Tarraleah Redevelopment Project
Development Application

Appendix H

Contaminated Land Assessment

Hydro Tasmania

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Executive Summary

Introduction

The Hydro-Electric Corporation (Hydro Tasmania) (the Client) is looking to redevelop the Tarraleah power scheme to upgrade and replace existing infrastructure as part of the Tarraleah Redevelopment. The objectives are to replace components of the scheme that fall within a high landslip risk area and improve power station response times (the Project). The Project encompasses four main areas of land disturbance which extend from Lake King William in the west to Tarraleah and Dee in the east. These areas are shown in the Figure 1 series (Appendix A) and include a distinction between areas of proposed underground disturbance (i.e. tunnelling) versus above ground disturbance. Together, the areas are referred to as 'the Site', for the purpose of environmental (contaminated land) investigations.

Assuming the Project will be assessed by Central Highlands Council (Council) and given the identification of potentially contaminating activities (PCAs) within the Site, an Environmental Site Assessment (ESA) is required as a component of the development application (DA) to allow Council to assess the suitability of the land for the proposed works (i.e. the Project) against the relevant provisions (Clause C14.5.1 (use) and Clause C14.6.1 (excavation)) of the Potentially Contaminated Land Code (PCLC) of the Tasmanian Planning Scheme (the Planning Scheme).

Hydro Tasmania engaged Pitt & Sherry (Operations) Pty Ltd (pitt&sherry) to prepare an ESA. The ESA has been completed in three stages:

- A Preliminary Site Investigation (PSI; BlueSphere, 2024)[1], comprising a desktop review of available information and an inspection of parts of the Site
- A sampling, analysis and quality plan (SAQP; pitt&sherry, 2025[2]), including a desktop groundwater review within the Tarraleah Switchyard, to guide the intrusive investigations component of the ESA; and
- An ESA (this document) to demonstrate the suitability of Area C, where surface excavations are proposed, for ongoing use (as per zoning)[3] to accompany the DA for the Project.

Completed works

The pitt&sherry scope of work comprised:

- Implementing the sampling program detailed the SAQP (pitt&sherry, 2025) (Appendix B), including inspecting boreholes and test pits excavated using a drill rig and excavator (supplied by Hydro Tasmania), and associated soil sampling
- Waste classifying soils unsuitable to remain onsite for offsite disposal
- Assessing the potential for the Site to be contaminated and the human health and ecological risks posed by any potential or identified contamination
- Determining whether any additional intrusive investigations and/or management measures are required for the ongoing use (as per zoning)[3]; and
- Compiling the findings into an ESA report (this report).

[1] *Preliminary Site Investigation, Tarraleah Development*, BlueSphere Environmental, 15 March 2024 (PSI; BlueSphere, 2024).
[2] *Tarraleah Power Scheme – Sampling Analysis and Quality Plan, Rev01*, pitt&sherry, 19 February 2025 (SAQP; pitt&sherry, 2025).
[3] The zoning for the Site is a combination of 'Rural', 'Utilities', 'Village', 'Environmental Management' and 'Recreation' (PSI (BlueSphere, 2024)) and the most sensitive use permissible is residential.

Conclusions

Based on the findings of this ESA, and noting the limitations in Section 1.5, the following conclusions are made:

- The SAQP (pitt&sherry, 2025) (Appendix B) in response to identified PCAs within the Area C footprint subject to surface disturbance as a component of the Project was successfully implemented; deviations / additions are discussed in Section 4.4.3
- No soil contamination above adopted guideline criteria was identified
- Test pit inflow waters potential lead (Pb) contamination was identified at around 3.0 metres below ground level (m bgl) at the Tarraleah Village (from an ecological perspective)
- Potential groundwater contamination was identified:
    - In shallow / perched groundwaters beneath the Tarraleah Switchyard (select metals, total suspended solids (TSS) and select nutrients from an ecological perspective)
    - In deeper groundwaters beneath the Tarraleah Switchyard (select metals, pH, electrical conductivity (EC), TSS and select nutrients from an ecological perspective)
- The risk to human health (including intrusive maintenance workers (IMW)) and ecological receptors (terrestrial and aquatic) from identified PCAs is considered to be **low** within the Area C surface disturbance footprint under both:
    - Tarraleah Village – the proposed low-density residential land use (as per zoning)
    - Tarraleah Switchyard – the ongoing commercial / industrial land use (as per zoning); and
- A number of recommendations have been made in Section 8.2 to manage the identified low-level potential contamination risks.

In response to the PCLC objectives (Section 1.2.1), the low-density residential use (as per zoning) within the surface disturbance footprint at Tarraleah Village and the ongoing commercial / industrial land use (as per zoning) within the surface disturbance footprint at the Tarraleah Switchyard complies with:

- P1 (b) of Clause C14.5.1 (use standard) for the following reasons:
    - This ESA demonstrates that the level of contamination does not present a risk to human health or the environment and Area C is suitable for the intended use
- P1 (c) of Clause C14.6.1 (development standard for building works) for the following reasons:
    - This ESA includes recommended protection measures (i.e. a construction environmental management plan; CEMP), which must be implemented before excavation commences; and
    - If the recommended protection measures outlined in Section 8.2 are implemented, excavation will not adversely impact on human health or the environment.

Recommendations

Based on the findings of this ESA, and noting the limitations in Section 1.5, **residual low-level risks** to human health and ecological receptors should be managed by implementing the recommendations in Section 8.2.

Abbreviations

Abbreviation	Description
ACL(s)	Added contaminant limit(s)
ACM	Asbestos-containing material(s)
ADWG	*National Water Quality Management Strategy – Australian Drinking Water Guidelines 2011, updated September 2022*
AES	Areas of ecological significance
AHD	Australian Height Datum
ALS	Australian Laboratory Services
ANZG, 2018	*Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2018*, Australian and New Zealand Governments and Australian State and Territory Governments, Canberra ACT, Australia
Area A	Western portion of the Site from Lake King William – pipeline and power tunnel portal within Fourteen Mile Road, Bronte Park as shown in Figure 1a (Appendix A)
Area B	Pump station and tunnel portal – tunnel access within Fourteen Mile Road, Bronte Park as shown in Figure 1b (Appendix A)
Area C	Tarraleah power station and switchyard and Tarraleah Village, as shown in Figures 1c and 1d (Appendix A) and comprising: • Power station upgrade / replacement at the existing Tarraleah Power Station located off Lyell Highway, Tarraleah • Pump and surge tower within the Tarraleah Village, 150 Oldina Drive, Tarraleah • Tunnel portal and access within Fourteen Mile Road, Bronte Park and off the Lyell Highway, adjacent to Canal Dam; and • Tarraleah Village construction camp and associated areas, 150 Oldina Drive, Tarraleah.
Area D	Eastern portion of the Site to Dee Lagoon as shown in Figure 1e (Appendix A) and comprising: • New switchyard at the existing Tarraleah Power Station located off Lyell Highway, Tarraleah; and • Transmission line through Victoria Valley Road, Dee.
Area E	Optional tunnel portal between Area B and Area C, as shown in Figure 1b (Appendix A)
As	Arsenic
ASC NEPM	*National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended 2013*
ASS	Acid sulfate soils
BaP	Benzo(a)pyrene
BDR	Building demolition rubble
BTEXN	Benzene, toluene, ethylbenzene, xylenes and naphthalene
Cd	Cadmium
CEC	Cation exchange capacity
CEMP	Construction Environmental Management Plan
CEnvP SC	Certified Environmental Practitioner Site Contamination specialist
CoC	Chain of custody
CoPC(s)	Contaminant(s) of potential concern

Abbreviation	Description
Council	Central Highlands Council
Cr / Cr(III) / Cr(VI)	Chromium (total) / trivalent chromium / hexavalent chromium
CRC Care Technical Report No. 10	CRC Care *Technical Report No. 10 Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater*, September 2011, including errata August 2012
CSM	Conceptual site model
CT(s)	Certificate(s) of Title
Cu	Copper
DA	Development Application
DGV(s)	Default guideline value(s)
DQO(s)	Data quality objective(s)
EC	Electrical conductivity
EIL(s) / ESL(s)	Ecological Investigation Level(s) / Ecological Screening Level(s)
EMPC Act	*Environmental Management and Pollution Control Act 1994* (Tasmania)
EPA	Environment Protection Authority, Tasmania
EPA 2021	*Default Guideline Values (DGVs) for Aquatic Ecosystems of the Upper Derwent Catchment*, Environment Protection Authority Tasmania, August 2021
ESA	Environmental Site Assessment
FCR	Fine crushed rock
GDE	Groundwater dependent ecosystem(s)
HDPE	High-density polyethylene
Hg	Mercury
HIL(s) / HSL(s)	Health Investigation Level(s) / Health Screening Level(s)
Hydro Tasmania	Hydro-Electric Corporation
IB105	*Information Bulletin No. 105 Classification and Management of Contaminated Soil for Disposal, Version* 3, Environment Protection Authority Tasmania, 2018
IMW(s)	Intrusive maintenance worker(s) (i.e. construction workers)
Jd	Jurassic-age Dolerite with locally developed granophyre
kL	Kilolitre(s)
km / km^2	Kilometre(s) / square kilometre(s)
L	Litre(s)
LISTmap	Land Information System Tasmania interactive web mapping tool
LOR(s)	(Laboratory) Limit(s) of reporting
m / m^2 / m^3	Metre (s) / square metre(s) / cubic metre(s)
m bgl	Metre(s) below ground level
mm	Millimetre(s)
NATA	National Association of Testing Authorities
NDD	Non-destructive drilling
NH_3-N	Ammonia as nitrogen
NHMRC	*Guidelines for Managing Risks in Recreational Water*, National Health and Medical Research Council, 2008

Abbreviation	Description
Ni	Nickel
NO_2-N / NO_3-N	Nitrite as nitrogen / nitrate as nitrogen
NOx	Oxides of nitrogen
PAH	Polycyclic aromatic hydrocarbons
Pb	Lead
PCA(s)	Potentially contaminating activity(ies)
PCB	Polychlorinated biphenyls
PCLC	Potentially Contaminated Land Code (of the Tasmanian Planning Scheme)
PEV(s)	Protected environmental value(s)
PFAS	Perfluoroalkyl and polyfluoroalkyl substances
PFAS NEMP	*National Environmental Management Plan, Version 3, 2025*, National Chemicals Working Group of the Heads of EPAs Australia and New Zealand
PID	Photoionisation detector
pitt&sherry	Pitt & Sherry (Operations) Pty Ltd
Planning Scheme	Tasmanian Planning Scheme
ppm	Parts per million
Project	Replace components of the Tarraleah power scheme that fall within a high landslip risk area.
PSI	Preliminary Site Investigation
QA/QC	Quality assurance / quality control
Qpd	Quaternary glacial systems formed within the sand and gravel of the glacial and glacigene deposits
R, Rq and Rv	Permian-Triassic sandstone
RP	Reactive phosphorus
RPD(s)	Relative percentage difference(s)
SAQP	Sampling, Analysis and Quality Plan
Site	Areas A to E disturbance footprints, as defined in the Figure 1 series (Appendix A)
SMF	Synthetic mineral fibres
SPR	Source-pathway-receptor
SPWQM	(Tasmanian) *State Policy on Water Quality Management 1997*
SWL(s)	Standing water level(s)
Tb	Tertiary basalt and related pyroclastic rocks
TDS	Total dissolved solids
THR	Tasmanian Heritage Register
TN	Total nitrogen
TP	Total phosphorus
TPH / TRH	Total petroleum hydrocarbons / total recoverable hydrocarbons
TPS	Tasmanian Planning Scheme
TSS	Total suspended solids
TV(s)	Trigger value(s)
UCL(s)	Upper confidence level(s)

Abbreviation	Description
UST(s)	Underground storage tank(s)
VOCs	Volatile organic compounds
Waste Regulations	*Environmental Management and Pollution Control (Waste Management) Regulations 2020*
WQM	Water quality meter
Zn	Zinc

1. Introduction

1.1 Background

The Hydro-Electric Corporation (Hydro Tasmania) (the Client) is looking to redevelop the Tarraleah power scheme to upgrade and replace existing infrastructure as part of the Tarraleah Redevelopment. The objectives are to replace components of the scheme that fall within a high landslip risk area and improve power station response times (the Project). The Project encompasses four main areas of land disturbance which extend from Lake King William in the west to Tarraleah and Dee in the east. These areas are shown in the Figure 1 series (Appendix A) and include a distinction between areas of proposed underground disturbance (i.e. tunnelling) versus above ground disturbance. Together, the areas are referred to as 'the Site', for the purpose of environmental (contaminated land) investigations. The Site includes:

- Area A disturbance footprint (western portion of the Site from Lake King William) – pipeline and power tunnel portal within Fourteen Mile Road, Bronte Park
- Area B disturbance footprint (pump station and tunnel portal) – tunnel access within Fourteen Mile Road, Bronte Park
- Area C disturbance footprint (including power station and switchyard), comprising:
    - Power station upgrade / replacement at the existing Tarraleah Power Station located off Lyell Highway, Tarraleah
    - Surge tower within the Tarraleah conservation area
    - Pump station on Hydro Tasmania land
    - Tunnel portal and access within Fourteen Mile Road, Bronte Park and off the Lyell Highway, adjacent to No. 2 Pond
    - Tarraleah Village construction camp and associated areas, 150 Oldina Drive, Tarraleah
- Area D disturbance footprint (eastern portion of the Site to Dee Lagoon), comprising:
    - New switchyard at the existing Tarraleah Power Station located off Lyell Highway, Tarraleah; and
    - Northern and southern rout options.

It is understood that there is also an optional tunnel portal (Area E) between Area B and Area C.

Proposed Project development works (surface excavations) within Area C comprise:

- Tarraleah Power Station – the new power station (up to 60 metres (m) long, 27 m wide and 16 m tall and 24 m east of the existing Tarraleah Power Station) is a multi-story building predominantly below ground level. It will house the generating equipment (i.e. turbines) and balance of plant and control systems to operate the power plant. The new power station is tanked to reduced level 349 m Australian Height Datum (AHD) to protect against flooding. Above this level, the building consists of steel framing with cladding and houses offices and amenities for workers as well as an assembly area for future machine refurbishment; and
- Tarraleah Village – camp construction will involve conventional earthworks activities to create a level area for the camp. Following this access roads will be formed, and utilities will be installed (power, water and sewer). The camp will consist of prefabricated accommodation units (dongas) along with recreation facilities, dining hall, a canteen and laundry facilities. Workshops will be required to support construction activities (e.g. mobile plant maintenance, some onsite fabrication and construction of specialised formwork, storehouse) and one option is for these to be constructed at the Tarraleah Village. Workshop construction will follow much the same construction methodology as the camp and the site will be cleared and remediated upon completion of the Project. The workshops will include bunded areas where work on construction plant can be carried out with any potential spills appropriately contained.

Assuming the Project will be assessed by Central Highlands Council (Council) and given the identification of potentially contaminating activities (PCAs) within the Site, an Environmental Site Assessment (ESA) is required as a component of the development application (DA) to allow Council to assess the suitability of the land for the proposed works (i.e. the Project) against the relevant provisions (Clause C14.5.1 (use) and Clause C14.6.1 (excavation)) of the Potentially Contaminated Land Code (PCLC) of the Tasmanian Planning Scheme (the Planning Scheme).

Hydro Tasmania engaged Pitt & Sherry (Operations) Pty Ltd (pitt&sherry) to prepare an ESA. The ESA has been completed in three stages:

- A Preliminary Site Investigation (PSI; BlueSphere, 2024)[4], comprising a desktop review of available information and an inspection of parts of the Site
- A sampling, analysis and quality plan (SAQP; pitt&sherry, 2025[5]), including a desktop groundwater review within the Tarraleah Switchyard, to guide the intrusive investigations component of the ESA; and
- An ESA (this document) to demonstrate the suitability of Area C, where surface excavations are proposed, for ongoing use (as per zoning)[6] to accompany the DA for the Project.

The ESA report (this document) has been completed in accordance with the ASC NEPM[7] and under the coordination of a Certified Environmental Practitioner Site Contamination Specialist (CEnvP SC), certified under the Environment Institute of Australia and New Zealand.

1.2 Objectives

1.2.1 Potentially Contaminated Land Code

The objective of the PCLC is to ensure that use or development of potentially-contaminated land does not adversely impact on human health or the environment.

The performance criteria (P1) under Clause C14.5.1 Use Standard – Suitability for intended use of the PCLC state that:

> *Land is suitable for the intended use, having regard to:*
>
> *(a) an environmental site assessment that demonstrates there is no evidence the land is contaminated; or*
>
> *(b) an environmental site assessment that demonstrates that the level of contamination does not present a risk to human health or the environment; or*
>
> *(c) a plan to manage contamination and associated risk to human health or the environment that includes:*
>
> *(i) an environmental site assessment;*
>
> *(ii) any specific remediation and protection measures required to be implemented before any use commences; and*
>
> *(iii) a statement that the land is suitable for the intended use.*

[4] *Preliminary Site Investigation, Tarraleah Development*, BlueSphere Environmental, 15 March 2024 (PSI; BlueSphere, 2024).
[5] *Tarraleah Power Scheme – Sampling Analysis and Quality Plan, Rev01*, pitt&sherry, 19 February 2025 (SAQP; pitt&sherry, 2025).
[6] The zoning for the Site is a combination of 'Rural', 'Utilities', 'Village', 'Environmental Management' and 'Recreation' (PSI (BlueSphere, 2024)) and the most sensitive use permissible is residential.
[7] *National Environment Protection (Assessment of Site Contamination) Measure 1999, amended 2013* (ASC NEPM).

The performance criteria (P1) under Clause C14.6.1 Development Standards for Building Works – Excavation works of the PCLC state that:

> *Excavation does not adversely impact on health and the environment, having regard to:*
>
> *(a) an environmental site assessment that demonstrates there is no evidence the land is contaminated; or*
>
> *(b) a plan to manage contamination and associated risk to human health and the environment that includes:*
>
> *(i) an environmental site assessment;*
>
> *(ii) any specific remediation and protection measures required to be implemented before excavation commences; and*
>
> *(iii) a statement that the excavation does not adversely impact on human health or the environment.*

Clause C14.7 Development Standards for Subdivision of the PCLC is not applicable as subdivision is not currently proposed.

1.2.2 Environmental site assessment

The objectives of this ESA are to assess the following, based on the SAQP (pitt&sherry 2025) (Appendix B):

- The potential for contamination to be present within the Site as a result of identified PCAs
- The risks posed by any potential, or identified contamination to human health and/or the environment from the Site during ongoing use (as per zoning)[8] or excavation works
- Whether any additional intrusive investigations (e.g. sampling) are required to confirm (or otherwise) the presence of contamination within the Site; and
- Whether any ongoing management or remediation works are required to demonstrate the suitability of the Site and specifically where surface excavations are proposed, for ongoing use (as per zoning).

and provide either:

- **Where suitable**, a statement that the Site and specifically where surface excavations are proposed is suitable for ongoing use (as per zoning) and excavation (from a contamination perspective) and complies with the PCLC (Clauses C14.5.1(a) or (b) and C14.6.2(a)); or
- **Where unsuitable**, a plan to manage any identified contamination and associated risk to human health and the environment at the Site and specifically where surface excavations are proposed (from a land contamination perspective), ensuring compliance with the PCLC (Clause C14.5.1(c), and/or Clause C14.6.1(b).

This ESA has been prepared under the guidance of a CEnvP SC, and has been reviewed by a second CEnvP SC. A CEnvP SC meets the requirements of '*person approved by the Director'* under Clause C14.4.1 of the PCLC.

1.3 Scope of works

The pitt&sherry scope of work comprised:

- Implementing the sampling program detailed the SAQP (pitt&sherry, 2025) (Appendix B), including inspecting boreholes and test pits excavated using a drill rig and excavator (supplied by Hydro Tasmania), and associated soil sampling

[8] The zoning for the Site is a combination of 'Rural', 'Utilities', 'Village', 'Environmental Management' and 'Recreation' (PSI (BlueSphere, 2024)) and the most sensitive use permissible is residential.

- Waste classifying soils unsuitable to remain onsite for offsite disposal
- Assessing the potential for the Site to be contaminated and the human health and ecological risks posed by any potential or identified contamination
- Determining whether any additional intrusive investigations and/or management measures are required for the ongoing use (as per zoning) and specifically where surface excavations are proposed; and
- Compiling the findings into an ESA report (this report).

1.4 Legislation and guidelines

This ESA was undertaken in general accordance with the following legislation and guidelines (as applicable):

- AS 4482.1 *Guide to the investigation and sampling of sites with potentially contaminated soil – Non-volatile and semi-volatile compounds*, Standards Australia, 2 November 2005 or as amended or substituted (AS 4482.1)
- AS 4482.2 *Guide to the sampling and investigation of potentially contaminated soil – Volatile substances, Standards Australia*, 5 September 1999 or as amended or substituted (AS 4482.2)
- AS 5667.1 Water Quality – Sampling – Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples, Standards Australia, 5 April 1998 or as amended or substituted (AS/NZS 5667.1)
- AS 5667.11: *Water Quality – Sampling – Guidance on sampling of groundwaters*, Standards Australia, 5 April 1998 or as amended or substituted (AS/NZS 5667.11)
- ASC NEPM
- CRC Care *Technical Report No. 10 Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater*, September 2011, including errata August 2012 (CRC Care Technical Report No. 10)
- *Environmental Management and Pollution Control Act 1994* (EMPC Act) (Tasmania) and relevant Regulations
- *Environmental Management and Pollution Control (Waste Management) Regulations 2020* (Waste Regulations)
- Information Bulletin No. 105 Classification and Management of Contaminated Soil for Disposal, Version 3, Environment Protection Authority, Tasmania (EPA), 2018 (IB105)
- *PFAS*[9] *National Environmental Management Plan 3.0, 2025*, National Chemicals Working Group of the Heads of EPAs Australia and New Zealand (PFAS NEMP); and
- The Planning Scheme.

1.5 Limitations

Limitations of this ESA include:

- Intrusive investigations were limited to two areas within the Area C disturbance footprint – Tarraleah Switchyard and Tarraleah Village, both of which are subject to surface disturbance as a component of the Project. The risk of contamination to underground disturbance areas (i.e. tunnelling) would be significantly lower than the risk to aboveground disturbance areas, other than where mobile contamination is identified or where contamination is present in groundwater
- Intrusive investigations were limited to assessment of contaminants of potential concern (CoPCs) from identified PCAs. Soils were not tested for acid sulfate soils (ASS) potential. It is recommended that ASS potential in tunnelling areas be assessed as a component of the separate geotechnical scope

[9] Per- and poly-fluoroalkyl substances (PFAS).

- No detailed grid sampling was completed. Intrusive investigations (Section 4) were completed to address the SAQP (pitt&sherry, 2025) requirements for Area C. The SAQP (pitt&sherry, 2025) was based on a targeted Site inspection, review of the PSI (BlueSphere, 2024), compilation of groundwater data for the existing Switchyard, and other standard SAQP processes per the ASC NEPM; in addition a judgemental approach was taken while on Site, so the lack of 'detailed grid sampling' is not considered to be a deficiency. The potential for offsite PCAs to impact on the Site from a contamination perspective is considered to be low
- Limitations from the SAQP (pitt&sherry, 2025) should be noted, in particular:
    - Historical information was limited to available information provided, reviewed, and summarised in Section 2 of the SAQP
    - The SAQP relates to soil within aboveground disturbance areas only (i.e. proposed tunnelling disturbance areas are excluded)
    - Although comprehensive, a number of gaps in the PSI (BlueSphere, 2024) are noted, and are addressed in Section 2.3 of the SAQP. The Site footprint has been modified since the PSI (BlueSphere, 2024) and there are large parts of some areas that have not been inspected, namely the following. Most of these areas are not within currently proposed construction areas / disturbance areas, as such these are addressed in the desktop assessment only and have not been included in intrusive investigations:
        - Area A – western portion, south of the intersection with Tarraleah Canal No. 2; northern portion, north of included area
        - Area B – linear portion between Area A and Area C; south-western portion between the included area and Mossy Marsh Tunnel; far southern portion, between Mossy Marsh Tunnel and Butlers Gorge Road
        - Area C – linear portion from Area B; expanded footprint around Paddys Quarry[10]; expanded footprint to the eastern and south-eastern portions, east and south-east of the Tarraleah Golf Club
        - Area D – entire south-eastern spur
        - Area E – western portion
- Intrusive investigations (Section 4) were limited to the locations and depths tested
- No leachability testing has been undertaken for soils; leachability testing may be required for any disposal of soil / waste materials to a landfill
- Adopted Area C use criteria have been selected based on the rationale provided in Section 4.8.1. If Area C future uses change, this may change the risk level (Section 7). If a change in Area C use is proposed, adopted criteria will need to be reviewed to ensure suitability; and
- If the Project design changes in a way which alters the development footprint shown in the figures provided in Attachment A [of the SAQP, Appendix B of this report], the risk of impact from PCAs (Section 3 of the SAQP) and the associated sampling plan (Section 4 of the SAQP) should be reassessed and modified, if necessary, for the new footprint area(s).

In addition to the above, the identified remaining data gaps (Section 7.4) should be noted, and the standard report limitations listed at the end of this report, titled *Important information about your report,* should also be considered.

[10] Now excluded from the surface disturbance footprint.

2. Site setting

Refer to the PSI (BlueSphere, 2024) for Site[11] setting details.

2.1 Site identification summary – Area C

Site identification details for the parts of the Site where PCAs have been identified and that are within aboveground disturbance areas only[12] (i.e. Area C) are provided in Table 1 with information primarily sourced from the PSI (BlueSphere, 2024).

Proposed aboveground disturbance footprints within Area C are shown in Figure 1c and Figure 1d (Appendix A).

Zoning within Area C is shown on Figure 2 (Appendix A).

Table 1: Site details summary – Area C

Item	**Area C Detail[A]**	
	Switchyard	**Tarraleah Village**
Address	Lyell Highway, Tarraleah, Tasmania 7140	150 Oldina Drive, Tarraleah, Tasmania 7140
Certificate of title (CT)	N/A	147038/2
Property identification	N/A	2737321
Area of proposed surface disturbance footprint	Approximately 0.75 square kilometres (km^2)	Approximately 4.12 km^2
Zoning	'Utilities' under the Planning Scheme. Refer to Figure 2 (Appendix A).	'Village' under the Planning Scheme. Refer to Figure 2 (Appendix A).
Regional setting	From the proposed switchyard disturbance footprint: • The existing Tarraleah Power Station is adjacent to the south • The Nive River is adjacent to the east • Tungatinah Power Station is approximately 300 metres (m) to the north on the eastern and opposite side of the Nive River; and • The water pipelines leading to the Tarraleah Power Station are located to the west of the Switchyard. The Tarraleah township is approximately 500 m to the west.	From the proposed village surface disturbance footprint: • Tarraleah township (and sports ground) is approximately 200 m to the east • Tarraleah Golf Course approximately 100 m to the north-west • Paddy's Quarry is approximately 600 m to the north-west • Sewage ponds are approximately 100 m to the south-east on the opposite side of Oldina Drive and the water pipelines • The existing Tarraleah Power Station and Switchyard are approximately 500 m to the east; and • The Nive River is approximately 920 m to the east.

[11] Noting that the Site disturbance footprint has been modified since the PSI (BlueSphere, 2024) (refer to Section 1.5).
[12] Proposed tunnelling disturbance areas are excluded.

Item	Area C Detail[A]	
	Switchyard	**Tarraleah Village**
Sensitive receptors	From the proposed switchyard disturbance footprint: • The Nive River is adjacent to the east; and • The Tarraleah township is approximately 500 m to the west.	From the proposed village disturbance footprint: • Tarraleah township (and sports ground) is approximately 200 m to the east • Tarraleah Golf Course approximately 100 m to the north-west; and • The Nive River is approximately 920 m to the east.
Current landowner	Hydro Tasmania	Woolnorth Bluff Point Holdings Pty Ltd
Current land use	Switchyard for the existing Tarraleah Power Station	The proposed village disturbance footprint is currently vacant land
Infrastructure features	Power station / switchyard infrastructure	The proposed village disturbance footprint is currently vacant land
Elevation	Elevation of approximately 350 m AHD, sloping to the east towards the Nive River	Elevation of approximately 600 m AHD, sloping locally to the north and east
Surface water	Lies within the Upper Derwent catchment area. The Nive River is adjacent to the east of the proposed switchyard disturbance footprint.	Lies within the Upper Derwent catchment area. From the proposed village disturbance footprint: • A tributary is adjacent to the south-west and discharges to Wilsons Creek approximately 1.2 km to the south-east • Sewage ponds are approximately 100 m to the south-east; and • The Nive River is approximately 920 m to the east.
Groundwater	Refer to Section 2.2	Refer to Section 2.2
Groundwater dependent ecosystems (GDE)	Aquatic – high potential aquatic GDE from national assessment within the Nive River, adjacent to the east of the proposed switchyard disturbance footprint. Terrestrial – no potential terrestrial GDEs from national assessment.	Aquatic – high potential aquatic GDE from national assessment within the Nive River, approximately 920 m east of the proposed village disturbance footprint. Terrestrial – no potential terrestrial GDEs from national assessment.
Geology	Mapped[B] as Jurassic-age dolerite with locally developed granophyre (Jd)	Mapped[B] as Tertiary basalt and related pyroclastic rocks (Tb)

Item	Area C Detail[A]	
	Switchyard	**Tarraleah Village**
Soils (including ASS)	Ferrosol – gently undulating ridges and almost flat plateau residuals at moderate elevation: moderate to steep slopes some slumping, and some areas of valley fill, all covered by brown friable porous earths (Gn4.31)--usually with a thick surface organic accumulation in natural areas, and in association with smaller areas of red friable porous earths (Gn4.11) and dark friable porous earths (Gn4.41); dissected by streams with narrow valley plains of undescribed soils. Mapped[C] extremely low probability (1- 5 % probability) of encountering ASS approximately 25 m south of the existing switchyard footprint, within the adjacent Nive River.	Sodosol – hilly to steep hilly: hills and hill slopes of hard neutral brown soils (Db2.42 and Db1.42) in association with small areas of many other (D) soils such as (Dr2.12 and Dr2.13), (Db1.43 and Db1.81), (Dy3.41, Dy3.43, and Dy3.62), (Dy5.61, Dy5.81, Dy5.41, and Dy5.21), and G soils such as (Gn4.11 and Gn4.31) and (Gn3.94); small valley plains of (Dy3.4) and (Ug5. 16 and Ug6. 1); at the highest elevations small areas of unit KL1 may be present. No mapped[C] areas of ASS within or adjacent to the proposed village surface disturbance footprint.
Heritage	No mapped[D] sites listed on the Tasmanian Heritage Register (THR) within or adjacent to the proposed switchyard surface disturbance footprint	No mapped[D] sites listed on the THR within or adjacent to the proposed village surface disturbance footprint
Local Government	Central Highlands Council	Central Highlands Council
Land tenure	Hydro Tasmania	Private freehold

Notes:

A – proposed aboveground disturbance footprint only.

B – Land Information Systems interactive mapping tool (LISTmap) – Geology Units 250k layer.

C – LISTmap – Inland ASS (>20m AHD) layer.

D – LISTmap – Tasmanian Heritage Register layer.

2.2 Surface water bodies and groundwater

2.2.1 Summary

As detailed in the PSI (BlueSphere, 2024) and Section 2.3.1 of the SAQP (pitt&sherry, 2025) (Appendix B):

- A number of surface water bodies are present in and around the Site, including Dee Lagoon, Lake King William and the River Derwent. Also of note are Tarraleah Canal No.1 and No.2, Nive River and Mossy Marsh Dam. Localised wetlands and unnamed creeks are also present throughout the Site; and
- In addition to potentially perched aquifers in surface fill (e.g. at the Switchyard), the Site is expected to be underlain by up to four different natural aquifers:
    - Localised Quaternary glacial systems formed within the sand and gravel of the glacial and glacigene deposits (Qpg)
    - Localised Quaternary aquifers present in alluvial deposits
    - Underlying the Quaternary glacial aquifer, and also likely forming the water table aquifer in certain portions of the Site, is the Permian-Triassic sandstone (Rq, Rv and R), where outcrops are constrained to certain portions of the Site; and

- The regional aquifer is anticipated to reside within the Jurassic dolerite (Jd) and is likely present beneath the broader Site. Groundwater within this aquifer is expected to flow in a generally south-easterly direction, with localised flow influenced by proximity to surface water features and topography.

A summary of existing groundwater well details (prior to the installation of additional wells as a component of this ESA) is provided in Table 2; those relevant to the proposed surface disturbance area at the Tarraleah Switchyard are shaded blue. The majority of these wells appear to be within the bedrock aquifer (either sandstone or dolerite) and any groundwater within the shallower sedimentary horizons would be more likely to be impacted by surface contamination. Additional groundwater wells were installed as a component of this ESA (Section 4.7).

Groundwater well locations in-, and in the vicinity of the Tarraleah Switchyard are shown on Figure 3b (Appendix A).

Table 2: Groundwater well and piezometer details for wells located within and near the Site

ID	Site Area	Depth (m bgl)	Diameter (mm)	Base of Screen (m)	SWL[A] (m bgl)
Groundwater Wells					
TA-DC214	Area C	24.70	50	24.70	15.65 – 18.65
TA-DC215	Area C	40.00[B]	50	40.00	22.44 – 23.15
TA-DC218	Area C	25.10	50	25.10	0.88 – 2.16
TA-DC234	Area C	15.00[B]	50	15.00	2.07 – 2.89
TA-DC235	Area C	33.25	50	>15.00	1.73 – 2.62
TA-DC237	Area C	20.00[B]	50	20.00	3.65 – 4.32
TA-DC238	Area C	33.40	50	C	3.06 – 4.11
TA-DC241	Area C	32.29	50	C	2.55 – 7.29
TA-DC242	Area C	17.13	100	C	1.00 – 1.64
TA-DC243	Area C	33.50	50	C	9.03 – 9.93
TA-DC247	Area A	C	50	C	1.81 – 2.20
TA-DC207	Area C	70.00	C	C	0.43 – 1.63
TAHS2019 (shallow)	Area C	20.55	30	20.00	11.89 – 14.70
PW20d (deep)	Area C	32.71	30	32.00	22.44 – 23.90
Piezometers					
S_SP1	Area C	C	C	C	C
S_SP2	Area C	17.90	100	C	14.65 – 15.64
S_SP5	Area C	C	C	C	C
Q_SP1	Area C	C	C	C	C

Notes:

m bgl – metre(s) below ground level; mm – millimetre(s); SWL – standing water level.

Blue shading – indicates the well is relevant to the proposed surface disturbance area at the Tarraleah Switchyard. All are either within the existing switchyard or south-west of the power station.

A – measured in 2024 over multiple sampling events; SWLs reported for this ESA's investigations (i.e. new wells) are provided in Table 7.

B – depth assumed from base of screen, to be confirmed.

C – unknown.

2.2.2 Hydrogeological interpretation

As detailed in Section 2.3.3 of the SAQP (pitt&sherry, 2025) (Appendix B), PSM completed a Hydrogeological Interpretive Report[13] which shows:

- Groundwater beneath the existing switchyard connected to the Nive River bed
- Potential for a perched aquifer in colluvium and landslip, although this is not shown beneath the switchyard segment
- Groundwater levels shallower than the screened intervals, suggesting that the bedrock aquifer is confined, or that the wells may be capturing deeper waters
- The switchyard is underlain by sheared fault breccia and represents a groundwater discharge zone (i.e. it may periodically have springs appearing through the ground, and means groundwater can be seasonally shallow); and
- The switchyard area is a discharge zone.

The Hydrogeological Interpretive Report (PSM, 2024) also suggests groundwater flow direction beneath the Tarraleah power station and switchyard is to the east-south-east, towards the Nive River.

Additional groundwater wells were installed as a component of this ESA (Section 4.7).

[13] *Hydrogeological Interpretive Report Stage 1*, by PSM for Entura, ref PSM4346-232L, 5 August 2024 (Hydrogeological Interpretive Report; PSM, 2024).

3. Identified potential contamination

3.1 Site history

Refer to the PSI (BlueSphere, 2024) and the SAQP (pitt&sherry, 2024) (Appendix B) for detailed Site history information.

The main sources of potential contamination within the proposed surface disturbance areas within Area C identified in the SAQP (pitt&sherry, 2024) (Appendix B) include:

Tarraleah Power Station and Switchyard:

- Localised residual hydrocarbon contamination in fill materials and soils from two 20 kilolitre (kL) USTs within the Tarraleah Switchyard which are believed to be oil containment tanks and serve as overflow from the transformers located in the Tarraleah Power Station
- Localised residual polychlorinated biphenyl (PCB) contamination from the transformer oils in fill materials and soils within the Tarraleah Switchyard
- Possible residual metals contamination in fill materials and soils associated with construction of the Tarraleah Power Station and Switchyard; and
- Possible and known hydrocarbon impact to groundwater (e.g. in deep aquifer well TA-DC237) from storage and use of hydrocarbon fuels and oils.

Tarraleah Village:

- Possible hydrocarbon impact from the potential former fuel service station located north of Oldina Drive, north-west of the sewage treatment ponds. The status of closure and remediation works associated with this service station is unknown.

3.2 Potential contamination sources and ASS

Based on the information review findings (Section 2 of the SAQP (pitt&sherry, 2024)) (Appendix B), and considering the proposed aboveground disturbance footprint within each area, PCAs identified as having potential to impact the Site soils and/or groundwater (by development area) from a contamination perspective, are summarised in Table 3. Those relevant to the proposed surface disturbance areas within Area C are shaded blue.
The locations of identified PCAs are shown on Figure 1a to Figure 1e (Appendix A).

Table 3: Summary of identified potential contamination impacts and acid generation potential from identified sources

PCA	Area A	Area B	Area C	Area D	Area E
Fill material	No[C]	No[A, C]	**Yes**	No[C]	No
Forestry activities	No[B]	No[B]	No	No	No
Quarry activities	No	No	**Yes**	No	No
Old dump / tip sites	No	No	**Yes**[E]	No	No
Crushed rock	No[A,D]	No[D]	**Yes**[A]	No[D]	No[D]
Land clearing	**Yes**[A]	**Yes**	**Yes**[A]	**Yes**	**Yes**
Tarraleah Power Station (general)	No	No	**Yes**	No	No
Tarraleah Power Station (switchyard)	No	No	**Yes**	No	No
Tungatinah Power Station (and switchyard)	No	No	**Yes**[B]	No	No
USTs	No	No	**Yes**	No	No
Sewage treatment ponds	No	No	**Yes**[B]	No	No

PCA	Area A	Area B	Area C	Area D	Area E
Potential former service station	No	No	**Yes**	No	No
Tarraleah town centre – commercial and residential premises (including former maintenance depot, historical workshops and storage facilities, USTs, potential former service station)	No	No	**Yes**	No	No
Old camps	No	No	**Yes**	No	No
Old piggery	No	No	No	No	No
Butler's Gorge village	No	No	No	No	No
Buttler's Gorge substation	No	No	No	No	No
Unknown building and machinery	No	No	No	No	No
ASS	**Yes**	**Yes**	**Yes**	**Yes**	No
Groundwater (secondary source / contamination from some PCAs is likely mobile)	**Yes**	No	**Yes**	No	No

Notes:

Grey text – indicates the activity is not likely to have impacted on the proposed development area from a contamination perspective.

Bold black text - indicates the activity occurs / occurred within the proposed development footprint and has the potential to have impacted on the proposed development footprint from a contamination perspective if disturbed but no aboveground disturbance is proposed, so no sampling is proposed as part of this ESA.

Bold red text – indicates the activity occurs / occurred within the proposed development footprint and has the potential to have impacted on, or to impact on the proposed development footprint from a contamination perspective and / or acid generation potential.

Bold blue text – indicates the activity occurs / occurred within an adjacent area, outside the proposed development footprint and has the potential to have indirectly impacted on the proposed development footprint from a contamination perspective.

Blue shading – indicates the PCA is relevant to the proposed surface disturbance within Area C.

A – not identified in the PSI (BlueSphere, 2024).

B – no aboveground disturbance proposed.

C – fill materials consisting of natural reworked material (rock, soils) are unlikely to be contaminated in and of themselves.

D – crushed rock application to unsealed access tracks is unlikely to be contaminated, in and of itself.

E – Tarraleah tip site only.

4. Intrusive investigations

4.1 Objectives

The objectives of the proposed intrusive investigations (SAQP (pitt&sherry, 2025); Appendix B) were to:

- Follow up on contamination information gaps identified in the PSI (BlueSphere, 2024) by investigating identified onsite PCAs within parts of Area C where surface excavation is proposed as part of the Project
- Determine concentrations of CoPCs in the soils / fill materials and groundwater as a result of identified PCAs within Area C
- Confirm (or otherwise) the presence of contamination within Area C
- Determine the suitability of Area C for ongoing use (as per zoning)
- Inform earthworks management during surface excavation works within Area C
- Inform any remediation and protection measures required to be implemented prior to any use commencing within Area C; and
- If possible, based on the findings, provide a statement that the Site is suitable from a contamination perspective for ongoing use (as per zoning) and specifically where surface excavations are proposed.

4.2 Overview

Targeted intrusive investigations completed by pitt&sherry within proposed disturbance areas within Area C for this ESA comprised:

- Inspecting and sampling test pits excavated within the Tarraleah Village to a maximum depth of 3.2 m bgl
- Inspecting and sampling boreholes and test pits excavated within the Tarraleah Power Station Switchyard to a maximum depth of 9.0 m bgl; and
- Sampling groundwater wells installed within the Tarraleah Power Station Switchyard.

Investigation locations are shown in the following figures (Appendix A):

- Figure 3a – Tarraleah Village; and
- Figure 3b – Tarraleah Switchyard.

4.3 Investigation stages

Intrusive investigations to address the identified PCAs within parts of Area C where aboveground disturbance is proposed were staged, and included the following:

- Stage 1 – Tarraleah Village soil and inflow water sampling (31 March and 1 April 2025) (Figure 3a (Appendix A)):
- Stage 2 – Tarraleah Switchyard soil sampling and groundwater well installation (7 to 14 April 2025) (Figure 3b (Appendix A)); and
- Stage 3 – Tarraleah Switchyard groundwater sampling (29 April 2025) (Figure 3b (Appendix A)).

4.4 Sampling plan

Intrusive investigations for Area C were completed in general accordance with the SAQP (pitt&sherry, 2025) (Appendix B). Deviations and additions are documented in Section 4.4.3

4.4.1 Data quality objectives

The data quality objective (DQO) process for this ESA is summarised in Table 4.

Table 4: Summary of data quality objectives

DQO	Details
The problem	• Unknown concentrations of CoPC associated with identified PCAs in soil / fill materials within parts of Area C to be disturbed from surface as a component of the Project, to the proposed maximum depth of surface construction works (i.e. tunnelling is excluded). • Unknown concentrations of CoPC associated with identified PCAs in the shallow groundwater aquifer within the Tarraleah Switchyard area.
Investigation questions	Investigation questions for the ESA include: • What is the current contamination status (if any) of the soils and/or fill materials within parts of Area C to be disturbed from surface as a component of the Project to the proposed maximum depth of surface construction works? • What is the current contamination of the fill / soil materials and groundwater (if present) within the fill / colluvium and alluvium beneath the Tarraleah switchyard? • What is the preliminary waste classification of sampled soils / fill materials for offsite disposal or suitability for onsite reuse? • Does the level of contamination (if any) at the sampled locations and media represent an unacceptable risk to human health and/or the environment under the proposed Site development and permitted uses (based on zoning) or during excavation; and • Are any management measures for soils, fill materials or groundwater at the sampled locations likely to be required?
Inputs to the decision	Information inputs comprise: • Desktop review – refer to the PSI (BlueSphere, 2024) and SAQP (pitt&sherry, 2025) (Appendix B) • Desktop groundwater assessment – refer to Section 2.2 (and Section 2.3 of the SAQP (pitt&sherry, 2025) (Appendix B)) • Field visual, olfactory and screening data – refer to Section 4.5 • Assessment criteria – refer to Section 4.8 • Analytical data – refer to Section 5 • Refined conceptual site model (CSM) – refer to the PSI (BlueSphere, 2024) for a preliminary CSM and Section 7 for a revised CSM for Area C; and • Source-pathway-receptor (SPR) linkages and risk assessment – refer to Section 7.3.
Boundary of the assessment	• Intrusive investigations were limited to parts of Area C in the vicinity of identified PCAs, in areas that are to be disturbed from surface as a component of the Project to the proposed maximum depth of surface construction works (i.e. tunnelling is excluded); and • Sampling locations are shown in Figure 3a and Figure 3b (Appendix A).

DQO	Details
Decision rules	• Comparison of reported concentrations of CoPCs in soils / fill materials against adopted assessment criteria (where available) to: o Allow the contamination status within the soils / fill materials at sampled locations within Area C to be assessed o Allow preliminary waste classification of soils / fill materials at sampled locations within Area C to be determined o Allow an assessment of whether the contamination status of the soil / fill materials within Area C represents an unacceptable risk to human health and/or the environment under the proposed development and permitted land uses (based on zoning) or during surface excavation works for the Project o Identify whether any management measures are likely to be needed to manage any identified contamination risks; and • Comparison of reported concentrations of CoPCs in groundwater against adopted assessment criteria (where available) to allow the contamination status within groundwater at sampled locations within Area C to be assessed.
Acceptable limits on decision errors	Variation in data may arise from samples collected in succession from a single sampling point due to: • The potential heterogenous nature of the soils / fill materials • The potential heterogenous dispersion of contaminants within the soil / fill material / groundwater profile; and • Fragments of materials which may bias samples in certain elements.
Design for obtaining data	• Intrusive investigations for the ESA targeted locations for the collection of soil / fill material and groundwater samples within parts of Area C subject to surface disturbance works as a component of the Project in general accordance with the legislation and guidelines outlined in Section 1.4 as applicable to an ESA and considering the limitations in Section 1.5.

4.4.2 Sampling methodology

A summary of the sampling methodology proposed in the SAQP (pitt&sherry, 2025) (Appendix B) and adopted for this ESA is provided in Table 5.

Table 5: Sampling methodology

Activity	Details
Rationale	• Investigation locations were determined to address the PCAs identified in the SAQP (pitt&sherry, 2025) (Appendix B) (i.e. targeted); and • Sampling depths were determined to target the different horizons identified within the encountered soil profile (i.e. fill materials and natural soils) and the expected depth to groundwater (groundwater wells) and any potential contamination (test pits and boreholes).
CoPCs	Identified CoPCs for Area C were generally as per the SHR (pitt&sherry, 2025) (Appendix B) and comprised: • Soils: o Village soil suite – benzene, toluene, ethylbenzene, xylenes, naphthalene (BTEXN), total petroleum hydrocarbons (TPH) / total recoverable hydrocarbons (TRH), polycyclic aromatic hydrocarbons (PAH), phenols and Pb o Switchyard soil suite – metals (arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), nickel (Ni), zinc (Zn), mercury (Hg)), BTEXN, TPH / TRH, PAH, phenols, PCB, perfluoroalkyl and polyfluoroalkyl substances (PFAS) (short suite) and asbestos fibre

Activity	Details
	• Waters: o Village water suite – BTEXN, TPH / TRH, PAH, phenols and Pb; and o Switchyard water suite[A] – pH, electrical conductivity (EC), total dissolved solids (TDS), total suspended solids (TSS), total and dissolved metals (As, Cd, Cr, Cu, Pb, Ni, Zn, Hg), BTEXN, TPH / TRH, PAH, phenols, PFAS (short suite), PCB, reactive silica, ammonia, nitrate, nitrite, total nitrogen, total Kjeldahl nitrogen, total phosphorus and reactive phosphorus.
Civil works	• Civil works were completed by: o Archers Underground Services – underground services locating and clearing of investigations locations prior to excavation o MSD – test pit excavations at Tarraleah Village and Tarraleah Switchyard o Tasmanian Drilling Services – borehole drilling and groundwater well installation at Tarraleah Switchyard • Test pitting work comprised: o Progressively excavating and stockpiling of soils adjacent to each test pit to the maximum depth of excavation o Allowing for profile logging and sample collection from nominated depths (detailed below) o Inflow water was observed in two test pits (refer to Section 4.5.4) o In accordance with ASC NEPM practice, excavated soils which were confirmed visually, olfactorily via photo-ionisation detector (PID) to not be impacted by the potential historical storage of fuel underground (associated with the potential former service station)) were backfilled into the test pit excavations from which they came o No excavated soils were disposed offsite • Borehole drilling and groundwater well installation work comprised: o Non-destructive drilling (NDD) completed by Archers Underground Services down to 1 to 1.4 m bgl in all drilling locations except TA-MB411 and TA-MB418 (both drilled with auger method from surface) o Drilling in all locations using auger until refusal at the beginning of the natural alluvial layer and switched to HQ coring through both the alluvial layer and the hard dolerite (bedrock) o Drilling extended into bedrock at the discretion of the Hydro Tasmania geotechnical personnel onsite (from 0.6 to 3.2 m) to provide additional geotechnical information (TA-MB411 was drilled until auger refusal at the beginning of bedrock (no alluvial horizon was present at this location)) o Plugging drillholes with bentonite up to the top of the bedrock layer to seal the upper unconfined aquifer from potential interference from the underlying bedrock aquifer o Installing groundwater wells (refer to Section 4.7); and o No surplus drilling wastes were generated as the drill cuttings were used to backfill the wider NDD borehole collar.
Sample collection	• Sampling was undertaken by pitt&sherry staff experienced with contaminated land sampling. Groundwater sampling from pre-existing wells was completed by Hydro Tasmania • All soil samples were collected using single-use disposable gloves into laboratory-supplied receptacles and snap-lock bags (as appropriate) suitable for the CoPCs to be tested, filled with minimal headspace, sealed, labelled, and placed on ice in portable chiller boxes • Soil samples were collected from the excavator bucket / drill rig during test pitting / borehole drilling from the nominated depth. The sampling depth was selected to obtain representative samples from the profile (i.e. fill materials, natural soil), was guided by the depth of any obvious contamination (i.e. odour / staining / fill) and extended to beneath any inferred impact, or into the natural undisturbed profile

Activity	Details
	• For CoPC testing, the snap-lock bag samples were checked in the field for visual and olfactory signs of contamination and screened for volatile organic compounds (VOCs) using a photo-ionisation detector (PID) • Groundwater samples were collected using high-density polyethylene (HDPE) bailers or Hydrasleeves (suitable for PFAS sampling) depending on the depth of the water column. Wells sampled by bailer were purged until dry and then sampled. Water quality parameters were recorded using a calibrated water quality metre (WQM) • Test pit inflow water grab samples were collected opportunistically where encountered (e.g. Tarraleah Village) directly from the bucket of the excavator • Additional samples were collected to satisfy quality assurance / quality control (QA/QC) requirements at the rate of: o One triplicate set (two additional samples) per 20 primary samples o One rinsate sample per piece of reuseable sampling equipment per day o One trip blank per batch of samples submitted to the laboratory (where volatile CoPCs were tested) • Additional samples were collected from locations deemed to represent background soil concentrations and characteristics for ASC NEPM soil characterisation testing and to allow for determination of site-specific EILs for some metals (Cr, Cu, Ni and Zn); and • Sample descriptions, location information and field screening results were recorded on the field sheets (Appendix C) and locations are shown on Figure 3a and Figure 3b (Appendix A).
Visual observations	• Refer to Section 4.5 for visual observations • Refer to Section 4.6 for field VOC screening; and • Field observations are recorded on the field sheets (Appendix C).
Profile logging	• The soil profile was logged during test pit excavations / borehole drilling and recorded on the field sheets (Appendix C) and groundwater well logs (Appendix D).
Groundwater well installation	• Refer to Section 4.7 for groundwater well installation details.
Photographs	• Representative photographs of test pit / borehole profiles and sampling locations and context are provided in Appendix E.
Decontamination	Decontamination and cross-contamination mitigation procedures included: • Clean equipment prior to Site works • Removing soil from the excavator bucket / drill rig between investigation locations • Cleaning of any reused pieces of sampling equipment between sampling locations • Single-use disposable nitrile gloves, changed after collection of each sample; and • New laboratory-supplied receptacles suitable for the CoPC to be tested for each sample.
Sample transport	• A chain of custody (CoC) form was completed, signed, dated, and submitted to the laboratory with each batch of samples for analysis • Ice / chiller bricks were added to the chiller boxes for sample preservation • The samples were transport to the primary laboratory under CoC conditions and within relevant holding times for the CoPCs to be tested • Samples were received by the laboratory at a temperature of less than 6 degrees Celsius (where relevant for particular CoPC / analytes); and • CoC forms and laboratory sample receipt notifications are provided in Appendix F.
Samples for analysis	• Soil / fill material (Tarraleah Village): o 13 primary samples tested for the Village soil suite o 2 primary samples for ASC NEPM soil characterisation parameters

Activity	Details
	o 1 triplicate set (2 replicated samples per set) tested for the Village soil suite (the interlaboratory duplicate was also tested for As, Cd, Cr, Cu, Ni, Pb, Zn, Hg, PFAS (short suite) and asbestos fibres o 1 trip blank was tested for BTEXN, TPH (C_6-C_9 fractions) and TRH (F1 fractions) • Soil / fill material (Tarraleah Switchyard): o 23 primary samples tested for the Switchyard soil suite o 1 primary sample for ASC NEPM soil characterisation parameters o 2 triplicate sets (2 replicated samples per set) tested for the Switchyard soil suite o 2 trip blanks tested for BTEXN, TPH (C_6-C_9 fractions) and TRH (F1 fractions) • Water (Tarraleah Village): o 2 primary samples tested for Village water suite • Groundwater (Tarraleah Switchyard): o 4 primary samples[14] tested for the Switchyard groundwater suite o 1 triplicate set (2 replicated samples) tested for the Switchyard groundwater suite o 2 rinsate samples tested for the Switchyard water suite; and o 1 trip blank tested for BTEXN, TPH (C_6-C_9 fractions) and TRH (F1 fractions).
Laboratory analysis	• All samples were submitted to the National Association of Testing Authorities (NATA)-accredited Analytical Laboratory Services (ALS) Laboratory (Accreditation No. 825) for testing of identified CoPCs; and • Secondary samples for QA/QC were onforwarded to the NATA-accredited Eurofins Laboratory (Accreditation No. 1261) for testing of identified CoPCs.
Holding times	• All samples were received by the laboratories within the required holding times for the individual parameters tested; and • The majority of samples were extracted for analysis by the laboratories within the required holding times for the individual parameters tested; observed outliers are discussed in Section 1.1.
Assessment criteria	• Refer to Section 4.8 for adopted assessment criteria and rationale.
Results	• Tabulated results are provided in Appendix G; and • Results are presented in Section 5, and discussed in Section 6.
Excavated soils / fill materials	• Test pits – in accordance with ASC NEPM practice, excavated soils were backfilled into the test pit excavations from which they came; and • Groundwater boreholes – No surplus drilling wastes were generated as the drill cuttings were used to backfill the wider NDD borehole collar.
Purged groundwater	• Well development waters and purged groundwaters were disposed to ground as per current groundwater monitoring practice at the Tarraleah Switchyard.

Notes:

A – not entirely consistent with the suite proposed in the SAQP (pitt&sherry, 2025) (Appendix B) refer to Section 4.4.3

[14] One well was dry (TA-MB411) and one well did not contain enough water for sampling (TA-MB414) (refer to Section 5.1.2).

4.4.3 Deviations from and additions to the sampling plan

Deviations from, and additions to, the Area C sampling plan proposed in the SAQP (pitt&sherry, 2025) comprised:

- Additions:
  - Water inflow was observed in two of the Tarraleah Village test pits and was opportunistically sampled (refer to Section 4.5.4)
  - Drilling at the Switchyard extended into bedrock at the discretion of the Hydro Tasmania geotechnical personnel onsite, to provide additional geotechnical information (refer to Section 4.7)
- Deviations:
  - Less than the proposed excavation depth of 3.5 m bgl in the test pits at Tarraleah Village due to refusal on basalt bedrock (refer to Section 4.5.1). No visual or olfactory indications of hydrocarbon contamination were identified in any of the test pits (Section 4.5.2) and this was confirmed by analytical results (Section 5)
  - Less than the proposed number of shallow / perched groundwater samples in the Tarraleah Switchyard as there was no water in TA-MB411 and insufficient water in TA-MB414 at the time of sampling (Section 4.7)
  - Less than the proposed number of test pits and groundwater wells in the Tarraleah Switchyard as access was not granted to the north of Lyell Highway for excavation purposes. Contamination impacts in this area (if any) are qualitatively inferred from investigation results from boreholes / test pits within Tarraleah Switchyard (Section 6.2) and the recommendations in Section 8.2 apply to this area
  - Conversion of one proposed test pit in the south of the Tarraleah Switchyard to a groundwater well (TA- MB418) due to access constraints
  - Reduced groundwater analytical suite for the Tarraleah Switchyard wells. Shallow / perched groundwaters were not tested for solvents, acids, alkalis or analytes relevant to detect impacts from organic flocculants as no suitable analytes could be determined given the absence of specific target chemicals (i.e. available analytical suites were too broad). Instead, visual and olfactory observations (Section 4.5) and PID screening (Section 4.6) were used to determine whether there may be concerns with any of these CoPCs; and
  - Testing for ASS was excluded from the scope.

4.5 Visual observations

To accompany the visual observations summary provided in the following subsections, please refer to:

- Appendix C – for the field sheets including details of the encountered soil types, depth intervals, field screening results for VOCs, odours and staining
- Appendix D – for the groundwater well construction logs; and
- Appendix E – for the photographic log.

4.5.1 Soil profile

A summary of the encountered soil profile is provided in Table 6. Refer to the field sheets (Appendix C) and groundwater well construction logs (Appendix D) for details.

Table 6: Soil profile summary

Location ID	Soil Profile (m bgl)						
	Fill	**Silt / Weathered Basalt**	**Sandy Clay with Gravel / Cobbles**	**Clayey Sand with Gravel / Cobbles**	**Cobbles and Boulders (alluvial layer)**	**Dolerite**	**Basalt**
Tarraleah Village							
TA-TP449	0.0-1.0	1.0-3.0					From 3.0
TA-TP450	0.0-1.4	1.4-1.8					From 1.8
TA-TP451	0.0-1.5	1.5-3.0					From 3.0
TA-TP452	0.0-1.1	1.1-3.2					From 3.2
TA-TP453		0.0-2.8					From 2.8
Tarraleah Switchyard							
TA-TP456	0.0-1.1						
TA-MB411	0.0-0.5		0.5-2.8				
TA-MB412	0.0-3.3				3.3-4.4	4.4-5.0	
TA-MB414	0.0-2.0				2.0-3.3	3.3-6.5	
TA-MB415	0.0-2.7		2.7-2.8	2.8-3.5	3.5-7.3	7.3-9.0	
TA-MB416	0.0-1.5			1.5-3.2	3.2-6.1	6.1-7.3	
TA-MB418	0.0-1.0			1.0-1.4	1.4-5.3	5.3-8.0	

Notes:

Grey shading – indicates the material was not encountered at the investigation location.

4.5.2 Odour and staining

As documented on the field sheets (Appendix C):

- No hydrocarbon odour or staining was observed at any of the investigation locations; and
- An organic odour was observed at TA-TP450 at a depth of 1.4 m bgl (Tarraleah Village).

The absence of hydrocarbon odour and staining generally correlated with low PID readings (Section 4.6).

4.5.3 Solid wastes

Solid waste materials pose an aesthetic impact when visible at surface. Waste materials may also pose a safety risk to excavation workers and appropriate management measures are required where present.

As documented on the field sheets (Appendix C):

- Tarraleah Village:
  - Rock cobbles were present in fill materials to a depth of around 1.5 m bgl at the majority of locations
  - An old irrigation pipe and disconnected power cables were present at 1.0 m bgl in TA-TP451
  - No building demolition rubble (BDR) or suspected asbestos containing materials (ACM)-like fragments were identified in the fill materials, which suggests that ‘uncontrolled’ fill is unlikely to be present

- Tarraleah Switchyard:
    - The fill is essentially engineered fill, comprising various sizes of blue metal (dolerite) gravel, cobbles and boulders (which are typically used in switchyards) to a depth of around 1.5 m bgl; and
    - No BDR or suspected ACM-like fragments were identified in the fill materials, which suggests that 'uncontrolled' fill is unlikely to be present.

4.5.4 Water inflow

As documented on the field sheets (Appendix C), water inflow was observed in two test pits excavated at the Tarraleah Village:

- TA-TP452 at a depth of 3.0 m bgl (no odour or sheen); and
- TA-TP453 at a depth of 3.0 m bgl (no odour or sheen).

Refer to Section 4.7 for depth to groundwater in the installed groundwater wells.

4.6 Field screening

A secondary sample from all sampled locations was collected and screened in the field for VOCs using a PID. Higher readings, usually above 20 parts per million (ppm), may indicate the presence of- and impacts from VOC-containing contaminants.

PID results are provided in the field sheets (Appendix C) and ranged from:

- Tarraleah Village – 0.0 to 1.2 ppm (the highest reading being at TA-TP449 at 0.8 m bgl); and
- Tarraleah Switchyard – 0.0 to 33.9 ppm (the highest reading being at TA-MB418 at 0.5 m bgl).

Low PID readings generally correlated with the absence of observed hydrocarbon odour or staining (Section 4.5.2). The slightly elevated PID reading at 0.5 m bgl at TA-MB418 correlated with the detection of low-level TPH / TRH above the laboratory limits of reporting (LORs) (Appendix G).

4.7 Groundwater well installation

Groundwater wells were installed at all six borehole locations by Tasmanian Drilling Services.

Wells were:

- Screened across both the alluvial and fill materials layers to be representative of the top unconfined aquifer
- Plugged with bentonite above the screened section to prevent surface runoff water from directly entering the well
- Installed with a flush mount gatic-type cover, concreted at ground level and with well lids secured in place by two counter sunk head flush bolts with 8 mm hexagonal screws
- Developed by purging using an automatic bottom feeder pump to remove debris and residual drilling and installation wastes. Purging was carried out until the well was dry or until at least three times the well volume was purged. At some locations, where time permitted, the wells were developed more than once.; and
- Well collars were surveyed by HydroTas.

A summary of groundwater well installation details are provided in Table 7.

Groundwater well construction logs are provided in Appendix D and interpreted groundwater contours are shown on Figure 4 (Appendix A). Based on a single monitoring round show the perched / shallow groundwater flow direction towards TA-MB412 (i.e. there is likely a gully running through the area) and from there it would flow eastwards towards the Niver River.

Table 7: Groundwater well installation details – Tarraleah Switchyard

Well ID	Depth (m bgl)	Depth (m AHD)	Diameter (mm)	Screened Interval	SWL[A] (m AHD)	Comment
TA-MB411	2.8	350.058	50	1.2-2.8	Dry	Refusal in dolerite bedrock at 2.8 m bgl
TA-MB412	4.8	339.184	50	1.8-4.8	341.064	End of drillhole at 5.0 m bgl in weathered dolerite rock
TA-MB414	3.3	336.953	50	0.8-3.3	341.183[D]	End of drillhole at 5.0 m bgl in dolerite bedrock Drillhole sealed with grout from 5 to 6 m bgl and plugged with bentonite from 3.3 to 5.0 m bgl
TA-MB415	7.0[B]	339.223	50	2.5-7.0	341.233	End of drillhole at 9.0 m bgl in weathered dolerite rock Drillhole plugged with bentonite from 7.3 to 9 m bgl[B]
TA-MB416	5.8	340.942	50	2.8-5.8	342.062	End of drillhole at 7.3 m bgl in weathered dolerite rock Drillhole plugged with bentonite from 5.8 to 6.5 m bgl
TA-MB418	5.0	340.866	50	1.0-5.0	341.166	End of drillhole at 8.0 m bgl in dolerite (not weathered) Drillhole plugged with bentonite from 5.0 to 5.6 m bgl[C]

Notes:

A – measured on 29 April 2025.

B – TA-MB415 was plugged back to 7.3 m bgl but there was 0.3 m of fall in on top of the plug when the rods were removed to install the well, so the bottom of the well was installed at 7.0 m bgl.

C – TA-MB418 was drilled down to 8 m bgl but there was fall in bridging the hole at 5.6 m bgl.

D –TA-MB414 contained insufficient water to sample.

4.8 Assessment criteria

4.8.1 Rationale

Site assessment criteria are typically selected based on the following criteria:

- Land zoning and the most sensitive use permissible under that zoning: the zoning for the Site is a combination of ‘Rural’, ‘Utilities’, ‘Village’, ‘Environmental Management’ and ‘Recreation’ (PSI (BlueSphere, 2024)) for Area C:
  - Tarraleah Switchyard is zoned ‘Utilities’ which is taken to be equivalent to a commercial / industrial land use setting under the ASC NEPM
  - Tarraleah Village is zoned ‘Village’ and the most sensitive use permissible is residential

- Proposed land use or new zoning:
  - Tarraleah Switchyard – the proposed development and use within this part of the Site is an upgrade and replacement of existing infrastructure associated with the power station (i.e. no change in use)
  - Tarraleah Village – construction contractor's camp which is consistent with the 'village' use (i.e. no change in use); potential workshop use and construction is assumed to be permitted within the 'village' zone; and
- Onsite or adjacent sensitive receptors, including human and ecological: parts of the Site are located within areas zoned 'Rural' and 'Village' (i.e. potential residential receptors) and parts of the Site are zoned 'Environmental Management' and are adjacent to or contain watercourses and/or wetlands (i.e. ecological receptors).

