	< 10	< 10	< 10	< 10
Zinc	5	mg/kg	45	22	31	41
% Moisture	1	%	24	22	33	15
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	0.1	pH Units	-	-	7.0	-

Client Sample ID			BH09/0.1	BH10/0.1	SS01	SS02
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22-Ap0038153	M22-Ap0038154	M22-Ap0038155	M22-Ap0038156
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Acid Herbicides						
2,4-D	0.5	mg/kg	-	-	< 0.5	-
2,4-DB	0.5	mg/kg	-	-	< 0.5	-
2,4,5-T	0.5	mg/kg	-	-	< 0.5	-
2,4,5-TP	0.5	mg/kg	-	-	< 0.5	-
Actril (loxynil)	0.5	mg/kg	-	-	< 0.5	-
Dicamba	0.5	mg/kg	-	-	< 0.5	-
Dichlorprop	0.5	mg/kg	-	-	< 0.5	-
Dinitro-o-cresol	0.5	mg/kg	-	-	< 0.5	-
Dinoseb	0.5	mg/kg	-	-	< 0.5	-
MCPA	0.5	mg/kg	-	-	< 0.5	-
MCPB	0.5	mg/kg	-	-	< 0.5	-
Mecoprop	0.5	mg/kg	-	-	< 0.5	-
Warfarin (surr.)	1	%	-	-	117	-

Client Sample ID			SS03	SS04	SS05	SS06
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22-Ap0038157	M22-Ap0038158	M22-Ap0038159	M22-Ap0038160
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	-	-	< 20	-
TRH C10-C14	20	mg/kg	-	-	< 20	-
TRH C15-C28	50	mg/kg	-	-	< 50	-
TRH C29-C36	50	mg/kg	-	-	< 50	-
TRH C10-C36 (Total)	50	mg/kg	-	-	< 50	-
Naphthalene ^{N02}	0.5	mg/kg	-	-	< 0.5	-
TRH C6-C10	20	mg/kg	-	-	< 20	-
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	-	-	< 20	-
TRH >C10-C16	50	mg/kg	-	-	< 50	-
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	-	-	< 50	-
TRH >C16-C34	100	mg/kg	-	-	< 100	-
TRH >C34-C40	100	mg/kg	-	-	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	-	-	< 100	-
BTEX						
Benzene	0.1	mg/kg	-	-	< 0.1	-
Toluene	0.1	mg/kg	-	-	< 0.1	-
Ethylbenzene	0.1	mg/kg	-	-	< 0.1	-
m&p-Xylenes	0.2	mg/kg	-	-	< 0.2	-
o-Xylene	0.1	mg/kg	-	-	< 0.1	-
Xylenes - Total*	0.3	mg/kg	-	-	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	-	-	80	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	< 0.1
4,4'-DDD	0.05	mg/kg	-	< 0.05	-	< 0.05
4,4'-DDE	0.05	mg/kg	-	< 0.05	-	< 0.05
4,4'-DDT	0.05	mg/kg	-	< 0.05	-	< 0.05
a-HCH	0.05	mg/kg	-	< 0.05	-	< 0.05

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	SS03 Soil M22- Ap0038157 Apr 13, 2022	SS04 Soil M22- Ap0038158 Apr 13, 2022	SS05 Soil M22- Ap0038159 Apr 13, 2022	SS06 Soil M22- Ap0038160 Apr 13, 2022
Organochlorine Pesticides						
Aldrin	0.05	mg/kg	-	< 0.05	-	< 0.05
b-HCH	0.05	mg/kg	-	< 0.05	-	< 0.05
d-HCH	0.05	mg/kg	-	< 0.05	-	< 0.05
Dieldrin	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan I	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan II	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin ketone	0.05	mg/kg	-	< 0.05	-	< 0.05
g-HCH (Lindane)	0.05	mg/kg	-	< 0.05	-	< 0.05
Heptachlor	0.05	mg/kg	-	< 0.05	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	< 0.05
Methoxychlor	0.05	mg/kg	-	< 0.05	-	< 0.05
Toxaphene	0.5	mg/kg	-	< 0.5	-	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	-	< 0.1
Dibutylchloroendate (surr.)	1	%	-	134	-	121
Tetrachloro-m-xylene (surr.)	1	%	-	150	-	100
Bifenthrin	0.05	mg/kg	-	-	< 0.05	-
Heavy Metals						
Arsenic	2	mg/kg	< 2	2.1	2.3	3.5
Barium	10	mg/kg	320	250	-	150
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	110	140	110	20
Cobalt	5	mg/kg	77	79	66	17
Copper	5	mg/kg	25	23	17	17
Lead	5	mg/kg	19	19	13	16
Manganese	5	mg/kg	7700	6600	3500	1200
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum	5	mg/kg	< 5	< 5	-	< 5
Nickel	5	mg/kg	32	48	34	16
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Silver	2	mg/kg	< 2	< 2	-	< 2
Tin	10	mg/kg	< 10	< 10	-	< 10
Zinc	5	mg/kg	27	37	38	69
% Moisture	1	%	15	19	21	27
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	0.1	pH Units	-	-	6.8	-
Chromium (hexavalent)	1	mg/kg	-	-	< 1	-
Cyanide (free)	5	mg/kg	-	-	< 5	-

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	SS03 Soil M22- Ap0038157 Apr 13, 2022	SS04 Soil M22- Ap0038158 Apr 13, 2022	SS05 Soil M22- Ap0038159 Apr 13, 2022	SS06 Soil M22- Ap0038160 Apr 13, 2022
Acid Herbicides						
2,4-D	0.5	mg/kg	< 0.5	-	-	-
2,4-DB	0.5	mg/kg	< 0.5	-	-	-
2,4,5-T	0.5	mg/kg	< 0.5	-	-	-
2,4,5-TP	0.5	mg/kg	< 0.5	-	-	-
Actril (loxynil)	0.5	mg/kg	< 0.5	-	-	-
Dicamba	0.5	mg/kg	< 0.5	-	-	-
Dichlorprop	0.5	mg/kg	< 0.5	-	-	-
Dinitro-o-cresol	0.5	mg/kg	< 0.5	-	-	-
Dinoseb	0.5	mg/kg	< 0.5	-	-	-
MCPA	0.5	mg/kg	< 0.5	-	-	-
MCPB	0.5	mg/kg	< 0.5	-	-	-
Mecoprop	0.5	mg/kg	< 0.5	-	-	-
Warfarin (surr.)	1	%	127	-	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	-	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	-	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	-	1.2	-
Acenaphthene	0.5	mg/kg	-	-	< 0.5	-
Acenaphthylene	0.5	mg/kg	-	-	< 0.5	-
Anthracene	0.5	mg/kg	-	-	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	-	-	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	-	-	< 0.5	-
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	-	-	< 0.5	-
Benzo(g,h,i)perylene	0.5	mg/kg	-	-	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	-	-	< 0.5	-
Chrysene	0.5	mg/kg	-	-	< 0.5	-
Dibenz(a,h)anthracene	0.5	mg/kg	-	-	< 0.5	-
Fluoranthene	0.5	mg/kg	-	-	< 0.5	-
Fluorene	0.5	mg/kg	-	-	< 0.5	-
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	-	-	< 0.5	-
Naphthalene	0.5	mg/kg	-	-	< 0.5	-
Phenanthrene	0.5	mg/kg	-	-	< 0.5	-
Pyrene	0.5	mg/kg	-	-	< 0.5	-
Total PAH*	0.5	mg/kg	-	-	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	-	-	80	-
p-Terphenyl-d14 (surr.)	1	%	-	-	82	-
Organophosphorus Pesticides						
Chlorpyrifos	0.2	mg/kg	-	-	< 0.2	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1221	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1232	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1242	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1248	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1254	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1260	0.1	mg/kg	-	-	< 0.1	-
Total PCB*	0.1	mg/kg	-	-	< 0.1	-
Dibutylchlorodate (surr.)	1	%	-	-	129	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	123	-

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	SS03 Soil M22- Ap0038157 Apr 13, 2022	SS04 Soil M22- Ap0038158 Apr 13, 2022	SS05 Soil M22- Ap0038159 Apr 13, 2022	SS06 Soil M22- Ap0038160 Apr 13, 2022
Triazines						
Atrazine	0.2	mg/kg	-	-	< 0.2	-
NEPM 2013 Acid Herbicides						
Picloram	0.5	mg/kg	-	-	< 0.5	-
2,4-D	0.5	mg/kg	-	-	< 0.5	-
2,4,5-T	0.5	mg/kg	-	-	< 0.5	-
MCPA	0.5	mg/kg	-	-	< 0.5	-
MCPB	0.5	mg/kg	-	-	< 0.5	-
Mecoprop	0.5	mg/kg	-	-	< 0.5	-
Warfarin (surr.)	1	%	-	-	116	-
NEPM 2013 Organochlorine Pesticides						
Endosulfan sulphate	0.05	mg/kg	-	-	< 0.05	-
Mirex	0.05	mg/kg	-	-	< 0.05	-
4,4'-DDD	0.05	mg/kg	-	-	< 0.05	-
4,4'-DDE	0.05	mg/kg	-	-	< 0.05	-
4,4'-DDT	0.05	mg/kg	-	-	< 0.05	-
Aldrin	0.05	mg/kg	-	-	< 0.05	-
Chlordanes - Total	0.1	mg/kg	-	-	< 0.1	-
Dieldrin	0.05	mg/kg	-	-	< 0.05	-
Endosulfan I	0.05	mg/kg	-	-	< 0.05	-
Endosulfan II	0.05	mg/kg	-	-	< 0.05	-
Endrin	0.05	mg/kg	-	-	< 0.05	-
Heptachlor	0.05	mg/kg	-	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	-	-	< 0.05	-
Methoxychlor	0.05	mg/kg	-	-	< 0.05	-
Toxaphene	0.5	mg/kg	-	-	< 0.5	-
Dibutylchloredate (surr.)	1	%	-	-	129	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	123	-
NEPM 2013 Phenols						
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	-	< 0.2	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	-	< 0.4	-
Pentachlorophenol	1	mg/kg	-	-	< 1	-
Phenol	0.5	mg/kg	-	-	< 0.5	-
Phenol-d6 (surr.)	1	%	-	-	39	-

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	SS07 Soil M22- Ap0038161 Apr 13, 2022	SS08 Soil M22- Ap0038162 Apr 13, 2022	SS09 Soil M22- Ap0038163 Apr 13, 2022	SS10 Soil M22- Ap0038164 Apr 13, 2022
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	< 0.1
4,4'-DDD	0.05	mg/kg	< 0.05	-	-	< 0.05
4,4'-DDE	0.05	mg/kg	< 0.05	-	-	< 0.05
4,4'-DDT	0.05	mg/kg	< 0.05	-	-	< 0.05
a-HCH	0.05	mg/kg	< 0.05	-	-	< 0.05
Aldrin	0.05	mg/kg	< 0.05	-	-	< 0.05
b-HCH	0.05	mg/kg	< 0.05	-	-	< 0.05

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	SS07 Soil M22- Ap0038161 Apr 13, 2022	SS08 Soil M22- Ap0038162 Apr 13, 2022	SS09 Soil M22- Ap0038163 Apr 13, 2022	SS10 Soil M22- Ap0038164 Apr 13, 2022
Organochlorine Pesticides						
d-HCH	0.05	mg/kg	< 0.05	-	-	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	-	-	< 0.05
g-HCH (Lindane)	0.05	mg/kg	< 0.05	-	-	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	-	-	< 0.05
Toxaphene	0.5	mg/kg	< 0.5	-	-	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	-	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	-	-	< 0.1
Dibutylchloroendate (surr.)	1	%	110	-	-	128
Tetrachloro-m-xylene (surr.)	1	%	134	-	-	143
Heavy Metals						
Arsenic	2	mg/kg	< 2	2.0	< 2	< 2
Barium	10	mg/kg	160	180	180	170
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	150	150	100	180
Cobalt	5	mg/kg	23	29	38	37
Copper	5	mg/kg	42	44	37	25
Lead	5	mg/kg	20	25	22	17
Manganese	5	mg/kg	5000	6400	7000	3900
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum	5	mg/kg	< 5	< 5	< 5	< 5
Nickel	5	mg/kg	45	41	35	32
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Silver	2	mg/kg	< 2	< 2	< 2	< 2
Tin	10	mg/kg	< 10	< 10	< 10	< 10
Zinc	5	mg/kg	69	36	28	27
% Moisture	1	%	15	17	18	20
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	0.1	pH Units	-	6.1	-	6.2
Acid Herbicides						
2,4-D	0.5	mg/kg	-	< 0.5	-	-
2,4-DB	0.5	mg/kg	-	< 0.5	-	-
2,4,5-T	0.5	mg/kg	-	< 0.5	-	-
2,4,5-TP	0.5	mg/kg	-	< 0.5	-	-
Actril (loxylin)	0.5	mg/kg	-	< 0.5	-	-
Dicamba	0.5	mg/kg	-	< 0.5	-	-
Dichlorprop	0.5	mg/kg	-	< 0.5	-	-

Client Sample ID			SS07	SS08	SS09	SS10
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22- Ap0038161	M22- Ap0038162	M22- Ap0038163	M22- Ap0038164
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Acid Herbicides						
Dinitro-o-cresol	0.5	mg/kg	-	< 0.5	-	-
Dinoseb	0.5	mg/kg	-	< 0.5	-	-
MCPA	0.5	mg/kg	-	< 0.5	-	-
MCPB	0.5	mg/kg	-	< 0.5	-	-
Mecoprop	0.5	mg/kg	-	< 0.5	-	-
Warfarin (surr.)	1	%	-	135	-	-

Client Sample ID			SS11	SS12	SS13	SS14
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22- Ap0038165	M22- Ap0038166	M22- Ap0038167	M22- Ap0038168
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	-	-	< 20	-
TRH C10-C14	20	mg/kg	-	-	< 20	-
TRH C15-C28	50	mg/kg	-	-	< 50	-
TRH C29-C36	50	mg/kg	-	-	< 50	-
TRH C10-C36 (Total)	50	mg/kg	-	-	< 50	-
Naphthalene ^{N02}	0.5	mg/kg	-	-	< 0.5	-
TRH C6-C10	20	mg/kg	-	-	< 20	-
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	-	-	< 20	-
TRH >C10-C16	50	mg/kg	-	-	< 50	-
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	-	-	< 50	-
TRH >C16-C34	100	mg/kg	-	-	< 100	-
TRH >C34-C40	100	mg/kg	-	-	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	-	-	< 100	-
BTEX						
Benzene	0.1	mg/kg	-	-	< 0.1	-
Toluene	0.1	mg/kg	-	-	< 0.1	-
Ethylbenzene	0.1	mg/kg	-	-	< 0.1	-
m&p-Xylenes	0.2	mg/kg	-	-	< 0.2	-
o-Xylene	0.1	mg/kg	-	-	< 0.1	-
Xylenes - Total*	0.3	mg/kg	-	-	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	-	-	83	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	-	< 0.1
4,4'-DDD	0.05	mg/kg	-	-	-	< 0.05
4,4'-DDE	0.05	mg/kg	-	-	-	0.12
4,4'-DDT	0.05	mg/kg	-	-	-	< 0.05
a-HCH	0.05	mg/kg	-	-	-	< 0.05
Aldrin	0.05	mg/kg	-	-	-	< 0.05
b-HCH	0.05	mg/kg	-	-	-	< 0.05
d-HCH	0.05	mg/kg	-	-	-	< 0.05
Dieldrin	0.05	mg/kg	-	-	-	< 0.05
Endosulfan I	0.05	mg/kg	-	-	-	< 0.05
Endosulfan II	0.05	mg/kg	-	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	-	< 0.05

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	SS11 Soil M22- Ap0038165 Apr 13, 2022	SS12 Soil M22- Ap0038166 Apr 13, 2022	SS13 Soil M22- Ap0038167 Apr 13, 2022	SS14 Soil M22- Ap0038168 Apr 13, 2022
Organochlorine Pesticides						
Endrin	0.05	mg/kg	-	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	-	< 0.05
Endrin ketone	0.05	mg/kg	-	-	-	< 0.05
g-HCH (Lindane)	0.05	mg/kg	-	-	-	< 0.05
Heptachlor	0.05	mg/kg	-	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	-	-	< 0.05
Methoxychlor	0.05	mg/kg	-	-	-	< 0.05
Toxaphene	0.5	mg/kg	-	-	-	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	-	0.12
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	-	0.12
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	-	< 0.1
Dibutylchloroendate (surr.)	1	%	-	-	-	133
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	136
Bifenthrin	0.05	mg/kg	-	-	< 0.05	-
Heavy Metals						
Arsenic	2	mg/kg	< 2	2.5	< 2	< 2
Barium	10	mg/kg	280	76	-	140
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	280	43	150	46
Cobalt	5	mg/kg	150	23	18	17
Copper	5	mg/kg	33	8.1	68	48
Lead	5	mg/kg	9.2	11	19	19
Manganese	5	mg/kg	4500	1400	4200	5600
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum	5	mg/kg	< 5	< 5	-	< 5
Nickel	5	mg/kg	100	12	22	18
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Silver	2	mg/kg	< 2	< 2	-	< 2
Tin	10	mg/kg	< 10	< 10	-	< 10
Zinc	5	mg/kg	93	24	33	32
% Moisture	1	%	21	15	20	17
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	0.1	pH Units	-	-	6.0	7.0
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	26	-	-	-
Chromium (hexavalent)	1	mg/kg	-	-	< 1	-
Cyanide (free)	5	mg/kg	-	-	< 5	-
Acid Herbicides						
2,4-D	0.5	mg/kg	-	< 0.5	-	-
2,4-DB	0.5	mg/kg	-	< 0.5	-	-
2,4,5-T	0.5	mg/kg	-	< 0.5	-	-
2,4,5-TP	0.5	mg/kg	-	< 0.5	-	-
Actril (loxylin)	0.5	mg/kg	-	< 0.5	-	-
Dicamba	0.5	mg/kg	-	< 0.5	-	-
Dichlorprop	0.5	mg/kg	-	< 0.5	-	-
Dinitro-o-cresol	0.5	mg/kg	-	< 0.5	-	-

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	SS11 Soil M22- Ap0038165 Apr 13, 2022	SS12 Soil M22- Ap0038166 Apr 13, 2022	SS13 Soil M22- Ap0038167 Apr 13, 2022	SS14 Soil M22- Ap0038168 Apr 13, 2022
Acid Herbicides						
Dinoseb	0.5	mg/kg	-	< 0.5	-	-
MCPA	0.5	mg/kg	-	< 0.5	-	-
MCPB	0.5	mg/kg	-	< 0.5	-	-
Mecoprop	0.5	mg/kg	-	< 0.5	-	-
Warfarin (surr.)	1	%	-	115	-	-
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	11	-	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	-	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	-	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	-	1.2	-
Acenaphthene	0.5	mg/kg	-	-	< 0.5	-
Acenaphthylene	0.5	mg/kg	-	-	< 0.5	-
Anthracene	0.5	mg/kg	-	-	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	-	-	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	-	-	< 0.5	-
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	-	-	< 0.5	-
Benzo(g,h,i)perylene	0.5	mg/kg	-	-	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	-	-	< 0.5	-
Chrysene	0.5	mg/kg	-	-	< 0.5	-
Dibenz(a,h)anthracene	0.5	mg/kg	-	-	< 0.5	-
Fluoranthene	0.5	mg/kg	-	-	< 0.5	-
Fluorene	0.5	mg/kg	-	-	< 0.5	-
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	-	-	< 0.5	-
Naphthalene	0.5	mg/kg	-	-	< 0.5	-
Phenanthrene	0.5	mg/kg	-	-	< 0.5	-
Pyrene	0.5	mg/kg	-	-	< 0.5	-
Total PAH*	0.5	mg/kg	-	-	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	-	-	85	-
p-Terphenyl-d14 (surr.)	1	%	-	-	89	-
Organophosphorus Pesticides						
Chlorpyrifos	0.2	mg/kg	-	-	< 0.2	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1221	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1232	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1242	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1248	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1254	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1260	0.1	mg/kg	-	-	< 0.1	-
Total PCB*	0.1	mg/kg	-	-	< 0.1	-
Dibutylchloroendate (surr.)	1	%	-	-	144	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	150	-
Triazines						
Atrazine	0.2	mg/kg	-	-	< 0.2	-

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	SS11 Soil M22- Ap0038165 Apr 13, 2022	SS12 Soil M22- Ap0038166 Apr 13, 2022	SS13 Soil M22- Ap0038167 Apr 13, 2022	SS14 Soil M22- Ap0038168 Apr 13, 2022
NEPM 2013 Acid Herbicides						
Picloram	0.5	mg/kg	-	-	< 0.5	-
2,4-D	0.5	mg/kg	-	-	< 0.5	-
2,4,5-T	0.5	mg/kg	-	-	< 0.5	-
MCPA	0.5	mg/kg	-	-	< 0.5	-
MCPB	0.5	mg/kg	-	-	< 0.5	-
Mecoprop	0.5	mg/kg	-	-	< 0.5	-
Warfarin (surr.)	1	%	-	-	111	-
NEPM 2013 Organochlorine Pesticides						
Endosulfan sulphate	0.05	mg/kg	-	-	< 0.05	-
Mirex	0.05	mg/kg	-	-	< 0.05	-
4,4'-DDD	0.05	mg/kg	-	-	< 0.05	-
4,4'-DDE	0.05	mg/kg	-	-	0.15	-
4,4'-DDT	0.05	mg/kg	-	-	< 0.05	-
Aldrin	0.05	mg/kg	-	-	< 0.05	-
Chlordanes - Total	0.1	mg/kg	-	-	< 0.1	-
Dieldrin	0.05	mg/kg	-	-	< 0.05	-
Endosulfan I	0.05	mg/kg	-	-	< 0.05	-
Endosulfan II	0.05	mg/kg	-	-	< 0.05	-
Endrin	0.05	mg/kg	-	-	< 0.05	-
Heptachlor	0.05	mg/kg	-	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	-	-	< 0.05	-
Methoxychlor	0.05	mg/kg	-	-	< 0.05	-
Toxaphene	0.5	mg/kg	-	-	< 0.5	-
Dibutylchloredate (surr.)	1	%	-	-	144	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	150	-
NEPM 2013 Phenols						
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	-	< 0.2	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	-	< 0.4	-
Pentachlorophenol	1	mg/kg	-	-	< 1	-
Phenol	0.5	mg/kg	-	-	< 0.5	-
Phenol-d6 (surr.)	1	%	-	-	51	-

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	SS15 Soil M22- Ap0038169 Apr 13, 2022	SS16 Soil M22- Ap0038170 Apr 13, 2022	SS17 Soil M22- Ap0038171 Apr 13, 2022	SS18 Soil M22- Ap0038172 Apr 13, 2022
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	< 0.1	-
4,4'-DDD	0.05	mg/kg	-	< 0.05	< 0.05	-
4,4'-DDE	0.05	mg/kg	-	< 0.05	0.16	-
4,4'-DDT	0.05	mg/kg	-	< 0.05	< 0.05	-
a-HCH	0.05	mg/kg	-	< 0.05	< 0.05	-
Aldrin	0.05	mg/kg	-	< 0.05	< 0.05	-
b-HCH	0.05	mg/kg	-	< 0.05	< 0.05	-
d-HCH	0.05	mg/kg	-	< 0.05	< 0.05	-
Dieldrin	0.05	mg/kg	-	< 0.05	< 0.05	-

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	SS15 Soil M22- Ap0038169 Apr 13, 2022	SS16 Soil M22- Ap0038170 Apr 13, 2022	SS17 Soil M22- Ap0038171 Apr 13, 2022	SS18 Soil M22- Ap0038172 Apr 13, 2022
Organochlorine Pesticides						
Endosulfan I	0.05	mg/kg	-	< 0.05	< 0.05	-
Endosulfan II	0.05	mg/kg	-	< 0.05	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin aldehyde	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin ketone	0.05	mg/kg	-	< 0.05	< 0.05	-
g-HCH (Lindane)	0.05	mg/kg	-	< 0.05	< 0.05	-
Heptachlor	0.05	mg/kg	-	< 0.05	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	< 0.05	-
Methoxychlor	0.05	mg/kg	-	< 0.05	< 0.05	-
Toxaphene	0.5	mg/kg	-	< 0.5	< 0.5	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	0.16	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	0.16	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	< 0.1	-
Dibutylchloroendate (surr.)	1	%	-	128	138	-
Tetrachloro-m-xylene (surr.)	1	%	-	135	97	-
Heavy Metals						
Arsenic	2	mg/kg	< 2	< 2	2.8	< 2
Barium	10	mg/kg	65	58	190	150
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	27	17	92	120
Cobalt	5	mg/kg	17	14	26	22
Copper	5	mg/kg	8.1	< 5	28	50
Lead	5	mg/kg	11	12	26	23
Manganese	5	mg/kg	1500	1900	7300	5100
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum	5	mg/kg	< 5	< 5	< 5	< 5
Nickel	5	mg/kg	9.2	< 5	18	27
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Silver	2	mg/kg	< 2	< 2	< 2	< 2
Tin	10	mg/kg	< 10	< 10	< 10	< 10
Zinc	5	mg/kg	11	9.8	29	26
% Moisture	1	%	16	18	20	16
Acid Herbicides						
2,4-D	0.5	mg/kg	< 0.5	-	-	< 0.5
2,4-DB	0.5	mg/kg	< 0.5	-	-	< 0.5
2,4,5-T	0.5	mg/kg	< 0.5	-	-	< 0.5
2,4,5-TP	0.5	mg/kg	< 0.5	-	-	< 0.5
Actril (loxynil)	0.5	mg/kg	< 0.5	-	-	< 0.5
Dicamba	0.5	mg/kg	< 0.5	-	-	< 0.5
Dichlorprop	0.5	mg/kg	< 0.5	-	-	< 0.5
Dinitro-o-cresol	0.5	mg/kg	< 0.5	-	-	< 0.5
Dinoseb	0.5	mg/kg	< 0.5	-	-	< 0.5
MCPA	0.5	mg/kg	< 0.5	-	-	< 0.5

Client Sample ID			SS15	SS16	SS17	SS18
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22- Ap0038169	M22- Ap0038170	M22- Ap0038171	M22- Ap0038172
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Acid Herbicides						
MCPB	0.5	mg/kg	< 0.5	-	-	< 0.5
Mecoprop	0.5	mg/kg	< 0.5	-	-	< 0.5
Warfarin (surr.)	1	%	114	-	-	108

Client Sample ID			SS19	SS20	SS21	DUP-13422A
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22- Ap0038173	M22- Ap0038174	M22- Ap0038175	M22- Ap0038176
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	-	< 20	-	< 20
TRH C10-C14	20	mg/kg	-	< 20	-	< 20
TRH C15-C28	50	mg/kg	-	< 50	-	< 50
TRH C29-C36	50	mg/kg	-	< 50	-	< 50
TRH C10-C36 (Total)	50	mg/kg	-	< 50	-	< 50
Naphthalene ^{N02}	0.5	mg/kg	-	< 0.5	-	< 0.5
TRH C6-C10	20	mg/kg	-	< 20	-	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	-	< 20	-	< 20
TRH >C10-C16	50	mg/kg	-	< 50	-	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	-	< 50	-	< 50
TRH >C16-C34	100	mg/kg	-	< 100	-	< 100
TRH >C34-C40	100	mg/kg	-	< 100	-	< 100
TRH >C10-C40 (total)*	100	mg/kg	-	< 100	-	< 100
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	-	< 0.1
Toluene	0.1	mg/kg	-	< 0.1	-	< 0.1
Ethylbenzene	0.1	mg/kg	-	< 0.1	-	< 0.1
m&p-Xylenes	0.2	mg/kg	-	< 0.2	-	< 0.2
o-Xylene	0.1	mg/kg	-	< 0.1	-	< 0.1
Xylenes - Total*	0.3	mg/kg	-	< 0.3	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	91	-	93
Organochlorine Pesticides						
Bifenthrin	0.05	mg/kg	-	< 0.05	-	-
Heavy Metals						
Arsenic	2	mg/kg	< 2	< 2	2.2	-
Barium	10	mg/kg	57	-	100	-
Beryllium	2	mg/kg	< 2	< 2	< 2	-
Boron	10	mg/kg	< 10	< 10	< 10	-
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	-
Chromium	5	mg/kg	30	19	15	-
Cobalt	5	mg/kg	13	15	10	-
Copper	5	mg/kg	8.0	< 5	11	-
Lead	5	mg/kg	14	14	14	-
Manganese	5	mg/kg	1400	1700	690	-
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Molybdenum	5	mg/kg	< 5	-	< 5	-
Nickel	5	mg/kg	5.9	< 5	9.1	-

Client Sample ID			SS19	SS20	SS21	DUP-13422A
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22- Ap0038173	M22- Ap0038174	M22- Ap0038175	M22- Ap0038176
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Heavy Metals						
Selenium	2	mg/kg	< 2	< 2	< 2	-
Silver	2	mg/kg	< 2	-	< 2	-
Tin	10	mg/kg	< 10	-	< 10	-
Zinc	5	mg/kg	8.8	8.4	41	-
% Moisture	1	%	14	7.7	21	27
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	0.1	pH Units	4.1	-	5.2	-
Chromium (hexavalent)	1	mg/kg	-	< 1	-	-
Cyanide (free)	5	mg/kg	-	< 5	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5	-	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6	-	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2	-	-
Acenaphthene	0.5	mg/kg	-	< 0.5	-	-
Acenaphthylene	0.5	mg/kg	-	< 0.5	-	-
Anthracene	0.5	mg/kg	-	< 0.5	-	-
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	-	-
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	-	-
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	-	< 0.5	-	-
Benzo(g,h,i)perylene	0.5	mg/kg	-	< 0.5	-	-
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	-	-
Chrysene	0.5	mg/kg	-	< 0.5	-	-
Dibenz(a,h)anthracene	0.5	mg/kg	-	< 0.5	-	-
Fluoranthene	0.5	mg/kg	-	< 0.5	-	-
Fluorene	0.5	mg/kg	-	< 0.5	-	-
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	-	< 0.5	-	-
Naphthalene	0.5	mg/kg	-	< 0.5	-	-
Phenanthrene	0.5	mg/kg	-	< 0.5	-	-
Pyrene	0.5	mg/kg	-	< 0.5	-	-
Total PAH*	0.5	mg/kg	-	< 0.5	-	-
2-Fluorobiphenyl (surr.)	1	%	-	80	-	-
p-Terphenyl-d14 (surr.)	1	%	-	88	-	-
Organophosphorus Pesticides						
Chlorpyrifos	0.2	mg/kg	-	< 0.2	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1221	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1232	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1242	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1248	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1254	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1260	0.1	mg/kg	-	< 0.1	-	-
Total PCB*	0.1	mg/kg	-	< 0.1	-	-
Dibutylchloroendate (surr.)	1	%	-	126	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	139	-	-
Triazines						
Atrazine	0.2	mg/kg	-	< 0.2	-	-