On the basis of the above, the following criteria have been adopted for the two disturbance areas of Area C:

- Tarraleah Village – residential criteria. There are two levels of residential criteria, one for low density residential use with access to soil (e.g. with access to soil for a vegetable garden, etc.) and one for high-density residential use, where access to soil is minimal or non-existent. The low-density residential criteria have been nominated for Tarraleah Village, as access to soil for growing vegetables, etc. is possible within this area; and
- Switchyard – commercial / industrial criteria.

4.8.2 Soils / fill materials criteria

On the basis of the above rationale and due to the need for earthworks and since excess soils may also need to be disposed offsite, the following Area C and waste classification criteria have been selected for this ESA.

Laboratory reported concentrations of tested CoPC in soil / fill were compared against these criteria (where available and as appropriate) (i.e. a Tier 1 Risk Assessment). The criteria are used as thresholds to assist in determining if further investigation, risk assessment and/or management may be required.

Asbestos was assessed on a presence / absence basis.

- ASC NEPM:
  - Health Screening Levels (HSLs) / Health Investigation Levels (HILs) to assess the risk to human health during the proposed ongoing Site use under a:
    - Residential A land use setting for Tarraleah Village
    - Commercial / industrial D land use setting for the Tarraleah Switchyard
  - Ecological Screening Levels (ESLs) / Ecological Investigation Levels (EILs) to assess the risk to ecological receptors during the proposed ongoing Site use. Site-specific EILs were determined for select metals (Cr, Cu, Ni, Zn):
    - Urban residential / public open space land use setting for Tarraleah Village
    - Commercial / industrial D land use setting for the Tarraleah Switchyard
  - Areas of ecological significance (AES) criteria may also be relevant to assess potential impacts on areas adjacent to the Site which are zoned 'Environmental Management' and adjacent to waterways / wetlands (i.e. adjacent to the Nive River)
- CRC CARE Technical Report No. 10:
  - HSLs to assess the risk to human health during direct contact under:
    - Residential A land use setting for Tarraleah Village
    - Commercial / industrial D land use setting for the Tarraleah Switchyard
  - HSLs for Intrusive Maintenance Workers (IMW; i.e. construction and maintenance workers) to assess the risk to human health from vapour intrusion and during direct contact in a shallow trench

- PFAS NEMP:
  - HILs to assess the risk to human health during the proposed ongoing Site use under:
    - Residential A land use setting for Tarraleah Village
    - Commercial / industrial D land use setting for the Tarraleah Switchyard
  - Direct and indirect ecological guideline values for soil (consistent for all land uses)
  - Landfill acceptance criteria to determine the classification of any excavated material for offsite disposal; and
- IB105 criteria to determine the likely classification of any excavated material for off-site disposal to landfill or suitability for reuse.

4.8.3 Waters criteria

Laboratory reported concentrations of tested CoPC in water were compared against these criteria (where available and as appropriate) (i.e. a Tier 1 Risk Assessment). The criteria are used as thresholds to assist in determining if further investigation, risk assessment and/or management may be required.

- ASC NEPM HSLs A, to assess the vapour intrusion risk to human health during the proposed ongoing Site use
- Technical Report No. 10 HSLs A, to assess the vapour intrusion risk to human health during the proposed ongoing Site use
- EPA 2021[15] – Upper Derwent Catchment-specific default guideline values (DGVs) specific to the season of sampling and level of disturbance in the vicinity of the Site to assess the risk to ecological receptors (full year criteria adopted)
- NHMRC[16] recreational criteria – to assess the risk to human health during contact with groundwater. The NHMRC criteria are 20 times the ADWG[17] criteria which are based on daily consumption of 2 litres (L) of water; consumption in a recreational setting is more likely to be 0.1 L per day. Furthermore, recreational use assumes swimming in the waters. Contact with groundwater would likely be just a splash or similar, so recreational criteria are still very conservative when assessing for likely Site exposure to groundwater
- ANZG 2018[18] – freshwater default guideline values (DGVs) for slightly to moderately disturbed systems (95% of species protection), to assess the risk to ecological receptors within the hydraulically downgradient receiving environment; and
- PFAS NEMP – freshwater guideline values for slightly to moderately disturbed systems (95% of species protection), to assess the risk to ecological receptors within the hydraulically downgradient receiving environment.

It should be noted that EPA 2021, ANZG 2018, PFAS NEMP and NHMRC 2008 relate to surface water environments (as opposed to groundwater) and therefore an exceedance in a groundwater sample does not necessarily imply ecological harm. Furthermore, the values are necessarily conservative as they are intended as triggers for further investigation; they do not consider background concentrations or site-specific conditions.

Under the SPWQM[19], water quality objectives for a given site are based on the protected environmental values (PEVs). Based on the TDS concentrations (25 to 1,470 mg/L) in the new groundwater wells installed as part of this ESA (Appendix C) and considering land uses within and surrounding Area C, the PEVs for Area C are ecosystem protection (modified not pristine) and recreational water quality and aesthetics. Drinking water, irrigation and livestock drinking are not likely to be realistic PEVs within the zone of influence of Tarraleah Power Station groundwater discharge and have therefore not been considered.

[15] *Default Guideline Values (DGVs) for Aquatic Ecosystems of the Upper Derwent Catchment*, Environment Protection Authority Tasmania, August 2021 (EPA 2021).
[16] *Guidelines for Managing Risks in Recreational Water*, National Health and Medical Research Council, 2008 (NHMRC).
[17] *National Water Quality Management Strategy – Australian Drinking Water Guidelines 2011*, updated September 2022 (ADWG).
[18] *Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2018*, Australian and New Zealand Governments and Australian State and Territory Governments, Canberra ACT, Australia (ANZG 2018).
[19] (Tasmanian) *State Policy on Water Quality Management 1997* (SPWQM).

5. Analytical results

5.1 Analytical results and comparison to adopted assessment criteria

Laboratory Certificates of Analysis are provided in Appendix F.

Analytical results are provided and compared to adopted assessment criteria (as appropriate) in the result tables in Appendix G. Basic statistics are also provided where appropriate.

Appendix G contains:

- Table G1 – tabulated soil and fill results for Tarraleah Village compared to adopted guideline criteria
- Table G2 – tabulated soil and fill results for Tarraleah Switchyard compared to adopted guideline criteria
- Table G3 – tabulated soil and fill results for Tarraleah Switchyard compared to AES criteria[20]
- Table G4 – tabulated water inflow results for Tarraleah Village compared to adopted guideline criteria
- Table G5 – tabulated groundwater results for Tarraleah Switchyard compared to adopted guideline criteria
- Table G6 – Site-specific EIL calculations for applicable metals (village and switchyard)
- Table G7 – tabulated soil triplicate results and calculated relative percentage differences (RPDs)
- Table G8 – tabulated soil trip blank results; and
- Table G9 – tabulated water trip blank and rinsate results.

A discussion of the reported concentrations and exceedances of adopted criteria is presented in Section 6.

Field and laboratory QA/QC are discussed in Section 6.7.

5.1.1 Soils / fill materials / solids

A total of 37 primary and 6 secondary soils / fill materials/ solids samples were collected from the Site for testing of identified CoPC. A summary of exceedances of adopted assessment criteria by area is provided in:

- Table 8 – assessment of Tarraleah Village results for soils / fill materials samples **remaining onsite** against relevant Site use and IMW criteria
- Table 9 – assessment of Tarraleah Switchyard results for soils / fill materials samples **remaining onsite** against relevant Site use and IMW criteria; and
- Table 10 – assessment of results for surplus soils / fill materials samples **if there are to be disposed offsite** against offsite disposal criteria.

5.1.2 Waters

A total of 6 primary and 2 secondary water samples were collected from the Site for testing of identified CoPC. A summary of exceedances of adopted assessment criteria by area is provided in Table 11.

[20] To inform soils / fill materials management requirements given the adjacent ecological receptors within the Nive River.

Table 8: Summary of exceedances of the adopted Area C Site use and IMW assessment criteria – soils / fill materials remaining onsite within the Tarraleah Village

Sample ID / Depth (m bgl)	Human Health Criteria[A]					Ecological Criteria[A]			Presence of Fibres		
	ASC NEPM HIL / HSL A (vapour intrusion)	CRC CARE HSL A (direct contact)	CRC CARE HSL IMW (direct contact)	CRC CARE HSL IMW (vapour intrusion)	PFAS NEMP HIL A (direct contact)	ASC NEPM EIL/ESL urban residential / public open space	PFAS NEMP Ecological direct exposure	PFAS NEMP Ecological indirect exposure	Asbestos Fibres (type)	Synthetic Mineral Fibres (SMF)	Organic Fibres
Tarraleah Village											
TA-TP449/0.4	NE	NE	NE	NE	-	NE	-	-	-	-	-
TA-TP449/0.8	NE	NE	NE	NE	-	NE	-	-	-	-	-
QCP01[B]	-	-	-	-	-	-	-	-	-	-	-
QCS01[C]	NE	NE	NE	NE	-	NE	-	-	NE	NE	Yes
TA-TP449/3.0	NE	NE	NE	NE	-	NE	-	-	-	-	-
TA-TP450/0.2	NE	NE	NE	NE	-	NE	-	-	-	-	-
TA-TP450/1.4	NE	NE	NE	NE	-	NE	-	-	-	-	-
TA-TP451/0.8	NE	NE	NE	NE	-	NE	-	-	-	-	-
TA-TP451/2.0	NE	NE	NE	NE	-	NE	-	-	-	-	-
TA-TP451/3.0	NE	NE	NE	NE	-	NE	-	-	-	-	-
TA-TP452/0.2	NE	NE	NE	NE	-	NE	-	-	-	-	-
TA-TP452/2.0	NE	NE	NE	NE	-	NE	-	-	-	-	-
TA-TP452/3.2	NE	NE	NE	NE	-	NE	-	-	-	-	-
TA-TP453/0.2	NE	NE	NE	NE	-	NE	-	-	-	-	-
TA-TP453/1.5	NE	NE	NE	NE	-	NE	-	-	-	-	-
TA-TP453/2.2[B]	-	-	-	-	-	-	-	-	-	-	-

Notes:

A – HILs/HSLs and EILs/ESLs for low-density residential use adopted for all sampled locations (based on the most sensitive land use permissible under the 'Village' zoning, Section 4.8.1).

B – not tested by ALS Laboratory, analytical suite was inadvertently not ticked on the CoC (Appendix F). Given the consistency of the dataset overall, this does not affect the conclusions of this ESA.

C – potential exceedance of adopted criteria for hexavalent Cr (Cr(VI)) based on reported total Cr concentration; sample was subsequently tested for speciated Cr and all total Cr was in the trivalent Cr form (Cr(III)).

NE – no exceedances reported in the sample; '–' not tested for PFAS and/or asbestos (as relevant).

Blue shaded cells – indicate presence of fibres as reported within the cell.

Table 9: Summary of exceedances of the adopted Area C Site use and IMW assessment criteria – soils / fill materials remaining onsite within the Tarraleah Switchyard

Sample ID / Depth (m bgl)	Human Health Criteria[A]					Ecological Criteria[A]			Presence of Fibres		
	ASC NEPM HIL / HSL D (vapour intrusion)	CRC CARE HSL D (direct contact)	CRC CARE HSL IMW (direct contact)	CRC CARE HSL IMW (vapour intrusion)	PFAS NEMP HIL D (direct contact)	ASC NEPM EIL/ESL commercial / industrial	PFAS NEMP Ecological direct exposure	PFAS NEMP Ecological indirect exposure	Asbestos Fibres (type)	Synthetic Mineral Fibres (SMF)	Organic Fibres
Tarraleah Switchyard											
TA-MB412/0.4	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
QCP02	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
QCS02	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	Yes
TA-MB412/1.5	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
TA-MB412/2.3	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
TA-MB412/3.0	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	Yes
TA-MB414/0.4[C]	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	Yes
TA-MB414/1.5[C]	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	Yes
TA-MB414/2.0[C]	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
TA-MB415/0.3[C]	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
TA-MB415/1.8[C]	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
TA-MB415/2.8[C]	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
TA-MB415/3.3[C]	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
TA-MB416/0.4[C]	NE	NE	NE	NE	NE	Zn[B]	NE	NE	NE	NE	NE
TA-MB416/2.3[C]	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
TA-MB416/2.8[C]	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	Yes
TA-MB416/3.2[C]	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
TA-TP456/0.3[C]	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	Yes
QCP03[C]	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	Yes
QCS03	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	Yes
TA-TP456/0.8[C]	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
TA-MB411/0.2[C]	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	Yes
TA-MB411/2.2[C]	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
TA-MB411/2.8[C]	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE

Sample ID / Depth (m bgl)	Human Health Criteria[A]					Ecological Criteria[A]			Presence of Fibres		
	ASC NEPM HIL / HSL D (vapour intrusion)	CRC CARE HSL D (direct contact)	CRC CARE HSL IMW (direct contact)	CRC CARE HSL IMW (vapour intrusion)	PFAS NEMP HIL D (direct contact)	ASC NEPM EIL/ESL commercial / industrial	PFAS NEMP Ecological direct exposure	PFAS NEMP Ecological indirect exposure	Asbestos Fibres (type)	Synthetic Mineral Fibres (SMF)	Organic Fibres
TA-MB418/0.3	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
TA-MB418/0.5	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
TA-MB418/1.3	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE

Notes:

A – HILs/HSLs and EILs/ESLs for commercial / industrial use adopted for all sampled locations (based on the most sensitive land use permissible under the 'Utilities' zoning, Section 4.8.1).

B – exceeded the Site-specific added contaminant limit (ACL) calculated from a single ASC NEPM classification sample. The ACL has been adopted as the EIL for initial screening, but this is a highly conservative approach as it does not consider background concentrations, nor individual soil types.

C – samples required dilution prior to PAH analysis due to matrix interferences; LOR values were adjusted accordingly; all reported concentrations were below the adjusted LORs.

NE – no exceedances reported in the sample.

Green shaded cells – indicate exceedances of adopted ecological assessment criteria for the analyte(s) reported within the cell.

Blue shaded cells – indicate presence of fibres as reported within the cell.

Table 10: Summary of exceedances of the adopted criteria for offsite disposal – soils / fill materials within Tarraleah Village and Switchyard if disposed offsite

Sample ID / Dept (m bgl)	Asbestos Fibres (type)	IB105 Criteria					PFAS NEMP Criteria		
		Level 1 Fill Material	Level 2 Low-level Contaminated Soil (Total)	Level 2 Low-level Contaminated Soil (Leachable)	Level 3 Contaminated Soil (Total)	Level 3 Contaminated Soil (Leachable)	Unlined Landfill	Clay / Single Lined landfill	Double Composite Lined Landfill
Tarraleah Village									
TA-TP449/0.4	-	NE	NE	-	NE	-	-	-	-
TA-TP449/0.8	-	NE	NE	-	NE	-	-	-	-
QCP01[A]	-	-	-	-	-	-	-	-	-
QCS01	NE	Cr, Ni	NE	-	NE	-	NE	NE	NE
TA-TP449/3.0	-	NE	NE	-	NE	-	-	-	-
TA-TP450/0.2	-	NE	NE	-	NE	-	-	-	-
TA-TP450/1.4	-	NE	NE	-	NE	-	-	-	-

Sample ID / Dept (m bgl)	Asbestos Fibres (type)	IB105 Criteria					PFAS NEMP Criteria		
		Level 1 Fill Material	Level 2 Low-level Contaminated Soil (Total)	Level 2 Low-level Contaminated Soil (Leachable)	Level 3 Contaminated Soil (Total)	Level 3 Contaminated Soil (Leachable)	Unlined Landfill	Clay / Single Lined landfill	Double Composite Lined Landfill
TA-TP451/0.8	-	NE	NE	-	NE	-	-	-	-
TA-TP451/2.0	-	NE	NE	-	NE	-	-	-	-
TA-TP451/3.0	-	NE	NE	-	NE	-	-	-	-
TA-TP452/0.2	-	NE	NE	-	NE	-	-	-	-
TA-TP452/2.0	-	NE	NE	-	NE	-	-	-	-
TA-TP452/3.2	-	NE	NE	-	NE	-	-	-	-
TA-TP453/0.2	-	NE	NE	-	NE	-	-	-	-
TA-TP453/1.5	-	NE	NE	-	NE	-	-	-	-
TA-TP453/2.2[A]	-	-	-	-	-	-	-	-	-
Tarraleah Switchyard									
TA-MB412/0.4	NE	As, Cr, Zn	NE	-	NE	-	NE	NE	NE
QCP02	NE	Cr, Zn	NE	-	NE	-	NE	NE	NE
QCS02	NE	Cr, Zn	NE	-	NE	-	NE	NE	NE
TA-MB412/1.5	NE	NE	NE	-	NE	-	NE	NE	NE
TA-MB412/2.3	NE	NE	NE	-	NE	-	NE	NE	NE
TA-MB412/3.0	NE	Cr	NE	-	NE	-	NE	NE	NE
TA-MB414/0.4	NE	As, *BaP*[B]	NE	-	NE	-	NE	NE	NE
TA-MB414/1.5	NE	*BaP*[B]	NE	-	NE	-	NE	NE	NE
TA-MB414/2.0	NE	Cr, *BaP*[B]	NE	-	NE	-	NE	NE	NE
TA-MB415/0.3	NE	Cr, Ni, *BaP*[B]	NE	-	NE	-	NE	NE	NE
TA-MB415/1.8	NE	*BaP*[B]	NE	-	NE	-	NE	NE	NE
TA-MB415/2.8	NE	*BaP*[B]	NE	-	NE	-	NE	NE	NE
TA-MB415/3.3	NE	*BaP*[B]	NE	-	NE	-	NE	NE	NE
TA-MB416/0.4	NE	Cr, Zn, *BaP*[B]	NE	-	NE	-	NE	NE	NE
TA-MB416/2.3	NE	*BaP*[B]	NE	-	NE	-	NE	NE	NE
TA-MB416/2.8	NE	Cr, *BaP*[B]	NE	-	NE	-	NE	NE	NE

Sample ID / Dept (m bgl)	Asbestos Fibres (type)	IB105 Criteria					PFAS NEMP Criteria		
		Level 1 Fill Material	Level 2 Low-level Contaminated Soil (Total)	Level 2 Low-level Contaminated Soil (Leachable)	Level 3 Contaminated Soil (Total)	Level 3 Contaminated Soil (Leachable)	Unlined Landfill	Clay / Single Lined landfill	Double Composite Lined Landfill
TA-MB416/3.2	NE	*BaP[B]*	NE	-	NE	-	NE	NE	NE
TA-TP456/0.3	NE	Cr, Ni, *BaP[B]*	NE	-	NE	-	NE	NE	NE
QCP03	NE	Cr, Ni, *BaP[B]*	NE	-	NE	-	NE	NE	NE
QCS03	NE	Cr, Ni	NE	-	NE	-	NE	NE	NE
TA-TP456/0.8	NE	Cr, *BaP[B]*	NE	-	NE	-	NE	NE	NE
TA-MB411/0.2	NE	Cr, Ni, *BaP[B]*	NE	-	NE	-	NE	NE	NE
TA-MB411/2.2	NE	Cr, *BaP[B]*	NE	-	NE	-	NE	NE	NE
TA-MB411/2.8	NE	Cr, *BaP[B]*	NE	-	NE	-	NE	NE	NE
TA-MB418/0.3	NE	Cr, Ni	NE	-	NE	-	NE	NE	NE
TA-MB418/0.5	NE	Cr, Ni	NE	-	NE	-	NE	NE	NE
TA-MB418/1.3	NE	NE	NE	-	NE	-	NE	NE	NE

Notes:

BaP – benzo(a)pyrene.

A – not tested by ALS Laboratory, analytical suite was inadvertently not ticked on the CoC (Appendix F). Given the consistency of the dataset overall, this does not affect the conclusions of this ESA.

B – potential exceedance of adopted criteria; some samples required dilution prior to analysis due to matrix interferences and the LOR values have been adjusted accordingly. Raised LORs were above the adopted guideline criteria for BaP of 0.08 mg/kg.

NE – no exceedances reported in the sample.

Italic grey – potential exceedance of adopted criteria as the LOR was above the adopted criteria. Refer to superscript comment.

'–' not tested for PFAS and/or asbestos and/or leachable concentrations (as relevant).

Blue shaded cells – indicate exceedances of adopted IB105 Level 1 Fill material criteria for the analyte(s) listed within the cell => those samples would be classified as Level 2, low level contaminated soil for offsite disposal to landfill

Table 11: Summary of exceedances of the adopted Site use assessment criteria – inflow waters within Tarraleah Village

Sample ID / Depth (m bgl)	Human Health Criteria[A]				Ecological Criteria[B]		
	ASC NEPM HIL / HSL A (vapour intrusion)	**CRC CARE HSL A (vapour intrusion)**	**PFAS NEMP (recreational criteria)**	**NHMRC (recreational criteria)**	**ANZG Freshwater TVs (95% of species protection)**	**PFAS NEMP Freshwater (95% of species protection)**	**EPA 2021 Freshwater TVs[C] (95% of species protection)**
TA-TP452/W	NE[D]	NE[D]	-	*BaP[E], total PAH[E]*	Pb	-	-
TA-TP454/W	NE[D]	NE[D]	-	*BaP[E], total PAH[E]*	Pb	-	-

Notes:

TV – trigger value.

A – HSLs for low-density residential use adopted for all sampled locations (based on the most sensitive land use permissible under the 'Village' zoning, Section 4.8.1).

B – freshwater criteria for slightly to moderately disturbed ecosystems (95% of species protection) adopted for all sampled locations (based on the modified nature of the ecosystem within the adjacent Nive River, Section 4.8.1).

C – TVs are season dependent. Average TVs for a full year have been adopted.

D – not considering sample depth or soil type.

E – potential exceedance of adopted criteria for BaP and total PAH (as BaP); the laboratory limit of reporting (LOR) of 0.5 µg/L is higher than the guideline criterion of 0.2 µg/L.

NE – no exceedances reported.

Italic grey – potential exceedance of adopted criteria as the LOR was above the adopted criteria. Refer to superscript comment.

'–' not tested for PFAS and/or nutrients (as relevant).

Yellow shaded cells – indicate exceedances of adopted human health assessment criteria for the analyte(s) noted within the cell; none identified in this ESA.

Green shaded cells – indicate exceedances of adopted ecological assessment criteria for the analyte(s) noted within the cell.

Table 12: Summary of exceedances of the adopted Site use assessment criteria – groundwaters within Tarraleah Switchyard

Sample ID / Depth (m bgl)	Human Health Criteria[A]				Ecological Criteria[B]		
	ASC NEPM HIL / HSL D (vapour intrusion)	**CRC CARE HSL B (vapour intrusion)**	**PFAS NEMP (recreational criteria)**	**NHMRC (recreational criteria)**	**ANZG Freshwater TVs (95% of species protection)**	**PFAS NEMP Freshwater (95% of species protection)**	**EPA 2021 Freshwater TVs[C] (95% of species protection)**
TA-MB411[D]	-	-	-	-	-	-	-
TA-MB412	NE[N]	NE[N]	NE[N]	*BaP[F], total PAH[F]*	Cd[H], Cr (total)[H], Cu[H], Pb[H], Ni[H], Zn[H], PAH[J], OCP/OPP[J]	NE	TSS, NO_3-N, TN, TP, RP
TA-MB414[E]	-	-	-	-	-	-	-
TA-MB415[G]	NE[N]	NE[N]	NE[N]	*BaP[F], total PAH[F]*	Cr (total)[H], Cu[H,I], Ni[H], Zn[H,I], PAH[J], OCP/OPP[J]	NE[O,P]	TSS, NO_3-N, TN, TP, RP
QAQC1[G]	NE[N]	NE[N]	NE[N]	*BaP[F], total PAH[F]*	Cr (total)[H], Cu[H,I], Pb[H], Ni[H], Zn[H,I], PAH[J], OCP/OPP[J]	NE	TSS, NO_3-N[M], TN[M], TP, RP
QAQC2	NE[N]	NE[N]	NE[N]	*BaP[F], total PAH[F]*	Cu[H,I], Zn[H,I], PAH[J], OCP/OPP[J], PCB[L]	NE[P]	TSS, NO_3-N[M], TN[M], RP
TA-MB416	NE[N]	NE[N]	NE[N]	*BaP[F], total PAH[F]*	Cu[H,I], Zn[H,I], PAH[J], OCP/OPP[J]	NE	NH_3-N, NO_3-N, NO_2-N, RP
TA-MB418	NE[N]	NE[N]	NE[N]	*BaP[F], total PAH[F]*	Cr (total)[H,I], Cu[H,I], Pb[H], Ni[H], Zn[H], PAH[J], OCP/OPP[J]	NE	TSS, NO_3-N, NO_2-N, TP, RP

Notes:

NH_3-N – ammonia as nitrogen; NO_3-N – nitrate as nitrogen; NO_2-N – nitrite as nitrogen; TN – total nitrogen; TP – total phosphorus; RP – reactive phosphorus.

A – HILs/HSLs and EILs/ESLs for commercial / industrial use adopted for all sampled locations (based on the most sensitive land use permissible under the 'Utilities' zoning, Section 4.8.1).

B – freshwater criteria for slightly to moderately disturbed ecosystems (95% of species protection) adopted for all sampled locations (based on the modified nature of the ecosystem within the adjacent Nive River, Section 4.8.1).

C – TVs are season dependent. Average TVs for a full year have been adopted.

D – dry and consequently not sampled.

E – not enough water for sample collection.

F – potential exceedance of adopted criteria for BaP and total PAH (as BaP); LOR of 2 μg/L is higher than the guideline criterion of 0.2 μg/L.

G – reported concentrations of total metals have been confirmed by re-digestion and re-analysis (Appendix F).

H – total concentration.

I – dissolved concentration.

J – potential exceedance of adopted criteria for PAH; LOR of 2 µg/L is higher than the guideline criteria for some of the individual parameters.

K – potential exceedance of adopted criteria for OCP / OPP; LOR of 2 µg/L is higher than the guideline criteria for the individual parameters.

L – potential exceedance of adopted criteria for PCBs; LOR of 5 µg/L is higher than the guideline criteria for the individual parameters; only sample QAQC2 was tested for PCBs.

M – it has been noted that oxides of nitrogen (NOx) is greater than TN, however this difference has been confirmed by the laboratory from their respective bottles (Appendix F).

N – not considering sample depth or soil type.

O – poor matrix spike recovery due to sample matrix interference; confirmed by re-analysis (Appendix F).

P – reported concentration of PFOS above the LOR was confirmed by re-extraction and re-analysis using a second container (Appendix F).

NE – no exceedances reported.

Italic grey – potential exceedance of adopted criteria as the LOR was above the adopted criteria. Refer to superscript comment.

'–' not tested.

Yellow shaded cells – indicate exceedances of adopted human health assessment criteria for the analyte(s) noted within the cell; none identified in this ESA.

Green shaded cells – indicate exceedances of adopted ecological assessment criteria for the analyte(s) reported within the cell (noting samples were collected to guide offsite disposal).

6. Discussion

A summary of the reported concentrations of CoPC, and exceedances of adopted criteria is provided in Appendix G.

Discussions of reported concentrations and exceedances of adopted criteria are presented in:

- Section 6.1 – Tarraleah Village soils / fill materials remaining onsite including IMW
- Section 6.2 – Tarraleah Switchyard soils / fill materials remaining onsite including IMW
- Section 6.3 – Indicative waste classification of soils / fill materials for offsite disposal
- Section 6.4 – Tarraleah Village inflow waters; and
- Section 6.5 – Tarraleah Switchyard groundwater.

A summary of identified contamination is provided in Section 6.6.

Findings from the QA/QC assessment are discussed in Section 1.1.

6.1 Tarraleah Village soils / fill materials remaining onsite including IMW

6.1.1 Asbestos, synthetic mineral fibres and organic fibres

Asbestos

Asbestos is a known carcinogen. Disturbing any amount of asbestos can release fibres into the air. These could be inhaled or swallowed, which may lead to diseases such as asbestosis, lung cancer or mesothelioma in later years in the lungs and potentially other diseases if swallowed. Even limited or short-term exposure to asbestos fibres can be dangerous[21]. The likelihood of exposure occurring depends upon the potential for the asbestos material to release fibres, whether the asbestos material is contained or covered, and any operational control measures or personal protective equipment which have been applied to limit the generation and/or inhalation of airborne fibres. Non-friable asbestos in sound condition represents a low human health and environmental risk, in the short term and provided it is *not* allowed to degrade at surface over time. However, friable asbestos materials or damaged-, crumbling bonded asbestos, have the potential to generate, or be associated with free asbestos fibres, and therefore must be carefully managed to minimise the release of asbestos fibres into the air (SafeWork NSW).

Although not a target CoPC associated with the identified PCA at the sampled locations within the Tarraleah Village soils / fill materials (e.g. storage of fuel in USTs), asbestos was tested for in one sample (QCS01, the inter-laboratory duplicate of TA-TP449/0.8). Where tested (Table 8), no asbestos was found in soils / fill materials at or above the LOR of 0.1 g/kg, by polarised light microscopy including dispersion staining. In addition, no suspected ACM fragments were identified during this ESA (refer to Section 4.5).

Synthetic mineral fibres (SMF)

SMF is a generic term used to collectively describe a number of amorphous (non-crystalline) fibrous materials including glassfibre, mineral wool and ceramic fibre. Glassfibre and mineral wool have been used for many decades. The major application of SMF materials is in thermal and acoustic insulation, and as a reinforcing agent. In some specialised instances, these materials have been used as a replacement for asbestos, especially where high temperature insulation properties are required. Ceramic fibre has also been used to replace refractory brick and mortar materials. Because of their similar application and appearance to asbestos, there has been some concern in the community regarding the health effects associated with exposure to SMF (NOHSC:1004(1990))[22].

[21] Asbestos safety (worksafe.tas.gov.au).

[22] *National Standard for Synthetic Mineral Fibres*, National Occupational Health and Safety Commission, May 1990 (NOHSC:1004(1990)).

Where tested (Table 8) and consistent with asbestos, SMF were reported as not present in sample QCS01.

Organic fibres

Where tested (Table 8), organic fibres were reported as present in sample QCS01. Organic fibres generally do not pose risks to human health or the environment and are likely associated with vegetation rootlets.

Based on the laboratory results (Table 8) and given the absence of potential ACM fragments (Section 4.5) and the absence of ACM as a PCA for the sampled locations within Area C, it is considered unlikely that asbestos or SMF may be present in soils / fill materials.

6.1.2 Other CoPC

Human health

Reported concentrations of tested CoPCs in soils / fill materials remaining onsite were below adopted ASC NEPM and CRC Care Technical Report No. 10 human health criteria (HILs / HSLs A) for all parameters tested irrespective of soil type and depth (Table 8).

One sample (QCS01, the inter-laboratory duplicate of TA-TP449/0.8), a clayey silt / basalt sample, reported a total Cr concentration (380 mg/kg) in excess of the ASC NEPM HIL A Cr(VI) criterion of 100 mg/kg. Given the potential exceedance, the sample was retested by the laboratory for speciated Cr (i.e. Cr(III) and Cr(VI)) and reported concentrations (Appendix F) showed all the sub-sample reported a lower total Cr (240 mg/kg) concentration, but importantly, reported that all of the Cr was in the less toxic Cr(III) form, and the reported concentration of Cr(VI) in QCS01 (<1 mg/kg) was well below the ASC NEPM HIL A criterion.

The reported total Cr concentration is therefore considered unlikely to pose an unacceptable risk to human health under the low density residential land use scenario (based on zoning).

Ecological

Where tested (Table 8), reported concentrations of tested CoPCs in soils / fill materials remaining onsite were below adopted ASC NEPM ecological criteria (EILs / ESLs A and/or direct / indirect exposure for all land uses) for all parameters tested irrespective of soil texture.

6.2 Tarraleah Switchyard soils / fill materials remaining onsite including IMW

6.2.1 Asbestos and synthetic mineral fibres

No suspected ACM fragments were identified during this ESA (refer to Section 4.5).

As detailed in Section 6.1.1, there are risks associated with exposure to asbestos and SMF.

Where tested, Table 9:

- No asbestos fibres were reported at the LOR of 0.1 g/kg in any of the soil / fill materials samples
- No SMF were reported as present in any of the soil / fill materials samples; and
- Organic fibres (likely associated with vegetation rootlets) were reported as present in nine of the 27 samples.

6.2.2 Other CoPC

Human health

Where tested (Table 9), reported concentrations of tested CoPCs in soils / fill materials remaining onsite were below adopted ASC NEPM, CRC Care Technical Report No. 10 and PFAS NEMP (as appropriate) human health criteria (HILs / HSLs A) for all parameters tested irrespective of soil type and depth.

Ecological

With the exception of one sample (TA-MB416/0.4), reported concentrations of tested CoPCs in soils / fill materials remaining onsite were below adopted ASC NEPM and PFAS NEMP (as appropriate) ecological criteria (EILs / ESLs A and/or direct / indirect exposure for all land uses) for all parameters tested irrespective of soil texture (Table 9).

The single sample which potentially exceeds an ecological criterion is from TA-MB416 which was taken at a depth of 0.4 m bgl, north-east of the Tarraleah Switchyard. This clayey SAND sample reported a Zn concentration (428 mg/kg) in excess of the conservative site-specific ACL (390 mg/kg), calculated from a single ASC NEPM characterisation sample. The ACL does not consider background concentrations, and the most stringent ACL was for the most clayey sample tested for ASC NEPM characterisation[23]. Given the non-uniform detection of Zn onsite (which ranged from 19 to 428 mg/kg and averaged 64 mg/kg[24]). If the average of 64 mg/kg is added to the conservative ACL of 390 mg/kg, the EIL for Zn should be around 454 mg/kg. Since the maximum Zn concentration of soils / fill materials remaining on site is 428 mg/kg, none of the soils are considered to exceed the site-specific EIL for Zn.

In addition, given Tarraleah Switchyard is highly disturbed / modified and since the elevated Zn concentration (0.4 m bgl) was well above the water table (Table 7), an isolated exceedance of adopted ecological criteria in soils / fill materials is not likely to pose an unacceptable risk to ecological receptors under the proposed ongoing commercial / industrial use. Proposed redevelopment works should consider the presence of elevated Zn in soils / fill materials in the vicinity of TA- MB416 (and likely other areas of the Tarraleah Switchyard) and appropriate management measures to avoid impacts to downstream ecological receptors (e.g. within the Nive River) should be incorporated into a Construction Environmental Management Plan (CEMP) (or similar) (refer to Section 7.5). Erosion and sediment management would effectively minimise risks from elevated Zn concentrations.

It should be noted that the adopted criteria are based on the commercial / industrial land use setting. The AES ACLs, which would relate to the Nive River, are more stringent with exceedances reported for As, Cr (total) Cu, Ni and Zn (Appendix F). Therefore the CEMP (or similar) must recognise the sensitive receiver represented by the Nive River and must manage works to avoid any erosion or sediment discharge to the river.

6.3 Indicative waste classification of soils / fill materials for offsite disposal

Should soils / fill materials from sampled locations be disposed offsite, indicative waste classification (based on reported total concentrations) is as follows.

No asbestos was detected in any of the samples and reported PFAS concentrations were below the PFAS NEMP unlined landfill criteria (where available) in all samples (Table 10). Consequently, **indicative** waste classification has been determined based on IB105 requirements using total concentrations only.

Soils / fill materials classified under IB105 as Level 2 and above IB105 must be transported to a landfill licenced to receive Level 2 low level contaminated soil, by a licenced waste transporter. Approval from the EPA may also be required.

[23] Note ACL calculations for Zn do not rely on clay content.

[24] When excluding the outliers / elevated Zn concentrations of 200 to 297 mg/kg (TA-MB412/0.4, QCP02 and QCS02) and 428 mg/kg (TA-MB416/0.4).

Tarraleah Village

With the exception of one sample (QCS01, the inter-laboratory duplicate of TA-TP449/0.8), reported concentrations of tested CoPCs in soils / fill materials were below the IB105 Level 1 – fill material criteria for all tested CoPCs (Table 10).

Clayey silt / basalt in TA-TP449 at a depth of around 0.8 m bgl is indicatively classified under IB105 as **Level 2 – low-level contaminated soil** for disposal based on the reported total concentrations of the following in a single sample (Appendix F):

- Cr (total) – concentrations of 380 and 240 mg/kg compared to IB105 Level 1 and Level 2 Cr (total) criteria of 50 and 500 mg/kg respectively; the Cr(VI) concentration of <1 mg/kg was below the IB105 Level 1 criterion of 1 mg/kg; and
- Ni – concentration of 140 mg/kg compared to IB105 Level 1 and Level 2 Ni criteria of 60 and 600 mg/kg respectively.

It is important to note that the Level 2 classification is based on a single sample tested for an extended metals suite. Given the consistency of the data set overall (e.g. Pb in all samples ranged from <5 to 13 mg/kg), it is reasonable to assume that soils in the vicinity of the other sampled locations would also have elevated total Ni and Cr (total) concentrations in excess of Level 1 criteria. It is likely that the slightly elevated Cr and Ni concentrations in this soil sample are due to the basalt parent rock. Basalt is typically high in Cr and Ni and some other metals. Leachability testing of these soils would likely show very low to no leachability of these metals. If this is the case, EPA may consider the soils to be Level 2, 'non-controlled' wastes, as opposed to 'controlled' wastes. This could have implications on approvals for reuse, landfill disposal and landfill costs.

Given the soils meet the Tarraleah Village Site use criteria for residential land use (Section 6.1), onsite reuse is an acceptable option.

Tarraleah Switchyard

Soils / fill materials at the Tarraleah Switchyard to a depth of around 3 m bgl are **indicatively** classified under IB105 as **Level 2 – low-level contaminated soil** for disposal (Table 10) as a 'controlled waste' based on the reported **total concentrations of Cr (total)** (Appendix F). A summary of exceedances and assessment of 95% UCL + mean values against IB105 criteria is provided below:

- As – concentrations of 31 and 42 mg/kg in two samples compared to IB105 Level 1 and Level 2 As criteria of 20 and 200 mg/kg respectively. However, the average concentration of 6.8 mg/kg (all 27 samples) and 95% upper confidence limit (UCL) on the mean[25] of 10.4 mg/kg is **within the IB105 Level 1** criterion of 20 mg/kg
- Cr (total) – concentrations ranging between 50 to 260 mg/kg (17 samples) compared to IB105 Level 1 and Level 2 total Cr criteria of 50 and 500 mg/kg respectively. Furthermore, the average concentration of 67 mg/kg (all 27 samples) and 95% UCL on the mean of 88.9 mg/kg are also **above the IB105 Level 1** criterion of 50 mg/kg, i.e. is **classified as Level 2 on the basis of the total Cr concentration**
- Ni – concentrations ranging between 66 to 115 mg/kg (7 samples) compared to IB105 Level 1 and Level 2 Ni criteria of 60 and 600 mg/kg respectively. However, the average concentration of 37 mg/kg (all 27 samples) and 95% UCL on the mean of 46.1 mg/kg are **within the IB105 Level 1** criterion of 60 mg/kg
- Zn – concentrations ranging between 200 to 428 mg/kg (4 samples) compared to IB105 Level 1 and Level 2 Zn criteria of 200 and 14,000 mg/kg respectively. However, the average concentration of 73 mg/kg (all 27 samples) and 95% UCL on the mean of 100.9 mg/kg are **within the IB105 Level 1** criterion of 200 mg/kg; and
- BaP – concentrations of <0.13 and <0.14 mg/kg (17 samples) compared to IB105 Level 1 and Level 2 criteria of 0.08 and 2 mg/kg respectively. The average concentration of 0.05 mg/kg (all 27 samples) was below the IB105 Level 1 criterion and 95% UCLs have not been calculated given all reported concentrations were below the LORs. A number of samples (17) required dilution prior to analysis due to matrix interferences, and the LOR value was adjusted accordingly. Reported PAH concentrations for the remaining ten samples were <0.05 mg/kg and **within the IB105 Level 1** criterion.

[25] A 95% UCL on the mean is a statistical estimate that provides an upper bound on the mean concentration of a contaminant with 95% confidence. It is used to provide confidence that the true mean of the contaminant concentration is not underestimated, due to dataset variables. A statistical approach is considered appropriate for waste classification given the inevitable 'mixing' of soils during excavation.

Given the widespread Cr (total) concentrations in excess of the IB105 Level 1 criterion, it is unlikely that segregation of material within the Tarraleah Switchyard would result in a lower classification of waste soils under IB105. In addition, there are no IB105 leachable criteria for Level 1 fill materials.

As noted above, if it can be demonstrated that the elevated metals are naturally-derived from the blue metal, and leachable concentrations are below the LORs, or low, it may be possible to reduce the Level 2 – low level contaminated soil classification for offsite disposal as a 'controlled waste' to a 'non-controlled' waste.

Given the soils meet the Tarraleah Switchyard Site use criteria for commercial / industrial land use (Section 6.2), the wastes could be reused within the same land title within an area to also be used for commercial / industrial or utilities purposes (noting the sensitive ecological receptor represented by the adjacent Niver River).

6.4 Tarraleah Village inflow waters

Human health

With the potential exception of BaP (and total PAH as BaP), reported concentrations of tested CoPCs in test pit inflow waters were below adopted ASC NEPM, CRC Care Technical Report No. 10 and NHMRC recreational (as appropriate) human health criteria (HSLs A / TVs) for all parameters tested irrespective of soil type and depth (Table 11).

There is a potential, although unlikely, exceedance of NHMRC recreational criterion of 0.2 μg/L for BaP (and total PAH as BaP) as the LOR of 0.5 μg/L is higher than the guideline criterion. Given the 3.0 m bgl depth of the waters (Section 4.5.4), the absence of visual and olfactory evidence of hydrocarbon contamination (Section 4.5.2), the absence of TRH above the LORs (Appendix F), the unlikely recreational use of the adjacent tributary of Wilsons Creek (Table 1) and the distance to surface water discharge within the Nive River (920 m east) (Table 1), BaP (and PAH as BaP) is unlikely to be present at the locations tested, and if it were present at concentrations below 0.5 ug/L, but above the NHMRC recreational criterion of 0.2 ug/L for BaP, it considered unlikely to pose an unacceptable risk to human health under the low density residential land use scenario (based on zoning). Wilsons Creek is also not large enough to be used for recreational purposes, so any (albeit unlikely) BaP which could report to that creek would not pose a human health risk.

Ecological

With the exception of Pb, reported concentrations of tested CoPCs in test pit inflow waters were below adopted ANZG 2018 (95% of species protection) ecological criteria for all parameters tested (Table 11).

The reported Pb concentration in both test pit samples of 0.008 mg/L was 2.4 times the ANZG 2018 freshwater TV of 0.0034 mg/L. Given the consistency in the two results from Tarraleah Village and the absence of hydrocarbon contamination (Appendix F), it is unlikely that the elevated Pb concentrations are the result of the historical adjacent storage of fuel underground.

Proposed redevelopment works should consider the presence of Pb in inflow waters at around 3.0 m bgl in the vicinity of TA-TP452 and TA-TP454 and if dewatering is proposed, appropriate management measures to avoid impacts to downstream ecological receptors (e.g. within Wilsons Creek (and tributary) and the Nive River) should be incorporated into a CEMP (or similar) (refer to Section 7.5). It is also recommended that ambient sampling be carried out prior to construction works, in all adjacent drainage lines / creeks / rivers, at appropriate locations up- and downgradient of the proposed construction works, to provide a baseline and to provide site-specific ecological criteria which can help inform the necessary management of Site waters.

6.5 Tarraleah Switchyard groundwater

6.5.1 Perched / shallow groundwater

Human health

With the potential exception of BaP and total PAH (as BaP), reported concentrations of tested CoPCs in perched / shallow groundwater were below adopted ASC NEPM, CRC Care Technical Report No. 10 and NHMRC recreational (as appropriate) human health criteria (HILs / HSLs D / TVs) for all parameters tested irrespective of soil type and depth (Table 12).

There is a potential exceedance of NHMRC recreational criterion of 0.2 μg/L for BaP (and total PAH as BaP) as the LOR of 2 μg/L is higher than the guideline criterion. Given the 2.97 to 3.87 m bgl depth of the waters (Section 4.7), the absence of visual and olfactory evidence of hydrocarbon contamination (Section 4.5.2), the general absence of TRH above the LORs[26] (Appendix F), the unlikely recreational use of the adjacent Nive River (Table 1) adjacent to the Switchyard, BaP (and PAH as BaP) is considered unlikely to pose an unacceptable risk to human health under the ongoing commercial / industrial land use scenario (based on zoning). The results suggest that shallow / perched groundwaters have not been impacted by hydrocarbons / fuels.

Ecological

Reported concentrations of tested CoPCs in perched / shallow groundwater (Table 12) were below adopted ANZG 2018 (95% of species protection), PFAS NEMP (95% of species protection) and EPA 2021 (annual average TVs for a slightly to moderately disturbed environment) (as appropriate) ecological criteria, with the exception of (Appendix F):

- ANZG 2018 (95% of species protection):
  - Total metals (Cd, Cr (total), Cu, Pb, Ni, Zn) – at all locations for at least one metal
  - Dissolved metals (Cu, Zn) – at the majority of locations
  - PAHs – potential exceedance at all locations as the LORs were above the criteria for individual parameters
  - OCP / OPP – potential exceedance at all locations as the LORs were above the criteria for individual parameters
- EPA 2021 (annual average TVs for a slightly to moderately disturbed environment):
  - TSS, TN and TP – at all locations for at least one parameter with the exception of TA-MB416
  - NH_3-N – at TA-MB416 only
  - NO_2-N – at TA-MB416 and TA-MB418; and
  - NO_3-N and RP – at all locations.

Elevated concentrations of metals in shallow / perched groundwaters are primarily likely due to blue metal gravel within the Tarraleah Switchyard, although contributions from the switchyard metal infrastructure cannot be discounted.

Elevated nutrients in shallow / perched groundwaters could be naturally occurring. The embankment to the west-north-west of the Tarraleah Switchyard is a hanging bog and may be naturally high in nutrients which would report to the switchyard via surface runoff.

[26] Single low-level detection of TRH (F3 fractions) above the LOR (100 μg/L) in TA-MB412 of 100 μg/L (Appendix F).

There is a potential exceedance of ANZG 2018 TVs of 0.2 to 1.4 μg/L for PAHs (individual parameters) as the LORs of <2 to <4 μg/L are higher than the guideline criteria. Given the 2.97 to 3.87 m bgl depth of the waters (Section 4.7), the absence of visual and olfactory evidence of hydrocarbon contamination (Section 4.5.2), the general absence of TRH above the LORs in groundwater[27] and soils[28] (Appendix F), it is unlikely that there are PAHs at levels that would exceed the criteria, and if there were low concentrations they are considered unlikely to pose an unacceptable risk to ecological receptors in the adjacent Nive River under the ongoing commercial / industrial land use scenario (based on zoning). The results suggest that shallow / perched groundwaters have not been impacted by hydrocarbons / fuels.

There is a potential exceedance of ANZG 2018 TVs of 0.0001 to 0.09 μg/L for OCP/OPP (individual parameters) as the LOR of 2 μg/L is higher than the guideline criteria. All reported OCP/OPP concentrations were below the higher LORs and risks associated with these CoPCs will need to be ascertained based on the next round of testing with lower LORs.

Proposed redevelopment works should consider the presence of metals and nutrients in shallow / perched groundwaters and if dewatering is proposed, appropriate management measures to avoid impacts to downstream ecological receptors (e.g. the Nive River) should be incorporated into a CEMP (or similar) (refer to Section 7.5). If future testing of groundwaters at lower LORs shows the presence of OCP/OPP at levels higher than ANZG 2018 TVs and higher than in the ambient / receiving environment, measures to avoid impacts from OCP/OPP in dewatering waters should also be added to the CEMP. As recommended above (Section 6.4), baseline sampling should be undertaken in surface water drainage lines prior to construction works.

6.5.2 Deeper groundwater aquifer

A review of Hydro Tasmania groundwater data from the six existing groundwater wells screened in the deeper aquifer in the vicinity of Tarraleah Switchyard (Appendix F) as a component of this ESA has identified the following.

Human health

Reported concentrations of tested CoPCs in deeper groundwater were below adopted ASC NEPM, CRC Care Technical Report No. 10, PFAS NEMP and NHMRC recreational (as appropriate) human health criteria (HILs / HSLs D / TVs) for all parameters tested irrespective of soil type and depth (Appendix F) with the exception of:

- NHMRC recreational:
    - PAH – potential exceedance at all locations as standard LORs were higher than NHMRC recreational criteria. All reported PAH concentrations were below the higher LORs and risks associated with these CoPCs will need to be ascertained based on the next round of testing with lower LORs.

As for shallow / perched groundwater (Section 6.5.1), elevated concentrations of metals in groundwaters are likely naturally occurring and associated with the dolerite bedrock.

Proposed redevelopment works should consider the presence of metals in groundwaters and if dewatering is proposed, appropriate management measures to avoid impacts to human health receptors should be incorporated into a CEMP (or similar) (refer to Section 7.5). If future testing of groundwaters at lower LORs shows the presence of PAHs at levels higher than NHMRC recreational criteria and higher than in the ambient / receiving environment, measures to avoid impacts from PAHs in dewatering waters should also be added to the CEMP. As recommended above (Section 6.4), baseline sampling should be undertaken in surface water drainage lines prior to construction works.

[27] Single low-level detection of TRH (F3 fractions) above the LOR (100 μg/L) in TA-MB412 of 100 μg/L (Appendix F).

[28] Detections of TRH (F3 and F4 fractions) above the LOR (100 mg/kg) at TAMB411 at 0.2 m bgl (470 and 330 mg/kg) and detections of TRH (F2 and F3 fractions) above the LORs (50 and 100 mg/kg respectively) at TA-MB418 at 0.5 m bgl (100 and 140 mg/kg respectively) (Appendix F).

Ecological

Reported concentrations of tested CoPCs in deeper groundwater (Appendix F) were below adopted ANZG 2018 (95% of species protection), PFAS NEMP (95% of species protection) and EPA 2021 (annual average TVs for a slightly to moderately disturbed environment) (as appropriate) ecological criteria, with the exception of:

- ANZG 2018 (95% of species protection):
  - Total metals (Cr (total)[29], Cu, Pb, Ni and/or Zn) – at all locations during at least one monitoring event; potential exceedances for total Cr (total) at TA-DC234, TA-DC237 and TA-DC-238 during some monitoring events as the reported concentrations exceeded the ANZG 2018 Cr(VI) criterion and speciated Cr was not tested for
  - Dissolved metals (Cu, Pb and/or Zn) – at TA-DC237, TA-DC243 and/or TAH2019 during at least one monitoring event; potential exceedances for dissolved Cr at TA-DC235 and TAH2019 during some monitoring events as the reported concentrations exceeded the ANZG 2018 Cr(VI) criterion and speciated Cr was not tested for
  - Toluene – at TA-DC237 in March 2024 only
  - OCP (aldrin) – potential exceedance at all locations as the standard LOR was above the ANZG 2018 criterion. All reported OCP/OPP concentrations were below the higher LORs and risks associated with these CoPCs will need to be ascertained based on the next round of testing with lower LORs
  - PCBs (Aroclor 1254) – potential exceedance at all locations as the standard LOR was above the ANZG 2018 criterion. All reported PCB concentrations were below the higher LORs and risks associated with these CoPCs will need to be ascertained based on the next round of testing with lower LORs
- EPA 2021 (annual average TVs for a slightly to moderately disturbed environment):
  - pH, EC and TSS – periodically at TA-DC237, TAH2019 (TSS only) and TA-DC238 (TSS in March 2024 only)
  - NH_3-N – once at TA-DC234 (March 2024) and TA-DC237 (August 2024); potential exceedance at all locations as the standard LOR was above the EPA 2021 criterion
  - NO_3-N, TN and TP – consistently at all locations
  - NO_2-N – at TA-DC237; potential exceedance at all locations as the standard LOR was above the EPA 2021 criterion; and
  - TP – at TA-DC235 (November 2024 only), TA-DC237, TA-DC238 and TAH019.

As for shallow / perched groundwater (Section 6.5.1), elevated concentrations of metals in groundwaters are likely naturally occurring and associated with the dolerite bedrock. Elevated nutrients in groundwaters could be naturally occurring. The embankment to the west-north-west of the Tarraleah Switchyard is a hanging bog and may be naturally high in nutrients which would report to the switchyard via surface runoff.

The single toluene exceedance at TA-DC237 in March 2024 (690 μg/L compared to the ANZG 2018 TV of 180 μg/L is unlikely to be representative of groundwater quality. Two subsequent monitoring events in March and April 2025, reported toluene concentrations of 3.1 and <0.4 μg/L respectively.

Proposed redevelopment works should consider the presence of metals and nutrients in groundwaters and if dewatering is proposed, appropriate management measures to avoid impacts to downstream ecological receptors (e.g. the Nive River) should be incorporated into a CEMP (or similar) (refer to Section 7.5). If future testing of groundwaters at lower LORs shows the presence of aldrin and/or Aroclor 1254 at levels higher than ANZG 2018 TVs and higher than in the ambient / receiving environment, measures to avoid impacts from OCP and/or PCBs in dewatering waters should also be added to the CEMP. As recommended above (Section 6.4), baseline sampling should be undertaken in surface water drainage lines prior to construction works.

[29] No criteria for total Cr but reported concentration of Cr (total) in TAH2019 in May 2025 exceeded both the Cr(III) and Cr(VI) criteria.

6.6 Summary of identified contamination

A summary of the identified contamination and remedial actions are presented in Table 13. Human health risks are shaded orange (none identified), ecological risks are shaded green, and recommended management measures are in blue text.

Analytical results (Section 5) and the associated discussion (Section 6) demonstrates that within Area C:

- No potential asbestos fragments or asbestos fibres in soils were identified
- No hydrocarbon odour or staining was observed
- No elevated VOCs were identified
- Soils – reported concentrations of tested CoPCs were below adopted human health and ecological criteria
- Inflow waters (Tarraleah Village) – reported concentrations of Pb were above the ANZG 2018 freshwater TV (95% of species protection) (i.e. exceedances of ecological criteria)
- Shallow / perched groundwaters (Tarraleah Switchyard) – reported concentrations of select metals (Cd, Cr (total)[30], Cu, Pb, Ni, Zn) were above the ANZG 2018 freshwater TV (95% of species protection) (i.e. exceedances of ecological criteria); reported concentrations of TSS, pH, EC and nutrients (NH_3-N, NO_2-N, NO_3-N, TN, TP, RP) were above the EPA 2021 DGVs (full year) (i.e. exceedances of ecological criteria); and
- Deeper groundwaters (Tarraleah Switchyard)[31] – reported concentrations of select metals (Cr (total)[30], Cu, Pb, Ni and/or Zn) were above the NHMRC recreational TVs (i.e. exceedances of human health criteria); reported concentrations of TSS and select nutrients (NH_3- N, NO_2-N, NO_3-N, TN, TP) were above the EPA 2021 DGVs (full year) (i.e. exceedances of ecological criteria).

[30] No criteria for total Cr but reported concentrations in excess of both the Cr(III) and Cr(VI) criteria.
[31] Sampled by HydroTas.

Table 13: Summary of identified contamination

Matrix	Description	
	Tarraleah Village	**Tarraleah Switchyard**
Asbestos fragments	• No suspected ACM fragments were identified during this ESA (Section 4.5).	• No suspected ACM fragments were identified during this ESA (Section 4.5).
BDR	• Not identified in the fill materials, which suggests that 'uncontrolled' fill is unlikely to be present (Section 4.5.3).	• Not identified in the fill materials, which suggests that 'uncontrolled' fill is unlikely to be present (Section 4.5.3).
Soils / fill materials	• Asbestos, SMF and organic fibres (Section 6.1.1): o Asbestos fibres – not present at or above the LOR, by polarised light microscopy including dispersion staining o SMF – not present o Organic fibres – present (likely associated with rootlets) • Hydrocarbon odour and staining – not observed (Section 4.5.2) • VOC screening – ranged from 0.0 to 1.2 ppm (Section 4.6) • Tested CoPCs (Section 6.1.2): o Human health – below adopted criteria for all parameters tested irrespective of soil type and depth; and o Ecological – below adopted criteria for all parameters tested irrespective of soil texture.	• Asbestos, SMF and organic fibres (Section 6.2.1): o Asbestos fibres – not present at or above the LOR, by polarised light microscopy including dispersion staining o SMF – not present o Organic fibres – occasionally present (likely associated with rootlets) • Hydrocarbon odour and staining – not observed (Section 4.5.2) • VOC screening – ranged from 0.0 to 33.9 ppm (Section 4.6) • Tested CoPCs (Section 6.2.2): o Human health – below adopted criteria for all parameters tested irrespective of soil type and depth o Ecological – below adopted criteria for all parameters tested irrespective of soil texture; above AES criteria for some metals; and • Proposed redevelopment works should consider the presence of elevated Zn in soils / fill materials in the vicinity of TA-MB416, and other areas of the Tarraleah Switchyard (and other metals in excess of AES criteria), and appropriate management measures to avoid impacts to downstream ecological receptors (e.g. within the Nive River) should be incorporated into a CEMP. Erosion and sediment management would effectively minimise risks from elevated Zn concentrations.

Matrix	Description	
	Tarraleah Village	**Tarraleah Switchyard**
Waste classification	• Onsite reuse – below adopted criteria for all parameters tested (Section 6.1.2) and therefore suitable for onsite reuse; and • Offsite disposal – indicatively classified under IB105 as Level 2 – low-level contaminated soil based on select metals (Cr (total) and Ni) concentrations (Section 6.3).	• Onsite reuse – below adopted criteria for all parameters tested (Section 6.2.2) and therefore suitable for onsite reuse within an area to also be used for commercial / industrial or utilities purposes • Offsite disposal – indicatively classified under IB105 as Level 2 – low-level contaminated soil based on Cr (total) concentrations (Section 6.3); and • If it can be demonstrated that the elevated metals are naturally derived from the blue metal and leachable concentrations are below the LORs, or low, it may be possible to reduce the Level 2 – low level contaminated soil classification for offsite disposal as a 'controlled waste' to a 'non-controlled' waste.
Inflow waters	• Observed in two test pits at a depth of 3.0 m bgl (Section 4.5.4) • Tested CoPCs (Section 6.4): o Human health – below adopted criteria[A] for all parameters tested irrespective of soil type and depth o Ecological – above ANZG 2018 TV for Pb; below adopted criteria for all other parameters tested • Proposed redevelopment works should consider the presence of Pb in inflow waters at 3.0 m bgl in the vicinity of TA-TP452 and TA-TP454 and if dewatering is proposed, appropriate management measures to avoid impacts to downstream ecological receptors (e.g. within Wilsons Creek and the Nive River) should be incorporated into a CEMP • Future water sampling should test PAHs at lower LORs; if PAHs are present at levels higher than NHMRC recreational criteria and higher than in the ambient / receiving environment, measures to avoid impacts from PAHs in dewatering waters should also be added to the CEMP; and • Ambient sampling should be carried out prior to construction works, in all adjacent drainage lines / creeks / rivers, at appropriate locations up- and downgradient of the proposed construction works, to provide a baseline and to provide site-specific ecological criteria which can help inform the necessary management of Site waters.	• None encountered in the one test pit dug to 1.1 m bgl; and • Refer to shallow / perched groundwaters below.

Matrix	Description	
	Tarraleah Village	**Tarraleah Switchyard**
Shallow / perched groundwaters	• Refer to inflow waters above.	• 6 wells installed to between 2.8 and 7.0 m bgl (Table 7) as a component of this ESA • Screened across both the alluvial and fill material layers to be representative of the top unconfined aquifer • Shallow / perched groundwater flow direction towards the Nive River (Section 4.7) • Tested CoPCs (Section 6.5.1): o Human health – below adopted criteria[A] for all parameters tested irrespective of soil type and depth o Ecological – above ANZG 2018 TVs for select metals (Cd, Cr (total)[E], Cu, Pb, Ni, Zn); above EPA 2021 TVs for TSS and nutrients (NH_3-N, NO_2-N, NO_3-N, TN, TP, RP); below adopted criteria for all other parameters[B] • Proposed redevelopment works should consider the presence of metals and nutrients in shallow / perched groundwaters and if dewatering is proposed, appropriate management measures to avoid impacts to downstream ecological receptors (e.g. within the Nive River) should be incorporated into a CEMP • Future groundwater sampling should test PAHs and OCP/OPP at lower LORs and if PAHs and/or OCP/OPP are present at levels higher than NHMRC recreational criteria and/or the ANZG 2018 TVs respectively and higher than in the ambient / receiving environment, measures to avoid impacts from PAHs and/or OCP/OPP in dewatering waters should also be added to the CEMP; and • Ambient sampling should be carried out prior to construction works, in all adjacent drainage lines / creeks / rivers, at appropriate locations up- and downgradient of the proposed construction works, to provide a baseline and to provide site-specific ecological criteria which can help inform the necessary management of Site waters.

Matrix	Description	
	Tarraleah Village	**Tarraleah Switchyard**
Groundwaters	• Not tested via groundwater wells; refer to inflow waters above.	• 7 wells previously installed to between 15 to 33.5 m bgl (Table 2) • Deeper groundwater flow direction towards the Nive River (Section 2.2) • Tested CoPCs (Section 6.5.2): o Human health – below adopted criteria[A] for all parameters tested irrespective of soil type and depth o Ecological – above ANZG 2018 TVs for select metals (Cr (total)[E], Cu, Pb, Ni, Zn) and toluene[C]; above EPA 2021 TVs for pH, EC, TSS and select nutrients (NH_3- N, NO_2-N, NO_3-N, TN, TP); below adopted criteria for all other parameters[D]; • Proposed redevelopment works should consider the presence of metals and nutrients in groundwaters and if dewatering is proposed, appropriate management measures to avoid impacts to downstream ecological receptors (e.g. within the Nive River) should be incorporated into a CEMP • Ambient sampling should be carried out prior to construction works, in all adjacent drainage lines / creeks / rivers, at appropriate locations up- and downgradient of the proposed construction works, to provide a baseline and to provide site-specific ecological criteria which can help inform the necessary management of Site waters; and • Future groundwater sampling should test PAHs, OCP/OPP and PCBs at lower LORs and if PAHs, OCP/OPP and/or PCBs are present at levels higher than the ANZG 2018 TVs and higher than in the ambient / receiving environment, measures to avoid impacts from PAHs, OCP/OPP and/or PCBs in dewatering waters should also be added to the CEMP

Notes:

A – potential exceedance of NHMRC recreational criteria for BaP due to LOR being higher than adopted criterion. All reported BaP concentrations were below the higher LOR and risks associated with this CoPC will need to be ascertained based on the next round of testing with lower LORs. Considered unlikely to pose an unacceptable risk to human health in inflow waters (Section 6.4) or shallow / perched groundwaters (Section 6.5.1).

B – potential exceedance of ANZG 2018 TVs for PAHs and OCP / OPP due to LORs being higher than adopted criteria. All reported PAH and OCP/OPP concentrations were below the higher LORs and risks associated with these CoPCs will need to be ascertained based on the next round of testing with lower LORs. PAHs are considered unlikely to pose an unacceptable risk to ecological receptors in shallow / perched groundwaters (Section 6.5.1).

C – single toluene exceedance at TA-DC237 in March 2024 (690 µg/L compared to the ANZG 2018 TV of 180 µg/L). considered unlikely to be representative of groundwater quality given subsequent reported toluene concentrations of 3.1 and <0.4 mg/L in March and April 2025 respectively (Section 6.5.2).

D – potential exceedance of ANZG 2018 TVs for OCP (aldrin) and PCBs (Aroclor 1254) due to LORs being higher than adopted criteria. All reported PAH and OCP/OPP concentrations were below the higher LORs and risks associated with these CoPCs will need to be ascertained based on the next round of testing with lower LORs.

E – No criteria for total Cr but reported concentrations in excess of both the Cr(III) and Cr(VI) criteria.

Orange shading – indicates an identified contamination risk from a human health perspective; none identified as a component of this ESA.

Green shading – indicates an identified contamination risk from an ecological perspective.

Blue text – indicates a recommended management measure (refer to Section 7.5).

6.7 Quality control / quality assurance assessment

Laboratory QA/QC reports are provided in Appendix F.

A tabulated summary of the field QA/QC results is provided in Appendix G.

Findings from the QA/QC assessment are provided in Appendix H:

- Field QA/QC assessment is summarised in Table H1
- ALS laboratory QA/QC assessment is provided in Table H2; and
- Eurofins laboratory QA/QC assessment is provided in Table H3.

Based on the findings of the QA/QC assessment detailed in Appendix H, it is considered that the analytical data are representative of the concentrations of tested CoPC at the specified locations at the time of sampling. Although some variation in reported concentrations of some CoPC, particularly metals and to a lesser degree nutrients, between primary and secondary samples exists, the reported concentrations of CoPC are overall of acceptable quality for the purposes of this ESA. The reported variation in metals concentrations in soils is not surprising given metals tend to bind preferentially to some soil particles over others, which makes it difficult to obtain a duplicate or triplicate sample which will provide highly repeatable / similar results to the primary sample (i.e. soils are generally quite heterogeneous). Similarly for waters, there is higher results variability for total metals compared to dissolved metals given the number of particulates present for total metals analysis which would bind the metals.

7. Risk assessment – Area C

The preliminary CSM and risk assessment provided in the PSI (BlueSphere, 2024) have been revised for Area C based on the findings of intrusive investigations completed during this ESA.

7.1 Conceptual site model – Area C

7.1.1 Sources of potential contamination

Sources of potential contamination associated with identified PCAs are documented in Section 3.2.

A summary of identified contamination is provided in Table 13 (Section 6.6), with human health risks shaded orange (none present), ecological risks shaded green, and recommended management measures in blue text.

7.1.2 Potential receptors

Potential **human** receptors within, and in the vicinity of, the Area C surface disturbance footprints which may be exposed to CoPC from identified PCAs include:

- Tarraleah Village:
  - Future users (low-density residential, as per zoning)
  - Neighbouring offsite land users (low-density residential, as per zoning)
  - Excavation workers and IMW
- Tarraleah Switchyard:
  - Current and future users (commercial / industrial, as per zoning)
  - Neighbouring offsite land users (rural, as per zoning); and
  - Excavation workers and IMW.

There are no current Site users within the investigated portion of Tarraleah Village as the area is vacant.

Potential **ecological** receptors within, and in the vicinity of, the Area C surface disturbance footprint which may be exposed to CoPC from identified PCAs include:

- Tarraleah Village:
  - Terrestrial fauna (transitory) and existing flora; and
  - Downgradient aquatic ecosystems (i.e. Wilsons Creek and tributary and the Nive River)
- Tarraleah Switchyard:
  - Terrestrial fauna (transitory) and existing flora; and
  - Downgradient aquatic ecosystems (i.e. the Nive River).

There are no terrestrial fauna or flora within the investigated portion of Tarraleah Switchyard as the area is predominantly developed and has been fenced off and vegetation has been cleared.

7.1.3 Potential exposure pathways

Potential migration pathways through which **human** receptors within, and in the vicinity of, the Area C surface disturbance footprint may be exposed to CoPC from identified PCAs include (for both Tarraleah Village and Tarraleah Switchyard):

- Inhalation of airborne contaminants in dust
- Direct contact with contaminated soil / fill materials or groundwaters; and
- Ingestion of contaminated soil / fill materials or groundwaters.

The pathway for offsite **human** receptors to be exposed to potential contamination from identified PCAs migrating offsite through the groundwater has not been considered due to the absence of identified mobile contamination (e.g. hydrocarbons and PFAS) beyond the depth of investigation and the absence of beneficial users of groundwater downgradient of the Area C surface disturbance footprint.

Potential migration pathways through which **ecological** receptors within, and in the vicinity of, the Area C surface disturbance footprint may be exposed to CoPC from identified PCAs include (for both Tarraleah Village and Tarraleah Switchyard):

- Plant uptake from contaminated soil / fill materials or groundwaters
- Direct contact with contaminated soil / fill materials or groundwaters; and
- Ingestion of contaminated soil / fill materials or groundwaters.

7.2 Risk matrices

Potential human health and environmental risks have been assessed using the matrices outlined in Table 14, Table 15 and Table 16. The matrices have been developed by pitt&sherry based on the principles outlined in AS ISO 31000 *Risk Management – Guidelines*.

Table 14: Likelihood ranking

Likelihood	Description
Almost Certain	Expected to happen
Likely	Expected to happen more than once per year
Possible	Expected to happen more than once or twice every five years
Unlikely	Expected to happen once or twice every ten years
Rare	Expected to happen once or twice every 100 years

Table 15: Consequence ranking

Consequence	Description
Catastrophic	• One or more fatalities; and • Significant impairment of ecosystem function.
Major	• Injury or illness that requires hospitalisation and/or results in permanent impairment (e.g. inhalation of asbestos fibres) • Major impairment of ecosystem function • Major impacts on soil, air or water that requires a large, coordinated clean-up; and • Offsite discharges / emissions with an impact that is long term.

Consequence	Description
Moderate	• Injury or illness that requires medical treatment and/or a temporary work restriction (e.g. direct contact with contaminants and/or acidic drainage water) • Moderate impacts on soil, air or water that requires coordinated clean-up; and • Offsite discharges / emissions with an impact that is short term.
Minor	• Direct contact with contaminants and/or acidic drainage water that requires medical treatment and/or a temporary work restriction • Minor impacts on soil, air or water that requires local clean-up; and • No offsite discharges / emissions.
Insignificant	• Injury or illness that requires no more than first aid treatment and no work restriction; and • Direct impacts on soil or water within immediate work area and immediately cleaned up with no residual contamination.

Table 16: Risk assessment matrix

Consequence / Likelihood	Catastrophic	Major	Moderate	Minor	Insignificant
Almost Certain	Extreme	Extreme	Extreme	High	Medium
Likely	Extreme	Extreme	High	Medium	Medium
Possible	Extreme	High	Medium	Medium	Low
Unlikely	High	Medium	Medium	Low	Very Low
Rare	High	Medium	Low	Very low	Very Low

7.3 Source-pathway-receptor linkages

The source-pathway-receptor (SPR) assessment evaluates the identified and potential sources, receptors and exposure pathways for contamination in light of the findings of intrusive investigations and validation sampling. Unacceptable risks from identified residual contamination may occur if the SPR linkage is complete.

SPR linkages for the various combinations are provided in Table 17 (Tarraleah Village) and Table 18 (Tarraleah Switchyard), with shading as follows:

- Green shading indicates the SPR linkage is unlikely to be complete or is very low or low risk
- Blue font indicates an information gap; and
- Red font indicates a recommended management measure.

No medium- or higher-risk ratings have been identified.

7.4 Remaining data gaps

The heterogeneous nature of soils means that concentrations of CoPC may vary across adjacent sample locations and depths. The following data gaps are noted with respect to the DQOs outlined in Table 4 (Section 4.4.1):

- Concentrations of CoPC in groundwater beneath Tarraleah Village are not known and associated human health and ecological risks are not known. However, based on the reported concentrations of CoPCs in the test pit inflow waters at 3.0 m bgl and the absence of tested CoPCs in soils / fill materials to the test pit maximum termination depth of 3.2 m bgl (i.e. absence of mobile contamination), the potential for groundwater at and near the investigation locations to be impacted as a result of identified PCAs is considered to be low. The investigation suggests that there does not appear to have been an impact from the historical storage of fuel underground hydraulically upgradient of the investigation area, and given the time elapsed since fuel was stored underground,

if any mobile contamination was to impact on the investigation area, it would have been detected during the investigations. There are no other known upgradient sources of mobile contamination so the gap in groundwater quality data beneath the Tarraleah Village surface disturbance footprint is not considered to pose a risk for Area C under the proposed low-density residential land use setting (as per zoning)

- Concentrations of CoPC in soils at depths greater than around 3 m bgl are not known and associated human health and ecological risks are not known. Bedrock was encountered in the base of the test pits. If contamination is present, it is generally at higher concentrations in the soil profile and generally at much lower concentrations in bedrock due to the low permeability. As no contamination was noted in the soils it is unlikely that the bedrock would have any contamination. Investigations occurred to a density which is considered to have sufficiently characterised the Area C contamination status based on the identified PCAs
- Surface water – groundwater interactions are not known. It is likely that groundwater at Tarraleah Switchyard discharges to the adjacent Nive River with groundwater at Tarraleah Village likely to discharge to the adjacent tributary to Wilsons Creek
- Ambient concentrations of tested CoPC in surface water (i.e. the Nive River or Wilson Creek) are unknown; and
- Analytical results are limited to the locations, depths and media tested, at the time of sampling.

In addition, the limitations listed in Section 1.5 should be noted.

7.5 Risk evaluation and proposed management measures

Based on Table 17 (Tarraleah Village) and Table 18 (Tarraleah Switchyard), and noting the limitations of this ESA in Section 1.5 and the remaining data gaps in Section 7.4, the CSM has only identified incomplete or low risk SPR linkages.

The risk to human health (including IMW) and ecological receptors (terrestrial and aquatic) within the surface disturbance Area C footprints under the proposed low-density residential land use (as per zoning) at Tarraleah Village and the ongoing commercial / industrial land use (as per zoning) at the Tarraleah Switchyard is considered to be **low**.

Subject to the final design as it develops, the **identified low-level contamination risks** to future Area C users, IMW, offsite human health and sensitive ecological receptors, **should be managed by measures such as**:

- **Baseline surface water monitoring**, ambient sampling should be carried out prior to construction works, in all adjacent drainage lines / creeks / rivers to Area C, at appropriate locations up- and downgradient of the proposed construction works, to provide a baseline and to provide site-specific ecological criteria which can help inform the necessary management of Site waters
- **Groundwater monitoring**, at Tarraleah Switchyard:
  - Should consider appropriate procedures to avoid impacts to human and ecological receptors
  - Should test PAHs, OCP/OPP and PCBs at lower LORs to allow comparison to adopted guideline criteria
  - Should compare reported concentrations of CoPCs to those reported in ambient surface waters
- **Construction excavation works**, must be completed under a CEMP which must include measures for:
  - Dust suppression
  - Stockpile management and containment
  - Erosion and sediment runoff controls
  - Dewatering
  - Dealing with any encountered unexpected contamination (e.g. asbestos-containing fill, stained or odorous soils, solid wastes, etc.), which may include stop works, communicate with Site supervisor, and the assessment of potential contamination by a qualified professional
- Any **waste soils** generated from Area C must be:
  - Visually and olfactorily inspected for contamination

- Temporarily stockpiled until testing has been completed and EPA approval obtained to remove the soils from Site
- Sampled and classified for offsite disposal in accordance with the requirements of IB105; and
- Disposed offsite by an appropriately licenced waste transporter to a landfill licenced to accept the waste (note that EPA approval is required for: asbestos-containing wastes, soils classified under IB105 as Level 2 and above, and soils containing PFAS in excess of landfill criteria in the PFAS NEMP).

Table 17: Source-pathway-receptor linkages – Tarraleah Village

Source	Pathway	Human Receptor			Ecological Receptors	
		Future Users (low-density residential, as per zoning)	**Onsite Excavation workers and IMW**	**Neighbouring Offsite Land Users (rural, as per zoning)**	**Onsite Terrestrial Fauna (transitory) and Existing Flora**	**Downgradient (offsite) Aquatic Ecosystems**
BDR containing asbestos fragments, asbestos fibres and/or SMF	Inhalation	Presence of BDR, asbestos (fragments and fines) and SMF outside of tested locations is not known; ACM is not a CoPC in areas of proposed surface disturbance outside of tested locations and therefore impact is unlikely. No BDR or suspected ACM fragments identified. No asbestos fibres or SMF detected in onsite fill materials / soils.	Presence of BDR, asbestos (fragments and fines) and SMF outside of tested locations is not known; ACM is not a CoPC in areas of proposed surface disturbance outside of tested locations and therefore impact is unlikely. No BDR or suspected ACM fragments identified. No asbestos fibres or SMF detected in onsite fill materials / soils.	Presence of BDR, asbestos (fragments and fines) and SMF outside of tested locations is not known; ACM is not a CoPC in areas of proposed surface disturbance outside of tested locations and therefore impact is unlikely. No BDR or suspected ACM fragments identified. No asbestos fibres or SMF detected in onsite fill materials / soils.	Presence of BDR, asbestos (fragments and fines) and SMF outside of tested locations is not known; ACM is not a CoPC in areas of proposed surface disturbance outside of tested locations and therefore impact is unlikely. No BDR or suspected ACM fragments identified. No asbestos fibres or SMF detected in onsite fill materials / soils. No sensitive ecological receptors onsite.	Presence of BDR, asbestos (fragments and fines) and SMF outside of tested locations is not known; ACM is not a CoPC in areas of proposed surface disturbance outside of tested locations and therefore impact is unlikely. No BDR or suspected ACM fragments identified. No asbestos fibres or SMF detected in onsite fill materials / soils.
Presence of CoPCs in soils / fill materials	Inhalation Direct contact Ingestion Plant uptake (ecological only)	Presence of CoPC outside of tested locations is not known. Reported concentrations of tested CoPC in soils / fill materials to 3.2 m bgl were below adopted human health criteria for all parameters tested irrespective of soil type and depth. No volatile contaminants reported.	Presence of CoPC outside of tested locations is not known. Reported concentrations of tested CoPC in soils / fill materials to 3.2 m bgl were below adopted human health criteria for all parameters tested irrespective of soil type and depth. No volatile contaminants reported.	Presence of CoPC outside of tested locations is not known. Reported concentrations of tested CoPC in soils / fill materials to 3.2 m bgl were below adopted human health criteria for all parameters tested irrespective of soil type and depth. No volatile contaminants reported.	Presence of CoPC outside of tested locations is not known. Reported concentrations of tested CoPC in soils / fill materials to 3.2 m bgl were below adopted ecological criteria for all parameters tested. No volatile contaminants reported. No sensitive ecological receptors onsite.	Presence of CoPC outside of tested locations is not known. Reported concentrations of tested CoPC in soils / fill materials to 3.2 m bgl were below adopted ecological criteria for all parameters tested. No volatile contaminants reported.

Source	Pathway	Human Receptor			Ecological Receptors	
		Future Users (low-density residential, as per zoning)	Onsite Excavation workers and IMW	Neighbouring Offsite Land Users (rural, as per zoning)	Onsite Terrestrial Fauna (transitory) and Existing Flora	Downgradient (offsite) Aquatic Ecosystems
Presence of CoPCs in inflow waters	Inhalation Direct contact Ingestion Plant uptake (ecological only)	Presence of CoPC outside of tested locations is not known. Reported concentrations of tested CoPC in test pit inflow waters at 3.0 m bgl were below adopted human health criteria for all parameters[A] tested irrespective of soil type and depth. No volatile contaminants reported.	Presence of CoPC outside of tested locations is not known. Reported concentrations of tested CoPC in test pit inflow waters at 3.0 m bgl were below adopted human health criteria for all parameters[A] tested irrespective of soil type and depth. No volatile contaminants reported.	Presence of CoPC outside of tested locations is not known. Reported concentrations of tested CoPC in test pit inflow waters at 3.0 m bgl were below adopted human health criteria for all parameters[A] tested irrespective of soil type and depth. No volatile contaminants reported.	Presence of CoPC outside of tested locations is not known. Reported concentrations of tested CoPC in test pit inflow waters at 3.0 m bgl were above ANZG 2018 freshwater TV (95% of species protection) for Pb. Were below adopted ecological criteria of all other tested parameters. No volatile contaminants reported. No sensitive ecological receptors onsite. Proposed redevelopment works should consider the presence of Pb in inflow waters at 3.0 m bgl in the vicinity of TA-TP452 and TA-TP454 and if dewatering is proposed, appropriate management measures to avoid impacts to downstream ecological receptors (e.g. within Wilsons Creek and the Nive River) should be incorporated into a CEMP. Ambient sampling should be carried out prior to construction works, in all adjacent drainage lines / creeks / rivers.	Presence of CoPC outside of tested locations is not known. Reported concentrations of tested CoPC in test pit inflow waters at 3.0 m bgl were above ANZG 2018 freshwater TV (95% of species protection) for Pb. Were below adopted ecological criteria of all other tested parameters. No volatile contaminants reported. Adjacent tributary to Wilsons Creek discharges to Wilsons Creek 1.2 km to the south-east. The Nive River is 920 m to the east. Proposed redevelopment works should consider the presence of Pb in inflow waters at 3.0 m bgl in the vicinity of TA-TP452 and TA-TP454 and if dewatering is proposed, appropriate management measures to avoid impacts to downstream ecological receptors (e.g. within Wilsons Creek and the Nive River) should be incorporated into a CEMP. Ambient sampling should be carried out prior to construction works, in all adjacent drainage lines / creeks / rivers.

Source	Pathway	Human Receptor			Ecological Receptors	
		Future Users (low-density residential, as per zoning)	**Onsite Excavation workers and IMW**	**Neighbouring Offsite Land Users (rural, as per zoning)**	**Onsite Terrestrial Fauna (transitory) and Existing Flora**	**Downgradient (offsite) Aquatic Ecosystems**
Presence of CoPCs in groundwaters	Inhalation (human health only) Direct contact Ingestion	No groundwater wells were installed. Reported concentrations of tested CoPC in test pit inflow waters at 3.0 m bgl were below adopted human health criteria for all parameters[A] tested irrespective of soil type and depth. No volatile contaminants reported.	No groundwater wells were installed. Reported concentrations of tested CoPC in test pit inflow waters at 3.0 m bgl were below adopted human health criteria for all parameters[A] tested irrespective of soil type and depth. No volatile contaminants reported.	No groundwater wells were installed. Reported concentrations of tested CoPC in test pit inflow waters at 3.0 m bgl were below adopted human health criteria for all parameters[A] tested irrespective of soil type and depth. No volatile contaminants reported.	No groundwater wells were installed. Reported concentrations of tested CoPC in test pit inflow waters at 3.0 m bgl were above ANZG 2018 freshwater TV (95% of species protection) for Pb. Were below adopted ecological criteria of all other tested parameters. No volatile contaminants reported. No sensitive ecological receptors onsite. Proposed redevelopment works should consider the presence of Pb in inflow waters at 3.0 m bgl in the vicinity of TA-TP452 and TA-TP454 and if dewatering is proposed, appropriate management measures to avoid impacts to downstream ecological receptors (e.g. within Wilsons Creek and the Nive River) should be incorporated into a CEMP. Ambient sampling should be carried out prior to construction works, in all adjacent drainage lines / creeks / rivers.	No groundwater wells were installed. Reported concentrations of tested CoPC in test pit inflow waters at 3.0 m bgl were above ANZG 2018 freshwater TV (95% of species protection) for Pb. Were below adopted ecological criteria of all other tested parameters. No volatile contaminants reported. Adjacent tributary to Wilsons Creek discharges to Wilsons Creek 1.2 km to the south-east. The Nive River is 920 m to the east. Proposed redevelopment works should consider the presence of Pb in inflow waters at 3.0 m bgl in the vicinity of TA-TP452 and TA-TP454 and if dewatering is proposed, appropriate management measures to avoid impacts to downstream ecological receptors (e.g. within Wilsons Creek and the Nive River) should be incorporated into a CEMP. Ambient sampling should be carried out prior to construction works, in all adjacent drainage lines / creeks / rivers.

Notes:

A – potential exceedance of NHMRC recreational criteria for BaP due to LOR being higher than adopted criterion. All reported BaP concentrations were below the higher LOR and risks associated with this CoPC will need to be ascertained based on the next round of testing with lower LORs. Considered unlikely to pose an unacceptable risk to human health in inflow waters (Section 6.4).

Green shading – indicates the SPR linkage is unlikely to be complete or is very low or low risk.

Blue font – indicates an information gap.

Red font – indicates a recommended management measure.

Table 18: Source-pathway-receptor linkages – Tarraleah Switchyard

Source	**Pathway**	**Human Receptor**			**Ecological Receptors**
		Current and Future Users (commercial / industrial, as per zoning)	**Onsite excavation and IMW**	**Neighbouring Offsite Land Users**	**Downgradient (offsite) Aquatic Ecosystems**
BDR containing asbestos fragments, asbestos fibres and/or SMF	Inhalation	Presence of BDR, asbestos (fragments and fines) and SMF outside of tested locations is not known; ACM is not a CoPC in areas of proposed surface disturbance outside of tested locations and therefore impact is unlikely. No BDR or suspected ACM fragments identified. No asbestos fibres or SMF detected in onsite fill materials / soils.	Presence of BDR, asbestos (fragments and fines) and SMF outside of tested locations is not known; ACM is not a CoPC in areas of proposed surface disturbance outside of tested locations and therefore impact is unlikely. No BDR or suspected ACM fragments identified. No asbestos fibres or SMF detected in onsite fill materials / soils.	Presence of BDR, asbestos (fragments and fines) and SMF outside of tested locations is not known; ACM is not a CoPC in areas of proposed surface disturbance outside of tested locations and therefore impact is unlikely. No BDR or suspected ACM fragments identified. No asbestos fibres or SMF detected in onsite fill materials / soils.	Presence of BDR, asbestos (fragments and fines) and SMF outside of tested locations is not known; ACM is not a CoPC in areas of proposed surface disturbance outside of tested locations and therefore impact is unlikely. No BDR or suspected ACM fragments identified. No asbestos fibres or SMF detected in onsite fill materials / soils.
Presence of CoPCs in soils / fill materials	Inhalation Direct contact Ingestion Plant uptake (ecological only)	Presence of CoPC outside of tested locations is not known. Reported concentrations of tested CoPC in soils / fill materials to the maximum investigation depth of 3.2 m bgl were below adopted human health criteria for all parameters tested irrespective of soil type and depth. No volatile contaminants reported.	Presence of CoPC outside of tested locations is not known. Reported concentrations of tested CoPC in soils / fill materials to the maximum investigation depth of 3.2 m bgl were below adopted human health criteria for all parameters tested irrespective of soil type and depth. No volatile contaminants reported.	Presence of CoPC outside of tested locations is not known. Reported concentrations of tested CoPC in soils / fill materials to the maximum investigation depth of 3.2 m bgl were below adopted ecological criteria for all parameters tested irrespective of soil type and depth. No volatile contaminants reported.	Presence of CoPC outside of tested locations is not known. Reported concentrations of tested CoPC in soils / fill materials to the maximum investigation depth of 3.2 m bgl were below adopted ecological criteria for all parameters tested irrespective of soil type and depth. No volatile contaminants reported. Proposed redevelopment works should consider the presence of elevated Zn in soils / fill materials in the vicinity of TA-MB416 and the remainder of the Tarraleah Switchyard (and other metals in excess of AES criteria), and appropriate management measures to avoid impacts to downstream ecological receptors (e.g. within the Nive River) should be incorporated into a CEMP.

Source	Pathway	Human Receptor			Ecological Receptors
		Current and Future Users (commercial / industrial, as per zoning)	**Onsite excavation and IMW**	**Neighbouring Offsite Land Users**	**Downgradient (offsite) Aquatic Ecosystems**
Presence of CoPCs in shallow / perched groundwaters	Inhalation Direct contact Ingestion Plant uptake (ecological only)	Presence of CoPC outside of tested locations is not known. Reported concentrations of tested CoPC in shallow / perched groundwaters were below adopted human health criteria for all parameters[A] tested irrespective of soil type and depth. No volatile contaminants reported.	Presence of CoPC outside of tested locations is not known. Reported concentrations of tested CoPC in shallow / perched groundwaters were below adopted human health criteria for all parameters[A] tested irrespective of soil type and depth. No volatile contaminants reported.	Presence of CoPC outside of tested locations is not known. Reported concentrations of tested CoPC in shallow / perched groundwaters were below adopted human health criteria for all parameters[A] tested irrespective of soil type and depth. No volatile contaminants reported.	Presence of CoPC outside of tested locations is not known. Reported concentrations of tested CoPC in shallow / perched groundwaters were above ANZG 2018 freshwater TV (95% of species protection) for select metals (Cd, Cr (total)[B], Cu, Pb, Ni, Zn) and were above EPA 2021 DGVs (full year) for TSS, pH, EC and nutrients (NH_3-N, NO_2- N, NO_3-N, TN, TP, RP). Were below adopted ecological criteria of all other tested parameters[C]. No volatile contaminants reported. The Nive River is adjacent to the east of the Tarraleah Switchyard. Proposed redevelopment works should consider the presence of metals and nutrients in shallow / perched groundwaters and if dewatering is proposed, appropriate management measures to avoid impacts to downstream ecological receptors (e.g. within the Nive River) should be incorporated into a CEMP. Ambient sampling should be carried out prior to construction works, in all adjacent drainage lines / creeks / rivers.

Source	Pathway	Human Receptor			Ecological Receptors
		Current and Future Users (commercial / industrial, as per zoning)	**Onsite excavation and IMW**	**Neighbouring Offsite Land Users**	**Downgradient (offsite) Aquatic Ecosystems**
Presence of CoPCs in deeper groundwaters	Inhalation (human health only) Direct contact Ingestion	Presence of CoPC outside of tested locations is not known. Reported concentrations of tested CoPC in deeper groundwaters were below adopted human health criteria for all parameters[A] tested irrespective of soil type and depth. irrespective of soil type and depth. No volatile contaminants reported. Contact with groundwater is limited to planned monitoring events by trained personnel.	Presence of CoPC outside of tested locations is not known. Reported concentrations of tested CoPC in deeper groundwaters were below adopted human health criteria for all parameters[A] tested irrespective of soil type and depth. No volatile contaminants reported. Contact with groundwater is limited to planned monitoring events by trained personnel.	Presence of CoPC outside of tested locations is not known. Reported concentrations of tested CoPC in deeper groundwaters were below adopted human health criteria for all parameters[A] tested irrespective of soil type and depth. No volatile contaminants reported. Contact with groundwater is limited to planned monitoring events by trained personnel. No users of groundwater immediately downgradient of Area C with the Nive River adjacent to the east.	Presence of CoPC outside of tested locations is not known. Reported concentrations of tested CoPC in deeper groundwaters above ANZG 2018 freshwater TV (95% of species protection) for select metals (Cr (total)[B], Cu, Pb, Ni, Zn) and toluene[D] and above EPA 2021 DGVs (full year) for TSS and select nutrients (NH_3- N, NO_2- N, NO_3-N, TN, TP). Below adopted ecological criteria of all other tested parameters[E]. No volatile contaminants reported. The Nive River is adjacent to the east of Tarraleah Switchyard. Proposed redevelopment works should consider the presence of metals and nutrients in deeper groundwaters and if dewatering is proposed, appropriate management measures to avoid impacts to downstream ecological receptors (e.g. the Nive River) should be incorporated into a CEMP. Ambient sampling should be carried out prior to construction works, in all adjacent drainage lines / creeks / rivers.

Notes:

A – potential exceedance of NHMRC recreational criteria for BaP due to LOR being higher than adopted criterion. All reported BaP concentrations were below the higher LOR and risks associated with this CoPC will need to be ascertained based on the next round of testing with lower LORs. Considered unlikely to pose an unacceptable risk to human health in shallow / perched groundwaters (Section 6.5.1).

B – no criteria for total Cr but reported concentrations in excess of both the Cr(III) and Cr(VI) criteria.

C – potential exceedance of ANZG 2018 TVs for PAHs and OCP / OPP due to LORs being higher than adopted criteria. All reported PAH and OCP/OPP concentrations were below the higher LORs and risks associated with these CoPCs will need to be ascertained based on the next round of testing with lower LORs. PAHs are considered unlikely to pose an unacceptable risk to ecological receptors in shallow / perched groundwaters (Section 6.5.1).

D – single toluene exceedance at TA-DC237 in March 2024 (690 µg/L compared to the ANZG 2018 TV of 180 µg/L). Considered unlikely to be representative of groundwater quality given subsequent reported toluene concentrations of 3.1 and <0.4 mg/L in March and April 2025 respectively (Section 6.5.2).

E – – potential exceedance of ANZG 2018 TVs for OCP (aldrin) and PCBs (Aroclor 1254) due to LORs being higher than adopted criteria. All reported PAH and OCP/OPP concentrations were below the higher LORs and risks associated with these CoPCs will need to be ascertained based on the next round of testing with lower LORs.

Green shading – indicates the SPR linkage is unlikely to be complete or is very low or low risk.

Blue font – indicates an information gap

Red font – indicates a recommended management measure.

8. Conclusion and recommendations

8.1 Conclusions

Based on the findings of this ESA, and noting the limitations in Section 1.5, the following conclusions are made:

- The SAQP (pitt&sherry, 2025) (Appendix B) in response to identified PCAs within the Area C footprint subject to surface disturbance as a component of the Project was successfully implemented; deviations / additions are discussed in Section 4.4.3
- No soil contamination above adopted guideline criteria was identified
- Test pit inflow waters potential Pb contamination was identified at around 3.0 m bgl at the Tarraleah Village (Pb exceeded the ANZG freshwater TV (95% of species protection) but local background concentrations in groundwater are not known)
- Potential groundwater contamination was identified:
    - In shallow / perched groundwaters beneath the Tarraleah Switchyard (select metals, TSS and select nutrients from an ecological perspective)
    - In deeper groundwaters beneath the Tarraleah Switchyard (select metals, pH, EC, TSS and select nutrients from an ecological perspective)
- The risk to human health (including IMW) and ecological receptors (terrestrial and aquatic) from identified PCAs is considered to be **low** within the Area C surface disturbance footprint under both:
    - Tarraleah Village – the proposed low-density residential land use (as per zoning)
    - Tarraleah Switchyard – the ongoing commercial / industrial land use (as per zoning); and
- A number of recommendations have been made in Section 8.2 to manage the identified low-level potential contamination risks.

In response to the PCLC objectives (Section 1.2.1), the low-density residential use (as per zoning) within the surface disturbance footprint at Tarraleah Village and the ongoing commercial / industrial land use (as per zoning) within the surface disturbance footprint at the Tarraleah Switchyard complies with:

- P1 (b) of Clause C14.5.1 (use standard) for the following reasons:
    - This ESA demonstrates that the level of contamination does not present a risk to human health or the environment and Area C is suitable for the intended use
- P1 (c) of Clause C14.6.1 (development standard for building works) for the following reasons:
    - This ESA includes recommended protection measures (i.e. CEMP), which must be implemented before excavation commences; and
    - If the recommended protection measures outlined in Section 8.2 are implemented, excavation will not adversely impact on human health or the environment.

8.2 Recommendations

Based on the findings of this ESA, and noting the limitations in Section 1.5, **identified low-level contamination risks** to future Area C users, IMW, offsite human health and sensitive ecological receptors **should be managed by measures such as**:

- **Baseline surface water monitoring**, ambient sampling should be carried out prior to construction works, in all adjacent drainage lines / creeks / rivers to Area C, at appropriate locations up- and downgradient of the proposed construction works, to provide a baseline and to provide site-specific ecological criteria which can help inform the necessary management of Site waters

- **Groundwater monitoring**, at Tarraleah Switchyard:
  - Should consider appropriate procedures to avoid impacts to human and ecological receptors
  - Should test PAHs, OCP/OPP and PCBs at lower LORs to allow comparison to adopted guideline criteria
  - Should compare reported concentrations of CoPCs to those reported in ambient surface waters
- **Construction excavation works**, must be completed under a CEMP which must include measures for:
  - Dust suppression
  - Stockpile management and containment
  - Erosion and sediment runoff controls
  - Dewatering
  - Dealing with any encountered unexpected contamination (e.g. asbestos-containing fill, stained or odorous soils, solid wastes, etc.), which may include stop works, communicate with Site supervisor, and the assessment of potential contamination by a qualified professional
- Any **waste soils** generated from Area C must be:
  - Handled under appropriate procedures to avoid impacts to human and ecological receptors
  - Visually and olfactorily inspected for signs of potential contamination (e.g. staining, odours, oily film, refuse, demolition rubble, etc.)
  - Temporarily stockpiled (segregated by material type, e.g. clean soil, clean gravel, mixed fill, stained / potentially contaminated soils or gravel, etc.) until testing has been completed and EPA approval obtained (where necessary) to remove the soils from Site
  - Sampled and classified for offsite disposal in accordance with the requirements of IB105, specifically:
    - Sampled at a rate of 1 per 25 m^3 initially (i.e. for the first round)
    - Tested for both total and leachable concentrations of metals (As, Cd, Cr (total), Cu, Pb, Ni, Zn and Hg) at a minimum
    - Where staining and/or odour are identified, tested for total and leachable concentrations (as applicable) of hydrocarbons (BTEXN, TPH / TRH, PAHs) and PCBs
    - Results assessed statistically and by material type to identify if the metals' concentrations in particular are naturally-derived and the wastes can be classed as Level 2 – non-controlled waste (after EPA assessment)
    - Where leachability testing demonstrates the elevated metals concentrations are naturally-occurring, the sampling density may be reduced to 1 in 100 m^3; and
  - Disposed offsite (where applicable) by an appropriately licenced waste transporter to a landfill licenced to accept the waste (note that EPA approval is required for: asbestos-containing wastes, soils classified under IB105 as Level 2 and above, and soils containing PFAS in excess of landfill criteria in the PFAS NEMP).

9. References

AS 4482.1 *Guide to the investigation and sampling of sites with potentially contaminated soil – Non-volatile and semi-volatile compounds*, Standards Australia, 2 November 2005 or as amended or substituted (AS 4882.1)

AS 4482.2 *Guide to the sampling and investigation of potentially contaminated soil – Volatile substances*, Standards Australia, 5 September 1999 or as amended or substituted (AS 4882.2)

AS 5667.1 *Water Quality – Sampling – Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples*, Standards Australia, 5 April 1998 or as amended or substituted (AS/NZS 5667.1)

AS 5667.11: *Water Quality – Sampling – Guidance on sampling of groundwaters*, Standards Australia, 5 April 1998 or as amended or substituted (AS/NZS 5667.11)

AS ISO 31000 *Risk Management – Guidelines*

Asbestos safety (worksafe.tas.gov.au)

Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2018, Australian and New Zealand Governments and Australian State and Territory Governments, Canberra ACT, Australia (ANZG 2018)

CRC Care Technical Report No. 10 *Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater September 2011, including errata August 2012* (Technical Report No. 10)

Default Guideline Values (DGVs) for Aquatic Ecosystems of the Upper Derwent Catchment, Environment Protection Authority Tasmania, August 2021 (EPA 2021)

Environmental Management and Pollution Control Act 1994 (EMPC Act) and relevant Regulations (Tasmania)

Environmental Management and Pollution Control (Waste Management) Regulations 2020 (Waste Regulations)

Guidelines for Managing Risks in Recreational Water, National Health and Medical Research Council, 2008 (NHMRC)

Information Bulletin No. 105 Classification and Management of Contaminated Soil for Disposal, Version 3, Environment Protection Authority Tasmania, 2018 (IB105)

AS ISO 31000 *Risk Management – Guidelines*

National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended 2013 (ASC NEPM)

National Standard for Synthetic Mineral Fibres, National Occupational Health and Safety Commission, May 1990 (NOHSC:1004(1990))

National Water Quality Management Strategy – Australian Drinking Water Guidelines 2011, updated September 2022 (ADWG)

National Water Quality Management Strategy – Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 (ANZECC 2000)

PFAS National Environmental Management Plan, Version 3.0, 2025, National Chemicals Working Group of the Heads of EPAs Australia and New Zealand (PFAS NEMP)

Preliminary Site Investigation, Tarraleah Development, BlueSphere Environmental, 15 March 2024 (PSI; BlueSphere, 2024)

Tarraleah Power Scheme – Sampling Analysis and Quality Plan, Rev01, pitt&sherry, 19 February 2025 (SAQP; pitt&sherry, 2025)

Tasmanian Planning Scheme

Tasmanian *State Policy on Water Quality Management 1997 (SPWQM)*

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Figures

Appendix A

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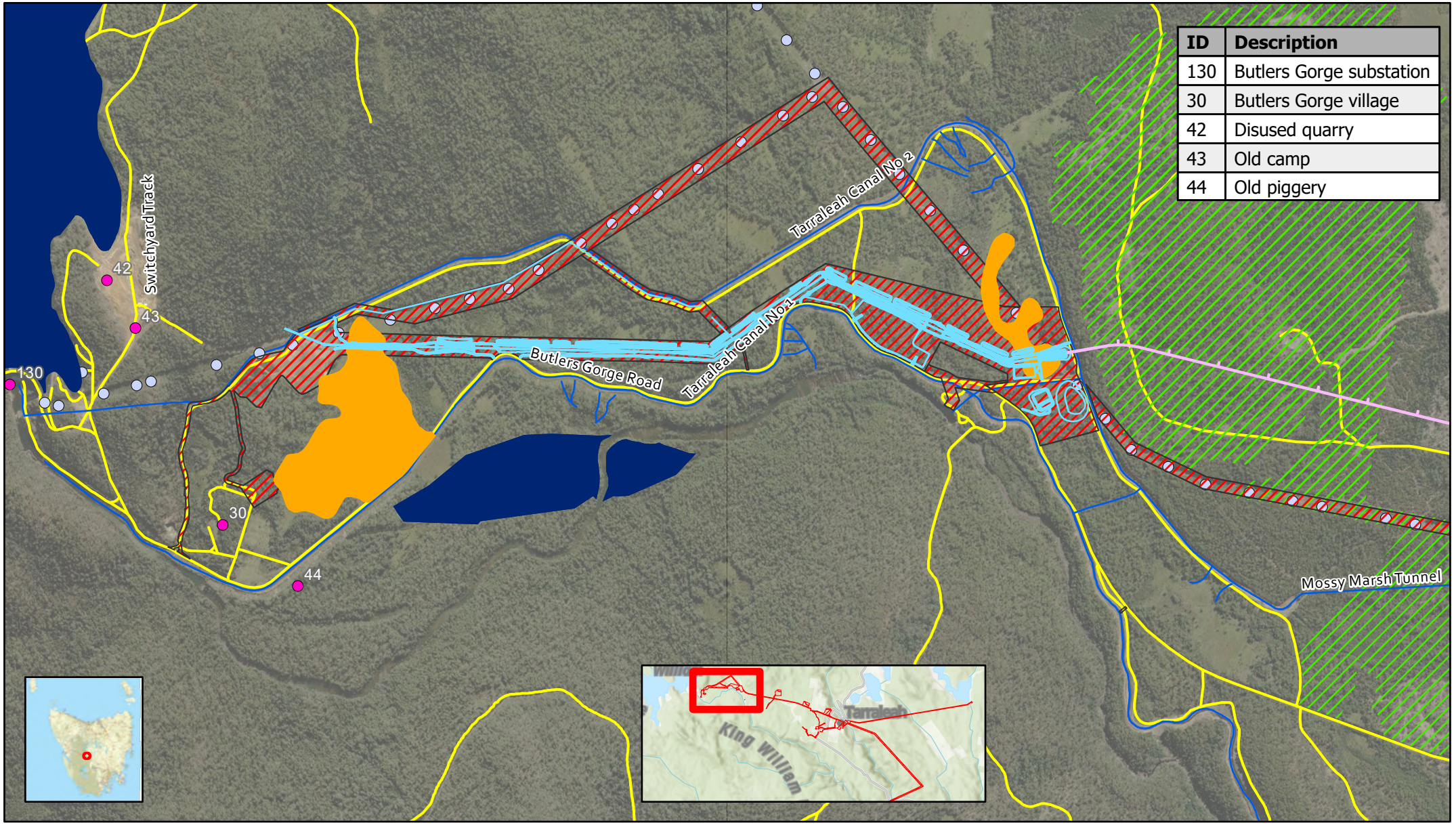


ID	Description
130	Butlers Gorge substation
30	Butlers Gorge village
42	Disused quarry
43	Old camp
44	Old piggery

Hydro-Electric Corporation

Figure 1A Tarraleah Power Scheme Upgrade ESA – Area A

pitt&sherry

N

0 0.25 0.5 1 km

Coordinate System: GDA2020 MGA Zone 55

1:25,000 When Printed at A4

MAP REF	P.24.1136
AUTHOR	JH
REVISION	E
DATE	9/05/2025

DATA SOURCES	Base map from ESRI Base data from The LIST Tasmanian Government Project specific data

Legend

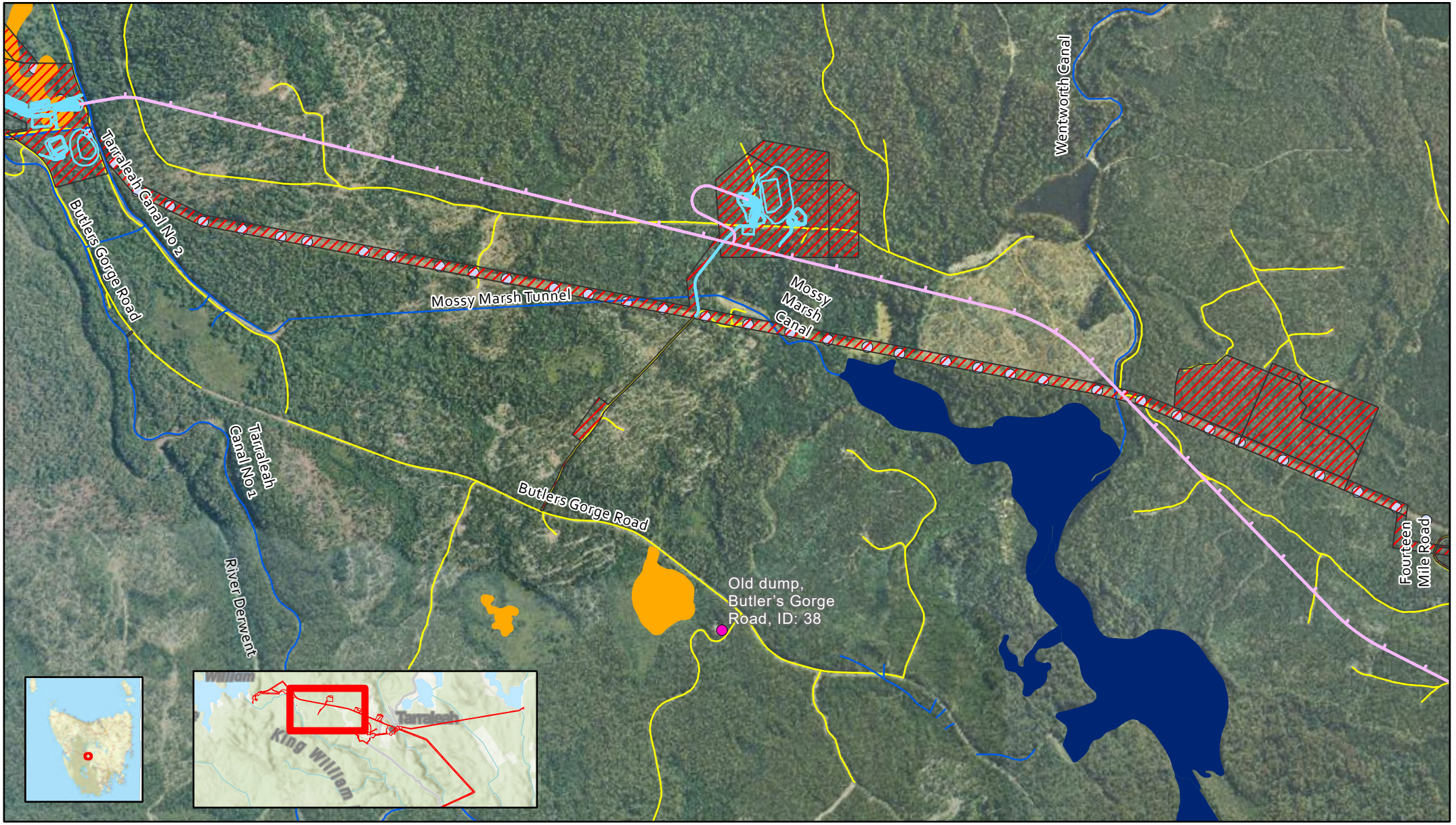
- Tarraleah EIS footprint for Approval - August 2024
- TARDEV - Reference Design (Lines) Underground
- TARDEV - Reference Design (Lines) Above ground

Inland Acid Sulfate Soils [more 20m AHD]

- High
- Low
- Extremely Low

Potential contamination

- Forestry
- Fill - infrastructure area
- Contaminated Sites
- Fill - roads
- Fill - infrastructure points
- Fill - canals



Hydro-Electric Corporation

Figure 1B Tarraleah Power Scheme Upgrade ESA – Areas B and E

pitt&sherry

N

0 0.28 0.55 1.1 km

Coordinate System: GDA2020 MGA Zone 55

1:28,000 When Printed at A4

MAP REF	P.24.1136
AUTHOR	JH
REVISION	E
DATE	9/05/2025

DATA SOURCES	Base map from ESRI Base data from The LIST Tasmanian Government Project specific data

Legend

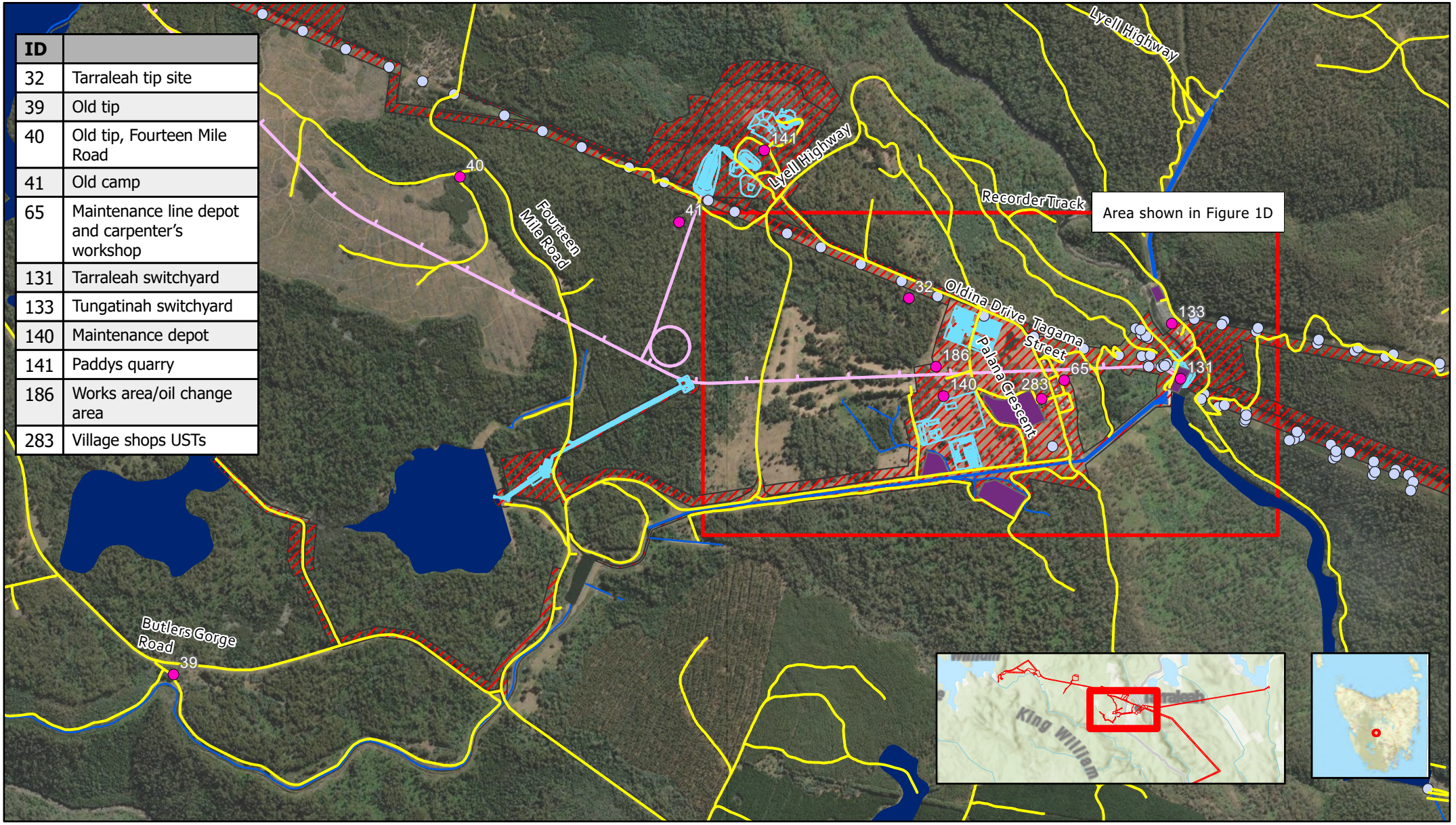
- Tarraleah EIS footprint for Approval
- TARDEV - Reference Design (Lines) Underground
- TARDEV - Reference Design (Lines) Above ground

Inland Acid Sulfate Soils [more 20m AHD]

- High
- Low
- Extremely Low

Potential contamination

- Fill - canals
- Contaminated Sites
- Fill - infrastructure points
- Fill - roads



ID	
32	Tarraleah tip site
39	Old tip
40	Old tip, Fourteen Mile Road
41	Old camp
65	Maintenance line depot and carpenter's workshop
131	Tarraleah switchyard
133	Tungatinah switchyard
140	Maintenance depot
141	Paddys quarry
186	Works area/oil change area
283	Village shops USTs

Hydro-Electric Corporation

Figure 1C Tarraleah Power Scheme Upgrade ESA – Area C

pitt&sherry

N

0 0.25 0.5 1 km

Coordinate System: GDA2020 MGA Zone 55

1:25,000 When Printed at A4

MAP REF	P.24.1136
AUTHOR	JH
REVISION	E
DATE	9/05/2025

DATA SOURCES	Base map from ESRI Base data from The LIST Tasmanian Government Project specific data

Legend

- TARDEV - Reference Design (Lines) Underground
- TARDEV - Reference Design (Lines) Above ground
- Tarraleah EIS footprint for Approval

Inland Acid Sulfate Soils [more 20m AHD]

- High
- Low
- Extremely Low

Potential contamination

- Contaminated areas
- Contaminated Sites
- Fill - infrastructure points
- Fill - canals
- Fill - roads

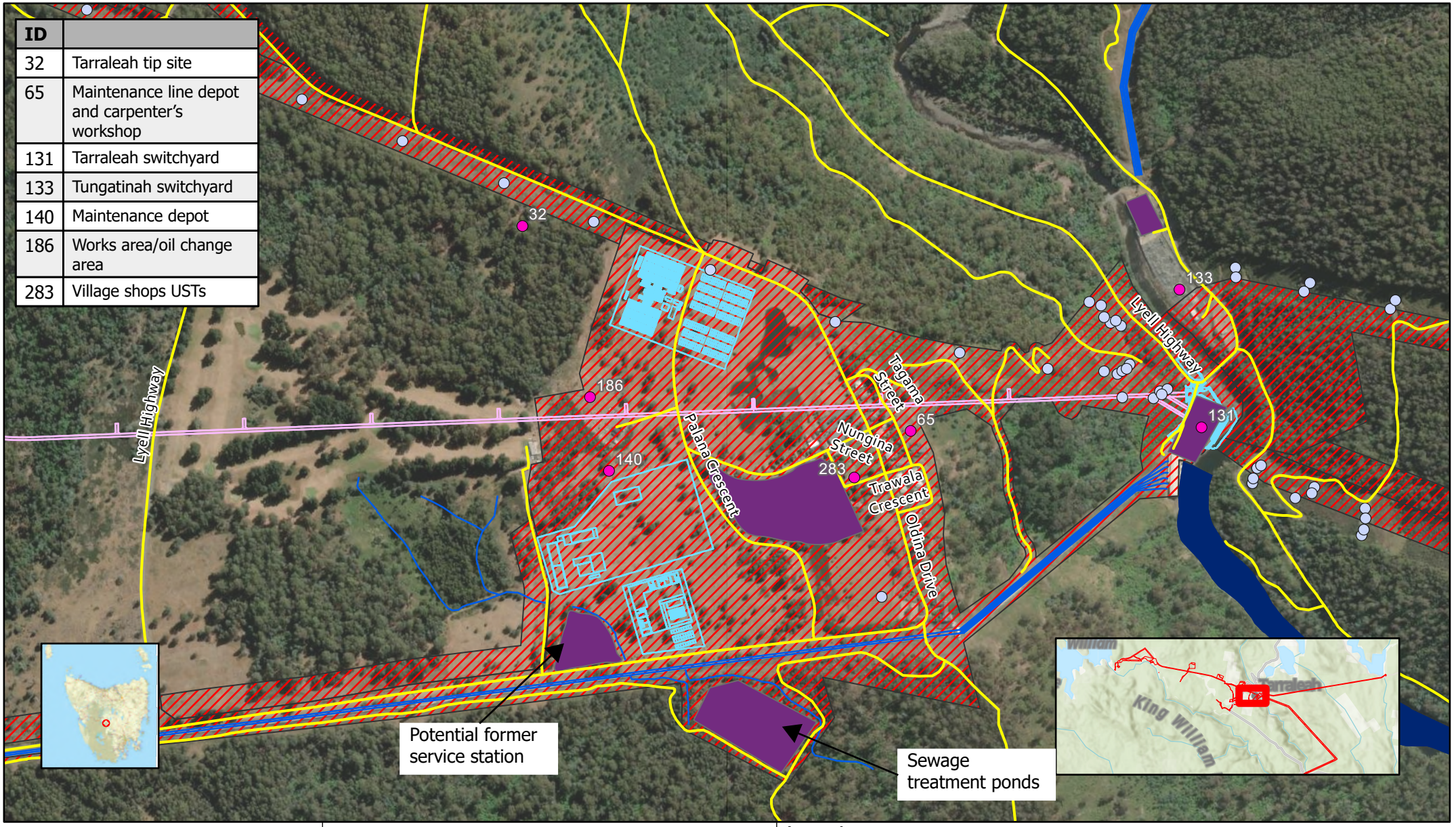


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Figure 1D Tarraleah Power Scheme Upgrade ESA – Area C (Tarraleah Village and Power Station)

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N

0 0.1 0.2 0.4 km

Coordinate System: GDA2020 MGA Zone 55

1:10,000 When Printed at A4

MAP REF	P.24.1136
AUTHOR	JH
REVISION	E
DATE	9/05/2025

DATA SOURCES	Base map from ESRI Base data from The LIST Tasmanian Government Project specific data

Legend

- Tarraleah EIS footprint for Approval
- TARDEV - Reference Design (Lines) Underground
- TARDEV - Reference Design (Lines) Above ground

Inland Acid Sulfate Soils [more 20m AHD]

- Extremely Low

Potential contamination

- Contaminated areas
- Fill - infrastructure points
- Fill - canals
- Contaminated Sites
- Fill - roads

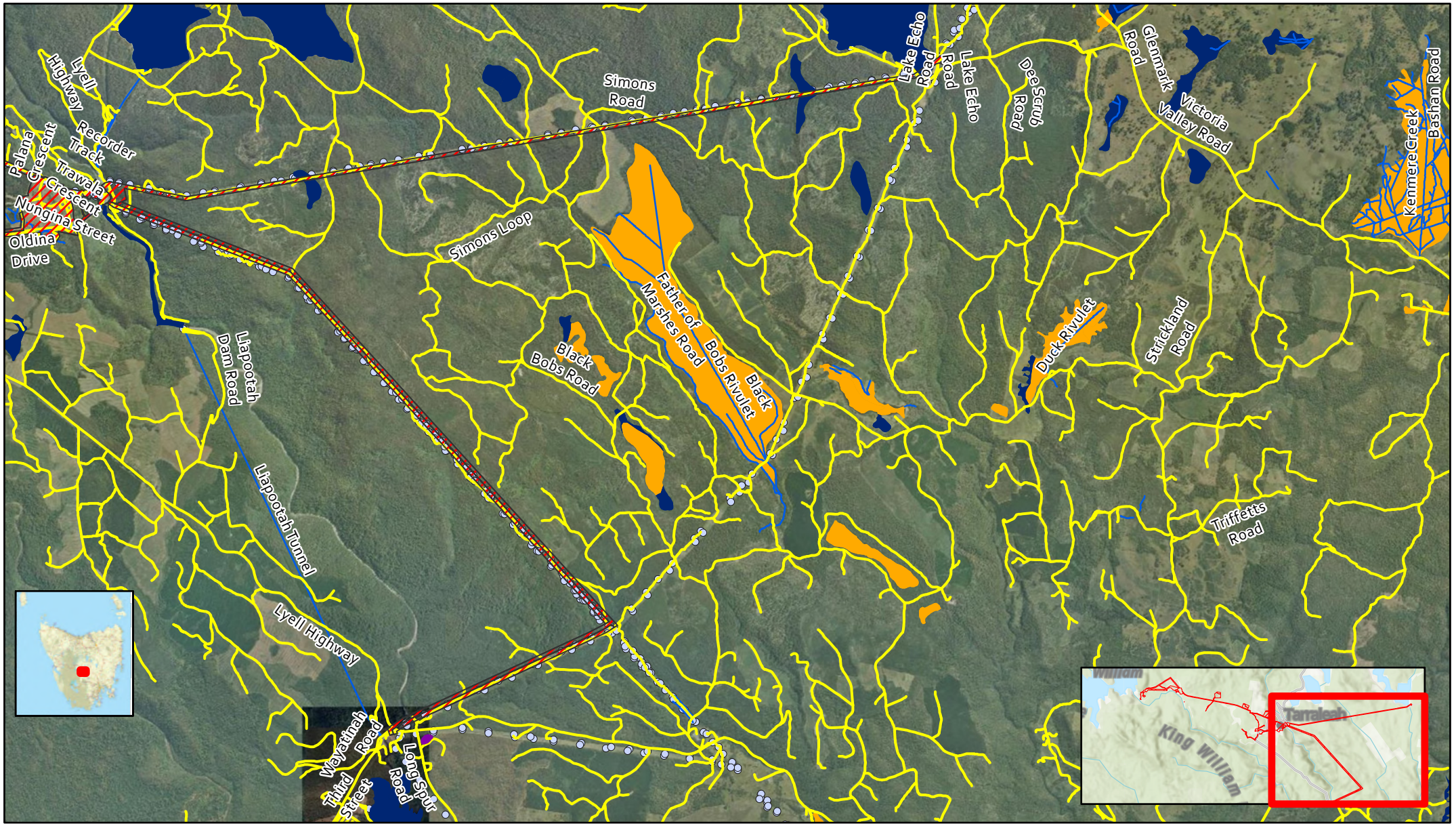

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Figure 1E Tarraleah Power Scheme Upgrade ESA – Area D

pitt&sherry

N

0 0.75 1.5 3 km

Coordinate System: GDA2020 MGA Zone 55

1:80,000 When Printed at A4

MAP REF	P.24.1136
AUTHOR	JH
REVISION	D
DATE	9/05/2025

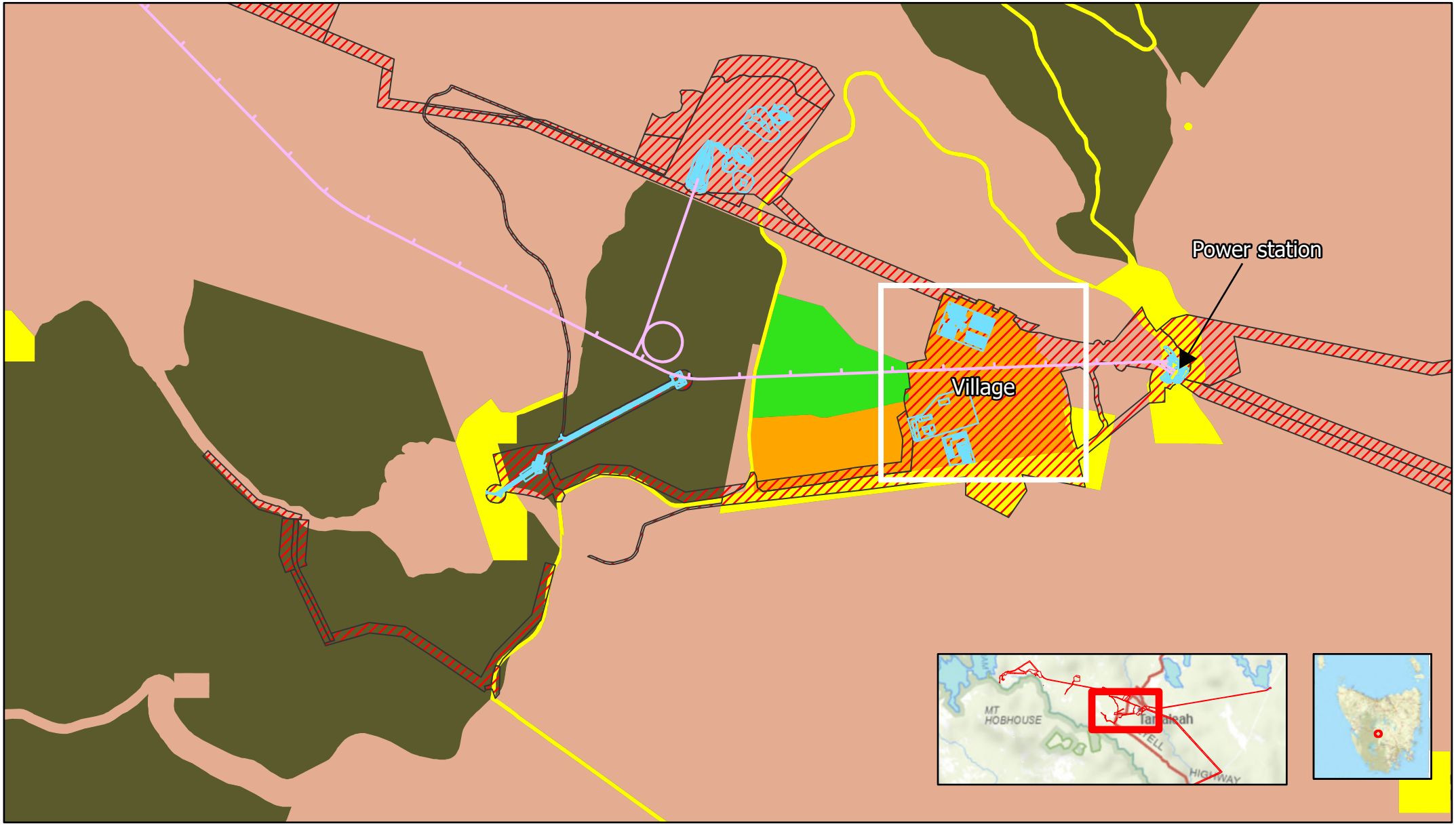
DATA SOURCES	Base map from ESRI Base data from The LIST Tasmanian Government Project specific data

Legend

- Tarraleah EIS footprint for Approval
- Fill - infrastructure points
- Fill - infrastructure area
- Fill - canals
- Fill - roads

Inland Acid Sulfate Soils [more 20m AHD]

- High
- Low
- Extremely Low



Hydro-Electric Corporation

Figure 2 Tarraleah Power Scheme Upgrade ESA Zoning – Area C (Tarraleah Village and Power Station)

pitt&sherry

N

0 0.25 0.5 1 km

Coordinate System: GDA2020 MGA Zone 55

1:25,000 When Printed at A4

MAP REF	P.24.1136
AUTHOR	JH
REVISION	A
DATE	12/05/2025

DATA SOURCES	Base map from ESRI Base data from The LIST Tasmanian Government Project specific data

Legend

- Tarraleah EIS footprint for Approval
- TARDEV - Reference Design (Lines) Underground
- TARDEV - Reference Design (Lines) Above ground

Tasmanian Planning Scheme Zones

- Village
- Rural
- Environmental Management
- Utilities
- Recreation

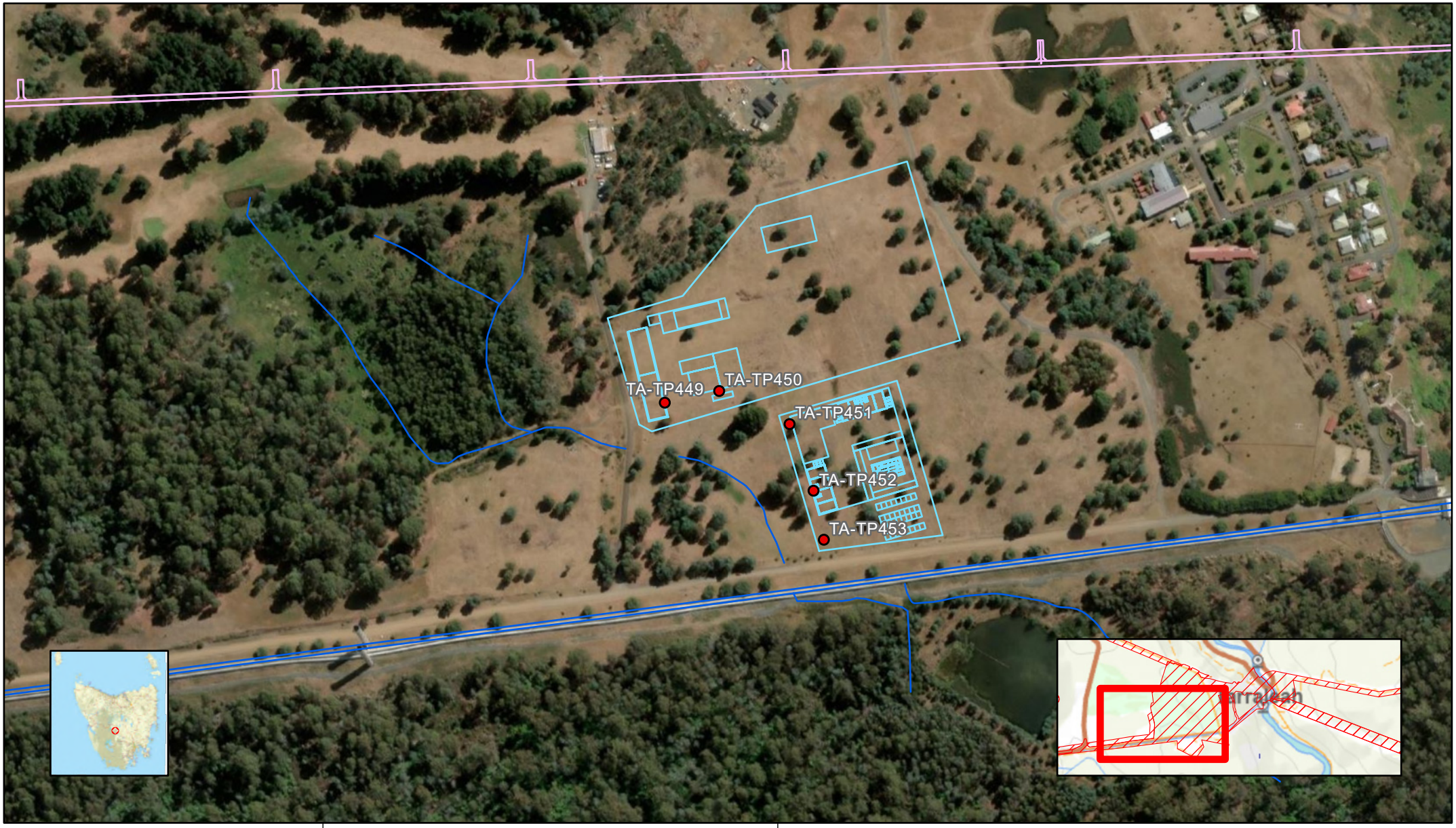


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Figure 3a Tarraleah Power Scheme Upgrade ESA Test Pit Locations
- Tarraleah Village

pitt&sherry

N

0 0.05 0.1 0.2 km

Coordinate System: GDA2020 MGA Zone 55

1:5,000 When Printed at A4

MAP REF	P.24.1136
AUTHOR	JH
REVISION	D
DATE	12/05/2025

DATA SOURCES	Base map from ESRI Base data from The LIST Tasmanian Government Project specific data

Legend

- Test pits
- TARDEV - Reference Design (Lines) Underground
- TARDEV - Reference Design (Lines) Above ground

Hydro-Electric Corporation

Figure 3b Tarraleah Power Scheme Upgrade ESA Test Pit & Groundwater Well Locations – Tarraleah Switchyard

pitt&sherry

N

0 0.03 0.05 0.1 km

Coordinate System: GDA2020 MGA Zone 55

1:2,500 When Printed at A4

MAP REF	P.24.1136
AUTHOR	JH
REVISION	D
DATE	23/05/2025

DATA SOURCES	Base map from ESRI Base data from The LIST Tasmanian Government Project specific data

Legend

- Existing groundwater wells
- Test Pit
- Test pits
- Canals
- TARDEV - Reference Design (Lines) Underground
- TARDEV - Reference Design (Lines) Above ground

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Figure 4 Tarraleah Power Scheme Upgrade ESA
Shallow Water Table flow direction

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N

0 0.01 0.01 0.03 km

Coordinate System: GDA2020 MGA Zone 55
1:750 When Printed at A4

MAP REF	P.24.1136
AUTHOR	JH
REVISION	B
DATE	23/05/2025

DATA SOURCES	Base map from ESRI Base data from The LIST Tasmanian Government Project specific data

Legend

- Shallow aquifer screened wells
- Shallow water table elevation (m ADH)
- Interpreted flow direction

Tarraleah Power Scheme – Sampling Analysis and Quality Plan (pitt&sherry, 2025)

Appendix B

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Newcastle
Devonport

19 February 2025

Mr Scott Rowell
Senior Environmental Planner, Entura obo
Hydro-Electric Corporation
89 Cambridge Park Drive
CAMBRIDGE Tasmania 7170

Dear Scott,

Re: Tarraleah Power Scheme – Sampling, Analysis and Quality Plan – Rev01

1. Introduction

1.1 Background

The Hydro-Electric Corporation (Hydro Tas) is looking to redevelop the Tarraleah power scheme to upgrade and replace existing infrastructure as part of the Battery of the Nation (BotN) strategy. The objectives are to replace components of the scheme that fall within a high landslip risk area and improve power station response times (the Project). The Project encompasses four main areas of land disturbance which extend from Lake King William in the west to Tarraleah and Dee in the east. These areas are shown on figures provided at Attachment A and include a distinction between areas of proposed underground disturbance (i.e. tunnelling) versus above ground disturbance. Together, the areas are referred to as 'the Site', for the purpose of environmental (contaminated land) investigations. The Site includes:

- Area A disturbance footprint (western portion of the Site from Lake King William) – pipeline and power tunnel portal within Fourteen Mile Road, Bronte Park
- Area B disturbance footprint (pump station and tunnel portal) – tunnel access within Fourteen Mile Road, Bronte Park
- Area C disturbance footprint (including power station and switchyard), comprising:
    - Power station upgrade / replacement at the existing Tarraleah Power Station located off Lyell Highway, Tarraleah
    - Pump and surge tower within the Tarraleah Village, 150 Oldina Drive, Tarraleah
    - Tunnel portal and access within Fourteen Mile Road, Bronte Park and off the Lyell Highway, adjacent to Canal Dam
    - Tarraleah Village construction camp and associated areas, 150 Oldina Drive, Tarraleah

- Area D disturbance footprint (eastern portion of the Site to Dee Lagoon), comprising:
    - New switchyard at the existing Tarraleah Power Station located off Lyell Highway, Tarraleah; and
    - Transmission line through Victoria Valley Road, Dee.