Client Sample ID			SS19	SS20	SS21	DUP-13422A
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22-Ap0038173	M22-Ap0038174	M22-Ap0038175	M22-Ap0038176
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
NEPM 2013 Acid Herbicides						
Picloram	0.5	mg/kg	-	< 0.5	-	-
2,4-D	0.5	mg/kg	-	< 0.5	-	-
2,4,5-T	0.5	mg/kg	-	< 0.5	-	-
MCPA	0.5	mg/kg	-	< 0.5	-	-
MCPB	0.5	mg/kg	-	< 0.5	-	-
Mecoprop	0.5	mg/kg	-	< 0.5	-	-
Warfarin (surr.)	1	%	-	122	-	-
NEPM 2013 Organochlorine Pesticides						
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	-
Mirex	0.05	mg/kg	-	< 0.05	-	-
4,4'-DDD	0.05	mg/kg	-	< 0.05	-	-
4,4'-DDE	0.05	mg/kg	-	< 0.05	-	-
4,4'-DDT	0.05	mg/kg	-	< 0.05	-	-
Aldrin	0.05	mg/kg	-	< 0.05	-	-
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	-
Dieldrin	0.05	mg/kg	-	< 0.05	-	-
Endosulfan I	0.05	mg/kg	-	< 0.05	-	-
Endosulfan II	0.05	mg/kg	-	< 0.05	-	-
Endrin	0.05	mg/kg	-	< 0.05	-	-
Heptachlor	0.05	mg/kg	-	< 0.05	-	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	-
Methoxychlor	0.05	mg/kg	-	< 0.05	-	-
Toxaphene	0.5	mg/kg	-	< 0.5	-	-
Dibutylchloredate (surr.)	1	%	-	126	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	139	-	-
NEPM 2013 Phenols						
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	< 0.2	-	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	< 0.4	-	-
Pentachlorophenol	1	mg/kg	-	< 1	-	-
Phenol	0.5	mg/kg	-	< 0.5	-	-
Phenol-d6 (surr.)	1	%	-	51	-	-

Client Sample ID			DUP-13422B	DUP-13422C
Sample Matrix			Soil	Soil
Eurofins Sample No.			M22-Ap0038177	M22-Ap0038178
Date Sampled			Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit		
Organochlorine Pesticides				
Chlordanes - Total	0.1	mg/kg	< 0.1	-
4,4'-DDD	0.05	mg/kg	< 0.05	-
4,4'-DDE	0.05	mg/kg	< 0.05	-
4,4'-DDT	0.05	mg/kg	< 0.05	-
a-HCH	0.05	mg/kg	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-
b-HCH	0.05	mg/kg	< 0.05	-
d-HCH	0.05	mg/kg	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-

Client Sample ID			DUP-13422B	DUP-13422C
Sample Matrix			Soil	Soil
Eurofins Sample No.			M22-Ap0038177	M22-Ap0038178
Date Sampled			Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit		
Organochlorine Pesticides				
Endosulfan I	0.05	mg/kg	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-
g-HCH (Lindane)	0.05	mg/kg	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-
Methoxychlor	0.05	mg/kg	< 0.05	-
Toxaphene	0.5	mg/kg	< 0.5	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	-
Dibutylchloroendate (surr.)	1	%	83	-
Tetrachloro-m-xylene (surr.)	1	%	88	-
Heavy Metals				
Arsenic	2	mg/kg	-	< 2
Barium	10	mg/kg	-	57
Beryllium	2	mg/kg	-	< 2
Boron	10	mg/kg	-	< 10
Cadmium	0.4	mg/kg	-	< 0.4
Chromium	5	mg/kg	-	26
Cobalt	5	mg/kg	-	12
Copper	5	mg/kg	-	6.8
Lead	5	mg/kg	-	14
Manganese	5	mg/kg	-	1200
Mercury	0.1	mg/kg	-	< 0.1
Molybdenum	5	mg/kg	-	< 5
Nickel	5	mg/kg	-	< 5
Selenium	2	mg/kg	-	< 2
Silver	2	mg/kg	-	< 2
Tin	10	mg/kg	-	< 10
Zinc	5	mg/kg	-	8.0
% Moisture	1	%	20	14

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins Suite B1			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Apr 21, 2022	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Apr 21, 2022	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Apr 21, 2022	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Melbourne	Apr 21, 2022	14 Days
- Method: LTM-ORG-2010 BTEX and Volatile TRH			
Organochlorine Pesticides	Melbourne	Apr 21, 2022	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8270)			
VIC EPA Metals : Metals M17	Melbourne	Apr 21, 2022	180 Days
- Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)			
pH (units)(1:5 soil:CaCl ₂ extract at 25°C as rec.)	Melbourne	Apr 21, 2022	7 Days
- Method: LTM-GEN-7090 pH in soil by ISE			
Acid Herbicides	Melbourne	Apr 21, 2022	14 Days
- Method: LTM-ORG-2180 Phenoxy Acid Herbicides			
NEPM Screen Table 1(A) HIL's for Soil Contaminants - Basic Suite - Excluding Methyl Mercury/PBDE			
NEPM 2013 Metals : Metals M12	Melbourne	Apr 21, 2022	28 Days
- Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)			
Heavy Metals	Melbourne	Apr 21, 2022	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Chromium (hexavalent)	Melbourne	Apr 21, 2022	28 Days
- Method: LTM-INO-4100 Hexavalent Chromium by Spectrometric detection			
Cyanide (free)	Melbourne	Apr 21, 2022	14 Days
- Method: LTM-INO-4020 Total Free WAD Cyanide by CFA			
Polycyclic Aromatic Hydrocarbons	Melbourne	Apr 21, 2022	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Organophosphorus Pesticides	Melbourne	Apr 21, 2022	14 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS (USEPA 8270)			
Polychlorinated Biphenyls	Melbourne	Apr 21, 2022	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8082)			
Triazines	Melbourne	Apr 21, 2022	14 Days
- Method: LTM-ORG-2210 Triazine Herbicides in Soil and Water by GC-MS/MS			
NEPM 2013 Acid Herbicides	Melbourne	Apr 21, 2022	14 Days
- Method: MGT 530			
NEPM 2013 Organochlorine Pesticides	Melbourne	Apr 21, 2022	14 Days
- Method: USEPA 8081 Organochlorine Pesticides			
NEPM 2013 Phenols	Melbourne	Apr 21, 2022	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
% Moisture	Melbourne	Apr 20, 2022	14 Days
- Method: LTM-GEN-7080 Moisture			
Conductivity (1:5 aqueous extract at 25°C as rec.)	Melbourne	Apr 21, 2022	7 Days
- Method: LTM-INO-4030 Conductivity			
Cation Exchange Capacity	Melbourne	Apr 26, 2022	28 Days
- Method: LTM-MET-3060 Cation Exchange Capacity by bases & Exchangeable Sodium Percentage			

Company Name: Atma Environmental
Address: 56 William St
Abbotsford
VIC 3067
Project Name: LONGATHA
Project ID: 2153

Order No.:
Report #: 881033
Phone: 9429 6955
Fax: 9429 5911

Received: Apr 14, 2022 5:35 PM
Due: Apr 27, 2022
Priority: 5 Day
Contact Name: Glenn Berry

Eurofins Analytical Services Manager : Savini Suduweli

Sample Detail						HOLD	pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	Organochlorine Pesticides	Acid Herbicides	VIC EPA Metals : Metals M17	Moisture Set	Cation Exchange Capacity	NEPM Screen Table 1(A) HIL's for Soil Contaminants - Basic Suite - Excluding	Total Recoverable Hydrocarbons	Eurofins Suite B1
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217															
Brisbane Laboratory - NATA # 1261 Site # 20794															
Mayfield Laboratory - NATA # 1261 Site # 25079															
Perth Laboratory - NATA # 2377 Site # 2370															
External Laboratory															
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID										
1	BH01/0.1	Apr 13, 2022		Soil	M22-Ap0038145			X		X	X				X
2	BH02/0.1	Apr 13, 2022		Soil	M22-Ap0038146			X	X	X	X				X
3	BH03/0.1	Apr 13, 2022		Soil	M22-Ap0038147		X	X	X	X	X			X	X
4	BH04/0.1	Apr 13, 2022		Soil	M22-Ap0038148					X	X				
5	BH05/0.1	Apr 13, 2022		Soil	M22-Ap0038149					X	X				
6	BH06/0.1	Apr 13, 2022		Soil	M22-					X	X				X

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Sample Detail						HOLD	pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	Organochlorine Pesticides	Acid Herbicides	VIC EPA Metals : Metals M17	Moisture Set	Cation Exchange Capacity	NEPM Screen Table 1(A) HIL's for Soil Contaminants - Basic Suite - Excluding	Total Recoverable Hydrocarbons	Eurofins Suite B1
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217															
Brisbane Laboratory - NATA # 1261 Site # 20794															
Mayfield Laboratory - NATA # 1261 Site # 25079															
Perth Laboratory - NATA # 2377 Site # 2370															
External Laboratory															
					Ap0038150										
7	BH07/0.1	Apr 13, 2022		Soil	M22-Ap0038151		X			X	X	X			
8	BH08/0.1	Apr 13, 2022		Soil	M22-Ap0038152			X	X	X	X				X
9	BH09/0.1	Apr 13, 2022		Soil	M22-Ap0038153					X	X				
10	BH10/0.1	Apr 13, 2022		Soil	M22-Ap0038154					X	X				
11	SS01	Apr 13, 2022		Soil	M22-Ap0038155		X		X	X	X				
12	SS02	Apr 13, 2022		Soil	M22-Ap0038156			X		X	X				

Company Name: Atma Environmental
Address: 56 William St
Abbotsford
VIC 3067
Project Name: LONGATHA
Project ID: 2153

Order No.:
Report #: 881033
Phone: 9429 6955
Fax: 9429 5911

Received: Apr 14, 2022 5:35 PM
Due: Apr 27, 2022
Priority: 5 Day
Contact Name: Glenn Berry

Eurofins Analytical Services Manager : Savini Suduweli

Sample Detail						HOLD	pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	Organochlorine Pesticides	Acid Herbicides	VIC EPA Metals : Metals M17	Moisture Set	Cation Exchange Capacity	NEPM Screen Table 1(A) HIL's for Soil Contaminants - Basic Suite - Excluding	Total Recoverable Hydrocarbons	Eurofins Suite B1
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217															
Brisbane Laboratory - NATA # 1261 Site # 20794															
Mayfield Laboratory - NATA # 1261 Site # 25079															
Perth Laboratory - NATA # 2377 Site # 2370															
External Laboratory															
13	SS03	Apr 13, 2022		Soil	M22-Ap0038157				X	X	X				
14	SS04	Apr 13, 2022		Soil	M22-Ap0038158			X		X	X				
15	SS05	Apr 13, 2022		Soil	M22-Ap0038159		X				X		X		
16	SS06	Apr 13, 2022		Soil	M22-Ap0038160			X		X	X				
17	SS07	Apr 13, 2022		Soil	M22-Ap0038161			X		X	X				
18	SS08	Apr 13, 2022		Soil	M22-Ap0038162		X		X	X	X				
19	SS09	Apr 13, 2022		Soil	M22-					X	X				

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Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217															
Brisbane Laboratory - NATA # 1261 Site # 20794															
Mayfield Laboratory - NATA # 1261 Site # 25079															
Perth Laboratory - NATA # 2377 Site # 2370															
External Laboratory															
					Ap0038163										
20	SS10	Apr 13, 2022		Soil	M22-Ap0038164		X	X		X	X				
21	SS11	Apr 13, 2022		Soil	M22-Ap0038165					X	X	X			
22	SS12	Apr 13, 2022		Soil	M22-Ap0038166				X	X	X				
23	SS13	Apr 13, 2022		Soil	M22-Ap0038167		X				X		X		
24	SS14	Apr 13, 2022		Soil	M22-Ap0038168		X	X		X	X				
25	SS15	Apr 13, 2022		Soil	M22-Ap0038169				X	X	X				

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Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217															
Brisbane Laboratory - NATA # 1261 Site # 20794															
Mayfield Laboratory - NATA # 1261 Site # 25079															
Perth Laboratory - NATA # 2377 Site # 2370															
External Laboratory															
26	SS16	Apr 13, 2022		Soil	M22-Ap0038170			X		X	X				
27	SS17	Apr 13, 2022		Soil	M22-Ap0038171			X		X	X				
28	SS18	Apr 13, 2022		Soil	M22-Ap0038172				X	X	X				
29	SS19	Apr 13, 2022		Soil	M22-Ap0038173		X			X	X				
30	SS20	Apr 13, 2022		Soil	M22-Ap0038174						X		X		
31	SS21	Apr 13, 2022		Soil	M22-Ap0038175		X			X	X				
32	DUP-13422A	Apr 13, 2022		Soil	M22-						X				X

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Sample Detail						HOLD	pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	Organochlorine Pesticides	Acid Herbicides	VIC EPA Metals : Metals M17	Moisture Set	Cation Exchange Capacity	NEPM Screen Table 1(A) HIL's for Soil Contaminants - Basic Suite - Excluding	Total Recoverable Hydrocarbons	Eurofins Suite B1
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217															
Brisbane Laboratory - NATA # 1261 Site # 20794															
Mayfield Laboratory - NATA # 1261 Site # 25079															
Perth Laboratory - NATA # 2377 Site # 2370															
External Laboratory															
					Ap0038176										
33	DUP-13422B	Apr 13, 2022		Soil	M22-Ap0038177			X			X				
34	DUP-13422C	Apr 13, 2022		Soil	M22-Ap0038178					X	X				
35	BH01/0.5	Apr 13, 2022		Soil	M22-Ap0038179	X									
36	BH02/0.5	Apr 13, 2022		Soil	M22-Ap0038180	X									
37	BH03/0.5	Apr 13, 2022		Soil	M22-Ap0038181	X									
38	BH04/0.5	Apr 13, 2022		Soil	M22-Ap0038182	X									

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Sample Detail						HOLD	pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	Organochlorine Pesticides	Acid Herbicides	VIC EPA Metals : Metals M17	Moisture Set	Cation Exchange Capacity	NEPM Screen Table 1(A) HIL's for Soil Contaminants - Basic Suite - Excluding	Total Recoverable Hydrocarbons	Eurofins Suite B1
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217															
Brisbane Laboratory - NATA # 1261 Site # 20794															
Mayfield Laboratory - NATA # 1261 Site # 25079															
Perth Laboratory - NATA # 2377 Site # 2370															
External Laboratory															
39	BH05/0.5	Apr 13, 2022		Soil	M22-Ap0038183	X									
40	BH06/0.5	Apr 13, 2022		Soil	M22-Ap0038184	X									
41	BH07/0.5	Apr 13, 2022		Soil	M22-Ap0038185	X									
42	BH08/0.5	Apr 13, 2022		Soil	M22-Ap0038186	X									
43	BH09/0.5	Apr 13, 2022		Soil	M22-Ap0038187	X									
44	BH10/0.5	Apr 13, 2022		Soil	M22-Ap0038188	X									
45	SS22	Apr 13, 2022		Soil	M22-	X									

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Sample Detail						HOLD	pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	Organochlorine Pesticides	Acid Herbicides	VIC EPA Metals : Metals M17	Moisture Set	Cation Exchange Capacity	NEPM Screen Table 1(A) HIL's for Soil Contaminants - Basic Suite - Excluding	Total Recoverable Hydrocarbons	Eurofins Suite B1
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217															
Brisbane Laboratory - NATA # 1261 Site # 20794															
Mayfield Laboratory - NATA # 1261 Site # 25079															
Perth Laboratory - NATA # 2377 Site # 2370															
External Laboratory															
					Ap0038189										
46	DECON-13422	Apr 13, 2022		Water	M22-Ap0038190	X									
47	TB-13422	Apr 13, 2022		Water	M22-Ap0038191	X									
48	FB-13422	Apr 13, 2022		Water	M22-Ap0038192	X									
Test Counts						14	10	13	9	29	34	2	3	1	6

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	µg/L: micrograms per litre
ppm: parts per million	ppb: parts per billion	%: Percentage
org/100 mL: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units	MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4,4'-DDD	mg/kg	< 0.05			0.05	Pass	
4,4'-DDE	mg/kg	< 0.05			0.05	Pass	
4,4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-HCH	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-HCH	mg/kg	< 0.05			0.05	Pass	
d-HCH	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-HCH (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 0.5			0.5	Pass	
Bifenthrin	mg/kg	< 0.05			0.05	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Barium	mg/kg	< 10			10	Pass	
Beryllium	mg/kg	< 2			2	Pass	
Boron	mg/kg	< 10			10	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Cobalt	mg/kg	< 5			5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Manganese	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Molybdenum	mg/kg	< 5			5	Pass	
Nickel	mg/kg	< 5			5	Pass	
Selenium	mg/kg	< 2			2	Pass	
Silver	mg/kg	< 2			2	Pass	
Tin	mg/kg	< 10			10	Pass	
Zinc	mg/kg	< 5			5	Pass	
Method Blank							
Chromium (hexavalent)	mg/kg	< 1			1	Pass	
Cyanide (free)	mg/kg	< 5			5	Pass	
Method Blank							
Acid Herbicides							
2,4-D	mg/kg	< 0.5			0.5	Pass	
2,4-DB	mg/kg	< 0.5			0.5	Pass	
2,4,5-T	mg/kg	< 0.5			0.5	Pass	
2,4,5-TP	mg/kg	< 0.5			0.5	Pass	
Actril (loxynil)	mg/kg	< 0.5			0.5	Pass	
Dicamba	mg/kg	< 0.5			0.5	Pass	
Dichlorprop	mg/kg	< 0.5			0.5	Pass	
Dinitro-o-cresol	mg/kg	< 0.5			0.5	Pass	
Dinoseb	mg/kg	< 0.5			0.5	Pass	
MCPA	mg/kg	< 0.5			0.5	Pass	
MCPB	mg/kg	< 0.5			0.5	Pass	
Mecoprop	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Cation Exchange Capacity							
Cation Exchange Capacity	meq/100g	< 0.05			0.05	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g,h,i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a,h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organophosphorus Pesticides							
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.1			0.1	Pass	
Aroclor-1242	mg/kg	< 0.1			0.1	Pass	
Aroclor-1248	mg/kg	< 0.1			0.1	Pass	
Aroclor-1254	mg/kg	< 0.1			0.1	Pass	
Aroclor-1260	mg/kg	< 0.1			0.1	Pass	
Total PCB*	mg/kg	< 0.1			0.1	Pass	
Method Blank							
Triazines							
Atrazine	mg/kg	< 0.2			0.2	Pass	
Method Blank							
NEPM 2013 Acid Herbicides							
Picloram	mg/kg	< 0.5			0.5	Pass	
2,4-D	mg/kg	< 0.5			0.5	Pass	
2,4,5-T	mg/kg	< 0.5			0.5	Pass	
MCPA	mg/kg	< 0.5			0.5	Pass	
MCPB	mg/kg	< 0.5			0.5	Pass	
Mecoprop	mg/kg	< 0.5			0.5	Pass	
Method Blank							
NEPM 2013 Organochlorine Pesticides							
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Mirex	mg/kg	< 0.05			0.05	Pass	
4,4'-DDD	mg/kg	< 0.05			0.05	Pass	
4,4'-DDE	mg/kg	< 0.05			0.05	Pass	
4,4'-DDT	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
NEPM 2013 Phenols							
2-Methylphenol (o-Cresol)	mg/kg	< 0.2			0.2	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 0.4			0.4	Pass	
Pentachlorophenol	mg/kg	< 1			1	Pass	
Phenol	mg/kg	< 0.5			0.5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	76			70-130	Pass	
TRH C10-C14	%	98			70-130	Pass	
Naphthalene	%	73			70-130	Pass	
TRH C6-C10	%	74			70-130	Pass	
TRH >C10-C16	%	105			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	74			70-130	Pass	
Toluene	%	119			70-130	Pass	
Ethylbenzene	%	78			70-130	Pass	
m&p-Xylenes	%	83			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Xylenes - Total*	%	82			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	97			70-130	Pass	
4,4'-DDD	%	102			70-130	Pass	
4,4'-DDE	%	104			70-130	Pass	
4,4'-DDT	%	102			70-130	Pass	
a-HCH	%	97			70-130	Pass	
Aldrin	%	83			70-130	Pass	
b-HCH	%	103			70-130	Pass	
d-HCH	%	105			70-130	Pass	
Dieldrin	%	74			70-130	Pass	
Endosulfan I	%	105			70-130	Pass	
Endosulfan II	%	103			70-130	Pass	
Endosulfan sulphate	%	102			70-130	Pass	
Endrin	%	74			70-130	Pass	
Endrin aldehyde	%	71			70-130	Pass	
Endrin ketone	%	79			70-130	Pass	
g-HCH (Lindane)	%	80			70-130	Pass	
Heptachlor	%	102			70-130	Pass	
Heptachlor epoxide	%	86			70-130	Pass	
Hexachlorobenzene	%	104			70-130	Pass	
Methoxychlor	%	100			70-130	Pass	
Bifenthrin	%	89			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	108			80-120	Pass	
Barium	%	113			80-120	Pass	
Beryllium	%	103			80-120	Pass	
Boron	%	94			80-120	Pass	
Cadmium	%	110			80-120	Pass	
Chromium	%	108			80-120	Pass	
Cobalt	%	107			80-120	Pass	
Copper	%	109			80-120	Pass	
Lead	%	108			80-120	Pass	
Manganese	%	109			80-120	Pass	
Mercury	%	97			80-120	Pass	
Molybdenum	%	110			80-120	Pass	
Nickel	%	104			80-120	Pass	
Selenium	%	107			80-120	Pass	
Silver	%	111			80-120	Pass	
Tin	%	108			80-120	Pass	
Zinc	%	109			80-120	Pass	
LCS - % Recovery							
Chromium (hexavalent)	%	97			70-130	Pass	
LCS - % Recovery							
Acid Herbicides							
2,4-D	%	93			70-130	Pass	
2,4-DB	%	130			70-130	Pass	
2,4,5-T	%	124			70-130	Pass	
2,4,5-TP	%	127			70-130	Pass	
Actril (loxynil)	%	122			70-130	Pass	
Dicamba	%	102			70-130	Pass	
Dichlorprop	%	117			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Dinitro-o-cresol	%	104			70-130	Pass	
Dinoseb	%	109			70-130	Pass	
MCPA	%	105			70-130	Pass	
MCPB	%	104			70-130	Pass	
Mecoprop	%	121			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	117			70-130	Pass	
Acenaphthylene	%	86			70-130	Pass	
Anthracene	%	115			70-130	Pass	
Benz(a)anthracene	%	75			70-130	Pass	
Benzo(a)pyrene	%	127			70-130	Pass	
Benzo(b&j)fluoranthene	%	81			70-130	Pass	
Benzo(g,h,i)perylene	%	115			70-130	Pass	
Benzo(k)fluoranthene	%	83			70-130	Pass	
Chrysene	%	86			70-130	Pass	
Dibenz(a,h)anthracene	%	118			70-130	Pass	
Fluoranthene	%	113			70-130	Pass	
Fluorene	%	127			70-130	Pass	
Indeno(1,2,3-cd)pyrene	%	115			70-130	Pass	
Naphthalene	%	116			70-130	Pass	
Phenanthrene	%	105			70-130	Pass	
Pyrene	%	118			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	78			70-130	Pass	
LCS - % Recovery							
NEPM 2013 Acid Herbicides							
Picloram	%	127			70-130	Pass	
2,4-D	%	100			70-130	Pass	
2,4,5-T	%	125			70-130	Pass	
MCPA	%	104			70-130	Pass	
MCPB	%	118			70-130	Pass	
Mecoprop	%	121			70-130	Pass	
LCS - % Recovery							
NEPM 2013 Organochlorine Pesticides							
Endosulfan sulphate	%	91			70-130	Pass	
Mirex	%	80			70-130	Pass	
4,4'-DDD	%	101			70-130	Pass	
4,4'-DDE	%	86			70-130	Pass	
4,4'-DDT	%	103			70-130	Pass	
Aldrin	%	80			70-130	Pass	
Chlordanes - Total	%	80			70-130	Pass	
Dieldrin	%	76			70-130	Pass	
Endosulfan I	%	73			70-130	Pass	
Endosulfan II	%	77			70-130	Pass	
Endrin	%	85			70-130	Pass	
Heptachlor	%	88			70-130	Pass	
Hexachlorobenzene	%	93			70-130	Pass	
Methoxychlor	%	122			70-130	Pass	
LCS - % Recovery							
NEPM 2013 Phenols							
2-Methylphenol (o-Cresol)	%	86			25-140	Pass	
3&4-Methylphenol (m&p-Cresol)	%	43			25-140	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Pentachlorophenol			%	51			25-140	Pass	
Phenol			%	109			25-140	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH C6-C9	M22-Ap0043086	NCP	%	108			70-130	Pass	
TRH C10-C14	M22-Ap0035286	NCP	%	108			70-130	Pass	
Naphthalene	M22-Ap0043086	NCP	%	76			70-130	Pass	
TRH C6-C10	M22-Ap0043086	NCP	%	100			70-130	Pass	
TRH >C10-C16	M22-Ap0035286	NCP	%	115			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M22-Ap0043086	NCP	%	76			70-130	Pass	
Toluene	M22-Ap0043086	NCP	%	80			70-130	Pass	
Ethylbenzene	M22-Ap0043086	NCP	%	81			70-130	Pass	
m&p-Xylenes	M22-Ap0043086	NCP	%	92			70-130	Pass	
o-Xylene	M22-Ap0043086	NCP	%	74			70-130	Pass	
Xylenes - Total*	M22-Ap0043086	NCP	%	86			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Manganese	M22-Ap0041475	NCP	%	104			75-125	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	M22-Ap0043514	NCP	%	85			70-130	Pass	
4,4'-DDD	M22-Ap0043514	NCP	%	85			70-130	Pass	
4,4'-DDE	M22-Ap0043514	NCP	%	92			70-130	Pass	
4,4'-DDT	M22-Ap0043514	NCP	%	123			70-130	Pass	
a-HCH	M22-Ap0043514	NCP	%	106			70-130	Pass	
Aldrin	M22-Ap0043514	NCP	%	84			70-130	Pass	
b-HCH	M22-Ap0043514	NCP	%	72			70-130	Pass	
d-HCH	M22-Ap0043514	NCP	%	104			70-130	Pass	
Dieldrin	M22-Ap0043514	NCP	%	79			70-130	Pass	
Endosulfan I	M22-Ap0043514	NCP	%	83			70-130	Pass	
Endosulfan II	M22-Ap0043514	NCP	%	78			70-130	Pass	
Endosulfan sulphate	M22-Ap0043514	NCP	%	101			70-130	Pass	
Endrin	M22-Ap0043514	NCP	%	92			70-130	Pass	
Endrin aldehyde	M22-Ap0043514	NCP	%	76			70-130	Pass	
Endrin ketone	M22-Ap0043514	NCP	%	103			70-130	Pass	
g-HCH (Lindane)	M22-Ap0043514	NCP	%	126			70-130	Pass	
Heptachlor	M22-Ap0043514	NCP	%	99			70-130	Pass	
Heptachlor epoxide	M22-Ap0043514	NCP	%	81			70-130	Pass	
Hexachlorobenzene	M22-Ap0043514	NCP	%	99			70-130	Pass	
Methoxychlor	M22-Ap0043514	NCP	%	97			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M22-Ap0038156	CP	%	78			75-125	Pass	
Beryllium	M22-Ap0038156	CP	%	97			75-125	Pass	
Boron	M22-Ap0038156	CP	%	91			75-125	Pass	
Cadmium	M22-Ap0038156	CP	%	109			75-125	Pass	
Chromium	M22-Ap0038156	CP	%	82			75-125	Pass	
Cobalt	M22-Ap0038156	CP	%	105			75-125	Pass	
Copper	M22-Ap0038156	CP	%	99			75-125	Pass	
Lead	M22-Ap0038156	CP	%	103			75-125	Pass	
Mercury	M22-Ap0038156	CP	%	103			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Molybdenum	M22-Ap0038156	CP	%	105		75-125	Pass	
Nickel	M22-Ap0038156	CP	%	99		75-125	Pass	
Selenium	M22-Ap0038156	CP	%	89		75-125	Pass	
Silver	M22-Ap0038156	CP	%	111		75-125	Pass	
Tin	M22-Ap0038156	CP	%	109		75-125	Pass	
Zinc	M22-Ap0038156	CP	%	96		75-125	Pass	
Spike - % Recovery								
Organochlorine Pesticides				Result 1				
Bifenthrin	M22-Ap0031223	NCP	%	97		70-130	Pass	
Spike - % Recovery								
				Result 1				
Chromium (hexavalent)	M22-Ap0038456	NCP	%	60		70-130	Fail	Q08
Spike - % Recovery								
Polycyclic Aromatic Hydrocarbons				Result 1				
Acenaphthene	M22-Ap0034145	NCP	%	84		70-130	Pass	
Acenaphthylene	M22-Ap0034145	NCP	%	89		70-130	Pass	
Anthracene	M22-Ap0034145	NCP	%	87		70-130	Pass	
Benz(a)anthracene	M22-Ap0034145	NCP	%	82		70-130	Pass	
Benzo(a)pyrene	M22-Ap0034145	NCP	%	87		70-130	Pass	
Benzo(b&j)fluoranthene	M22-Ap0034145	NCP	%	71		70-130	Pass	
Benzo(g,h,i)perylene	M22-Ap0034145	NCP	%	82		70-130	Pass	
Benzo(k)fluoranthene	M22-Ap0034145	NCP	%	119		70-130	Pass	
Chrysene	M22-Ap0034145	NCP	%	102		70-130	Pass	
Dibenz(a,h)anthracene	M22-Ap0034145	NCP	%	79		70-130	Pass	
Fluoranthene	M22-Ap0034145	NCP	%	75		70-130	Pass	
Fluorene	M22-Ap0034145	NCP	%	85		70-130	Pass	
Indeno(1,2,3-cd)pyrene	M22-Ap0034145	NCP	%	78		70-130	Pass	
Naphthalene	M22-Ap0034145	NCP	%	82		70-130	Pass	
Phenanthrene	M22-Ap0034145	NCP	%	80		70-130	Pass	
Pyrene	M22-Ap0034145	NCP	%	78		70-130	Pass	
Spike - % Recovery								
Polychlorinated Biphenyls				Result 1				
Aroclor-1016	M22-Ap0035793	NCP	%	100		70-130	Pass	
Aroclor-1260	M22-Ap0035793	NCP	%	117		70-130	Pass	
Spike - % Recovery								
NEPM 2013 Organochlorine Pesticides				Result 1				
Mirex	M22-Ap0031223	NCP	%	84		70-130	Pass	
Spike - % Recovery								
NEPM 2013 Phenols				Result 1				
2-Methylphenol (o-Cresol)	M22-Ap0034145	NCP	%	66		30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	M22-Ap0034145	NCP	%	99		30-130	Pass	
Pentachlorophenol	M22-Ap0034145	NCP	%	44		30-130	Pass	
Phenol	M22-Ap0034145	NCP	%	74		30-130	Pass	
Spike - % Recovery								
Heavy Metals				Result 1				
Arsenic	M22-Ap0038166	CP	%	101		75-125	Pass	
Beryllium	M22-Ap0038166	CP	%	102		75-125	Pass	
Boron	M22-Ap0038166	CP	%	93		75-125	Pass	
Cadmium	M22-Ap0038166	CP	%	113		75-125	Pass	
Chromium	M22-Ap0038166	CP	%	84		75-125	Pass	
Cobalt	M22-Ap0038166	CP	%	101		75-125	Pass	
Copper	M22-Ap0038166	CP	%	105		75-125	Pass	
Lead	M22-Ap0038166	CP	%	111		75-125	Pass	
Mercury	M22-Ap0038166	CP	%	105		75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Molybdenum	M22-Ap0038166	CP	%	111			75-125	Pass	
Nickel	M22-Ap0038166	CP	%	100			75-125	Pass	
Selenium	M22-Ap0038166	CP	%	94			75-125	Pass	
Silver	M22-Ap0038166	CP	%	112			75-125	Pass	
Tin	M22-Ap0038166	CP	%	110			75-125	Pass	
Zinc	M22-Ap0038166	CP	%	106			75-125	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M22-Ap0038178	CP	%	96			75-125	Pass	
Barium	M22-Ap0038178	CP	%	101			75-125	Pass	
Beryllium	M22-Ap0038178	CP	%	83			75-125	Pass	
Boron	M22-Ap0038178	CP	%	93			75-125	Pass	
Cadmium	M22-Ap0038178	CP	%	122			75-125	Pass	
Chromium	M22-Ap0038178	CP	%	118			75-125	Pass	
Cobalt	M22-Ap0038178	CP	%	103			75-125	Pass	
Copper	M22-Ap0038178	CP	%	94			75-125	Pass	
Lead	M22-Ap0038178	CP	%	97			75-125	Pass	
Mercury	M22-Ap0038178	CP	%	116			75-125	Pass	
Molybdenum	M22-Ap0038178	CP	%	94			75-125	Pass	
Nickel	M22-Ap0038178	CP	%	92			75-125	Pass	
Selenium	M22-Ap0038178	CP	%	78			75-125	Pass	
Silver	M22-Ap0038178	CP	%	121			75-125	Pass	
Tin	M22-Ap0038178	CP	%	94			75-125	Pass	
Zinc	M22-Ap0038178	CP	%	97			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C10-C14	M22-Ap0035285	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M22-Ap0035285	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M22-Ap0035285	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C10-C16	M22-Ap0035285	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M22-Ap0035285	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M22-Ap0035285	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	L22-Ap0039404	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4,4'-DDD	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4,4'-DDE	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4,4'-DDT	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-HCH	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-HCH	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-HCH	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-HCH (Lindane)	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate								
Organochlorine Pesticides				Result 1	Result 2	RPD		
Methoxychlor	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Toxaphene	L22-Ap0039404	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	M22-Ap0038145	CP	%	24	23	3.0	30%	Pass
Duplicate								
Cation Exchange Capacity				Result 1	Result 2	RPD		
Cation Exchange Capacity	B22-Ap0018967	NCP	meq/100g	25	23	8.0	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	M22-Ap0038155	CP	mg/kg	2.3	2.2	3.0	30%	Pass
Barium	M22-Ap0038155	CP	mg/kg	230	200	16	30%	Pass
Beryllium	M22-Ap0038155	CP	mg/kg	< 2	< 2	<1	30%	Pass
Boron	M22-Ap0038155	CP	mg/kg	< 10	< 10	<1	30%	Pass
Cadmium	M22-Ap0038155	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	M22-Ap0038155	CP	mg/kg	98	90	8.0	30%	Pass
Cobalt	M22-Ap0038155	CP	mg/kg	37	32	14	30%	Pass
Copper	M22-Ap0038155	CP	mg/kg	42	36	15	30%	Pass
Lead	M22-Ap0038155	CP	mg/kg	26	23	14	30%	Pass
Manganese	M22-Ap0038155	CP	mg/kg	8600	7500	13	30%	Pass
Mercury	M22-Ap0038155	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Molybdenum	M22-Ap0038155	CP	mg/kg	< 5	< 5	<1	30%	Pass
Nickel	M22-Ap0038155	CP	mg/kg	38	32	17	30%	Pass
Selenium	M22-Ap0038155	CP	mg/kg	< 2	< 2	<1	30%	Pass
Silver	M22-Ap0038155	CP	mg/kg	< 2	< 2	<1	30%	Pass
Tin	M22-Ap0038155	CP	mg/kg	< 10	< 10	<1	30%	Pass
Zinc	M22-Ap0038155	CP	mg/kg	31	25	19	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	M22-Ap0038155	CP	%	33	34	3.0	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	M22-Ap0038156	CP	mg/kg	2.9	2.8	2.0	30%	Pass
Barium	M22-Ap0038156	CP	mg/kg	320	320	1.0	30%	Pass
Beryllium	M22-Ap0038156	CP	mg/kg	< 2	< 2	<1	30%	Pass
Boron	M22-Ap0038156	CP	mg/kg	< 10	< 10	<1	30%	Pass
Cadmium	M22-Ap0038156	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	M22-Ap0038156	CP	mg/kg	87	89	2.0	30%	Pass
Cobalt	M22-Ap0038156	CP	mg/kg	64	64	1.0	30%	Pass
Copper	M22-Ap0038156	CP	mg/kg	53	53	1.0	30%	Pass
Lead	M22-Ap0038156	CP	mg/kg	30	30	1.0	30%	Pass
Manganese	M22-Ap0038156	CP	mg/kg	13000	13000	2.0	30%	Pass
Mercury	M22-Ap0038156	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Molybdenum	M22-Ap0038156	CP	mg/kg	< 5	< 5	<1	30%	Pass
Nickel	M22-Ap0038156	CP	mg/kg	48	48	<1	30%	Pass
Selenium	M22-Ap0038156	CP	mg/kg	< 2	< 2	<1	30%	Pass
Silver	M22-Ap0038156	CP	mg/kg	< 2	< 2	<1	30%	Pass
Tin	M22-Ap0038156	CP	mg/kg	< 10	< 10	<1	30%	Pass
Zinc	M22-Ap0038156	CP	mg/kg	41	42	2.0	30%	Pass