It is understood that there is also an optional tunnel portal (Area E) between Area B and Area C.

A Preliminary Site Investigation (PSI; BlueSphere, 2024)[1], comprising a desktop review of available information and an inspection has been completed for parts of Areas A to E. The Site footprint has been modified since the PSI (BlueSphere, 2024) and there are large parts of some areas that have not been inspected. A number of potentially contaminating activities (PCAs) were identified within the Site and intrusive investigations (i.e. sampling) were recommended. The PSI (BlueSphere, 2024) recommended:

- Soil and/or groundwater assessments within areas where **high and medium** contamination risks were identified (i.e. Area C) [presumably to assess the suitability of the relevant areas of the Site for the Project against the relevant provisions (Clause C14.5.1 (use) and Clause C14.6.1 (excavation)[2]) of the Potentially Contaminated Land Code (PCLC) of the Tasmanian Planning Scheme (TPS)]; and
- Soil assessments where earthworks are proposed within areas where **low** contamination risks were identified (i.e. Area A, Area B, Area D and Area E) [presumably to confirm the low risk and to classify soils for suitability for onsite reuse and/or offsite disposal].

1.2 Objectives

Assuming the Project will be assessed by Central Highlands Council (Council) and given the identification of PCAs within the Site, an Environmental Site Assessment (ESA) is required as a component of the development application to allow Council to assess the suitability of the land for the proposed works (i.e. the Project) against the relevant provisions (Clause C14.5.1 (use) and Clause C14.6.1 (excavation)) of the PCLC of the TPS.

The objective of the PCLC is to ensure that use or development of potentially contaminated land does not adversely impact on human health or the environment.

The PSI (BlueSphere, 2024) forms the first part of the ESA (Stage 1 – Desktop), with intrusive investigations (i.e. sampling) (Stage 2) now required to assess:

- The potential for contamination to be present within the Site as a result of PCAs identified in the PSI (BlueSphere, 2024); and
- The risks posed by any potential, or identified contamination to human health and/or the environment from the Site, during use and excavation works.

and provide either:

- **Where suitable**, a statement that the Site is suitable for the proposed use and development (from a land contamination perspective) and complies with the PCLC (Clauses C14.5.1(a) or (b) and C14.6.1(a) or (b)); or
- **Where unsuitable**, a plan to manage any identified contamination and associated risk to human health and the environment at the Site (from a land contamination perspective), to comply with the PCLC (Clause 14.5.1(c) and 14.6.1(c)).

Hydro Tas has requested a sampling, analysis and quality plan (SAQP; this document) be developed to guide the Stage 2 intrusive investigations component of the ESA.

[1] *Preliminary Site Investigation, Tarraleah Development*, BlueSphere Environmental, 15 March 2024 (PSI; BlueSphere, 2024).
[2] It has been assumed that subdivision is not required.

1.3 Scope

The pitt&sherry scope of work comprised:

- Reviewing the PSI (BlueSphere, 2024) and other information / documents provided by Hydro Tas / Entura (refer to Section 2.1) relating to potential contamination within the Site, and identifying whether any additional desktop and/or Site investigation works are required to supplement the work done under the PSI (BlueSphere, 2024)
- Developing a SAQP to:
    - Address identified areas of potential contamination and follow up on information gaps identified in the PSI (BlueSphere, 2024)
    - Address the requirements of the PCLC
    - Determine concentrations of likely CoPC in the soils[3] as a result of identified PCAs
    - Confirm (or otherwise) the presence of contamination within the Site
    - Determine the suitability of the Site for the proposed use; and
    - Provide preliminary waste classification information to inform earthworks management.

The SAQP has been prepared by a suitably-qualified and experienced person in accordance with the ASC NEPM[4]. Pitt and Sherry (Operations) Pty Ltd (pitt&sherry) has two Certified Environmental Practitioner Site Contamination Specialists (CEnvP SC), certified under the Environment Institute of Australia and New Zealand. A CEnvP SC meets the requirements of '*person approved by the Director*' under Clause C14.4.1 of the PCLC.

1.4 Limitations

Limitations of this SAQP include:

- No intrusive investigations were completed. The purpose of this SAQP is to document proposed intrusive investigations
- Historical information was limited to available information provided and reviewed, and summarised in Section 2
- Limitations of reviewed information (Section 2) should be noted
- This SAQP relates to soil within aboveground disturbance areas only (i.e. proposed tunnelling disturbance areas are excluded). The risk of contamination to underground areas would be significantly lower than the risk to aboveground disturbance areas, other than where mobile contamination is identified or where contamination is present in groundwater. Risks to underground disturbance areas will be investigated through proposed deeper drilling and or groundwater sampling
- The potential for acid sulfate soils (ASS) in tunnelling areas has not been assessed. It is recommended that ASS potential in tunnelling areas be assessed as a component of the geotechnical scope
- There are no groundwater wells around the Tarraleah power station itself, only within and around the switchyard
- Groundwater analytical results have not been compared to relevant guideline criteria as a component of this SAQP (Section 2.3.1). It is recommended (Section 2.3.1) that this be done with the ESA reporting associated with the proposed soil sampling as a component of the next phase of works

[3] Groundwater has not been considered at this stage for areas outside of the Tarraleah switchyard / power station. Recommendations for investigations into groundwater quality outside of the Tarraleah switchyard / power station, will be made depending on the results of soil investigations in those other areas, if applicable.

[4] *National Environment Protection (Assessment of Site Contamination) Measure 1999 amended 2013* (ASC NEPM).

- Locations and depths of existing soil results from within the switchyard are not known (Section 2.3.2) and therefore reported concentrations of analytes should be considered as a guide only
- Although comprehensive, a number of gaps in the PSI (BlueSphere, 2024) are noted, and are addressed in Section 2.3. The Site footprint has been modified since the PSI (BlueSphere, 2024) and there are large parts of some areas that have not been inspected, namely the following. Most of these areas are not within currently proposed construction areas / disturbance areas, other than Paddys Quarry, as such these are addressed in the desktop assessment only and are not proposed to be included in any intrusive investigations at this stage:
    - Area A – western portion, south of the intersection with Tarraleah Canal No. 2; northern portion, north of included area. However, neither of the additional footprints will be disturbed by currently proposed construction works
    - Area B – linear portion between Area A and Area C; south-western portion between the included area and Mossy Marsh Tunnel; far southern portion, between Mossy Marsh Tunnel and Butlers Gorge Road. However, neither of the additional footprints will be disturbed by currently proposed construction works
    - Area C – linear portion from Area B; expanded footprint around Paddys Quarry; expanded footprint to the eastern and south-eastern portions, east and south-east of the Tarraleah Golf Club. The expanded footprint around Paddys Quarry will be subject to aboveground disturbance; the remaining additional footprints will not be disturbed by currently proposed construction works
    - Area D – entire south-eastern spur. The additional footprint will not be disturbed by currently proposed construction works
    - Area E – western portion. Additional footprint will not be disturbed by currently proposed construction works
- The location of the PCAs identified in the *Land Contamination Survey & Risk Assessment, Energy Business Unit, April 1995* (Land Contamination Survey, 1995) are not clear (Section 2.3.4) and the age of the document (almost 30 years' old) is a significant limitation; location information has been supplemented by the *Contaminated Sites Status figure, BotN-TAR-552-01-ENV-TARDEV-Contamianted site – A3* and associated spreadsheet (Contaminated Sites), both undated and provided by Entura (Attachment B)
- No Site walkover has been completed by pitt&sherry. It is recommended (Section 4.1) that the proposed sampling locations be ground-truthed prior to commencement of intrusive investigations to confirm the suitability of the locations to achieve the sampling objectives, and to ensure safe access, etc. is available; and
- If the Project design changes in a way which alters the development footprint shown in the figures provided in Attachment A, the risk of impact from PCAs (Section 3) and the associated sampling plan (Section 4) should be reassessed and modified, if necessary, for the new footprint area(s).

2. Information review

2.1 Overview

Information reviewed or referred to by pitt&sherry comprised (from most recent to oldest):

- Correspondence with various authorities, November 2024 (Authority Correspondence, 2024) (Attachment C)
- List of environmental incidents for the Tarraleah Power Station from 1 October 2013 to 31 October 2024 (Environmental Incidents 2013-2024)(Attachment D)
- *Tarraleah Village Layout*, Hydro Tasmania, 13 September 2024 (Village Layout, 2024) (Attachment E)
- *Hydrogeological Interpretive Report Stage 1*, by PSM for Entura, ref PSM4346-232L, 5 August 2024 (only referred to for the Tarraleah switchyard and power station) (PSM, 2024)
- Baseline groundwater quality monitoring data for the Project from January to August 2024 (GW data, 2024)
- PSI (BlueSphere, 2024)

- Memorandum: *Tarraleah Redevelopment – Baseline Groundwater Sampling Program*, PSM, 2 November 2023 to Entura (PSM, 2023)
- *Tarraleah NDD Spoil Assessment – Factual report*, Spectran Group, 22 December 2022 (Spoil Assessment, 2022)
- *AST Laboratory Report 31414,* 16 September 2022, for drillholes within the switchyard (AST Report, 2022)
- *Technical Specification for the Construction of Transformer Catchpits, Drainage, Oil Containment & Miscellaneous Works at Tarraleah Power Station, ENE-0239-TN-401*, Hydro-Electric Corporation, 23 December 1996 (Technical Specifications, 1996)
- Contaminated Sites (Attachment B); and
- Land Contamination Survey, 1995.

Other information provided but not reviewed by pitt&sherry as a component of this SAQP comprised:

- Tarraleah Redevelopment Project, Hydrogeological Interpretive Report PSM4346-11R, PSM Tunnel QLD Pty Limited, 22 December 2023 (Hydrogeological Report, 2023); and
- Borehole logs.

It is recommended (Section 2.3.1) that the above documents be reviewed with the reporting associated with the proposed soil sampling as a component of the next phase of works.

2.2 Anecdotal information

The below information was provided by Mr Scott Rowell, Senior Environmental Planner at Entura, in response to queries by pitt&sherry:

- Use of firefighting foam – the only known discharge of firefighting foam would have been on training days when extinguishers may have been emptied for training at the power station [firefighting foam may have historically contained per- and poly- fluoroalkyl substances (PFAS) and there is potential for PFAS within the power station footprint]
- Weed control – spray (likely Roundup and Grazon (glyphosate)) is used in and around the switchyard; and
- Remediation of contaminated areas (refer to Section 2.3.4) – common practice was to only remove rubbish if it was visible or if it was a sewerage or fuel tank, so anything buried in a landfill / tip site is likely still in situ.

2.3 Findings

2.3.1 Surface water bodies and groundwater

As detailed in the PSI (BlueSphere, 2024), a number of surface water bodies are present in and around the Site, including Dee Lagoon, Lake King William and River Derwent. Also of note are Tarraleah Canal No.1 and No.2, Nive River and Mossy Marsh Dam. Localised wetlands and unnamed creeks are also present throughout the Site.

As detailed in the PSI (BlueSphere, 2024), the Site is expected to be underlain by up to four aquifers:

- Localised Quaternary glacial systems formed within the sand and gravel of the glacial and glacigene deposits (Qpg)
- Localised Quaternary aquifers present in alluvial deposits

- Underlying the Quaternary glacial aquifer, and also likely forming the water table aquifer in certain portions of the Site, is the Permian-Triassic sandstone (Rq, Rv and R), where outcrops are constrained to certain portions of the Site; and
- The regional aquifer is anticipated to reside within the Jurassic Dolerite (Jd) and is likely present beneath the broader Site. Groundwater within this aquifer is expected to flow in a generally south-easterly direction, with localised flow influenced by proximity to surface water features and topography.

BlueSphere, 2024, noted that due to the potential for multiple aquifers and unclear interactions within surface water and potentially groundwater dependent ecosystems, the protected environmental values (PEVs) within each Area are not clear.

Existing baseline groundwater data for the Site (GW Data, 2024) suggests:

- A total of 14 groundwater wells and 4 piezometers have been installed within the Site to monitor standing water levels (SWLs) and baseline groundwater quality prior to the Project construction commencing (locations are shown on the *Baseline Groundwater Quality Monitoring Locations* figure in Attachment F)
- The groundwater wells and piezometers have been monitored since January 2024 with monitoring frequency varying between real-time, monthly and quarterly
- A summary of groundwater well details is provided in Table 1 [the majority of these wells appear to be within the bedrock aquifer (either sandstone or dolerite); any groundwater within the shallower sedimentary horizons would be much more likely to be impacted by surface contamination]. It is recommended that borehole logs be reviewed with the reporting associated with the proposed soil sampling
- Screen lengths are 3 m long [assuming the wells were properly constructed, it would appear that the deeper / bedrock aquifer(s) are artesian / confined; the SWLs are very shallow compared to the depth of the well and 3 m long screen]
- Groundwater flow directions have been modelled for a number of areas of the Site. These are not discussed here as they differ from area to area and reference should be made to PSM, 2024, or subsequent documents to confirmed groundwater flow directions in each area (and at particular depths / aquifers)
- Analytical results have not been compared to relevant guideline criteria as a component of this SAQP. It is recommended that this be done with the reporting associated with the proposed soil sampling
- Tested analytes comprise (and are generally adequate for the identified PCAs (Table 4)):
    - Field parameters – pH, electrical conductivity (EC), dissolved oxygen (DO), turbidity and temperature
    - Analytical parameters – pH, EC, total dissolved solids (TDS), total suspended solids (TSS), alkalinity, major cations, major anions, molybdate reactive silica, nutrients, metals (total and dissolved), polychlorinated biphenyls (PCBs), total petroleum hydrocarbons / total recoverable hydrocarbons (TPH / TRH), polycyclic aromatic hydrocarbons (PAHs) and benzene, toluene, ethylbenzene, xylenes and naphthalene (BTEXN); and
    - It is recommended that a combination of phenols, organochlorine pesticides / organophosphorus pesticides (OCP / OPP), PFAS, solvents, acids, alkalis, analytes relevant to detect impacts from organic flocculants be added to the analytic suite based on anecdotal information (Section 2.2) and the identified PCAs (Section 2.3.4).

A desktop review of the Tarraleah power station and switchyard groundwater wells and their suitability is provided in Section 2.3.3.

Table 1: Groundwater well and piezometer details for wells located within the Site (GW Data, 2024)

ID	Site Area	Depth (m bgl)	Diameter (mm)	Base of Screen (m)	SWL[A] (m bgl)
Groundwater Wells					
TA-DC214	Area C	24.70	50	24.70	15.65 – 18.65
TA-DC215	Area C	40.00[B]	50	40.00	22.44 – 23.15
TA-DC218	Area C	25.10	50	25.10	0.88 – 2.16
TA-DC234	Area C	15.00[B]	50	15.00	2.07 – 2.89
TA-DC235	Area C	33.25	50	>15.00	1.73 – 2.62
TA-DC237	Area C	20.00[B]	50	20.00	3.65 – 4.32
TA-DC238	Area C	33.40	50	C	3.06 – 4.11
TA-DC241	Area C	32.29	50	C	2.55 – 7.29
TA-DC242	Area C	17.13	100	C	1.00 – 1.64
TA-DC243	Area C	33.50	50	C	9.03 – 9.93
TA-DC247	Area A	C	50	C	1.81 – 2.20
TA-DC207	Area C	70.00	C	C	0.43 – 1.63
TAHS2019 (shallow)	Area C	20.55	30	20.00	11.89 – 14.70
PW20d (deep)	Area C	32.71	30	32.00	22.44 – 23.90
Piezometers					
S_SP1	Area C	C	C	C	C
S_SP2	Area C	17.90	100	C	14.65 – 15.64
S_SP5	Area C	C	C	C	C
Q_SP1	Area C	C	C	C	C

Notes:

A – measured in 2024 over multiple sampling events.

B – depth assumed from base of screen, to be confirmed.

C – unknown.

D – location is not known.

E – refer to *Baseline Groundwater Quality Monitoring Locations* figure in Attachment F.

m bgl – metre(s) below ground level; mm – millimetre(s).

2.3.2 Soils including acid sulfate soils

Existing soil data for the switchyard (within Area C) comprises:

- Spoil Assessment, 2022:
  - Spoil from non-destructive drilling (NDD) within the switchyard was tested (single sample, location and depth unknown) for the full list of contaminants given in IB105[5] (all analytes were tested for total concentrations, with the exception of metals which were also tested for leachable concentrations)
  - Reported total concentrations exceeded the IB105 Level 1 – fill material criteria for total chromium, total manganese and total nickel

[5] *Information Bulletin No. 105 Classification and Management of Contaminated Soil for Disposal, Version 3*, Environment Protection Authority Tasmania, 2018 (IB105).

- Reported leachable concentrations were below Level 2 – low-level contaminated soil criteria[6]

- NDD spoil is most likely blue metal (dolerite) gravel. Concentrations of total chromium, total manganese and total nickel in excess of Level 1 criteria is typical of dolerite, and the low leachability seems to confirm this
- AST Report, 2022:
  - Spoil from five locations, understood to be from drillholes within the switchyard (locations and depths unknown) was tested for total concentrations of BTEX, TPH, PCBs and metals
  - Reported total concentrations exceeded the IB105 Level 1 – fill material criteria for arsenic (1 sample), total chromium (4 samples), copper (2 samples), manganese (all 5 samples), nickel (3 samples), zinc (1 sample)
  - All reported total concentrations were below the Level 2 – low-level contamination soil criteria
  - Reported concentrations of BTEX, TPH and PCBs were all below the laboratory limits of reporting (LORs); and
- Likely to include significant quantities of blue metal / dolerite, which would explain the exceedances of Level 1 criteria for total chromium, total manganese and total nickel in particular.

The locations and depths of the abovementioned soil samples are not known and therefore the reported concentrations of analytes should be considered as a guide only.

A summary of the potential for ASS to be present beneath parts of the Site based on mapped areas in the PSI (BlueSphere, 2024) is provided in Table 2.

Table 2: Mapped ASS potential (PSI (BlueSphere, 2024))

Mapped Probability of Encountering ASS	Area A	Area B	Area C	Area D	Area E
Extremely low probability (1-5% chance of occurrence)	Majority of Area A	All of Area B	All of Area C	All of Area D	All of Area E
Low probability (6-70% chance of occurrence)	Small portions in western and eastern extents of Area A	-	-	-	-

2.3.3 Tarraleah power station and switchyard groundwater desktop review

A desktop review of groundwater wells information has been completed by pitt&sherry for the Tarraleah power station and switchyard. The aim of the review was to check the suitability of the existing groundwater monitoring wells for the purposes of contamination assessment. The assessment did not include a full review of groundwater quality data since monitoring began. In addition, the review did not include any of the other areas of the Site. The desktop summary is provided below.

[6] Note the Spoil Assessment, 2022 suggests the leachable concentrations were below the Level 1 leachable criterion, however, there are no leachable criteria for Level 1 in IB105.

Groundwater wells included in the review

There are six groundwater wells installed at / near the Tarraleah power station, these include:

- TA-DC234 – south-western area of the switchyard
- TA-DC235 – south, south-eastern area of the switchyard
- TA-DC237 – eastern area of the switchyard
- TA-DC238 – northern area of the switchyard
- TA-DC243 – north-western area of the switchyard; and
- TAHS2019-PW20 – around 400 m south-west of the switchyard. Due to its distance from the power station and switchyard, and location lateral to the inferred groundwater movement, this well has not been fully assessed in this review.

There are no wells around the power station itself, all of the above are either within the switchyard, or southwest of the power station (refer to figure in Attachment F). This is likely due to the large building footprint and amount of underground infrastructure within the area.

Note TA-DC270 shown in the figure at Attachment F, is not considered in this review as it is related to the lower headrace tunnel.

Geological profile

A simplified profile log is summarised below from the borehole logs provided (refer to Attachment F). TAHS2019-PW20 has not been considered due to its distance of more than 400 m from the power station:

- TA-DC234 includes:
    - approximately 0.5 m of fill underlain by
    - dolerite
- TA-DC235 includes:
    - approximately 3 m of fill underlain by
    - approximately 2 m of alluvium underlain by
    - dolerite
- TA-DC237 includes:
    - approximately 0.8m of fill underlain by
    - approximately 3 m of possible colluvium or fill underlain by
    - approximately 4 m of alluvium underlain by
    - dolerite
- TA-DC238 includes:
    - approximately 0.8m of fill underlain by
    - approximately 2.5 m of possible colluvium or fill underlain by
    - approximately 1.5 m of alluvium underlain by
    - dolerite
- TA-DC243 includes:
    - approximately 3 m of colluvium and possibly surface fil, underlain by
    - dolerite.

An indicative hand sketch of two sections (Sections A and B) from north-west to south-east, through the two following lines, has been completed (refer to Attachment F). These sections are broadly perpendicular to the Nive River and can be taken to represent the approximate inferred groundwater flow direction from west to east towards the Nive River (i.e. from left to right in the sections as indicated in the sketches):

- **Section A** is through TA-DC243, TA-DC238 and TA-DC237. TA-DC238 and TA-DC237 appear to be screened at broadly equivalent intervals and to represent upgradient and downgradient groundwater from beneath the switchyard within dolerite. TA-DC243 is screened at least 5 m deeper than the other two wells on Section A and may not be equivalent to the aquifer intersected in TA-DC238 and TA-DC237; and
- **Section B** is through TA-DC234 and TA-DC235. TA-DC234 and TA-DC235 appear to be screened at broadly equivalent intervals and to also represent upgradient and downgradient groundwater from beneath the switchyard within dolerite.

Monitoring wells installation details

An extract of the installation summary table is provided in Table 3 below. All wells listed are noted as ‘active’ and as ‘water quality monitoring bores’. All bores are noted as installed in March or April 2023, except TAHS2019-PW20 which is not dated, but was likely installed in 2019 as suggested by its well identification.

Other than TAHS2019-PW20, which was installed as a vertical bore, the other five wells were installed as angled bores as they were initially intended as geotechnical / structural mapping bores. Their angles range from -75 to -85 degrees instead of vertical (-90 degrees). The angles are not expected to impact on suitability for groundwater monitoring. However, the bore angles could impact on the optimal installation of well materials including bentonite, gravel pack screening material, etc.

There is only incomplete screen interval information for TA-DC235, therefore comparison of that well’s water quality information to the other wells must be made with caution. The interpretation in this review assumes a 3 or 6 m long screen above the gravel pack ‘To’ depth of 324.5 m AHD.

Due to the elevation differences of over 100 m between the screened intervals in TAHS2019-PW20 and the other five wells around the switchyard, the use of TAHS2019-PW20 as a background well from a water quality perspective is limited, and any comparisons should be made with caution.

Other than the well screen intervals and gravel pack depths, there is no certainty about how the wells have actually been constructed. It is not clear whether bentonite plugs have been used above and below the gravel packs to ensure that sampled waters are only from the screened intervals.

Table 3: Extract from the groundwater/standpipe installation details provided by Entura

BHID	Elevation (mAHD)	Hole Depth (m)	Screen Depth (m)		Screen Elevation (m AHD)		Gravel Pack (m AHD)	
			From	To	From	To	From	To
TA-DC234	344.2	39.7	9	15	335.5	329.7	341.3	-
TA-DC235	344.0	41.3	-	-	-	-	-	324.9
TA-DC237	345.3	41.3	17	20	362.1	365.0	358.6	365.0
TA-DC238	345.9	39.7	9	15	336.9	330.9	342.9	-
TA-DC243	353.2	39.8	39.8	33.5	313.4	319.7	-	-
TAHS2019-PW20	488.4	80.0	14	20	474.4	468.4	-	-
			23	32	465.4	456.4	-	-

Purpose of, and rationale for, the groundwater wells

Discussions with Entura / Hydro personnel (16 January 2025) noted that the wells were installed opportunistically within bores which were drilled to understand the geology and geotechnical properties of the profile at the power station.

It is understood that monitoring in the switchyard wells will continue (while wells outside of the switchyard are expected to be dropped from the monitoring program).

PSM's memorandum[7] (PSM, 2023) notes that the initial groundwater sampling program was to establish baselines for the Tarraleah Redevelopment Project. The PSM program included proposed monitoring locations, frequency of head (standing water level – SWL) monitoring, frequency of water quality monitoring for field and laboratory analyses.

PSM's proposed sampling for these six wells is reproduced below from their Table 2. While the proposed water quality testing is reproduced, below from their Table 3.

[7] Memorandum: *Tarraleah Redevelopment – Baseline Groundwater Sampling Program*, PSM, 2 November 2023 to Entura (PSM, 2023)

Table 2 - Groundwater Sampling Locations.

Bore	Type	Head Monitoring Frequency [1]	Quality Monitoring Frequency [2]	Monitoring Target
TAH2019-PW20d	Standpipe	Monthly	Quarterly	• Seasonal change of water quality and heads
TA-DC234	Standpipe	Monthly	Quarterly	
TA-DC235	Standpipe	Monthly	Quarterly	
TA-DC237	Standpipe	Monthly	Quarterly	
TA-DC238	Standpipe	Real-time	Monthly	• Real-time monitoring of head and EC is recommended to capture the episodic change (response to recharge) • Seasonal fluctuations of water quality
TA-DC243	Standpipe	Real-time	Monthly	

Table 3 - Water Quality Parameters for Field and Laboratory Testing.

Parameters for Field Analysis	Parameters for Laboratory Analysis
Filtered samples: Electrical Conductivity, pH, Dissolved Oxygen, temperature, turbidity.	• **Physicochemical parameters:** pH, Electrical conductivity, Total Dissolved Solids, Total suspended Solids, Total Alkalinity as CaCO3, Bicarbonate alkalinity as CaCO3, Carbonate alkalinity as CaCO3, pH at saturation state of CaCO3 • **Major ions:** calcium, magnesium, sodium, chloride, sulphate, bicarbonate, potassium • **Minor ions:** carbonate, silica, hydroxide, fluoride • **Metals (total and soluble):** aluminium, arsenic, cadmium, chromium, copper, iron, lead, manganese, nickel, selenium, zinc • **Nutrients:** nitrite, nitrate, ammonium, total phosphorus

Analytes

It is noted that none of the analytes address the contamination risks from the switchyard, including:

- Historical use of PCB-containing oils in transformers
- Long-term storage of oils
- Storage of hydrocarbon fuels, particularly in the western portion of the switchyard; and
- Potential use of PFAS-containing fire-fighting foams, either for incidents, training and servicing of fire-fighting extinguishers and equipment.

The SAQP and conversation on 16 January 2025 confirmed that the additional groundwater analytes recommended in the SAQP will be included in the groundwater monitoring analytical suite. Previously only one round of testing was undertaken in TA-DC237 for hydrocarbons and PCBs as well as pesticides.

Hydrogeological interpretation

PSM completed a Hydrogeological Interpretive Report[8]. The schematic cross section developed over the area of the Tarraleah power station switchyard is copied in Attachment F (PSM, 2024, Insert 13). It includes wells TA-DC243 and TA-DC238, which are included in Section A of this review.

[8] *Hydrogeological Interpretive Report Stage 1*, by PSM for Entura, ref PSM4346-232L, 5 August 2024

The schematic shows:

- Groundwater beneath the Site connected to the Nive River bed
- Potential for a perched aquifer in colluvium and landslip, although this is not shown beneath the switchyard segment; and
- Groundwater levels shallower than the screened intervals, suggesting that the bedrock aquifer is confined, or that the wells may be capturing shallower waters.

The report also suggests groundwater flow direction beneath the Tarraleah power station and switchyard is to the east-south-east, towards the Nive River.

PSM also drew up a cross section from south-west to north-east, across the Tarraleah power station and switchyard (refer to Attachment F, PSM, 2024, Figure 9). The eastern end is perpendicular to other section in Attachment F (PSM, 2024, Insert 13), and is also perpendicular to both sketched Section A and Section B of this review (also in Attachment F).

The right-hand side of the figure represents the section through the switchyard and wells TA-DC234, TA-DC237 and TA-DC238. The section suggests:

- The switchyard is underlain by sheared fault breccia
- It represent a groundwater discharge zone, i.e. it may periodically have springs appearing through the ground, and means groundwater can be seasonally shallow; and
- This is further supported by groundwater modelling in that report, which suggests the switchyard area is a discharge zone.

Suitability of the existing wells to monitor potential contamination from identified PCAs

Indicative sections have been plotted and are shown in Section A and Section B (Attachment F).

It is clear from the sections that the wells have been exclusively screened in dolerite. The shallower horizons which comprise fill, colluvium and alluvium have not been included in the monitoring (if it is assumed that the monitoring wells have been constructed properly with bentonite seals above and below the screened intervals).

The shallower horizons are the ones most likely to be impacted by contamination from the switchyard. Furthermore, as they are the most porous, mobile contamination is most likely to migrate vertically and laterally through these horizons and to impact on groundwater.

Due to the shallower depths of these porous horizons, i.e. 0.5 to 5 m bgl in Section B and 3 to 7.8 m bgl in Section A, it is possible that presence of groundwater in these horizons might be seasonal. Nonetheless, monitoring for groundwater contamination of these more at-risk horizons should be undertaken, considering they potentially also link directly to the adjacent Nive River.

This recommendation is reinforced by the fact that hydrocarbons (BTEX and TPH C_6-C_9) have been reported in well TA-DC237 (14/3/2024) at concentrations of:

- 1,200 µg/L TPH C_6-C_9 and 1,200 µg/L total TPH C_6 – C_{36}; and
- 690 µg/L total BTEX.

The results confirm that groundwater contamination is present in the eastern portion of the switchyard within dolerite. The source of this contamination has not been confirmed however the contamination is expected to have migrated through the profile (laterally and vertically) and to have impacted the shallow porous horizons before impacting on groundwater.

Additional groundwater installation and/or monitoring requirements for the power station and switchyard

The review has highlighted the need for:

- The analytical suite to be broadened to include hydrocarbons (TPH/TRH/PAH and BTEXN), PCBs, phenols for **all** wells in the switchyard, as well as PFAS to confirm presence or absence
- The need for additional groundwater wells to be installed / screened within the shallower more porous units including fill, colluvium and alluvium within the switchyard; and
- It is also apparent that no groundwater wells have been installed within the power station itself. The priority has been to identify what additional contamination investigations are required within the Tarraleah power station switchyard. Furthermore, access to the profile within the power station itself if not practicable due to the large building and underground infrastructure footprints. Contamination investigations within the power station itself, if required, will be scoped separately as they would be best completed as part of the demolition/post demolition stage, if this was to proceed.

Indicative new groundwater well locations to be screened across fill, colluvium and alluvium are shown together with proposed soil/fill investigation locations in Figure 2Cii, Attachment H.

2.3.4 Potentially contaminating activities

A summary of identified PCAs from a review of available documents, listed in Section 2.1, is provided in Table 4. Where sampling is proposed, based on the proposed aboveground disturbance areas coinciding with identified PCAs this is shaded blue.

PSI (BlueSphere, 2024) and subsequent information requests

The PSI (BlueSphere, 2024) comprised a desktop review of available information and an inspection of parts of the Site in accordance with the ASC NEPM. Although the PSI (BlueSphere, 2024) is reasonably comprehensive, the following gaps are noted and where possible have been addressed in this SAQP:

- The change in the Project layout since BlueSphere's review means there are a number of Site areas that have not been inspected. The only material area (i.e. where aboveground disturbance is currently proposed) is the expanded footprint around Paddys Quarry (Section 1.4). Sampling within Paddys Quarry is no longer proposed as a component of this SAQP (Section 4) as it is understood that no surface disturbance activities will be carried out there
- No sourcing of any dangerous goods files for the Site from WorkSafe Tasmania (WST)
    - WST hold details on underground petroleum storage systems (UPSS) and other chemical storage. The absence of dangerous goods files (if they exist) results in uncertainty regarding the storage (historical or current) of dangerous goods including type, quantity and location, and in turn the potential for contamination to have resulted from such storage
    - WST was contacted by Entura on 4 November 2024, requesting any records relating to dangerous goods licencing and site contamination at the power station. WST advised that they do not hold a dangerous goods file for the power station and in addition, there is no file on the Environment Protection Authority, Tasmania (EPA) Environmentally Relevant Land Use Register. Correspondence with WST is provided in Attachment C
- No consultation with the EPA:
    - No request for information pertaining to the potential for contamination at the Site was submitted to the EPA. The EPA holds documents relating to environmental regulation, environmental incidents and complaints. The EPA was contacted by Entura on 4 November 2024, requesting any records relating to the power station. Provided information comprised:
        - November 1989 – the dewatering pump failed and was considered the likely source of discharge of approximately 10 L of oily water into Lake Liapootah (see below)

- April 1990 – the EPA were notified of oily scum and fibrous material found in Lake Liapootah
- July 2013 and February 2014 – the EPA approved requests to dilute and reuse 80 cubic metres (m^3) and 30 m^3 of TPH-contaminated soil excavated from switching yards at both Tarraleah and Tungatinah power stations as fill Paddy's Quarry (Mining Lease 16M/1998), within Area C. Paddys Quarry was identified in the PSI (BlueSphere, 2024), refer to Table 4
- February 2014 – the EPA approved a request to treat 30 m^3 of Level 3 [under IB105] TPH-contaminated soil excavated from the Tarraleah Power Station switchyard at Port Latta Waste Depot Landfarm facility

Correspondence with the EPA is provided in Attachment C

- EPA databases on the Land Information Systems Tasmania, interactive mapping tool (LISTmap) were not reviewed:
  - EPA Regulated Premises – this layer identifies the location of Level 2 regulated premises as well as potentially-contaminated sites, which are currently regulated. A review of this layer identified two EPA-regulated premises in the vicinity of the Site – Lake King William Upgrade Works, approximately 1 km north-west of Area A and regulated under Environment Protection Notice (EPN) 11376/1[9]; Paddys Quarry, within Area C and regulated under Permit Conditions Environmental (PCE) 9048[10]. The upgrade works were not identified in the PSI (BlueSphere, 2024) but are unlikely to impact on Area A from a contamination perspective due to distance. Paddys Quarry was identified in the PSI (BlueSphere, 2024), refer to Table 4
  - EPA UPSS – this layer shows sites where EPA has received notification of the registration, temporary decommissioning or permanent decommissioning of UPSS; the locations are indicative of registered UPSS, and do not necessarily represent all existing or historical UPSS. No registered UPSS are mapped within the Site or vicinity
- No consultation with Council. No request for information pertaining to the potential for contamination at the Site was submitted to Council
  - Council may hold documents relating to contamination (potential or actual). Council's Environmental Section was contacted by Entura on 4 November 2024 (by telephone)
  - Council advised they have no knowledge of any contamination or contaminating activities that would have led to contamination of the power station site (S. Rowell pers. comm. 5 November 2024)
- No information relating to environmentally-relevant incidents was provided
  - A list of environmental incidents for the power station from 1 October 2013 to 31 October 2024 was provided by Entura on 11 November 2024 (Attachment D). A review of the incidents with leaks / releases found they related to:
    - 2020 – sump pump collecting drill cuttings had main outlet gate valve left half open. When sump level exceeded gate valve housing fluid containing concrete cutting spilled 10 Litres approximately into parking area. When identified, gate valve was shut immediately and stopped the flow. Area contained and temporary earth bund installed
    - 2019 – oil spill from unit TA2 during maintenance shut (cleaned up and recovered spilt oil); possible contamination resulting from damage to runner grinding brushes
- No anecdotal evidence was provided although the Site inspection was led by the Entura site manager for the upgrade works (Mr Anthony Hills):
  - Anecdotal information assists with cross-checking and corroborating other information sources (i.e. multiple lines of evidence)
  - Refer to Section 2.2 for anecdotal information provided to pitt&sherry as a component of this review

[9] The Lake King William intake upgrade works, including the operation of a materials handling facility (ACTIVITY TYPE: Crushing, grinding, milling or separating into different sizes (rocks, ores or minerals)), Lake King William Upgrade Works, Off Butler's Gorge Road, Bronte Park, Tas 7140, EPA, 10 January 2024 (EPN 11376/1).

[10] The operation of an extractive quarry (ACTIVITY TYPE: Crushing, grinding, milling or separating into different sizes (rocks, ores or minerals)), Paddys Quarry. Lyell Highway, Tarraleah, Tas 7140, EPA, 3 March 2015 (PCE 9048)

- No integrity assessment to confirm (or otherwise) the findings
    - Cross-checking information between multiple data sources (i.e. multiple lines of evidence) provides confidence in the findings; and
    - The absence of this information is not expected to significantly alter the findings of the PSI (BlueSphere, 2024).

Land Contamination Survey, 1995

The Land Contamination Survey, 1995 identified the following in relation to contamination within and/or in the vicinity of the Site.

The location of the PCAs identified in Land Contamination Survey, 1995 are not clearly marked on the included figures and hence their proximity to the Site is unclear from this report. Copies of the figures are provided in Attachment G. The Contaminated Sites plan, and associated spreadsheet (Attachment B) identify the locations of these PCAs. PCAs are shown on figures in Attachment A.

Tarraleah

- Old dump, Butler's Gorge Road (ID 5A on Figure 1, Attachment G) – scrap metal, glass, waste concrete and 44-gallon drums (some containing oil or creosote) over an approximately 1 hectare (ha) area on either side of the road leading off Butler's Gorge Road. The area is swampy and many of the drums were half submerged in water. Recommendation was to remove drums and contaminated soil. Represented by ID 38 on the figure in Attachment B and therefore south of Area B (near Mossy Marsh Tunnel); with a status of 'unknown' and a pre-rehabilitation note of 'completed'
- Old tip (adjacent to the [then 1995] current tip) (ID 5B on Figure 1, Attachment G but location unclear) – rubbish buried in trenches, crushed car body (in a trench but not buried). Recommendation was to bury old car bodies, seed and fertilise. Represented by ID 39 on the figure in Attachment B and therefore south-west of Area C; with a status of 'unknown' and a pre-rehabilitation note of 'limited work completed'
- Old tip, Fourteen Mile Road (ID 5C on Figure 1, Attachment G but location unclear) – buried rubbish, recent [1995] general refuse and scrap metal dumped along the roadside over an approximately 0.2 ha area. Recommendation was to remove or bury rubbish. Represented by ID 40 on the figure in Attachment B and therefore north-west of Area C and south-west of Area E; with a status of 'unknown' and a pre-rehabilitation note of 'completed'
- Old camp, West Coast Road (ID 5D on Figure 1, Attachment G) – buried rubbish alongside the track, recent [1995] rubbish including scrap metal, wire and general refuse dumped along the track over an approximately 1 ha area. Recommendation was to restrict access and remove or bury rubbish. Represented by ID 41 on the figure in Attachment B and therefore south-west of part of Area C (north-west of the bulk of Area C); with a status of 'unknown' and a pre-rehabilitation note of 'completed'
- Works area, oil change area (ID 5E on Figure 1, Attachment G) – contaminated soil resulting from dumping of oily rubbish into a bin with a hole in the bottom. Adjacent to the recently [1995] rehabilitated oil change area. Recommendation was to remove the waste bin and clean up the contaminated area. Represented by ID 186 on the figure in Attachment B and therefore within Area C; with a status of 'unknown' and a pre-rehabilitation note of 'completed'; and
- Note the Bronte Tip and Active [1995] tip with buried asbestos were not discussed (it has been assumed that these are outside the Site footprint and within Bronte Park).

Butler's Gorge

- Quarry near Clark Dam (ID 6A on Figure 2, Attachment G) – disused quarry contains scrap metal and old car bodies which have been dumped on the quarry floor. Represented by ID 42 on the figure in Attachment B and therefore north-west of Area A; with a status of 'unknown' and a pre-rehabilitation note of 'ify job'

- Old camp (ID 6B on Figure 2, Attachment G) – scrap metal scattered through [then 1995] light bush and bracken fern, over an area of approximately 2 ha. Represented by ID 43 on the figure in Attachment B and therefore north-west of Area A; with a status of ‘unknown’ and a pre-rehabilitation note of ‘ify job’; and
- Old piggery (ID 6C on Figure 2, Attachment G) – concrete slabs and troughs still visible [1995]. Scrap metal, old tins, glass and 44-gallon drums dumped in the area around the piggery. Represented by ID 44 on the figure in Attachment B and therefore south-west of Area A; with a status of ‘unknown’ and a pre-rehabilitation note of ‘completed’.

Contaminated Sites plan

In addition to the above, the Contaminated Sites plan, and associated spreadsheet (Attachment B) identified the following in relation to contamination within and/or in the vicinity of the Site.

- Tarraleah tip sites (ID 32 on the figure in Attachment B) – relates to additional former Hydro-Electric Corporation (HEC) disposal sites identified (presumably post the Land Contamination Survey, 1995), Status is noted as ‘unknown’ with a pre-rehabilitation note of 'some sites were remediated in 1994’; located adjacent and north of Area C
- Tarraleah maintenance transmission line depot and carpenter’s workshop (ID 65 on the figure in Attachment B) – preliminary investigations in 2000 revealed a generally clean site except for two small areas of oil contamination in the stores yard. Status is noted as ‘decontaminated’ with a pre-rehabilitation note of ‘the site was remediated in 2001 and validation sampling showed TPH to be below detection’; located within Area C
- Tarraleah Power Station switchyard (ID 131 on the figure in Attachment B) – sampling in 1997 indicated the site was uncontaminated with respect to PCBs, and most samples contained no detectable TPH or metals. Petroleum hydrocarbons were locally elevated in surface and near-surface oil stains were noted in road base pavement materials, and some of this contamination had migrated to the water table. There was also local contamination of surface or near surface fill with zinc and lead, with no migration to subsurface materials or groundwater. It was concluded that the potential for adverse human health and off-site environmental effects was low and acceptable. Status is noted as ‘decontaminated’ with a pre-rehabilitation note of ‘it was not considered necessary to undertake site remediation at the time’; located within Area C
- Tungatinah Power Station switchyard (ID 133 on the figure in Attachment B) – a site contamination assessment was conducted in 1998 prior to upgrade works. It was determined that soils in the transformer yard were marginally contaminated with copper. TPH, PAH and PCB concentrations indicated that there had been little loss of insulating oils from adjacent equipment. Status is noted as ‘not recorded’ with a pre-rehabilitation note of ‘contaminated blue metal was removed from the site. There may be some contamination remaining at the site’; located within Area C
- Tarraleah depot (ID 140 on the figure in Attachment B) – former civil works area for HEC activities in the upper Derwent area. It was a large and complex site and full details can be obtained from the relevant reports (not provided or reviewed). Status is noted as ‘decontaminated’ with a pre-rehabilitation note of ‘buildings were removed prior to 1995. In 1995 contaminated soils were removed from the site. Three underground storage tanks (UST's) were removed and backfilled’; located within Area C; and
- Tarraleah village (ID 283 on the figure in Attachment B) – formerly included USTs in the vicinity of the village shops. Status is noted as ‘decontaminated’ with a pre-rehabilitation note of ‘the area of the village shops had the USTs removed’; located within Area C.

The below are outside the Site and have not been considered further:

- Paddys Quarry (ID 141 on the figure in Attachment B) – consisted of a creosote and pitch storage area, a transformer and tip site. No USTs were present. Status is noted as ‘decontaminated’ with a pre-rehabilitation note of ‘all visibly contaminated materials around the creosote and pitch storage area were removed and the area was covered with approximately 0.5 m of clay and rehabilitated. Sampling was conducted and no phenols were detected. No work was undertaken on the transformer. Drums and rubbish were removed from the tip site. Removal and burial of rubbish on the face of the tip was undertaken. The tip face was then benched and armoured with coarse rock. The creek at the base of the tip was diverted away from its base in order to improve tip stability and water quality. A diversion bank was constructed above the face to divert catchment water away from the tip face and the tip surface was capped with 0.3-0.5 m clay. Samples were analysed for hydrocarbons, BTEX, metals, phenols, PAH's and PCB's. No contamination was found; located within the northernmost part of Area C
- Butler’s Gorge Village (ID 30 on the figure in Attachment B) – no details in relation to contamination provided in the spreadsheet, with a status of ‘not recorded’; located south-west of Area A; and
- Butler’s Gorge substation (ID 130 on the figure in Attachment B) – in preparation for the upgrading of the sub-station the contamination status of the site was determined. Sampling was undertaken in December 1998 and showed little penetration of oil below the top 50 mm of the surface. There was a patch of ground outside the planned excavation area that had sub-soil contamination. This patch was not considered to pose any significant threat. Status is noted as ‘decontaminated’; located west of Area A.

Table 4: Identified sources of potential contamination from review of provided information

PCA	Comment / Potential for PCA to Impact the Site	Information Source
Area A		
Fill material (onsite and offsite)	• Potential historical fill material associated with construction of Butler's Gorge Road, Tarraleah Canal No.1, Tarraleah Canal No.2, above ground infrastructure, and other minor unsealed roads • The PSI (BlueSphere, 2024) identified contaminants of potential concern (CoPCs) comprised a broad range of organic and inorganic contaminants depending on source, but generally comprising metals/metalloids, PAHs, TRHs, and asbestos containing material (ACM) • The PSI (BlueSphere, 2024) assessed the potential for contamination to be 'low' and the potential risk for Area A to be 'low'; recommendation to assess contamination within soil in areas of proposed earthworks; and • Proposed aboveground earthworks within areas of potential historical fill material. Fill is assumed to be natural crushed rock and associated with low-risk construction activities. No sampling is proposed at this stage as a component of the PSI.	PSI (BlueSphere, 2024) Figure 1A (Attachment A)
Groundwater	• One groundwater well has been installed within Area A to monitor baseline water quality • Tested CoPCs include pH, EC, TDS, TSS, alkalinity, major cations, major anions, molybdate reactive silica, nutrients, metals (total and dissolved), PCBs, TPH / TRH, PAHs and BTEXN; [Note pesticides (OCP / OPP), associated with forestry activities (see below), weed control (Section 2.2) and acids, alkalis, organic flocculants, associated with quarry activities, are not included in the groundwater analytical suite] • No PCAs (including those with potential for mobile contamination) within, or in the vicinity of, the proposed aboveground disturbance area. No soil sampling proposed; and • Ongoing baseline monitoring of groundwater from the existing well with the addition of the abovementioned CoPCs is recommended (this may be adjusted following the recommended groundwater review).	GW Data, 2024 Anecdotal information (Section 2.2)
Forestry activities (offsite)	• Offsite to the east and north-east of Area A since 1993 • The PSI (BlueSphere, 2024) identified CoPCs comprised a broad range of organic and inorganic contaminants depending on source, but generally comprising nutrients (e.g. nitrates, nitrites, and phosphates), OCP / OPP, PAHs and TRHs • The PSI (BlueSphere, 2024) assessed the potential for contamination to be 'medium' and the risk for Area A to be 'low' given the clearing was completed predominately to the north-east of the Area A; no assessment of soil contamination was recommended; and • No proposed aboveground earthworks within, or immediately adjacent to, the offsite forestry activities. No sampling is proposed at this stage as a component of the PSI, as fill is assumed to be natural crushed rock and other CoPCs have short lifespans or biodegrade rapidly at the expected concentrations in this land use.	PSI (BlueSphere, 2024) Figure 1A (Attachment A)

PCA	Comment / Potential for PCA to Impact the Site	Information Source
Quarry, near Clark dam (offsite)	• North-west of Area A • Disused quarry contains scrap metal and old car bodies which have been dumped on the quarry floor; status of 'unknown' and a pre-rehabilitation note of 'ify job' • The PSI (BlueSphere, 2024) identified CoPCs comprised acids, alkalis, organic flocculants, metals, TPHs, BTEX • The PSI (BlueSphere, 2024) assessed the potential for contamination to be 'high' and the risk for Area A to be' low' given the apparent scale of the quarry activities and distance from Area A; no assessment of soil contamination was recommended • Common practice was to only remove rubbish if it was visible or if it was a sewerage or fuel tank, so anything buried in a landfill / tip site is likely still in situ; and • No proposed aboveground earthworks within, or in the immediate vicinity of, the disused quarry. No sampling is proposed as a component of this PSI.	PSI (BlueSphere, 2024) Land Contamination Survey, 1995 Anecdotal information (Section 2.2) Figure 1A (Attachment A) Contaminated Sites (Attachment B)
Old camp (offsite)	• North-west of Area A • Scrap metal scattered through light bush and bracken fern (1995); status of 'unknown' and a pre-rehabilitation note of 'ify job' • Common practice was to only remove rubbish if it was visible or if it was a sewerage or fuel tank, so anything buried in a landfill / tip site is likely still in situ; and • No proposed aboveground earthworks within, or in the immediate vicinity of, the old camp. No sampling is proposed as a component of this PSI.	Land Contamination Survey, 1995 Anecdotal information (Section 2.2) Figure 1A (Attachment A) Contaminated Sites (Attachment B)
Old piggery (offsite)	• South-west of Area A • Concrete slabs and troughs still visible, scrap metal, old tins, glass and 44-gallon drums dumped in the area around the piggery (1995); status of 'unknown' and a pre-rehabilitation note of 'completed' • Common practice was to only remove rubbish if it was visible or if it was a sewerage or fuel tank, so anything buried in a landfill / tip site is likely still in situ; and • No proposed aboveground earthworks within, or in the immediate vicinity of, the old piggery. No sampling proposed as a component of this PSI.	Land Contamination Survey, 1995 Anecdotal information (Section 2.2) Figure 1A (Attachment A) Contaminated Sites (Attachment B)
ASS	• Majority of Area A is mapped as having an extremely low probability of encountering ASS (1-5% chance of occurrence); and • Small portions in western and eastern extents of Area A are mapped as having a low probability of encountering ASS (6-70% chance of occurrence). Where these mapped areas coincide with aboveground earthworks, sampling for ASS potential is recommended.	PSI (BlueSphere, 2024) Figure 1A (Attachment A)

PCA	Comment / Potential for PCA to Impact the Site	Information Source
Area B		
Crushed rock (onsite and offsite)	• Possible crushed rock application to unsealed tracks • Identified CoPCs comprised a broad range of organic and inorganic contaminants depending on source, but generally comprising metals/metalloids, PAHs, TRHs, and ACM • The PSI (BlueSphere, 2024) assessed the potential for contamination to be 'low' and the risk for Area B to be 'low; recommendation was to assess contamination within soil in areas of proposed earthworks; and • Proposed aboveground earthworks within areas of possible crushed rock application. Crushed rock is associated with low risk construction activities, and natural crushed rock is considered low risk from a contamination perspective. No sampling is proposed as a component of this PSI.	PSI (BlueSphere, 2024) Figure 1B (Attachment A)
Land clearing (onsite and offsite)	• Identified CoPCs comprised a broad range of organic and inorganic contaminants depending on the land clearing method utilised, but possibly comprising metals/metalloids, PAHs and TRHs • The PSI (BlueSphere, 2024) assessed the potential for contamination to be 'medium' and the risk for Area B to be 'low'; recommendation was to assess contamination within soil in areas of proposed earthworks; and • No proposed aboveground earthworks within cleared areas. No sampling proposed as a component of this PSI.	PSI (BlueSphere, 2024) Figure 1B (Attachment A)
Old dump, Butler's Gorge Road (offsite)	• South of Area B • Scrap metal, glass, waste concrete and 44-gallon drums (some containing oil or creosote) on either side of the road leading off Butler's Gorge Road (1995); swampy area • Recommendation was to remove drums and contaminated soil; status of 'unknown' and a pre-rehabilitation note of 'completed' • Common practice was to only remove rubbish if it was visible or if it was a sewerage or fuel tank, so anything buried in a landfill / tip site is likely still in situ; and • No proposed aboveground earthworks within, or in the immediate vicinity of, the old dump. No sampling proposed as a component of this PSI.	Land Contamination Survey, 1995 Anecdotal information (Section 2.2) Figure 1B (Attachment A) Contaminated Sites (Attachment B)
Groundwater	• No groundwater wells or piezometers have been installed within Area B to monitor baseline water quality.	GW Data, 2024
ASS	• Parts of Area B are adjacent to areas mapped as having an extremely low probability of encountering ASS (1-5% chance of occurrence); and • No proposed aboveground earthworks are located within, or adjacent to, mapped ASS areas. No sampling proposed as a component of this PSI.	PSI (BlueSphere, 2024) Figure 1B (Attachment A)

PCA	Comment / Potential for PCA to Impact the Site	Information Source
Area C		
Fill material (onsite)	• Potential historical fill material associated with construction of Tarraleah Power Station and associated switchyards, Tungatinah Power Station, construction and demolition works in the town of Tarraleah and Paddys Quarry • The existing (1996) levelled switchyard is on fill, with a solid moderately weathered dolerite rock layer approximately 3 to 4 metres below the 1996 ground level • PSI (BlueSphere, 2024) identified CoPCs comprised a broad range of organic and inorganic contaminants depending on source, but generally comprising metals/metalloids, PAHs, TRHs, and ACM • The PSI (BlueSphere, 2024) assessed the potential for contamination to be 'medium' and did not specify the risk for Area C; no assessment of soil contamination was recommended; and • Proposed aboveground earthworks within areas of potential historical fill material. Given the identified PCAs within Area C, sampling of fill materials is recommended.	PSI (BlueSphere, 2024) Technical Specifications, 1996 Figure 1C & 1Ci (Attachment A)
Tarraleah Power Station – general (onsite)	• General commercial / industrial operational processes associated with Tarraleah Power Station, Tungatinah Power Station, historical maintenance workshops and storage facilities • Transformers present; other than the switchyard (see below row) no known USTs present and none are mapped as being present • No WST dangerous goods file for the power station (e.g. storage of dangerous goods in bulk is unlikely) • Incidents (between 1989 and 2020) – oily water spill, sump pump leak, fire below transformer, oil spills, suspected asbestos in old gasket material • The PSI (BlueSphere, 2024) identified CoPCs comprise metals, BTEX, PAHs, TRHs, PCBs, ACM and solvents [note PFAS were not included in the recommended analytical suite] • The PSI (BlueSphere, 2024) assessed the potential to cause contamination to be 'high' and the risk for Area C to be 'high'; recommendation was to assess contamination within soil and groundwater; and • Proposed aboveground earthworks within the Tarraleah Power Station. Sampling is recommended although access is constrained.	PSI (BlueSphere, 2024) Anecdotal information (Section 2.2) Figure 1C & 1Ci (Attachment A) Authority Correspondence, 2024 (Attachment C) LISTmap (EPA UPSS layer) Environmental Incidents 2013-2024) (Attachment E)

PCA	Comment / Potential for PCA to Impact the Site	Information Source
Switchyard (onsite)	• Within the Tarraleah Power Station • Two 20 kilolitre (kL) USTs within the switchyard which are believed to serve as overflow from the transformers located in the Tarraleah Power Station (assumed to be the oil containment tank(s) in the Technical Specifications, 1996) • Reported concentrations in spoil in 1996 (presumably within the switchyard) were below the detection limits for metals and TPH. TPH and zinc concentrations were locally elevated in surface and near surface road-base pavement materials. All contaminated fine crushed rock (FCR) and clay in the vicinity of the oil tank bund area were PCB-free • Reported total concentrations in spoil from NDD within the switchyard (single sample in 2022) exceeded the IB105 Level 1 – fill material criteria for total chromium, total manganese and total nickel; reported leachable concentrations were below Level 2 – low-level contaminated soil criteria; typical for dolerite • Reported total concentrations in spoil from 5 locations within the switchyard (in 2022) exceeded the IB105 Level 1 – fill material criteria for arsenic (1 sample), total chromium (4 samples), copper (2 samples), manganese (all 5 samples), nickel (3 samples), zinc (1 sample); all reported total concentrations were below the Level 2 – low-level contamination soil criteria; typical for dolerite • EPA approved disposal of TPH-contaminated soil from the switchyard at Paddy's Quarry (2013) and Port Latta Waste Depot (2014) • Sampling (1997) indicated the site was uncontaminated with respect to PCBs, and most samples contained no detectable TPH or metals. TPH was locally elevated in surface and near-surface oil stains in road base pavement materials and some of this contamination had migrated to the water table. There was also local contamination of surface or near surface fill with zinc and lead, with no migration to subsurface materials or groundwater. It was concluded that the potential for adverse human health and off-site environmental effects was low and acceptable. Status is noted as 'decontaminated' with a pre-rehabilitation note of 'it was not considered necessary to undertake site remediation at the time' • A 600-millimetre (mm) diameter stormwater pipe passes directly under the pad for transformer T1 at a depth of approximately 3 to 4 m bgl • The water table beneath the switchyard (1996) was approximately 1.5 m bgl and varies with the river level • Weed control spray is used in and around the switchyard • The PSI (BlueSphere, 2024) identified CoPCs comprised metals, BTEX, PAHs, TRHs, PCBs, solvents, ACM [note: OCP / OPP, phenols and PFAS were not included in recommended analytical suite] • The PSI (BlueSphere, 2024) assessed the potential to cause contamination to be 'high' and the risk for Area C to be 'high'; recommendation was to assess contamination within soil and groundwater; and • Proposed aboveground earthworks within the Tarraleah Power Station switchyard. Sampling is recommended.	PSI (BlueSphere, 2024) Spoil Assessment, 2022 AST Report, 2022 Technical Specifications, 1996 Anecdotal information (Section 2.2) Figure 1C & 1Ci (Attachment A) Contaminated Sites (Attachment B) Authority Correspondence, 2024 (Attachment C)

PCA	Comment / Potential for PCA to Impact the Site	Information Source
Sewage treatment ponds (onsite)	• South of the water pipeline, south-west of the Tarraleah township • The PSI (BlueSphere, 2024) identified CoPCs comprised metals, biosolids, nutrients (ammonia, nitrate, total Kjeldahl nitrogen (TKN)), biological oxygen demand (BOD), TDS and pH • The PSI (BlueSphere, 2024) assessed the potential to cause contamination to be 'high' and the risk to Area C to be 'high'; recommendation was to assess contamination within groundwater; and • No proposed aboveground earthworks within ponds footprint. Ponds are downgradient of Area C. No sampling proposed as a component of this PSI.	PSI (BlueSphere, 2024) Figure 1C & 1Ci (Attachment A) Village Layout, 2024 (Attachment E)
Paddys Quarry (onsite)	• Northernmost part of Area C • General operational processes associated with a quarry • Consisted of a creosote and pitch storage area, a transformer and tip site; no USTs were present; status is noted as 'decontaminated'; samples were analysed for hydrocarbons, BTEX, metals, phenols, PAH's and PCB's and no contamination was found; no work was undertaken on the transformer • EPA approved disposal of TPH-contaminated soil from the switchyard at Paddy's Quarry (2013) • The PSI (BlueSphere, 2024) identified CoPCs comprised acids, alkalis, organic flocculants, metals, TPHs and BTEX • The PSI (BlueSphere, 2024) assessed the potential for contamination to be 'high' and the risk for Area C to be 'high'; recommendation was to assess contamination within soil in areas of proposed earthworks; and • As no surface disturbance works / activities are currently proposed, sampling is not required as a component of this PSI.	PSI (BlueSphere, 2024) Figure 1C & 1Ci (Attachment A) Contaminated Sites (Attachment B) Authority Correspondence, 2024 (Attachment C) Village Layout, 2024 (Attachment E)
Potential former service station (onsite)	• Potential former fuel service station located north of Oldina Drive, north-west of the sewage treatment ponds • The status of closure and remediation works associated with this service station is unknown • The PSI (BlueSphere, 2024) identified CoPCs comprised metals, TRHs, TPHs, BTEXN, PAHs and phenols • The PSI (BlueSphere, 2024) assessed the potential for contamination to be 'high' and the risk for Area C to be 'high'; recommendation was to assess soil and groundwater quality, with the potential for a soil vapour investigation pending confirmation of the future use of the area [and subject to soil and groundwater quality results]; and • Proposed aboveground earthworks adjacent to the potential former service station footprint. Sampling is recommended.	PSI (BlueSphere, 2024) Figure 1C & 1Ci (Attachment A) Village Layout, 2024 (Attachment E)