Duplicate								
Acid Herbicides				Result 1	Result 2	RPD		
2.4-D	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
2.4-DB	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
2.4.5-T	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
2.4.5-TP	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Actril (loxylin)	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dicamba	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dichlorprop	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dinitro-o-cresol	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dinoseb	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
MCPA	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
MCPB	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Mecoprop	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
NEPM 2013 Acid Herbicides				Result 1	Result 2	RPD		
Picloram	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Organochlorine Pesticides				Result 1	Result 2	RPD		
Bifenthrin	M22-Ap0038470	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
Chromium (hexavalent)	M22-Ap0046078	NCP	mg/kg	< 1	< 1	<1	30%	Pass
Duplicate								
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD		
Acenaphthene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Acenaphthylene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Anthracene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benz(a)anthracene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(a)pyrene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(b&j)fluoranthene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(g,h,i)perylene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(k)fluoranthene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Chrysene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dibenz(a,h)anthracene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluoranthene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluorene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Indeno(1,2,3-cd)pyrene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Naphthalene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Phenanthrene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Pyrene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Organophosphorus Pesticides				Result 1	Result 2	RPD		
Chlorpyrifos	M22-Ap0038470	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Duplicate								
Polychlorinated Biphenyls				Result 1	Result 2	RPD		
Aroclor-1016	M22-Ap0038470	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1221	M22-Ap0038470	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1232	M22-Ap0038470	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1242	M22-Ap0038470	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1248	M22-Ap0038470	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1254	M22-Ap0038459	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1260	M22-Ap0038459	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Total PCB*	M22-Ap0038459	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Duplicate								
Triazines				Result 1	Result 2	RPD		
Atrazine	M22-Ap0038470	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass

Duplicate								
NEPM 2013 Acid Herbicides				Result 1	Result 2	RPD		
Picloram	M22-Ap0035284	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
NEPM 2013 Organochlorine Pesticides				Result 1	Result 2	RPD		
Mirex	M22-Ap0038470	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Duplicate								
NEPM 2013 Phenols				Result 1	Result 2	RPD		
2-Methylphenol (o-Cresol)	M22-Ap0038470	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
3&4-Methylphenol (m&p-Cresol)	M22-Ap0038470	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Pentachlorophenol	M22-Ap0038470	NCP	mg/kg	< 1	< 1	<1	30%	Pass
Phenol	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	M22-Ap0038165	CP	mg/kg	< 2	2.2	16	30%	Pass
Barium	M22-Ap0038165	CP	mg/kg	280	320	11	30%	Pass
Beryllium	M22-Ap0038165	CP	mg/kg	< 2	< 2	<1	30%	Pass
Boron	M22-Ap0038165	CP	mg/kg	< 10	< 10	<1	30%	Pass
Cadmium	M22-Ap0038165	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	M22-Ap0038165	CP	mg/kg	280	250	13	30%	Pass
Cobalt	M22-Ap0038165	CP	mg/kg	150	170	14	30%	Pass
Copper	M22-Ap0038165	CP	mg/kg	33	32	3.0	30%	Pass
Lead	M22-Ap0038165	CP	mg/kg	9.2	9.4	2.0	30%	Pass
Manganese	M22-Ap0038165	CP	mg/kg	4500	5500	22	30%	Pass
Mercury	M22-Ap0038165	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Molybdenum	M22-Ap0038165	CP	mg/kg	< 5	< 5	<1	30%	Pass
Nickel	M22-Ap0038165	CP	mg/kg	100	110	6.0	30%	Pass
Selenium	M22-Ap0038165	CP	mg/kg	< 2	< 2	<1	30%	Pass
Silver	M22-Ap0038165	CP	mg/kg	< 2	< 2	<1	30%	Pass
Tin	M22-Ap0038165	CP	mg/kg	< 10	< 10	<1	30%	Pass
Zinc	M22-Ap0038165	CP	mg/kg	93	92	1.0	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	M22-Ap0038165	CP	%	21	18	16	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	M22-Ap0038166	CP	mg/kg	2.5	2.6	2.0	30%	Pass
Barium	M22-Ap0038166	CP	mg/kg	76	76	1.0	30%	Pass
Beryllium	M22-Ap0038166	CP	mg/kg	< 2	< 2	<1	30%	Pass
Boron	M22-Ap0038166	CP	mg/kg	< 10	< 10	<1	30%	Pass
Cadmium	M22-Ap0038166	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	M22-Ap0038166	CP	mg/kg	43	43	<1	30%	Pass
Cobalt	M22-Ap0038166	CP	mg/kg	23	24	1.0	30%	Pass
Copper	M22-Ap0038166	CP	mg/kg	8.1	8.2	1.0	30%	Pass
Lead	M22-Ap0038166	CP	mg/kg	11	11	1.0	30%	Pass
Manganese	M22-Ap0038166	CP	mg/kg	1400	1500	1.0	30%	Pass
Mercury	M22-Ap0038166	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Molybdenum	M22-Ap0038166	CP	mg/kg	< 5	< 5	<1	30%	Pass
Nickel	M22-Ap0038166	CP	mg/kg	12	12	1.0	30%	Pass
Selenium	M22-Ap0038166	CP	mg/kg	< 2	< 2	<1	30%	Pass
Silver	M22-Ap0038166	CP	mg/kg	< 2	< 2	<1	30%	Pass
Tin	M22-Ap0038166	CP	mg/kg	< 10	< 10	<1	30%	Pass
Zinc	M22-Ap0038166	CP	mg/kg	24	24	3.0	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	M22-Ap0043089	NCP	pH Units	6.7	6.8	pass	30%	Pass

Duplicate								
				Result 1	Result 2	RPD		
Conductivity (1:5 aqueous extract at 25°C as rec.)	M22-Ap0038168	CP	uS/cm	43	43	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	M22-Ap0038172	CP	mg/kg	< 2	< 2	<1	30%	Pass
Barium	M22-Ap0038172	CP	mg/kg	150	140	7.0	30%	Pass
Beryllium	M22-Ap0038172	CP	mg/kg	< 2	< 2	<1	30%	Pass
Boron	M22-Ap0038172	CP	mg/kg	< 10	< 10	<1	30%	Pass
Cadmium	M22-Ap0038172	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	M22-Ap0038172	CP	mg/kg	120	110	8.0	30%	Pass
Cobalt	M22-Ap0038172	CP	mg/kg	22	20	7.0	30%	Pass
Copper	M22-Ap0038172	CP	mg/kg	50	45	10	30%	Pass
Lead	M22-Ap0038172	CP	mg/kg	23	21	8.0	30%	Pass
Manganese	M22-Ap0038172	CP	mg/kg	5100	4700	8.0	30%	Pass
Mercury	M22-Ap0038172	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Molybdenum	M22-Ap0038172	CP	mg/kg	< 5	< 5	<1	30%	Pass
Nickel	M22-Ap0038172	CP	mg/kg	27	24	11	30%	Pass
Selenium	M22-Ap0038172	CP	mg/kg	< 2	< 2	<1	30%	Pass
Silver	M22-Ap0038172	CP	mg/kg	< 2	< 2	<1	30%	Pass
Tin	M22-Ap0038172	CP	mg/kg	< 10	< 10	<1	30%	Pass
Zinc	M22-Ap0038172	CP	mg/kg	26	23	11	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	M22-Ap0038175	CP	%	21	20	3.0	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD		
TRH C6-C9	M22-Ap0038176	CP	mg/kg	< 20	< 20	<1	30%	Pass
Naphthalene	M22-Ap0038176	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
TRH C6-C10	M22-Ap0038176	CP	mg/kg	< 20	< 20	<1	30%	Pass
Duplicate								
BTEX				Result 1	Result 2	RPD		
Benzene	M22-Ap0038176	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Toluene	M22-Ap0038176	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Ethylbenzene	M22-Ap0038176	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
m&p-Xylenes	M22-Ap0038176	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
o-Xylene	M22-Ap0038176	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Xylenes - Total*	M22-Ap0038176	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	M22-Ap0038178	CP	mg/kg	< 2	< 2	<1	30%	Pass
Barium	M22-Ap0038178	CP	mg/kg	57	58	2.0	30%	Pass
Beryllium	M22-Ap0038178	CP	mg/kg	< 2	< 2	<1	30%	Pass
Boron	M22-Ap0038178	CP	mg/kg	< 10	< 10	<1	30%	Pass
Cadmium	M22-Ap0038178	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	M22-Ap0038178	CP	mg/kg	26	26	1.0	30%	Pass
Cobalt	M22-Ap0038178	CP	mg/kg	12	12	1.0	30%	Pass
Copper	M22-Ap0038178	CP	mg/kg	6.8	6.9	2.0	30%	Pass
Lead	M22-Ap0038178	CP	mg/kg	14	15	<1	30%	Pass
Manganese	M22-Ap0038178	CP	mg/kg	1200	1200	<1	30%	Pass
Mercury	M22-Ap0038178	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Molybdenum	M22-Ap0038178	CP	mg/kg	< 5	< 5	<1	30%	Pass
Nickel	M22-Ap0038178	CP	mg/kg	< 5	< 5	<1	30%	Pass
Selenium	M22-Ap0038178	CP	mg/kg	< 2	< 2	<1	30%	Pass
Silver	M22-Ap0038178	CP	mg/kg	< 2	< 2	<1	30%	Pass

Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Tin	M22-Ap0038178	CP	mg/kg	< 10	< 10	<1	30%	Pass
Zinc	M22-Ap0038178	CP	mg/kg	8.0	7.9	1.0	30%	Pass

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.

Authorised by:

Harry Bacalis	Analytical Services Manager
Scott Beddoes	Senior Analyst (NSW)
Mary Makarios	Senior Analyst (NSW)
Carroll Lee	Senior Analyst (NSW)
Joseph Edouard	Senior Analyst (VIC)
Edward Lee	Senior Analyst (VIC)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

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Revision No.: 1 / Date of Last Revision: 04/02/2022

Sheet No. 1 of 1



PROJECT NAME: LEONGATHA	Sampler's Signature: <i>TOBE BELFITT</i>	
Project Ref. No.: 2153	Sampler's Name: TOBE BELFITT	
	DATE: 13 APR 2022	
	Time:	

[illegible]

TOTAL:		3		3		0	1	1					1	3	
DISPATCHED BY: (sign)		(DATE/TIME)													
EUROFINS ENVIRONMENT TESTING		■ RECEIVED BY: (sign)													
△		Received: 20/4 10:08 (DATE/TIME) C/note: Carier: 													
COURIERED BY: (sign)		(DATE/TIME)													
		Temp: 17.4 C Seal: Y  LAB NAME: ALS fee / Icebricks / NA 													

INITIAL RESULTS REQUESTED WITHIN:	24Hrs	48Hrs	3-4 DAYS	NORMAL
REMARKS:				

REMARKS:	Please email completed COC, Sample Receipt Notification, results and invoices to: > gberry@atmaenvironmental.com > ,	relinquished Emily D 20/4/22 8:

NOTE: Δ Must be completed by Atma Environmental

Must be completed with date and time by laboratory.

CERTIFICATE OF ANALYSIS

Work Order : **EM2207191**
Client : **ATMA ENVIRONMENTAL P/L**
Contact : **MR GLEN BERRY**
Address : **56 William Street**
ABBOTSFORD VIC, AUSTRALIA 3067
Telephone : **+61 94296955**
Project : **2153**
Order number : **----**
C-O-C number : **----**
Sampler : **TOBE BELFITT**
Site : **----**
Quote number : **EN/333/21 Seconday work only**
No. of samples received : **3**
No. of samples analysed : **2**

Page : 1 of 5
Laboratory : Environmental Division Melbourne
Contact : Customer Services EM
Address : 4 Westall Rd Springvale VIC Australia 3171
Telephone : +61-3-8549 9600
Date Samples Received : 20-Apr-2022 10:00
Date Analysis Commenced : 26-Apr-2022
Issue Date : 28-Apr-2022 15:25



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Jarwis Nheu	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EG005-T : EM2207051 #37 Poor spike recovery for chromium due to sample matrix. Confirmed by re-digestion and re-analysis.
- EP071: EM2206916_074 Poor duplicate precision due to sample heterogeneity. Confirmed by re-extraction and re-analysis.



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				SPLIT-13422A	SPLIT-13422C	----	----	----
Sampling date / time				13-Apr-2022 00:00	13-Apr-2022 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EM2207191-001	EM2207191-003	-----	-----	-----
				Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	24.6	----	----	----	----
Moisture Content	----	1.0	%	----	13.7	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	----	<5	----	----	----
Barium	7440-39-3	10	mg/kg	----	50	----	----	----
Beryllium	7440-41-7	1	mg/kg	----	<1	----	----	----
Boron	7440-42-8	50	mg/kg	----	<50	----	----	----
Cadmium	7440-43-9	1	mg/kg	----	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	----	23	----	----	----
Cobalt	7440-48-4	2	mg/kg	----	9	----	----	----
Copper	7440-50-8	5	mg/kg	----	6	----	----	----
Lead	7439-92-1	5	mg/kg	----	12	----	----	----
Manganese	7439-96-5	5	mg/kg	----	942	----	----	----
Nickel	7440-02-0	2	mg/kg	----	5	----	----	----
Selenium	7782-49-2	5	mg/kg	----	<5	----	----	----
Vanadium	7440-62-2	5	mg/kg	----	43	----	----	----
Zinc	7440-66-6	5	mg/kg	----	6	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	<0.1	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg	<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	110	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	110	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	SPLIT-13422A	SPLIT-13422C	----	----	----
Sampling date / time					13-Apr-2022 00:00	13-Apr-2022 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EM2207191-001	EM2207191-003	-----	-----	-----
				Result	Result		----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ >C10 - C16 Fraction minus Naphthalene (F2)		----	50	mg/kg	<50	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	----	----	----
^ Sum of BTEX		----	0.2	mg/kg	<0.2	----	----	----	----
^ Total Xylenes		----	0.5	mg/kg	<0.5	----	----	----	----
Naphthalene		91-20-3	1	mg/kg	<1	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		65.6	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		72.2	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		78.4	----	----	----	----



Surrogate Control Limits

Sub-Matrix: **SOIL**

		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	51	125
Toluene-D8	2037-26-5	55	125
4-Bromofluorobenzene	460-00-4	56	124

QUALITY CONTROL REPORT

Work Order	: EM2207191	Page	: 1 of 7
Client	: ATMA ENVIRONMENTAL P/L	Laboratory	: Environmental Division Melbourne
Contact	: MR GLEN BERRY	Contact	: Customer Services EM
Address	: 56 William Street ABBOTSFORD VIC, AUSTRALIA 3067	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: +61 94296955	Telephone	: +61-3-8549 9600
Project	: 2153	Date Samples Received	: 20-Apr-2022
Order number	: ----	Date Analysis Commenced	: 26-Apr-2022
C-O-C number	: ----	Issue Date	: 28-Apr-2022
Sampler	: TOBE BELFITT		
Site	:		
Quote number	: EN/333/21 Seconday work only		
No. of samples received	: 3		
No. of samples analysed	: 2		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Jarvis Nheu	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 4302589)									
EM2207051-033	Anonymous	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	<10	<10	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Cobalt	7440-48-4	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	5	<5	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.0	No Limit
EM2207051-054	Anonymous	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	70	40	42.2	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	15	14	8.4	No Limit
		EG005T: Cobalt	7440-48-4	2	mg/kg	10	10	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	38	38	0.0	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	5	5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	20	20	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	45	27	49.5	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	244	258	5.5	0% - 20%



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 4302589) - continued									
EM2207051-054	Anonymous	EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	19	19	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	82	65	22.7	0% - 50%
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.0	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4302879)									
EM2207126-006	Anonymous	EA055: Moisture Content	----	0.1	%	32.9	31.9	3.0	0% - 20%
EM2207207-001	Anonymous	EA055: Moisture Content	----	0.1	%	3.0	2.9	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 4302590)									
EM2207051-033	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EM2207051-054	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4302128)									
EM2207191-001	SPLIT-13422A	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EM2207204-018	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4302177)									
EM2206916-074	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	2730	# 3620	28.2	0% - 20%
		EP071: C29 - C36 Fraction	----	100	mg/kg	1290	# 2000	43.5	0% - 20%
		EP071: C10 - C14 Fraction	----	50	mg/kg	70	80	25.1	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	4090	# 5700	32.9	0% - 20%
EM2207207-035	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4302128)									
EM2207191-001	SPLIT-13422A	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EM2207204-018	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4302177)									
EM2206916-074	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	3740	# 5260	33.9	0% - 20%
		EP071: >C34 - C40 Fraction	----	100	mg/kg	380	570	39.8	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	190	220	16.2	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	4310	# 6050	33.6	0% - 20%
EM2207207-035	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEXN (QC Lot: 4302128)									
EM2207191-001	SPLIT-13422A	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Page : 4 of 7
 Work Order : EM2207191
 Client : ATMA ENVIRONMENTAL P/L
 Project : 2153



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP080: BTEXN (QC Lot: 4302128) - continued									
EM2207191-001	SPLIT-13422A	EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
EM2207204-018	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit



Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 4302589)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	123 mg/kg	100	70.0	130
EG005T: Barium	7440-39-3	10	mg/kg	<10	99.3 mg/kg	99.9	70.0	130
EG005T: Beryllium	7440-41-7	1	mg/kg	<1	0.67 mg/kg	105	70.0	130
EG005T: Boron	7440-42-8	50	mg/kg	<50	----	----	----	----
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	1.23 mg/kg	57.0	50.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	20.2 mg/kg	105	70.0	130
EG005T: Cobalt	7440-48-4	2	mg/kg	<2	11.2 mg/kg	88.5	70.0	130
EG005T: Copper	7440-50-8	5	mg/kg	<5	55.9 mg/kg	94.6	70.0	130
EG005T: Lead	7439-92-1	5	mg/kg	<5	62.4 mg/kg	94.8	70.0	130
EG005T: Manganese	7439-96-5	5	mg/kg	<5	590 mg/kg	91.6	70.0	130
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.4 mg/kg	96.9	70.0	130
EG005T: Selenium	7782-49-2	5	mg/kg	<5	----	----	----	----
EG005T: Vanadium	7440-62-2	5	mg/kg	<5	61.3 mg/kg	98.7	70.0	130
EG005T: Zinc	7440-66-6	5	mg/kg	<5	162 mg/kg	75.8	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4302590)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.64 mg/kg	88.3	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4302128)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	94.2	58.6	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4302177)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	700 mg/kg	107	75.0	128
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	2930 mg/kg	111	82.0	123
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1380 mg/kg	114	82.4	121
EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	5010 mg/kg	111	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4302128)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	90.8	59.3	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4302177)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	1030 mg/kg	104	77.0	130
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	3680 mg/kg	119	81.5	120
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	270 mg/kg	110	73.3	137
EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	4980 mg/kg	116	70.0	130
EP080: BTEXN (QCLot: 4302128)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	91.1	61.6	117
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	96.9	65.8	125



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result			Low	High
EP080: BTEXN (QCLot: 4302128) - continued								
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	93.6	65.8	124
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	4 mg/kg	98.8	64.8	134
	106-42-3							
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	95.9	68.7	132
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	86.2	61.8	123

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 4302589)							
EM2207051-037	Anonymous	EG005T: Chromium	7440-47-3	50 mg/kg	# 47.7	79.0	121
EM2207051-037	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	103	78.0	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	97.3	79.7	116
		EG005T: Copper	7440-50-8	250 mg/kg	101	80.0	120
		EG005T: Lead	7439-92-1	250 mg/kg	98.6	80.0	120
		EG005T: Nickel	7440-02-0	50 mg/kg	104	78.0	120
		EG005T: Zinc	7440-66-6	250 mg/kg	110	80.0	120
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4302590)							
EM2207051-037	Anonymous	EG035T: Mercury	7439-97-6	0.5 mg/kg	101	76.0	116
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4302128)							
EM2207204-002	Anonymous	EP080: C6 - C9 Fraction	----	28 mg/kg	80.3	33.4	124
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4302177)							
EM2206916-079	Anonymous	EP071: C10 - C14 Fraction	----	700 mg/kg	101	71.2	125
		EP071: C15 - C28 Fraction	----	2930 mg/kg	104	75.6	122
		EP071: C29 - C36 Fraction	----	1380 mg/kg	108	78.0	120
		EP071: C10 - C36 Fraction (sum)	----	5010 mg/kg	107	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4302128)							
EM2207204-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	76.0	30.8	120
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4302177)							
EM2206916-079	Anonymous	EP071: >C10 - C16 Fraction	----	1030 mg/kg	97.9	72.2	128
		EP071: >C16 - C34 Fraction	----	3680 mg/kg	112	76.5	119
		EP071: >C34 - C40 Fraction	----	270 mg/kg	105	66.8	138
		EP071: >C10 - C40 Fraction (sum)	----	4980 mg/kg	109	70.0	130



Sub-Matrix: SOIL

Laboratory sample IDSample IDMethod: CompoundCAS Number				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
				Concentration	MS	Low	High
EP080: BTEXN (QCLot: 4302128)							
EM2207204-002	Anonymous	EP080: Benzene	71-43-2	2 mg/kg	86.1	54.4	127
		EP080: Toluene	108-88-3	2 mg/kg	99.7	57.1	131

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EM2207191	Page	: 1 of 5
Client	: ATMA ENVIRONMENTAL P/L	Laboratory	: Environmental Division Melbourne
Contact	: MR GLEN BERRY	Telephone	: +61-3-8549 9600
Project	: 2153	Date Samples Received	: 20-Apr-2022
Site	:	Issue Date	: 28-Apr-2022
Sampler	: TOBE BELFITT	No. of samples received	: 3
Order number	: ----	No. of samples analysed	: 2

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Laboratory Control outliers occur.
- Duplicate outliers exist - please see following pages for full details.
- Matrix Spike outliers exist - please see following pages for full details.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- **NO** Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP080/071: Total Petroleum Hydrocarbons	EM2206916--074	Anonymous	C15 - C28 Fraction	----	28.2 %	0% - 20%	RPD exceeds LOR based limits
EP080/071: Total Petroleum Hydrocarbons	EM2206916--074	Anonymous	C29 - C36 Fraction	----	43.5 %	0% - 20%	RPD exceeds LOR based limits
EP080/071: Total Petroleum Hydrocarbons	EM2206916--074	Anonymous	C10 - C36 Fraction (sum)	----	32.9 %	0% - 20%	RPD exceeds LOR based limits
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	EM2206916--074	Anonymous	>C16 - C34 Fraction	----	33.9 %	0% - 20%	RPD exceeds LOR based limits
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	EM2206916--074	Anonymous	>C10 - C40 Fraction (sum)	----	33.6 %	0% - 20%	RPD exceeds LOR based limits
Matrix Spike (MS) Recoveries							
EG005(ED093)T: Total Metals by ICP-AES	EM2207051--037	Anonymous	Chromium	7440-47-3	47.7 %	79.0-121%	Recovery less than lower data quality objective

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) SPLIT-13422A, SPLIT-13422C	13-Apr-2022	----	----	----	26-Apr-2022	27-Apr-2022	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) SPLIT-13422C	13-Apr-2022	26-Apr-2022	10-Oct-2022	✓	26-Apr-2022	10-Oct-2022	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) SPLIT-13422C	13-Apr-2022	26-Apr-2022	11-May-2022	✓	26-Apr-2022	11-May-2022	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080) SPLIT-13422A	13-Apr-2022	26-Apr-2022	27-Apr-2022	✓	26-Apr-2022	27-Apr-2022	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080) SPLIT-13422A	13-Apr-2022	26-Apr-2022	27-Apr-2022	✓	26-Apr-2022	27-Apr-2022	✓



Matrix: SOIL

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080) SPLIT-13422A	13-Apr-2022	26-Apr-2022	27-Apr-2022	✓	26-Apr-2022	27-Apr-2022	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Total Mercury by FIMS	EG035T	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Total Mercury by FIMS	EG035T	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Total Mercury by FIMS	EG035T	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl ₂) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM Schedule B(3).
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.
Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na ₂ SO ₄ and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.



Appendix B: ProUCL inputs and outputs

Concentrations in soil (mg/kg)

Cobalt	Manganese
24	5300
320	6200
46	6200
17	4600
18	4500
15	3700
13	3600
5	68
16	2800
33	10000
37	8600
64	13000
77	7700
79	6600
66	3500
17	1200
23	5000
29	6400
38	7000
37	3900
150	4500
23	1400
18	4200
17	5600
17	1500
14	1900
26	7300
22	5100
13	1400
15	1700
10	690

UCL Statistics for Uncensored Full Data Sets

User Selected Options

Date/Time of Computation ProUCL 5.12/05/2022 3:14:00 PM
From File WorkSheet.xls
Full Precision OFF
Confidence Coefficient 95%
Number of Bootstrap Operations 2000

Cobalt

General Statistics

Total Number of Observations	31	Number of Distinct Observations	23
		Number of Missing Observations	0
Minimum	5	Mean	41.9
Maximum	320	Median	23
SD	59.24	Std. Error of Mean	10.64
Coefficient of Variation	1.414	Skewness	3.866

Normal GOF Test

Shapiro Wilk Test Statistic	0.525	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.929	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.3	Lilliefors GOF Test
5% Lilliefors Critical Value	0.156	Data Not Normal at 5% Significance Level
Data Not Normal at 5% Significance Level		

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	59.96	95% Adjusted-CLT UCL (Chen-1995)	67.3
		95% Modified-t UCL (Johnson-1978)	61.19

Gamma GOF Test

A-D Test Statistic	1.969	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.769	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.198	Kolmogorov-Smirnov Gamma GOF Test
5% K-S Critical Value	0.161	Data Not Gamma Distributed at 5% Significance Level
Data Not Gamma Distributed at 5% Significance Level		

Gamma Statistics

k hat (MLE)	1.279	k star (bias corrected MLE)	1.177
Theta hat (MLE)	32.77	Theta star (bias corrected MLE)	35.61
nu hat (MLE)	79.29	nu star (bias corrected)	72.95
MLE Mean (bias corrected)	41.9	MLE Sd (bias corrected)	38.63
		Approximate Chi Square Value (0.05)	54.28
Adjusted Level of Significance	0.0413	Adjusted Chi Square Value	53.38

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	56.31	95% Adjusted Gamma UCL (use when n<50)	57.26

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.931	Shapiro Wilk Lognormal GOF Test
5% Shapiro Wilk Critical Value	0.929	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.137	Lilliefors Lognormal GOF Test
5% Lilliefors Critical Value	0.156	Data appear Lognormal at 5% Significance Level
Data appear Lognormal at 5% Significance Level		

Lognormal Statistics

Minimum of Logged Data	1.609	Mean of logged Data	3.296
Maximum of Logged Data	5.768	SD of logged Data	0.838

Assuming Lognormal Distribution

95% H-UCL	54.08	90% Chebyshev (MVUE) UCL	56.81
95% Chebyshev (MVUE) UCL	65.42	97.5% Chebyshev (MVUE) UCL	77.37
99% Chebyshev (MVUE) UCL	100.8		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	59.4	95% Jackknife UCL	59.96
95% Standard Bootstrap UCL	59.42	95% Bootstrap-t UCL	88.96
95% Hall's Bootstrap UCL	131.8	95% Percentile Bootstrap UCL	60.06
95% BCA Bootstrap UCL	70.61		
90% Chebyshev(Mean, Sd) UCL	73.82	95% Chebyshev(Mean, Sd) UCL	88.28
97.5% Chebyshev(Mean, Sd) UCL	108.3	99% Chebyshev(Mean, Sd) UCL	147.8

Suggested UCL to Use

95% H-UCL	54.08

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.