PCA	Comment / Potential for PCA to Impact the Site	Information Source
Tarraleah town centre – commercial and residential premises (onsite)	• General operational processes associated with commercial premises, including former maintenance depot, historical workshops and storage facilities, residences west of and within the Tarraleah township • Preliminary investigations at the Tarraleah maintenance line depot and carpenter's workshop (2000) identified two small areas of oil contamination in the stores yard; status is noted as 'decontaminated' with a pre-rehabilitation note of 'the site was remediated in 2001 and validation sampling showed TPH to be below detection' • Formerly included USTs in the vicinity of the village shops; status is noted as 'decontaminated' with a pre-rehabilitation note of 'the area of the village shops had the USTs removed' • Tarraleah depot was the former civil works area for HEC activities in the upper Derwent area. It is noted as a large and complex site; status is noted as 'decontaminated' with a pre-rehabilitation note of 'buildings were removed prior to 1995. In 1995 contaminated soils were removed from the site. Three UST's were removed and backfilled' • Contaminated soil resulting at the works area / oil change area (assumed to be the former maintenance depot within Area C). Recommendation was to remove the damaged waste bin and clean up the contaminated area; status of 'unknown' and a pre-rehabilitation note of 'completed' • The PSI (BlueSphere, 2024) identified CoPCs comprised a broad range of contaminants, but likely include metals/metalloids, BTEX, PAHs, TRHs, and ACM • The PSI (BlueSphere, 2024) assessed potential for contamination to be 'medium' and the risk for Area C to be 'medium'; recommendation to assess contamination within soil in areas of proposed earthworks; and • Proposed aboveground earthworks within the Tarraleah town centre and adjacent to identified PCAs. Sampling is recommended.	PSI (BlueSphere, 2024) Land Contamination Survey, 1995 Figure 1C & 1Ci (Attachment A) Contaminated Sites (Attachment C) Village Layout, 2024 (Attachment E)
Tungatinah Power Station switchyard (offsite)	• Soils in the transformer yard were marginally contaminated (1998) with copper • TPH, PAH and PCB concentrations (1998) indicated that there had been little loss of insulating oils from adjacent equipment. Status is noted as 'not recorded' with a pre-rehabilitation note of 'contaminated blue metal was removed from the site. There may be some contamination remaining at the site'; and • No proposed aboveground earthworks are located within, or immediately adjacent to, the Tungatinah Power Station. No sampling is proposed as a component of this PSI.	Figure 1C & 1Ci (Attachment A) Contaminated Sites (Attachment B)
Tarraleah tip site (offsite)	• North and adjacent to Area C • Relates to additional former HEC disposal sites identified (presumably post the Land Contamination Survey, 1995); status is noted as 'unknown' with a pre-rehabilitation note of 'some sites were remediated in 1994' • Common practice was to only remove rubbish if it was visible or if it was a sewerage or fuel tank, so anything buried in a landfill / tip site is likely still in situ; and • Proposed aboveground earthworks adjacent to, and potentially downgradient from, the Tarraleah tip site. Sampling is proposed.	Figure 1C & 1Ci (Attachment A) Contaminated Sites (Attachment B) Anecdotal information (Section 2.2)

PCA	Comment / Potential for PCA to Impact the Site	Information Source
Old tip (offsite)	• South-west of Area C • Rubbish buried in trenches, crushed car body (in a trench but not buried) (1995) • Recommendation was to bury old car bodies, seed and fertilise; status of 'unknown' and a pre-rehabilitation note of 'limited work completed' • Common practice was to only remove rubbish if it was visible or if it was a sewerage or fuel tank, so anything buried in a landfill / tip site is likely still in situ; and • No proposed aboveground earthworks within, or in the vicinity of, the old tip. No sampling is proposed as a component of this PSI.	Land Contamination Survey, 1995 Figure 1C & 1Ci (Attachment A) Contaminated Sites (Attachment B) Anecdotal information (Section 2.2)
Old tip, Fourteen Mile Road (offsite)	• North-west of Area C (and south-west of Area E) • Buried rubbish, general refuse and scrap metal dumped along the roadside (1995) • Recommendation was to remove or bury rubbish; status of 'unknown' and a pre-rehabilitation note of 'completed' • Common practice was to only remove rubbish if it was visible or if it was a sewerage or fuel tank, so anything buried in a landfill / tip site is likely still in situ; and • No proposed aboveground earthworks within, or in the immediate vicinity of, the old tip. No sampling is proposed as a component of this PSI.	Land Contamination Survey, 1995 Figure 1C & 1Ci (Attachment A) Contaminated Sites (Attachment B) Anecdotal information (Section 2.2)
Old camp, West Coast Road (offsite)	• South-west of part of Area C (north-west of the bulk of Area C) • Buried rubbish alongside the track, including scrap metal, wire and general refuse (1995) • Recommendation was to restrict access and remove or bury rubbish; status of 'unknown' and a pre-rehabilitation note of 'completed' • Common practice was to only remove rubbish if it was visible or if it was a sewerage or fuel tank, so anything buried in a landfill / tip site is likely still in situ; and • Proposed aboveground earthworks adjacent to the old camp. Sampling is proposed.	Land Contamination Survey, 1995 Figure 1C & 1Ci (Attachment A) Contaminated Sites (Attachment B) Anecdotal information (Section 2.2)

PCA	Comment / Potential for PCA to Impact the Site	Information Source
Groundwater	• Sampling in 1997 (within the switchyard) indicated TPH was locally elevated in surface and near-surface oil stains in road base pavement materials and some of this contamination had migrated to the water table. There was also local contamination of surface or near surface fill with zinc and lead, with no migration to subsurface materials or groundwater. It was concluded that the potential for adverse human health and off-site environmental effects was low and acceptable. Status is noted as 'decontaminated' with a pre-rehabilitation note of 'it was not considered necessary to undertake site remediation at the time' • 13 groundwater wells and 4 piezometers have been installed within Area C to monitor baseline water quality • Tested CoPCs include pH, EC, TDS, TSS, alkalinity, major cations, major anions, molybdate reactive silica, nutrients, metals (total and dissolved), PCBs, TPH / TRH, PAHs and BTEXN; [Note phenols, associated with fuel storage, solvents associated with the switchyard and acids, alkalis, organic flocculants, associated with quarry activities, are not included in the groundwater analytical suite]; and • Ongoing monitoring of groundwater from the existing wells with the addition of the abovementioned CoPCs is recommended. Additional groundwater wells should be installed and screened through the shallow fill, colluvium and alluvium aquifer.	GW Data, 2024 Contaminated Sites (Attachment B) PSM, 2024
ASS	• Parts of Area C are mapped as having an extremely low probability of encountering ASS (1-5% chance of occurrence). Where these mapped areas coincide with aboveground earthworks, sampling for ASS potential is recommended.	PSI (BlueSphere, 2024) Figure 1C & 1Ci (Attachment A)
Area D		
Fill material (onsite)	• Historical fill material that may be associated with the construction of the Dee Lagoon dam and other possible areas of fill material deposition • PSI (BlueSphere, 2024) identified CoPCs comprised a broad range of organic and inorganic contaminants depending on source, but generally comprising metals/metalloids, PAHs, TRHs and ACM • PSI (BlueSphere, 2024) assessed the potential for contamination to be 'medium' and the risk for Area D to be 'low'; recommendation was to assess contamination within soil in areas of proposed earthworks; and • No proposed aboveground disturbance within Area D and no PCAs within, or in the vicinity of the proposed aboveground development footprint. Fill is associated with low risk construction activities as it is assumed to be natural rock or excavated soil which are considered low risk from a contamination perspective. No sampling is proposed as a component of this PSI.	PSI (BlueSphere, 2024) Figure 1D (Attachment A)

PCA	Comment / Potential for PCA to Impact the Site	Information Source
Crushed rock (onsite and offsite)	• Possible crushed rock application to unsealed tracks • PSI (BlueSphere, 2024) identified CoPCs comprised a broad range of organic and inorganic contaminants depending on source, but generally comprising metals/metalloids, PAHs, TRHs, and ACM • PSI (BlueSphere, 2024) assessed the potential for contamination to be 'low' and the risk for Area D to be 'low'; recommendation was to assess contamination within soil in areas of proposed earthworks; and • No proposed aboveground earthworks within Area D. Crushed rock is associated with low risk construction activities and is considered low risk from a contamination perspective. No sampling is proposed as a component of this PSI.	PSI (BlueSphere, 2024) Figure 1D (Attachment A)
Land clearing (onsite and offsite)	• PSI (BlueSphere, 2024) identified CoPCs comprised a broad range of organic and inorganic contaminants depending on the land clearing method utilised, but possibly comprising metals/metalloids, PAHs and TRHs • PSI (BlueSphere, 2024) assessed the potential for contamination to be 'medium' and the risk for Area D to be 'low'; recommendation was to assess contamination within soil in areas of proposed earthworks; and • No proposed aboveground earthworks within areas Area D. No sampling proposed as a component of this PSI.	PSI (BlueSphere, 2024) Figure 1D (Attachment A)
Groundwater	• No groundwater wells or piezometers have been installed within Area D to monitor baseline water quality.	GW Data, 2024
Earth fill material storage (offsite)	• West of Area D • PSI (BlueSphere, 2024) identified CoPCs comprised a broad range of organic and inorganic contaminants depending on the land clearing method utilised, but possibly comprising metals/metalloids, PAHs and TRHs • PSI (BlueSphere, 2024) assessed the potential for contamination to be 'medium' and the risk for Area D to be 'low'; recommendation was to assess contamination within soil in areas of proposed earthworks; and • No proposed aboveground earthworks within Area D. No sampling proposed as a component of this PSI.	PSI (BlueSphere, 2024)
Unknown building and machinery (offsite)	• South of Area D (exact location not known) • Unknown building with large machinery attached, if not operational, then potentially utilised as a storage facility • PSI (BlueSphere, 2024) identified CoPCs comprised TPH, BTEX, PAHs, metals (e.g., barium, cadmium, copper, lead, nickel, zinc), phenols, chlorinated hydrocarbons (e.g. trichloroethylene), oil and grease [chlorinated hydrocarbons are more likely to be present in a workshop than a storage facility] • PSI (BlueSphere, 2024) assessed the potential for contamination to be 'medium' and the risk for Area D to be 'low'; recommendation was to assess contamination within soil in areas of proposed earthworks; and • No proposed aboveground earthworks within Area D. No sampling proposed as a component of this PSI.	PSI (BlueSphere, 2024)
ASS	• Parts of Area D are mapped as having an extremely low probability of encountering ASS (1-5% chance of occurrence); and • No proposed aboveground disturbance within Area D. No sampling proposed as a component of this PSI.	PSI (BlueSphere, 2024)

PCA	Comment / Potential for PCA to Impact the Site	Information Source
Area E		
Crushed rock (onsite and offsite)	• Possible crushed rock application to unsealed tracks • PSI (BlueSphere, 2024) identified CoPCs comprised a broad range of organic and inorganic contaminants depending on source, but generally comprising metals/metalloids, PAHs, TRHs, and ACM • PSI (BlueSphere, 2024) assessed the potential for contamination to be 'low' and the risk for Area E to be 'low'; recommendation was to assess contamination within soil in areas of proposed earthworks; and • No proposed aboveground earthworks within Area E. Crushed rock is associated with low risk construction activities and is considered low risk from a contamination perspective. No sampling is proposed as a component of this PSI.	PSI (BlueSphere, 2024) Figure 1B (Attachment A)
Land clearing (onsite and offsite)	• PSI (BlueSphere, 2024) identified CoPCs comprised a broad range of organic and inorganic contaminants depending on the land clearing method utilised, but possibly comprising metals/metalloids, PAHs and TRHs • PSI (BlueSphere, 2024) assessed the potential for contamination to be 'medium' and the risk for Area E to be 'low'; recommendation was to assess contamination within soil in areas of proposed earthworks; and • No proposed aboveground earthworks within areas Area E. No sampling proposed as a component of this PSI.	PSI (BlueSphere, 2024) Figure 1B (Attachment A)
Old tip, Fourteen Mile Road (offsite)	• South-east of Area E (and north-west of Area C) • Buried rubbish, general refuse and scrap metal dumped along the roadside (1995) • Recommendation was to remove or bury rubbish; status of 'unknown' and a pre-rehabilitation note of 'completed' • Common practice was to only remove rubbish if it was visible or if it was a sewerage or fuel tank, so anything buried in a landfill / tip site is likely still in situ; and • No proposed aboveground earthworks within, or in the immediate vicinity of, the old tip. No sampling proposed as a component of this PSI.	Land Contamination Survey, 1995 Figure 1B (Attachment A) Contaminated Sites (Attachment B) Anecdotal information (Section 2.2)
Groundwater	• No groundwater wells or piezometers have been installed within Area D to monitor baseline water quality.	GW Data, 2024
ASS	• area E is not mapped as having a probability of encountering ASS No sampling is proposed as a component of this PSI.	PSI (BlueSphere, 2024)

3. Summary of potential for contamination and ASS

Based on the information review findings (Section 2), and considering the proposed aboveground disturbance footprint within each area, PCAs identified as having potential to impact the Site soils and/or groundwater (by development area) from a contamination perspective, are summarised in Table 5.

The locations of identified PCAs are shown on Figures 1A to 1D (Attachment A).

Table 5: Summary of identified potential contamination impacts from identified sources

PCA	Area A	Area B	Area C	Area D	Area E
Fill material	No[C]	No[A,C]	**Yes**	No[C]	No
Forestry activities	No[B]	No[B]	No	No	No
Quarry activities	No	No	**Yes**	No	No
Old dump / tip sites	No	No	**Yes**[E]	No	No
Crushed rock	No[A,D]	No[D]	**Yes**[A]	No[D]	No[D]
Land clearing	**Yes**[A]	**Yes**	**Yes**[A]	**Yes**	**Yes**
Tarraleah Power Station (general)	No	No	**Yes**	No	No
Tarraleah Power Station (switchyard)	No	No	**Yes**	No	No
Tungatinah Power Station (and switchyard)	No	No	**Yes**[B]	No	No
USTs	No	No	**Yes**	No	No
Sewage treatment ponds	No	No	**Yes**[B]	No	No
Potential former service station	No	No	**Yes**	No	No
Tarraleah town centre – commercial and residential premises (including former maintenance depot, historical workshops and storage facilities, USTs, potential; former service station)	No	No	**Yes**	No	No
Old camps	No	No	**Yes**	No	No
Old piggery	No	No	No	No	No
Butler's Gorge village	No	No	No	No	No
Buttler's Gorge substation	No	No	No	No	No
Unknown building and machinery	No	No	No	No	No
ASS	**Yes**	**Yes**	**Yes**	**Yes**	No
Groundwater (secondary source / contamination from some PCAs is likely mobile)	**Yes**	No	**Yes**	No	No

Notes:

Grey text – indicates the activity is not likely to have impacted on the proposed development area from a contamination perspective.

Bold black text - indicates the activity occurs / occurred within the proposed development footprint and has the potential to have impacted on the proposed development footprint from a contamination perspective if disturbed but no aboveground disturbance is proposed, so no sampling is proposed as part of this PSI.

Bold red text – indicates the activity occurs / occurred within the proposed development footprint and has the potential to have impacted on the proposed development footprint from a contamination perspective.

Bold blue text – indicates the activity occurs / occurred within an adjacent area, outside the proposed development footprint and has the potential to have indirectly impacted on the proposed development footprint from a contamination perspective.

A – not identified in the PSI (BlueSphere, 2024).

B – no aboveground disturbance proposed.

C – fill materials consisting of natural reworked material (rock, soils) are unlikely to be contaminated.

D – crushed rock application to unsealed access tracks is unlikely to be contaminated.

E – Tarraleah tip site only.

4. Sampling analysis and quality plan

4.1 Overview

Based on the identified potential contamination sources (Table 5), the following sampling is recommended as detailed below:

- Soil – sampling in areas where aboveground earthworks are proposed (figures in Attachment H)):
  - Within areas of mixed fill[11]
  - Within cleared land areas
  - Within the Tarraleah Power Station footprint, in particular the switchyard and adjacent to transformers, as wells as north west of the bridge over the Nive River, where the new switchyard is expected to be constructed
  - Adjacent and downgradient of any identified UPSS, including the oil USTs within the switchyard
  - Within the Tarraleah township, including within and downgradient of the former maintenance depot, historical workshops, potential service station and storage facilities
  - Within areas mapped as having an ASS risk
  - In any other areas identified as potentially contaminated during investigations (e.g. other UPSS and lines, former transformer locations, waste disposal pits (where their locations are known), etc.)
- Groundwater – the existing baseline monitoring program is to continue with the addition of phenols, OCP / OPP and PFAS to the analytical suite. Additional groundwater investigations / sampling may be required in the event that:
  - Soil results indicate the presence of contamination at depth which could be mobile and could impact on groundwater
  - Soil results indicate shallow and mobile contamination
- Groundwater – additional groundwater wells should be installed in the Tarraleah power station switchyard to intersect any groundwater/perched groundwater within the fill / colluvium and alluvium which is above bedrock; and
- Document the sampling.

A Site walkover was completed by pitt&sherry in January 2025 with the aim of confirming the general suitability of the proposed sampling locations. Actual locations will be confirmed based on underground services locating and access.

4.2 Guidelines

Any intrusive investigations are to be undertaken in general accordance with the following (as appropriate):

- AS 4482.1 *Guide to the investigation and sampling of sites with potentially contaminated soil – Non-volatile and semi-volatile compounds,* Standards Australia, 2 November 2005 or as amended or substituted (AS 4482.1)
- AS 4482.2 *Guide to the sampling and investigation of potentially contaminated soil – Volatile substances,* Standards Australia, 5 September 1999 or as amended or substituted (AS 4482.2)

[11] Where this is not likely to be reworked natural materials, or the materials have been mixed with fill of unknown origins which could be contaminated. No sampling is proposed in response to crushed rock application.

- AS 5667.1 *Water Quality – Sampling – Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples*, Standards Australia, 5 April 1998 or as amended or substituted (AS/NZS 5667.1)
- AS 5667.11: *Water Quality – Sampling – Guidance on sampling of groundwaters*, Standards Australia, 5 April 1998 or as amended or substituted (AS/NZS 5667.11)
- ASC NEPM
- CRC Care Technical Report No. 10 *Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater September 2011, including errata August 2012* (CRC Care Technical Report No. 10)
- *Environmental Management and Pollution Control Act 1994* (EMPC Act) and relevant Regulations
- *Information Bulletin No. 105 Classification and Management of Contaminated Soil for Disposal, Version 3*, Environment Protection Authority, Tasmania (EPA), 2018 (IB105)
- *PFAS National Environmental Management Plan, Version 2.0*, January 2020, National Chemicals Working Group of the Heads of EPAs Australia and New Zealand (PFAS NEMP); and
- *Tasmanian Acid Sulfate Soil Management Guidelines,* Department of Primary Industries, Parks, Water and the Environment, 2009.

4.3 Data quality objectives

The data quality objective (DQO) process for the ESA is summarised in Table 6.

It is proposed that intrusive investigations be limited to soils / fill materials within areas of the Site to be disturbed from surface (i.e. tunnelling is excluded). Installation of new groundwater wells is recommended within the Tarraleah switchyard. Surface water sampling is not proposed, and it is assumed that groundwater sampling will be undertaken by Hydro / Entura as part of their existing groundwater sampling program.

Table 6: Summary of data quality objectives

DQO	Details
The problem	• Unknown concentrations of CoPC associated with identified PCAs in soil / fill materials within areas of the Site to be disturbed from surface as a component of the Project, to the proposed maximum depth of surface construction works (i.e. tunnelling is excluded); and • Unknown presence and level of ASS in soils associated with mapped ASS within areas of the Site to the disturbed as a component of the Project, to the proposed maximum depth of construction works.
Investigation questions	Investigation questions for the ESA include: • What is the current contamination status (if any) of the soils and/or fill materials within areas of the Site to be disturbed from surface as a component of the Project to the proposed maximum depth of surface construction works? • What is the current contamination of the fill / soil materials and groundwater (if present) within the fill / colluvium and alluvium beneath the Tarraleah switchyard? • Are ASS present within areas of the Site to be disturbed from surface as a component of the Project to the proposed maximum depth of surface construction works? • What is the preliminary waste classification of sampled soils / fill materials for offsite disposal or suitability for onsite reuse? • Does the level of contamination (if any) at the sampled locations represent an unacceptable risk to human health and/or the environment under the proposed Site development and permitted uses (based on zoning) or during excavation; and • Are any management measures for soils or fill materials within the Site likely to be required?

DQO	Details
Inputs to the decision	Information inputs comprise: • Desktop review – refer to the PSI (BlueSphere, 2024) and Section 2 • Desktop groundwater assessment (partly completed Section 2.3.3) • Assessment criteria – refer to Section 4.5 • Field visual, olfactory and screening data • Analytical data • Refined conceptual site model (CSM) – refer to the PSI (BlueSphere, 2024) for a preliminary CSM; and • Source-pathway-receptor (SPR) linkages and risk assessment.
Boundary of the assessment	• Intrusive investigations will be limited to areas of the Site in the vicinity of identified PCAs and areas of mapped ASS risk that are to be disturbed from surface as a component of the Project to the proposed maximum depth of surface construction works (i.e. tunnelling is excluded); and • Proposed sampling locations are shown on figures in Attachment H.
Decision rules	Comparison of reported concentrations of CoPC and ASS in soils / fill materials against adopted assessment criteria (where available) to: • Allow the contamination status / presence of ASS within the soils / fill materials at sampled locations within the Site to be assessed • Allow preliminary waste classification of soils / fill materials at sampled locations within the Site to be determined • Allow an assessment of whether the contamination status of the soil / fill materials within the Site represents an unacceptable risk to human health and/or the environment under the proposed development and permitted land uses (based on zoning) or during excavation works for the proposed development • Identify whether any management measures are likely to be needed to manage any identified contamination risks; and • Comparison of reported concentrations of CoPC in groundwater against adopted assessment criteria (where available) to allow the contamination status within groundwater at sampled locations within the Site to be assessed.
Acceptable limits on decision errors	Variation in data may arise from samples collected in succession from a single sampling point due to: • The potential heterogenous nature of the soils / fill materials • The potential heterogenous dispersion of contaminants within the soil / fill material / groundwater profile; and • Fragments of materials which may bias samples in certain elements.
Design for obtaining data	• Intrusive investigations for the ESA will targeted locations for the collection of soil / fill material samples within the Site in general accordance with the legislation and guidelines outlined in Section 4.2 as applicable to an ESA and considering the limitations in Section 1.4.

4.4 Sampling details

4.4.1 Sampling methodology

A summary of the sampling methodology to be adopted for the ESA is provided in Table 7.

Table 7: Sampling methodology

Activity	Details
Rationale	• Sampling is to target the different horizons identified within the encountered soil profile (i.e. fill materials and natural soils); and • Where a different soil horizon is observed in a test pit / borehole, it is to be prioritised for sampling.
CoPC	• Identified CoPC (including ASS), by development footprint, are provided in Table 9.
Sample collection	• Sampling is to be undertaken by a person experienced with contaminated land work • All samples are to be collected using single-use disposable gloves into laboratory-supplied receptacles and snap-lock bags (as appropriate) suitable for the CoPC to be tested, filled with minimal headspace, sealed, labelled, and placed on ice in a portable chiller box • Complete targeted and grid excavations at the locations identified in Table 8 and shown on figures in Attachment H); refer to Table 9 for proposed / target depth of investigations and CoPC • **Soil samples** are to be: o Collected from the excavator bucket / drill rig / hand auger during test pitting / borehole drilling from the nominated depth; the sampling depth will be dictated by the proposed maximum depth of surface construction works (i.e. tunnelling is excluded) and will extend beneath any obvious contamination (i.e. odour / staining / fill), or into the natural undisturbed profile o For CoPC testing, the snap-lock bag samples are to be checked in the field for visual and olfactory signs of contamination and screened for volatile organic compounds (VOCs) using a photo-ionisation detector o For ASS testing, soils from the profile are to be screened in the field for field pH (pH_F), field peroxide pH (pH_{FOX}), reaction rate and hydrochloric acid fizz test to determine whether laboratory analysis for ASS was required based on ASS field screening • **Quality assurance / quality control (QA/QC)** – additional samples are to be collected to satisfy QA/QC requirements at the rate of: o One triplicate set (two additional samples) per 20 primary samples o One rinsate sample per piece of reuseable equipment per day o One trip blank per batch of samples submitted to the laboratory (where volatile CoPCs are being tested) • Additional samples are to be collected from locations which are deemed to represent background soil concentrations and characteristics for ASC NEPM soil characterisation testing; and • Sampling and location information is to be recorded on field sheets and Site layout plans.
Profile logging	• The soil profile is to be logged during test pit excavations / borehole drilling and recorded on the field sheet.
Photographs	• Representative photographs are to be taken of test pit / borehole profiles and sampling location and context.

Activity	Details
Decontamination	Decontamination and cross-contamination mitigation procedures are to include: • Clean equipment prior to Site works • Removing soil from the excavator bucket / drill rig / hand auger between investigation locations • Cleaning of any reused pieces of sampling equipment between sampling locations • Single-use disposable nitrile gloves, changed after collection of each sample; and • New laboratory-supplied receptacles for each sample.
Sample transport	• A chain of custody (CoC) form is to be completed, signed, dated, and submitted to the laboratory with each batch of samples for analysis • Ice / chiller bricks are to be added to the chiller boxes for sample preservation; samples for ASS testing must be sent to the laboratory on the day they are collected by overnight courier or must be frozen • The samples are to be transport to the primary laboratory under CoC conditions and within relevant holding times for the CoPC to be tested; and • Samples are to be received by the laboratory at a temperature of less than 6 degrees Celsius (where relevant for particular CoPC / analytes).
Laboratory analysis	• All samples are to be submitted to the National Association of Testing Authorities (NATA)-accredited Analytical Laboratory Services (ALS) Laboratory (Accreditation No. 825) • Secondary samples for QA/QC are to be onforwarded to the NATA-accredited Eurofins Laboratory (Accreditation No. 1261); and • Samples are to be analysed for total concentrations of identified CoPCs (refer to Table 9); depending on the results and whether the material will be disposed offsite or reused onsite, leachability testing may be required.
Holding times	• All samples are to be received by the laboratories within the required holding times for the individual parameters tested; and • All samples are to be extracted for analysis by the laboratories within the required holding times for the individual parameters tested.
Reporting	• An ESA report is to be prepared documenting findings from the intrusive investigations; and • If required, management plans(s) are to be prepared.

4.4.2 Sampling type by development footprint

Sampling type within areas of the Site to be disturbed (from surface) as a component of the Project, by development area are listed in Table 8 and shown on figures in Attachment H. Locations of existing groundwater wells are shown on the Hydro Tasmania figure in Attachment F.

Table 8: Sampling type by development area

ID	Sampling Type
Area A	
Area A1	Targeted sampling for ASS susceptibility where mapped ASS areas coincide with aboveground earthworks within natural soils
-	Sampling of existing groundwater wells by Hydro / Entura

ID	Sampling Type
Area B	
-	None proposed
Area C	
Area C1	Broad targeted sampling of fill materials (at target locations below)
Area C2	No sampling proposed within Paddys quarry footprint based on changes to the proposed disturbance works
Area C3	Broad targeted sampling within the Tarraleah Power Station, in particular with the existing and proposed switchyard footprints
Area C4	Targeted sampling adjacent and downgradient of transformers
Area C5	Sampling adjacent and downgradient of the 2 x USTs within the Tarraleah switchyard – location(s) could not be confirmed; investigations should provide good preliminary investigation coverage, sufficient to identify potential ground contamination
Area C6	Target[12]ed sampling adjacent to the potential former service station
Area C7	Sampling no longer required based on Site walkover
Area C8	Targeted sampling adjacent to Tarraleah tip site
Area C9	Targeted sampling for ASS susceptibility where mapped ASS areas coincide with aboveground earthworks within natural soils
Area C10	Sampling no longer required based on changes to the proposed disturbance works[12]
-	Sampling of existing groundwater wells by Hydro / Entura
Area D	
-	None proposed
Area E	
-	None proposed

4.4.3 Indicative sampling locations and CoPC / ASS

Indicative soil / fill material sampling locations and CoPC / ASS are listed in Table 9.

A walkover of the areas of the Site proposed for sampling was completed in January 2025 by pitt&sherry. The objective was to help inform the SAQP and check for any other PCAs which may not have been identified. Accessibility to proposed sample locations was checked at a high level, however, locations will be dependent on presence/absence of underground services, ground conditions (i.e. boggy, etc.) and possible access constraints on the day.

Testing for PFAS has been included for Area C given that they are often found in disturbed commercial / industrial areas, particularly where firefighting training has occurred. PFAS chemicals are highly persistent and can bioaccumulate in people and animals.

[12] Note that at January 2025, Hydro / Entura noted that Paddy's quarry and the Old Camp area are no longer included in proposed surface works areas and these locations have been removed from the sampling requirements.

Table 9: Indicative proposed sampling locations and CoPC / ASS

Scope ID[A]	Location	Excavation Type	Number of Investigation Locations[B]	Nominal Depth of Investigation (m bgl)[E,F]	Number of Primary Samples	CoPC[C] / ASS
Area A						
Area A1	Where mapped ASS areas coincide with aboveground earthworks within natural soils	Borehole	4	1.0 m below proposed depth of disturbance	16[J]	ASS[D]
-	Existing groundwater well	-	1[L]	-	1	Suite G
Area B						
-	None proposed	-	-	-	-	-
Area C						
Area C1[I]	Fill materials	Test pit / borehole	H	To natural undisturbed profile (residual profile)	H	Suite A Suite D[G]
Area C2	Quarry footprint	-	0	-	-	-
Area C3[I]	Tarraleah Power Station, including the existing and proposed new switchyard	Test pit / borehole and new shallow groundwater wells (7)	10[K]	Soils to natural undisturbed profile (residual profile); well bores to bedrock	K	Suite C Suite D[G]
Area C4[I]	Adjacent and downgradient of transformers	Test pit / borehole	Included in C3	1 or to natural	Included in C3	as per C3
Area C5[I]	Adjacent and downgradient of the 2 x USTs (actual location is not known)	Test pit / borehole	Included in C3	3.5 or as per C3	Included in C3	As per C3 as location not known
Area C6	Adjacent to the potential former service station	Borehole	5	3.5	15	Suite B Suite D[G]
Area C7	Within and downgradient of the former maintenance depot	-	0	-	-	-
Area C8	Adjacent to the Tarraleah tip site	Test pit	2	2.0	4	Suite A Suite D[G]

Scope ID[A]	Location	Excavation Type	Number of Investigation Locations[B]	Nominal Depth of Investigation (m bgl)[E,F]	Number of Primary Samples	CoPC[C] / ASS
Area C9	Where mapped ASS areas coincide with aboveground earthworks within natural soils	Borehole	2	1.0 m below proposed depth of disturbance	8[J]	ASS[D]
Area C10	Adjacent to the old camp, West Coast Road	-	0	-	-	-
-	Existing (5) and proposed new (7) groundwater wells and piezometers	-	12	-	12	Suite H
Area D						
-	None proposed	-	-	-	-	-
Area E						
-	None proposed	-	-	-	-	-

Notes:

A – consistent with Table 8.

B – indicative minimum number of locations if any contamination is identified, additional sampling, remediation and validation may be required.

C – analytical suites comprise (total concentrations only, no leachability testing proposed):

Suite A (general Site suite) – metals (8), TPH / TRH, PAH, BTEXN and asbestos fibres in soil (presence / absence)

Suite B (fuel suite) – BTEXN, TPH / TRH, PAH, phenols and lead (Pb)

Suite C (power station suite) – Suite A plus PCBs, phenols and PFAS

Suite D (asbestos solids) – asbestos (presence / absence)

Suite E (transformers) – BTEXN, TPH/TRH and PCBs

Suite F (maintenance suite) – BTEXN, TPH / TRH, PAH, phenols, Pb and chlorinated hydrocarbons / solvents

Suite G (Area A groundwater suite) – existing monitored parameters (refer to Section 2.3.1 for existing field and analytical parameters) plus OCP / OPP, acids, alkalis, analytes relevant to detect impacts from organic flocculants

Suite H (Area C groundwater contamination suite, excluding hydrogeological characterisation parameters) – existing monitored parameters (refer to Section 2.3.1 for existing field and analytical parameters) plus PFAS, phenols, solvents, acids, alkalis, analytes relevant to detect impacts from organic flocculants

D – laboratory testing for ASS to be guided by field screening results; allow for one sample per excavation to be laboratory tested for ASS.

E – excavation depth for CoPC testing will be informed by proposed maximum depth of surface disturbance and will extend beyond any obvious impact (i.e. staining, odour), or to natural; generally, rock will not be sampled.

F – excavation depth for ASS testing will extend to 1 m below the proposed maximum depth of surface disturbance; generally, rock will not be sampled.

G – laboratory testing for asbestos in solids to be guided by identification of suspected ACM fragments.

H – sampling of fill within the profile of target locations (i.e. no standalone locations proposed).

I – included in Figure 2Cii (Attachment H).

J – assumes maximum depth of surface disturbance of 4 m bgl and 4 samples will suffice to characterise the profile for ASS.

K – locations were refined following Site walkover however exact locations will depend on underground services and other access constraints.

L – locations of existing groundwater wells are shown on the Hydro Tasmania figure in Attachment F.

4.5 Assessment criteria

4.5.1 Rationale

Site assessment criteria are typically selected based on the following criteria:

- Land zoning and the most sensitive use permissible under that zoning: the zoning for the Site is a combination of 'Rural', 'Utilities', 'Village', 'Environmental Management' and 'Recreation' (PSI (BlueSphere, 2024)) and the most sensitive use permissible is residential
- Proposed land use or new zoning: the proposed development and use on Site is an upgrade and replacement of existing infrastructure associated with the power station (i.e. no change in use); and
- Onsite or adjacent sensitive receptors, including human and ecological: parts of the Site are located within areas zoned 'Rural' and 'Village' (i.e. potential residential receptors) and parts of the Site are zoned 'Environmental Management' and are adjacent to or contain watercourses and/or wetlands (i.e. ecological receptors).

On the basis of the above, residential criteria have been adopted for this assessment. There are two levels of residential criteria, one for low density residential use with access to soil (e.g. for a vegetable garden, etc.) and one for high density residential use, where access to soil is minimal or non-existent. The low-density residential criteria have been nominated for this Site, as access to soil for growing vegetables, etc. is possible within the Site area.

4.5.2 Criteria – soils / fill materials

On the basis of the above rationale and due to the need for earthworks and since excess soils may also need to be disposed offsite, the following Site and waste classification criteria have been selected for the ESA.

Laboratory reported concentrations of tested CoPC / ASS in soil / fill are to be compared against these criteria (where available and as appropriate) (i.e. a Tier 1 Risk Assessment). The criteria are used as thresholds to assist in determining if further investigation, risk assessment and/or management may be required.

CoPCs

Asbestos and microbiological parameters will be assessed on a presence / absence basis.

- ASC NEPM:
  - Health Screening Levels (HSLs) / Health Investigation Levels (HILs) residential A, to assess the risk to human health during the proposed ongoing Site use
  - Ecological Screening Levels (ESLs) / Ecological Investigation Levels (EILs) for an urban residential / public open space land use setting, to assess the risk to ecological receptors during the proposed ongoing Site use. Site-specific added contaminant limits (ACLs) are to be calculated based on soil characterisation samples to be collected and added to background concentrations to determine EILs for selected heavy metals
  - Areas of ecological significance (AES) criteria may also be relevant within and adjacent to Site areas zoned 'Environmental Management' and adjacent to waterways / wetlands
- CRC CARE Technical Report No. 10:
  - HSLs residential A to assess the risk to human health during direct contact
  - HSLs for Intrusive maintenance Workers (IMW; i.e. construction workers) to assess the risk to human health from vapour intrusion and during direct contact in a shallow trench
- PFAS NEMP:
  - HIL A to assess the risk to human health during the proposed ongoing Site use
  - Direct and indirect ecological guideline values for soil (consistent for all land uses)

- Landfill acceptance criteria to determine the classification of any excavated material for offsite disposal; and

- IB105 criteria to determine the likely classification of any excavated material for off-site disposal to landfill, if required.

ASS

- *Tasmanian Acid Sulfate Soil Management Guidelines* (DPIPWE, 2009), net acidity action criteria.

Net acidity action criteria are dependent on:

- Soil texture (fine, medium or coarse); and
- Volume of soil disturbed: either 100 – 1,000 tonnes (t) of material, or greater than 1,000 t of material.

Based on the analytical results, soils are to be classified as either NASS, PASS or AASS, which are defined as:

- NASS (not acid sulfate soils) – soils which do not indicate presence of acidity via field screening, have no net acid generating potential (i.e. are below the laboratory LOR), and contain no sulfur
- AASS (actual acid sulfate soils) – soils which indicate presence of acidity via field screening, have some remaining potential acidity but at levels below action criteria, and may contain some sulfur, but have already oxidised, and typically occur above the water table; and
- PASS (potential acid sulfate soils) – soils which indicate presence of acidity via field screening, have remaining potential acidity at levels above or below action criteria, and contain some sulfur, have not fully oxidised, and typically occur below the water table i.e. in an undisturbed waterlogged state.

Based on the ASS risk ratings defined below, the samples are to be assigned one of the risk ratings for potential oxidation and, hence, acid generation, during disturbance:

- Low risk – NASS or AASS soils
- Medium risk – PASS soils but with net acidity reported at levels which are lower than the action criteria; or
- High risk – PASS soils with net acidity reported at levels which exceed the action criteria.

4.5.3 Criteria – waters

For the desktop assessment of existing groundwater data, laboratory reported concentrations of tested CoPC in waters are to be compared against these criteria (where available and as appropriate) (i.e. a Tier 1 Risk Assessment). The criteria are used as thresholds to assist in determining if further investigation, risk assessment and/or management may be required. The relevance of each criteria will be determined once the PEVs for each Site area have been determined.

- ASC NEPM HSLs A, to assess the vapour intrusion risk to human health during the proposed ongoing Site use
- Technical Report No. 10 HSLs A, to assess the vapour intrusion risk to human health during the proposed ongoing Site use
- EPA 2021[13] – Upper Derwent Catchment-specific default guideline values (DGVs) specific to the season of sampling and level of disturbance in the vicinity of the Site to assess the risk to ecological receptors
- NHMRC[14] recreational criteria – to assess the risk to human health during contact with groundwater; the NHMRC criteria are 20 times the ADWG[15] criteria which are based on daily consumption of 2 litres (L) of water; consumption in a recreational setting is more likely to be 0.1 L per day

[13] *Default Guideline Values (DGVs) for Aquatic Ecosystems of the Upper Derwent Catchment*, Environment Protection Authority Tasmania, August 2021 (EPA 2021).
[14] *Guidelines for Managing Risks in Recreational Water*, National Health and Medical Research Council, 2008 (NHMRC).
[15] *National Water Quality Management Strategy – Australian Drinking Water Guidelines 2011*, updated September 2022 (ADWG).

- ANZG 2018[16] – freshwater default guideline values (DGVs) for slightly to moderately disturbed systems (95% of species protection), to assess the risk to ecological receptors within the downgradient receiving environment
- ANZECC 2000[17]:
    - Short-term (<20 year) irrigation trigger values (STVs), to assess the risk to ecological receptors from short-term irrigation
    - Livestock drinking trigger values (TVs), to assess the risk to livestock; and
- PFAS NEMP – freshwater guideline values for slightly to moderately disturbed systems (95% of species protection), to assess the risk to ecological receptors within the downgradient receiving environment.

It should be noted that EPA 2021, ANZG 2018, ANZECC 2000, PFAS NEMP and NHMRC 2008 relate to surface water environments (as opposed to groundwater) and therefore an exceedance in a groundwater sample does not necessarily imply ecological harm. Furthermore, the values are necessarily conservative as they are intended as triggers for further investigation; they do not consider background concentrations or site-specific conditions.

5. Summary

Based on the information documented in this SAQP, the following is recommended:

- Hydro / Entura should continue groundwater monitoring of existing field parameters (pH, EC, DO, turbidity and temperature) and analytical parameters relevant to contamination (pH, EC, TDS, TSS, nutrients, metals (total and dissolved), PCBs, TPH / TRH, PAHs and BTEXN) with the following additions:
    - Area A – OCP / OPP, acids, alkalis, analytes relevant to detect impacts from organic flocculants
    - Area C – PFAS, phenols, solvents, acids, alkalis, analytes relevant to detect impacts from organic flocculants (in existing and proposed wells)
- Complete intrusive soil investigations (i.e. sampling) as per Section 4; and
- Assess ASS potential in tunnelling areas as a component of the geotechnical scope.

Yours sincerely

Carly Clark
Senior Principal Environmental Scientist, CEnvP SC 40054

Reviewed and updated by: Fiona Keserue-Ponte, Senior Principal Environmental Scientist, CEnvP SC 41034

[16] *Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2018*, Australian and New Zealand Governments and Australian State and Territory Governments, Canberra ACT, Australia (ANZG 2018).
[17] *National Water Quality Management Strategy – Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000* (ANZECC 2000).

Enc. Attachment A – SAQP figures
Attachment B – Contaminated Sites figure and associated spreadsheet
Attachment C – Authority correspondence
Attachment D – Environmental incidents
Attachment E – Tarraleah village layout
Attachment F – Groundwater locations, Tarraleah power station well logs, interpretive sections
Attachment G – Land Contamination Survey 1995, figures
Attachment H – Proposed sampling locations figures

Important information about your report

In some circumstances the scope of services may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints. The Report may only be used and relied on by the Client for the purpose set out in the Report. Any use which a third party makes of this document, or any reliance on or decisions to be made based on it, is the responsibility of the Client or such third parties.

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SAQP figures

Attachment A

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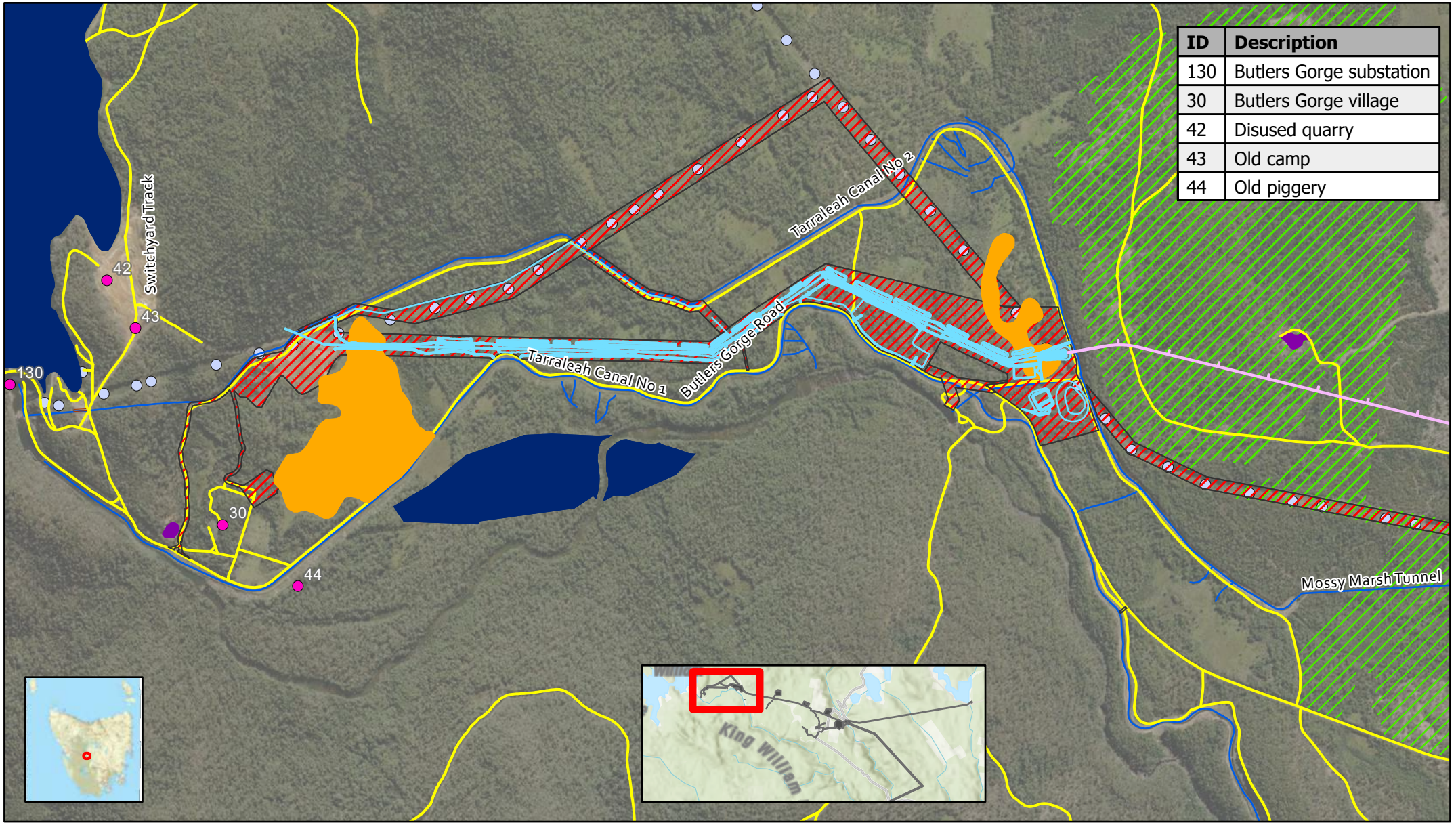


ID	Description
130	Butlers Gorge substation
30	Butlers Gorge village
42	Disused quarry
43	Old camp
44	Old piggery

Hydro-Electric Corporation

Figure 1A Tarraleah Power Scheme
Preliminary Site Investigation - Area A

pitt&sherry

N

0 0.25 0.5 1 km

Coordinate System: GDA2020 MGA Zone 55
1:25,000 When Printed at A4

MAP REF	P.24.1136
AUTHOR	JH
REVISION	D
DATE	13/12/2024

DATA SOURCES	Base map from ESRI Base data from The LIST Tasmanian Government Project specific data

Legend

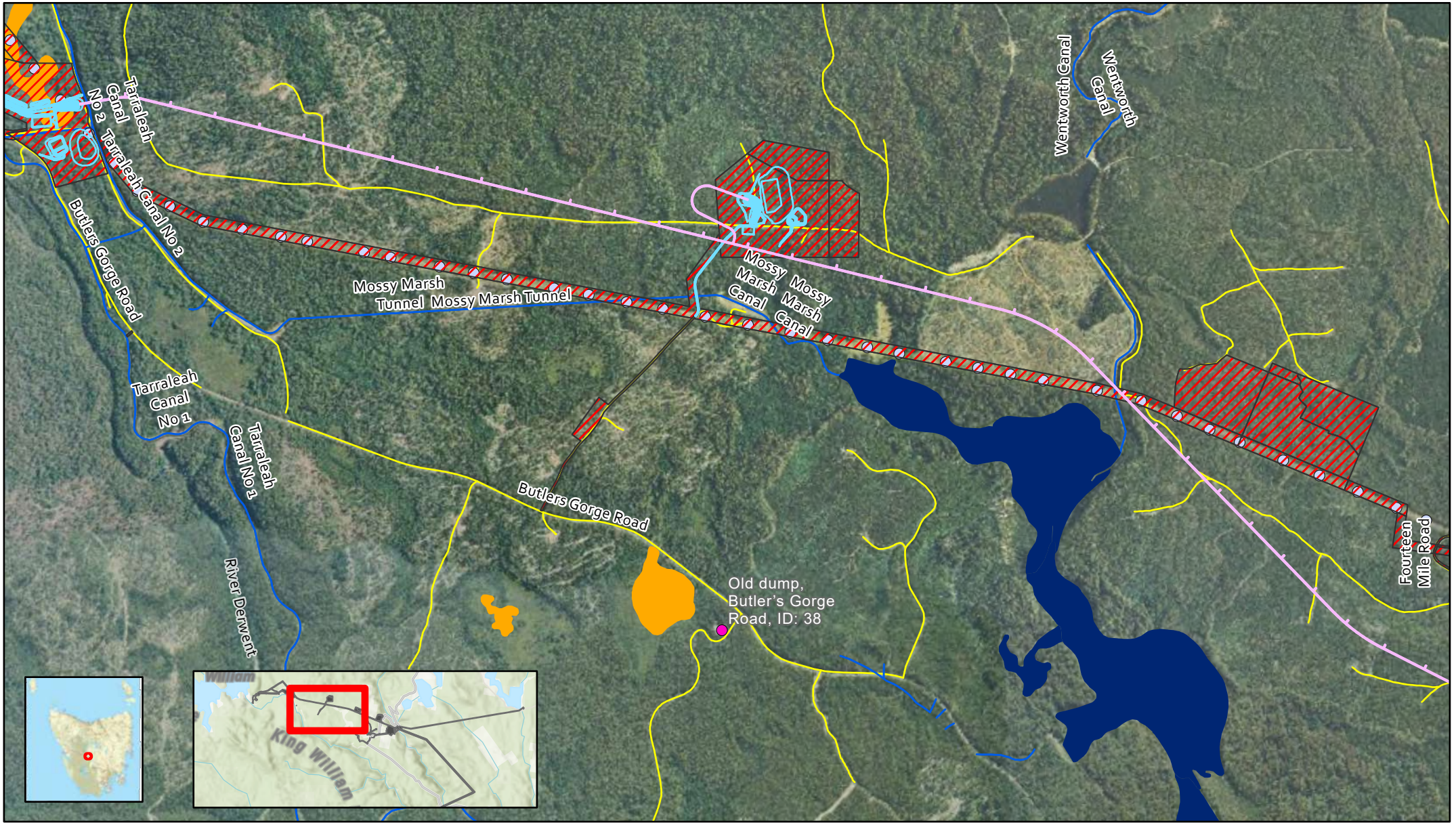
- TARDEV - Reference Design (Lines) Above ground
- TARDEV - Reference Design (Lines) Underground
- Tarraleah EIS footprint for Approval - August 2024

Inland Acid Sulfate Soils [more 20m AHD]

- High
- Low
- Extremely Low

Potential contamination

- Fill - roads
- Fill - canals
- Forestry
- Fill - infrastructure area
- Fill - infrastructure points
- Contaminated Sites



Hydro-Electric Corporation

Figure 1B Tarraleah Power Scheme Preliminary Site Investigation - Areas B &E

pitt&sherry

N

0 0.28 0.55 1.1 km

Coordinate System: GDA2020 MGA Zone 55

1:28,000 When Printed at A4

MAP REF	P.24.1136
AUTHOR	JH
REVISION	D
DATE	16/12/2024

DATA SOURCES	Base map from ESRI Base data from The LIST Tasmanian Government Project specific data

Legend

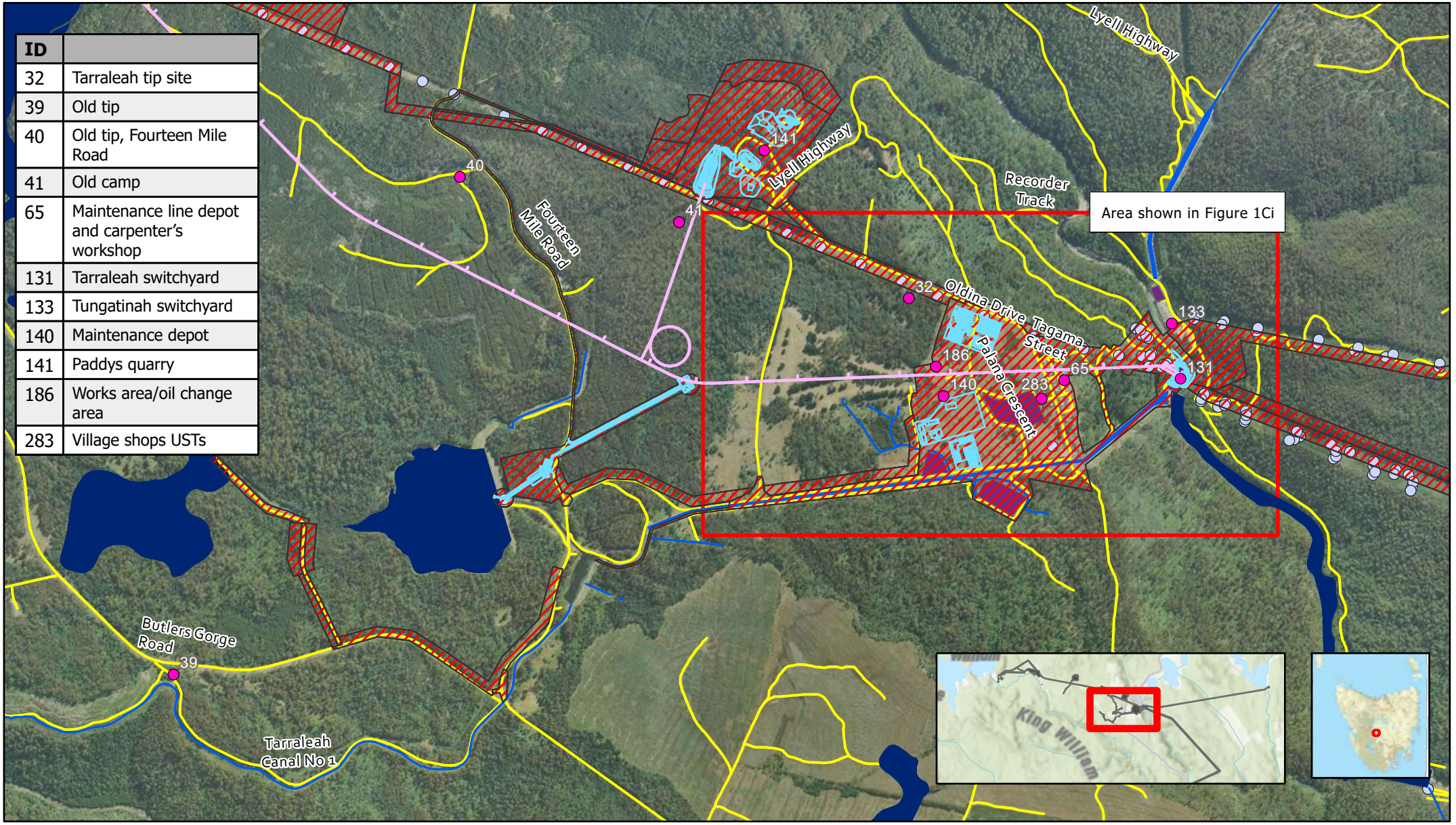
- TARDEV - Reference Design (Lines) Underground
- TARDEV - Reference Design (Lines) Above ground
- Tarraleah EIS footprint for Approval

Inland Acid Sulfate Soils [more 20m AHD]

- High
- Low
- Extremely Low

Potential contamination

- Fill - roads
- Fill - infrastructure points
- Contaminated Sites
- Fill - canals



ID	
32	Tarraleah tip site
39	Old tip
40	Old tip, Fourteen Mile Road
41	Old camp
65	Maintenance line depot and carpenter's workshop
131	Tarraleah switchyard
133	Tungatinah switchyard
140	Maintenance depot
141	Paddys quarry
186	Works area/oil change area
283	Village shops USTs

Hydro-Electric Corporation

Figure 1C Tarraleah Power Scheme
Preliminary Site Investigation

pitt&sherry

N

0 0.25 0.5 1 km

Coordinate System: GDA2020 MGA Zone 55
1:25,000 When Printed at A4

MAP REF P.24.1136
AUTHOR JH
REVISION D
DATE 16/12/2024

DATA SOURCES Base map from ESRI
Base data from The LIST Tasmanian Government
Project specific data

Legend

- TARDEV - Reference Design (Lines) Above ground
- TARDEV - Reference Design (Lines) Underground
- Tarraleah EIS footprint for Approval

Inland Acid Sulfate Soils [more 20m AHD]

- High
- Low
- Extremely Low

Potential contamination

- Fill - infrastructure points
- Contaminated areas
- Fill - roads
- Fill - canals
- Contaminated Sites

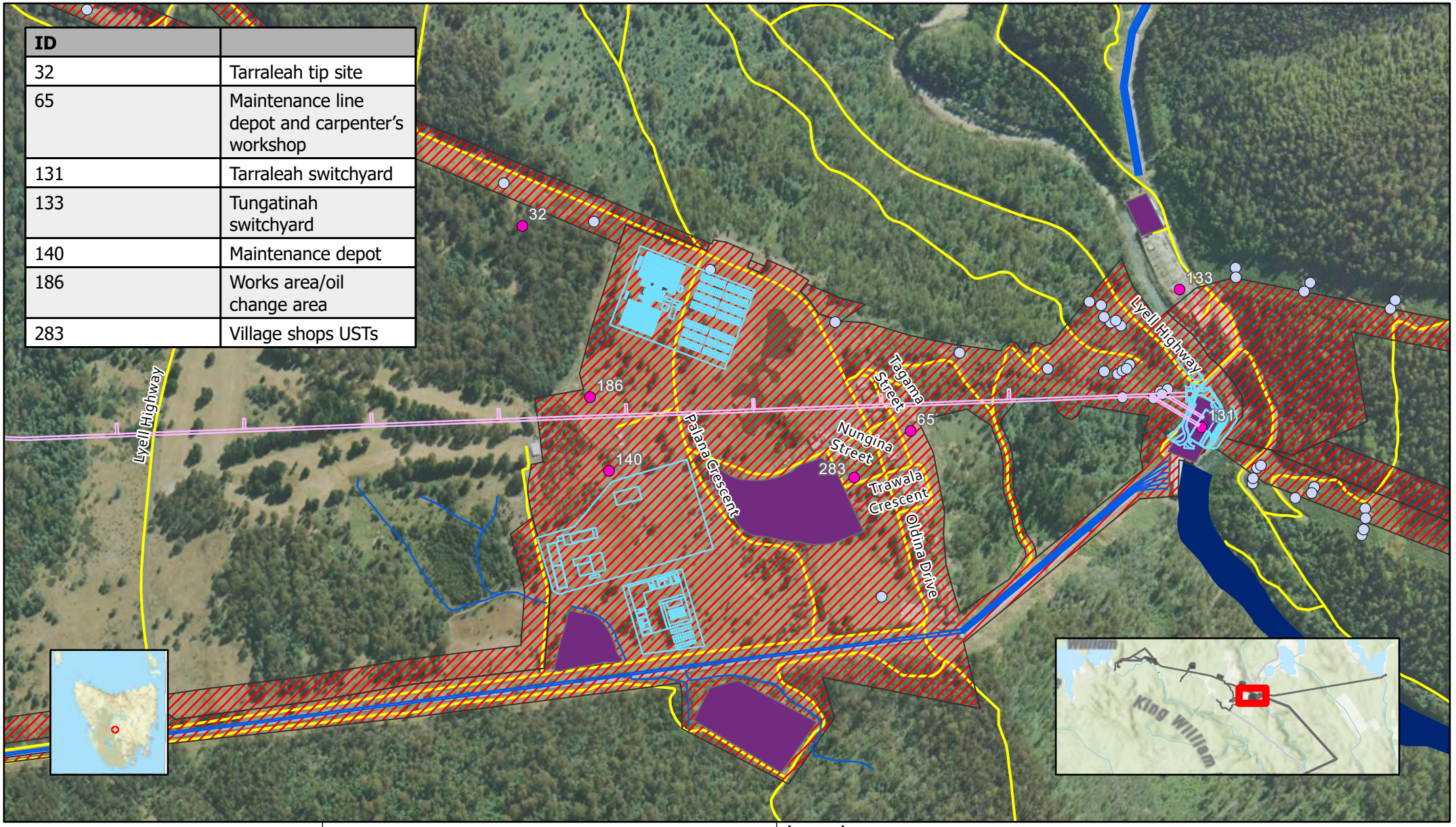


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Figure 1Ci Tarraleah Power Scheme Preliminary Site Investigation - Area C (Tarraleah village and power station)

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N

0 0.1 0.2 0.4 km

Coordinate System: GDA2020 MGA Zone 55

1:10,000 When Printed at A4

MAP REF	P.24.1136
AUTHOR	JH
REVISION	B
DATE	13/12/2024

DATA SOURCES	Base map from ESRI Base data from The LIST Tasmanian Government Project specific data

Legend

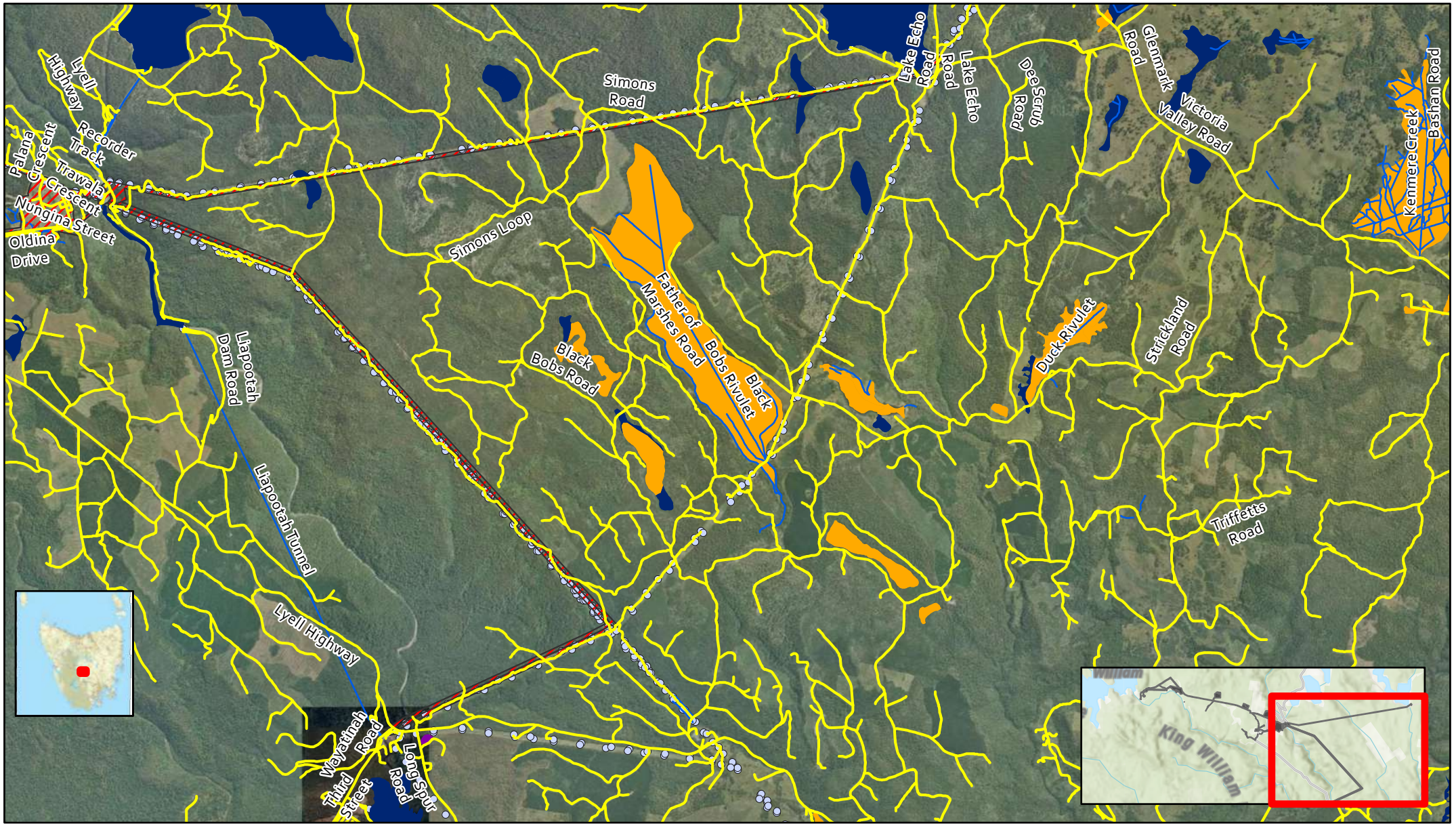
- TARDEV - Reference Design (Lines) Underground
- TARDEV - Reference Design (Lines) Above ground
- Tarraleah EIS footprint for Approval

Inland Acid Sulfate Soils [more 20m AHD]

- High
- Low
- Extremely Low

Potential contamination

- Contaminated Sites
- Fill - infrastructure points
- Contaminated areas
- Fill - canals
- Fill - roads



Hydro-Electric Corporation

Figure 1D Tarraleah Power Scheme
Preliminary Site Investigation
Area D (expanded)

pitt&sherry

N

0 0.75 1.5 3 km

Coordinate System: GDA2020 MGA Zone 55

1:80,000 When Printed at A4

MAP REF	P.24.1136
AUTHOR	JH
REVISION	D
DATE	16/12/2024

DATA SOURCES	Base map from ESRI Base data from The LIST Tasmanian Government Project specific data

Legend

- Tarraleah EIS footprint for Approval

Inland Acid Sulfate Soils [more 20m AHD]

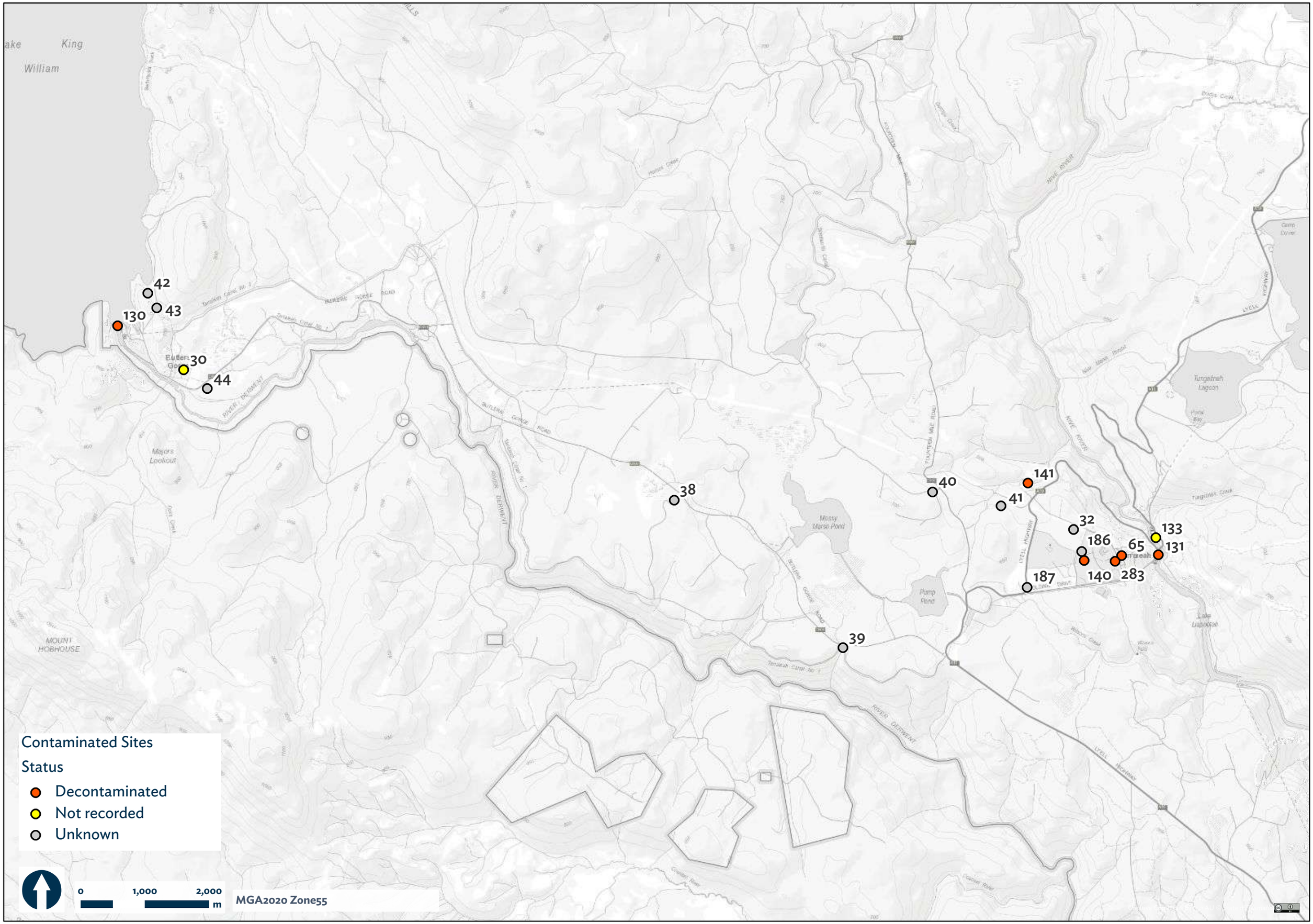
- High
- Low
- Extremely Low

- Fill - infrastructure points
- Fill - infrastructure area
- Fill - canals
- Fill - roads