H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.

It is therefore recommended to avoid the use of H-statistic based 95% UCLs.

Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Manganese

General Statistics

Total Number of Observations	31	Number of Distinct Observations	28
		Number of Missing Observations	0
Minimum	68	Mean	4683
Maximum	13000	Median	4500
SD	2901	Std. Error of Mean	521.1
Coefficient of Variation	0.62	Skewness	0.726

Normal GOF Test

Shapiro Wilk Test Statistic	0.958	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.929	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.0893	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.156	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	5567	95% Adjusted-CLT UCL (Chen-1995)	5612
		95% Modified-t UCL (Johnson-1978)	5578

Gamma GOF Test

A-D Test Statistic	0.667	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.761	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.162	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.16	Data Not Gamma Distributed at 5% Significance Level	
Detected data follow Appr. Gamma Distribution at 5% Significance Level			

Gamma Statistics

k hat (MLE)	1.822	k star (bias corrected MLE)	1.667
Theta hat (MLE)	2571	Theta star (bias corrected MLE)	2809
nu hat (MLE)	112.9	nu star (bias corrected)	103.3
MLE Mean (bias corrected)	4683	MLE Sd (bias corrected)	3627
		Approximate Chi Square Value (0.05)	80.88
Adjusted Level of Significance	0.0413	Adjusted Chi Square Value	79.78

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	5983	95% Adjusted Gamma UCL (use when n<50)	6065

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.815	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.929	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.213	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.156	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			

Lognormal Statistics

Minimum of Logged Data	4.22	Mean of logged Data	8.153
Maximum of Logged Data	9.473	SD of logged Data	1.004

Assuming Lognormal Distribution

95% H-UCL	8975	90% Chebyshev (MVUE) UCL	9119
95% Chebyshev (MVUE) UCL	10705	97.5% Chebyshev (MVUE) UCL	12906
99% Chebyshev (MVUE) UCL	17231		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	5540	95% Jackknife UCL	5567
95% Standard Bootstrap UCL	5513	95% Bootstrap-t UCL	5665
95% Hall's Bootstrap UCL	5717	95% Percentile Bootstrap UCL	5547
95% BCA Bootstrap UCL	5573		
90% Chebyshev(Mean, Sd) UCL	6246	95% Chebyshev(Mean, Sd) UCL	6954
97.5% Chebyshev(Mean, Sd) UCL	7937	99% Chebyshev(Mean, Sd) UCL	9867

Suggested UCL to Use

95% Student's-t UCL	5567

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.



Appendix B2 – Enrisks HHRA Report



11 May 2022

Rural Subdivision Specialists
<https://www.ruralsubdivisionspecialists.com.au/>

Attn: Saxil Tuxen, Daniel De Pasquale

Environmental Risk Sciences Pty Ltd
P.O. Box 2537
Carlingford Court, NSW 2118

Phone: +61 2 9614 0297
Fax: +61 2 8215 0657
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www.enrisks.com.au

Human health risk assessment regarding cobalt and manganese present in soil at 108 and 110 Parr St, Leongatha, Victoria

1 Background

Environmental Risk Sciences Pty Ltd (enRiskS) has been engaged to conduct a human health risk assessment (HHRA) in relation to the presence of elevated concentrations of manganese and other metals (where relevant) in soil at 108 and 110 Parr Street, Leongatha, Victoria ("the site").

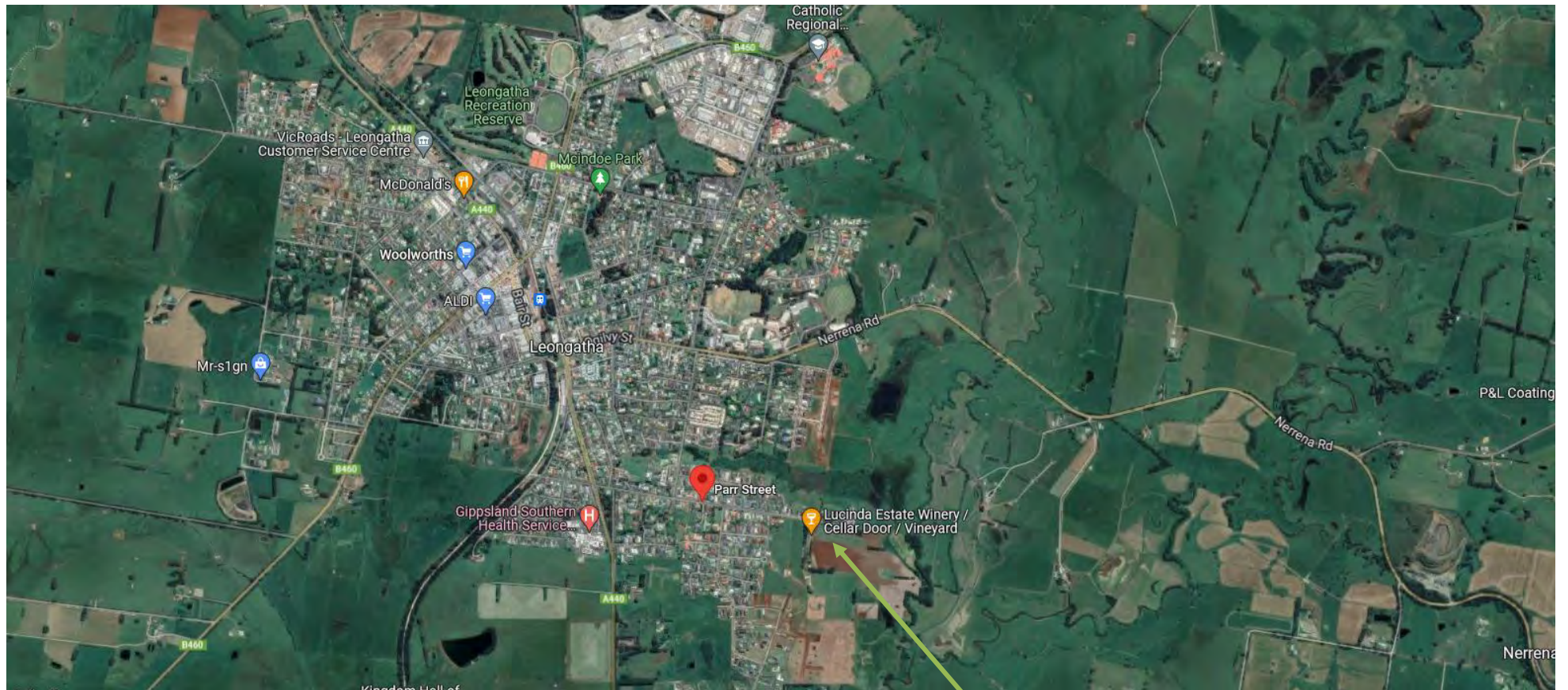
Site investigations have been undertaken by Atma Environmental. Soil samples have been collected across the properties and analysed for the list of potential contaminants commonly required under the National Environmental Protection (Assessment of Site Contamination) Measure (ASC NEPM). The sampling reported that manganese and cobalt were present at concentrations above the relevant Health Investigation level (HIL) in soil at one or more locations.

Both manganese and cobalt are elements commonly present in most soils. Some soil can contain higher levels in the form of minerals (i.e. ore bodies). It appears these properties are in a location in Victoria known to have higher levels of manganese and perhaps cobalt. Both manganese and cobalt are essential micronutrients for plants, animals and people meaning they are essential for life.

The HILs make a range of conservative assumptions about the potential for people to be exposed to chemicals in soil at a site including those that are naturally occurring like minerals. These conservative assumptions ensure that the potential for contamination can be confidently excluded when concentrations are below the relevant HIL. However, concentrations above the HIL do not mean that levels are of concern, rather such situations trigger a more detailed site-specific assessment to check that risks remain low if some of those conservative assumptions are adjusted based on the actual situation.

These properties have been used for farming activities including cropping and as a vineyard. The site location is shown in **Figure 1** and the layout for the blocks in the proposed residential subdivision is shown in **Figure 2**.

This letter report outlines how these more site specific assessments can be undertaken for both manganese and cobalt.



108-110 Parr Street

Figure 1: Site location



**RURAL SUBDIVISION
SPECIALISTS**

POTENTIAL SUBDIVISION DESIGN LAYOUT
108 & 110 PARR STREET LEONGATHA
PREPARED BY SAXIL TUXEN
Ph. 0428 858 060 e: saxil.jnr@ruralsubs.com.au
(Not to be reproduced or used without express permission)

- LSIO (OLD FLOOD EXTENT)
- NEW 1 in 100 FLOOD EXTENT - WG CMA
- WATER BODY
- BUILDING ENVELOPE



2 Objectives

The objectives of this assessment are:

- review the available data for metals in the soil samples taken at the site
- provide a background description of the calculation of the existing HIL
- provide a more detailed evaluation of how the HIL can be adjusted for manganese (to develop a site-specific guideline) especially given the proposed development at the site and the locations of the elevated concentrations and statistical analysis of the data
- undertake a limited human health risk assessment for manganese using a site-specific soil guideline that are more relevant for the site.

The assessment has considered use of the properties for low density residential land uses but has not addressed the potential for environmental risks. The assessment has focused only on metals. All other chemicals assessed in the soil samples will be addressed in the report by Atma Environmental.

3 Methodology and scope of works

The methodology adopted for the conduct of this review will be in accordance with the relevant National protocols/ guidelines including:

- enHealth, Environmental Health Risk Assessment, Guidelines for Assessing Human Health Risks from Environmental Hazards (enHealth 2012a)
- enHealth, Australian Exposure Factor Guide (enHealth 2012b)
- NEPM (1999 amended 2013) National Environmental Protection Measure – Assessment of Site Contamination including (the “NEPM 2013”):
 - Schedule B1 Investigation Levels for Soil and Groundwater (NEPC 1999 amended 2013a)
 - Schedule B4 Guideline on Health Risk Assessment Methodology (NEPC 1999 amended 2013b)
 - Schedule B7 Guideline on Health-Based Investigation Levels (NEPC 1999 amended 2013c)
- Toolbox Note – Key principles for the remediation and management of contaminated sites (NEPC 2013)

4 Site information

A site investigation has been conducted by Atma Environmental to determine the nature and extent of any soil contamination that may be present on these properties as part of the process for considering the subdivision.

In order to prepare this letter report, the following information was provided to enRiskS by Atma Environmental and Rural Subdivision Specialists:

- Lotsearch report (now included as **Appendix A** of the Atma Environmental report)
- Figures showing sampling locations and layout for the proposed subdivision
- Laboratory reports for the soil samples and summary information re QA/QC for analytical results (included as **Appendix E** of the Atma Environmental report and **Appendix A** of this letter report).

The site is located on the south eastern edge of the township of Leongatha in south eastern Victoria. **Figure 1** shows the location. General aspects of the site are described in **Table 1**. The land uses adjoining the site are summarised in **Table 2**.



Table 1: Site Details

Site Details	
Location	108 and 110 Parr Street, Leongatha, VIC
Local Government Area	South Gippsland Shire
Site Area	225,680 m ² (i.e. 225 ha)
Current zoning	Farming zone

Table 2: Surrounding Land Uses

Direction (Relative to site)	Description
North	Agricultural
South	Residential
East	Creek
West	Agricultural then residential

Aerial imagery provided in the Lotsearch report indicates that the site was undeveloped or was used for agriculture since 1947. A house appears to have been constructed on the site (nw corner) between 1972 and 1985. Additional buildings, which appear to be sheds, were constructed after 1990 but before 2010. All these buildings remain in place according to imagery from 2021.

Depth to groundwater for the eastern half of the site is quite shallow (<5 m below ground level) while the western half of the site is indicated as having a depth to groundwater between 5 and 20 m below ground level. The local topography has a slope toward the creek to the east and the surface elevation varies from 33 to 61 m AHD (i.e. site has a 30 m change in vertical height from east to west) (Lotsearch 2022).

The geology for the site is mostly alluvium (gravel, sand and silt) with underlying basalt in some areas (Lotsearch 2022).

The site is subject to a number of planning overlays including that it is land within a water catchment (i.e. close to the creek), that it is land that is subject to erosion and that it is land subject to inundation. These overlays have requirements that will need to be addressed for the subdivision, where relevant (Lotsearch 2022).

5 Soil results

Details of the sampling design and methodologies will be provided in the report from Atma Environmental. It is presumed, for the purposes of this HHRA, that the approach taken is in line with the following:

- Samples were collected from surface soil, which is representative of soil that future users of the site may come into direct contact with when the site is redeveloped (some locations were in and around the buildings and other work areas along the western boundary (BH01-BH10) and grid sampling across the rest of the site (SS01-SS21)) with soil from 0.1 m depth analysed for all locations.
- The sample collection methods were appropriate
- Analysis of the samples was undertaken by a NATA accredited laboratory, with appropriate levels of quality control samples collected and analysed
- Assessment of quality assurance and quality control parameters associated with the data showed that the data were reliable and suitable for interpretative use.

Table 3 presents a summary of the metal concentrations reported in soil at the site, with **Figures 3 and 4** showing the locations from which the soil samples were collected. The laboratory reports are included in **Appendix A**.

Analysis included all the metal/metalloids listed in the ASC NEPM:

- As = Arsenic



- Be = Beryllium
- B = Boron
- Cd = Cadmium
- Cr = Chromium
- Co = Cobalt
- Cu = Copper
- Pb = Lead
- Mn = Manganese
- Hg = Mercury
- Ni = Nickel
- Se = Selenium
- Zn = Zinc

Mercury, selenium, cadmium and boron were not detected above the limit of reporting for any samples at this site. Beryllium was detected around the limit of reporting in one sample location only.

Arsenic, chromium, cobalt, copper, lead, manganese, nickel and zinc were detected above the limit of reporting in most, if not all, sampling locations. These are metals/metalloids that are commonly present in soils around Australia (and globally) as they are present in many rocks and other geological materials (i.e. minerals that make up these geological materials). It is noted that some geologies are considered “mineralised” which means they have higher than average concentrations of one or more metals because ore bodies are present.

The limit of reporting is the lowest concentration the laboratory can measure with confidence. The limits of reporting used in this work were in line with standard practice for measuring metals/metalloids in soil samples for contaminated site investigations and are well below the ASC NEPM guideline values, so these limits of reporting are appropriate for this investigation.

The ASC NEPM health investigation levels are included in **Table 3**. Where a soil concentration at this site is above a HIL value, the cell is shaded.

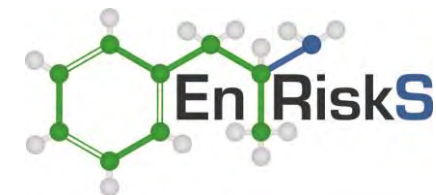


Table 3: Metal Concentrations in Surface Soil

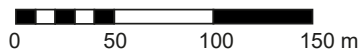
Sample Locations	Concentration (mg/kg)												
	As	Be	B	Cd	Cr	Co	Cu	Pb	Mn	Hg	Ni	Se	Zn
BH01	2.3	<2	<10	<0.4	150	24	39	31	5,300	<0.1	36	<2	52
BH02	2.9	2.7	<10	<0.4	180	320	75	19	6,200	<0.1	110	<2	120
BH03	3.3	<2	<10	<0.4	250	46	70	33	6,200	<0.1	58	<2	530
BH04	<2	<2	<10	<0.4	130	17	33	25	4,600	<0.1	28	<2	320
BH05	<2	<2	<10	<0.4	170	18	29	20	4,500	<0.1	22	<2	34
BH06	<2	<2	<10	<0.4	140	15	27	17	3,700	<0.1	20	<2	38
BH07	<2	<2	<10	<0.4	130	13	21	18	3,600	<0.1	15	<2	20
BH08	<2	<2	<10	<0.4	13	<5	16	6	68	<0.1	<5	<2	23
BH09	3.1	<2	<10	<0.4	79	16	26	29	2,800	<0.1	13	<2	45
BH10	4	<2	<10	<0.4	120	33	23	31	10,000	<0.1	18	<2	22
SS01	2.3	<2	<10	<0.4	98	37	42	26	8,600	<0.1	38	<2	31
SS02	2.9	<2	<10	<0.4	87	64	53	30	13,000	<0.1	48	<2	41
SS03	<2	<2	<10	<0.4	110	77	25	19	7,700	<0.1	32	<2	27
SS04	2.1	<2	<10	<0.4	140	79	23	19	6,600	<0.1	48	<2	37
SS05	2.3	<2	<10	<0.4	110	66	17	13	3,500	<0.1	34	<2	38
SS06	3.5	<2	<10	<0.4	20	17	17	16	1,200	<0.1	16	<2	69
SS07	<2	<2	<10	<0.4	150	23	42	20	5,000	<0.1	45	<2	69
SS08	2	<2	<10	<0.4	150	29	44	25	6,400	<0.1	41	<2	36
SS09	<2	<2	<10	<0.4	100	38	37	22	7,000	<0.1	35	<2	28
SS010	<2	<2	<10	<0.4	180	37	25	17	3,900	<0.1	32	<2	27
SS011	<2	<2	<10	<0.4	280	150	33	9.2	4,500	<0.1	100	<2	93
SS012	2.5	<2	<10	<0.4	43	23	8.1	11	1,400	<0.1	12	<2	24
SS013	<2	<2	<10	<0.4	150	18	68	19	4,200	<0.1	22	<2	33
SS014	<2	<2	<10	<0.4	46	17	48	19	5,600	<0.1	18	<2	32
SS015	<2	<2	<10	<0.4	27	17	8.1	11	1,500	<0.1	9.2	<2	11
SS016	<2	<2	<10	<0.4	17	14	<5	12	1,900	<0.1	<5	<2	9.8
SS017	2.8	<2	<10	<0.4	92	26	28	26	7,300	<0.1	18	<2	29
SS018	<2	<2	<10	<0.4	120	22	50	23	5,100	<0.1	27	<2	26
SS019	<2	<2	<10	<0.4	30	13	8	14	1,400	<0.1	5.9	<2	8.8
SS020	<2	<2	<10	<0.4	19	15	<5	14	1,700	<0.1	<5	<2	8.4
SS021	2.2	<2	<10	<0.4	15	10	11	14	690	<0.1	9.1	<2	41
HIL-A	100	60	4,500	20	100	100	6,000	300	3,800	40	400	200	7,400
HIL-B	500	90	40,000	150	500	600	30,000	1,200	14,000	120	1,200	1,400	60,000

LEGEND:

-  Investigation Area
-  Site Buildings
-  Grid Sample Location



Approximate Scale:



Imagery: Nearmap 2021

Atma Environmental



Client:

Rural Subdivision Specialists

Project: #2153 Leongatha - ESA

Drawn by: GRB Dated: 29/04.2022 Status: Final

**Figure 2. Overall Site Plan
and Grid Sampling Locations**





LEGEND:

-  Investigation Area
-  Target Borehole
-  Building



Imagery: Nearmap 2021



Client:

Rural Subdivision Specialists

Project: 2153 - Leongatha - PSI

Drawn by: G.B. Dated: 12/04/2022 Revision: Draft

Figure 3. Built Areas & Target Sample Locations



No metals/metalloids were present at levels above the guideline value for high density residential sites, but chromium, cobalt and manganese were above the guideline value relevant for low density residential sites.

Levels in excess of the HILs do not imply unacceptable levels of exposure or risks to human health. Rather exceedance of the HILs triggers the need to undertake a site-specific assessment, including a site-specific HHRA, which is presented in this assessment.

Chromium

It is noted that the HILs for chromium apply to one form of chromium only – chromium VI. Given that the site has only been used for agricultural purposes, there is no specific industrial source of chromium VI at this site. Naturally occurring chromium in soils is generally in the form of chromium III. Consequently, it is unlikely that chromium VI levels will be in excess of HIL-A where the total chromium concentrations range from 15-280 mg/kg.

6 Background soil – metals

A critical component for understanding the potential for health risks due to metal levels in soil is determining what levels might be naturally occurring in the area. Metals such as manganese and cobalt are routinely present in most soils, so it is important to understand what concentrations are likely in a particularly location.

6.1 Manganese

Manganese is present at the site primarily due to natural occurrence but the if manganese fertilisers were applied when the site was used for agricultural purposes this would add to the levels at the site.

Hosking et al. provides information about the presence of trace elements including manganese in soils in Victoria (Hosking et al. 1986).

In regard to manganese, Hosking et al. indicates:

- Manganese is required for the healthy growth of plants and animals
- Not enough manganese can cause impacts as well as too much manganese
- Manganese deficiency is not common in Victoria – in particular, acid soils are likely to have higher levels of manganese
- There are areas in Victoria where naturally occurring levels of manganese are high and soil treatment to limit the availability of manganese may be required
- Liming of soils to increase soil pH limits the availability of manganese to plants and animals.

Other public information indicates that manganese can be present in soils at levels ranging from 0.02% to 13% - i.e. 200 mg/kg to 130,000 mg/kg (these higher levels are for some volcanic soils). This site has levels ranging from 690 to 13,000 mg/kg – these levels are in line with normally expected levels.

In addition, manganese can be tightly bound in soil especially for neutral or alkaline soils or when organic matter is high. This limits how people can be exposed.

When manganese is low in soil, farmers use a manganese fertiliser to ensure sufficient levels of this essential nutrient for healthy growth of crops or livestock – i.e. they add manganese into the soil.

6.2 Cobalt

In regard to cobalt, Hosking et al. indicates:

- Cobalt is required for healthy growth of animals and some plants – in particular, to allow the formation of Vitamin B12
- Not enough cobalt can cause impacts as well as too much cobalt



- Parts of Victoria have low levels of cobalt in soil and supplementation may be required in agricultural situations
- Availability of cobalt can also be affected if acidic soils are treated with lime
- Excessive levels of cobalt are not a common issue in Victoria (Hosking et al. 1986).

7 Detailed assessment

7.1 General

The results for cobalt, chromium and manganese can be analysed in a number of ways to further understand the potential risks in line with the national guidelines. Statistical analysis of the data can be undertaken in line with guidance in the ASC NEPM. In addition, consideration of what is included in the calculations to determine the national guidelines to assess if adjustments can be made.

7.2 Statistical analysis

The ASC NEPM allows the use of a statistical test to determine if a dataset is in compliance with the relevant HIL. The test requires the following:

- 95%UCL concentration (i.e. 95% upper confidence limit of the mean) is less than the relevant HIL
- standard deviation for the dataset is less than half of the relevant HIL to show that the data are not too variable for the 95%UCL to be relevant
- no single sample can be greater than 250% of the relevant HIL also to show that the data are not too variable for the 95%UCL to be relevant.

ProUCL 5 is a program prepared by the USEPA to allow the calculation of the 95% UCL (USEPA 2013). Using this program, the statistics relevant to the ASC NEPM test have been calculated for the data set for this site from chromium, cobalt and manganese.

For those locations where levels were not detected, the limit of reporting was used in the statistical analysis which is a conservative approach.

Input and output pages are included in **Appendix B**.

Using ProUCL5, the statistics relevant to the ASC NEPM test have been calculated with the results shown in **Table 4**.

Table 4: Statistical Evaluation

Statistic	Value (mg/kg)	ASC NEPM Statistical Test – HIL-A
Cobalt		
Minimum	5	--
Maximum	320	250 (250% HIL-A)
Mean	42	--
Median	23	--
Standard Deviation	59	50 (50% HIL-A)
95% UCL	54	100 (HIL-A)
Total number of observations	31	--
Manganese		
Minimum	68	--
Maximum	13,000	9,500 (250% HIL-A)
Mean	4,680	--
Median	4,500	--
Standard Deviation	2,900	1,900 (50% HIL-A)
95% UCL	5,500	3,800 (HIL-A)
Total number of observations	31	--



This analysis indicates that:

- Cobalt
 - while the 95%UCL concentration for cobalt is definitely in compliance with the relevant national guideline, there are still aspects of the dataset that do not comply with the ASC NEPM test
- Manganese
 - dataset requires further consideration.

Further consideration of the national guidelines and how they are calculated is provided in **Section 7.3**.

7.3 Guideline calculations

The process used to calculate the ASC NEPM health investigation levels is documented in Schedule B7 of the ASC NEPM (NEPC 1999 amended 2013c).

The scenario for calculating the health investigation levels for low density residential land use (HIL-A) involves assuming people are exposed to the contaminants in soil through:

- Incidental ingestion of 50 mg soil per day for adults and 100 mg per day for children every day of the year for 29 years for adults and 6 years for children
- Soil coming into contact with 1/3 of the skin surface area for adults and almost half of the skin surface area for children every day of the year for 29 years for adults and 6 years for children – the calculations assume the soil stays on the skin until the next shower
- Consumption of homegrown fruit and vegetables (10% of daily intake)
- Inhalation of dust while outside for 4 hours every day of the year for 29 years for adults and 6 years for children.

The scenario for calculating the health investigation levels for high density residential land use (HIL-B) involves assuming people are exposed to the contaminants in soil through:

- Incidental ingestion of 12.5 mg soil per day for adults and 25 mg per day for children every day of the year for 29 years for adults and 6 years for children
- Soil coming into contact with 1/3 of the skin surface area for adults and almost half of the skin surface area for children every day of the year for 29 years for adults and 6 years for children – the calculations assume the soil stays on the skin until the next shower
- Inhalation of dust while outside for 1 hour every day of the year for 29 years for adults and 6 years for children.

All of these calculations assume 100% of the manganese and cobalt present in soil will be sufficiently available to be absorbed into the body for people who may be exposed. This assumption is made in the calculations to ensure the national guidelines are sufficiently conservative and are likely to appropriately highlight situations needing more detailed assessment.

7.4 Adjustment to guideline calculations

7.4.1 Manganese

It is well established that manganese, in particular, is tightly bound into the soil and is not particularly available.

The World Health Organisation (WHO) indicates that only around 3% of manganese in water or food is absorbed into the body (WHO 1999). For soil, the manganese has to dissolve from the soil into the fluids in the stomach. Once present in those fluids, the manganese could then be absorbed into the body but as WHO indicate only around 3% of that manganese would be likely to be absorbed.



In addition to a low fraction of actual absorption of manganese, WHO also notes that, because manganese is an essential nutrient required for good health, human bodies have systems to manage the amount of manganese we take up from our food and water. This means, if levels in the blood and other tissues increase due to the presence of higher manganese levels in food, water or via incidental ingestion of soil, bodies will react and begin excreting more of this metal to make sure levels inside the body do not reach high levels. This is an additional protective factor (WHO 1999).

If it is assumed that 100% of the manganese present in soil at this site is able to dissolve from the soil into the stomach fluids and that only 10% of that manganese present in the fluids gets absorbed into the body (based on the fraction absorbed discussed in WHO guidance of 3% rounded up to 10% to be conservative), then the overall bioavailability is 10% (WHO 1999).

The HIL-A guideline can then be adjusted using this change in bioavailability. If only 10% of the manganese can reach inside the body instead of 100%, then there can be 10 times the concentration in soil to reach the same exposure concentration inside the body. This means the adjusted HIL-A can then be 38,000 mg/kg instead of 3,800 mg/kg. This adjusted guideline still considers potential exposure of a young child in line with the scenario outlined in **Section 7.3** – i.e. includes incidental ingestion of soil, dermal contact with soil, inhalation of dust and consumption of home grown fruit and vegetables.

7.4.2 Cobalt

The availability of cobalt for absorption into the body is quite variable depending on the nature of the source of the cobalt (WHO 2006).

Given that this site has not been used for industrial purposes and the source of the cobalt is likely to be naturally occurring minerals, it is likely that the cobalt present in the 2 affected locations on the site is a more insoluble form. This means it is not likely to be 100% available when soil is incidentally ingested (WHO 2006).

WHO indicate that 10-30% of the cobalt in the stomach can be absorbed for more soluble salts while 1-3% is absorbed for more insoluble salts in laboratory animals. For people, studies showed 20-80% absorption depending on the form of cobalt and the dose (WHO 2006).

If it is assumed that 100% of the cobalt present in soil at this site is able to dissolve from the soil into the stomach fluids and that only 50% of that cobalt present in those fluids gets absorbed into the body (based on the fraction absorbed discussed in WHO guidance indicating 1-3% absorbed for insoluble forms in laboratory animals and 20-40% absorbed in more limited data available for absorption in people for insoluble forms rounded up to 50% to be conservative), then the overall bioavailability is 50%.

The HIL-A guideline can then be adjusted using this change in bioavailability. If only 50% of the cobalt can reach inside the body instead of 100%, then there can be 2 times the concentration in soil to reach the same exposure concentration inside the body. This means the adjusted HIL-A can then be 200 mg/kg instead of 100 mg/kg. This adjusted guideline still considers potential exposure of a young child in line with the scenario outlined in **Section 7.3** – i.e. includes incidental ingestion of soil, dermal contact with soil, inhalation of dust and consumption of home grown fruit and vegetables.

7.5 Adjusted screening assessment

The adjusted HIL-A values can then be used to assess the results for this site. Using ProUCL5, the statistics relevant to the ASC NEPM test have been calculated with the results shown in **Table 5**.

Table 5: Statistical Evaluation with adjusted guidelines

Statistic	Value (mg/kg)	ASC NEPM Statistical Test – HIL-A
Cobalt		
Minimum	5	--
Maximum	320	500 (250% adjusted HIL-A)
Mean	42	--
Median	23	--
Standard Deviation	59	100 (50% adjusted HIL-A)
95% UCL	54	200 (adjusted HIL-A)
Total number of observations	31	--
Manganese		
Minimum	68	--
Maximum	13,000	95,000 (250% adjusted HIL-A)
Mean	4,680	--
Median	4,500	--
Standard Deviation	2,900	19,000 (50% adjusted HIL-A)
95% UCL	5,500	38,000 (adjusted HIL-A)
Total number of observations	31	--

This analysis indicates that all results for this site are within the parameters recommended by the ASC NEPM when adjusted for site-specific considerations regarding the sources of manganese and cobalt in the soil.

As there have been no industrial sources of manganese or cobalt used at this site, it is relevant to consider that these metals are present due to naturally occurring minerals containing these metals present in the soil. As a result, it is appropriate to adjust the national guidelines for low density residential land uses based on guidance from the World Health Organisation regarding how easily these metals are absorbed into the body. In addition to the fact that not all of the manganese or cobalt present in the fluids in the stomach are absorbed into the body, given the mineralised sources of these metals, it is also unlikely that 100% of what is present in the soil will dissolve into the fluids in the stomach which provides further conservatism to the assumptions in this assessment.

8 Uncertainties

Uncertainty in any assessment refers to a lack of knowledge (that could be better refined through the collection of additional data or conducting additional studies) and is an important aspect of the risk assessment process. An assessment of uncertainty is a qualitative process relating to the selection and rejection of specific data, estimates or scenarios within the risk assessment. In general, to compensate for uncertainty, conservative assumptions are often made that result in an overestimate rather than an underestimate of risk.

This assessment has focused on the maximum concentrations for metals measured in soil and the 95%UCL (worst case estimate of the average concentration) for manganese and cobalt, in particular. The

The quantification of exposure in developing the national guidelines has adopted a number of conservative assumptions as recommended by the ASC NEPM (NEPC 1999 amended 2013a, 1999 amended 2013b). Many of the parameters adopted for reasonable maximally exposed person (RME) are considered to be an overestimate of actual exposures for young children. The values adopted for the purpose of quantifying exposure are point values that are derived from a wide range of physiological or behavioural values that are better defined using a distribution. It is overly complex to present the assessment based on distributions hence the point values identified provide a reasonable approximation of the RME. Potential exposure and chemical intake by older children and adults will be lower than considered for young children. The overall approach, however, is expected to result in an overestimate of actual exposure.



For this assessment, adjustments to the national guidelines have been adopted based on bioavailability information from the World Health Organisation. For both manganese and cobalt, conservative assumptions were made based on the available information (i.e. values rounded up to 10% and 50% respectively).

These results show there is no difference in the conclusions for this assessment whether the 95%UCL or the maximum concentrations are considered for comparison with the adjusted national guidelines.

9 Conclusions

Environmental Risk Sciences Pty Ltd (enRiskS) has undertaken a human health risk assessment (HHRA) in relation to the presence of elevated concentrations of manganese in soil at 108 and 110 Parr Street, Leongatha, Victoria ("the site"). These properties have been used for farming activities including cropping and as a vineyard and are now proposed for a residential sub-division.

Atma Environmental undertook relevant sampling of soil at the site in line with national requirements for understanding potential contamination at sites being redeveloped. The results indicated that some metals were present at concentrations above relevant national guidelines for low density residential land use resulting in the need for a human health risk assessment to further evaluate potential risks.

The assessment outlined in this letter report has considered potential risks in line with national guidance as outlined in **Section 3**.

Based on the assessment presented and the uncertainties discussed, risks to human health for this proposed subdivision are considered to be low and acceptable.

10 References

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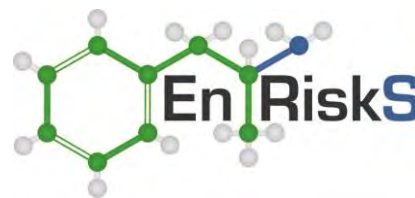
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11 Limitations

Environmental Risk Sciences has prepared this report for the use of Rural Subdivision Specialists Pty Ltd in accordance with the usual care and thoroughness of the consulting profession. It is based on generally accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this report.

It is prepared in accordance with the scope of work and for the purpose outlined in the **Section 2** of this report.

The methodology adopted, and sources of information used are outlined in this report. Environmental Risk Sciences has made no independent verification of this information beyond the agreed scope of works and assumes no responsibility for any inaccuracies or omissions. No indications were found that information contained in the reports provided for use in this assessment was false.

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12 Closure

If you require any additional information or if you wish to discuss any aspect, please do not hesitate to contact Therese on (02) 9614 0297 or 0487 622 551.

Yours sincerely,

Dr Jackie Wright (Fellow ACTRA)
Principal/Director
Environmental Risk Sciences Pty Ltd



Appendix A: Laboratory reports



CHAIN OF CUSTODY RECORD

Company: Atma Environmental		Project ID: 2153		Project Manager: Glenn Berry		Sample ID: T Bellitt	
Address: 56 William Street, ABBOTSFORD, Vic 3067 Australia		Project Name: Leongatha		Client Name: Glenn Berry		Contact Name: T Bellitt	
Contact Name: GLENN BERRY		Project Status: On Hold		Email for Results: aberry@atmaenvironmental.com		Email for Samples: aberry@atmaenvironmental.com	
Phone No: 03-9429 6355		Project Location: Leongatha		Sample Date: 13/04/22		Sample Time: 14:00	
Special Directions:		Project Details:		Sample Location: Leongatha		Sample Type: Soil	
Purchase Order:		Project Notes:		Sample Depth: 0-10cm		Sample Volume: 1kg	
Order ID No:		Project ID:		Sample ID:		Sample ID:	
No:		Client Sample ID:		Sample Date:		Sample Time:	
1		BH01/0.1		13/04/22		14:00	
2		BH01/0.5		13/04/22		14:00	
3		BH02/0.1		13/04/22		14:00	
4		BH02/0.5		13/04/22		14:00	
5		BH03/0.1		13/04/22		14:00	
6		BH03/0.5		13/04/22		14:00	
7		BH04/0.1		13/04/22		14:00	
8		BH04/0.5		13/04/22		14:00	
9		BH05/0.1		13/04/22		14:00	
10		BH05/0.5		13/04/22		14:00	
11		BH06/0.1		13/04/22		14:00	
12		BH06/0.5		13/04/22		14:00	
13		BH07/0.1		13/04/22		14:00	
14		BH07/0.5		13/04/22		14:00	
15		BH08/0.1		13/04/22		14:00	
16		BH08/0.5		13/04/22		14:00	
17		BH09/0.1		13/04/22		14:00	
18		BH09/0.5		13/04/22		14:00	
19		BH10/0.1		13/04/22		14:00	
20		BH10/0.5		13/04/22		14:00	
21		SS01		13/04/22		14:00	
22		SS02		13/04/22		14:00	
23		SS03		13/04/22		14:00	
24		SS04		13/04/22		14:00	
25		SS05		13/04/22		14:00	
26		SS06		13/04/22		14:00	
27		SS07		13/04/22		14:00	
28		SS08		13/04/22		14:00	
29		SS09		13/04/22		14:00	
30		SS10		13/04/22		14:00	
31		SS11		13/04/22		14:00	
32		SS12		13/04/22		14:00	
33		SS13		13/04/22		14:00	
34		SS14		13/04/22		14:00	
35		SS15		13/04/22		14:00	
36		SS16		13/04/22		14:00	
37		SS17		13/04/22		14:00	
38		SS18		13/04/22		14:00	
39		SS19		13/04/22		14:00	
40		SS20		13/04/22		14:00	
41		SS21		13/04/22		14:00	
42		SS22		13/04/22		14:00	
43		DUP-13422A		13/04/22		14:00	
44		DUP-13422B		13/04/22		14:00	
45		DUP-13422C		13/04/22		14:00	
46		SPLIT-13422A		13/04/22		14:00	
47		SPLIT-13422B		13/04/22		14:00	
48		SPLIT-13422C		13/04/22		14:00	
49		DECON-13422		13/4/22		14:00	
50		TB-13422		13/4/22		14:00	
51		FB-13422		13/4/22		14:00	
52		ADD Rows		Total Rows: 52		Total Rows: 52	
53		Date: 13/04/22		Date: 13/04/22		Date: 13/04/22	
54		Signature: T Bellitt		Signature: T Bellitt		Signature: T Bellitt	
55		Date: 13/04/22		Date: 13/04/22		Date: 13/04/22	
56		Signature: T Bellitt		Signature: T Bellitt		Signature: T Bellitt	
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64		Signature: T Bellitt		Signature: T Bellitt		Signature: T Bellitt	
65		Date: 13/04/22		Date: 13/04/22		Date: 13/04/22	
66		Signature: T Bellitt		Signature: T Bellitt		Signature: T Bellitt	
67		Date: 13/04/22		Date: 13/04/22		Date: 13/04/22	
68		Signature: T Bellitt		Signature: T Bellitt		Signature: T Bellitt	
69		Date: 13/04/22		Date: 13/04/22		Date: 13/04/22	
70		Signature: T Bellitt		Signature: T Bellitt		Signature: T Bellitt	
71		Date: 13/04/22		Date: 13/04/22		Date: 13/04/22	
72		Signature: T Bellitt		Signature: T Bellitt		Signature: T Bellitt	
73		Date: 13/04/22		Date: 13/04/22		Date: 13/04/22	
74		Signature: T Bellitt		Signature: T Bellitt		Signature: T Bellitt	
75		Date: 13/04/22		Date: 13/04/22		Date: 13/04/22	
76		Signature: T Bellitt		Signature: T Bellitt		Signature: T Bellitt	
77		Date: 13/04/22		Date: 13/04/22		Date: 13/04/22	
78		Signature: T Bellitt		Signature: T Bellitt		Signature: T Bellitt	
79		Date: 13/04/22		Date: 13/04/22		Date: 13/04/22	
80		Signature: T Bellitt		Signature: T Bellitt		Signature: T Bellitt	
81		Date: 13/04/22		Date: 13/04/22		Date: 13/04/22	
82		Signature: T Bellitt		Signature: T Bellitt		Signature: T Bellitt	
83		Date: 13/04/22		Date: 13/04/22		Date: 13/04/22	
84		Signature: T Bellitt		Signature: T Bellitt		Signature: T Bellitt	
85		Date: 13/04/22		Date: 13/04/22		Date: 13/04/22	
86		Signature: T Bellitt		Signature: T Bellitt		Signature: T Bellitt	
87		Date: 13/04/22		Date: 13/04/22		Date: 13/04/22	
88		Signature: T Bellitt		Signature: T Bellitt		Signature: T Bellitt	
89		Date: 13/04/22		Date: 13/04/22		Date: 13/04/22	
90		Signature: T Bellitt		Signature: T Bellitt		Signature: T Bellitt	
91		Date: 13/04/22		Date: 13/04/22		Date: 13/04/22	
92		Signature: T Bellitt		Signature: T Bellitt		Signature: T Bellitt	
93		Date: 13/04/22		Date: 13/04/22		Date: 13/04/22	
94		Signature: T Bellitt		Signature: T Bellitt		Signature: T Bellitt	
95		Date: 13/04/22		Date: 13/04/22		Date: 13/04/22	
96		Signature: T Bellitt		Signature: T Bellitt		Signature: T Bellitt	
97		Date: 13/04/22		Date: 13/04/22		Date: 13/04/22	
98		Signature: T Bellitt		Signature: T Bellitt		Signature: T Bellitt	
99		Date: 13/04/22		Date: 13/04/22		Date: 13/04/22	
100		Signature: T Bellitt		Signature: T Bellitt		Signature: T Bellitt	

881033
Joke

FOR-29. Chain of Custody Record

Revision No.: 1 / Date of Last Revision: 04/02/2022

Sheet No. 1 of 1

Atma Environmental

8

PROJECT

NAME: **LEONGATHA**

Sampler's

Signature: *TB BELFITT*

Sampler's

Name: **TOBE BELFITT**

Project

Ref. No.: **2153**

DATE: 13 APR 2022

Time:

SAMPLE IDs:	SAMPLE MATRIX:			ANALYSIS FOR:										NO. of CONTAINERS	HIGH CONTAM EXPECTED	COMPOSITING INSTRUCTIONS:
	DISCRETE	COMPOSITE	GRAB	SOIL	WATER	BLANK /	OCPs	METALS - 15	TRH/BTEX							
SPLIT -13422A	X			X					X						1	
SPLIT-13422B	X			X									X		1	
SPLIT-13422C	X			X				X							1	
TOTAL:	3			3			0	1	1					1	3	

DISPATCHED BY: (sign)

(DATE/TIME)

RECEIVED BY: (sign)

(DATE/TIME)

EUROFINS ENVIRONMENT TESTING

COURIERED BY: (sign)

(DATE/TIME)

LAB NAME: **ALS**

INITIAL RESULTS REQUESTED WITHIN:

24Hrs

48Hrs

3-4 DAYS

NORMAL

REMARKS:

Please email completed COC. Sample Receipt Notification results and invoices to:

> gberry@atmaenvironmental.com

>

COPY

NOTE: ☐ Must be completed by Atma Environmental

☐ Must be completed with date and time by laboratory.

#AU_CAU001_EnviroSampleVic

From: Glenn Berry <gberry@atmaenvironmental.com>
Sent: Thursday, 14 April 2022 5:35 PM
To: Savini Suduweli Kondage; Tobe Belfitt
Cc: #AU_CAU001_EnviroSampleVic
Subject: RE: CoC for 2153 - Leongatha samples collected today
Attachments: 2153_eRegCoC - Soils2 - FOR ANALYSIS.xlsm; 2153 LEONGATHA Chain of Custody - ALS.pdf

CAUTION: EXTERNAL EMAIL - Sent from an email domain that is not formally trusted by Eurofins.

Do not click on links or open attachments unless you recognise the sender and are certain that the content is safe.

Hi ;

Please refer to attached COCs

Glenn Berry, *CEnvP*
Director | Principal Environmental Consultant

Atma Environmental

Professionalism | Value | Service

56 William Street, ABBOTSFORD, Vic 3067 Australia
Tel: +61-3-9429 6955 | Mob: +61-412 000 445

Email: gberry@atmaenvironmental.com Web: www.atmaenvironmental.com

At Atma Environmental we value and respect flexible work arrangements. If I am sending this email outside of normal business hours, it is because it suits me to do so. Please do not feel any pressure to respond outside of your own work schedule.

From: Savini Suduweli Kondage <SaviniSuduweli@eurofins.com>
Sent: Thursday, 14 April 2022 3:33 PM
To: Tobe Belfitt <tbelfitt@atmaenvironmental.com>
Cc: Glenn Berry <gberry@atmaenvironmental.com>; #AU_CAU001_EnviroSampleVic <EnviroSampleVic@eurofins.com>
Subject: RE: CoC for 2153 - Leongatha samples collected today

Hi Tobe,

Thanks for sending that through.

SR – Please see attached for analysis on incoming samples.

Kind Regards,
Savini Suduweli

Phone : +61 3 8564 5051
Mobile : +61 447 222 760
Email : SaviniSuduweli@eurofins.com

From: Tobe Belfitt <tbelfitt@atmaenvironmental.com>
Sent: Thursday, 14 April 2022 3:26 PM

To: Savini Suduweli Kondage <SaviniSuduweli@eurofins.com>

Cc: Glenn Berry <gberry@atmaenvironmental.com>

Subject: CoC for 2153 - Leongatha samples collected today

CAUTION: EXTERNAL EMAIL - Sent from an email domain that is not formally trusted by Eurofins.

Do not click on links or open attachments unless you recognise the sender and are certain that the content is safe.

Hi Savini,

Attached is the CoC for samples collected today from the Atma office.

CoC with the required analysis to follow.

Cheers!

Regards,

Tobe Belfitt
Environmental Consultant

Atma Environmental



25 YR
1996 - 2021

56 William Street, ABBOTSFORD, Vic 3067 Australia

Tel: +61-3-9429 6955 Mob: +61-420 985 285

E-mail: tbelfitt@atmaenvironmental.com Web: www.atmaenvironmental.com



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Linked in



Environment Testing

PROJECT INFORMATION

Date Received:

14/4/22 4:15pm

Company:

ATMA

Contact person:

Contact Number:

Contact E-mail:

Project Name/site:

Project Number:

2153

COC: Attached ☐

E-mailed ☐

Not received ☐

YES/NO

10-5-0-4

10.1

2 esky

Last modified on: 16 October 2019	Approved on: 16 October 2019	Version: QS1039_R2
Last modified by: H. Le	Approver: M. Makarios	Page 1 of 1
Editorial Committee: T. Lakeland, F. Sanjaya, H. Le, M. Makarios		Next required review date: 16 October 2022

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IANZ # 1290

Sample Receipt Advice

Company name: Atma Environmental
Contact name: Glenn Berry
Project name: LONGATHA
Project ID: 2153
Turnaround time: 5 Day
Date/Time received: Apr 14, 2022 5:35 PM
Eurofins reference: 881033

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 10.1 degrees Celsius.
- ✓ All samples have been received as described on the above COC.
- ✓ COC has been completed correctly.
- ✓ Attempt to chill was evident.
- ✓ Appropriately preserved sample containers have been used.
- ✓ All samples were received in good condition.
- ✓ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ✓ Appropriate sample containers have been used.
- ✓ Sample containers for volatile analysis received with zero headspace.
- ✓ Split sample sent to requested external lab.
- ✗ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

Samples received by the laboratory after 5.30pm are deemed to have been received the following working day.

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Savini Suduweli on phone : or by email: SaviniSuduweli@eurofins.com

Results will be delivered electronically via email to Glenn Berry - gberry@atmaenvironmental.com.

Atma Environmental
56 William St
Abbotsford
VIC 3067



NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition
Arrangement for the mutual recognition of the
equivalence of testing, medical testing, calibration,
inspection, proficiency testing scheme providers and
reference materials producers reports and certificates.

Attention: Glenn Berry

Report 881033-S
Project name LONGATHA
Project ID 2153
Received Date Apr 14, 2022

Client Sample ID			BH01/0.1	BH02/0.1	BH03/0.1	BH04/0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22- Ap0038145	M22- Ap0038146	M22- Ap0038147	M22- Ap0038148
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	-
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	-
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	-
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	-
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	-
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	-
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	< 20	-
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	-
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	< 50	-
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	-
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	66	87	95	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
4,4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
4,4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
4,4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
a-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
b-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
d-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-

Client Sample ID			BH01/0.1	BH02/0.1	BH03/0.1	BH04/0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22- Ap0038145	M22- Ap0038146	M22- Ap0038147	M22- Ap0038148
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
g-HCH (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Toxaphene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Dibutylchlorendate (surr.)	1	%	73	82	71	-
Tetrachloro-m-xylene (surr.)	1	%	90	92	86	-
Heavy Metals						
Arsenic	2	mg/kg	2.3	2.9	3.3	< 2
Barium	10	mg/kg	140	360	130	120
Beryllium	2	mg/kg	< 2	2.7	< 2	< 2
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	150	180	250	130
Cobalt	5	mg/kg	24	320	46	17
Copper	5	mg/kg	39	75	70	33
Lead	5	mg/kg	31	19	33	25
Manganese	5	mg/kg	5300	6200	6200	4600
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum	5	mg/kg	< 5	< 5	< 5	< 5
Nickel	5	mg/kg	36	110	58	28
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Silver	2	mg/kg	< 2	< 2	< 2	< 2
Tin	10	mg/kg	< 10	< 10	< 10	< 10
Zinc	5	mg/kg	52	120	530	320
% Moisture	1	%	24	18	29	29
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	0.1	pH Units	-	-	6.1	-
Acid Herbicides						
2,4-D	0.5	mg/kg	-	< 0.5	< 0.5	-
2,4-DB	0.5	mg/kg	-	< 0.5	< 0.5	-
2,4,5-T	0.5	mg/kg	-	< 0.5	< 0.5	-
2,4,5-TP	0.5	mg/kg	-	< 0.5	< 0.5	-
Actril (loxylin)	0.5	mg/kg	-	< 0.5	< 0.5	-
Dicamba	0.5	mg/kg	-	< 0.5	< 0.5	-
Dichlorprop	0.5	mg/kg	-	< 0.5	< 0.5	-
Dinitro-o-cresol	0.5	mg/kg	-	< 0.5	< 0.5	-
Dinoseb	0.5	mg/kg	-	< 0.5	< 0.5	-
MCPA	0.5	mg/kg	-	< 0.5	< 0.5	-
MCPB	0.5	mg/kg	-	< 0.5	< 0.5	-
Mecoprop	0.5	mg/kg	-	< 0.5	< 0.5	-
Warfarin (surr.)	1	%	-	142	109	-

Client Sample ID			BH05/0.1	BH06/0.1	BH07/0.1	BH08/0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22- Ap0038149	M22- Ap0038150	M22- Ap0038151	M22- Ap0038152
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	-	< 20	-	< 20
TRH C10-C14	20	mg/kg	-	< 20	-	< 20
TRH C15-C28	50	mg/kg	-	< 50	-	200
TRH C29-C36	50	mg/kg	-	< 50	-	250
TRH C10-C36 (Total)	50	mg/kg	-	< 50	-	450
Naphthalene ^{N02}	0.5	mg/kg	-	< 0.5	-	< 0.5
TRH C6-C10	20	mg/kg	-	< 20	-	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	-	< 20	-	< 20
TRH >C10-C16	50	mg/kg	-	< 50	-	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	-	< 50	-	< 50
TRH >C16-C34	100	mg/kg	-	< 100	-	400
TRH >C34-C40	100	mg/kg	-	< 100	-	110
TRH >C10-C40 (total)*	100	mg/kg	-	< 100	-	510
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	-	< 0.1
Toluene	0.1	mg/kg	-	< 0.1	-	< 0.1
Ethylbenzene	0.1	mg/kg	-	< 0.1	-	< 0.1
m&p-Xylenes	0.2	mg/kg	-	< 0.2	-	< 0.2
o-Xylene	0.1	mg/kg	-	< 0.1	-	< 0.1
Xylenes - Total*	0.3	mg/kg	-	< 0.3	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	50	-	94
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	-	< 0.1
4,4'-DDD	0.05	mg/kg	-	-	-	< 0.05
4,4'-DDE	0.05	mg/kg	-	-	-	< 0.05
4,4'-DDT	0.05	mg/kg	-	-	-	< 0.05
a-HCH	0.05	mg/kg	-	-	-	< 0.05
Aldrin	0.05	mg/kg	-	-	-	< 0.05
b-HCH	0.05	mg/kg	-	-	-	< 0.05
d-HCH	0.05	mg/kg	-	-	-	< 0.05
Dieldrin	0.05	mg/kg	-	-	-	< 0.05
Endosulfan I	0.05	mg/kg	-	-	-	< 0.05
Endosulfan II	0.05	mg/kg	-	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	-	< 0.05
Endrin	0.05	mg/kg	-	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	-	< 0.05
Endrin ketone	0.05	mg/kg	-	-	-	< 0.05
g-HCH (Lindane)	0.05	mg/kg	-	-	-	< 0.05
Heptachlor	0.05	mg/kg	-	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	-	-	< 0.05
Methoxychlor	0.05	mg/kg	-	-	-	< 0.05
Toxaphene	0.5	mg/kg	-	-	-	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	-	< 0.1
Dibutylchlorendate (surr.)	1	%	-	-	-	88
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	73

Client Sample ID			BH05/0.1	BH06/0.1	BH07/0.1	BH08/0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22- Ap0038149	M22- Ap0038150	M22- Ap0038151	M22- Ap0038152
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	< 2	< 2	< 2	< 2
Barium	10	mg/kg	120	100	94	< 10
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	170	140	130	13
Cobalt	5	mg/kg	18	15	13	< 5
Copper	5	mg/kg	29	27	21	16
Lead	5	mg/kg	20	17	18	6.0
Manganese	5	mg/kg	4500	3700	3600	68
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum	5	mg/kg	< 5	< 5	< 5	< 5
Nickel	5	mg/kg	22	20	15	< 5
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Silver	2	mg/kg	< 2	< 2	< 2	< 2
Tin	10	mg/kg	< 10	< 10	< 10	< 10
Zinc	5	mg/kg	34	38	20	23
% Moisture	1	%	24	27	20	7.5
pH (units)(1:5 soil:CaCl ₂ extract at 25°C as rec.)	0.1	pH Units	-	-	5.2	-
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	-	-	13	-
Acid Herbicides						
2,4-D	0.5	mg/kg	-	-	-	< 0.5
2,4-DB	0.5	mg/kg	-	-	-	< 0.5
2,4,5-T	0.5	mg/kg	-	-	-	< 0.5
2,4,5-TP	0.5	mg/kg	-	-	-	< 0.5
Actril (loxylin)	0.5	mg/kg	-	-	-	< 0.5
Dicamba	0.5	mg/kg	-	-	-	< 0.5
Dichlorprop	0.5	mg/kg	-	-	-	< 0.5
Dinitro-o-cresol	0.5	mg/kg	-	-	-	< 0.5
Dinoseb	0.5	mg/kg	-	-	-	< 0.5
MCPA	0.5	mg/kg	-	-	-	< 0.5
MCPB	0.5	mg/kg	-	-	-	< 0.5
Mecoprop	0.5	mg/kg	-	-	-	< 0.5
Warfarin (surr.)	1	%	-	-	-	115
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	-	-	7.5	-

Client Sample ID			BH09/0.1	BH10/0.1	SS01	SS02
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22- Ap0038153	M22- Ap0038154	M22- Ap0038155	M22- Ap0038156
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	-	< 0.1
4,4'-DDD	0.05	mg/kg	-	-	-	< 0.05
4,4'-DDE	0.05	mg/kg	-	-	-	< 0.05
4,4'-DDT	0.05	mg/kg	-	-	-	< 0.05
a-HCH	0.05	mg/kg	-	-	-	< 0.05
Aldrin	0.05	mg/kg	-	-	-	< 0.05
b-HCH	0.05	mg/kg	-	-	-	< 0.05
d-HCH	0.05	mg/kg	-	-	-	< 0.05
Dieldrin	0.05	mg/kg	-	-	-	< 0.05
Endosulfan I	0.05	mg/kg	-	-	-	< 0.05
Endosulfan II	0.05	mg/kg	-	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	-	< 0.05
Endrin	0.05	mg/kg	-	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	-	< 0.05
Endrin ketone	0.05	mg/kg	-	-	-	< 0.05
g-HCH (Lindane)	0.05	mg/kg	-	-	-	< 0.05
Heptachlor	0.05	mg/kg	-	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	-	-	< 0.05
Methoxychlor	0.05	mg/kg	-	-	-	< 0.05
Toxaphene	0.5	mg/kg	-	-	-	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	-	< 0.1
Dibutylchlorodate (surr.)	1	%	-	-	-	122
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	127
Heavy Metals						
Arsenic	2	mg/kg	3.1	4.0	2.3	2.9
Barium	10	mg/kg	110	230	230	320
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	79	120	98	87
Cobalt	5	mg/kg	16	33	37	64
Copper	5	mg/kg	26	23	42	53
Lead	5	mg/kg	29	31	26	30
Manganese	5	mg/kg	2800	10000	8600	13000
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum	5	mg/kg	< 5	< 5	< 5	< 5
Nickel	5	mg/kg	13	18	38	48
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Silver	2	mg/kg	< 2	< 2	< 2	< 2
Tin	10	mg/kg	< 10	< 10	< 10	< 10
Zinc	5	mg/kg	45	22	31	41
% Moisture	1	%	24	22	33	15
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	0.1	pH Units	-	-	7.0	-

Client Sample ID			BH09/0.1	BH10/0.1	SS01	SS02
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22-Ap0038153	M22-Ap0038154	M22-Ap0038155	M22-Ap0038156
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Acid Herbicides						
2,4-D	0.5	mg/kg	-	-	< 0.5	-
2,4-DB	0.5	mg/kg	-	-	< 0.5	-
2,4,5-T	0.5	mg/kg	-	-	< 0.5	-
2,4,5-TP	0.5	mg/kg	-	-	< 0.5	-
Actril (loxynil)	0.5	mg/kg	-	-	< 0.5	-
Dicamba	0.5	mg/kg	-	-	< 0.5	-
Dichlorprop	0.5	mg/kg	-	-	< 0.5	-
Dinitro-o-cresol	0.5	mg/kg	-	-	< 0.5	-
Dinoseb	0.5	mg/kg	-	-	< 0.5	-
MCPA	0.5	mg/kg	-	-	< 0.5	-
MCPB	0.5	mg/kg	-	-	< 0.5	-
Mecoprop	0.5	mg/kg	-	-	< 0.5	-
Warfarin (surr.)	1	%	-	-	117	-

Client Sample ID			SS03	SS04	SS05	SS06
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22-Ap0038157	M22-Ap0038158	M22-Ap0038159	M22-Ap0038160
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	-	-	< 20	-
TRH C10-C14	20	mg/kg	-	-	< 20	-
TRH C15-C28	50	mg/kg	-	-	< 50	-
TRH C29-C36	50	mg/kg	-	-	< 50	-
TRH C10-C36 (Total)	50	mg/kg	-	-	< 50	-
Naphthalene ^{N02}	0.5	mg/kg	-	-	< 0.5	-
TRH C6-C10	20	mg/kg	-	-	< 20	-
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	-	-	< 20	-
TRH >C10-C16	50	mg/kg	-	-	< 50	-
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	-	-	< 50	-
TRH >C16-C34	100	mg/kg	-	-	< 100	-
TRH >C34-C40	100	mg/kg	-	-	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	-	-	< 100	-
BTEX						
Benzene	0.1	mg/kg	-	-	< 0.1	-
Toluene	0.1	mg/kg	-	-	< 0.1	-
Ethylbenzene	0.1	mg/kg	-	-	< 0.1	-
m&p-Xylenes	0.2	mg/kg	-	-	< 0.2	-
o-Xylene	0.1	mg/kg	-	-	< 0.1	-
Xylenes - Total*	0.3	mg/kg	-	-	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	-	-	80	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	< 0.1
4,4'-DDD	0.05	mg/kg	-	< 0.05	-	< 0.05
4,4'-DDE	0.05	mg/kg	-	< 0.05	-	< 0.05
4,4'-DDT	0.05	mg/kg	-	< 0.05	-	< 0.05
a-HCH	0.05	mg/kg	-	< 0.05	-	< 0.05

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	SS03 Soil M22- Ap0038157 Apr 13, 2022	SS04 Soil M22- Ap0038158 Apr 13, 2022	SS05 Soil M22- Ap0038159 Apr 13, 2022	SS06 Soil M22- Ap0038160 Apr 13, 2022
Organochlorine Pesticides						
Aldrin	0.05	mg/kg	-	< 0.05	-	< 0.05
b-HCH	0.05	mg/kg	-	< 0.05	-	< 0.05
d-HCH	0.05	mg/kg	-	< 0.05	-	< 0.05
Dieldrin	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan I	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan II	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin ketone	0.05	mg/kg	-	< 0.05	-	< 0.05
g-HCH (Lindane)	0.05	mg/kg	-	< 0.05	-	< 0.05
Heptachlor	0.05	mg/kg	-	< 0.05	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	< 0.05
Methoxychlor	0.05	mg/kg	-	< 0.05	-	< 0.05
Toxaphene	0.5	mg/kg	-	< 0.5	-	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	-	< 0.1
Dibutylchloroendate (surr.)	1	%	-	134	-	121
Tetrachloro-m-xylene (surr.)	1	%	-	150	-	100
Bifenthrin	0.05	mg/kg	-	-	< 0.05	-
Heavy Metals						
Arsenic	2	mg/kg	< 2	2.1	2.3	3.5
Barium	10	mg/kg	320	250	-	150
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	110	140	110	20
Cobalt	5	mg/kg	77	79	66	17
Copper	5	mg/kg	25	23	17	17
Lead	5	mg/kg	19	19	13	16
Manganese	5	mg/kg	7700	6600	3500	1200
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum	5	mg/kg	< 5	< 5	-	< 5
Nickel	5	mg/kg	32	48	34	16
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Silver	2	mg/kg	< 2	< 2	-	< 2
Tin	10	mg/kg	< 10	< 10	-	< 10
Zinc	5	mg/kg	27	37	38	69
% Moisture	1	%	15	19	21	27
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	0.1	pH Units	-	-	6.8	-
Chromium (hexavalent)	1	mg/kg	-	-	< 1	-
Cyanide (free)	5	mg/kg	-	-	< 5	-

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	SS03 Soil M22- Ap0038157 Apr 13, 2022	SS04 Soil M22- Ap0038158 Apr 13, 2022	SS05 Soil M22- Ap0038159 Apr 13, 2022	SS06 Soil M22- Ap0038160 Apr 13, 2022
Acid Herbicides						
2,4-D	0.5	mg/kg	< 0.5	-	-	-
2,4-DB	0.5	mg/kg	< 0.5	-	-	-
2,4,5-T	0.5	mg/kg	< 0.5	-	-	-
2,4,5-TP	0.5	mg/kg	< 0.5	-	-	-
Actril (loxynil)	0.5	mg/kg	< 0.5	-	-	-
Dicamba	0.5	mg/kg	< 0.5	-	-	-
Dichlorprop	0.5	mg/kg	< 0.5	-	-	-
Dinitro-o-cresol	0.5	mg/kg	< 0.5	-	-	-
Dinoseb	0.5	mg/kg	< 0.5	-	-	-
MCPA	0.5	mg/kg	< 0.5	-	-	-
MCPB	0.5	mg/kg	< 0.5	-	-	-
Mecoprop	0.5	mg/kg	< 0.5	-	-	-
Warfarin (surr.)	1	%	127	-	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	-	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	-	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	-	1.2	-
Acenaphthene	0.5	mg/kg	-	-	< 0.5	-
Acenaphthylene	0.5	mg/kg	-	-	< 0.5	-
Anthracene	0.5	mg/kg	-	-	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	-	-	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	-	-	< 0.5	-
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	-	-	< 0.5	-
Benzo(g,h,i)perylene	0.5	mg/kg	-	-	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	-	-	< 0.5	-
Chrysene	0.5	mg/kg	-	-	< 0.5	-
Dibenz(a,h)anthracene	0.5	mg/kg	-	-	< 0.5	-
Fluoranthene	0.5	mg/kg	-	-	< 0.5	-
Fluorene	0.5	mg/kg	-	-	< 0.5	-
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	-	-	< 0.5	-
Naphthalene	0.5	mg/kg	-	-	< 0.5	-
Phenanthrene	0.5	mg/kg	-	-	< 0.5	-
Pyrene	0.5	mg/kg	-	-	< 0.5	-
Total PAH*	0.5	mg/kg	-	-	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	-	-	80	-
p-Terphenyl-d14 (surr.)	1	%	-	-	82	-
Organophosphorus Pesticides						
Chlorpyrifos	0.2	mg/kg	-	-	< 0.2	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1221	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1232	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1242	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1248	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1254	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1260	0.1	mg/kg	-	-	< 0.1	-
Total PCB*	0.1	mg/kg	-	-	< 0.1	-
Dibutylchlorodate (surr.)	1	%	-	-	129	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	123	-