Contaminated Sites figure and associated spreadsheet

Attachment B

pitt&sherry



ID	Date_added	Planned_work	Status	PCB	USTs	Description	Pre_Rehabilitation	New_Owner	Pre_Owner	Responsibility	Reg_Clearance	Date_Clearance	Pre_Recommendations	Recommendations_2004	Work_done_2005	Reports_2005	Status_2005	Document_Location	Site_Location_Description
30			Not recorded			Not known		Forestry Tasmania	Hydro Tasmania	Divested				None required					Butlers Gorge village
32			Unknown			These were former HEC disposal sites.	Some sites were remediated in 1994.	Forestry Tasmania	Hydro Tasmania	Divested			It was recommended that investigations be undertaken on the additional tip sites identified.	None required				P:\Project\Projects\123xxx\1232xx\123211 Land Environment Program 0506\123221 Land Contamination\10-Work\Contaminated sites 2005\CURRENT WORK\Supporting Documentation\	Tarraleah tip sites
38			Unknown			Scrap metal, glass, waste concrete and 44 gallon drums over approximately 1ha. on either side of the road leading from Butlers Gorge Road. Some drums contained oil or reosote and have contaminated the ground. This is a swampy area.	Completed	Forestry Tasmania	Hydro Tasmania	Divested			Remove drums, contaminated soil, scrap tins	None required					Butlers Gorge Road Old dump, 5A
39			Unknown			This old tip has rubbish buried in trenches, with some crushed car bodies in a trench but not buried.	Limited work completed	Forestry Tasmania	Hydro Tasmania	Divested			Bury old car bodies, seed and fertilise	None required					Butlers Gorge Road Old tip (adjacent to current tip), 5B
40			Unknown			There is old rubbish buried here, wirth recent general refuse scrap metal dumped along the roadside over approximately 0.2 ha.	Completed	Forestry Tasmania	Hydro Tasmania	Divested			Remove or bury rubbish	None required				P:\Project\Projects\123xxx\1232xx\123211 Land Environment Program 0506\123221 Land Contamination\10-Work\Contaminated sites 2005\CURRENT WORK\Supporting Documentation\	Tarraleah (nw of village) Old tip, 14 Mile Road, 5C
41			Unknown			Rubbish is buried alongside the track, and recent rubbish including scrap metal, wire and general refuse has been dumped along the track over an area of approximately one ha.	Completed	Forestry Tasmania	Hydro Tasmania	Divested			Restrict access, remove or bury rubbish	None required				U:\Non-Oneworld Projects\Client\Environ\4000srn\4063tarr	Tarraleah (NW of village) Old camp, 5D
42			Unknown			This disused quarry contains scrap metal and old car bodies which have been dumped on the quarry floor.	Ify job	Forestry Tasmania	Hydro Tasmania	Divested			Bury or remove rubbish	None required					Butlers Gorge, Clark Dam, Quarry, 6A
43			Unknown			The old camp area has scrap metal scattered through light bush and bracken fern, over approximately 2 ha.	Ify job	Forestry Tasmania	Hydro Tasmania	Divested			Remove scrap metal	None required					Butlers Gorge, Lake King William Old camp, 6B
44			Unknown			The old piggery concrete slabs and troughs are still visible. In addition scrap metal, old tins, glass and 44 gallon drums have been dumped in the area around the piggery.	Completed	Forestry Tasmania	Hydro Tasmania	Divested			Remove tins, leave slabs and troughs	None required					Butlers Gorge Old Piggery, 6C
65			Decontaminated			This was a former maintenance transmission lines depot and carpenters workshop area. Preliminary investigations in 2000 revealed a generally clean site except for two small areas of oil contamination in the stores yard.	The site was remediated in 2001. Validation sampling was conducted and showeed TPH to be below detection. It was concluded that the site had been succesfully remediated and suitable for a wide range of end uses.	Private	Hydro Tasmania	Divested	No attempt was made to seek DELM clearance for the site as it is not been remediated for residential standard.		None made	None required				P:\Project\Projects\123xxx\1232xx\123211 Land Environment Program 0506\123221 Land Contamination\10-Work\Contaminated sites 2005\CURRENT WORK\Supporting Documentation\; C5505685421 SRN 4063; U:\Non-Oneworld Projects\Client\Environ\4000srn\4063tarr	Tarraleah MTL depot and carpenters workshop
130			Decontaminated			In preparation for the upgrading of the sub-station the contamination status of the site was determined. Sampling was undertaken in December 1998. There had been little penetration of oil below the top 50mm of the surface. There was a patch of ground outside the planned excavation area that had sub-soil contamination. This patch was not considered to pose any significant threat.		Hydro Tasmaia	Hydro Tasmania	Hydro Tasmania	None Required			None required				C5505685421 SRN 4065; U:\Non-Oneworld Projects\Client\Environ\4000srn\4065but	Butlers Gorge substation
131			Decontaminated			The Tarraleah switchyard is located adjacent to the Tarraleah Power Station. Samplin in 1997 revealed that the site was uncontaminated with respect to PCB's, and most samples contained no detectable TPH or metals. However, petroleum hydrocarbons are locally elevated in surface and near-surface oil stains in road base pavement materiasl and some of this contamination has migrated to the water table. There is also local contamination of surface or near surface fill with zinc and lead, but the contamination has not migrated to subsurface materials or groundwater. It was concluded that the potential for adverse human health and off-site environmental effects was low and acceptable.	It was not considered necessary to undertake site remediation at the time.	Hydro Tasmania	Hydro Tasmania	Hydro Tasmania	Not required		ETS (1997) Recommendations were made to remove surfaec oil staining and to encapuslate the localised surface oil and lead/zinc contamination by covering with concrete or bitumen pavement.	Determine if recommendations were undertaken.				P:\Project\Projects\123xxx\1232xx\123211 Land Environment Program 0506\123221 Land Contamination\10-Work\Contaminated sites 2005\CURRENT WORK\Supporting Documentation\; U:\Non-Oneworld Projects\Client\Environ\4000srn\4045TAR\; C5505685420 SRN 4045	Tarraleah switchyard
133			Not recorded	Unknown		A site contamination assessment was conducted in 1998 prior to upgrade works. It was determined that soils in the transformer yard were marginally contaminated with Cu. TPH, PAH and PCB indicated that there had been little loss of insulating oils from adjacent equipment.	Contaminated blue metal was removed from the site. There maybe some contamination remaining at the site.	Hydro Tasmania	Hydro Tasmania	Hydro Tasmania				Determine extent of remaining contamination. Site specific information on contaminated sites and remediation activities is not clearly presented in the existing files. It is recommended that some time is spent documenting each site within the Tarraleah area to create an updated site history.				C5505685421 SRN 4055; P:\Project\Projects\123xxx\1232xx\123211 Land Environment Program 0506\123221 Land Contamination\10-Work\Contaminated sites 2005\CURRENT WORK\Supporting DocumentationU:\Non-Oneworld Projects\Client\Environ\4000srn\4055TUNG P:\Project\Projects\123xxx\1232xx\123211 Land Environment Program 0506\123221 Land Contamination\10-Work\Contaminated sites 2005\CURRENT WORK\Supporting Documentation\; C5505685421 SRN 4063; U:\Non-Oneworld Projects\Client\Environ\4000srn\4063tarr	Tungatinah switchyard
140			Decontaminated		Removed	This was a former civil works area for HEC activities in the upper Derwent area. It was a large and complex site. Full details can be obtained from the relevant reports.	Building were removed prior to 1995. In 1995 contaminated soils were removed from the site. Three UST's were removed and backfilled.	Hydro Tasmania	Hydro Tasmania	Hydro Tasmania									Tarraleah depot
141			Decontaminated	Unknown	No	The Paddys quarry area consisted of a creosite and pitch storage area, transformer and tip site.	All visibly contaminated materials around the creosite and pitch storage area were removed and the are was covered with approximately 0.5m of clay and the area rehabiliated. Sampling was conducted and no phenols were detected. No work was undertaken on the transformer. Drums and rubbish were removed from the tip site. Removal and burial of rubbish on the face of the tip was undertaken. The tip face was then benched and armoured with coarse rock. The creek at the base of the tip was diverted away from it's base in order to improve tip stability and water quality. A diversion bank was constructed above the face to divert catchment water away from the tip face and the tip surface was capped with 0.3-0.5m clay. Samples were analysed for hydrocarbons, BTEX, metals, phenols, PAH's and PCB's. No contamination was found.	Hydro Tasmania	Hydro Tasmania	Hydro Tasmania				Determine what work was undertaken on the transformer at this site.				C5505685419 SRN 4014	Tarraleah, north of Lyell Highway, Paddys quarry
186			Unknown			Soil contamination over a small area has resulted from dumping of oily rubbish into a bin with a hole in the bottom. This is adjacent to a recently rehabilitated oil change area.	Completed	Hydro Tasmania	Hydro Tasmania	Hydro Tasmania			Remove waste bin, clean up contaminated area	None required				C5505685420 SRN 4045	Tarraleah works area, oil change area, 5E
187			Unknown			The land between the Lyell Highway and the Tarraleah Roads contains a large population of English and Canary broom. This covers approximately 2 ha. and extends along the road side towards Tarraleah.	Completed	Hydro Tasmania	Hydro Tasmania	Hydro Tasmania			Map outbreak, control spread, develop eradication program	None required					Tarraleah Broom infestation 5F
283		Review	Decontaminated		Removed	Tarraleah Village area.	The area of the village shops had the UST's removed.	Hydro Tasmania and Private	Hydro Tasmania	Hydro Tasmania				Site specific information on contaminated sites and remediation activities is not clearly presented in the existing files. It is recommended that some time is spent documenting each site within the Tarraleah area to create an updated site history.				P:\Project\Projects\123xxx\1232xx\123211 Land Environment Program 0506\123221 Land Contamination\10-Work\Contaminated sites 2005\CURRENT WORK\Supporting Documentation\	Tarraleah Village

Authority correspondence

Attachment C

pitt&sherry

Carly Clark

From: Scott Rowell <Scott.Rowell@entura.com.au>
Sent: Tuesday, 5 November 2024 3:12 PM
To: Carly Clark
Subject: FW: Dangerous goods and site contamination at Tasrraleah Power Station

fyi

Scott Rowell | Senior Environmental Planner
m +61 0418 561 818 **e** scott.rowell@entura.com.au | **w** entura.com.au

---

From: WST Disclosures <WSTDisclosures@justice.tas.gov.au>
Sent: Tuesday, November 5, 2024 2:00 PM
To: Scott Rowell <Scott.Rowell@entura.com.au>
Subject: RE: Dangerous goods and site contamination at Tasrraleah Power Station

I meant to say also that I checked the EPA's Environmentally Relevant Land Use Register and no file was identified on that either.

Lorraine Case
Information Support Officer | Business Services / Corporate Governance

Department of Justice
30 Gordons Hill Road
Rosny Park Tasmania 7018 Australia
P: 03 6166 4656
E: WSTDisclosures@justice.tas.gov.au

In recognition of the deep history and culture of this Island, we acknowledge Tasmanian Aboriginal people, the original and continuing Custodians of the Land, Sea and Sky. We acknowledge and pay our respects to all

Tasmanian Aboriginal people, all of whom have survived invasion and dispossession, and continue to maintain their identity, culture and Aboriginal rights.

From: Scott Rowell <Scott.Rowell@entura.com.au>
Sent: Tuesday, November 5, 2024 12:56 PM
To: WST Disclosures <WSTDisclosures@justice.tas.gov.au>
Subject: RE: Dangerous goods and site contamination at Tasrraleah Power Station

Thanks very much Lorraine

Scott Rowell | Senior Environmental Planner
m +61 0418 561 818 **e** scott.rowell@entura.com.au | **w** entura.com.au

---

From: WST Disclosures <WSTDisclosures@justice.tas.gov.au>
Sent: Tuesday, November 5, 2024 12:48 PM
To: Scott Rowell <Scott.Rowell@entura.com.au>
Subject: RE: Dangerous goods and site contamination at Tasrraleah Power Station

Hi Scott

We do not have a dangerous goods file for this site, only a premise file titled HEC Tarraleah and another for plant registration, neither of which would hold dangerous goods records.

Regards

Lorraine Case
Information Support Officer | Business Services / Corporate Governance

Department of Justice
30 Gordons Hill Road
Rosny Park Tasmania 7018 Australia
P: 03 6166 4656
E: WSTDisclosures@justice.tas.gov.au

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From: Scott Rowell <Scott.Rowell@entura.com.au>
Sent: Tuesday, November 5, 2024 11:30 AM
To: WST Disclosures <WSTDisclosures@justice.tas.gov.au>
Subject: RE: Dangerous goods and site contamination at Tasrraleah Power Station

Hi Lorraine,
No, it is the Tarraleah Power Station.

Regards

Scott Rowell | Senior Environmental Planner
m +61 0418 561 818 **e** scott.rowell@entura.com.au | **w** entura.com.au

---

From: WST Disclosures <WSTDisclosures@justice.tas.gov.au>
Sent: Tuesday, November 5, 2024 8:56 AM
To: Scott Rowell <Scott.Rowell@entura.com.au>
Subject: RE: Dangerous goods and site contamination at Tasrraleah Power Station

Hi Scott

We have a dangerous substances file titled Tungatinah Power Station, Lyell Highway, Tarraleah – is this the site?

Kind regards

Lorraine Case
Information Support Officer | Business Services / Corporate Governance

Department of Justice
30 Gordons Hill Road
Rosny Park Tasmania 7018 Australia
P: 03 6166 4656
E: WSTDisclosures@justice.tas.gov.au

In recognition of the deep history and culture of this Island, we acknowledge Tasmanian Aboriginal people, the original and continuing Custodians of the Land, Sea and Sky. We acknowledge and pay our respects to all Tasmanian Aboriginal people, all of whom have survived invasion and dispossession, and continue to maintain their identity, culture and Aboriginal rights.

From: Scott Rowell <Scott.Rowell@entura.com.au>
Sent: Monday, November 4, 2024 10:36 AM
To: WST Licensing <WST.Licensing@justice.tas.gov.au>
Subject: Dangerous goods and site contamination at Tasrraleah Power Station

> You don't often get email from scott.rowell@entura.com.au. Learn why this is important

Hi there,
I am looking for any records you may have on any dangerous goods licencing and site contamination at the Tarraleah Power Station.
The information is for a site contamination assessment.
Thankyou

Scott Rowell | Senior Environmental Planner

entura

m +61 0418 561 818
e scott.rowell@entura.com.au | **w** entura.com.au
a 4 Elizabeth Street, Hobart TAS 7000, Australia
Connect with us on Facebook, Twitter and LinkedIn

We own. We operate. We consult.

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Carly Clark

From: Contaminated Sites <ContaminatedSites@epa.tas.gov.au>
Sent: Wednesday, 13 November 2024 10:58 AM
To: Scott Rowell
Subject: EPA records and Tarraleah Power station - 13 November 2024

Good afternoon, Scott
Further to our conversations regarding the documents held by the EPA concerning the Tarraleah Power Station .
As we discussed documents relating to rehabilitation of Tarraleah village circa 2000 have been excluded .

Below are records which refer specifically to the Power station.

April 1990 HEC notified the EPA of oily scum and Fibrous material found in Lake Liapootah
the Failure of the Tarraleah power station dewatering pump in Nov 1989 was considered the likely source as approximately 10 litres of oily water was discharged to the Lake.

- The EPA hold some correspondence and lab reports

July 2013 & Feb 2014 The EPA received requests to dilute and reuse TPH contaminated soil excavated from switching yards at Tarraleah and Tungatinah power stations .
Approvals were provided for 80 m3 and 30m3 material to be used as fill at MSD Constructions - Paddy's Quarry - Mineral Lease16M/1998

- The EPA hold correspondence and lab reports

Feb 2014 The EPA approved a request to treat 30m3 of level three TPH contaminated soil at Port Latta Waste Depot Landfarm facility .
The material had been excavated from the Tarraleah Switch yard:

- The EPA hold correspondence and lab reports

Under the *Right to Information Act 2009* (RTI Act), you could apply for any records mentioned within this email. For further information on how the RTI process works and how to request information under the RTI Act please visit the EPA website or Right to Information | EPA Tasmania
Should you have further enquiries please contact us
Kind regards

Deborah
Contaminated Sites Unit
Contaminated Land & Regulatory Systems
Environment Protection Authority
GPO BOX 1550, HOBART, TAS, 7001
T: (03) 6165 4599
E: contaminatedsites@epa.tas.gov.au
W: **www.epa.tas.gov.au**

EPA TASMANIA
ENVIRONMENT PROTECTION AUTHORITY

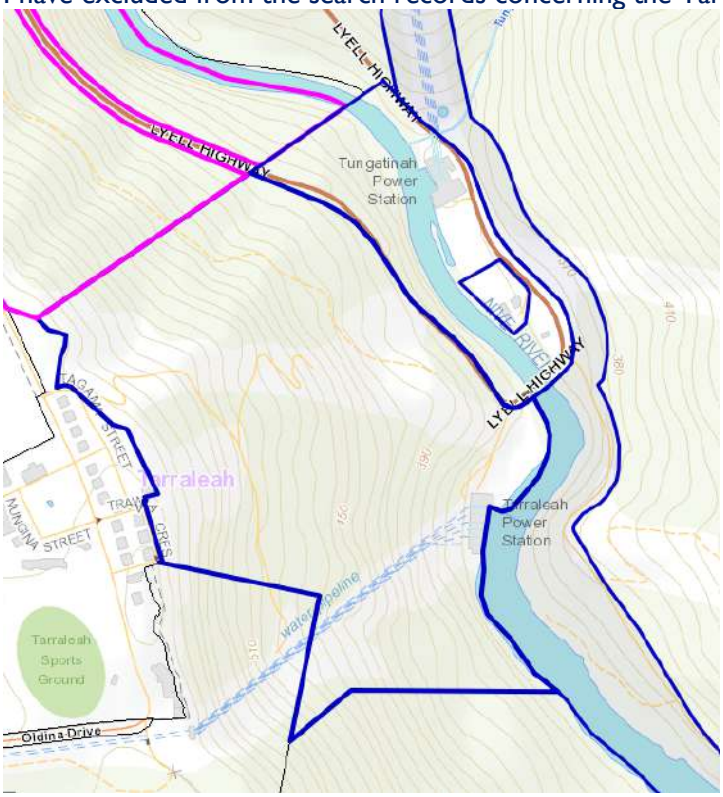
From: Scott Rowell <Scott.Rowell@entura.com.au>
Sent: Tuesday, 5 November 2024 3:14 PM
To: Contaminated Sites <ContaminatedSites@epa.tas.gov.au>
Subject: RE: EPA records and Tarraleah Power station

Thanks for your help so far Deborah

Scott Rowell | Senior Environmental Planner
m +61 0418 561 818 **e** scott.rowell@entura.com.au | **w** entura.com.au

From: Contaminated Sites <ContaminatedSites@epa.tas.gov.au>
Sent: Tuesday, November 5, 2024 2:58 PM
To: Scott Rowell <Scott.Rowell@entura.com.au>
Subject: EPA records and Tarraleah Power station

Good afternoon, Scott
I refer to our conversation yesterday concerning records the EPA may hold regarding the Tarraleah Power station.
As we discussed many recent records relate to proposed upgrades and refurbishments of the power station .
The physical archives may have records concerning disposal of contaminated soil excavated from the power station circa 2012
I should have access to those documents early next.
I have excluded from the search records concerning the Tarraleah Sewage Lagoons, as requested .



Please contact us if you have further enquiries
Kind regards

Deborah
Contaminated Sites Unit
Contaminated Land & Regulatory Systems
Environment Protection Authority
GPO BOX 1550, HOBART, TAS, 7001
T: (03) 6165 4599
E: contaminatedsites@epa.tas.gov.au
W: www.epa.tas.gov.au

ENVIRONMENT PROTECTION AUTHORITY

Environmental incidents

Attachment D

pitt&sherry

Incident	Title	Description	Immediate Actions	Event Type	Group	Location	Potential Risk Rating	Raised Date
9646	Governor bund damaged/defective.	Noticed when restoring governor system that one of the blocks making up the bund was detached from the grout on both edges and loose sitting in place. This creating a leakage path if an oil spill were to occur within the bund.	Immediate Actions Undertaken: Reported, and ordered sika & grout to seal back up. Recommended Actions Reported: Seal back up, inspect other machines for same issue. Improvement Opportunities Reported:	Hazard	Environment (Release)	Tarraleah Power Station	Low	8/09/2020
9491	Sump Pump Leak	Sump Pump collecting drill cuttings had main outlet gate valve left half open. When sump level exceeded gate valve housing fluid containing concrete cutting spilled 10 Litres approx into parking area. When identified gate valve shut immediately and stopped flow. Area contained and temporary earth bund installed.	Immediate Actions Undertaken: Gate Valve shut off. spill contained by creating earth bund. liquid evaporates and concrete bagged and removed. Site rehabilitated Recommended Actions Reported: Check main outlet is closed before sump pump is operated Improvement Opportunities Reported: Double check equipment prior to starting	Incident	Environment (Release)	Tarraleah Power Station	Low	13/07/2020
7879	Oil spill	When Tarraleah unit TA2 was being shut down for maintenance it discharged oil liquid and vapour into the immediate area. Issue being investigated as an asset event (asset event logged also.	Immediate Actions Undertaken: Cleaned up and recovered all spilt oil Recommended Actions Reported: Investigate why this unit has done this previously. Improvement Opportunities Reported: Identify cause of oil discharge and eliminate this cause.	Incident	Environment (Release)	Tarraleah Power Station	Low	5/05/2019

Tarraleah village layout

Attachment E

pitt&sherry

Data Acknowledgments:
Base data from Natural Resources & Environment (thelist.tas.gov.au) provided under Creative Commons 3.0
Imagery and base data from ESRI
All reasonable care has been taken in collecting and recording the information shown on this map.
Hydro Tasmania assumes no liability resulting from errors or omissions in this information or its use in any way.

Date : 13/09/2024
Prepared by : Thomas5
Verified by : TBA
Approved by : Scott Rowell
Revision : 1
Scale 1:6,000 @A4
GDA2020 MGA Zone 55

***Battery of the Nation* - Tarraleah**

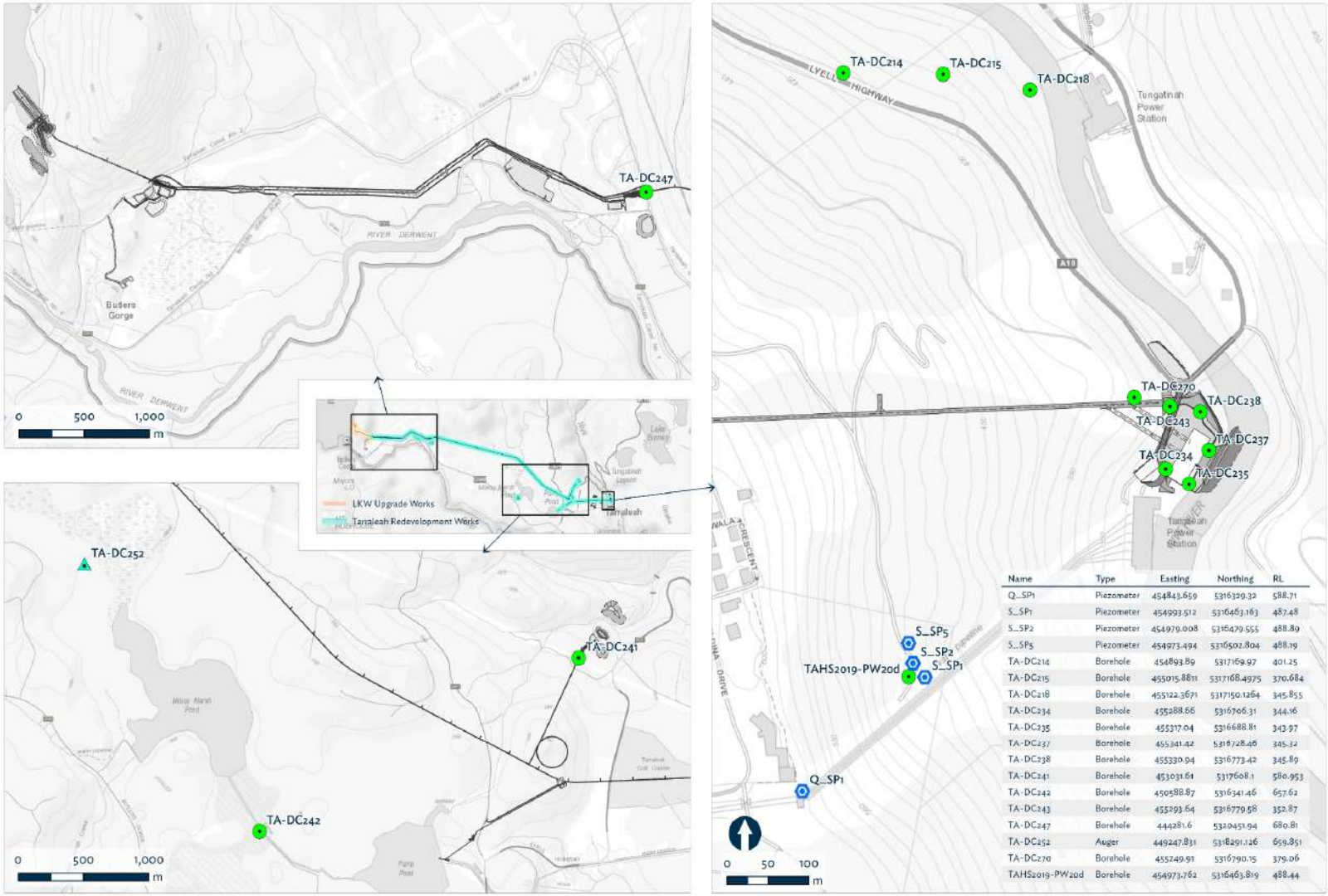
Tarraleah Village Layout

Hydro Tasmania

Groundwater locations, Tarraleah power station well logs, interpretive sections

Attachment F

pitt&sherry



Name	Type	Easting	Northing	RL
Q_SP1	Piezometer	454843.659	5316329.32	588.71
S_SP1	Piezometer	454993.512	5316463.163	487.48
S_SP2	Piezometer	454979.008	5316479.555	488.89
S_SP5	Piezometer	454973.494	5316502.804	488.19
TA-DC214	Borehole	454893.89	5317169.97	401.25
TA-DC215	Borehole	455015.8811	5317168.4975	370.684
TA-DC218	Borehole	455122.3671	5317150.1264	345.855
TA-DC234	Borehole	455288.66	5316706.31	344.16
TA-DC235	Borehole	455317.04	5316688.81	343.97
TA-DC237	Borehole	455341.42	5316728.46	345.32
TA-DC238	Borehole	455330.94	5316773.42	345.89
TA-DC241	Borehole	453031.61	5317608.1	580.953
TA-DC242	Borehole	450588.87	5316341.46	657.62
TA-DC243	Borehole	455293.64	5316779.58	352.87
TA-DC247	Borehole	444281.6	5320451.94	680.81
TA-DC252	Auger	449247.831	5318291.126	659.851
TA-DC270	Borehole	455249.91	5316790.15	379.06
TAHS2019-PW20d	Borehole	454973.762	5316463.819	488.44

Date: 17/07/2020
Prepared By: Agung Wahyudi
Verified By: David Procter
Approved By: Steve Thomas
Revision: 0
Scale: 1:4,000 at A3
GDA2020 MGA Zone 55
"Intended to be printed at A3"

Borehole,Completed
Piezometer,Completed
Auger,Completed

Battery of the Nation - Tarraleah Redevelopment

Baseline Groundwater Quality Monitoring Locations

Hydro Tasmania

Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	AT
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455288.7 m E 5316706.3 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-76°	RL Surface:	344.16 m	Drilled:	11/04/2023 - 13/04/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	308°	Datum:	AHD	Operator:	TDS

Drilling Information							Rock Substance													Rock Mass Defects		
Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)	Graphic Log	Material Description ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components	Weathering XW	HW	MW	SW	FR	Strength Is(50) ● - Axial ○ - Diametral VL 0.1	L 0.3	M 1	H 3	VH 10	EH	Defect Spacing (mm) <20	60	200	600	1000	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, thickness, shape, roughness, other
PQ3		80			343.2	1		Vacuum Drilled: 500 mm.																	Inferred FILL
		63						DOLERITE: medium grained, dark blue grey and orange brown grey, massive texture. Presence of healed defects typically spaced up to 150 mm. Iron oxide and trace quartz veins up to 1 mm thick, perpendicular to moderately inclined to core axis spaced up to 200 mm.																	Inferred TOP OF ROCK - JURASSIC DOLERITE JT, 65°/-, FE SN, UN, RF CZ, 23°/-, CL, RF 25 mm, UN, RF CZ, 23°/-, RF, CL 20 mm, UN, RF JT, 35°/-, RF, CL 1 mm, UN, RF JT, 35°/-, RF, CL 1 mm, UN, RF JT, 35°/-, FE SN, UN, RF JT, 60°/-, FE SN, PR, RF
		29			342.2	2																			JT, 40°/-, FE, CL 1 mm, UN, RF JT, 55°/-, FE SN, ST, RF JT, 62°/-, FE SN, ST, RF JT, 45°/-, FE SN, UN, RF JT, 45°/-, FE SN, UN, RF JT, 32°/-, CL, FE 1 mm, UN, RF
		75						NO CORE: 100 mm.																	
HQ3	14/03/2024	60			341.2	3		DOLERITE: medium grained, dark blue grey, massive texture. Presence of healed defects typically spaced up to 150 mm. Iron oxide and quartz veins up to 1 mm thick, perpendicular to steeply inclined to core axis, spaced up to 400 mm.																	JT, 31°/-, FE SN, UN, RF JT, 60°/-, FE SN, UN, RF JT, 24°/-, CN, UN, RF
		100																							JT, 50°/-, FE SN, ST, RF
		64			340.3	4																			JT, 60°/-, QZ, FE VN, ST, RF JT, 10°/335°, FE SN, ST, RF JT, 40°/345°, FE SN, ST, RF CZ, 30°/242°, RF, CL 20 mm, UN, RF JT, 12°/104°, FE SN, IR, RF JT, 48°/261°, FE SN, PR, RF JT, 40°/251°, FE SN, PR, RF JT, 60°/111°, QZ, FE VN, UN, VR JT, 22°/208°, CL, FE 1 mm, UN, RF
					339.3																				

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3 - Wireline core (61.0 mm)
PQ3 - Wireline core (83.0 mm)
SPT - Standard penetration test
PT - Push tube

Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Testing Type
UCS - Unconfined Compressive Strength
TXL - Triaxial Shear Test
DS - Direct Shear Test
PET - Petrography
STS - Splitting Tensile Strength
DEN - Density
CER - Cerchar Abrasivity
SS - Sodium Sulphate Soundness
M - Moisture Content
SD - Slake Durability
LA - Los Angeles Abrasion
ISS - In Situ Stress
PP - Pocket Penetrometer

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock Fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous
CHL - Chlorite
ZE - Zeolite
SE - Sericite
MG - Manganese
SU - Sulphide
SI - Silicate
PY - Pyrite

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	AT
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455288.7 m E 5316706.3 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-76°	RL Surface:	344.16 m	Drilled:	11/04/2023 - 13/04/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	308°	Datum:	AHD	Operator:	TDS

Drilling Information

Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)
HQ3		64			338.3	6
		70			337.4	7
		76	Is(50) d>8.41 MPa		336.4	8
		90			335.4	9
		77			334.5	

Rock Substance

Graphic Log	Material Description ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components	Weathering (XW HW MW SW FR)	Strength Is(50) ● - Axial ○ - Diametral (VL 0.1 L 0.3 M 1 H 3 VH 10 EH)
	DOLERITE: medium grained, dark blue grey and orange brown, massive texture. Presence of healed defects typically spaced up to 100 mm. Iron oxide and trace quartz veins up to 1 mm thick, perpendicular to moderately inclined to core axis, spaced up to 500 mm.		
	150 mm orange brown zone.		

Rock Mass Defects

Defect Spacing (mm) (<20 60 200 600 1000)	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, thickness, shape, roughness, other
	JT, 40°/261°, FE SN, UN, RF
	JT, 22°/003°, RF, CL 1 mm, UN, RF
	JT, 23°/177°, FE SN, UN, RF
	JT, 51°/095°, FE SN, UN, RF
	CZ, 20°/093°, RF, CL 25 mm, UN, RF
	JT, 22°/231°, FE SN, UN, RF
	JT, 83°/111°, FE SN, UN, RF
	JT, 28°/111°, FE SN, UN, RF
	JT, 10°/074°, FE, CL 1 mm, UN, RF
	JT, 80°/083°, FE SN, UN, RF
	JT, 70°/205°, FE SN, UN, RF
	CZ, 60°/214°, RF, CL 10 mm, UN, RF
	JT, 10°/205°, RF, CL 1 mm, UN, RF
	JT, 17°/205°, FE SN, UN, RF
	JT, 17°/205°, FE SN, UN, RF
	JT, 25°/341°, FE SN, UN, RF
	JT, 11°/251°, FE SN, UN, RF
	JT, 11°/110°, FE SN, UN, RF
	JT, 40°/205°, FE SN, UN, RF
	JT, 70°/298°, FE SN, ST, RF
	JT, 09°/270°, CN, ST, RF
	JT, 78°/302°, FE SN, UN, RF
	JT, 10°/186°, FE SN, ST, RF
	JT, 18°/225°, FE SN, ST, RF

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3 - Wireline core (61.0 mm)
PQ3 - Wireline core (83.0 mm)
SPT - Standard penetration test
PT - Push tube

Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Testing Type
UCS - Unconfined Compressive Strength
TXL - Triaxial Shear Test
DS - Direct Shear Test
PET - Petrography
STS - Splitting Tensile Strength
DEN - Density
CER - Cerchar Abrasivity
SS - Sodium Sulphate Soundness
M - Moisture Content
SD - Slake Durability
LA - Los Angeles Abrasion
ISS - In Situ Stress
PP - Pocket Penetrometer

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock Fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous
CHL - Chlorite
ZE - Zeolite
SE - Sericite
MG - Manganese
SU - Sulphide
SI - Silicate
PY - Pyrite

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	AT
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455288.7 m E 5316706.3 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-76°	RL Surface:	344.16 m	Drilled:	11/04/2023 - 13/04/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	308°	Datum:	AHD	Operator:	TDS

Drilling Information

Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)
HQ3		77			333.5	11
		100				
		93	Is(50) d>7.88 MPa		332.5	12
					331.5	13
		93				
					330.6	14
		87				
					329.6	

Rock Substance

Graphic Log	Material Description ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components	Weathering (XW HW MW SW FR)	Strength Is(50) ● - Axial ○ - Diametral (VL 0.1 L 0.3 M 1 H 3 VH 10 EH)
	DOLERITE: medium grained, dark blue grey and orange brown, massive texture.		
	Becoming dark blue grey. Calcite and quartz veins up to 1 mm thick, perpendicular to moderately inclined to core axis, spaced up to 500 mm.		○
	DOLERITE FAULT BRECCIA: red brown, brecciated, fine to coarse grained sand sized clasts and fine to medium grained gravel sized clasts, angular to sub-angular. Clay matrix, medium plasticity. Matrix supported, clast to matrix ratio 75:25.		
	DOLERITE: medium grained, dark blue grey, massive texture. Calcite and quartz veins up to 1 mm thick, moderately inclined to core axis, spaced up to 400 mm.		
	Becoming dark blue grey and orange brown. Iron oxide veins up to 1 mm thick, perpendicular to steeply inclined, spaced up to 50 mm. Becoming dark blue grey.		

Rock Mass Defects

Defect Spacing (mm) (<20 60 200 600 1000)	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, thickness, shape, roughness, other
	JT, 18°/164°, FE SN, ST, RF
	JT, 28°/238°, FE SN, ST, RF
	JT, 22°/205°, FE SN, ST, RF
	JT, 28°/253°, FE SN, ST, RF
	JT, 28°/246°, FE SN, ST, RF
	JT, 19°/-, CN, UN, RF
	JT, 27°/-, CN, ST, RF
	JT, 25°/-, CN, ST, RF
	CZ, 32°/-, CL, RF 160 mm, ST, RF
	JT, 64°/-, CN, ST, RF
	JT, 24°/184°, QZ, CL 1 mm, ST, RF
	JT, 39°/123°, FE SN, ST, RF
	JT, 40°/124°, FE SN, UN, RF

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
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PQ3 - Wireline core (83.0 mm)
SPT - Standard penetration test
PT - Push tube

Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Testing Type
UCS - Unconfined Compressive Strength
TXL - Triaxial Shear Test
DS - Direct Shear Test
PET - Petrography
STS - Splitting Tensile Strength
DEN - Density
CER - Cerchar Abrasivity
SS - Sodium Sulphate Soundness
M - Moisture Content
SD - Slake Durability
LA - Los Angeles Abrasion
ISS - In Situ Stress
PP - Pocket Penetrometer

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock Fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous
CHL - Chlorite
ZE - Zeolite
SE - Sericite
MG - Manganese
SU - Sulphide
SI - Silicate
PY - Pyrite

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	AT
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455288.7 m E 5316706.3 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-76°	RL Surface:	344.16 m	Drilled:	11/04/2023 - 13/04/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	308°	Datum:	AHD	Operator:	TDS

Drilling Information

Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)
HQ3		87				
			Is(50) d=8.41 MPa		328.6	16
		87				
					327.7	17
		60			326.7	18
		83			325.7	19
					324.8	

Rock Substance

Graphic Log	Material Description ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components	Weathering (XW HW MW SW FR)	Strength Is(50) ● - Axial ○ - Diametral (VL 0.1 L 0.3 M 1 H 3 VH 10 EH)
	DOLERITE: medium grained, dark blue grey, massive texture. Calcite and quartz veins up to 1 mm thick, perpendicular to moderately inclined to core axis, spaced up to 400 mm.		
	150 mm zone of dark blue grey and orange brown. Iron oxide veins up to 1 mm thick, perpendicular to core axis, spaced up to 50 mm.		
	100 mm zone of dark blue grey and orange brown. Iron oxide veins up to 1 mm thick, perpendicular to core axis, spaced up to 50 mm.		
	Becoming fine to medium grained, dark grey and orange brown. Calcite and trace quartz veins up to 5 mm thick, moderately inclined to core axis, spaced up to 300 mm.		
	Becoming medium grained, orange brown and dark grey.		
	Becoming dark blue grey.		
	Becoming dark blue grey and brown.		

Rock Mass Defects

Defect Spacing (mm) (<20 60 200 600 1000)	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, thickness, shape, roughness, other
	JT, 43°/177°, CN, UN, RF
	JT, 75°/167°, FE SN, UN, RF
	JT, 28°/261°, FE SN, UN, RF
	CZ, 22°/251°, RF 10 mm, UN, RF
	CZ, 28°/205°, RF 12 mm, UN, RF
	CZ, 28°/205°, RF 15 mm, UN, RF
	JT, 12°/205°, CL 1 mm, UN, RF
	JT, 12°/233°, CL 1 mm, PR, RF
	JT, 26°/074°, CN, UN, RF
	JT, 40°/326°, FE SN, IR, RF
	JT, 32°/111°, QZ VN, IR, RF
	JT, 32°/111°, FE SN, UN, RF
	JT, 42°/354°, CA VN, PR, RF
	JT, 22°/354°, CN, UN, RF
	CZ, 30°/354°, CL, RF 55 mm, UN, RF
	JT, 40°/352°, FE SN, UN, RF
	JT, 23°/352°, CHL, CL 1 mm, UN, RF
	JT, 28°/205°, CHL, RF 4 mm, UN, RF
	CZ, 22°/205°, RF, CL 60 mm, UN, RF
	JT, 50°/003°, QZ VN, UN, RF
	JT, 22°/246°, CHL VN, UN, RF
	JT, 20°/335°, CHL VN, ST, RF
	JT, 64°/354°, RF, CA 1 mm, UN,

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3 - Wireline core (61.0 mm)
PQ3 - Wireline core (83.0 mm)
SPT - Standard penetration test
PT - Push tube

Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Testing Type
UCS - Unconfined Compressive Strength
TXL - Triaxial Shear Test
DS - Direct Shear Test
PET - Petrography
STS - Splitting Tensile Strength
DEN - Density
CER - Cerchar Abrasivity
SS - Sodium Sulphate Soundness
M - Moisture Content
SD - Slake Durability
LA - Los Angeles Abrasion
ISS - In Situ Stress
PP - Pocket Penetrometer

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock Fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous
CHL - Chlorite
ZE - Zeolite
SE - Sericite
MG - Manganese
SU - Sulphide
SI - Silicate
PY - Pyrite

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	AT
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455288.7 m E 5316706.3 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-76°	RL Surface:	344.16 m	Drilled:	11/04/2023 - 13/04/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	308°	Datum:	AHD	Operator:	TDS

Drilling Information

Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)
HQ3		83			323.8	21
		73			322.8	22
		80			321.8	23
		70			320.9	24
		80			319.9	
		50				

Rock Substance

Graphic Log

Material Description
ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components

DOLERITE: medium grained, dark blue grey and brown, massive texture. Iron oxide and trace calcite or quartz veins up to 1 mm thick, perpendicular to steeply inclined to core axis, spaced up to 200 mm.

Becoming dark blue grey.

Becoming dark blue grey and brown.

Presence of abundant healed defects, typically iron stained.

Weathering: XW HW MW SW FR

Strength Is(50) ● - Axial ○ - Diametral: VL (0.1) L (0.3) M (1) H (3) VH (10) EH

Rock Mass Defects

Defect Spacing (mm): <20 60 200 600 1000

Defect Descriptions / Comments
Description, alpha/beta, infilling or coating, thickness, shape, roughness, other

RF
JT, 10°/139°, RF, CA 1 mm, ST, RF
JT, 22°/-, CN, UN, RF
JT, 23°/-, FE SN, UN, RF
JT, 30°/-, CN, UN, RF
JT, 62°/-, FE SN, UN, RF
JT, 70°/-, FE, RF 1 mm, UN, RF
JT, 60°/272°, CL VN, UN, S
JT, 25°/264°, FE, CHL SN, ST, RF
CZ, 08°/-, RF 10 mm, UN, RF
JT, 42°/-, CN, UN, RF
JT, 32°/-, CN, UN, RF
JT, 15°/195°, FE SN, IR, VR
JT, 35°/233°, CN, PR, RF
JT, 28°/195°, CN, PR, RF
JT, 48°/345°, CN, UN, RF
JT, 30°/139°, FE SN, PR, RF
JT, 12°/242°, CN, ST, RF
FZ, 40°/111°, RF 60 mm, UN, RF

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3 - Wireline core (61.0 mm)
PQ3 - Wireline core (83.0 mm)
SPT - Standard penetration test
PT - Push tube

Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Testing Type
UCS - Unconfined Compressive Strength
TXL - Triaxial Shear Test
DS - Direct Shear Test
PET - Petrography
STS - Splitting Tensile Strength
DEN - Density
CER - Cerchar Abrasivity
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Weathering
XW - Extremely Weathered
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MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
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CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous
CHL - Chlorite
ZE - Zeolite
SE - Sericite
MG - Manganese
SU - Sulphide
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PY - Pyrite

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	AT
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455288.7 m E 5316706.3 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-76°	RL Surface:	344.16 m	Drilled:	11/04/2023 - 13/04/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	308°	Datum:	AHD	Operator:	TDS

Drilling Information

Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)
HQ3		50	Is(50) a=6.82 MPa		318.9	26
		77	Is(50) d=6.84 MPa Is(50) a=11.16 MPa		318.0	27
		0			317.0	28
		85			316.0	29
		73			315.1	

Rock Substance

Graphic Log	Material Description ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components	Weathering (XW HW MW SW FR)	Strength Is(50) ● - Axial ○ - Diametral (VL 0.1 L 0.3 M 1 H 3 VH 10 EH)
	DOLERITE: medium grained, dark blue grey and brown, massive texture. Presence of abundant healed defects, typically iron stained.		
	Healed defects no longer present. Iron oxide and trace calcite or quartz veins up to 1 mm thick, perpendicular to moderately inclined to core axis, spaced up to 400 mm.		
	Becoming dark green blue and brown.		
	200 mm orange brown zone.		
	Becoming dark blue grey and brown.		

Rock Mass Defects

Defect Spacing (mm) (<20 60 200 600 1000)	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, thickness, shape, roughness, other
	JT, 10°/145°, RF 2 mm, ST, RF
	FZ, 45°/126°, RF 30 mm, ST, RF
	FZ, 45°/130°, RF 3 mm, ST, RF
	FZ, 42°/123°, RF 5 mm, ST, RF
	JT, 41°/110°, CN, PR, RF
	FZ, 32°/115°, RF 8 mm, ST, RF
	JT, 15°/126°, FE SN, UN, RF
	JT, 40°/139°, CN, UN, RF
	JT, 30°/130°, CN, UN, RF
	JT, 30°/149°, CN, UN, RF
	JT, 31°/149°, CN, PR, RF
	JT, 40°/326°, CN, UN, RF
	JT, 50°/242°, FE SN, UN, RF
	JT, 35°/195°, CN, UN, RF
	JT, 50°/317°, RF, CL 2 mm, ST, VR
	JT, 28°/335°, CN, ST, RF
	JT, 22°/261°, CHL, CL VN, UN, RF
	JT, 40°/074°, CN, ST, RF
	JT, 31°/-, CN, ST, RF
	JT, 46°/-, CN, UN, RF
	JT, 28°/-, RF, FE 1 mm, UN, RF
	JT, 50°/-, FE SN, IR, RF
	JT, 30°/-, RF, CL 1 mm, UN, RF
	JT, 40°/-, CN, UN, RF
	CZ, 60°/-, RF, CL 30 mm, ST, RF
	JT, 30°/-, CN, UN, RF
	JT, 25°/-, CN, ST, RF

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3 - Wireline core (61.0 mm)
PQ3 - Wireline core (83.0 mm)
SPT - Standard penetration test
PT - Push tube

Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Testing Type
UCS - Unconfined Compressive Strength
TXL - Triaxial Shear Test
DS - Direct Shear Test
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STS - Splitting Tensile Strength
DEN - Density
CER - Cerchar Abrasivity
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Weathering
XW - Extremely Weathered
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SW - Slightly Weathered
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Strength
VL - Very Low
L - Low
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VH - Very High
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Defect Type
FT - Fault
SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
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IS - Infilled Seam
JT - Joint
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CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock Fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous
CHL - Chlorite
ZE - Zeolite
SE - Sericite
MG - Manganese
SU - Sulphide
SI - Silicate
PY - Pyrite

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	AT
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455288.7 m E 5316706.3 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-76°	RL Surface:	344.16 m	Drilled:	11/04/2023 - 13/04/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	308°	Datum:	AHD	Operator:	TDS

Drilling Information

Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)
HQ3		73				
		25				
		0				
		0			314.1	31
		25				
		83			313.1	32
		69			312.1	33
		31			311.2	34
		33			310.2	

Rock Substance

Graphic Log	Material Description ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components	Weathering (XW HW MW SW FR)	Strength Is(50) ● - Axial ○ - Diametral (VL 0.1 L 0.3 M 1 H 3 VH 10 EH)
	DOLERITE: medium grained, dark blue grey and brown, massive texture. Iron oxide veins up to 1 mm thick, moderately to steeply inclined to core axis, spaced up to 200 mm.		
△ △	DOLERITE FAULT GOUGE: medium plasticity, light orange brown. Fine to coarse grained gravel size clasts, angular to sub angular. Matrix supported, clast to matrix ratio 10:90.		
	DOLERITE: medium grained, orange brown, massive texture. Presence of healed defects, spaced up to 100 mm.		
	Becoming blue grey and orange brown. Healed defects no longer present. Iron oxide and calcite veins up to 5 mm thick, moderately inclined to core axis, spaced up to 500 mm.		
△ △	DOLERITE FAULT BRECCIA: light and dark brown, brecciated, medium to coarse grained gravel sized clasts, angular to sub-angular. Clay matrix, medium plasticity. Matrix supported, clast to matrix ratio: 30:70. Highly altered.		
	DOLERITE: medium grained, dark blue grey and orange brown, massive texture. Presence of healed defects, typically spaced up to 150 mm. Iron oxide veins up to 2 mm thick, moderately to steeply inclined to core axis, spaced up to 150 mm.		

Rock Mass Defects

Defect Spacing (mm) (<20 60 200 600 1000)	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, thickness, shape, roughness, other
	JT, 22°/-, CN, UN, RF
	JT, 40°/-, CN, UN, RF
	JT, 30°/-, QZ, RF 1 mm, UN, RF
	JT, 22°/-, CN, UN, RF
	JT, 60°/-, FE SN, UN, RF
	JT, 60°/-, FE SN, UN, RF
	JT, 42°/-, FE, CL 1 mm, UN, RF
	JT, 50°/-, FE, CHL SN, UN, RF
	JT, 50°/-, FE, CHL SN, UN, RF
	JT, 50°/-, FE, CHL VN, UN, RF
	JT, 32°/-, CN, UN, RF
	JT, 31°/-, CN, UN, RF
	JT, 34°/-, CN, UN, RF
	JT, 52°/-, FE, QZ 1 mm, UN, RF
	JT, 70°/-, QZ, FE 2 mm, UN, RF
	JT, 22°/-, CN, UN, RF
	SS, 68°/-, RF, CL 6 mm, ST, RF
	CZ, 70°/-, RF, CL 60 mm, ST, RF
	SZ, 71°/-, CL, RF 50 mm, UN, RF
	JT, 40°/-, FE, CHL SN, UN, RF
	JT, 28°/-, FE SN, PR, RF
	JT, 50°/-, FE SN, UN, RF
	JT, 68°/-, FE SN, UN, RF
	JT, 42°/-, CHL, FE VN, UN, RF
	JT, 53°/-, CN, UN, RF
	JT, 40°/-, RF 1 mm, UN, RF

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3 - Wireline core (61.0 mm)
PQ3 - Wireline core (83.0 mm)
SPT - Standard penetration test
PT - Push tube

Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Testing Type
UCS - Unconfined Compressive Strength
TXL - Triaxial Shear Test
DS - Direct Shear Test
PET - Petrography
STS - Splitting Tensile Strength
DEN - Density
CER - Cerchar Abrasivity
SS - Sodium Sulphate Soundness
M - Moisture Content
SD - Slake Durability
LA - Los Angeles Abrasion
ISS - In Situ Stress
PP - Pocket Penetrometer

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock Fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous
CHL - Chlorite
ZE - Zeolite
SE - Sericite
MG - Manganese
SU - Sulphide
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PY - Pyrite

Roughness
SL - Slickensided
POL - Polished
S - Smooth
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Shape
PR - Planar
CU - Curved
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Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	AT
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455288.7 m E 5316706.3 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-76°	RL Surface:	344.16 m	Drilled:	11/04/2023 - 13/04/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	308°	Datum:	AHD	Operator:	TDS

Drilling Information / Rock Substance / Rock Mass Defects

Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)	Graphic Log	Material Description ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components	Weathering (XW HW MW SW FR)	Strength Is(50) ● - Axial ○ - Diametral (VL 0.1 L 0.3 M 1 H 3 VH 10 EH)	Defect Spacing (mm) (<20 60 200 600 1000)	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, thickness, shape, roughness, other
HQ3		33						DOLERITE: medium grained, dark blue grey and orange brown, massive texture. Presence of healed defects, spaced up to 150 mm.	SW	○		JT, 66°/091°, CHL 1 mm, UN, RF
		100	Is(50) d=5.96 MPa		309.2	36		Becoming dark blue grey, evidence of healed defects no longer present.	SW	○		
								Becoming dark blue grey and orange brown. Iron oxide and calcite veins up to 5 mm thick, perpendicular to steeply inclined, spaced up to 200 mm.	SW	○		JT, 11°/104°, CN, UN, RF
					308.3	37			SW	○		JT, 52°/294°, FE SN, UN, RF
		93							SW	○		JT, 31°/251°, FE SN, UN, RF
									SW	○		JT, 33°/193°, CN, UN, RF
									SW	○		JT, 30°/147°, CHL, CL 1 mm, ST, RF
									SW	○		JT, 40°/332°, CL 1 mm, ST, RF
									SW	○		JT, 39°/343°, CN, UN, RF
					307.3	38		Becoming dark blue grey. Calcite and trace quartz veins up to 1 mm thick, moderately to steeply inclined to core axis, spaced up to 900 mm.	SW	○		
									SW	○		JT, 29°/102°, QZ VN, IR, RF
		97			306.3	39		50 mm dark blue grey and orange brown zone.	SW	○		JT, 12°/037°, FE SN, UN, RF
			Is(50) d>9.07 MPa						SW	○		JT, 30°/158°, QZ VN, UN, RF
					305.3			Borehole Terminated at 39.70 m Target depth. Televiewer survey conducted. Open standpipe installed.				

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Method
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HQ3 - Wireline core (61.0 mm)
PQ3 - Wireline core (83.0 mm)
SPT - Standard penetration test
PT - Push tube

Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Testing Type
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TXL - Triaxial Shear Test
DS - Direct Shear Test
PET - Petrography
STS - Splitting Tensile Strength
DEN - Density
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M - Moisture Content
SD - Slake Durability
LA - Los Angeles Abrasion
ISS - In Situ Stress
PP - Pocket Penetrometer

Weathering
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HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
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SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
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Infilling/Coating
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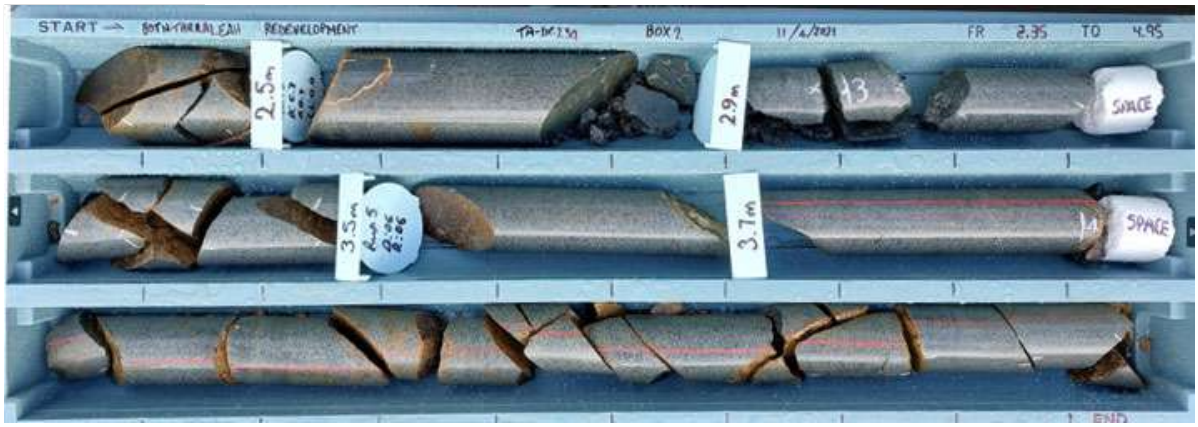
SN - Stain
VN - Veneer
CO - Coating
RF - Rock Fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous
CHL - Chlorite
ZE - Zeolite
SE - Sericite
MG - Manganese
SU - Sulphide
SI - Silicate
PY - Pyrite

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

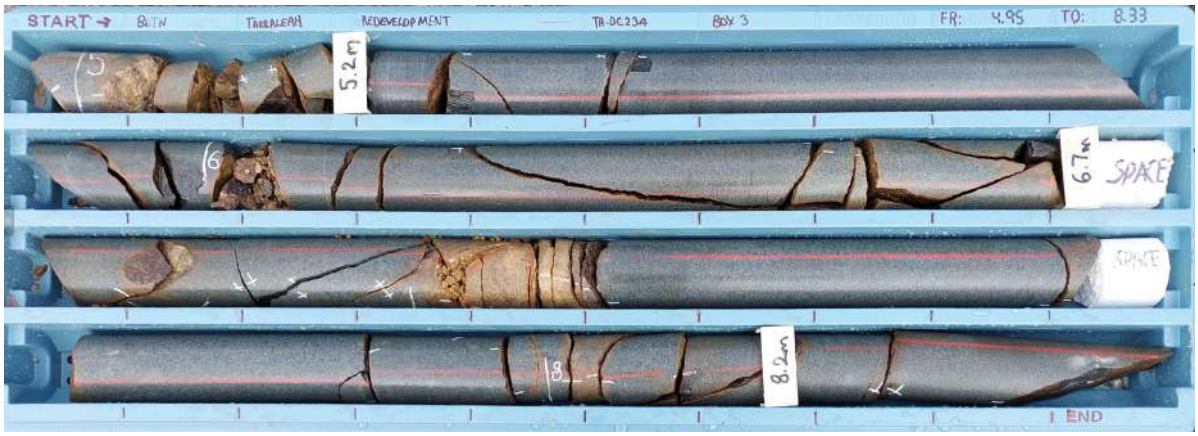
Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

TA-DC234 Tray 1 Depth Range: 0.00 - 2.35 m

TA-DC234 Tray 2 Depth Range: 2.35 - 4.95 m



TA-DC234 Tray 3 Depth Range: 4.95 - 8.35 m



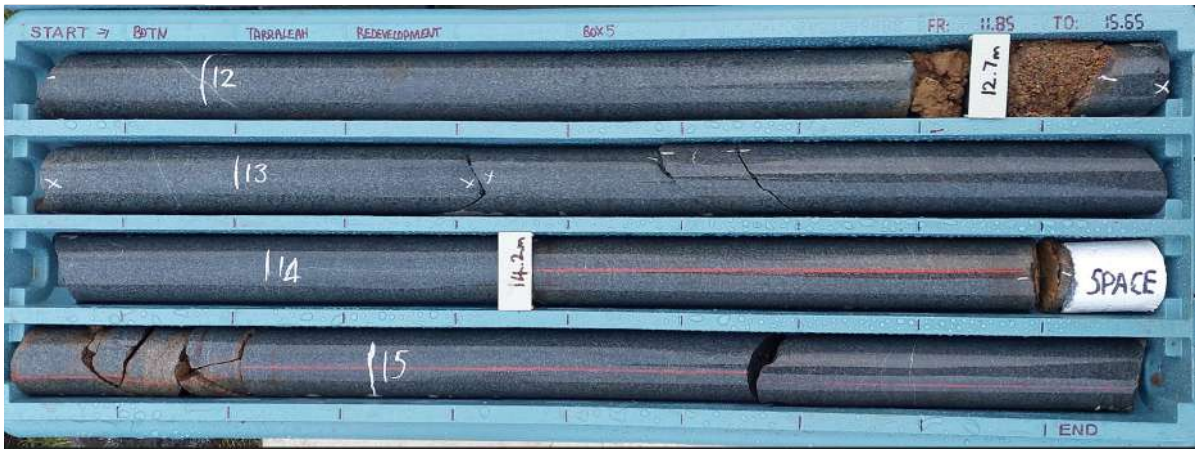
Notes:

1. Photos not to scale

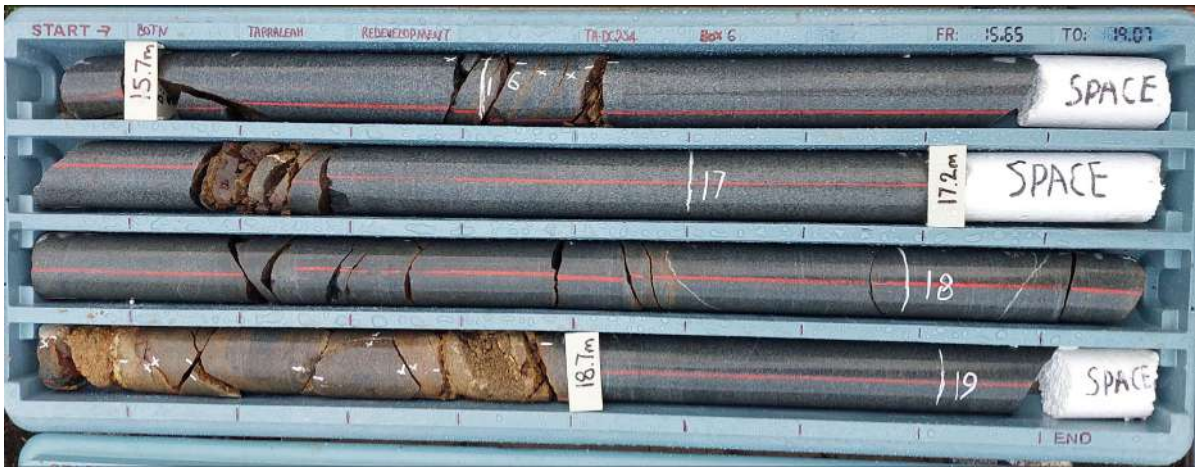
Hydro Tasmania
BoTN - Tarraleah Redevelopment
Tarraleah Switchyard
Reference Design - Site Investigation
TA-DC234

TA-DC234 Tray 4 Depth Range: 8.35 - 11.85 m

TA-DC234 Tray 5 Depth Range: 11.85 - 15.65 m



TA-DC234 Tray 6 Depth Range: 15.65 - 19.05 m

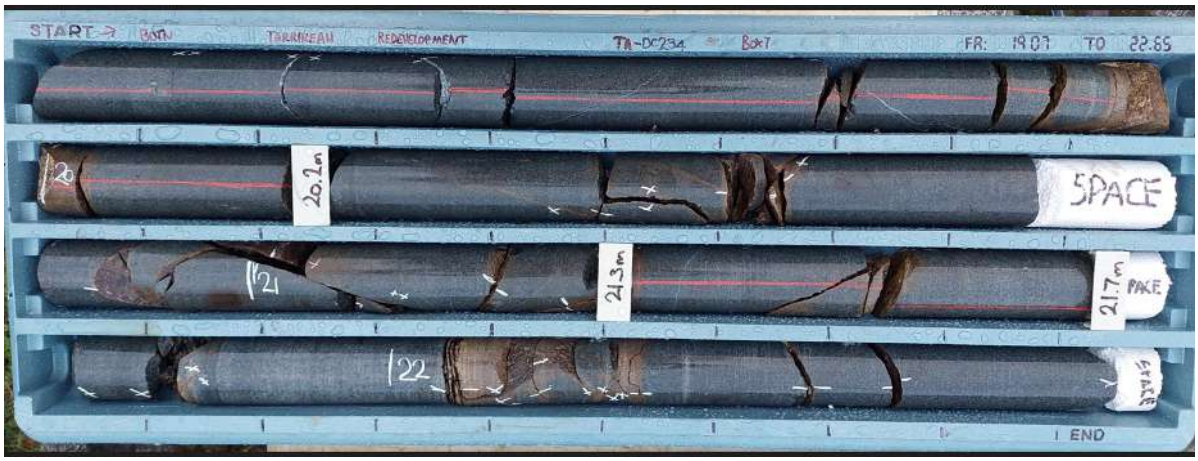


Notes:

1. Photos not to scale

Hydro Tasmania
BoTN - Tarraleah Redevelopment
Tarraleah Switchyard
Reference Design - Site Investigation
TA-DC234

TA-DC234 Tray 7 Depth Range: 19.05 - 22.65 m



TA-DC234 Tray 8 Depth Range: 22.65 - 26.10 m

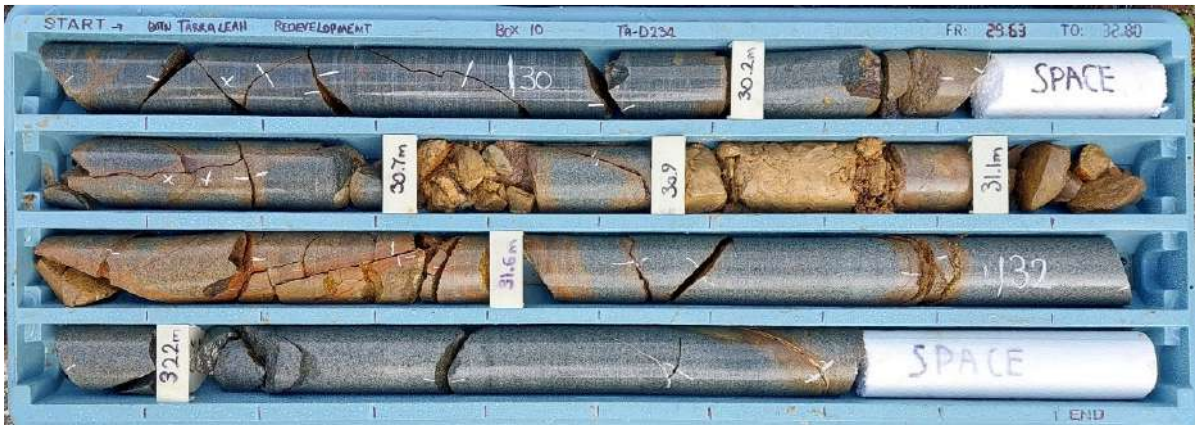
TA-DC234 Tray 9 Depth Range: 26.10 - 29.65 m

Notes:

1. Photos not to scale

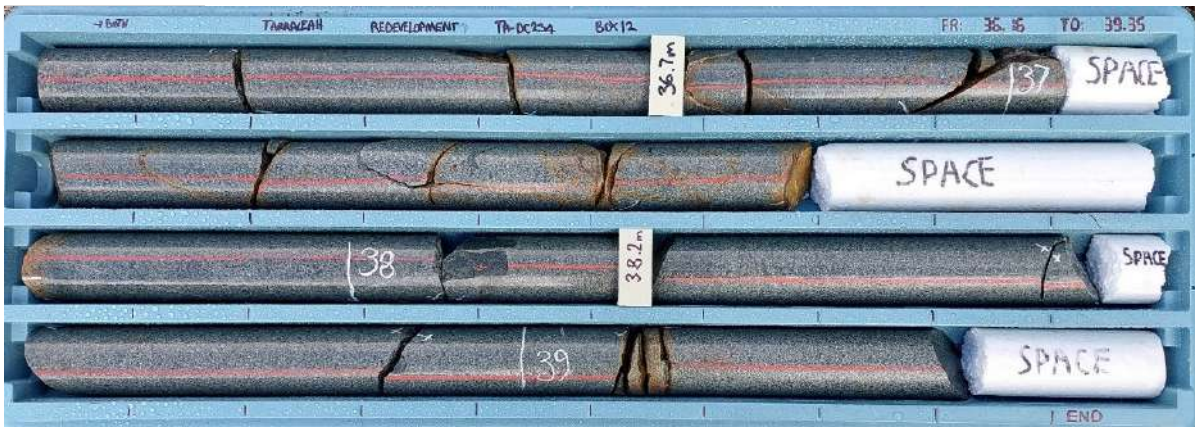
Hydro Tasmania
BoTN - Tarraleah Redevelopment
Tarraleah Switchyard
Reference Design - Site Investigation
TA-DC234

TA-DC234 Tray 10 Depth Range: 29.65 - 32.80 m



TA-DC234 Tray 11 Depth Range: 32.80 - 36.15 m

TA-DC234 Tray 12 Depth Range: 36.15 - 39.35 m



Notes:

1. Photos not to scale

Hydro Tasmania
BoTN - Tarraleah Redevelopment
Tarraleah Switchyard
Reference Design - Site Investigation
TA-DC234

TA-DC234 Tray 13 Depth Range: 39.35 - 39.70 m

Notes:

1. Photos not to scale

Hydro Tasmania
BoTN - Tarraleah Redevelopment
Tarraleah Switchyard
Reference Design - Site Investigation
TA-DC234

Engineering Log - Cored Borehole - Soil

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	JK
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455317.0 m E 5316688.8 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-79°	RL Surface:	343.97 m	Drilled:	14/03/2023 - 17/03/2023
Hole Diameter:	122 mm	Bearing (TN):	041°	Datum:	AHD	Operator:	TDS

Drilling Information						Soil Description					Observations
Method	Support	Water	Samples Tests Remarks	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: plasticity/particle size, colour, secondary and minor components	Moisture Condition	Consistency / Relative Density	Hand Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
PQ3	C	14/03/2024		343.0	1			Vacuum Drilled: 1500 mm.				Inferred FILL
				342.0	2			FILL: GRAVEL with cobbles, trace clay: medium to coarse grained, angular to sub-angular, orange brown and blue grey. Cobbles are sub-rounded to sub-angular, composed of concrete. Clay has moderate plasticity.				
								NO CORE: 100 mm.				
								FILL: Gravelly CLAY: moderate plasticity, dark brown, soft. Gravel is medium to coarse grained, angular to sub-angular composed of basalt and dolerite.				
								NO CORE: 400 mm.				
				341.0	3		GW	GRAVEL with trace cobbles: medium to coarse grained, angular to rounded, blue grey and orange grey, composed of dolerite. Cobbles are sub-angular to sub-rounded, composed of slightly weathered, high strength dolerite.	M	MD		Inferred ALLUVIUM
								NO CORE: 100 mm.				
								COBBLES with gravels and boulders: angular to sub-angular, blue grey and orange brown, composed of slightly weathered, high strength dolerite. Gravel is medium to coarse grained, sub-angular to rounded. Boulders are composed of slightly weathered, high strength dolerite.		VD		
				340.0	4		GC		M			
							GP	Clayey GRAVEL with trace sand: medium to coarse grained, angular to sub-rounded, blue grey and orange brown. Clay is low plasticity, soft. Sand is fine grained.				
								GRAVEL with cobbles: coarse grained, angular to sub-rounded, blue grey and orange brown. Cobbles are angular to sub-rounded, composed of slightly weathered, high strength dolerite.		MD		
				339.1				NO CORE: 200 mm.				