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	SS03 Soil M22- Ap0038157 Apr 13, 2022	SS04 Soil M22- Ap0038158 Apr 13, 2022	SS05 Soil M22- Ap0038159 Apr 13, 2022	SS06 Soil M22- Ap0038160 Apr 13, 2022
Triazines						
Atrazine	0.2	mg/kg	-	-	< 0.2	-
NEPM 2013 Acid Herbicides						
Picloram	0.5	mg/kg	-	-	< 0.5	-
2,4-D	0.5	mg/kg	-	-	< 0.5	-
2,4,5-T	0.5	mg/kg	-	-	< 0.5	-
MCPA	0.5	mg/kg	-	-	< 0.5	-
MCPB	0.5	mg/kg	-	-	< 0.5	-
Mecoprop	0.5	mg/kg	-	-	< 0.5	-
Warfarin (surr.)	1	%	-	-	116	-
NEPM 2013 Organochlorine Pesticides						
Endosulfan sulphate	0.05	mg/kg	-	-	< 0.05	-
Mirex	0.05	mg/kg	-	-	< 0.05	-
4,4'-DDD	0.05	mg/kg	-	-	< 0.05	-
4,4'-DDE	0.05	mg/kg	-	-	< 0.05	-
4,4'-DDT	0.05	mg/kg	-	-	< 0.05	-
Aldrin	0.05	mg/kg	-	-	< 0.05	-
Chlordanes - Total	0.1	mg/kg	-	-	< 0.1	-
Dieldrin	0.05	mg/kg	-	-	< 0.05	-
Endosulfan I	0.05	mg/kg	-	-	< 0.05	-
Endosulfan II	0.05	mg/kg	-	-	< 0.05	-
Endrin	0.05	mg/kg	-	-	< 0.05	-
Heptachlor	0.05	mg/kg	-	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	-	-	< 0.05	-
Methoxychlor	0.05	mg/kg	-	-	< 0.05	-
Toxaphene	0.5	mg/kg	-	-	< 0.5	-
Dibutylchloredate (surr.)	1	%	-	-	129	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	123	-
NEPM 2013 Phenols						
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	-	< 0.2	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	-	< 0.4	-
Pentachlorophenol	1	mg/kg	-	-	< 1	-
Phenol	0.5	mg/kg	-	-	< 0.5	-
Phenol-d6 (surr.)	1	%	-	-	39	-

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	SS07 Soil M22- Ap0038161 Apr 13, 2022	SS08 Soil M22- Ap0038162 Apr 13, 2022	SS09 Soil M22- Ap0038163 Apr 13, 2022	SS10 Soil M22- Ap0038164 Apr 13, 2022
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	< 0.1
4,4'-DDD	0.05	mg/kg	< 0.05	-	-	< 0.05
4,4'-DDE	0.05	mg/kg	< 0.05	-	-	< 0.05
4,4'-DDT	0.05	mg/kg	< 0.05	-	-	< 0.05
a-HCH	0.05	mg/kg	< 0.05	-	-	< 0.05
Aldrin	0.05	mg/kg	< 0.05	-	-	< 0.05
b-HCH	0.05	mg/kg	< 0.05	-	-	< 0.05

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	SS07 Soil M22- Ap0038161 Apr 13, 2022	SS08 Soil M22- Ap0038162 Apr 13, 2022	SS09 Soil M22- Ap0038163 Apr 13, 2022	SS10 Soil M22- Ap0038164 Apr 13, 2022
Organochlorine Pesticides						
d-HCH	0.05	mg/kg	< 0.05	-	-	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	-	-	< 0.05
g-HCH (Lindane)	0.05	mg/kg	< 0.05	-	-	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	-	-	< 0.05
Toxaphene	0.5	mg/kg	< 0.5	-	-	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	-	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	-	-	< 0.1
Dibutylchloroendate (surr.)	1	%	110	-	-	128
Tetrachloro-m-xylene (surr.)	1	%	134	-	-	143
Heavy Metals						
Arsenic	2	mg/kg	< 2	2.0	< 2	< 2
Barium	10	mg/kg	160	180	180	170
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	150	150	100	180
Cobalt	5	mg/kg	23	29	38	37
Copper	5	mg/kg	42	44	37	25
Lead	5	mg/kg	20	25	22	17
Manganese	5	mg/kg	5000	6400	7000	3900
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum	5	mg/kg	< 5	< 5	< 5	< 5
Nickel	5	mg/kg	45	41	35	32
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Silver	2	mg/kg	< 2	< 2	< 2	< 2
Tin	10	mg/kg	< 10	< 10	< 10	< 10
Zinc	5	mg/kg	69	36	28	27
% Moisture	1	%	15	17	18	20
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	0.1	pH Units	-	6.1	-	6.2
Acid Herbicides						
2,4-D	0.5	mg/kg	-	< 0.5	-	-
2,4-DB	0.5	mg/kg	-	< 0.5	-	-
2,4,5-T	0.5	mg/kg	-	< 0.5	-	-
2,4,5-TP	0.5	mg/kg	-	< 0.5	-	-
Actril (loxylin)	0.5	mg/kg	-	< 0.5	-	-
Dicamba	0.5	mg/kg	-	< 0.5	-	-
Dichlorprop	0.5	mg/kg	-	< 0.5	-	-

Client Sample ID			SS07	SS08	SS09	SS10
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22- Ap0038161	M22- Ap0038162	M22- Ap0038163	M22- Ap0038164
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Acid Herbicides						
Dinitro-o-cresol	0.5	mg/kg	-	< 0.5	-	-
Dinoseb	0.5	mg/kg	-	< 0.5	-	-
MCPA	0.5	mg/kg	-	< 0.5	-	-
MCPB	0.5	mg/kg	-	< 0.5	-	-
Mecoprop	0.5	mg/kg	-	< 0.5	-	-
Warfarin (surr.)	1	%	-	135	-	-

Client Sample ID			SS11	SS12	SS13	SS14
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22- Ap0038165	M22- Ap0038166	M22- Ap0038167	M22- Ap0038168
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	-	-	< 20	-
TRH C10-C14	20	mg/kg	-	-	< 20	-
TRH C15-C28	50	mg/kg	-	-	< 50	-
TRH C29-C36	50	mg/kg	-	-	< 50	-
TRH C10-C36 (Total)	50	mg/kg	-	-	< 50	-
Naphthalene ^{N02}	0.5	mg/kg	-	-	< 0.5	-
TRH C6-C10	20	mg/kg	-	-	< 20	-
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	-	-	< 20	-
TRH >C10-C16	50	mg/kg	-	-	< 50	-
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	-	-	< 50	-
TRH >C16-C34	100	mg/kg	-	-	< 100	-
TRH >C34-C40	100	mg/kg	-	-	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	-	-	< 100	-
BTEX						
Benzene	0.1	mg/kg	-	-	< 0.1	-
Toluene	0.1	mg/kg	-	-	< 0.1	-
Ethylbenzene	0.1	mg/kg	-	-	< 0.1	-
m&p-Xylenes	0.2	mg/kg	-	-	< 0.2	-
o-Xylene	0.1	mg/kg	-	-	< 0.1	-
Xylenes - Total*	0.3	mg/kg	-	-	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	-	-	83	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	-	< 0.1
4,4'-DDD	0.05	mg/kg	-	-	-	< 0.05
4,4'-DDE	0.05	mg/kg	-	-	-	0.12
4,4'-DDT	0.05	mg/kg	-	-	-	< 0.05
a-HCH	0.05	mg/kg	-	-	-	< 0.05
Aldrin	0.05	mg/kg	-	-	-	< 0.05
b-HCH	0.05	mg/kg	-	-	-	< 0.05
d-HCH	0.05	mg/kg	-	-	-	< 0.05
Dieldrin	0.05	mg/kg	-	-	-	< 0.05
Endosulfan I	0.05	mg/kg	-	-	-	< 0.05
Endosulfan II	0.05	mg/kg	-	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	-	< 0.05

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	SS11 Soil M22- Ap0038165 Apr 13, 2022	SS12 Soil M22- Ap0038166 Apr 13, 2022	SS13 Soil M22- Ap0038167 Apr 13, 2022	SS14 Soil M22- Ap0038168 Apr 13, 2022
Organochlorine Pesticides						
Endrin	0.05	mg/kg	-	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	-	< 0.05
Endrin ketone	0.05	mg/kg	-	-	-	< 0.05
g-HCH (Lindane)	0.05	mg/kg	-	-	-	< 0.05
Heptachlor	0.05	mg/kg	-	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	-	-	< 0.05
Methoxychlor	0.05	mg/kg	-	-	-	< 0.05
Toxaphene	0.5	mg/kg	-	-	-	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	-	0.12
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	-	0.12
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	-	< 0.1
Dibutylchlorobenzene (surr.)	1	%	-	-	-	133
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	136
Bifenthrin	0.05	mg/kg	-	-	< 0.05	-
Heavy Metals						
Arsenic	2	mg/kg	< 2	2.5	< 2	< 2
Barium	10	mg/kg	280	76	-	140
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	280	43	150	46
Cobalt	5	mg/kg	150	23	18	17
Copper	5	mg/kg	33	8.1	68	48
Lead	5	mg/kg	9.2	11	19	19
Manganese	5	mg/kg	4500	1400	4200	5600
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum	5	mg/kg	< 5	< 5	-	< 5
Nickel	5	mg/kg	100	12	22	18
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Silver	2	mg/kg	< 2	< 2	-	< 2
Tin	10	mg/kg	< 10	< 10	-	< 10
Zinc	5	mg/kg	93	24	33	32
% Moisture	1	%	21	15	20	17
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	0.1	pH Units	-	-	6.0	7.0
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	26	-	-	-
Chromium (hexavalent)	1	mg/kg	-	-	< 1	-
Cyanide (free)	5	mg/kg	-	-	< 5	-
Acid Herbicides						
2,4-D	0.5	mg/kg	-	< 0.5	-	-
2,4-DB	0.5	mg/kg	-	< 0.5	-	-
2,4,5-T	0.5	mg/kg	-	< 0.5	-	-
2,4,5-TP	0.5	mg/kg	-	< 0.5	-	-
Actril (loxylin)	0.5	mg/kg	-	< 0.5	-	-
Dicamba	0.5	mg/kg	-	< 0.5	-	-
Dichlorprop	0.5	mg/kg	-	< 0.5	-	-
Dinitro-o-cresol	0.5	mg/kg	-	< 0.5	-	-

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	SS11 Soil M22- Ap0038165 Apr 13, 2022	SS12 Soil M22- Ap0038166 Apr 13, 2022	SS13 Soil M22- Ap0038167 Apr 13, 2022	SS14 Soil M22- Ap0038168 Apr 13, 2022
Acid Herbicides						
Dinoseb	0.5	mg/kg	-	< 0.5	-	-
MCPA	0.5	mg/kg	-	< 0.5	-	-
MCPB	0.5	mg/kg	-	< 0.5	-	-
Mecoprop	0.5	mg/kg	-	< 0.5	-	-
Warfarin (surr.)	1	%	-	115	-	-
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	11	-	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	-	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	-	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	-	1.2	-
Acenaphthene	0.5	mg/kg	-	-	< 0.5	-
Acenaphthylene	0.5	mg/kg	-	-	< 0.5	-
Anthracene	0.5	mg/kg	-	-	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	-	-	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	-	-	< 0.5	-
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	-	-	< 0.5	-
Benzo(g,h,i)perylene	0.5	mg/kg	-	-	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	-	-	< 0.5	-
Chrysene	0.5	mg/kg	-	-	< 0.5	-
Dibenz(a,h)anthracene	0.5	mg/kg	-	-	< 0.5	-
Fluoranthene	0.5	mg/kg	-	-	< 0.5	-
Fluorene	0.5	mg/kg	-	-	< 0.5	-
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	-	-	< 0.5	-
Naphthalene	0.5	mg/kg	-	-	< 0.5	-
Phenanthrene	0.5	mg/kg	-	-	< 0.5	-
Pyrene	0.5	mg/kg	-	-	< 0.5	-
Total PAH*	0.5	mg/kg	-	-	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	-	-	85	-
p-Terphenyl-d14 (surr.)	1	%	-	-	89	-
Organophosphorus Pesticides						
Chlorpyrifos	0.2	mg/kg	-	-	< 0.2	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1221	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1232	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1242	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1248	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1254	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1260	0.1	mg/kg	-	-	< 0.1	-
Total PCB*	0.1	mg/kg	-	-	< 0.1	-
Dibutylchloroendate (surr.)	1	%	-	-	144	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	150	-
Triazines						
Atrazine	0.2	mg/kg	-	-	< 0.2	-

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	SS11 Soil M22- Ap0038165 Apr 13, 2022	SS12 Soil M22- Ap0038166 Apr 13, 2022	SS13 Soil M22- Ap0038167 Apr 13, 2022	SS14 Soil M22- Ap0038168 Apr 13, 2022
NEPM 2013 Acid Herbicides						
Picloram	0.5	mg/kg	-	-	< 0.5	-
2,4-D	0.5	mg/kg	-	-	< 0.5	-
2,4,5-T	0.5	mg/kg	-	-	< 0.5	-
MCPA	0.5	mg/kg	-	-	< 0.5	-
MCPB	0.5	mg/kg	-	-	< 0.5	-
Mecoprop	0.5	mg/kg	-	-	< 0.5	-
Warfarin (surr.)	1	%	-	-	111	-
NEPM 2013 Organochlorine Pesticides						
Endosulfan sulphate	0.05	mg/kg	-	-	< 0.05	-
Mirex	0.05	mg/kg	-	-	< 0.05	-
4,4'-DDD	0.05	mg/kg	-	-	< 0.05	-
4,4'-DDE	0.05	mg/kg	-	-	0.15	-
4,4'-DDT	0.05	mg/kg	-	-	< 0.05	-
Aldrin	0.05	mg/kg	-	-	< 0.05	-
Chlordanes - Total	0.1	mg/kg	-	-	< 0.1	-
Dieldrin	0.05	mg/kg	-	-	< 0.05	-
Endosulfan I	0.05	mg/kg	-	-	< 0.05	-
Endosulfan II	0.05	mg/kg	-	-	< 0.05	-
Endrin	0.05	mg/kg	-	-	< 0.05	-
Heptachlor	0.05	mg/kg	-	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	-	-	< 0.05	-
Methoxychlor	0.05	mg/kg	-	-	< 0.05	-
Toxaphene	0.5	mg/kg	-	-	< 0.5	-
Dibutylchloredate (surr.)	1	%	-	-	144	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	150	-
NEPM 2013 Phenols						
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	-	< 0.2	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	-	< 0.4	-
Pentachlorophenol	1	mg/kg	-	-	< 1	-
Phenol	0.5	mg/kg	-	-	< 0.5	-
Phenol-d6 (surr.)	1	%	-	-	51	-

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	SS15 Soil M22- Ap0038169 Apr 13, 2022	SS16 Soil M22- Ap0038170 Apr 13, 2022	SS17 Soil M22- Ap0038171 Apr 13, 2022	SS18 Soil M22- Ap0038172 Apr 13, 2022
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	< 0.1	-
4,4'-DDD	0.05	mg/kg	-	< 0.05	< 0.05	-
4,4'-DDE	0.05	mg/kg	-	< 0.05	0.16	-
4,4'-DDT	0.05	mg/kg	-	< 0.05	< 0.05	-
a-HCH	0.05	mg/kg	-	< 0.05	< 0.05	-
Aldrin	0.05	mg/kg	-	< 0.05	< 0.05	-
b-HCH	0.05	mg/kg	-	< 0.05	< 0.05	-
d-HCH	0.05	mg/kg	-	< 0.05	< 0.05	-
Dieldrin	0.05	mg/kg	-	< 0.05	< 0.05	-

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	SS15 Soil M22- Ap0038169 Apr 13, 2022	SS16 Soil M22- Ap0038170 Apr 13, 2022	SS17 Soil M22- Ap0038171 Apr 13, 2022	SS18 Soil M22- Ap0038172 Apr 13, 2022
Organochlorine Pesticides						
Endosulfan I	0.05	mg/kg	-	< 0.05	< 0.05	-
Endosulfan II	0.05	mg/kg	-	< 0.05	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin aldehyde	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin ketone	0.05	mg/kg	-	< 0.05	< 0.05	-
g-HCH (Lindane)	0.05	mg/kg	-	< 0.05	< 0.05	-
Heptachlor	0.05	mg/kg	-	< 0.05	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	< 0.05	-
Methoxychlor	0.05	mg/kg	-	< 0.05	< 0.05	-
Toxaphene	0.5	mg/kg	-	< 0.5	< 0.5	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	0.16	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	0.16	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	< 0.1	-
Dibutylchloroendate (surr.)	1	%	-	128	138	-
Tetrachloro-m-xylene (surr.)	1	%	-	135	97	-
Heavy Metals						
Arsenic	2	mg/kg	< 2	< 2	2.8	< 2
Barium	10	mg/kg	65	58	190	150
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Boron	10	mg/kg	< 10	< 10	< 10	< 10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	27	17	92	120
Cobalt	5	mg/kg	17	14	26	22
Copper	5	mg/kg	8.1	< 5	28	50
Lead	5	mg/kg	11	12	26	23
Manganese	5	mg/kg	1500	1900	7300	5100
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum	5	mg/kg	< 5	< 5	< 5	< 5
Nickel	5	mg/kg	9.2	< 5	18	27
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Silver	2	mg/kg	< 2	< 2	< 2	< 2
Tin	10	mg/kg	< 10	< 10	< 10	< 10
Zinc	5	mg/kg	11	9.8	29	26
% Moisture	1	%	16	18	20	16
Acid Herbicides						
2,4-D	0.5	mg/kg	< 0.5	-	-	< 0.5
2,4-DB	0.5	mg/kg	< 0.5	-	-	< 0.5
2,4,5-T	0.5	mg/kg	< 0.5	-	-	< 0.5
2,4,5-TP	0.5	mg/kg	< 0.5	-	-	< 0.5
Actril (loxynil)	0.5	mg/kg	< 0.5	-	-	< 0.5
Dicamba	0.5	mg/kg	< 0.5	-	-	< 0.5
Dichlorprop	0.5	mg/kg	< 0.5	-	-	< 0.5
Dinitro-o-cresol	0.5	mg/kg	< 0.5	-	-	< 0.5
Dinoseb	0.5	mg/kg	< 0.5	-	-	< 0.5
MCPA	0.5	mg/kg	< 0.5	-	-	< 0.5

Client Sample ID			SS15	SS16	SS17	SS18
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22- Ap0038169	M22- Ap0038170	M22- Ap0038171	M22- Ap0038172
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Acid Herbicides						
MCPB	0.5	mg/kg	< 0.5	-	-	< 0.5
Mecoprop	0.5	mg/kg	< 0.5	-	-	< 0.5
Warfarin (surr.)	1	%	114	-	-	108

Client Sample ID			SS19	SS20	SS21	DUP-13422A
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22- Ap0038173	M22- Ap0038174	M22- Ap0038175	M22- Ap0038176
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	-	< 20	-	< 20
TRH C10-C14	20	mg/kg	-	< 20	-	< 20
TRH C15-C28	50	mg/kg	-	< 50	-	< 50
TRH C29-C36	50	mg/kg	-	< 50	-	< 50
TRH C10-C36 (Total)	50	mg/kg	-	< 50	-	< 50
Naphthalene ^{N02}	0.5	mg/kg	-	< 0.5	-	< 0.5
TRH C6-C10	20	mg/kg	-	< 20	-	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	-	< 20	-	< 20
TRH >C10-C16	50	mg/kg	-	< 50	-	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	-	< 50	-	< 50
TRH >C16-C34	100	mg/kg	-	< 100	-	< 100
TRH >C34-C40	100	mg/kg	-	< 100	-	< 100
TRH >C10-C40 (total)*	100	mg/kg	-	< 100	-	< 100
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	-	< 0.1
Toluene	0.1	mg/kg	-	< 0.1	-	< 0.1
Ethylbenzene	0.1	mg/kg	-	< 0.1	-	< 0.1
m&p-Xylenes	0.2	mg/kg	-	< 0.2	-	< 0.2
o-Xylene	0.1	mg/kg	-	< 0.1	-	< 0.1
Xylenes - Total*	0.3	mg/kg	-	< 0.3	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	91	-	93
Organochlorine Pesticides						
Bifenthrin	0.05	mg/kg	-	< 0.05	-	-
Heavy Metals						
Arsenic	2	mg/kg	< 2	< 2	2.2	-
Barium	10	mg/kg	57	-	100	-
Beryllium	2	mg/kg	< 2	< 2	< 2	-
Boron	10	mg/kg	< 10	< 10	< 10	-
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	-
Chromium	5	mg/kg	30	19	15	-
Cobalt	5	mg/kg	13	15	10	-
Copper	5	mg/kg	8.0	< 5	11	-
Lead	5	mg/kg	14	14	14	-
Manganese	5	mg/kg	1400	1700	690	-
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Molybdenum	5	mg/kg	< 5	-	< 5	-
Nickel	5	mg/kg	5.9	< 5	9.1	-

Client Sample ID			SS19	SS20	SS21	DUP-13422A
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M22- Ap0038173	M22- Ap0038174	M22- Ap0038175	M22- Ap0038176
Date Sampled			Apr 13, 2022	Apr 13, 2022	Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit				
Heavy Metals						
Selenium	2	mg/kg	< 2	< 2	< 2	-
Silver	2	mg/kg	< 2	-	< 2	-
Tin	10	mg/kg	< 10	-	< 10	-
Zinc	5	mg/kg	8.8	8.4	41	-
% Moisture	1	%	14	7.7	21	27
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	0.1	pH Units	4.1	-	5.2	-
Chromium (hexavalent)	1	mg/kg	-	< 1	-	-
Cyanide (free)	5	mg/kg	-	< 5	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5	-	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6	-	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2	-	-
Acenaphthene	0.5	mg/kg	-	< 0.5	-	-
Acenaphthylene	0.5	mg/kg	-	< 0.5	-	-
Anthracene	0.5	mg/kg	-	< 0.5	-	-
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	-	-
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	-	-
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	-	< 0.5	-	-
Benzo(g,h,i)perylene	0.5	mg/kg	-	< 0.5	-	-
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	-	-
Chrysene	0.5	mg/kg	-	< 0.5	-	-
Dibenz(a,h)anthracene	0.5	mg/kg	-	< 0.5	-	-
Fluoranthene	0.5	mg/kg	-	< 0.5	-	-
Fluorene	0.5	mg/kg	-	< 0.5	-	-
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	-	< 0.5	-	-
Naphthalene	0.5	mg/kg	-	< 0.5	-	-
Phenanthrene	0.5	mg/kg	-	< 0.5	-	-
Pyrene	0.5	mg/kg	-	< 0.5	-	-
Total PAH*	0.5	mg/kg	-	< 0.5	-	-
2-Fluorobiphenyl (surr.)	1	%	-	80	-	-
p-Terphenyl-d14 (surr.)	1	%	-	88	-	-
Organophosphorus Pesticides						
Chlorpyrifos	0.2	mg/kg	-	< 0.2	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1221	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1232	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1242	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1248	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1254	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1260	0.1	mg/kg	-	< 0.1	-	-
Total PCB*	0.1	mg/kg	-	< 0.1	-	-
Dibutylchloroendate (surr.)	1	%	-	126	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	139	-	-
Triazines						
Atrazine	0.2	mg/kg	-	< 0.2	-	-

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	SS19 Soil M22- Ap0038173 Apr 13, 2022	SS20 Soil M22- Ap0038174 Apr 13, 2022	SS21 Soil M22- Ap0038175 Apr 13, 2022	DUP-13422A Soil M22- Ap0038176 Apr 13, 2022
NEPM 2013 Acid Herbicides						
Picloram	0.5	mg/kg	-	< 0.5	-	-
2,4-D	0.5	mg/kg	-	< 0.5	-	-
2,4,5-T	0.5	mg/kg	-	< 0.5	-	-
MCPA	0.5	mg/kg	-	< 0.5	-	-
MCPB	0.5	mg/kg	-	< 0.5	-	-
Mecoprop	0.5	mg/kg	-	< 0.5	-	-
Warfarin (surr.)	1	%	-	122	-	-
NEPM 2013 Organochlorine Pesticides						
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	-
Mirex	0.05	mg/kg	-	< 0.05	-	-
4,4'-DDD	0.05	mg/kg	-	< 0.05	-	-
4,4'-DDE	0.05	mg/kg	-	< 0.05	-	-
4,4'-DDT	0.05	mg/kg	-	< 0.05	-	-
Aldrin	0.05	mg/kg	-	< 0.05	-	-
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	-
Dieldrin	0.05	mg/kg	-	< 0.05	-	-
Endosulfan I	0.05	mg/kg	-	< 0.05	-	-
Endosulfan II	0.05	mg/kg	-	< 0.05	-	-
Endrin	0.05	mg/kg	-	< 0.05	-	-
Heptachlor	0.05	mg/kg	-	< 0.05	-	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	-
Methoxychlor	0.05	mg/kg	-	< 0.05	-	-
Toxaphene	0.5	mg/kg	-	< 0.5	-	-
Dibutylchloredate (surr.)	1	%	-	126	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	139	-	-
NEPM 2013 Phenols						
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	< 0.2	-	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	< 0.4	-	-
Pentachlorophenol	1	mg/kg	-	< 1	-	-
Phenol	0.5	mg/kg	-	< 0.5	-	-
Phenol-d6 (surr.)	1	%	-	51	-	-

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	DUP-13422B Soil M22- Ap0038177 Apr 13, 2022	DUP-13422C Soil M22- Ap0038178 Apr 13, 2022
Organochlorine Pesticides				
Chlordanes - Total	0.1	mg/kg	< 0.1	-
4,4'-DDD	0.05	mg/kg	< 0.05	-
4,4'-DDE	0.05	mg/kg	< 0.05	-
4,4'-DDT	0.05	mg/kg	< 0.05	-
a-HCH	0.05	mg/kg	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-
b-HCH	0.05	mg/kg	< 0.05	-
d-HCH	0.05	mg/kg	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-

Client Sample ID			DUP-13422B	DUP-13422C
Sample Matrix			Soil	Soil
Eurofins Sample No.			M22-Ap0038177	M22-Ap0038178
Date Sampled			Apr 13, 2022	Apr 13, 2022
Test/Reference	LOR	Unit		
Organochlorine Pesticides				
Endosulfan I	0.05	mg/kg	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-
g-HCH (Lindane)	0.05	mg/kg	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-
Methoxychlor	0.05	mg/kg	< 0.05	-
Toxaphene	0.5	mg/kg	< 0.5	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	-
Dibutylchloroendate (surr.)	1	%	83	-
Tetrachloro-m-xylene (surr.)	1	%	88	-
Heavy Metals				
Arsenic	2	mg/kg	-	< 2
Barium	10	mg/kg	-	57
Beryllium	2	mg/kg	-	< 2
Boron	10	mg/kg	-	< 10
Cadmium	0.4	mg/kg	-	< 0.4
Chromium	5	mg/kg	-	26
Cobalt	5	mg/kg	-	12
Copper	5	mg/kg	-	6.8
Lead	5	mg/kg	-	14
Manganese	5	mg/kg	-	1200
Mercury	0.1	mg/kg	-	< 0.1
Molybdenum	5	mg/kg	-	< 5
Nickel	5	mg/kg	-	< 5
Selenium	2	mg/kg	-	< 2
Silver	2	mg/kg	-	< 2
Tin	10	mg/kg	-	< 10
Zinc	5	mg/kg	-	8.0
% Moisture	1	%	20	14

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins Suite B1			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Apr 21, 2022	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Apr 21, 2022	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Apr 21, 2022	14 Days
BTEX - Method: LTM-ORG-2010 BTEX and Volatile TRH	Melbourne	Apr 21, 2022	14 Days
Organochlorine Pesticides - Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8270)	Melbourne	Apr 21, 2022	14 Days
VIC EPA Metals : Metals M17 - Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)	Melbourne	Apr 21, 2022	180 Days
pH (units)(1:5 soil:CaCl ₂ extract at 25°C as rec.) - Method: LTM-GEN-7090 pH in soil by ISE	Melbourne	Apr 21, 2022	7 Days
Acid Herbicides - Method: LTM-ORG-2180 Phenoxy Acid Herbicides	Melbourne	Apr 21, 2022	14 Days
NEPM Screen Table 1(A) HIL's for Soil Contaminants - Basic Suite - Excluding Methyl Mercury/PBDE			
NEPM 2013 Metals : Metals M12 - Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)	Melbourne	Apr 21, 2022	28 Days
Heavy Metals - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Apr 21, 2022	28 Days
Chromium (hexavalent) - Method: LTM-INO-4100 Hexavalent Chromium by Spectrometric detection	Melbourne	Apr 21, 2022	28 Days
Cyanide (free) - Method: LTM-INO-4020 Total Free WAD Cyanide by CFA	Melbourne	Apr 21, 2022	14 Days
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Melbourne	Apr 21, 2022	14 Days
Organophosphorus Pesticides - Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS (USEPA 8270)	Melbourne	Apr 21, 2022	14 Days
Polychlorinated Biphenyls - Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8082)	Melbourne	Apr 21, 2022	28 Days
Triazines - Method: LTM-ORG-2210 Triazine Herbicides in Soil and Water by GC-MS/MS	Melbourne	Apr 21, 2022	14 Days
NEPM 2013 Acid Herbicides - Method: MGT 530	Melbourne	Apr 21, 2022	14 Days
NEPM 2013 Organochlorine Pesticides - Method: USEPA 8081 Organochlorine Pesticides	Melbourne	Apr 21, 2022	14 Days
NEPM 2013 Phenols - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Melbourne	Apr 21, 2022	14 Days
% Moisture - Method: LTM-GEN-7080 Moisture	Melbourne	Apr 20, 2022	14 Days
Conductivity (1:5 aqueous extract at 25°C as rec.) - Method: LTM-INO-4030 Conductivity	Melbourne	Apr 21, 2022	7 Days
Cation Exchange Capacity - Method: LTM-MET-3060 Cation Exchange Capacity by bases & Exchangeable Sodium Percentage	Melbourne	Apr 26, 2022	28 Days

Company Name: Atma Environmental
Address: 56 William St
Abbotsford
VIC 3067

Project Name: LONGATHA
Project ID: 2153

Order No.:
Report #: 881033
Phone: 9429 6955
Fax: 9429 5911

Received: Apr 14, 2022 5:35 PM
Due: Apr 27, 2022
Priority: 5 Day
Contact Name: Glenn Berry

Eurofins Analytical Services Manager : Savini Suduweli

Sample Detail						HOLD	pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	Organochlorine Pesticides	Acid Herbicides	VIC EPA Metals : Metals M17	Moisture Set	Cation Exchange Capacity	NEPM Screen Table 1(A) HIL's for Soil Contaminants - Basic Suite - Excluding	Total Recoverable Hydrocarbons	Eurofins Suite B1
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217															
Brisbane Laboratory - NATA # 1261 Site # 20794															
Mayfield Laboratory - NATA # 1261 Site # 25079															
Perth Laboratory - NATA # 2377 Site # 2370															
External Laboratory															
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID										
1	BH01/0.1	Apr 13, 2022		Soil	M22-Ap0038145			X		X	X				X
2	BH02/0.1	Apr 13, 2022		Soil	M22-Ap0038146			X	X	X	X				X
3	BH03/0.1	Apr 13, 2022		Soil	M22-Ap0038147		X	X	X	X	X			X	X
4	BH04/0.1	Apr 13, 2022		Soil	M22-Ap0038148					X	X				
5	BH05/0.1	Apr 13, 2022		Soil	M22-Ap0038149					X	X				
6	BH06/0.1	Apr 13, 2022		Soil	M22-					X	X				X

Company Name:	Atma Environmental	Order No.:		Received:	Apr 14, 2022 5:35 PM
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Project ID:	2153	Fax:	9429 5911	Contact Name:	Glenn Berry

Eurofins Analytical Services Manager : Savini Suduweli

Sample Detail						HOLD	pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	Organochlorine Pesticides	Acid Herbicides	VIC EPA Metals : Metals M17	Moisture Set	Cation Exchange Capacity	NEPM Screen Table 1(A) HIL's for Soil Contaminants - Basic Suite - Excluding	Total Recoverable Hydrocarbons	Eurofins Suite B1
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217															
Brisbane Laboratory - NATA # 1261 Site # 20794															
Mayfield Laboratory - NATA # 1261 Site # 25079															
Perth Laboratory - NATA # 2377 Site # 2370															
External Laboratory															
					Ap0038150										
7	BH07/0.1	Apr 13, 2022		Soil	M22-Ap0038151		X			X	X	X			
8	BH08/0.1	Apr 13, 2022		Soil	M22-Ap0038152			X	X	X	X				X
9	BH09/0.1	Apr 13, 2022		Soil	M22-Ap0038153					X	X				
10	BH10/0.1	Apr 13, 2022		Soil	M22-Ap0038154					X	X				
11	SS01	Apr 13, 2022		Soil	M22-Ap0038155		X		X	X	X				
12	SS02	Apr 13, 2022		Soil	M22-Ap0038156			X		X	X				

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Sample Detail						HOLD	pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	Organochlorine Pesticides	Acid Herbicides	VIC EPA Metals : Metals M17	Moisture Set	Cation Exchange Capacity	NEPM Screen Table 1(A) HIL's for Soil Contaminants - Basic Suite - Excluding	Total Recoverable Hydrocarbons	Eurofins Suite B1
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217															
Brisbane Laboratory - NATA # 1261 Site # 20794															
Mayfield Laboratory - NATA # 1261 Site # 25079															
Perth Laboratory - NATA # 2377 Site # 2370															
External Laboratory															
13	SS03	Apr 13, 2022		Soil	M22-Ap0038157				X	X	X				
14	SS04	Apr 13, 2022		Soil	M22-Ap0038158			X		X	X				
15	SS05	Apr 13, 2022		Soil	M22-Ap0038159		X				X		X		
16	SS06	Apr 13, 2022		Soil	M22-Ap0038160			X		X	X				
17	SS07	Apr 13, 2022		Soil	M22-Ap0038161			X		X	X				
18	SS08	Apr 13, 2022		Soil	M22-Ap0038162		X		X	X	X				
19	SS09	Apr 13, 2022		Soil	M22-					X	X				

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Sample Detail						HOLD	pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	Organochlorine Pesticides	Acid Herbicides	VIC EPA Metals : Metals M17	Moisture Set	Cation Exchange Capacity	NEPM Screen Table 1(A) HIL's for Soil Contaminants - Basic Suite - Excluding	Total Recoverable Hydrocarbons	Eurofins Suite B1
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217															
Brisbane Laboratory - NATA # 1261 Site # 20794															
Mayfield Laboratory - NATA # 1261 Site # 25079															
Perth Laboratory - NATA # 2377 Site # 2370															
External Laboratory															
					Ap0038163										
20	SS10	Apr 13, 2022		Soil	M22-Ap0038164		X	X		X	X				
21	SS11	Apr 13, 2022		Soil	M22-Ap0038165					X	X	X			
22	SS12	Apr 13, 2022		Soil	M22-Ap0038166				X	X	X				
23	SS13	Apr 13, 2022		Soil	M22-Ap0038167		X				X		X		
24	SS14	Apr 13, 2022		Soil	M22-Ap0038168		X	X		X	X				
25	SS15	Apr 13, 2022		Soil	M22-Ap0038169				X	X	X				

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Sample Detail						HOLD	pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	Organochlorine Pesticides	Acid Herbicides	VIC EPA Metals : Metals M17	Moisture Set	Cation Exchange Capacity	NEPM Screen Table 1(A) HIL's for Soil Contaminants - Basic Suite - Excluding	Total Recoverable Hydrocarbons	Eurofins Suite B1
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217															
Brisbane Laboratory - NATA # 1261 Site # 20794															
Mayfield Laboratory - NATA # 1261 Site # 25079															
Perth Laboratory - NATA # 2377 Site # 2370															
External Laboratory															
26	SS16	Apr 13, 2022		Soil	M22-Ap0038170			X		X	X				
27	SS17	Apr 13, 2022		Soil	M22-Ap0038171			X		X	X				
28	SS18	Apr 13, 2022		Soil	M22-Ap0038172				X	X	X				
29	SS19	Apr 13, 2022		Soil	M22-Ap0038173		X			X	X				
30	SS20	Apr 13, 2022		Soil	M22-Ap0038174						X		X		
31	SS21	Apr 13, 2022		Soil	M22-Ap0038175		X			X	X				
32	DUP-13422A	Apr 13, 2022		Soil	M22-						X				X

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Sample Detail						HOLD	pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	Organochlorine Pesticides	Acid Herbicides	VIC EPA Metals : Metals M17	Moisture Set	Cation Exchange Capacity	NEPM Screen Table 1(A) HIL's for Soil Contaminants - Basic Suite - Excluding	Total Recoverable Hydrocarbons	Eurofins Suite B1
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217															
Brisbane Laboratory - NATA # 1261 Site # 20794															
Mayfield Laboratory - NATA # 1261 Site # 25079															
Perth Laboratory - NATA # 2377 Site # 2370															
External Laboratory															
					Ap0038176										
33	DUP-13422B	Apr 13, 2022		Soil	M22-Ap0038177			X			X				
34	DUP-13422C	Apr 13, 2022		Soil	M22-Ap0038178					X	X				
35	BH01/0.5	Apr 13, 2022		Soil	M22-Ap0038179	X									
36	BH02/0.5	Apr 13, 2022		Soil	M22-Ap0038180	X									
37	BH03/0.5	Apr 13, 2022		Soil	M22-Ap0038181	X									
38	BH04/0.5	Apr 13, 2022		Soil	M22-Ap0038182	X									

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Sample Detail						HOLD	pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	Organochlorine Pesticides	Acid Herbicides	VIC EPA Metals : Metals M17	Moisture Set	Cation Exchange Capacity	NEPM Screen Table 1(A) HIL's for Soil Contaminants - Basic Suite - Excluding	Total Recoverable Hydrocarbons	Eurofins Suite B1
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217															
Brisbane Laboratory - NATA # 1261 Site # 20794															
Mayfield Laboratory - NATA # 1261 Site # 25079															
Perth Laboratory - NATA # 2377 Site # 2370															
External Laboratory															
39	BH05/0.5	Apr 13, 2022		Soil	M22-Ap0038183	X									
40	BH06/0.5	Apr 13, 2022		Soil	M22-Ap0038184	X									
41	BH07/0.5	Apr 13, 2022		Soil	M22-Ap0038185	X									
42	BH08/0.5	Apr 13, 2022		Soil	M22-Ap0038186	X									
43	BH09/0.5	Apr 13, 2022		Soil	M22-Ap0038187	X									
44	BH10/0.5	Apr 13, 2022		Soil	M22-Ap0038188	X									
45	SS22	Apr 13, 2022		Soil	M22-	X									

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Sample Detail						HOLD	pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	Organochlorine Pesticides	Acid Herbicides	VIC EPA Metals : Metals M17	Moisture Set	Cation Exchange Capacity	NEPM Screen Table 1(A) HIL's for Soil Contaminants - Basic Suite - Excluding	Total Recoverable Hydrocarbons	Eurofins Suite B1
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217															
Brisbane Laboratory - NATA # 1261 Site # 20794															
Mayfield Laboratory - NATA # 1261 Site # 25079															
Perth Laboratory - NATA # 2377 Site # 2370															
External Laboratory															
					Ap0038189										
46	DECON-13422	Apr 13, 2022		Water	M22-Ap0038190	X									
47	TB-13422	Apr 13, 2022		Water	M22-Ap0038191	X									
48	FB-13422	Apr 13, 2022		Water	M22-Ap0038192	X									
Test Counts						14	10	13	9	29	34	2	3	1	6

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	µg/L: micrograms per litre
ppm: parts per million	ppb: parts per billion	%: Percentage
org/100 mL: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units	MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4,4'-DDD	mg/kg	< 0.05			0.05	Pass	
4,4'-DDE	mg/kg	< 0.05			0.05	Pass	
4,4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-HCH	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-HCH	mg/kg	< 0.05			0.05	Pass	
d-HCH	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-HCH (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 0.5			0.5	Pass	
Bifenthrin	mg/kg	< 0.05			0.05	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Barium	mg/kg	< 10			10	Pass	
Beryllium	mg/kg	< 2			2	Pass	
Boron	mg/kg	< 10			10	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Cobalt	mg/kg	< 5			5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Manganese	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Molybdenum	mg/kg	< 5			5	Pass	
Nickel	mg/kg	< 5			5	Pass	
Selenium	mg/kg	< 2			2	Pass	
Silver	mg/kg	< 2			2	Pass	
Tin	mg/kg	< 10			10	Pass	
Zinc	mg/kg	< 5			5	Pass	
Method Blank							
Chromium (hexavalent)	mg/kg	< 1			1	Pass	
Cyanide (free)	mg/kg	< 5			5	Pass	
Method Blank							
Acid Herbicides							
2,4-D	mg/kg	< 0.5			0.5	Pass	
2,4-DB	mg/kg	< 0.5			0.5	Pass	
2,4,5-T	mg/kg	< 0.5			0.5	Pass	
2,4,5-TP	mg/kg	< 0.5			0.5	Pass	
Actril (loxynil)	mg/kg	< 0.5			0.5	Pass	
Dicamba	mg/kg	< 0.5			0.5	Pass	
Dichlorprop	mg/kg	< 0.5			0.5	Pass	
Dinitro-o-cresol	mg/kg	< 0.5			0.5	Pass	
Dinoseb	mg/kg	< 0.5			0.5	Pass	
MCPA	mg/kg	< 0.5			0.5	Pass	
MCPB	mg/kg	< 0.5			0.5	Pass	
Mecoprop	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Cation Exchange Capacity							
Cation Exchange Capacity	meq/100g	< 0.05			0.05	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g,h,i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a,h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organophosphorus Pesticides							
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.1			0.1	Pass	
Aroclor-1242	mg/kg	< 0.1			0.1	Pass	
Aroclor-1248	mg/kg	< 0.1			0.1	Pass	
Aroclor-1254	mg/kg	< 0.1			0.1	Pass	
Aroclor-1260	mg/kg	< 0.1			0.1	Pass	
Total PCB*	mg/kg	< 0.1			0.1	Pass	
Method Blank							
Triazines							
Atrazine	mg/kg	< 0.2			0.2	Pass	
Method Blank							
NEPM 2013 Acid Herbicides							
Picloram	mg/kg	< 0.5			0.5	Pass	
2,4-D	mg/kg	< 0.5			0.5	Pass	
2,4,5-T	mg/kg	< 0.5			0.5	Pass	
MCPA	mg/kg	< 0.5			0.5	Pass	
MCPB	mg/kg	< 0.5			0.5	Pass	
Mecoprop	mg/kg	< 0.5			0.5	Pass	
Method Blank							
NEPM 2013 Organochlorine Pesticides							
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Mirex	mg/kg	< 0.05			0.05	Pass	
4,4'-DDD	mg/kg	< 0.05			0.05	Pass	
4,4'-DDE	mg/kg	< 0.05			0.05	Pass	
4,4'-DDT	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
NEPM 2013 Phenols							
2-Methylphenol (o-Cresol)	mg/kg	< 0.2			0.2	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 0.4			0.4	Pass	
Pentachlorophenol	mg/kg	< 1			1	Pass	
Phenol	mg/kg	< 0.5			0.5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	76			70-130	Pass	
TRH C10-C14	%	98			70-130	Pass	
Naphthalene	%	73			70-130	Pass	
TRH C6-C10	%	74			70-130	Pass	
TRH >C10-C16	%	105			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	74			70-130	Pass	
Toluene	%	119			70-130	Pass	
Ethylbenzene	%	78			70-130	Pass	
m&p-Xylenes	%	83			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Xylenes - Total*	%	82			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	97			70-130	Pass	
4,4'-DDD	%	102			70-130	Pass	
4,4'-DDE	%	104			70-130	Pass	
4,4'-DDT	%	102			70-130	Pass	
a-HCH	%	97			70-130	Pass	
Aldrin	%	83			70-130	Pass	
b-HCH	%	103			70-130	Pass	
d-HCH	%	105			70-130	Pass	
Dieldrin	%	74			70-130	Pass	
Endosulfan I	%	105			70-130	Pass	
Endosulfan II	%	103			70-130	Pass	
Endosulfan sulphate	%	102			70-130	Pass	
Endrin	%	74			70-130	Pass	
Endrin aldehyde	%	71			70-130	Pass	
Endrin ketone	%	79			70-130	Pass	
g-HCH (Lindane)	%	80			70-130	Pass	
Heptachlor	%	102			70-130	Pass	
Heptachlor epoxide	%	86			70-130	Pass	
Hexachlorobenzene	%	104			70-130	Pass	
Methoxychlor	%	100			70-130	Pass	
Bifenthrin	%	89			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	108			80-120	Pass	
Barium	%	113			80-120	Pass	
Beryllium	%	103			80-120	Pass	
Boron	%	94			80-120	Pass	
Cadmium	%	110			80-120	Pass	
Chromium	%	108			80-120	Pass	
Cobalt	%	107			80-120	Pass	
Copper	%	109			80-120	Pass	
Lead	%	108			80-120	Pass	
Manganese	%	109			80-120	Pass	
Mercury	%	97			80-120	Pass	
Molybdenum	%	110			80-120	Pass	
Nickel	%	104			80-120	Pass	
Selenium	%	107			80-120	Pass	
Silver	%	111			80-120	Pass	
Tin	%	108			80-120	Pass	
Zinc	%	109			80-120	Pass	
LCS - % Recovery							
Chromium (hexavalent)	%	97			70-130	Pass	
LCS - % Recovery							
Acid Herbicides							
2,4-D	%	93			70-130	Pass	
2,4-DB	%	130			70-130	Pass	
2,4,5-T	%	124			70-130	Pass	
2,4,5-TP	%	127			70-130	Pass	
Actril (loxynil)	%	122			70-130	Pass	
Dicamba	%	102			70-130	Pass	
Dichlorprop	%	117			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Dinitro-o-cresol	%	104			70-130	Pass	
Dinoseb	%	109			70-130	Pass	
MCPA	%	105			70-130	Pass	
MCPB	%	104			70-130	Pass	
Mecoprop	%	121			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	117			70-130	Pass	
Acenaphthylene	%	86			70-130	Pass	
Anthracene	%	115			70-130	Pass	
Benz(a)anthracene	%	75			70-130	Pass	
Benzo(a)pyrene	%	127			70-130	Pass	
Benzo(b&j)fluoranthene	%	81			70-130	Pass	
Benzo(g,h,i)perylene	%	115			70-130	Pass	
Benzo(k)fluoranthene	%	83			70-130	Pass	
Chrysene	%	86			70-130	Pass	
Dibenz(a,h)anthracene	%	118			70-130	Pass	
Fluoranthene	%	113			70-130	Pass	
Fluorene	%	127			70-130	Pass	
Indeno(1,2,3-cd)pyrene	%	115			70-130	Pass	
Naphthalene	%	116			70-130	Pass	
Phenanthrene	%	105			70-130	Pass	
Pyrene	%	118			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	78			70-130	Pass	
LCS - % Recovery							
NEPM 2013 Acid Herbicides							
Picloram	%	127			70-130	Pass	
2,4-D	%	100			70-130	Pass	
2,4,5-T	%	125			70-130	Pass	
MCPA	%	104			70-130	Pass	
MCPB	%	118			70-130	Pass	
Mecoprop	%	121			70-130	Pass	
LCS - % Recovery							
NEPM 2013 Organochlorine Pesticides							
Endosulfan sulphate	%	91			70-130	Pass	
Mirex	%	80			70-130	Pass	
4,4'-DDD	%	101			70-130	Pass	
4,4'-DDE	%	86			70-130	Pass	
4,4'-DDT	%	103			70-130	Pass	
Aldrin	%	80			70-130	Pass	
Chlordanes - Total	%	80			70-130	Pass	
Dieldrin	%	76			70-130	Pass	
Endosulfan I	%	73			70-130	Pass	
Endosulfan II	%	77			70-130	Pass	
Endrin	%	85			70-130	Pass	
Heptachlor	%	88			70-130	Pass	
Hexachlorobenzene	%	93			70-130	Pass	
Methoxychlor	%	122			70-130	Pass	
LCS - % Recovery							
NEPM 2013 Phenols							
2-Methylphenol (o-Cresol)	%	86			25-140	Pass	
3&4-Methylphenol (m&p-Cresol)	%	43			25-140	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Pentachlorophenol			%	51			25-140	Pass	
Phenol			%	109			25-140	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH C6-C9	M22-Ap0043086	NCP	%	108			70-130	Pass	
TRH C10-C14	M22-Ap0035286	NCP	%	108			70-130	Pass	
Naphthalene	M22-Ap0043086	NCP	%	76			70-130	Pass	
TRH C6-C10	M22-Ap0043086	NCP	%	100			70-130	Pass	
TRH >C10-C16	M22-Ap0035286	NCP	%	115			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M22-Ap0043086	NCP	%	76			70-130	Pass	
Toluene	M22-Ap0043086	NCP	%	80			70-130	Pass	
Ethylbenzene	M22-Ap0043086	NCP	%	81			70-130	Pass	
m&p-Xylenes	M22-Ap0043086	NCP	%	92			70-130	Pass	
o-Xylene	M22-Ap0043086	NCP	%	74			70-130	Pass	
Xylenes - Total*	M22-Ap0043086	NCP	%	86			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Manganese	M22-Ap0041475	NCP	%	104			75-125	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	M22-Ap0043514	NCP	%	85			70-130	Pass	
4,4'-DDD	M22-Ap0043514	NCP	%	85			70-130	Pass	
4,4'-DDE	M22-Ap0043514	NCP	%	92			70-130	Pass	
4,4'-DDT	M22-Ap0043514	NCP	%	123			70-130	Pass	
a-HCH	M22-Ap0043514	NCP	%	106			70-130	Pass	
Aldrin	M22-Ap0043514	NCP	%	84			70-130	Pass	
b-HCH	M22-Ap0043514	NCP	%	72			70-130	Pass	
d-HCH	M22-Ap0043514	NCP	%	104			70-130	Pass	
Dieldrin	M22-Ap0043514	NCP	%	79			70-130	Pass	
Endosulfan I	M22-Ap0043514	NCP	%	83			70-130	Pass	
Endosulfan II	M22-Ap0043514	NCP	%	78			70-130	Pass	
Endosulfan sulphate	M22-Ap0043514	NCP	%	101			70-130	Pass	
Endrin	M22-Ap0043514	NCP	%	92			70-130	Pass	
Endrin aldehyde	M22-Ap0043514	NCP	%	76			70-130	Pass	
Endrin ketone	M22-Ap0043514	NCP	%	103			70-130	Pass	
g-HCH (Lindane)	M22-Ap0043514	NCP	%	126			70-130	Pass	
Heptachlor	M22-Ap0043514	NCP	%	99			70-130	Pass	
Heptachlor epoxide	M22-Ap0043514	NCP	%	81			70-130	Pass	
Hexachlorobenzene	M22-Ap0043514	NCP	%	99			70-130	Pass	
Methoxychlor	M22-Ap0043514	NCP	%	97			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M22-Ap0038156	CP	%	78			75-125	Pass	
Beryllium	M22-Ap0038156	CP	%	97			75-125	Pass	
Boron	M22-Ap0038156	CP	%	91			75-125	Pass	
Cadmium	M22-Ap0038156	CP	%	109			75-125	Pass	
Chromium	M22-Ap0038156	CP	%	82			75-125	Pass	
Cobalt	M22-Ap0038156	CP	%	105			75-125	Pass	
Copper	M22-Ap0038156	CP	%	99			75-125	Pass	
Lead	M22-Ap0038156	CP	%	103			75-125	Pass	
Mercury	M22-Ap0038156	CP	%	103			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Molybdenum	M22-Ap0038156	CP	%	105			75-125	Pass	
Nickel	M22-Ap0038156	CP	%	99			75-125	Pass	
Selenium	M22-Ap0038156	CP	%	89			75-125	Pass	
Silver	M22-Ap0038156	CP	%	111			75-125	Pass	
Tin	M22-Ap0038156	CP	%	109			75-125	Pass	
Zinc	M22-Ap0038156	CP	%	96			75-125	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Bifenthrin	M22-Ap0031223	NCP	%	97			70-130	Pass	
Spike - % Recovery									
				Result 1					
Chromium (hexavalent)	M22-Ap0038456	NCP	%	60			70-130	Fail	Q08
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M22-Ap0034145	NCP	%	84			70-130	Pass	
Acenaphthylene	M22-Ap0034145	NCP	%	89			70-130	Pass	
Anthracene	M22-Ap0034145	NCP	%	87			70-130	Pass	
Benz(a)anthracene	M22-Ap0034145	NCP	%	82			70-130	Pass	
Benzo(a)pyrene	M22-Ap0034145	NCP	%	87			70-130	Pass	
Benzo(b&j)fluoranthene	M22-Ap0034145	NCP	%	71			70-130	Pass	
Benzo(g,h,i)perylene	M22-Ap0034145	NCP	%	82			70-130	Pass	
Benzo(k)fluoranthene	M22-Ap0034145	NCP	%	119			70-130	Pass	
Chrysene	M22-Ap0034145	NCP	%	102			70-130	Pass	
Dibenz(a,h)anthracene	M22-Ap0034145	NCP	%	79			70-130	Pass	
Fluoranthene	M22-Ap0034145	NCP	%	75			70-130	Pass	
Fluorene	M22-Ap0034145	NCP	%	85			70-130	Pass	
Indeno(1,2,3-cd)pyrene	M22-Ap0034145	NCP	%	78			70-130	Pass	
Naphthalene	M22-Ap0034145	NCP	%	82			70-130	Pass	
Phenanthrene	M22-Ap0034145	NCP	%	80			70-130	Pass	
Pyrene	M22-Ap0034145	NCP	%	78			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1016	M22-Ap0035793	NCP	%	100			70-130	Pass	
Aroclor-1260	M22-Ap0035793	NCP	%	117			70-130	Pass	
Spike - % Recovery									
NEPM 2013 Organochlorine Pesticides				Result 1					
Mirex	M22-Ap0031223	NCP	%	84			70-130	Pass	
Spike - % Recovery									
NEPM 2013 Phenols				Result 1					
2-Methylphenol (o-Cresol)	M22-Ap0034145	NCP	%	66			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	M22-Ap0034145	NCP	%	99			30-130	Pass	
Pentachlorophenol	M22-Ap0034145	NCP	%	44			30-130	Pass	
Phenol	M22-Ap0034145	NCP	%	74			30-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M22-Ap0038166	CP	%	101			75-125	Pass	
Beryllium	M22-Ap0038166	CP	%	102			75-125	Pass	
Boron	M22-Ap0038166	CP	%	93			75-125	Pass	
Cadmium	M22-Ap0038166	CP	%	113			75-125	Pass	
Chromium	M22-Ap0038166	CP	%	84			75-125	Pass	
Cobalt	M22-Ap0038166	CP	%	101			75-125	Pass	
Copper	M22-Ap0038166	CP	%	105			75-125	Pass	
Lead	M22-Ap0038166	CP	%	111			75-125	Pass	
Mercury	M22-Ap0038166	CP	%	105			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Molybdenum	M22-Ap0038166	CP	%	111			75-125	Pass	
Nickel	M22-Ap0038166	CP	%	100			75-125	Pass	
Selenium	M22-Ap0038166	CP	%	94			75-125	Pass	
Silver	M22-Ap0038166	CP	%	112			75-125	Pass	
Tin	M22-Ap0038166	CP	%	110			75-125	Pass	
Zinc	M22-Ap0038166	CP	%	106			75-125	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M22-Ap0038178	CP	%	96			75-125	Pass	
Barium	M22-Ap0038178	CP	%	101			75-125	Pass	
Beryllium	M22-Ap0038178	CP	%	83			75-125	Pass	
Boron	M22-Ap0038178	CP	%	93			75-125	Pass	
Cadmium	M22-Ap0038178	CP	%	122			75-125	Pass	
Chromium	M22-Ap0038178	CP	%	118			75-125	Pass	
Cobalt	M22-Ap0038178	CP	%	103			75-125	Pass	
Copper	M22-Ap0038178	CP	%	94			75-125	Pass	
Lead	M22-Ap0038178	CP	%	97			75-125	Pass	
Mercury	M22-Ap0038178	CP	%	116			75-125	Pass	
Molybdenum	M22-Ap0038178	CP	%	94			75-125	Pass	
Nickel	M22-Ap0038178	CP	%	92			75-125	Pass	
Selenium	M22-Ap0038178	CP	%	78			75-125	Pass	
Silver	M22-Ap0038178	CP	%	121			75-125	Pass	
Tin	M22-Ap0038178	CP	%	94			75-125	Pass	
Zinc	M22-Ap0038178	CP	%	97			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C10-C14	M22-Ap0035285	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M22-Ap0035285	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M22-Ap0035285	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C10-C16	M22-Ap0035285	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M22-Ap0035285	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M22-Ap0035285	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	L22-Ap0039404	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-HCH	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-HCH	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-HCH	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-HCH (Lindane)	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate								
Organochlorine Pesticides				Result 1	Result 2	RPD		
Methoxychlor	L22-Ap0039404	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Toxaphene	L22-Ap0039404	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	M22-Ap0038145	CP	%	24	23	3.0	30%	Pass
Duplicate								
Cation Exchange Capacity				Result 1	Result 2	RPD		
Cation Exchange Capacity	B22-Ap0018967	NCP	meq/100g	25	23	8.0	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	M22-Ap0038155	CP	mg/kg	2.3	2.2	3.0	30%	Pass
Barium	M22-Ap0038155	CP	mg/kg	230	200	16	30%	Pass
Beryllium	M22-Ap0038155	CP	mg/kg	< 2	< 2	<1	30%	Pass
Boron	M22-Ap0038155	CP	mg/kg	< 10	< 10	<1	30%	Pass
Cadmium	M22-Ap0038155	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	M22-Ap0038155	CP	mg/kg	98	90	8.0	30%	Pass
Cobalt	M22-Ap0038155	CP	mg/kg	37	32	14	30%	Pass
Copper	M22-Ap0038155	CP	mg/kg	42	36	15	30%	Pass
Lead	M22-Ap0038155	CP	mg/kg	26	23	14	30%	Pass
Manganese	M22-Ap0038155	CP	mg/kg	8600	7500	13	30%	Pass
Mercury	M22-Ap0038155	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Molybdenum	M22-Ap0038155	CP	mg/kg	< 5	< 5	<1	30%	Pass
Nickel	M22-Ap0038155	CP	mg/kg	38	32	17	30%	Pass
Selenium	M22-Ap0038155	CP	mg/kg	< 2	< 2	<1	30%	Pass
Silver	M22-Ap0038155	CP	mg/kg	< 2	< 2	<1	30%	Pass
Tin	M22-Ap0038155	CP	mg/kg	< 10	< 10	<1	30%	Pass
Zinc	M22-Ap0038155	CP	mg/kg	31	25	19	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	M22-Ap0038155	CP	%	33	34	3.0	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	M22-Ap0038156	CP	mg/kg	2.9	2.8	2.0	30%	Pass
Barium	M22-Ap0038156	CP	mg/kg	320	320	1.0	30%	Pass
Beryllium	M22-Ap0038156	CP	mg/kg	< 2	< 2	<1	30%	Pass
Boron	M22-Ap0038156	CP	mg/kg	< 10	< 10	<1	30%	Pass
Cadmium	M22-Ap0038156	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	M22-Ap0038156	CP	mg/kg	87	89	2.0	30%	Pass
Cobalt	M22-Ap0038156	CP	mg/kg	64	64	1.0	30%	Pass
Copper	M22-Ap0038156	CP	mg/kg	53	53	1.0	30%	Pass
Lead	M22-Ap0038156	CP	mg/kg	30	30	1.0	30%	Pass
Manganese	M22-Ap0038156	CP	mg/kg	13000	13000	2.0	30%	Pass
Mercury	M22-Ap0038156	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Molybdenum	M22-Ap0038156	CP	mg/kg	< 5	< 5	<1	30%	Pass
Nickel	M22-Ap0038156	CP	mg/kg	48	48	<1	30%	Pass
Selenium	M22-Ap0038156	CP	mg/kg	< 2	< 2	<1	30%	Pass
Silver	M22-Ap0038156	CP	mg/kg	< 2	< 2	<1	30%	Pass
Tin	M22-Ap0038156	CP	mg/kg	< 10	< 10	<1	30%	Pass
Zinc	M22-Ap0038156	CP	mg/kg	41	42	2.0	30%	Pass

Duplicate								
Acid Herbicides				Result 1	Result 2	RPD		
2.4-D	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
2.4-DB	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
2.4.5-T	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
2.4.5-TP	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Actril (loxylin)	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dicamba	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dichlorprop	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dinitro-o-cresol	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dinoseb	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
MCPA	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
MCPB	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Mecoprop	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
NEPM 2013 Acid Herbicides				Result 1	Result 2	RPD		
Picloram	M22-Ap0038157	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Organochlorine Pesticides				Result 1	Result 2	RPD		
Bifenthrin	M22-Ap0038470	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
Chromium (hexavalent)	M22-Ap0046078	NCP	mg/kg	< 1	< 1	<1	30%	Pass
Duplicate								
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD		
Acenaphthene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Acenaphthylene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Anthracene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benz(a)anthracene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(a)pyrene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(b&j)fluoranthene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(g,h,i)perylene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(k)fluoranthene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Chrysene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dibenz(a,h)anthracene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluoranthene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluorene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Indeno(1,2,3-cd)pyrene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Naphthalene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Phenanthrene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Pyrene	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Organophosphorus Pesticides				Result 1	Result 2	RPD		
Chlorpyrifos	M22-Ap0038470	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Duplicate								
Polychlorinated Biphenyls				Result 1	Result 2	RPD		
Aroclor-1016	M22-Ap0038470	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1221	M22-Ap0038470	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1232	M22-Ap0038470	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1242	M22-Ap0038470	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1248	M22-Ap0038470	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1254	M22-Ap0038459	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1260	M22-Ap0038459	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Total PCB*	M22-Ap0038459	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Duplicate								
Triazines				Result 1	Result 2	RPD		
Atrazine	M22-Ap0038470	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass