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
SPT - Standard penetration test
PT - Push tube
AS - Auger Screwing
HFA - Hollow Flight Auger
PQ3 - PQ3 Core Barrel
HQ3 - HQ3 Core Barrel

Water
Inflow
Partial Loss
Complete Loss
Level (Date)
Static Level (Date)

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
LB - Large Disturbed Sample
PSD - Particle Size Distribution
ATT - Atterberg
PT - Push Tube
SS - Split Spoon
B - Bulk Sample
PP - Pocket Penetrometer

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
VS - Very soft
S - Soft
F - Firm
St - Stiff
VSt - Very stiff
H - Hard
Fr - Friable
VL - Very loose
L - Loose
MD - Medium dense
D - Dense
VD - Very dense

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Engineering Log - Cored Borehole - Soil

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	JK
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455317.0 m E 5316688.8 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-79°	RL Surface:	343.97 m	Drilled:	14/03/2023 - 17/03/2023
Hole Diameter:	122 mm	Bearing (TN):	041°	Datum:	AHD	Operator:	TDS

Drilling Information						Soil Description					Observations
Method	Support	Water	Samples Tests Remarks	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: plasticity/particle size, colour, secondary and minor components	Moisture Condition	Consistency / Relative Density	Hand Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
PQ3	C			338.1	0.0		GP	GRAVEL with cobbles: medium to coarse grained, angular to rounded, blue grey and orange brown, composed of slightly weathered to fresh dolerite. Cobbles are angular to sub-rounded, composed of slightly weathered, high strength dolerite.	M	MD		
								Continued on cored borehole - rock sheet				
				337.1	6.0							
				336.1	7.0							
				335.1	8.0							
				334.2	9.0							

Method
- AD/T - Auger drilling TC bit
- AD/V - Auger drilling V bit
- WB - Washbore
- SPT - Standard penetration test
- PT - Push tube
- AS - Auger Screwing
- HFA - Hollow Flight Auger
- PQ3 - PQ3 Core Barrel
- HQ3 - HQ3 Core Barrel

Water
- Inflow
- Partial Loss
- Complete Loss
- Level (Date)
- Static Level (Date)

Samples and Tests
- U - Undisturbed Sample
- D - Disturbed Sample
- SPT - Standard Penetration Test
- LB - Large Disturbed Sample
- PSD - Particle Size Distribution
- ATT - Atterberg
- PT - Push Tube
- SS - Split Spoon
- B - Bulk Sample
- PP - Pocket Penetrometer

Moisture Condition
- D - Dry
- M - Moist
- W - Wet

Consistency/Relative Density
- VS - Very soft
- S - Soft
- F - Firm
- St - Stiff
- VSt - Very stiff
- H - Hard
- Fr - Friable
- VL - Very loose
- L - Loose
- MD - Medium dense
- D - Dense
- VD - Very dense

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	JK
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455317.0 m E 5316688.8 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-79°	RL Surface:	343.97 m	Drilled:	14/03/2023 - 17/03/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	041°	Datum:	AHD	Operator:	TDS

Drilling Information							Rock Substance					Rock Mass Defects	
Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)	Graphic Log	Material Description ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components	Weathering XW HW MW SW FR	Strength Is(50) ● - Axial ○ - Diametral VL 0.1 L 0.3 M 1 H 3 VH 10 EH	Defect Spacing (mm) <20 60 200 600 1000	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, thickness, shape, roughness, other
								Continued from cored borehole - soil sheet				
PQ3		100			338.1	6		DOLERITE: medium grained, dark blue grey, massive texture. Presence of healed defects. Iron oxide and trace quartz veins up to 1 mm thick, perpendicular to moderately inclined to core axis, spaced up to 300 mm.	SW	H		Inferred TOP OF ROCK - JURASSIC DOLERITE JT, 31°/-, CL 1 mm, PR, RF JT, 36°/-, CL VN, ST, RF
		90						Evidence of healed defects no longer present.				JT, 24°/-, CL VN, IR, RF JT, 10°/-, CL VN, PR, RF
		0						NO CORE: 150 mm.				
HQ3		71			337.1	7		DOLERITE: medium grained, dark blue grey, massive texture. Iron oxide and trace quartz veins up to 1 mm thick, perpendicular to moderately inclined to core axis, spaced up to 400 mm.		VH		FZ, 10°/-, RF 290 mm, PR, RF JT, 55°/-, FE SN, PR, RF JT, 29°/-, FE SN, PR, RF JT, 11°/-, FE SN, PR, RF
		90			336.1	8			SW			JT, 05°/-, FE SN, PR, RF JT, 10°/-, FE SN, ST, RF
		83			335.1	9						JT, 05°/354°, Z VN, PR, RF JT, 33°/121°, FE SN, PR, RF JT, 21°/090°, FE SN, PR, RF JT, 20°/099°, CL, FE VN, PR, RF JT, 52°/058°, CL, FE VN, UN, S JT, 12°/246°, CN, PR, RF VN, 67°/073°, CL, FE VN, UN, S
		83			334.2							JT, 15°/134°, FE SN, PR, RF JT, 41°/328°, FE SN, PR, RF JT, 38°/139°, FE SN, PR, RF

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Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Testing Type
UCS - Unconfined Compressive Strength
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XW - Extremely Weathered
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Strength
VL - Very Low
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FT - Fault
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SZ - Shear Zone
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JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

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VN - Veneer
CO - Coating
RF - Rock Fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous
CHL - Chlorite
ZE - Zeolite
SE - Sericite
MG - Manganese
SU - Sulphide
SI - Silicate
PY - Pyrite

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	JK
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455317.0 m E 5316688.8 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-79°	RL Surface:	343.97 m	Drilled:	14/03/2023 - 17/03/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	041°	Datum:	AHD	Operator:	TDS

Drilling Information

Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)
HQ3		83			333.2	11
		90			332.2	12
		60			331.2	13
					330.2	14
		60			329.2	

Rock Substance

Graphic Log	Material Description ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components	Weathering (XW HW MW SW FR)	Strength Is(50) ● - Axial ○ - Diametral (VL 0.1 L 0.3 M 1 H 3 VH 10 EH)
	DOLERITE: medium grained, dark blue grey, massive texture.		
	Iron oxide and quartz veins up to 1 mm thick, perpendicular to steeply oriented to core axis, spaced up to 300 mm.		
	Presence of healed defects.		
	Becoming dark blue grey and orange brown.		
	100 mm orange brown zone.		
	Becoming brown.		

Rock Mass Defects

Defect Spacing (mm) (<20 60 200 600 1000)	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, thickness, shape, roughness, other
	JT, 14°/-, FE SN, PR, RF
	JT, 63°/-, FE, CL SN, PR, RF
	JT, 03°/354°, FE, CL SN, PR, S
	JT, 12°/341°, FE SN, PR, RF
	JT, 08°/354°, FE SN, CU, RF
	JT, 70°/073°, FE SN, PR, VR
	JT, 73°/055°, FE, MG SN, CU, RF
	JT, 03°/332°, FE SN, PR, RF
	JT, 25°/148°, FE SN, PR, RF
	JT, 04°/213°, FE, Z SN, IR, RF
	JT, 16°/058°, FE SN, PR, RF
	JT, 09°/-, CL VN, PR, S
	JT, 19°/-, FE SN, PR, VR
	JT, 20°/-, CL VN, PR, S
	JT, 32°/-, FE SN, CU, VR
	JT, 25°/-, FE SN, UN, RF
	FZ, 28°/-, RF 450 mm, PR, RF
	CZ, 28°/-, RF, CL 100 mm, IR, RF

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3 - Wireline core (61.0 mm)
PQ3 - Wireline core (83.0 mm)
SPT - Standard penetration test
PT - Push tube

Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Testing Type
UCS - Unconfined Compressive Strength
TXL - Triaxial Shear Test
DS - Direct Shear Test
PET - Petrography
STS - Splitting Tensile Strength
DEN - Density
CER - Cerchar Abrasivity
SS - Sodium Sulphate Soundness
M - Moisture Content
SD - Slake Durability
LA - Los Angeles Abrasion
ISS - In Situ Stress
PP - Pocket Penetrometer

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock Fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous
CHL - Chlorite
ZE - Zeolite
SE - Sericite
MG - Manganese
SU - Sulphide
SI - Silicate
PY - Pyrite

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	JK
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455317.0 m E 5316688.8 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-79°	RL Surface:	343.97 m	Drilled:	14/03/2023 - 17/03/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	041°	Datum:	AHD	Operator:	TDS

Drilling Information

Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)
HQ3		60			328.3	16
		13			327.3	17
		0			326.3	18
		46			325.3	19
		50			324.3	

Rock Substance

Graphic Log	Material Description ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components	Weathering XW HW MW SW FR	Strength Is(50) ● - Axial ○ - Diametral VL 0.1 L 0.3 M 1 H 3 VH 10 EH
	DOLERITE: medium grained, green brown and grey, massive texture. Presence of healed defects. Iron oxide and quartz veins up to 5 mm thick, moderately inclined to core axis, spaced up to 100 mm.		
	Healed defects increasing in abundance.		
	DOLERITE FAULT BRECCIA: yellow brown, brecciated, fine to coarse grained, sub-angular to sub rounded. Clay matrix, medium plasticity. Matrix supported, clast to matrix ratio 65:35. Highly altered.		
	DOLERITE: medium grained, red brown and green grey, massive texture. Presence of healed defects. Iron oxide, zeolite or trace quartz veins up to 20 mm, moderately to steeply inclined to core axis, spaced up to 200 mm.		

Rock Mass Defects

Defect Spacing (mm) <20 60 200 600 1000	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, thickness, shape, roughness, other
	JT, 64°/-, FE SN, PR, VR
	JT, 64°/-, FE SN, PR, VR
	JT, 64°/-, FE SN, PR, VR
	JT, 50°/-, FE SN, PR, S
	JT, 60°/-, FE SN, PR, VR
	CZ, 40°/-, RF, Z 20 mm, IR, VR
	CZ, 06°/-, CL 8 mm, IR, VR
	VN, 45°/-, ZE VN, PR, VR
	CZ, 47°/-, RF, CL 80 mm, PR, RF
	JT, 33°/-, FE SN, PR, VR
	JT, 33°/-, FE SN, PR, VR
	JT, 33°/-, FE SN, PR, VR
	JT, 33°/-, FE SN, PR, VR
	JT, 33°/-, FE SN, PR, VR
	JT, 33°/-, FE SN, PR, VR
	JT, 33°/-, FE SN, PR, VR
	SS, 25°/-, CL 10 mm, PR, VR
	FZ, 17°/-, RF 860 mm, PR, RF
	SZ, 30°/-, RF, CL 290 mm, CU, RF
	SZ, 19°/-, RF, CL 420 mm, PR, RF
	SS, 10°/-, CL 5 mm, PR, RF
	VN, 70°/-, QZ, CL 4 mm, PR, RF
	VN, 60°/-, QZ, CL 1 mm, PR, VR
	SS, 61°/-, CL, FE VN, PR, SL
	JT, 40°/-, RF 3 mm, PR, VR
	JT, 39°/-, RF, CL 2 mm, PR, RF
	CZ, 19°/-, RF, CL 70 mm, IR, RF
	SS, 62°/-, CL 3 mm, CU, RF
	JT, 55°/-, S, FE VN, PR, S
	JT, 61°/-, FE, MG SN, PR, S

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3 - Wireline core (61.0 mm)
PQ3 - Wireline core (83.0 mm)
SPT - Standard penetration test
PT - Push tube

Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Testing Type
UCS - Unconfined Compressive Strength
TXL - Triaxial Shear Test
DS - Direct Shear Test
PET - Petrography
STS - Splitting Tensile Strength
DEN - Density
CER - Cerchar Abrasivity
SS - Sodium Sulphate Soundness
M - Moisture Content
SD - Slake Durability
LA - Los Angeles Abrasion
ISS - In Situ Stress
PP - Pocket Penetrometer

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock Fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous
CHL - Chlorite
ZE - Zeolite
SE - Sericite
MG - Manganese
SU - Sulphide
SI - Silicate
PY - Pyrite

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	JK
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455317.0 m E 5316688.8 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-79°	RL Surface:	343.97 m	Drilled:	14/03/2023 - 17/03/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	041°	Datum:	AHD	Operator:	TDS

Drilling Information

Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)
HQ3		50			323.4	21
		59			322.4	22
		28			321.4	23
		72			320.4	24
		54			319.4	

Rock Substance

Graphic Log

Material Description
ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components

DOLERITE: medium grained, red brown and green grey, massive texture. Presence of healed defects. Iron oxide, zeolite or trace quartz veins up to 15 mm, moderately inclined to parallel to core axis, spaced up to 400 mm.

Becoming red brown and dark blue grey.

Becoming orange brown.

DOLERITE FAULT BRECCIA: pale yellow brown, brecciated, fine to medium grained gravel in clay matrix. Matrix supported, clast to matrix ratio 80:20. Highly altered.

DOLERITE: medium grained, red brown and grey brown, massive texture. Presence of healed defects. Iron oxide, zeolite and trace quartz veins up to 5 mm thick, moderately to steeply inclined to core axis, spaced up to 400 mm.

Weathering: XW HW MW SW FR

Strength Is(50) ● - Axial ○ - Diametral: VL 0.1 L 0.3 M 1 H 3 VH 10 EH

Rock Mass Defects

Defect Spacing (mm): <20 60 200 600 1000

Defect Descriptions / Comments
Description, alpha/beta, infilling or coating, thickness, shape, roughness, other

- JT, 09°/-, CL VN, PR, RF
- VN, 82°/-, QZ VN, UN, S
- JT, 18°/-, CL VN, CU, RF
- JT, 10°/-, CL, S VN, PR, RF
- JT, 11°/-, CL VN, PR, RF
- JT, 13°/-, CL, S VN, PR, RF
- JT, 10°/-, FE SN, PR, S
- JT, 10°/-, FE SN, IR, VR
- JT, 08°/-, FE, CL SN, PR, S
- JT, 15°/-, CL VN, PR, RF
- JT, 31°/-, CL, S VN, PR, RF
- JT, 16°/-, S, CL VN, PR, RF
- JT, 39°/-, CL, S VN, PR, RF
- JT, 30°/-, S, CL VN, CU, RF
- CZ, 20°/-, RF, S 40 mm, IR, RF
- FZ, 41°/-, RF, S 50 mm, PR, RF
- SZ, 48°/-, CL, RF 200 mm, IR, RF
- JT, 65°/-, CL, RF 2 mm, PR, RF
- VN, 76°/-, RF, S 2 mm, UN, RF
- JT, 40°/-, FE, CL SN, IR, RF
- JT, 62°/-, FE, MG SN, PR, RF
- JT, 70°/-, RF, S VN, IR, RF
- JT, 52°/-, CL VN, PR, RF
- JT, 38°/-, CL, S VN, CU, VR
- JT, 56°/-, FE, MG SN, CU, VR
- JT, 63°/-, Z VN, PR, RF

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3 - Wireline core (61.0 mm)
PQ3 - Wireline core (83.0 mm)
SPT - Standard penetration test
PT - Push tube

Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Testing Type
UCS - Unconfined Compressive Strength
TXL - Triaxial Shear Test
DS - Direct Shear Test
PET - Petrography
STS - Splitting Tensile Strength
DEN - Density
CER - Cerchar Abrasivity
SS - Sodium Sulphate Soundness
M - Moisture Content
SD - Slake Durability
LA - Los Angeles Abrasion
ISS - In Situ Stress
PP - Pocket Penetrometer

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock Fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous
CHL - Chlorite
ZE - Zeolite
SE - Sericite
MG - Manganese
SU - Sulphide
SI - Silicate
PY - Pyrite

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	JK
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455317.0 m E 5316688.8 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-79°	RL Surface:	343.97 m	Drilled:	14/03/2023 - 17/03/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	041°	Datum:	AHD	Operator:	TDS

Drilling Information

Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)
HQ3		54			318.4	26
		87			317.5	27
		64			316.5	28
		37			315.5	29
		50			314.5	

Rock Substance

Graphic Log

Material Description
ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components

Weathering: XW HW MW SW FR

Strength Is(50) ● - Axial ○ - Diametral: VL 0.1 L 0.3 M 1 H 3 VH 10 EH

DOLERITE: medium grained, brown and green grey, massive texture. Presence of healed defects. Iron oxide, zeolite or trace quartz veins up to 20 mm, moderately to steeply inclined to core axis, spaced up to 200 mm.

Becoming dark blue grey and orange brown.

Becoming red brown and grey brown. Increased abundance of healed defects.

Becoming dark blue grey and orange brown.

Rock Mass Defects

Defect Spacing (mm): <20 60 200 600 1000

Defect Descriptions / Comments
Description, alpha/beta, infilling or coating, thickness, shape, roughness, other

- JT, 19°/-, Z, S VN, PR, RF
- CZ, 40°/-, RF, CL 60 mm, PR, S
- JT, 09°/064°, CL VN, PR, VR
- JT, 06°/055°, CL VN, PR, RF
- JT, 51°/321°, CL VN, PR, RF
- CZ, 17°/242°, CL, RF 20 mm, IR, RF
- JT, 15°/189°, FE SN, PR, S
- FZ, 24°/117°, RF 90 mm, PR, RF
- JT, 27°/192°, CL 1 mm, IR, RF
- SS, 56°/345°, CL 1 mm, UN, SL
- FZ, 27°/-, RF 1370 mm, PR, RF
- JT, 25°/-, CL VN, PR, RF

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3 - Wireline core (61.0 mm)
PQ3 - Wireline core (83.0 mm)
SPT - Standard penetration test
PT - Push tube

Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Testing Type
UCS - Unconfined Compressive Strength
TXL - Triaxial Shear Test
DS - Direct Shear Test
PET - Petrography
STS - Splitting Tensile Strength
DEN - Density
CER - Cerchar Abrasivity
SS - Sodium Sulphate Soundness
M - Moisture Content
SD - Slake Durability
LA - Los Angeles Abrasion
ISS - In Situ Stress
PP - Pocket Penetrometer

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock Fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous
CHL - Chlorite
ZE - Zeolite
SE - Sericite
MG - Manganese
SU - Sulphide
SI - Silicate
PY - Pyrite

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	JK
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455317.0 m E 5316688.8 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-79°	RL Surface:	343.97 m	Drilled:	14/03/2023 - 17/03/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	041°	Datum:	AHD	Operator:	TDS

Drilling Information							***Rock Substance***							***Rock Mass Defects***	
Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)	Graphic Log	Material Description ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components	Weathering XW HW MW SW FR	Strength Is(50) ● - Axial ○ - Diametral VL 0.1 L 0.3 M 1 H 3 VH 10 EH	Defect Spacing (mm) <20 60 200 600 1000	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, thickness, shape, roughness, other
HQ3		50						DOLERITE: medium grained, dark blue grey and orange brown, massive texture. Iron oxide veins up to 1 mm thick, perpendicular to moderately inclined to core axis, spaced up to 100 mm.				
					313.5	31		Borehole Terminated at 30.35 m Target depth. Televiewer survey conducted. Open standpipe installed.				
					312.6	32						
					311.6	33						
					310.6	34						
					309.6							

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3 - Wireline core (61.0 mm)
PQ3 - Wireline core (83.0 mm)
SPT - Standard penetration test
PT - Push tube

Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Testing Type
UCS - Unconfined Compressive Strength
TXL - Triaxial Shear Test
DS - Direct Shear Test
PET - Petrography
STS - Splitting Tensile Strength
DEN - Density
CER - Cerchar Abrasivity
SS - Sodium Sulphate Soundness
M - Moisture Content
SD - Slake Durability
LA - Los Angeles Abrasion
ISS - In Situ Stress
PP - Pocket Penetrometer

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock Fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous
CHL - Chlorite
ZE - Zeolite
SE - Sericite
MG - Manganese
SU - Sulphide
SI - Silicate
PY - Pyrite

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

TA-DC235 Tray 1 Depth Range: 0.00 - 2.40 m

TA-DC235 Tray 2 Depth Range: 2.40 - 4.90 m

TA-DC235 Tray 3 Depth Range: 4.90 - 7.60 m

Notes:

1. Photos not to scale

Hydro Tasmania BoTN - Tarraleah Redevelopment Tarraleah Switchyard Reference Design - Site Investigation TA-DC235	
PSM4346	Page 1 of 4

TA-DC235 Tray 4 Depth Range: 7.60 - 11.15 m

TA-DC235 Tray 5 Depth Range: 11.15 - 14.65 m

TA-DC235 Tray 6 Depth Range: 14.65 - 18.15 m

Notes:

1. Photos not to scale

Hydro Tasmania BoTN - Tarraleah Redevelopment Tarraleah Switchyard Reference Design - Site Investigation TA-DC235	
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TA-DC235 Tray 7 Depth Range: 18.15 - 21.35 m

TA-DC235 Tray 8 Depth Range: 21.35 - 24.96 m

TA-DC235 Tray 9 Depth Range: 24.96 - 28.61 m

Notes:

1. Photos not to scale

Hydro Tasmania BoTN - Tarraleah Redevelopment Tarraleah Switchyard Reference Design - Site Investigation TA-DC235	
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TA-DC235 Tray 10 Depth Range: 28.61 - 30.35 m

Notes:

1. Photos not to scale

Hydro Tasmania BoTN - Tarraleah Redevelopment Tarraleah Switchyard Reference Design - Site Investigation TA-DC235	
PSM4346	Page 4 of 4

Engineering Log - Cored Borehole - Soil

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	JK
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455341.4 m E 5316728.5 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-78°	RL Surface:	345.32 m	Drilled:	22/03/2023 - 28/03/2023
Hole Diameter:	122 mm	Bearing (TN):	239°	Datum:	AHD	Operator:	TDS

Drilling Information						Soil Description					Observations
Method	Support	Water	Samples Tests Remarks	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: plasticity/particle size, colour, secondary and minor components	Moisture Condition	Consistency / Relative Density	Hand Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
PQ3	C	28/03/2023 08:03 27/03/2023 10:08 14/03/2024		344.3	1			Vacuum drilled: 800 mm.				Inferred FILL
								COBBLES with gravel: sub-rounded to sub-angular, grey, composed of slightly weathered to fresh, very high strength dolerite. Gravel is medium grained, sub-rounded.	M	MD		Inferred COLLUVIUM. Composition supported by angular clasts. No water return.
								NO CORE: 100 mm.				
				343.4	2			Gravelly COBBLES: sub-rounded to angular, grey, composed of fresh, very high strength dolerite. Gravel is coarse grained, sub-angular to angular.	M	MD VD		
								NO CORE: 800 mm.				
				342.4	3			Gravelly COBBLES with trace boulders: sub-rounded to sub-angular, grey, composed of slightly weathered to fresh, very high strength dolerite. Gravel is medium to coarse grained, sub-angular to angular dolerite. Boulders composed of sub-angular, fresh, very high strength dolerite.	M	MD VD MD		
				341.4	4		GW	Sandy GRAVEL with cobbles: fine to coarse grained, sub-angular to sub-rounded, brown. Sand is fine to coarse grained, sub-rounded. Cobbles are composed of sub-angular, slightly weathered, very high strength dolerite.		D		Inferred ALLUVIUM. Composition matrix supported.
				340.4						MD		Alluvium composition becoming clast supported.

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
SPT - Standard penetration test
PT - Push tube
AS - Auger Screwing
HFA - Hollow Flight Auger
PQ3 - PQ3 Core Barrel
HQ3 - HQ3 Core Barrel

Water
Inflow
Partial Loss
Complete Loss
Level (Date)
Static Level (Date)

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
LB - Large Disturbed Sample
PSD - Particle Size Distribution
ATT - Atterberg
PT - Push Tube
SS - Split Spoon
B - Bulk Sample
PP - Pocket Penetrometer

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
VS - Very soft
S - Soft
F - Firm
St - Stiff
VSt - Very stiff
H - Hard
Fr - Friable
VL - Very loose
L - Loose
MD - Medium dense
D - Dense
VD - Very dense

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Engineering Log - Cored Borehole - Soil

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	JK
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455341.4 m E 5316728.5 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-78°	RL Surface:	345.32 m	Drilled:	22/03/2023 - 28/03/2023
Hole Diameter:	122 mm	Bearing (TN):	239°	Datum:	AHD	Operator:	TDS

Drilling Information						Soil Description					Observations
Method	Support	Water	Samples Tests Remarks	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: plasticity/particle size, colour, secondary and minor components	Moisture Condition	Consistency / Relative Density	Hand Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
PQ3	C			339.5	6			Gravelly COBBLES: sub-rounded to sub-angular, grey, composed of slightly weathered to fresh, very high strength dolerite. Gravel is medium grained, sub-rounded dolerite. *(continued)*		MD		Inferred ALLUVIUM. Composition clast supported.
							GW	GRAVEL with trace sand: fine to coarse grained, sub-rounded to sub-angular dolerite, grey-blue. Sand is coarse grained.				
				338.5	7			Cobbly BOULDERS with trace gravel: sub-angular, grey, composed of fresh, very high strength dolerite. Cobbles are composed of sub-rounded to sub-angular, slightly weathered to fresh, very high strength dolerite. Gravel is fine to coarse grained, sub-angular to sub-rounded dolerite.	M	VD		
				337.5	8							
				336.5	9			Continued on cored borehole - rock sheet				
				335.5								

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
SPT - Standard penetration test
PT - Push tube
AS - Auger Screwing
HFA - Hollow Flight Auger
PQ3 - PQ3 Core Barrel
HQ3 - HQ3 Core Barrel

Water
Inflow
Partial Loss
Complete Loss
Level (Date)
Static Level (Date)

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
LB - Large Disturbed Sample
PSD - Particle Size Distribution
ATT - Atterberg
PT - Push Tube
SS - Split Spoon
B - Bulk Sample
PP - Pocket Penetrometer

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
VS - Very soft
S - Soft
F - Firm
St - Stiff
VSt - Very stiff
H - Hard
Fr - Friable
VL - Very loose
L - Loose
MD - Medium dense
D - Dense
VD - Very dense

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	JK
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455341.4 m E 5316728.5 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-78°	RL Surface:	345.32 m	Drilled:	22/03/2023 - 28/03/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	239°	Datum:	AHD	Operator:	TDS

Drilling Information							***Rock Substance***				***Rock Mass Defects***	
Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)	Graphic Log	Material Description ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components	Weathering XW HW MW SW FR	Strength Is(50) ● - Axial ○ - Diametral VL 0.1 L 0.3 M 1 H 3 VH 10 EH	Defect Spacing (mm) <20 60 200 600 1000	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, thickness, shape, roughness, other
					339.5	6						
					338.5	7						
					337.5	8		Continued from cored borehole - soil sheet				
PQ3		40			336.5	9		DOLERITE: medium grained, dark blue grey, massive texture. Iron oxide veins up to 1 mm thick, perpendicular to moderately inclined to core axis, spaced up to 200 mm.				Inferred TOP OF ROCK - JURASSIC DOLERITE JT, 39°/-, FE SN, PR, VR JT, 34°/-, FE SN, PR, RF JT, 11°/-, FE SN, PR, RF VN, 69°/-, QZ, FE VN, PR, RF JT, 15°/-, FE SN, PR, RF JT, 05°/-, FE, S SN, IR, RF
		28										VN, 78°/-, QZ, FE 4 mm, PR, S
		64										JT, 03°/-, FE SN, PR, RF JT, 15°/-, CN, PR, RF JT, 10°/-, S VN, PR, RF JT, 15°/-, FE SN, PR, RF
		35			335.5							

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3 - Wireline core (61.0 mm)
PQ3 - Wireline core (83.0 mm)
SPT - Standard penetration test
PT - Push tube

Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Testing Type
UCS - Unconfined Compressive Strength
TXL - Triaxial Shear Test
DS - Direct Shear Test
PET - Petrography
STS - Splitting Tensile Strength
DEN - Density
CER - Cerchar Abrasivity
SS - Sodium Sulphate Soundness
M - Moisture Content
SD - Slake Durability
LA - Los Angeles Abrasion
ISS - In Situ Stress
PP - Pocket Penetrometer

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock Fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous
CHL - Chlorite
ZE - Zeolite
SE - Sericite
MG - Manganese
SU - Sulphide
SI - Silicate
PY - Pyrite

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	JK
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455341.4 m E 5316728.5 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-78°	RL Surface:	345.32 m	Drilled:	22/03/2023 - 28/03/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	239°	Datum:	AHD	Operator:	TDS

Drilling Information							***Rock Substance***			***Rock Mass Defects***	
Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)	Graphic Log	Material Description ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components	Weathering (XW HW MW SW FR) / Strength Is(50) ● - Axial ○ - Diametral (VL 0.1 L 0.3 M 1 H 3 VH 10 EH)	Defect Spacing (mm) (<20 60 200 600 1000)	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, thickness, shape, roughness, other
PQ3		35						DOLERITE: medium grained, dark blue grey, massive texture. Iron oxide and quartz veins up to 1 mm thick, moderately to steeply inclined to core axis, spaced up to 200 mm.			FZ, 41°/-, RF 70 mm, IR, RF JT, 61°/-, FE SN, PR, S
		70						Becoming green brown and grey.			JT, 20°/-, FE SN, CU, RF JT, 19°/-, CL VN, PR, RF
		37			334.6	11					JT, 73°/-, FE, MG SN, PR, RF
		76									SZ, 77°/-, RF, CL 15 mm, UN, RF
		54			333.6	12					JT, 08°/-, FE SN, PR, RF CZ, 36°/-, RF, CL 60 mm, IR, RF
		0						Becoming dark blue grey and orange brown.			FZ, 18°/-, RF 50 mm, IR, VR VN, 48°/-, QZ, FE VN, PR, VR
HQ3		0			332.6	13					JT, 39°/-, FE SN, PR, RF Water return after casing off. Inferred drilling induced fracturing associated with change in core diameter size.
								NO CORE: 200 mm.			
		100			331.6	14		DOLERITE: medium grained, dark grey, massive texture. Quartz and possible zeolite veins up to 5 mm thick, steeply inclined to core axis spaced up to 300 mm.			
								Becoming dark grey and orange brown.			
		88						Becoming dark grey.			JT, 30°/-, FE SN, PR, RF
					330.6						Packer test completed: 14.80 m to 19.80 m

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3 - Wireline core (61.0 mm)
PQ3 - Wireline core (83.0 mm)
SPT - Standard penetration test
PT - Push tube

Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Testing Type
UCS - Unconfined Compressive Strength
TXL - Triaxial Shear Test
DS - Direct Shear Test
PET - Petrography
STS - Splitting Tensile Strength
DEN - Density
CER - Cerchar Abrasivity
SS - Sodium Sulphate Soundness
M - Moisture Content
SD - Slake Durability
LA - Los Angeles Abrasion
ISS - In Situ Stress
PP - Pocket Penetrometer

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock Fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous
CHL - Chlorite
ZE - Zeolite
SE - Sericite
MG - Manganese
SU - Sulphide
SI - Silicate
PY - Pyrite

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	JK
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455341.4 m E 5316728.5 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-78°	RL Surface:	345.32 m	Drilled:	22/03/2023 - 28/03/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	239°	Datum:	AHD	Operator:	TDS

Drilling Information / Rock Substance / Rock Mass Defects

Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)	Graphic Log	Material Description ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components	Weathering (XW HW MW SW FR)	Strength Is(50) ● - Axial ○ - Diametral (VL 0.1 L 0.3 M 1 H 3 VH 10 EH)	Defect Spacing (mm) (<20 60 200 600 1000)	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, thickness, shape, roughness, other
HQ3		88	Is(50) d=8.14 MPa	0.4 Lugeons	329.7	16		DOLERITE: medium grained, dark grey, massive texture. Quartz veins up to 1 mm thick, perpendicular to moderately inclined to core axis, spaced up to 1200 mm.				JT, 26°/102°, CA, CHL VN, PR, S JT, 18°/260°, CA VN, PR, RF
		93			328.7	17						
		97			327.7	18		Becoming dark grey and red brown. Vein spacing decreasing to up to 400 mm.				JT, 55°/075°, CA, CHL VN, CU, RF JT, 28°/088°, FE SN, PR, RF JT, 57°/145°, FE SN, PR, RF Packer test completed: 18.30 m to 23.30 m
		51	Is(50) d=1.88 MPa	1.09 Lugeons	326.7	19		Becoming orange brown and green grey.				
		0						DOLERITE FAULT BRECCIA: dark green, brecciated, fine to coarse gravel sized clasts, angular to sub-angular. Clay matrix. Clast supported. Clast to matrix ratio 90:10. Quartz calcite and quartz gypsum stockwork veins up to 10 mm thick. Highly altered, chlorite-white mica-epidote alteration.				1.2 m breccia zone with true thickness: 0.2 m. CZ, RF, CL 300 mm, PR, S
		0			325.8							CZ, 27°/-, RF, CL 80 mm, CU, S CZ, 20°/-, RF, CL 30 mm, IR, RF

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3 - Wireline core (61.0 mm)
PQ3 - Wireline core (83.0 mm)
SPT - Standard penetration test
PT - Push tube

Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Testing Type
UCS - Unconfined Compressive Strength
TXL - Triaxial Shear Test
DS - Direct Shear Test
PET - Petrography
STS - Splitting Tensile Strength
DEN - Density
CER - Cerchar Abrasivity
SS - Sodium Sulphate Soundness
M - Moisture Content
SD - Slake Durability
LA - Los Angeles Abrasion
ISS - In Situ Stress
PP - Pocket Penetrometer

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock Fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous
CHL - Chlorite
ZE - Zeolite
SE - Sericite
MG - Manganese
SU - Sulphide
SI - Silicate
PY - Pyrite

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	JK
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455341.4 m E 5316728.5 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-78°	RL Surface:	345.32 m	Drilled:	22/03/2023 - 28/03/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	239°	Datum:	AHD	Operator:	TDS

Drilling Information

Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)
HQ3		0		1.09 Lugeons	324.8	21
		33			323.8	22
		42			322.8	23
		40			321.8	24
		0			320.9	
		50				
		67				
		0				

Rock Substance

Graphic Log	Material Description ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components	Weathering XW HW MW SW FR	Strength Is(50) ● - Axial ○ - Diametral VL 0.1 L 0.3 M 1 H 3 VH 10 EH
△ △	DOLERITE FAULT BRECCIA: dark green, brecciated, fine to coarse gravel and cobbles sized clasts, angular to sub-angular with clay matrix. Clast supported, clast to matrix ratio 90:10. Quartz calcite and quartz gypsum stockwork veins up to 10 mm thick. Highly altered, chlorite-white mica-epidote alteration.		
	DOLERITE: medium grained, dark blue grey and orange, massive texture. Chlorite, iron oxide and quartz veins up to 10 mm thick, perpendicular to moderately inclined to core axis, spaced up to 300 mm. 150 mm zone with quartz calcite veins spaced up to 20 mm. Becoming dark blue grey and orange brown. Healed defects becoming present. Becoming orange brown and green brown. Healed defects increasing in abundance. Zeolite veins also becoming present up to 20 mm.		

Rock Mass Defects

Defect Spacing (mm) <20 60 200 600 1000	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, thickness, shape, roughness, other
	SS, 60°/-, CHL, CA CO, PR, SL
	CZ, 41°/-, RF, CL 240 mm, CU, S
	CZ, 52°/-, RF, CL 30 mm, PR, S
	CZ, 50°/-, RF, CL 15 mm, IR, RF
	CZ, 31°/-, RF, CL 3 mm, PR, RF
	CZ, 21°/-, CL, RF 30 mm, PR, RF
	CZ, 55°/-, CL 3 mm, PR, RF
	JT, 53°/-, CL VN, CU, RF
	JT, 67°/-, FE SN, PR, RF
	JT, 39°/-, CL, S VN, PR, RF
	JT, 51°/-, FE SN, PR, RF
	VN, 65°/-, QZ 2 mm, PR, RF
	VN, 40°/-, QZ 1 mm, PR, RF
	VN, 79°/-, QZ 2 mm, PR, VR
	JT, 28°/-, QZ, FE VN, PR, RF
	JT, 45°/-, QZ, FE VN, PR, S
	FZ, 25°/-, RF 40 mm, PR, RF
	JT, 22°/-, CL VN, UN, S
	JT, 40°/-, CL VN, PR, S
	JT, 30°/-, CL VN, PR, S
	JT, 60°/-, FE SN, ST, VR
	JT, 22°/-, FE SN, PR, RF
	FZ, RF 100 mm, IR, RF

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3 - Wireline core (61.0 mm)
PQ3 - Wireline core (83.0 mm)
SPT - Standard penetration test
PT - Push tube

Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Testing Type
UCS - Unconfined Compressive Strength
TXL - Triaxial Shear Test
DS - Direct Shear Test
PET - Petrography
STS - Splitting Tensile Strength
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LA - Los Angeles Abrasion
ISS - In Situ Stress
PP - Pocket Penetrometer

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock Fragments
G - Gravel
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CA - Calcite
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QZ - Quartz
X - Carbonaceous
CHL - Chlorite
ZE - Zeolite
SE - Sericite
MG - Manganese
SU - Sulphide
SI - Silicate
PY - Pyrite

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	JK
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455341.4 m E 5316728.5 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-78°	RL Surface:	345.32 m	Drilled:	22/03/2023 - 28/03/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	239°	Datum:	AHD	Operator:	TDS

Drilling Information / Rock Substance / Rock Mass Defects

Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)	Graphic Log	Material Description ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components	Weathering (XW HW MW SW FR)	Strength Is(50) ● - Axial ○ - Diametral (VL 0.1 L 0.3 M 1 H 3 VH 10 EH)	Defect Spacing (mm) (<20 60 200 600 1000)	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, thickness, shape, roughness, other
HQ3		0						NO CORE: 130 mm.*(continued)*				
		0						DOLERITE: medium grained, orange brown and brown grey. Quartz carbonate stockwork veins up to 10 mm thick.				–2.6 m breccia zone with true thickness: 0.8 m.
		12						Becoming dark green grey and brown, massive texture. Presence of healed defects. Quartz carbonate veins up to 5 mm thick, moderately to steeply inclined to core axis, spaced up to 200 mm.				FZ, 15°/-, RF 30 mm, IR, VR CZ, 35°/-, RF, CL 80 mm, IR, VR FZ, 34°/-, RF 10 mm, IR, VR JT, 31°/-, CN, PR, RF JT, 52°/-, CN, PR, RF
					319.9	26		DOLERITE FAULT BRECCIA: fine grained, dark grey green, brecciated, medium to coarse grained, angular gravel sized clasts. Carbonate-quartz matrix supported, clast to matrix ratio 60:40. Highly altered.				
		0						DOLERITE: medium grained, green brown, massive texture. Presence of healed defects. Carbonate-quartz veins up to 10 mm thick, moderately to steeply inclined to core axis, spaced up to 150 mm.				CZ, 10°/-, RF, CL 40 mm, IR, VR JT, 18°/-, CN, PR, RF
		25										CZ, 37°/-, RF, S 10 mm, IR, VR CZ, 65°/-, RF, CL 20 mm, UN, RF
					318.9	27		DOLERITE FAULT BRECCIA: fine grained, dark grey green, brecciated, medium to coarse grained, angular gravel sized clasts. Quartz-carbonate matrix supported, clast to matrix ratio 50:50. Highly altered.				FZ, 11°/-, RF 40 mm, IR, VR
		39	Is(50) d=0.21 MPa					DOLERITE: fine grained, dark grey green, massive texture. Quartz-carbonate stockwork veins up to 20 mm thick, spaced up to 50 mm.		○		FZ, 25°/-, RF 10 mm, ST, RF
		0			317.9	28		Becoming medium grained with iron oxide veins also becoming present. Veins moderately to steeply inclined to core axis. Presence of healed defects.				FZ, 10°/-, RF 90 mm, IR, VR JT, 08°/-, CL CO, IR, RF CZ, 19°/-, RF, CL 120 mm, PR, RF FZ, 13°/-, RF 150 mm, PR, RF JT, 52°/-, CN, PR, RF FZ, 13°/-, RF 10 mm, PR, VR
		0										JT, 15°/-, CL CO, PR, RF CZ, 27°/-, RF, CL 180 mm, PR, RF VN, 15°/-, QZ CO, PR, RF
		35			317.0	29						CZ, 68°/-, RF, S 20 mm, CU, POL FZ, 32°/-, RF 250 mm, PR, S
		19										FZ, 60°/-, RF, S 90 mm, IR, VR JT, 54°/-, CHL, QZ VN, PR, S
					316.0							

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3 - Wireline core (61.0 mm)
PQ3 - Wireline core (83.0 mm)
SPT - Standard penetration test
PT - Push tube

Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Testing Type
UCS - Unconfined Compressive Strength
TXL - Triaxial Shear Test
DS - Direct Shear Test
PET - Petrography
STS - Splitting Tensile Strength
DEN - Density
CER - Cerchar Abrasivity
SS - Sodium Sulphate Soundness
M - Moisture Content
SD - Slake Durability
LA - Los Angeles Abrasion
ISS - In Situ Stress
PP - Pocket Penetrometer

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock Fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous
CHL - Chlorite
ZE - Zeolite
SE - Sericite
MG - Manganese
SU - Sulphide
SI - Silicate
PY - Pyrite

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	JK
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455341.4 m E 5316728.5 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-78°	RL Surface:	345.32 m	Drilled:	22/03/2023 - 28/03/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	239°	Datum:	AHD	Operator:	TDS

Drilling Information

Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)
HQ3		19			315.0	31
		0			314.0	32
		47			313.0	33
		0			312.1	34
		39			311.1	
		67				

Rock Substance

Graphic Log	Material Description ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components	Weathering (XW HW MW SW FR)	Strength Is(50) ● - Axial ○ - Diametral (VL 0.1 L 0.3 M 1 H 3 VH 10 EH)
	DOLERITE: medium grained, grey brown and orange brown, massive texture. Presence of healed defects. Quartz carbonate, chlorite and iron oxide veins up to 5 mm thick, moderately to steeply inclined to core axis, spaced up to 100 mm.		
	DOLERITE FAULT BRECCIA: grey brown and orange brown, brecciated, fine to coarse grained, angular to sub-angular gravel sized clasts in a quartz-carbonate matrix. Clast supported, clast to matrix ratio 80:20. Highly altered.		
	DOLERITE: medium grained, grey brown and orange brown, massive texture. Presence of healed defects. Quartz carbonate, chlorite and iron oxide veins up to 5 mm thick, moderately to steeply inclined to core axis, spaced up to 100 mm.		
	DOLERITE FAULT BRECCIA: grey green and orange brown, brecciated, medium to coarse grained, angular to sub-angular gravel sized clasts in a quartz-carbonate matrix. Clast supported, clast to matrix ratio: 90:10. Highly altered. Quartz-carbonate stockwork veins also present.		
	DOLERITE: medium grained, grey brown, massive texture. Quartz-carbonate veins up to 10 mm thick, steeply inclined to core axis, spaced up to 50 mm.		
	DOLERITE FAULT BRECCIA: orange brown, brecciated, sub-rounded to sub-angular cobble sized clasts and fine to coarse grained, angular to sub-rounded gravel sized clasts. Quartz-carbonate and chlorite matrix, pale cream and blue green. Matrix supported, clast to matrix ratio 60:40. Highly altered.		
	DOLERITE: orange brown and grey, massive texture. Healed defects present. Quartz-carbonate veins up to 5 mm thick, moderately to steeply inclined to core axis, spaced up to 400 mm.		
	Becoming grey and orange brown.		

Rock Mass Defects

Defect Spacing (mm) (<20 60 200 600 1000)	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, thickness, shape, roughness, other
	JT, 31°/-, CA VN, PR, RF
	VN, 62°/-, QZ 3 mm, PR, VR
	VN, 60°/-, QZ 2 mm, PR, VR
	FZ, 22°/-, RF 30 mm, PR, S 2.8 m breccia zone with true thickness: 0.6 m.
	SZ, 62°/-, RF 200 mm, ST, S
	CZ, 20°/-, RF, CL 80 mm, IR, RF
	CZ, 15°/-, RF, CL 20 mm, ST, RF
	CZ, 14°/-, RF, CL 80 mm, IR, RF
	CZ, 05°/-, RF, CL 20 mm, IR, RF
	CZ, 07°/-, RF, CL 30 mm, IR, RF
	CZ, 04°/-, RF, CL 2 mm, IR, RF
	CZ, 07°/-, RF, CL 50 mm, IR, RF
	VN, 39°/-, QZ 3 mm, PR, RF
	CZ, 55°/-, RF, CL 30 mm, IR, RF
	JT, 46°/-, CN, PR, RF
	FZ, 60°/-, RF 140 mm, PR, RF
	JT, 43°/-, FE SN, PR, RF
	Packer test completed: 34.80 m to 39.80 m

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3 - Wireline core (61.0 mm)
PQ3 - Wireline core (83.0 mm)
SPT - Standard penetration test
PT - Push tube

Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Testing Type
UCS - Unconfined Compressive Strength
TXL - Triaxial Shear Test
DS - Direct Shear Test
PET - Petrography
STS - Splitting Tensile Strength
DEN - Density
CER - Cerchar Abrasivity
SS - Sodium Sulphate Soundness
M - Moisture Content
SD - Slake Durability
LA - Los Angeles Abrasion
ISS - In Situ Stress
PP - Pocket Penetrometer

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock Fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous
CHL - Chlorite
ZE - Zeolite
SE - Sericite
MG - Manganese
SU - Sulphide
SI - Silicate
PY - Pyrite

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	JK
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455341.4 m E 5316728.5 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-78°	RL Surface:	345.32 m	Drilled:	22/03/2023 - 28/03/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	239°	Datum:	AHD	Operator:	TDS

Drilling Information

Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)
HQ3		67				
		0				
		58			310.1	36
		37				
		20			309.1	37
		35		0.35 Lugeons		
					308.2	38
		35				
					307.2	39
		40				
		61			306.2	

Rock Substance

Graphic Log	Material Description ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components	Weathering XW HW MW SW FR	Strength Is(50) ● - Axial ○ - Diametral VL 0.1 L 0.3 M 1 H 3 VH 10 EH
	DOLERITE: medium grained, grey and orange brown, massive texture. Iron oxide and chlorite veins up to 2 mm thick, moderately to steeply inclined to core axis, spaced up to 200 mm. Becoming coarse grained.		
	Becoming medium grained, green brown and grey. Quartz-carbonate veins up to 5 mm thick, moderately to steeply inclined to core axis, spaced up to 200 mm.		
	DOLERITE FAULT BRECCIA: green brown and grey, brecciated, medium to coarse grained, angular gravel sized clasts. Quartz-carbonate matrix. Clast supported, clast to matrix ratio 75:25.		
	DOLERITE: medium grained, green brown and grey, massive texture. Quartz-carbonate veins up to 5 mm thick, moderately to steeply inclined to core axis, spaced up to 200 mm. Becoming dark grey and green brown. Presence of healed defects.		
	Becoming blue grey. Quartz-chlorite-calcite veins up to 1 mm thick, moderately to steeply inclined to core axis, spaced up to 200 mm.		
	Becoming blue grey and orange brown. Iron oxide veins also becoming present.		
	Becoming blue grey.		

Rock Mass Defects

Defect Spacing (mm) <20 60 200 600 1000	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, thickness, shape, roughness, other
	JT, 16°/-, FE SN, PR, RF
	JT, 16°/-, FE SN, PR, RF
	JT, 38°/-, CN, PR, RF
	JT, 30°/-, CN, PR, RF
	JT, 56°/-, CN, UN, VR
	JT, 30°/-, CL VN, PR, RF
	JT, 46°/-, CN, CU, RF
	JT, 60°/-, CN, PR, RF
	JT, 21°/-, CN, IR, RF
	CZ, 33°/-, RF, CL 40 mm, IR, S
	JT, 36°/-, CN, IR, RF
	JT, 38°/-, CN, PR, RF
	JT, 13°/-, CN, PR, VR
	JT, 12°/-, CN, PR, RF
	JT, 24°/-, CN, PR, RF
	JT, 15°/-, CN, PR, VR
	JT, 45°/-, CN, PR, S
	JT, 23°/-, CN, PR, RF
	JT, 27°/-, CN, PR, RF
	CZ, 22°/-, RF 40 mm, IR, VR
	JT, 12°/-, CN, CU, RF
	JT, 63°/-, CN, UN, S
	JT, 50°/-, CL CO, CU, S
	JT, 14°/-, CN, PR, RF

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3 - Wireline core (61.0 mm)
PQ3 - Wireline core (83.0 mm)
SPT - Standard penetration test
PT - Push tube

Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Testing Type
UCS - Unconfined Compressive Strength
TXL - Triaxial Shear Test
DS - Direct Shear Test
PET - Petrography
STS - Splitting Tensile Strength
DEN - Density
CER - Cerchar Abrasivity
SS - Sodium Sulphate Soundness
M - Moisture Content
SD - Slake Durability
LA - Los Angeles Abrasion
ISS - In Situ Stress
PP - Pocket Penetrometer

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock Fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous
CHL - Chlorite
ZE - Zeolite
SE - Sericite
MG - Manganese
SU - Sulphide
SI - Silicate
PY - Pyrite

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	JK
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455341.4 m E 5316728.5 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-78°	RL Surface:	345.32 m	Drilled:	22/03/2023 - 28/03/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	239°	Datum:	AHD	Operator:	TDS

Drilling Information							***Rock Substance***			***Rock Mass Defects***	
Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)	Graphic Log	Material Description ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components	Weathering XW HW MW SW FR Strength Is(50) ● - Axial ○ - Diametral VL 0.1 L 0.3 M 1 H 3 VH 10 EH	Defect Spacing (mm) <20 60 200 600 1000	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, thickness, shape, roughness, other
		61			305.2	41		DOLERITE: medium grained, blue grey, massive texture. Quartz-chlorite-calcite veins up to 5 mm thick, moderately inclined to core axis, spaced up to 300 mm.			JT, 22°/-, CA VN, UN, RF JT, 28°/-, CA VN, PR, RF JT, 32°/-, CN, PR, RF JT, 19°/-, CN, PR, RF FZ, 49°/-, RF 30 mm, PR, S
					304.2	42		Borehole Terminated at 41.30 m Target depth. Televiewer survey conducted. Open standpipe installed.			
					303.3	43					
					302.3	44					
					301.3						

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3 - Wireline core (61.0 mm)
PQ3 - Wireline core (83.0 mm)
SPT - Standard penetration test
PT - Push tube

Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Testing Type
UCS - Unconfined Compressive Strength
TXL - Triaxial Shear Test
DS - Direct Shear Test
PET - Petrography
STS - Splitting Tensile Strength
DEN - Density
CER - Cerchar Abrasivity
SS - Sodium Sulphate Soundness
M - Moisture Content
SD - Slake Durability
LA - Los Angeles Abrasion
ISS - In Situ Stress
PP - Pocket Penetrometer

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock Fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous
CHL - Chlorite
ZE - Zeolite
SE - Sericite
MG - Manganese
SU - Sulphide
SI - Silicate
PY - Pyrite

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

TA-DC237 Tray 1 Depth Range: 0.00 - 2.85 m

TA-DC237 Tray 2 Depth Range: 2.85 - 5.40 m

TA-DC237 Tray 3 Depth Range: 5.40 - 7.60 m

Notes:

1. Photos not to scale

Hydro Tasmania
BoTN - Tarraleah Redevelopment
Tarraleah Switchyard
Reference Design - Site Investigation
TA-DC237

TA-DC237 Tray 4 Depth Range: 7.60 - 10.10 m

TA-DC237 Tray 5 Depth Range: 10.10 - 12.30 m

TA-DC237 Tray 6 Depth Range: 12.30 - 15.50 m

Notes:

1. Photos not to scale

Hydro Tasmania
BoTN - Tarraleah Redevelopment
Tarraleah Switchyard
Reference Design - Site Investigation
TA-DC237

TA-DC237 Tray 7 Depth Range: 15.50 - 19.00 m

TA-DC237 Tray 8 Depth Range: 19.00 - 22.40 m

TA-DC237 Tray 9 Depth Range: 22.40 - 25.75 m

Notes:

1. Photos not to scale

Hydro Tasmania
BoTN - Tarraleah Redevelopment
Tarraleah Switchyard
Reference Design - Site Investigation
TA-DC237

TA-DC237 Tray 10 Depth Range: 25.75 - 29.00 m

TA-DC237 Tray 11 Depth Range: 29.00 - 32.50 m

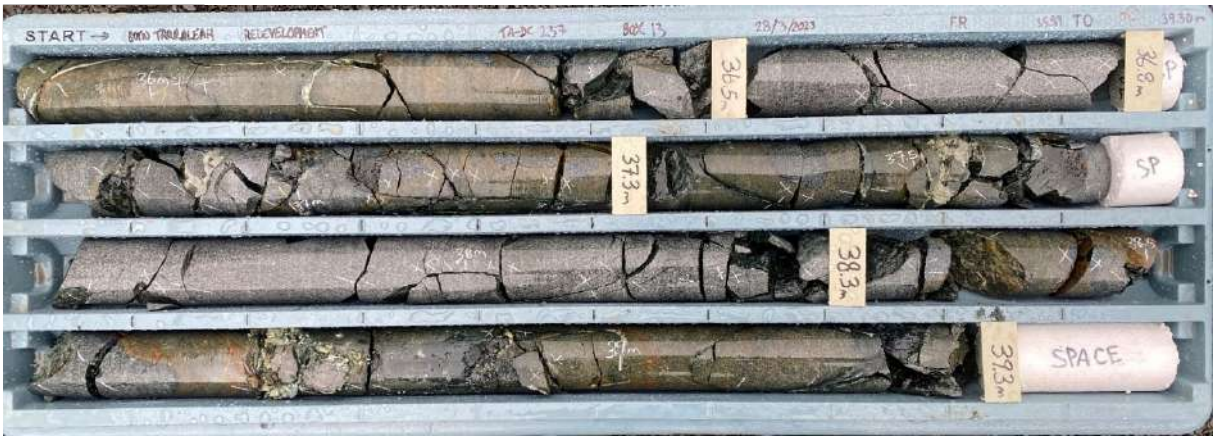
TA-DC237 Tray 12 Depth Range: 32.50 - 35.90 m

Notes:

1. Photos not to scale

Hydro Tasmania
BoTN - Tarraleah Redevelopment
Tarraleah Switchyard
Reference Design - Site Investigation
TA-DC237

TA-DC237 Tray 13 Depth Range: 35.90 - 39.30 m



TA-DC237 Tray 14 Depth Range: 39.30 - 41.30 m

Notes:

1. Photos not to scale

Hydro Tasmania BoTN - Tarraleah Redevelopment Tarraleah Switchyard Reference Design - Site Investigation TA-DC237	
PSM4346	Page 5 of 5

Engineering Log - Cored Borehole - Soil

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	AT
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455330.9 m E 5316773.4 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-80°	RL Surface:	345.89 m	Drilled:	13/04/2023 - 18/04/2023
Hole Diameter:	122 mm	Bearing (TN):	242°	Datum:	AHD	Operator:	TDS

Drilling Information						Soil Description					Observations
Method	Support	Water	Samples Tests Remarks	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: plasticity/particle size, colour, secondary and minor components	Moisture Condition	Consistency / Relative Density	Hand Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
PQ3	C							Vacuum Drilled: 800 mm.				Inferred FILL
				344.9	1			NO CORE: 700 mm.				Inferred COLLUVIUM
			PP 1.50 m PP =40 kPa				CI	Sandy CLAY, trace gravel: medium plasticity, dark red brown. Sand is fine to medium grained. Gravel is medium grained, angular.	M	S	×	
				343.9	2			NO CORE: 800 mm.				
			PP 2.60 m PP =90 kPa				CI	Sandy CLAY, trace gravel: medium plasticity, dark orange brown. Sand is fine to medium grained, angular. Gravel is fine to medium grained angular to sub-angular.	M	F	×	
			PP 3.30 m PP =90 kPa	342.9	3			Gravel no longer present.			×	
		14/03/2024					GW	GRAVEL with clay, trace cobbles: Medium to coarse grained, rounded to sub-angular, orange brown. Clay has medium plasticity. Cobbles are sub-rounded to rounded, composed of high strength dolerite.		MD		Inferred ALLUVIUM
				342.0	4			NO CORE 500 mm.				
								BOULDER: dark blue grey, fresh, high strength, medium grained dolerite.	M	VD		
				341.0			GW			MD		

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
SPT - Standard penetration test
PT - Push tube
AS - Auger Screwing
HFA - Hollow Flight Auger
PQ3 - PQ3 Core Barrel
HQ3 - HQ3 Core Barrel

Water
Inflow
Partial Loss
Complete Loss
Level (Date)
Static Level (Date)

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
LB - Large Disturbed Sample
PSD - Particle Size Distribution
ATT - Atterberg
PT - Push Tube
SS - Split Spoon
B - Bulk Sample
PP - Pocket Penetrometer

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
VS - Very soft
S - Soft
F - Firm
St - Stiff
VSt - Very stiff
H - Hard
Fr - Friable
VL - Very loose
L - Loose
MD - Medium dense
D - Dense
VD - Very dense

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Engineering Log - Cored Borehole - Soil

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	AT
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455330.9 m E 5316773.4 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-80°	RL Surface:	345.89 m	Drilled:	13/04/2023 - 18/04/2023
Hole Diameter:	122 mm	Bearing (TN):	242°	Datum:	AHD	Operator:	TDS

Drilling Information						Soil Description					Observations
Method	Support	Water	Samples Tests Remarks	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: plasticity/particle size, colour, secondary and minor components	Moisture Condition	Consistency / Relative Density	Hand Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
PQ3	C						GW	GRAVEL with cobbles, trace sand: Medium to coarse grained, rounded to angular, dark grey. Cobbles are rounded to sub-rounded composed of fresh, high strength dolerite. Sand is fine to coarse grained, angular to sub-angular. *(continued)*	M	MD		
								Continued on cored borehole - rock sheet				
				340.0	6							
				339.0	7							
				338.0	8							
				337.0	9							
				336.0								

Method
- AD/T - Auger drilling TC bit
- AD/V - Auger drilling V bit
- WB - Washbore
- SPT - Standard penetration test
- PT - Push tube
- AS - Auger Screwing
- HFA - Hollow Flight Auger
- PQ3 - PQ3 Core Barrel
- HQ3 - HQ3 Core Barrel

Water
- Inflow
- Partial Loss
- Complete Loss
- Level (Date)
- Static Level (Date)

Samples and Tests
- U - Undisturbed Sample
- D - Disturbed Sample
- SPT - Standard Penetration Test
- LB - Large Disturbed Sample
- PSD - Particle Size Distribution
- ATT - Atterberg
- PT - Push Tube
- SS - Split Spoon
- B - Bulk Sample
- PP - Pocket Penetrometer

Moisture Condition
- D - Dry
- M - Moist
- W - Wet

Consistency/Relative Density
- VS - Very soft
- S - Soft
- F - Firm
- St - Stiff
- VSt - Very stiff
- H - Hard
- Fr - Friable
- VL - Very loose
- L - Loose
- MD - Medium dense
- D - Dense
- VD - Very dense

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	AT
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455330.9 m E 5316773.4 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-80°	RL Surface:	345.89 m	Drilled:	13/04/2023 - 18/04/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	242°	Datum:	AHD	Operator:	TDS

Drilling Information

Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)
PQ3		86			340.0	6
		80				
HQ3		87			339.0	7
		40			338.0	8
		14				
		48			337.0	9
		14			336.0	

Rock Substance

Graphic Log	Material Description ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components	Weathering (XW HW MW SW FR)	Strength Is(50) ● - Axial ○ - Diametral (VL 0.1 L 0.3 M 1 H 3 VH 10 EH)
	Continued from cored borehole - soil sheet		
	DOLERITE: medium grained, dark blue grey and orange brown, massive texture. Presence of healed defects.		
	Becoming dark blue grey.		
	Becoming dark blue grey and orange brown. Healed defects increasing in abundance.		
	Becoming dark blue grey. Healed defect spacing up to 150 mm, typically iron stained.		
	Becoming dark blue grey and orange brown.		