Duplicate								
NEPM 2013 Acid Herbicides				Result 1	Result 2	RPD		
Picloram	M22-Ap0035284	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
NEPM 2013 Organochlorine Pesticides				Result 1	Result 2	RPD		
Mirex	M22-Ap0038470	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Duplicate								
NEPM 2013 Phenols				Result 1	Result 2	RPD		
2-Methylphenol (o-Cresol)	M22-Ap0038470	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
3&4-Methylphenol (m&p-Cresol)	M22-Ap0038470	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Pentachlorophenol	M22-Ap0038470	NCP	mg/kg	< 1	< 1	<1	30%	Pass
Phenol	M22-Ap0038470	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	M22-Ap0038165	CP	mg/kg	< 2	2.2	16	30%	Pass
Barium	M22-Ap0038165	CP	mg/kg	280	320	11	30%	Pass
Beryllium	M22-Ap0038165	CP	mg/kg	< 2	< 2	<1	30%	Pass
Boron	M22-Ap0038165	CP	mg/kg	< 10	< 10	<1	30%	Pass
Cadmium	M22-Ap0038165	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	M22-Ap0038165	CP	mg/kg	280	250	13	30%	Pass
Cobalt	M22-Ap0038165	CP	mg/kg	150	170	14	30%	Pass
Copper	M22-Ap0038165	CP	mg/kg	33	32	3.0	30%	Pass
Lead	M22-Ap0038165	CP	mg/kg	9.2	9.4	2.0	30%	Pass
Manganese	M22-Ap0038165	CP	mg/kg	4500	5500	22	30%	Pass
Mercury	M22-Ap0038165	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Molybdenum	M22-Ap0038165	CP	mg/kg	< 5	< 5	<1	30%	Pass
Nickel	M22-Ap0038165	CP	mg/kg	100	110	6.0	30%	Pass
Selenium	M22-Ap0038165	CP	mg/kg	< 2	< 2	<1	30%	Pass
Silver	M22-Ap0038165	CP	mg/kg	< 2	< 2	<1	30%	Pass
Tin	M22-Ap0038165	CP	mg/kg	< 10	< 10	<1	30%	Pass
Zinc	M22-Ap0038165	CP	mg/kg	93	92	1.0	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	M22-Ap0038165	CP	%	21	18	16	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	M22-Ap0038166	CP	mg/kg	2.5	2.6	2.0	30%	Pass
Barium	M22-Ap0038166	CP	mg/kg	76	76	1.0	30%	Pass
Beryllium	M22-Ap0038166	CP	mg/kg	< 2	< 2	<1	30%	Pass
Boron	M22-Ap0038166	CP	mg/kg	< 10	< 10	<1	30%	Pass
Cadmium	M22-Ap0038166	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	M22-Ap0038166	CP	mg/kg	43	43	<1	30%	Pass
Cobalt	M22-Ap0038166	CP	mg/kg	23	24	1.0	30%	Pass
Copper	M22-Ap0038166	CP	mg/kg	8.1	8.2	1.0	30%	Pass
Lead	M22-Ap0038166	CP	mg/kg	11	11	1.0	30%	Pass
Manganese	M22-Ap0038166	CP	mg/kg	1400	1500	1.0	30%	Pass
Mercury	M22-Ap0038166	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Molybdenum	M22-Ap0038166	CP	mg/kg	< 5	< 5	<1	30%	Pass
Nickel	M22-Ap0038166	CP	mg/kg	12	12	1.0	30%	Pass
Selenium	M22-Ap0038166	CP	mg/kg	< 2	< 2	<1	30%	Pass
Silver	M22-Ap0038166	CP	mg/kg	< 2	< 2	<1	30%	Pass
Tin	M22-Ap0038166	CP	mg/kg	< 10	< 10	<1	30%	Pass
Zinc	M22-Ap0038166	CP	mg/kg	24	24	3.0	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	M22-Ap0043089	NCP	pH Units	6.7	6.8	pass	30%	Pass

Duplicate								
				Result 1	Result 2	RPD		
Conductivity (1:5 aqueous extract at 25°C as rec.)	M22-Ap0038168	CP	uS/cm	43	43	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	M22-Ap0038172	CP	mg/kg	< 2	< 2	<1	30%	Pass
Barium	M22-Ap0038172	CP	mg/kg	150	140	7.0	30%	Pass
Beryllium	M22-Ap0038172	CP	mg/kg	< 2	< 2	<1	30%	Pass
Boron	M22-Ap0038172	CP	mg/kg	< 10	< 10	<1	30%	Pass
Cadmium	M22-Ap0038172	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	M22-Ap0038172	CP	mg/kg	120	110	8.0	30%	Pass
Cobalt	M22-Ap0038172	CP	mg/kg	22	20	7.0	30%	Pass
Copper	M22-Ap0038172	CP	mg/kg	50	45	10	30%	Pass
Lead	M22-Ap0038172	CP	mg/kg	23	21	8.0	30%	Pass
Manganese	M22-Ap0038172	CP	mg/kg	5100	4700	8.0	30%	Pass
Mercury	M22-Ap0038172	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Molybdenum	M22-Ap0038172	CP	mg/kg	< 5	< 5	<1	30%	Pass
Nickel	M22-Ap0038172	CP	mg/kg	27	24	11	30%	Pass
Selenium	M22-Ap0038172	CP	mg/kg	< 2	< 2	<1	30%	Pass
Silver	M22-Ap0038172	CP	mg/kg	< 2	< 2	<1	30%	Pass
Tin	M22-Ap0038172	CP	mg/kg	< 10	< 10	<1	30%	Pass
Zinc	M22-Ap0038172	CP	mg/kg	26	23	11	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	M22-Ap0038175	CP	%	21	20	3.0	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD		
TRH C6-C9	M22-Ap0038176	CP	mg/kg	< 20	< 20	<1	30%	Pass
Naphthalene	M22-Ap0038176	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
TRH C6-C10	M22-Ap0038176	CP	mg/kg	< 20	< 20	<1	30%	Pass
Duplicate								
BTEX				Result 1	Result 2	RPD		
Benzene	M22-Ap0038176	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Toluene	M22-Ap0038176	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Ethylbenzene	M22-Ap0038176	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
m&p-Xylenes	M22-Ap0038176	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
o-Xylene	M22-Ap0038176	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Xylenes - Total*	M22-Ap0038176	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	M22-Ap0038178	CP	mg/kg	< 2	< 2	<1	30%	Pass
Barium	M22-Ap0038178	CP	mg/kg	57	58	2.0	30%	Pass
Beryllium	M22-Ap0038178	CP	mg/kg	< 2	< 2	<1	30%	Pass
Boron	M22-Ap0038178	CP	mg/kg	< 10	< 10	<1	30%	Pass
Cadmium	M22-Ap0038178	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	M22-Ap0038178	CP	mg/kg	26	26	1.0	30%	Pass
Cobalt	M22-Ap0038178	CP	mg/kg	12	12	1.0	30%	Pass
Copper	M22-Ap0038178	CP	mg/kg	6.8	6.9	2.0	30%	Pass
Lead	M22-Ap0038178	CP	mg/kg	14	15	<1	30%	Pass
Manganese	M22-Ap0038178	CP	mg/kg	1200	1200	<1	30%	Pass
Mercury	M22-Ap0038178	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Molybdenum	M22-Ap0038178	CP	mg/kg	< 5	< 5	<1	30%	Pass
Nickel	M22-Ap0038178	CP	mg/kg	< 5	< 5	<1	30%	Pass
Selenium	M22-Ap0038178	CP	mg/kg	< 2	< 2	<1	30%	Pass
Silver	M22-Ap0038178	CP	mg/kg	< 2	< 2	<1	30%	Pass

Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Tin	M22-Ap0038178	CP	mg/kg	< 10	< 10	<1	30%	Pass
Zinc	M22-Ap0038178	CP	mg/kg	8.0	7.9	1.0	30%	Pass

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.

Authorised by:

Harry Bacalis	Analytical Services Manager
Scott Beddoes	Senior Analyst (NSW)
Mary Makarios	Senior Analyst (NSW)
Carroll Lee	Senior Analyst (NSW)
Joseph Edouard	Senior Analyst (VIC)
Edward Lee	Senior Analyst (VIC)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Revision No.: 1 / Date of Last Revision: 04/02/2022

Sheet No. 1 of 1



PROJECT NAME: LEONGATHA	Sampler's Signature: <i>TB BELFITT</i>	
Project Ref. No.: 2153	Sampler's Name: TOBE BELFITT	
	DATE: 13 APR 2022	
	Time:	

[illegible]

TOTAL:		3		3		0	1	1					1	3	
DISPATCHED BY: (sign)		(DATE/TIME)													
EUROFINS ENVIRONMENT TESTING		■ RECEIVED BY: (sign)													
△		Received: 20/4 10:08 (DATE/TIME) C/note: Carier: 													
COURIERED BY: (sign)		(DATE/TIME)													
		Temp: 17.4 C Seal: Y  LAB NAME: ALS fee / Icebricks / NA 													

INITIAL RESULTS REQUESTED WITHIN:	24Hrs	48Hrs	3-4 DAYS	NORMAL
REMARKS:				

REMARKS:	24hrs	48hrs	3-4 DAYS	NORMAL
	Please email completed COC, Sample Receipt Notification, results and invoices to:			relinquished
>	gberry@atmaenvironmental.com			Emily D
>				20/4/22 8:

NOTE: Δ Must be completed by Atma Environmental

Must be completed with date and time by laboratory.

CERTIFICATE OF ANALYSIS

Work Order : **EM2207191**
Client : **ATMA ENVIRONMENTAL P/L**
Contact : **MR GLEN BERRY**
Address : **56 William Street**
ABBOTSFORD VIC, AUSTRALIA 3067
Telephone : **+61 94296955**
Project : **2153**
Order number : **----**
C-O-C number : **----**
Sampler : **TOBE BELFITT**
Site : **----**
Quote number : **EN/333/21 Seconday work only**
No. of samples received : **3**
No. of samples analysed : **2**

Page : 1 of 5
Laboratory : Environmental Division Melbourne
Contact : Customer Services EM
Address : 4 Westall Rd Springvale VIC Australia 3171
Telephone : +61-3-8549 9600
Date Samples Received : 20-Apr-2022 10:00
Date Analysis Commenced : 26-Apr-2022
Issue Date : 28-Apr-2022 15:25



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Jarwis Nheu	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EG005-T : EM2207051 #37 Poor spike recovery for chromium due to sample matrix. Confirmed by re-digestion and re-analysis.
- EP071: EM2206916_074 Poor duplicate precision due to sample heterogeneity. Confirmed by re-extraction and re-analysis.



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				SPLIT-13422A	SPLIT-13422C	----	----	----
Sampling date / time				13-Apr-2022 00:00	13-Apr-2022 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EM2207191-001	EM2207191-003	-----	-----	-----
				Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	24.6	----	----	----	----
Moisture Content	----	1.0	%	----	13.7	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	----	<5	----	----	----
Barium	7440-39-3	10	mg/kg	----	50	----	----	----
Beryllium	7440-41-7	1	mg/kg	----	<1	----	----	----
Boron	7440-42-8	50	mg/kg	----	<50	----	----	----
Cadmium	7440-43-9	1	mg/kg	----	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	----	23	----	----	----
Cobalt	7440-48-4	2	mg/kg	----	9	----	----	----
Copper	7440-50-8	5	mg/kg	----	6	----	----	----
Lead	7439-92-1	5	mg/kg	----	12	----	----	----
Manganese	7439-96-5	5	mg/kg	----	942	----	----	----
Nickel	7440-02-0	2	mg/kg	----	5	----	----	----
Selenium	7782-49-2	5	mg/kg	----	<5	----	----	----
Vanadium	7440-62-2	5	mg/kg	----	43	----	----	----
Zinc	7440-66-6	5	mg/kg	----	6	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	<0.1	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg	<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	110	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	110	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	SPLIT-13422A	SPLIT-13422C	----	----	----
Sampling date / time					13-Apr-2022 00:00	13-Apr-2022 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EM2207191-001	EM2207191-003	-----	-----	-----
				Result	Result		----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ >C10 - C16 Fraction minus Naphthalene (F2)		----	50	mg/kg	<50	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	----	----	----
^ Sum of BTEX		----	0.2	mg/kg	<0.2	----	----	----	----
^ Total Xylenes		----	0.5	mg/kg	<0.5	----	----	----	----
Naphthalene		91-20-3	1	mg/kg	<1	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		65.6	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		72.2	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		78.4	----	----	----	----



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	51	125
Toluene-D8	2037-26-5	55	125
4-Bromofluorobenzene	460-00-4	56	124

QUALITY CONTROL REPORT

Work Order	: EM2207191	Page	: 1 of 7
Client	: ATMA ENVIRONMENTAL P/L	Laboratory	: Environmental Division Melbourne
Contact	: MR GLEN BERRY	Contact	: Customer Services EM
Address	: 56 William Street ABBOTSFORD VIC, AUSTRALIA 3067	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: +61 94296955	Telephone	: +61-3-8549 9600
Project	: 2153	Date Samples Received	: 20-Apr-2022
Order number	: ----	Date Analysis Commenced	: 26-Apr-2022
C-O-C number	: ----	Issue Date	: 28-Apr-2022
Sampler	: TOBE BELFITT		
Site	:		
Quote number	: EN/333/21 Seconday work only		
No. of samples received	: 3		
No. of samples analysed	: 2		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Jarwis Nheu	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 4302589)									
EM2207051-033	Anonymous	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	<10	<10	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Cobalt	7440-48-4	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	5	<5	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.0	No Limit
EM2207051-054	Anonymous	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	70	40	42.2	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	15	14	8.4	No Limit
		EG005T: Cobalt	7440-48-4	2	mg/kg	10	10	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	38	38	0.0	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	5	5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	20	20	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	45	27	49.5	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	244	258	5.5	0% - 20%



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 4302589) - continued									
EM2207051-054	Anonymous	EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	19	19	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	82	65	22.7	0% - 50%
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.0	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4302879)									
EM2207126-006	Anonymous	EA055: Moisture Content	----	0.1	%	32.9	31.9	3.0	0% - 20%
EM2207207-001	Anonymous	EA055: Moisture Content	----	0.1	%	3.0	2.9	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 4302590)									
EM2207051-033	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EM2207051-054	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4302128)									
EM2207191-001	SPLIT-13422A	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EM2207204-018	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4302177)									
EM2206916-074	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	2730	# 3620	28.2	0% - 20%
		EP071: C29 - C36 Fraction	----	100	mg/kg	1290	# 2000	43.5	0% - 20%
		EP071: C10 - C14 Fraction	----	50	mg/kg	70	80	25.1	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	4090	# 5700	32.9	0% - 20%
EM2207207-035	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4302128)									
EM2207191-001	SPLIT-13422A	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EM2207204-018	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4302177)									
EM2206916-074	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	3740	# 5260	33.9	0% - 20%
		EP071: >C34 - C40 Fraction	----	100	mg/kg	380	570	39.8	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	190	220	16.2	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	4310	# 6050	33.6	0% - 20%
EM2207207-035	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEXN (QC Lot: 4302128)									
EM2207191-001	SPLIT-13422A	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Page : 4 of 7
 Work Order : EM2207191
 Client : ATMA ENVIRONMENTAL P/L
 Project : 2153



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP080: BTEXN (QC Lot: 4302128) - continued									
EM2207191-001	SPLIT-13422A	EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
EM2207204-018	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit



Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 4302589)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	123 mg/kg	100	70.0	130
EG005T: Barium	7440-39-3	10	mg/kg	<10	99.3 mg/kg	99.9	70.0	130
EG005T: Beryllium	7440-41-7	1	mg/kg	<1	0.67 mg/kg	105	70.0	130
EG005T: Boron	7440-42-8	50	mg/kg	<50	----	----	----	----
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	1.23 mg/kg	57.0	50.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	20.2 mg/kg	105	70.0	130
EG005T: Cobalt	7440-48-4	2	mg/kg	<2	11.2 mg/kg	88.5	70.0	130
EG005T: Copper	7440-50-8	5	mg/kg	<5	55.9 mg/kg	94.6	70.0	130
EG005T: Lead	7439-92-1	5	mg/kg	<5	62.4 mg/kg	94.8	70.0	130
EG005T: Manganese	7439-96-5	5	mg/kg	<5	590 mg/kg	91.6	70.0	130
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.4 mg/kg	96.9	70.0	130
EG005T: Selenium	7782-49-2	5	mg/kg	<5	----	----	----	----
EG005T: Vanadium	7440-62-2	5	mg/kg	<5	61.3 mg/kg	98.7	70.0	130
EG005T: Zinc	7440-66-6	5	mg/kg	<5	162 mg/kg	75.8	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4302590)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.64 mg/kg	88.3	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4302128)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	94.2	58.6	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4302177)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	700 mg/kg	107	75.0	128
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	2930 mg/kg	111	82.0	123
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1380 mg/kg	114	82.4	121
EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	5010 mg/kg	111	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4302128)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	90.8	59.3	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4302177)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	1030 mg/kg	104	77.0	130
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	3680 mg/kg	119	81.5	120
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	270 mg/kg	110	73.3	137
EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	4980 mg/kg	116	70.0	130
EP080: BTEXN (QCLot: 4302128)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	91.1	61.6	117
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	96.9	65.8	125



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result			Low	High
EP080: BTEXN (QCLot: 4302128) - continued								
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	93.6	65.8	124
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	4 mg/kg	98.8	64.8	134
	106-42-3							
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	95.9	68.7	132
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	86.2	61.8	123

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 4302589)							
EM2207051-037	Anonymous	EG005T: Chromium	7440-47-3	50 mg/kg	# 47.7	79.0	121
EM2207051-037	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	103	78.0	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	97.3	79.7	116
		EG005T: Copper	7440-50-8	250 mg/kg	101	80.0	120
		EG005T: Lead	7439-92-1	250 mg/kg	98.6	80.0	120
		EG005T: Nickel	7440-02-0	50 mg/kg	104	78.0	120
		EG005T: Zinc	7440-66-6	250 mg/kg	110	80.0	120
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4302590)							
EM2207051-037	Anonymous	EG035T: Mercury	7439-97-6	0.5 mg/kg	101	76.0	116
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4302128)							
EM2207204-002	Anonymous	EP080: C6 - C9 Fraction	----	28 mg/kg	80.3	33.4	124
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4302177)							
EM2206916-079	Anonymous	EP071: C10 - C14 Fraction	----	700 mg/kg	101	71.2	125
		EP071: C15 - C28 Fraction	----	2930 mg/kg	104	75.6	122
		EP071: C29 - C36 Fraction	----	1380 mg/kg	108	78.0	120
		EP071: C10 - C36 Fraction (sum)	----	5010 mg/kg	107	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4302128)							
EM2207204-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	76.0	30.8	120
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4302177)							
EM2206916-079	Anonymous	EP071: >C10 - C16 Fraction	----	1030 mg/kg	97.9	72.2	128
		EP071: >C16 - C34 Fraction	----	3680 mg/kg	112	76.5	119
		EP071: >C34 - C40 Fraction	----	270 mg/kg	105	66.8	138
		EP071: >C10 - C40 Fraction (sum)	----	4980 mg/kg	109	70.0	130



Sub-Matrix: SOIL

Laboratory sample IDSample IDMethod: CompoundCAS Number				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
				Concentration	MS	Low	High
EP080: BTEXN (QCLot: 4302128)							
EM2207204-002	Anonymous	EP080: Benzene	71-43-2	2 mg/kg	86.1	54.4	127
		EP080: Toluene	108-88-3	2 mg/kg	99.7	57.1	131

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EM2207191	Page	: 1 of 5
Client	: ATMA ENVIRONMENTAL P/L	Laboratory	: Environmental Division Melbourne
Contact	: MR GLEN BERRY	Telephone	: +61-3-8549 9600
Project	: 2153	Date Samples Received	: 20-Apr-2022
Site	:	Issue Date	: 28-Apr-2022
Sampler	: TOBE BELFITT	No. of samples received	: 3
Order number	: ----	No. of samples analysed	: 2

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Laboratory Control outliers occur.
- Duplicate outliers exist - please see following pages for full details.
- Matrix Spike outliers exist - please see following pages for full details.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- **NO** Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP080/071: Total Petroleum Hydrocarbons	EM2206916--074	Anonymous	C15 - C28 Fraction	----	28.2 %	0% - 20%	RPD exceeds LOR based limits
EP080/071: Total Petroleum Hydrocarbons	EM2206916--074	Anonymous	C29 - C36 Fraction	----	43.5 %	0% - 20%	RPD exceeds LOR based limits
EP080/071: Total Petroleum Hydrocarbons	EM2206916--074	Anonymous	C10 - C36 Fraction (sum)	----	32.9 %	0% - 20%	RPD exceeds LOR based limits
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	EM2206916--074	Anonymous	>C16 - C34 Fraction	----	33.9 %	0% - 20%	RPD exceeds LOR based limits
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	EM2206916--074	Anonymous	>C10 - C40 Fraction (sum)	----	33.6 %	0% - 20%	RPD exceeds LOR based limits
Matrix Spike (MS) Recoveries							
EG005(ED093)T: Total Metals by ICP-AES	EM2207051--037	Anonymous	Chromium	7440-47-3	47.7 %	79.0-121%	Recovery less than lower data quality objective

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) SPLIT-13422A, SPLIT-13422C	13-Apr-2022	----	----	----	26-Apr-2022	27-Apr-2022	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) SPLIT-13422C	13-Apr-2022	26-Apr-2022	10-Oct-2022	✓	26-Apr-2022	10-Oct-2022	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) SPLIT-13422C	13-Apr-2022	26-Apr-2022	11-May-2022	✓	26-Apr-2022	11-May-2022	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080) SPLIT-13422A	13-Apr-2022	26-Apr-2022	27-Apr-2022	✓	26-Apr-2022	27-Apr-2022	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080) SPLIT-13422A	13-Apr-2022	26-Apr-2022	27-Apr-2022	✓	26-Apr-2022	27-Apr-2022	✓



Matrix: SOIL

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080) SPLIT-13422A	13-Apr-2022	26-Apr-2022	27-Apr-2022	✓	26-Apr-2022	27-Apr-2022	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Total Mercury by FIMS	EG035T	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Total Mercury by FIMS	EG035T	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Total Mercury by FIMS	EG035T	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl ₂) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM Schedule B(3).
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.
Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na ₂ SO ₄ and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.



Appendix B: ProUCL inputs and outputs

Concentrations in soil (mg/kg)

Cobalt	Manganese
24	5300
320	6200
46	6200
17	4600
18	4500
15	3700
13	3600
5	68
16	2800
33	10000
37	8600
64	13000
77	7700
79	6600
66	3500
17	1200
23	5000
29	6400
38	7000
37	3900
150	4500
23	1400
18	4200
17	5600
17	1500
14	1900
26	7300
22	5100
13	1400
15	1700
10	690

UCL Statistics for Uncensored Full Data Sets

User Selected Options

Date/Time of Computation	ProUCL 5.12/05/2022 3:14:00 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Cobalt

General Statistics

Total Number of Observations	31	Number of Distinct Observations	23
		Number of Missing Observations	0
Minimum	5	Mean	41.9
Maximum	320	Median	23
SD	59.24	Std. Error of Mean	10.64
Coefficient of Variation	1.414	Skewness	3.866

Normal GOF Test

Shapiro Wilk Test Statistic	0.525	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.929	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.3	Lilliefors GOF Test
5% Lilliefors Critical Value	0.156	Data Not Normal at 5% Significance Level
Data Not Normal at 5% Significance Level		

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	59.96	95% Adjusted-CLT UCL (Chen-1995)	67.3
		95% Modified-t UCL (Johnson-1978)	61.19

Gamma GOF Test

A-D Test Statistic	1.969	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.769	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.198	Kolmogorov-Smirnov Gamma GOF Test
5% K-S Critical Value	0.161	Data Not Gamma Distributed at 5% Significance Level
Data Not Gamma Distributed at 5% Significance Level		

Gamma Statistics

k hat (MLE)	1.279	k star (bias corrected MLE)	1.177
Theta hat (MLE)	32.77	Theta star (bias corrected MLE)	35.61
nu hat (MLE)	79.29	nu star (bias corrected)	72.95
MLE Mean (bias corrected)	41.9	MLE Sd (bias corrected)	38.63
		Approximate Chi Square Value (0.05)	54.28
Adjusted Level of Significance	0.0413	Adjusted Chi Square Value	53.38

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	56.31	95% Adjusted Gamma UCL (use when n<50)	57.26

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.931	Shapiro Wilk Lognormal GOF Test
5% Shapiro Wilk Critical Value	0.929	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.137	Lilliefors Lognormal GOF Test
5% Lilliefors Critical Value	0.156	Data appear Lognormal at 5% Significance Level
Data appear Lognormal at 5% Significance Level		

Lognormal Statistics

Minimum of Logged Data	1.609	Mean of logged Data	3.296
Maximum of Logged Data	5.768	SD of logged Data	0.838

Assuming Lognormal Distribution

95% H-UCL	54.08	90% Chebyshev (MVUE) UCL	56.81
95% Chebyshev (MVUE) UCL	65.42	97.5% Chebyshev (MVUE) UCL	77.37
99% Chebyshev (MVUE) UCL	100.8		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	59.4	95% Jackknife UCL	59.96
95% Standard Bootstrap UCL	59.42	95% Bootstrap-t UCL	88.96
95% Hall's Bootstrap UCL	131.8	95% Percentile Bootstrap UCL	60.06
95% BCA Bootstrap UCL	70.61		
90% Chebyshev(Mean, Sd) UCL	73.82	95% Chebyshev(Mean, Sd) UCL	88.28
97.5% Chebyshev(Mean, Sd) UCL	108.3	99% Chebyshev(Mean, Sd) UCL	147.8

Suggested UCL to Use

95% H-UCL	54.08

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.

H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.

It is therefore recommended to avoid the use of H-statistic based 95% UCLs.

Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Manganese

General Statistics

Total Number of Observations	31	Number of Distinct Observations	28
		Number of Missing Observations	0
Minimum	68	Mean	4683
Maximum	13000	Median	4500
SD	2901	Std. Error of Mean	521.1
Coefficient of Variation	0.62	Skewness	0.726

Normal GOF Test

Shapiro Wilk Test Statistic	0.958	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.929	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.0893	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.156	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	5567	95% Adjusted-CLT UCL (Chen-1995)	5612
		95% Modified-t UCL (Johnson-1978)	5578

Gamma GOF Test

A-D Test Statistic	0.667	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.761	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.162	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.16	Data Not Gamma Distributed at 5% Significance Level	
Detected data follow Appr. Gamma Distribution at 5% Significance Level			

Gamma Statistics

k hat (MLE)	1.822	k star (bias corrected MLE)	1.667
Theta hat (MLE)	2571	Theta star (bias corrected MLE)	2809
nu hat (MLE)	112.9	nu star (bias corrected)	103.3
MLE Mean (bias corrected)	4683	MLE Sd (bias corrected)	3627
		Approximate Chi Square Value (0.05)	80.88
Adjusted Level of Significance	0.0413	Adjusted Chi Square Value	79.78

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	5983	95% Adjusted Gamma UCL (use when n<50)	6065

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.815	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.929	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.213	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.156	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			

Lognormal Statistics

Minimum of Logged Data	4.22	Mean of logged Data	8.153
Maximum of Logged Data	9.473	SD of logged Data	1.004

Assuming Lognormal Distribution

95% H-UCL	8975	90% Chebyshev (MVUE) UCL	9119
95% Chebyshev (MVUE) UCL	10705	97.5% Chebyshev (MVUE) UCL	12906
99% Chebyshev (MVUE) UCL	17231		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	5540	95% Jackknife UCL	5567
95% Standard Bootstrap UCL	5513	95% Bootstrap-t UCL	5665
95% Hall's Bootstrap UCL	5717	95% Percentile Bootstrap UCL	5547
95% BCA Bootstrap UCL	5573		
90% Chebyshev(Mean, Sd) UCL	6246	95% Chebyshev(Mean, Sd) UCL	6954
97.5% Chebyshev(Mean, Sd) UCL	7937	99% Chebyshev(Mean, Sd) UCL	9867

Suggested UCL to Use

95% Student's-t UCL	5567

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.



Appendix C – Titles

REGISTER SEARCH STATEMENT (Title Search) Transfer of Land Act 1958

Page 1 of 1

VOLUME 10635 FOLIO 158

Security no : 124107372745X
Produced 05/07/2023 09:49 AM

LAND DESCRIPTION

Lot F on Plan of Subdivision 448885F.

PARENT TITLES :

Volume 10601 Folio 698 to Volume 10601 Folio 699

Created by instrument PS448885F 07/03/2002

REGISTERED PROPRIETOR

Estate Fee Simple

Sole Proprietor

108 PARR ST PTY LTD of 21 HUME DRIVE LYSTERFIELD VIC 3156

AV986748J 23/08/2022

ENCUMBRANCES, CAVEATS AND NOTICES

Any encumbrances created by Section 98 Transfer of Land Act 1958 or Section 24 Subdivision Act 1988 and any other encumbrances shown or entered on the plan set out under DIAGRAM LOCATION below.

DIAGRAM LOCATION

SEE PS448885F FOR FURTHER DETAILS AND BOUNDARIES

ACTIVITY IN THE LAST 125 DAYS

NIL

-----END OF REGISTER SEARCH STATEMENT-----

Additional information: (not part of the Register Search Statement)

Street Address: 108 PARR STREET LEONGATHA VIC 3953

ADMINISTRATIVE NOTICES

NIL

eCT Control 20393M KOORNANG LEGAL SERVICES

Effective from 23/08/2022

DOCUMENT END

REGISTER SEARCH STATEMENT (Title Search) Transfer of Land Act 1958

Page 1 of 2

VOLUME 08988 FOLIO 043

Security no : 124107372898G
Produced 05/07/2023 09:52 AM

LAND DESCRIPTION

Lot 1 on Title Plan 615766W (formerly known as Lot 2 on Plan of Subdivision 098406).

PARENT TITLE Volume 08076 Folio 559

Created by instrument LP098406 06/09/1973

REGISTERED PROPRIETOR

Estate Fee Simple

TENANTS IN COMMON

As to 1 of a total of 2 equal undivided shares

Sole Proprietor

BEVAL PTY LTD of 3 MARTHA STREET SEAFORD VIC 3198

As to 1 of a total of 2 equal undivided shares

Sole Proprietor

LAMB & BELL PTY LTD of 3 MARTHA STREET SEAFORD VIC 3198

AF327620F 10/09/2007

ENCUMBRANCES, CAVEATS AND NOTICES

CAVEAT AV414308J 10/03/2022

Caveator

110 PARR ST PTY LTD ACN: 657629288

Grounds of Claim

PURCHASERS' CONTRACT WITH THE FOLLOWING PARTIES AND DATE.

Parties

THE REGISTERED PROPRIETOR(S)

Date

11/11/2021

Estate or Interest

FREEHOLD ESTATE

Prohibition

ABSOLUTELY

Lodged by

KOORNANG LEGAL SERVICES

Notices to

DANIEL DE PASQUALE of 21 HUME DRIVE Lysterfield VIC 3156

Any encumbrances created by Section 98 Transfer of Land Act 1958 or Section 24 Subdivision Act 1988 and any other encumbrances shown or entered on the plan set out under DIAGRAM LOCATION below.

DIAGRAM LOCATION

SEE TP615766W FOR FURTHER DETAILS AND BOUNDARIES

ACTIVITY IN THE LAST 125 DAYS

NIL

-----END OF REGISTER SEARCH STATEMENT-----

Additional information: (not part of the Register Search Statement)

REGISTER SEARCH STATEMENT (Title Search) Transfer of Land Act 1958

Page 2 of 2

Street Address: 110 PARR STREET LEONGATHA VIC 3953

See MI305751U for WATER FRONTAGE LICENCE details

DOCUMENT END



Appendix D – Proposed Development Plans



**RURAL SUBDIVISION
SPECIALISTS**

POTENTIAL SUBDIVISION DESIGN LAYOUT

108 & 110 PARR STREET LEONGATHA

PREPARED BY SAXIL TUXEN

Ph. 0428 858 060 e: saxil.jnr@ruralsubs.com.au

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- LSIO (OLD FLOOD EXTENT)
- NEW 1 in 100 FLOOD EXTENT - WG CMA
- WATER BODY
- BUILDING ENVELOPE