Rock Mass Defects

Defect Spacing (mm) (<20 60 200 600 1000)	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, thickness, shape, roughness, other
	Inferred TOP OF ROCK - JURASSIC DOLERITE
	JT, 55°/-, CL, RF 4 mm, ST, RF
	JT, 23°/-, FE SN, UN, RF
	JT, 70°/-, FE, CL 1 mm, IR, RF
	JT, 40°/-, FE, CL 1 mm, UN, RF
	JT, 41°/-, FE SN, ST, RF
	JT, 22°/-, FE SN, ST, RF
	JT, 51°/-, FE SN, UN, RF
	JT, 25°/-, CN, UN, RF
	JT, 84°/-, FE SN, UN, RF
	JT, 38°/-, FE SN, UN, RF
	CZ, 43°/-, RF, CL 70 mm, IR, RF
	JT, 51°/-, FE, CA SN, UN, RF
	JT, 30°/-, CA, FE VN, UN, RF
	JT, 48°/-, CA, FE VN, UN, RF
	JT, 48°/-, CA, FE 1 mm, UN, RF
	FZ, 41°/-, RF, FE 150 mm, UN, RF
	JT, 43°/-, RF, FE 1 mm, UN, RF
	JT, 30°/-, RF, FE 1 mm, ST, RF
	CZ, 33°/-, RF, CHL 25 mm, UN, RF
	CZ, 22°/-, RF 2 mm, UN, RF
	JT, 58°/-, RF 1 mm, ST, RF
	JT, 41°/-, CN, UN, RF
	JT, 40°/-, FE SN, UN, RF
	JT, 40°/-, FE SN, PR, RF
	JT, 36°/-, FE SN, PR, RF
	JT, 80°/-, RF 2 mm, IR, RF
	JT, 42°/-, RF, CA 2 mm, UN, RF
	JT, 22°/-, CN, PR, RF
	JT, 55°/-, FE SN, UN, RF
	JT, 20°/-, FE SN, UN, RF
	JT, 50°/-, FE, CA 1 mm, UN, RF
	JT, 25°/-, FE SN, UN, RF

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Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3 - Wireline core (61.0 mm)
PQ3 - Wireline core (83.0 mm)
SPT - Standard penetration test
PT - Push tube

Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Testing Type
UCS - Unconfined Compressive Strength
TXL - Triaxial Shear Test
DS - Direct Shear Test
PET - Petrography
STS - Splitting Tensile Strength
DEN - Density
CER - Cerchar Abrasivity
SS - Sodium Sulphate Soundness
M - Moisture Content
SD - Slake Durability
LA - Los Angeles Abrasion
ISS - In Situ Stress
PP - Pocket Penetrometer

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock Fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous
CHL - Chlorite
ZE - Zeolite
SE - Sericite
MG - Manganese
SU - Sulphide
SI - Silicate
PY - Pyrite

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	AT
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455330.9 m E 5316773.4 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-80°	RL Surface:	345.89 m	Drilled:	13/04/2023 - 18/04/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	242°	Datum:	AHD	Operator:	TDS

Drilling Information

Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)
HQ3		14			335.1	11
		56			334.1	12
		71			333.1	13
		86			332.1	14
		77	Is(50) d=3.78 MPa		331.1	
		55				

Rock Substance

Graphic Log	Material Description ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components	Weathering (XW HW MW SW FR)	Strength Is(50) ● - Axial ○ - Diametral (VL 0.1 L 0.3 M 1 H 3 VH 10 EH)
	DOLERITE: medium grained, dark blue grey and orange brown, massive texture. Presence of healed defects spaced up to 150 mm, typically iron stained.		
	Becoming dark blue grey.		
	Becoming dark blue grey and orange brown. Calcite and zeolite veins up to 4 mm thick, moderately to steeply inclined to core axis, spaced up to 400 mm.		
	Becoming dark blue grey.		
	Becoming dark blue grey and orange brown.		

Rock Mass Defects

Defect Spacing (mm) (<20 60 200 600 1000)	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, thickness, shape, roughness, other
	JT, 30°/-, CA, FE 3 mm, UN, RF
	FZ, 40°/-, RF 40 mm, UN, RF
	JT, 30°/-, CN, PR, RF
	FZ, 50°/-, RF, CHL 40 mm, UN, RF
	JT, 39°/-, FE SN, PR, RF
	JT, 32°/225°, CHL VN, UN, RF
	JT, 69°/018°, CHL VN, UN, RF
	JT, 10°/214°, CN, UN, RF
	JT, 30°/188°, CHL VN, UN, RF
	JT, 40°/005°, FE SN, UN, RF
	JT, 35°/-, CHL VN, IR, RF
	CZ, 28°/-, RF 10 mm, UN, RF
	JT, 32°/-, RF, FE 1 mm, UN, RF
	JT, 33°/-, CN, PR, RF
	JT, 18°/-, RF 1 mm, UN, RF
	VN, 55°/-, CA 2 mm, ST, RF
	JT, 20°/-, FE SN, UN, RF
	JT, 55°/-, CN, UN, RF
	CZ, 48°/-, RF, CL 30 mm, UN, RF
	JT, 61°/-, FE, CA SN, IR, RF
	JT, 21°/-, FE SN, UN, RF
	CZ, 12°/-, RF 8 mm, UN, RF
	JT, 21°/-, FE, CA 1 mm, UN, RF
	JT, 20°/-, CN, PR, RF
	CZ, 40°/-, RF 20 mm, UN, RF
	VN, 40°/-, CA 3 mm, IR, RF
	JT, 13°/-, CN, PR, RF
	Packer test attempted: 14.60 m to 16.60 m
	Test failed
	JT, 68°/-, FE, CHL SN, UN, RF
	JT, 15°/-, FE SN, UN, RF

Method
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SPT - Standard penetration test
PT - Push tube

Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Testing Type
UCS - Unconfined Compressive Strength
TXL - Triaxial Shear Test
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STS - Splitting Tensile Strength
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Defect Type
FT - Fault
SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock Fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous
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ST - Stepped
IR - Irregular

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	AT
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455330.9 m E 5316773.4 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-80°	RL Surface:	345.89 m	Drilled:	13/04/2023 - 18/04/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	242°	Datum:	AHD	Operator:	TDS

Drilling Information / Rock Substance / Rock Mass Defects

Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)	Graphic Log	Material Description ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components	Weathering XW HW MW SW FR	Strength Is(50) ● - Axial ○ - Diametral VL 0.1 L 0.3 M 1 H 3 VH 10 EH	Defect Spacing (mm) <20 60 200 600 1000	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, thickness, shape, roughness, other
HQ3		55						DOLERITE: medium grained, dark blue grey and orange brown, massive texture. Presence of healed defects, spaced up to 100 mm.				JT, 16°/-, FE SN, UN, RF JT, 60°/-, CA 1 mm, UN, RF JT, 12°/-, FE, CHL SN, UN, RF FZ, 40°/-, RF, FE 20 mm, UN, RF
		0										FZ, 30°/-, RF 170 mm, UN, RF
		17	PP =110kPa		330.1	16		DOLERITE FAULT BRECCIA: mottled brown grey and light yellow grey, brecciated, fine to coarse grained, sub-rounded to angular sand sized particles and fine to coarse grained, angular to sub-angular gravel sized clasts. Clay matrix, medium plasticity, stiff. Matrix supported, clast to matrix ratio 40:60. Highly altered.				FT, 30°/-, CL, RF 450 mm, UN, RF
		56						DOLERITE: medium grained, dark blue green and grey, sheared texture steeply inclined to core axis. Presence of healed defects. Calcite veins up to 4 mm thick, moderately to steeply inclined to core axis, spaced up to 200 mm.				FT, 80°/-, CL, RF 15 mm, IR, RF
					329.1	17		Becoming dark blue grey, massive texture.				
		67						Becoming dark blue grey and orange brown. Iron oxide veins and calcite veins up to 2 mm thick, perpendicular to moderately inclined to core axis, spaced up to 300 mm.				JT, 12°/-, FE SN, UN, RF
					328.2	18		Becoming dark blue grey.				JT, 38°/-, FE SN, UN, RF Packer test attempted: 17.60 m to 20.60 m Test failed JT, 10°/-, CA VN, UN, RF JT, 40°/-, FE SN, UN, RF JT, 20°/-, FE SN, UN, RF JT, 20°/-, FE SN, UN, RF
		67										JT, 40°/-, CN, UN, RF JT, 71°/-, FE SN, UN, RF JT, 50°/-, CN, UN, RF
		20			327.2	19		Becoming dark blue grey and orange brown. Iron oxide veins calcite and zeolite veins up to 5 mm thick, perpendicular to moderately inclined to core axis, spaced up to 300 mm.				JT, 30°/-, FE SN, UN, RF JT, 48°/-, RF 1 mm, UN, RF JT, 14°/-, RF 1 mm, UN, RF JT, 20°/-, RF 1 mm, UN, RF JT, 50°/-, RF, CL 2 mm, UN, RF CZ, 30°/-, RF, CL 10 mm, UN, RF JT, 53°/-, CA VN, UN, RF JT, 54°/-, CA, RF 2 mm, ST, RF JT, 41°/-, FE SN, UN, RF JT, 32°/-, CA 1 mm, UN, RF JT, 31°/-, FE, CA 1 mm, UN, RF
		0										FZ, RF, CL 100 mm
		25			326.2			NO CORE: 200 mm.				

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Method
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AD/V - Auger drilling V bit
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HQ3 - Wireline core (61.0 mm)
PQ3 - Wireline core (83.0 mm)
SPT - Standard penetration test
PT - Push tube

Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Testing Type
UCS - Unconfined Compressive Strength
TXL - Triaxial Shear Test
DS - Direct Shear Test
PET - Petrography
STS - Splitting Tensile Strength
DEN - Density
CER - Cerchar Abrasivity
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M - Moisture Content
SD - Slake Durability
LA - Los Angeles Abrasion
ISS - In Situ Stress
PP - Pocket Penetrometer

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
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G - Gravel
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SI - Silicate
PY - Pyrite

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
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Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	AT
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455330.9 m E 5316773.4 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-80°	RL Surface:	345.89 m	Drilled:	13/04/2023 - 18/04/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	242°	Datum:	AHD	Operator:	TDS

Drilling Information / Rock Substance / Rock Mass Defects

Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)	Graphic Log	Material Description ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components	Weathering (XW HW MW SW FR)	Strength Is(50) ● - Axial ○ - Diametral (VL 0.1 L 0.3 M 1 H 3 VH 10 EH)	Defect Spacing (mm) (<20 60 200 600 1000)	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, thickness, shape, roughness, other
HQ3		25						DOLERITE: medium grained, dark blue grey, massive texture. Calcite veins up to 5 mm thick, perpendicular to moderately inclined to core axis, spaced up to 300 mm.				JT, 27°/-, FE SN, UN, RF
												JT, 29°/-, CHL, QZ VN, PR, RF
		67			325.2	21		Healed defects becoming present.				JT, 50°/-, CHL, QZ VN, UN, RF JT, 21°/-, CHL, QZ VN, UN, RF JT, 20°/-, CN, PR, S
												JT, 54°/-, CN, PR, RF Packer test attempted: 21.20 m to 24.20 m Test failed JT, 40°/-, CN, UN, RF JT, 30°/-, CN, UN, RF JT, 62°/-, CN, UN, RF
		33			324.2	22		Becoming dark blue grey and orange brown.				JT, 22°/-, FE SN, UN, RF JT, 22°/-, FE SN, UN, RF JT, 31°/-, FE SN, UN, RF JT, 29°/-, RF 1mm, UN, RF JT, 44°/-, FE SN, UN, RF FZ, 22°/-, RF 40 mm, UN, RF JT, 30°/-, FE SN, UN, RF JT, 40°/-, FE SN, UN, RF JT, 39°/-, FE SN, UN, RF
		0			323.2	23		Presence of abundant healed defects.				FZ, RF 200 mm, UN, RF FZ, 20°/-, RF 50 mm, UN, RF FZ, RF, CL 100 mm
		33										JT, 42°/-, FE, CHL SN, UN, RF
		54			322.3	24		Becoming dark blue grey, evidence of healed defects no longer present.				JT, 40°/-, FE, CHL SN, UN, RF JT, 41°/-, FE, CHL SN, UN, RF JT, 50°/-, FE, CHL SN, UN, RF JT, 40°/-, FE SN, UN, RF JT, 43°/-, FE SN, UN, RF JT, 60°/-, FE, CHL SN, UN, RF CZ, 23°/-, RF, CL 9 mm, UN, RF JT, 50°/-, CHL VN, UN, S JT, 30°/-, CHL VN, UN, S JT, 32°/-, CHL VN, UN, RF JT, 20°/-, CHL VN, UN, RF
		73			321.3							JT, 23°/-, CHL VN, UN, RF JT, 70°/-, CHL, FE VN, ST, RF

Method
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AD/V - Auger drilling V bit
WB - Washbore
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PQ3 - Wireline core (83.0 mm)
SPT - Standard penetration test
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Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
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Defect Type
FT - Fault
SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
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SN - Stain
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See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	AT
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455330.9 m E 5316773.4 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-80°	RL Surface:	345.89 m	Drilled:	13/04/2023 - 18/04/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	242°	Datum:	AHD	Operator:	TDS

Drilling Information / Rock Substance / Rock Mass Defects

Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)	Graphic Log	Material Description ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components	Weathering (XW HW MW SW FR)	Strength Is(50) ● - Axial ○ - Diametral (VL 0.1 L 0.3 M 1 H 3 VH 10 EH)	Defect Spacing (mm) (<20 60 200 600 1000)	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, thickness, shape, roughness, other
HQ3		73						DOLERITE: medium grained, dark blue grey, massive texture.				JT, 40°/-, CHL, FE VN, UN, S JT, 20°/-, CHL, CL VN, PR, RF
								Becoming dark blue grey and orange brown. Calcite veins up to 5 mm thick, perpendicular to moderately inclined to core axis, spaced up to 400 mm.				JT, 12°/-, CHL VN, PR, RF
		50			320.3	26		DOLERITE FAULT GOUGE: low plasticity, light grey. Silty clay matrix, matrix supported, clast to matrix ratio 0:100.				FZ, 12°/-, CL, RF 100 mm JT, 30°/-, FE SN, PR, RF JT, 23°/-, FE SN, IR, RF
								DOLERITE: medium grained, dark blue grey and orange brown, massive texture. Calcite veins up to 5 mm thick, perpendicular to moderately inclined to core axis, spaced up to 400 mm. Becoming dark blue grey.				JT, 65°/-, CHL VN, IR, RF
		90			319.3	27						JT, 30°/-, CN, UN, RF
		78			318.3	28		100 mm dark blue grey and orange brown.				JT, 45°/-, FE SN, IR, RF JT, 39°/-, CHL VN, ST, S JT, 60°/-, ZE VN, UN, RF JT, 60°/-, ZE VN, UN, RF JT, 60°/-, CHL VN, UN, RF
		75			317.3	29		NO CORE: 100 mm.				JT, 31°/-, CHL VN, PR, RF
		90			316.3			DOLERITE: medium grained, dark green grey and blue grey, massive texture. Calcite and chlorite veins up to 5 mm thick, moderately to steeply inclined to core axis, spaced up to 500 mm.				100 mm of inferred cave in associated with core loss zone above. FZ, 06°/-, RF, CL 100 mm, PR, RF JT, 10°/-, CN, UN, RF JT, 70°/-, CHL VN, IR, RF

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3 - Wireline core (61.0 mm)
PQ3 - Wireline core (83.0 mm)
SPT - Standard penetration test
PT - Push tube

Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Testing Type
UCS - Unconfined Compressive Strength
TXL - Triaxial Shear Test
DS - Direct Shear Test
PET - Petrography
STS - Splitting Tensile Strength
DEN - Density
CER - Cerchar Abrasivity
SS - Sodium Sulphate Soundness
M - Moisture Content
SD - Slake Durability
LA - Los Angeles Abrasion
ISS - In Situ Stress
PP - Pocket Penetrometer

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock Fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous
CHL - Chlorite
ZE - Zeolite
SE - Sericite
MG - Manganese
SU - Sulphide
SI - Silicate
PY - Pyrite

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	AT
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455330.9 m E 5316773.4 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-80°	RL Surface:	345.89 m	Drilled:	13/04/2023 - 18/04/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	242°	Datum:	AHD	Operator:	TDS

Drilling Information

Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)
HQ3		90	Is(50) d=4.34 MPa	1.09 Lugeons	315.4	31
		95			314.4	32
		100			313.4	33
		87			312.4	34
		80			311.4	

Rock Substance

Graphic Log	Material Description ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components	Weathering (XW HW MW SW FR)	Strength Is(50) ● - Axial ○ - Diametral (VL 0.1 L 0.3 M 1 H 3 VH 10 EH)
	DOLERITE: medium grained, dark green grey and blue grey, massive texture. Becoming dark blue grey. Calcite and quartz veins up to 5 mm thick, moderately inclined to core axis, spaced up to 400 mm.		
	Becoming dark blue grey and orange brown.		
	50 mm zone of CLAY with gravel: low plasticity, grey. Gravel is fine to coarse grained, angular. Becoming dark blue grey.		
	Becoming dark blue grey and orange brown. Presence of minor healed defects. Vein spacing up to 150 mm.		

Rock Mass Defects

Defect Spacing (mm) (<20 60 200 600 1000)	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, thickness, shape, roughness, other
	JT, 59°/-, QZ, CHL 1 mm, ST, RF
	CZ, 20°/-, CL, RF 50 mm, UN, RF
	VN, 21°/-, QZ 3 mm, UN, RF Packer test completed: 33.20 m to 39.70 m JT, 33°/-, QZ VN, ST, RF
	VN, 39°/007°, QZ 3 mm, IR, RF JT, 33°/007°, QZ, RF 1 mm, UN, RF CZ, 34°/121°, RF, QZ 10 mm, ST, RF JT, 30°/214°, CL 1 mm, UN, RF

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3 - Wireline core (61.0 mm)
PQ3 - Wireline core (83.0 mm)
SPT - Standard penetration test
PT - Push tube

Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Testing Type
UCS - Unconfined Compressive Strength
TXL - Triaxial Shear Test
DS - Direct Shear Test
PET - Petrography
STS - Splitting Tensile Strength
DEN - Density
CER - Cerchar Abrasivity
SS - Sodium Sulphate Soundness
M - Moisture Content
SD - Slake Durability
LA - Los Angeles Abrasion
ISS - In Situ Stress
PP - Pocket Penetrometer

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock Fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous
CHL - Chlorite
ZE - Zeolite
SE - Sericite
MG - Manganese
SU - Sulphide
SI - Silicate
PY - Pyrite

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	AT
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455330.9 m E 5316773.4 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-80°	RL Surface:	345.89 m	Drilled:	13/04/2023 - 18/04/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	242°	Datum:	AHD	Operator:	TDS

Drilling Information

Method: HQ3

Water: 1.09 Lugeons

RQD (%): 80, 75, 60, 30, 65

SAMPLES & FIELD TESTS

WPT (Lugeons)

RL (m): 310.4, 309.5, 308.5, 307.5, 306.5

Depth (m): 36, 37, 38, 39

Rock Substance

Graphic Log

Material Description
ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components

Weathering: XW, HW, MW, SW, FR

Strength Is(50) ● - Axial ○ - Diametral: VL 0.1, L 0.3, M 1, H 3, VH 10, EH

DOLERITE: medium grained, dark blue grey and orange brown, massive texture. Calcite veins up to 3 mm thick, perpendicular to moderately inclined to core axis, spaced up to 100 mm.

DOLERITE FAULT BRECCIA: dark green brown, brecciated, fine to coarse grained, angular to sub-angular gravel sized clasts. Clay matrix, medium plasticity. Matrix supported, clast to matrix ratio: 60:40.

DOLERITE: medium grained, dark blue grey and orange brown grey. Presence of chlorite and calcite veins up to 3 mm thick, spaced up to 150 mm.

Becoming dark green grey and blue green.

Becoming brecciated, with angular rock fragments within a cemented white infill.

Becoming massive in texture.

Borehole Terminated at 39.70 m
Target depth. Televiewer survey conducted. Open standpipe installed.

Rock Mass Defects

Defect Spacing (mm): <20, 60, 200, 600, 1000

Defect Descriptions / Comments
Description, alpha/beta, infilling or coating, thickness, shape, roughness, other

- JT, 30°/-, FE SN, PR, RF
- JT, 20°/-, CHL VN, UN, RF
- JT, 30°/-, CHL VN, ST, RF
- CZ, 23°/-, CL, RF 140 mm, UN, RF
- JT, 30°/166°, FE, QZ VN, UN, RF
- JT, 30°/214°, CN, UN, RF
- JT, 14°/251°, QZ VN, UN, RF
- JT, 59°/214°, QZ VN, UN, RF
- JT, 50°/-, FE SN, UN, RF
- CZ, 08°/-, RF, CL 20 mm, UN, RF
- JT, 31°/-, FE, CHL SN, UN, RF
- JT, 70°/-, CHL VN, IR, RF
- JT, 33°/-, CHL, FE VN, UN, RF
- JT, 40°/-, CHL, QZ VN, UN, RF
- JT, 60°/-, CHL, QZ 1 mm, UN, RF
- JT, 30°/-, CHL VN, UN, RF
- JT, 40°/-, RF, QZ 1 mm, UN, RF
- JT, 41°/335°, CHL, CL 5 mm, IR, RF
- FZ, 39°/024°, CHL, CL 30 mm, UN, RF
- FZ, 10°/272°, RF, CL 60 mm, ST, RF
- JT, 40°/272°, QZ VN, UN, RF
- JT, 89°/005°, QZ, CHL 1 mm, UN, RF
- SS, 70°/276°, RF, QZ 10 mm, UN, RF
- JT, 39°/080°, FE SN, UN, RF
- VN, 55°/001°, QZ, CHL 4 mm, UN, RF

Method
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PQ3 - Wireline core (83.0 mm)
SPT - Standard penetration test
PT - Push tube

Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Testing Type
UCS - Unconfined Compressive Strength
TXL - Triaxial Shear Test
DS - Direct Shear Test
PET - Petrography
STS - Splitting Tensile Strength
DEN - Density
CER - Cerchar Abrasivity
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M - Moisture Content
SD - Slake Durability
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ISS - In Situ Stress
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Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock Fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous
CHL - Chlorite
ZE - Zeolite
SE - Sericite
MG - Manganese
SU - Sulphide
SI - Silicate
PY - Pyrite

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

TA-DC238 Tray 1 Depth Range: 0.00 - 3.00 m

TA-DC238 Tray 2 Depth Range: 3.00 - 5.60 m

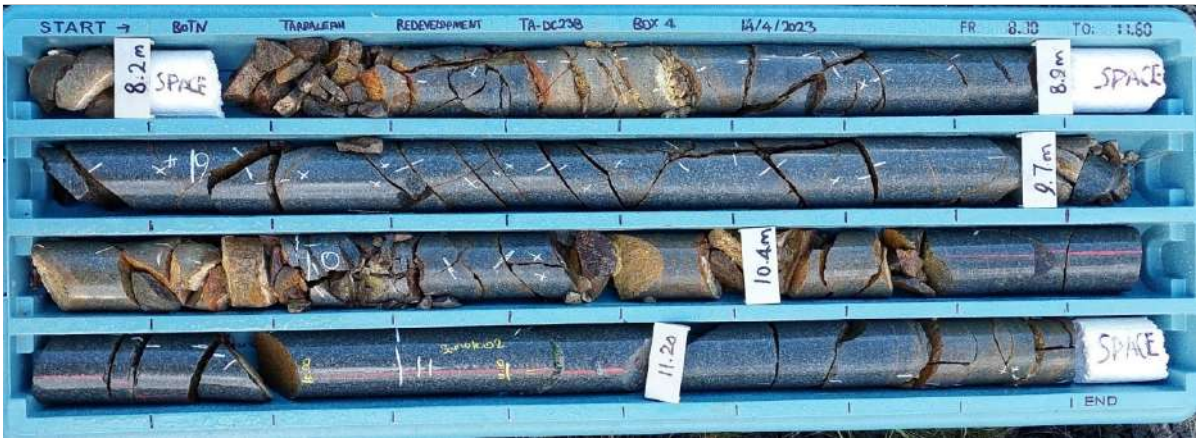
TA-DC238 Tray 3 Depth Range: 5.60 - 8.10 m

Notes:

1. Photos not to scale

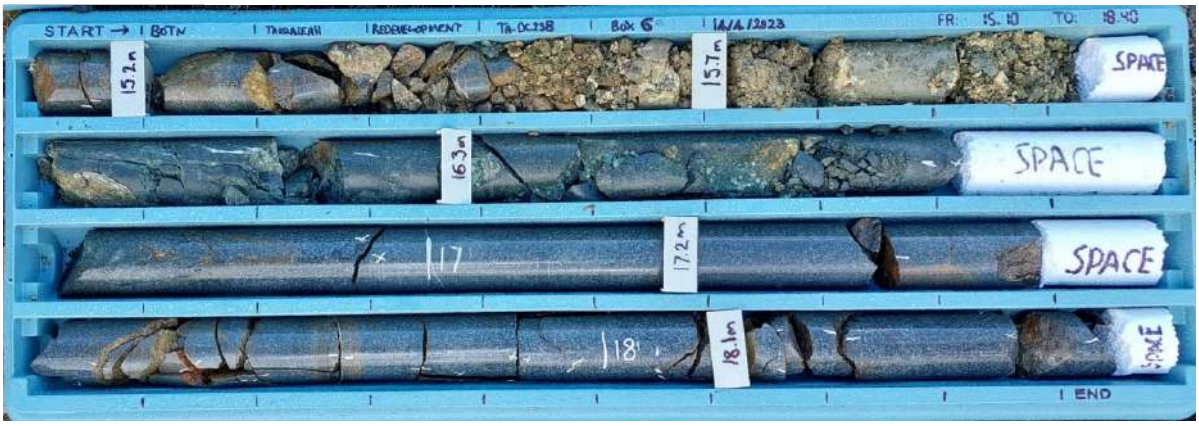
Hydro Tasmania BoTN - Tarraleah Redevelopment Tarraleah Switchyard Reference Design - Site Investigation TA-DC238	
PSM4346	Page 1 of 5

TA-DC238 Tray 4 Depth Range: 8.10 - 11.60 m



TA-DC238 Tray 5 Depth Range: 11.60 - 15.10 m

TA-DC238 Tray 6 Depth Range: 15.10 - 18.40 m

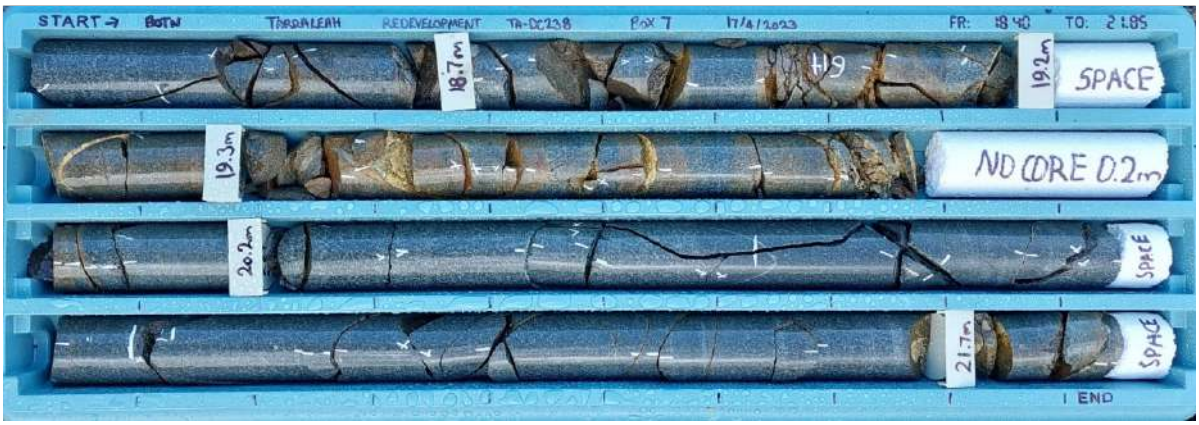


Notes:

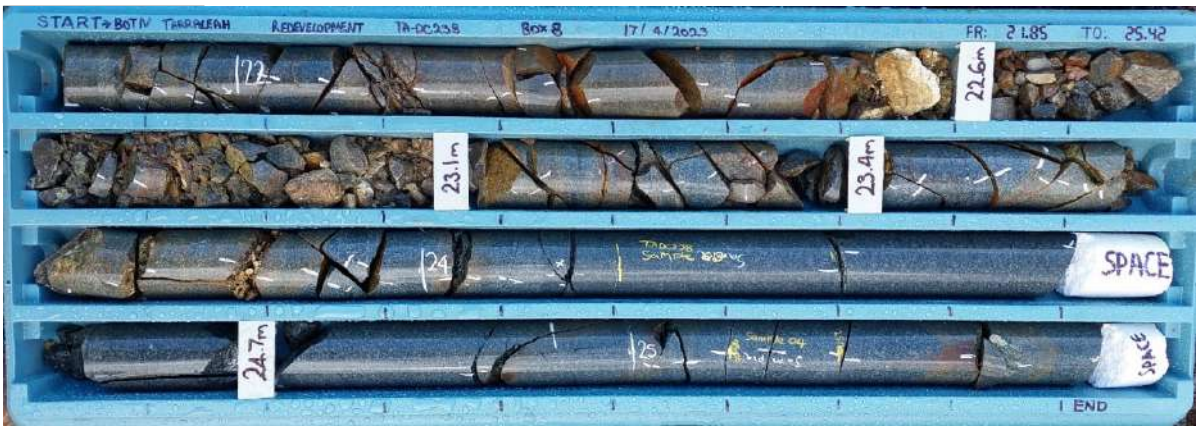
1. Photos not to scale

Hydro Tasmania
BoTN - Tarraleah Redevelopment
Tarraleah Switchyard
Reference Design - Site Investigation
TA-DC238

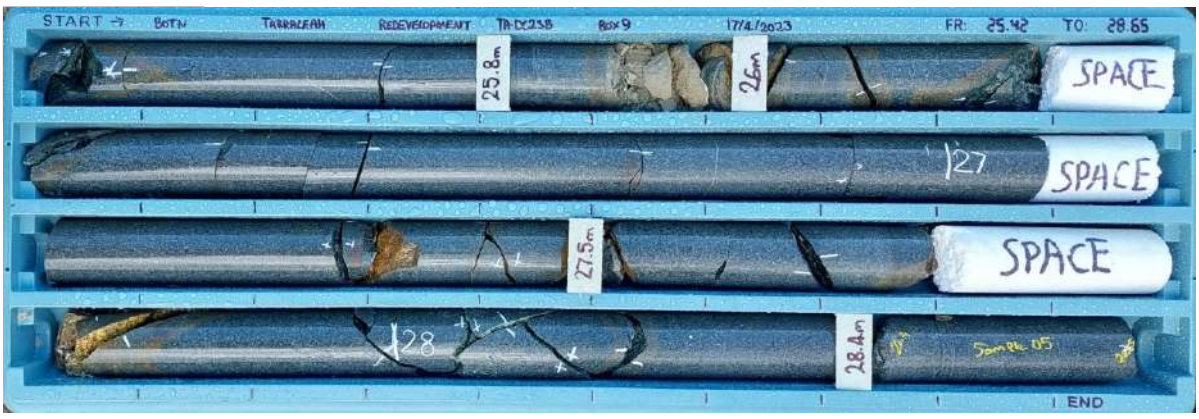
TA-DC238 Tray 7 Depth Range: 18.40 - 21.85 m



TA-DC238 Tray 8 Depth Range: 21.85 - 25.40 m



TA-DC238 Tray 9 Depth Range: 25.40 - 28.65 m

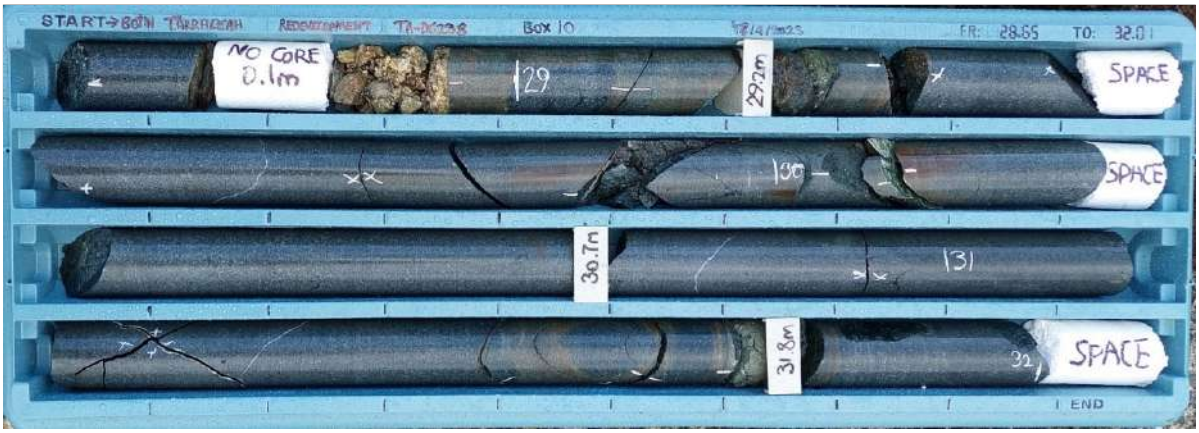


Notes:

1. Photos not to scale

Hydro Tasmania
BoTN - Tarraleah Redevelopment
Tarraleah Switchyard
Reference Design - Site Investigation
TA-DC238

TA-DC238 Tray 10 Depth Range: 28.65 - 32.00 m



TA-DC238 Tray 11 Depth Range: 32.00 - 35.50 m

TA-DC238 Tray 12 Depth Range: 35.50 - 38.85 m

Notes:

1. Photos not to scale

Hydro Tasmania
BoTN - Tarraleah Redevelopment
Tarraleah Switchyard
Reference Design - Site Investigation
TA-DC238

TA-DC238 Tray 13 Depth Range: 38.85 - 39.70 m

Notes:

1. Photos not to scale

Hydro Tasmania
BoTN - Tarraleah Redevelopment
Tarraleah Switchyard
Reference Design - Site Investigation
TA-DC238

Engineering Log - Cored Borehole - Soil

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	JK/AT
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455293.6 m E 5316779.6 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-78°	RL Surface:	352.80 m	Drilled:	31/03/2023 - 05/04/2023
Hole Diameter:	122 mm	Bearing (TN):	261°	Datum:	AHD	Operator:	TDS

Drilling Information						Soil Description					Observations
Method	Support	Water	Samples Tests Remarks	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: plasticity/particle size, colour, secondary and minor components	Moisture Condition	Consistency / Relative Density	Hand Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
PQ3	C			352.80	0			NO CORE: 100 mm.				Inferred COLLUVIUM. Composition matrix supported.
							GW	Sandy GRAVEL with silt: medium to coarse grained, sub-rounded to sub-angular, dark grey and brown. Sand is coarse grained, sub-angular to angular.				
							GC	Presence of minor roots.	M	D		
								Clayey GRAVEL with cobbles: fine to coarse grained, sub-rounded to angular, grey and brown orange. Clay is medium plasticity. Cobbles are sub-angular to angular, composed of slightly weathered to fresh, very high strength dolerite.				
				351.8	1		Cl	NO CORE: 100 mm.				
								Gravelly CLAY with cobbles: medium plasticity, brown. Gravel is fine to coarse grained, sub-rounded to angular. Cobbles are sub-angular to angular, composed of slightly weathered to fresh, very high strength dolerite.	M	F		
							Cl	NO CORE: 100 mm.				
				350.8	2			Gravelly CLAY with cobbles: medium plasticity, orange brown. Gravel is fine to coarse grained, sub-rounded to angular, grey. Cobbles are sub-angular to angular, composed of slightly weathered to fresh, very high strength dolerite.	M	F		
				349.9	3		GW	GRAVEL with sand, trace clay: fine to coarse grained, sub-rounded to angular, grey and orange. Sand is fine to coarse grained, sub-angular to angular.		D		
								Continued on cored borehole - rock sheet				
				348.9	4							
				347.9								

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
SPT - Standard penetration test
PT - Push tube
AS - Auger Screwing
HFA - Hollow Flight Auger
PQ3 - PQ3 Core Barrel
HQ3 - HQ3 Core Barrel

Water
Inflow
Partial Loss
Complete Loss
Level (Date)
Static Level (Date)

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
LB - Large Disturbed Sample
PSD - Particle Size Distribution
ATT - Atterberg
PT - Push Tube
SS - Split Spoon
B - Bulk Sample
PP - Pocket Penetrometer

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
VS - Very soft
S - Soft
F - Firm
St - Stiff
VSt - Very stiff
H - Hard
Fr - Friable
VL - Very loose
L - Loose
MD - Medium dense
D - Dense
VD - Very dense

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	JK/AT
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455293.6 m E 5316779.6 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-78°	RL Surface:	352.80 m	Drilled:	31/03/2023 - 05/04/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	261°	Datum:	AHD	Operator:	TDS

Drilling Information / Rock Substance / Rock Mass Defects

Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)	Graphic Log	Material Description ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components	Weathering XW HW MW SW FR	Strength Is(50) ● - Axial ○ - Diametral VL 0.1 L 0.3 M 1 H 3 VH 10 EH	Defect Spacing (mm) <20 60 200 600 1000	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, thickness, shape, roughness, other
					351.8	1						
					350.8	2						
					349.9	3		Continued from cored borehole - soil sheet				
PQ3		0						DOLERITE: medium grained, dark blue grey and orange brown, massive texture. Presence of healed defects. Iron oxide veins up to 2 mm, moderately to steeply inclined to core axis, spaced up to 100 mm.				Inferred TOP OF ROCK - JURASSIC DOLERITE JT, 07°/-, FE SN, CU, VR JT, 12°/-, FE SN, PR, RF
		31			348.9	4						CZ, 62°/-, S, RF 15 mm, CU, VR CZ, 13°/-, RF, Z 30 mm, PR, VR JT, 43°/-, FE SN, PR, VR FZ, 35°/-, RF, Z 80 mm, CU, VR
		31			347.9							JT, 50°/-, S, Z CO, PR, VR JT, 54°/-, Z VN, PR, VR VN, 40°/-, QZ, FE VN, PR, VR JT, 58°/-, FE SN, PR, RF JT, 36°/-, FE SN, PR, VR

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
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Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

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UCS - Unconfined Compressive Strength
TXL - Triaxial Shear Test
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SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
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CN - Clean
SN - Stain
VN - Veneer
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QZ - Quartz
X - Carbonaceous
CHL - Chlorite
ZE - Zeolite
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PY - Pyrite

Roughness
SL - Slickensided
POL - Polished
S - Smooth
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VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
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Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	JK/AT
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455293.6 m E 5316779.6 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-78°	RL Surface:	352.80 m	Drilled:	31/03/2023 - 05/04/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	261°	Datum:	AHD	Operator:	TDS

Drilling Information / Rock Substance / Rock Mass Defects

Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)	Graphic Log	Material Description ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components	Weathering (XW HW MW SW FR)	Strength Is(50) ● - Axial ○ - Diametral (VL 0.1 L 0.3 M 1 H 3 VH 10 EH)	Defect Spacing (mm) (<20 60 200 600 1000)	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, thickness, shape, roughness, other
PQ3		77			346.9	6		DOLERITE: medium grained, dark blue grey and orange brown, massive texture. Iron oxide and calcite veins up to 5 mm thick, perpendicular to steeply inclined to core axis, spaced up to 300 mm.				JT, 48°/-, FE SN, PR, VR
HQ3		50										JT, 17°/-, CL VN, PR, RF
		0										JT, 54°/-, FE SN, UN, RF
												JT, 56°/-, FE SN, ST, VR
												JT, 53°/-, FE, CL SN, PR, RF
					346.0	7						JT, 39°/-, FE, CL 1 mm, IR, RF
												JT, 42°/-, FE SN, UN, RF
												JT, 10°/-, FE SN, UN, RF
			Is(50) d=7.48 MPa									JT, 29°/-, FE SN, UN, RF
		71										JT, 29°/-, FE SN, UN, RF
												JT, 22°/-, FE SN, IR, RF
												JT, 25°/-, FE, CL 1 mm, UN, RF
					345.0	8						JT, 69°/-, FE SN, UN, RF
												JT, 26°/-, FE SN, UN, RF
												JT, 50°/-, FE SN, UN, RF
												JT, 08°/-, FE SN, UN, RF
												JT, 62°/-, FE SN, UN, RF
												JT, 33°/-, FE SN, UN, RF
	14/03/2024	76			344.0	9						CZ, 38°/-, RF, CL 10 mm, UN, RF
												JT, 48°/-, FE SN, UN, RF
												JT, 34°/-, FE, CL 1 mm, UN, RF
												JT, 62°/-, FE SN, IR, RF
		53			343.0							JT, 41°/-, QZ, FE VN, IR, RF

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Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3 - Wireline core (61.0 mm)
PQ3 - Wireline core (83.0 mm)
SPT - Standard penetration test
PT - Push tube

Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Testing Type
UCS - Unconfined Compressive Strength
TXL - Triaxial Shear Test
DS - Direct Shear Test
PET - Petrography
STS - Splitting Tensile Strength
DEN - Density
CER - Cerchar Abrasivity
SS - Sodium Sulphate Soundness
M - Moisture Content
SD - Slake Durability
LA - Los Angeles Abrasion
ISS - In Situ Stress
PP - Pocket Penetrometer

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock Fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous
CHL - Chlorite
ZE - Zeolite
SE - Sericite
MG - Manganese
SU - Sulphide
SI - Silicate
PY - Pyrite

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	JK/AT
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455293.6 m E 5316779.6 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-78°	RL Surface:	352.80 m	Drilled:	31/03/2023 - 05/04/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	261°	Datum:	AHD	Operator:	TDS

Drilling Information / Rock Substance / Rock Mass Defects

Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)	Graphic Log	Material Description ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components	Weathering (XW HW MW SW FR)	Strength Is(50) ● - Axial ○ - Diametral (VL 0.1 L 0.3 M 1 H 3 VH 10 EH)	Defect Spacing (mm) (<20 60 200 600 1000)	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, thickness, shape, roughness, other
HQ3		53						DOLERITE: medium grained, dark blue grey and orange brown, massive texture. Presence of healed defects. Iron oxide and calcite veins up to 5 mm thick, moderately to steeply inclined to core axis, spaced up to 500 mm.				JT, 51°/-, CL, QZ 1 mm, UN, RF JT, 12°/-, FE SN, UN, RF JT, 30°/-, FE, QZ SN, ST, RF
					342.0	11						JT, 28°/-, FE SN, UN, RF JT, 75°/-, QZ 2 mm, ST, RF
		67										JT, 55°/-, FE SN, ST, RF JT, 60°/-, FE SN, IR, RF JT, 18°/-, FE SN, PR, RF
					341.1	12						JT, 50°/-, RF, CL 3 mm, UN, RF
												JT, 20°/-, FE SN, UN, RF JT, 52°/-, QZ, FE VN, UN, RF JT, 20°/-, FE SN, UN, RF JT, 62°/-, CL, FE 1 mm, UN, RF JT, 20°/-, CL, FE 1 mm, ST, RF
		42			340.1	13		Becoming coarse grained.				JT, 31°/-, FE SN, PR, RF JT, 29°/-, FE SN, UN, RF JT, 88°/-, FE SN, UN, RF
		29						Becoming medium grained, orange brown.				JT, 65°/-, QZ, FE VN, UN, RF CZ, 67°/-, RF, CL 10 mm, UN, RF JT, 60°/-, QZ VN, UN, RF
					339.1	14		Becoming coarse grained, dark blue grey and orange brown.				JT, 50°/-, QZ, FE VN, UN, RF JT, 28°/-, FE SN, UN, RF JT, 38°/-, FE SN, UN, RF
		59			338.1							JT, 14°/-, FE SN, UN, RF

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Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

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Defect Type
FT - Fault
SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
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Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock Fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
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FE - Iron
QZ - Quartz
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CHL - Chlorite
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Roughness
SL - Slickensided
POL - Polished
S - Smooth
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VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
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IR - Irregular

Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	JK/AT
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455293.6 m E 5316779.6 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-78°	RL Surface:	352.80 m	Drilled:	31/03/2023 - 05/04/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	261°	Datum:	AHD	Operator:	TDS

Drilling Information / Rock Substance / Rock Mass Defects

Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)	Graphic Log	Material Description ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components	Weathering (XW HW MW SW FR)	Strength Is(50) ● - Axial ○ - Diametral (VL 0.1 L 0.3 M 1 H 3 VH 10 EH)	Defect Spacing (mm) (<20 60 200 600 1000)	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, thickness, shape, roughness, other
HQ3		59			337.1	16		DOLERITE: coarse grained, dark blue grey and orange brown, massive texture. Presence of healed defects. Iron oxide and calcite veins up to 2 mm thick, perpendicular to moderately inclined to coarse axis, spaced up to 400 mm.				JT, 60°/-, QZ, FE VN, UN, RF JT, 35°/-, FE, RF 1 mm, ST, RF
		25			336.2	17		Becoming brown grey. Zeolite veins up to 5 mm thick, perpendicular to moderately inclined to core axis, spaced up to 300 mm.				JT, 60°/-, FE SN, UN, RF CZ, 10°/-, RF, CL 40 mm, UN, RF JT, 18°/-, FE SN, UN, RF JT, 28°/-, FE SN, PR, RF JT, 60°/-, FE SN, PR, RF JT, 66°/-, QZ, FE VN, UN, RF JT, 70°/-, FE SN, UN, RF JT, 10°/-, FE SN, UN, RF JT, 10°/-, FE SN, UN, RF JT, 20°/-, FE SN, UN, RF CZ, 18°/-, RF, CL 50 mm, UN, RF JT, 18°/-, FE SN, UN, RF JT, 20°/-, FE SN, UN, RF
		47			335.2	18		Becoming dark blue grey and orange brown. Becoming medium grained, dark blue grey and green brown. Healed defects increasing in abundance. Iron oxide, calcite and chlorite veins up to 3 mm thick, moderately to steeply inclined to core axis, spaced up to 200 mm.				JT, 20°/-, FE SN, UN, RF JT, 45°/-, FE SN, PR, RF JT, 50°/-, FE SN, PR, RF JT, 50°/-, FE SN, PR, RF JT, 50°/-, FE SN, PR, RF JT, 45°/-, FE, CL 1 mm, PR, RF JT, 30°/-, CL 1 mm, PR, RF JT, 30°/-, FE SN, PR, RF JT, 29°/-, QZ, FE VN, ST, RF
		51			334.2	19						JT, 45°/-, FE SN, UN, RF JT, 20°/-, CHL, FE VN, UN, RF JT, 60°/-, FE, CL 1 mm, UN, RF JT, 38°/-, FE SN, UN, RF
					333.2							

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Partial Loss
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Static Level (Date)

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Defect Type
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SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
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VN - Vein
FZ - Fracture Zone
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Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock Fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
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QZ - Quartz
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ZE - Zeolite
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SU - Sulphide
SI - Silicate
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Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
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Shape
PR - Planar
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See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	JK/AT
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455293.6 m E 5316779.6 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-78°	RL Surface:	352.80 m	Drilled:	31/03/2023 - 05/04/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	261°	Datum:	AHD	Operator:	TDS

Drilling Information / Rock Substance / Rock Mass Defects

Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)	Graphic Log	Material Description ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components	Weathering (XW HW MW SW FR)	Strength Is(50) ● - Axial ○ - Diametral (VL 0.1 L 0.3 M 1 H 3 VH 10 EH)	Defect Spacing (mm) (<20 60 200 600 1000)	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, thickness, shape, roughness, other
HQ3		51						DOLERITE: medium grained, dark blue grey and orange brown, massive texture.				
		19	PP =370kPa					DOLERITE FAULT BRECCIA: pale yellow brown, brecciated, fine grained, angular gravel sized clasts. Clay matrix, medium plasticity, very stiff. Matrix supported, clast to matrix ratio 60:40. Highly altered.				20.40 m to 22.50 m: 2.1 m breccia zone with true thickness: 0.5 m SS, 60°/-, CL, RF 100 mm, UN, RF SS, 60°/-, QZ VN, UN, S JT, 22°/-, FE, CHL SN, IR, RF JT, 50°/-, QZ, CL 1 mm, UN, RF
					332.3	21		DOLERITE: medium grained, dark blue grey and orange brown, massive texture. Presence of healed defects. Calcite and zeolite veins up to 4 mm thick, moderately to steeply inclined to core axis, spaced up to 200 mm.				
		16						100 mm zone with zeolites.				VN, 78°/-, QZ 3 mm, UN, RF
		0			331.3	22		Becoming yellow brown and grey. Presence of calcite and zeolite veins up to 40 mm thick, steeply inclined to core axis.				CZ, 25°/-, CL, RF 20 mm, UN, RF JT, 07°/-, FE SN, CU, VR
												CZ, 88°/-, RF, CL 30 mm, IR, RF
		0						Becoming dark green grey and brown orange. Presence of healed defects. Iron oxide and calcite veins up to 3 mm thick, moderately to steeply inclined, spaced up to 300 mm.				JT, 70°/-, QZ 3 mm, UN, RF JT, 40°/-, QZ, FE 1 mm, UN, RF JT, 45°/-, FE SN, UN, RF JT, 52°/-, FE SN, PR, RF JT, 58°/-, QZ VN, ST, RF
					330.3	23						
		47	Is(50) d=8.04 MPa									FZ, RF, CL 50 mm JT, 82°/-, QZ, FE 3 mm, UN, RF
					329.3	24		Becoming dark blue grey and orange brown.				JT, 25°/-, FE SN, PR, RF JT, 28°/-, FE SN, UN, RF
												JT, 20°/-, QZ, FE 1 mm, UN, RF JT, 52°/-, QZ, CL 1 mm, UN, RF
		49			328.3							

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Method
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PT - Push tube

Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
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Testing Type
UCS - Unconfined Compressive Strength
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Weathering
XW - Extremely Weathered
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Strength
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Defect Type
FT - Fault
SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
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Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
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RF - Rock Fragments
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SU - Sulphide
SI - Silicate
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Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
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Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	JK/AT
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455293.6 m E 5316779.6 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-78°	RL Surface:	352.80 m	Drilled:	31/03/2023 - 05/04/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	261°	Datum:	AHD	Operator:	TDS

Drilling Information / Rock Substance / Rock Mass Defects

Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)	Graphic Log	Material Description ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components	Weathering (XW HW MW SW FR)	Strength Is(50) ● - Axial ○ - Diametral (VL 0.1 L 0.3 M 1 H 3 VH 10 EH)	Defect Spacing (mm) (<20 60 200 600 1000)	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, thickness, shape, roughness, other
HQ3		49			327.4	26		DOLERITE: medium grained, dark blue grey and orange brown, massive texture. Presence of healed defects. Iron oxide and calcite veins up to 3 mm thick, perpendicular to moderately inclined to core axis, spaced up to 400 mm.				JT, 40°/-, QZ VN, UN, RF JT, 60°/-, QZ VN, UN, RF JT, 89°/-, QZ, FE 1 mm, UN, RF
		0						Becoming orange brown and grey.				JT, 33°/-, QZ, FE VN, PR, RF JT, 55°/-, CL, RF 2 mm, UN, RF JT, 50°/-, QZ VN, UN, RF FZ, RF, CL 450 mm
		34			326.4	27		Becoming dark blue grey and orange brown.				JT, 45°/-, CL 2 mm, UN, RF JT, 28°/-, CN, UN, RF JT, 30°/-, FE SN, UN, RF FZ, 40°/-, RF 20 mm, IR, RF JT, 15°/-, CN, UN, RF JT, 60°/-, FE SN, IR, RF
		37			325.4	28						CZ, 29°/-, RF, CL 20 mm, ST, RF JT, 40°/-, CL, CHL 1 mm, UN, RF JT, 38°/-, RF, CL 2 mm, UN, RF JT, 38°/-, RF, CL 2 mm, UN, RF JT, 18°/-, CHL, CL 1 mm, UN, RF JT, 60°/-, CHL, CL 1 mm, UN, RF JT, 60°/-, CHL, CL 1 mm, UN, RF JT, 60°/-, CHL VN, UN, RF JT, 62°/-, RF, CL 5 mm, ST, RF JT, 28°/-, RF, CL 2 mm, UN, RF FZ, 10°/-, RF, CL 30 mm, ST, RF
		25			324.4	29		Healed defect abundance increasing. Veins becoming steeply inclined to parallel to core axis.				JT, 40°/-, RF, CL 10 mm, ST, RF JT, 60°/-, RF, CL 3 mm, ST, RF JT, 16°/-, RF, CL 2 mm, ST, RF
					323.5							FT, 60°/-, RF, CL 3 mm, ST, RF

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SPT - Standard penetration test
PT - Push tube

Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
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Testing Type
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VL - Very Low
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SL - Slickensided
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Shape
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Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	JK/AT
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455293.6 m E 5316779.6 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-78°	RL Surface:	352.80 m	Drilled:	31/03/2023 - 05/04/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	261°	Datum:	AHD	Operator:	TDS

Drilling Information

Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)
HQ3		25			322.5	31
		0				
		0				
		48			321.5	32
		42			320.5	33
		43				
		0	PP =40kPa		319.5	34
		50			318.6	

Rock Substance

Graphic Log

Material Description
ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components

Weathering: XW HW MW SW FR

Strength Is(50) ● - Axial ○ - Diametral: VL 0.1 L 0.3 M 1 H 3 VH 10 EH

DOLERITE: medium grained, dark blue grey and orange brown, massive texture. Presence of abundant healed defects. Iron oxide veins up to 1 mm thick, perpendicular to moderately inclined to core axis, spaced up to 100 mm.

Becoming fine grained, orange brown. Calcite veins up to 5 mm thick, steeply inclined to core axis also becoming present.

Becoming medium grained, dark blue grey and orange brown. Vein spacing up to 100 mm.

DOLERITE FAULT BRECCIA: brown grey, brecciated, fine to coarse grained, angular gravel sized clasts. Clay matrix, medium plasticity. Matrix supported, clast to matrix ratio 60:40.

DOLERITE: medium grained, orange brown and dark green grey, massive texture. Presence of closely spaced healed defects. Quartz vein 10 mm thick, steeply inclined to core axis.

60 mm interval of brown-grey clay with medium plasticity, soft.
Becoming dark blue grey and orange brown.

Rock Mass Defects

Defect Spacing (mm): <20 60 200 600 1000

Defect Descriptions / Comments
Description, alpha/beta, infilling or coating, thickness, shape, roughness, other

- JT, 12°/-, RF, CL 2 mm, ST, RF
- JT, 62°/-, CL 1 mm, PR, RF
- JT, 33°/-, CL 2 mm, ST, RF
- FZ, RF, CL 500 mm
- JT, 20°/-, CL 2 mm, UN, RF
- JT, 40°/-, CL 1 mm, UN, RF
- FZ, 20°/-, RF 10 mm, UN, RF
- JT, 32°/-, CL 1 mm, UN, RF
- JT, 20°/-, CL 1 mm, PR, RF
- JT, 50°/-, CL 2 mm, PR, RF
- FZ, RF, CL 100 mm
- JT, 10°/-, CL, RF 5 mm, UN, RF
- JT, 25°/-, CL, RF 2 mm, UN, RF
- JT, 10°/-, FE SN, UN, RF
- JT, 32°/-, RF, CL 1 mm, UN, RF
- JT, 18°/-, CL 1 mm, UN, RF
- JT, 40°/-, CL, CHL 1 mm, ST, RF
- JT, 10°/-, CL 1 mm, UN, RF
- CZ, 40°/-, RF, CL 30 mm, ST, RF
- JT, 50°/-, CL 1 mm, UN, RF
- JT, 48°/-, CL 1 mm, UN, RF
- JT, 22°/-, CL 3 mm, UN, RF
- JT, 67°/-, CL, RF 2 mm, UN, RF
- JT, 67°/-, CL, RF 3 mm, UN, RF
- CZ, CL, RF 270 mm, UN, RF
- JT, 42°/-, CL, RF 1 mm, UN, RF
- JT, 50°/-, CL, RF 1 mm, UN, RF
- SS, 10°/-, CL 60 mm, UN, RF
- JT, 06°/-, FE, CL 1 mm, UN, RF
- JT, 40°/-, FE SN, UN, RF
- JT, 20°/-, CL, RF 1 mm, UN, RF

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3 - Wireline core (61.0 mm)
PQ3 - Wireline core (83.0 mm)
SPT - Standard penetration test
PT - Push tube

Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Testing Type
UCS - Unconfined Compressive Strength
TXL - Triaxial Shear Test
DS - Direct Shear Test
PET - Petrography
STS - Splitting Tensile Strength
DEN - Density
CER - Cerchar Abrasivity
SS - Sodium Sulphate Soundness
M - Moisture Content
SD - Slake Durability
LA - Los Angeles Abrasion
ISS - In Situ Stress
PP - Pocket Penetrometer

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock Fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous
CHL - Chlorite
ZE - Zeolite
SE - Sericite
MG - Manganese
SU - Sulphide
SI - Silicate
PY - Pyrite

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	JK/AT
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455293.6 m E 5316779.6 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-78°	RL Surface:	352.80 m	Drilled:	31/03/2023 - 05/04/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	261°	Datum:	AHD	Operator:	TDS

Drilling Information / Rock Substance / Rock Mass Defects

Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)	Graphic Log	Material Description ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components	Weathering (XW HW MW SW FR)	Strength Is(50) ● - Axial ○ - Diametral (VL 0.1 L 0.3 M 1 H 3 VH 10 EH)	Defect Spacing (mm) (<20 60 200 600 1000)	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, thickness, shape, roughness, other
HQ3		45						DOLERITE: medium grained, orange brown and dark blue grey, massive texture. Presence of healed defects. Iron oxide and calcite veins up to 2 mm thick, perpendicular to moderately inclined to core axis, spaced up to 150 mm.				JT, 32°/-, CL 1 mm, UN, RF JT, 32°/-, CL 30 mm, UN, RF JT, 32°/-, CL 1 mm, UN, RF
		80			317.6	36						
			PP =50kPa					DOLERITE FAULT BRECCIA: light brown grey, brecciated, fine to coarse grained, angular gravel. Clay matrix, medium plasticity, soft. Matrix supported, clast to matrix ratio 40:60.				CZ, 10°/-, CL, RF 100 mm, UN, RF JT, 15°/-, CL 8 mm, UN, RF JT, 50°/-, CL, RF 2 mm, UN, RF JT, 08°/-, CL, RF 2 mm, UN, RF
		44										
		40			316.6	37		DOLERITE: medium grained, brown orange and dark blue grey, massive texture. Presence of healed defects. Iron oxide and calcite veins up to 3 mm thick, perpendicular to steeply inclined to core axis, spaced up to 600 mm.				SZ, 08°/-, CL, RF 60 mm, UN, RF JT, 60°/-, CL 2 mm, UN, RF
		0										
		44			315.6	38						JT, 40°/-, CL 2 mm, UN, RF CZ, 22°/-, RF, CL 10 mm, UN, RF VN, 41°/-, QZ 5 mm, UN, RF JT, 50°/-, CL 1 mm, UN, RF JT, 25°/-, CL 1 mm, UN, RF JT, 20°/-, CL 1 mm, UN, RF
		69						Becoming dark blue grey and orange brown.				JT, 14°/-, FE SN, ST, RF JT, 12°/-, CN, ST, RF JT, 50°/-, CN, IR, RF FZ, 20°/-, RF 10 mm, UN, RF JT, 30°/-, CL 1 mm, UN, RF JT, 10°/-, CL 1 mm, UN, RF
					314.7	39						
		0						Becoming orange brown.				JT, 33°/-, CL VN, IR, RF
		0						DOLERITE FAULT GOUGE: clay matrix, medium plasticity, light orange brown. Fine grained gravel sized clasts of zeolite. Matrix supported, clast to matrix ratio 20:80. Highly altered.				
					313.7			DOLERITE: medium grained, yellow brown and white,				

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PQ3 - Wireline core (83.0 mm)
SPT - Standard penetration test
PT - Push tube

Water
Level (Date)
Partial Loss
Complete Loss
Static Level (Date)

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Testing Type
UCS - Unconfined Compressive Strength
TXL - Triaxial Shear Test
DS - Direct Shear Test
PET - Petrography
STS - Splitting Tensile Strength
DEN - Density
CER - Cerchar Abrasivity
SS - Sodium Sulphate Soundness
M - Moisture Content
SD - Slake Durability
LA - Los Angeles Abrasion
ISS - In Situ Stress
PP - Pocket Penetrometer

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
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SZ - Shear Zone
BP - Bedding Parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
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SN - Stain
VN - Veneer
CO - Coating
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CL - Clay
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Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Engineering Log - Cored Borehole - Rock

Project No.: PSM4346

Client:	Hydro Tasmania	Logged By:	JK/AT
Project Name:	Tarraleah Redevelopment	Checked By:	VR
Hole Location:	Tarraleah Switchyard	Report ID:	GDR - Stage 1
Hole Position:	455293.6 m E 5316779.6 m N GDA2020 Z55		

Drill Model and Mounting:	HANJIN D&B 8	Inclination:	-78°	RL Surface:	352.80 m	Drilled:	31/03/2023 - 05/04/2023
Barrel Type and Length:	Triple Tube 3 m	Bearing (TN):	261°	Datum:	AHD	Operator:	TDS

Drilling Information							***Rock Substance***			***Rock Mass Defects***	
Method	Water	RQD (%)	SAMPLES & FIELD TESTS	WPT (Lugeons)	RL (m)	Depth (m)	Graphic Log	Material Description ROCK NAME: grain size, colour, texture/fabric, structure, inclusions and minor components	Weathering XW HW MW SW FR	Strength Is(50) ● - Axial ○ - Diametral VL 0.1 L 0.3 M 1 H 3 VH 10 EH	Defect Spacing (mm) <20 60 200 600 1000	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, thickness, shape, roughness, other
					312.7	41		presence of zeolite veins up to 5 mm, moderately inclined to core axis.				
					311.7	42		Borehole Terminated at 39.80 m Target depth. Televiewer survey conducted. Open standpipe installed.				
					310.7	43						
					309.8	44						
					308.8							

See AS 1726:2017 and Project Specific Logging Descriptions for further details.

Method
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Static Level (Date)

Graphic Log/Core Loss
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DS - Direct Shear Test
PET - Petrography
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Weathering
XW - Extremely Weathered
HW - Highly Weathered
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Strength
VL - Very Low
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SS - Shear Seam
SZ - Shear Zone
BP - Bedding Parting
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RF - Rock Fragments
G - Gravel
S - Sand
Z - Silt
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QZ - Quartz
X - Carbonaceous
CHL - Chlorite
ZE - Zeolite
SE - Sericite
MG - Manganese
SU - Sulphide
SI - Silicate
PY - Pyrite

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

TA-DC243 Tray 1 Depth Range: 0.00 - 2.63 m

TA-DC243 Tray 2 Depth Range: 2.63 - 5.00 m

TA-DC243 Tray 3 Depth Range: 5.00 - 7.70 m

Notes:

1. Photos not to scale

Hydro Tasmania BoTN - Tarraleah Redevelopment Tarraleah Switchyard Reference Design - Site Investigation TA-DC243	
PSM4346	Page 1 of 5

TA-DC243 Tray 4 Depth Range: 7.70 - 11.10 m

TA-DC243 Tray 5 Depth Range: 11.10 - 14.80 m

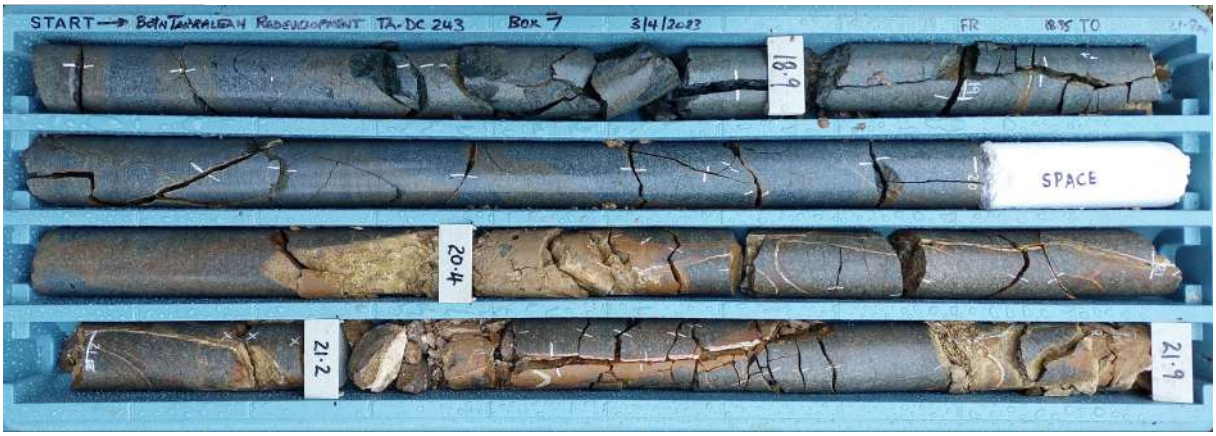
TA-DC243 Tray 6 Depth Range: 14.80 - 18.35 m

Notes:

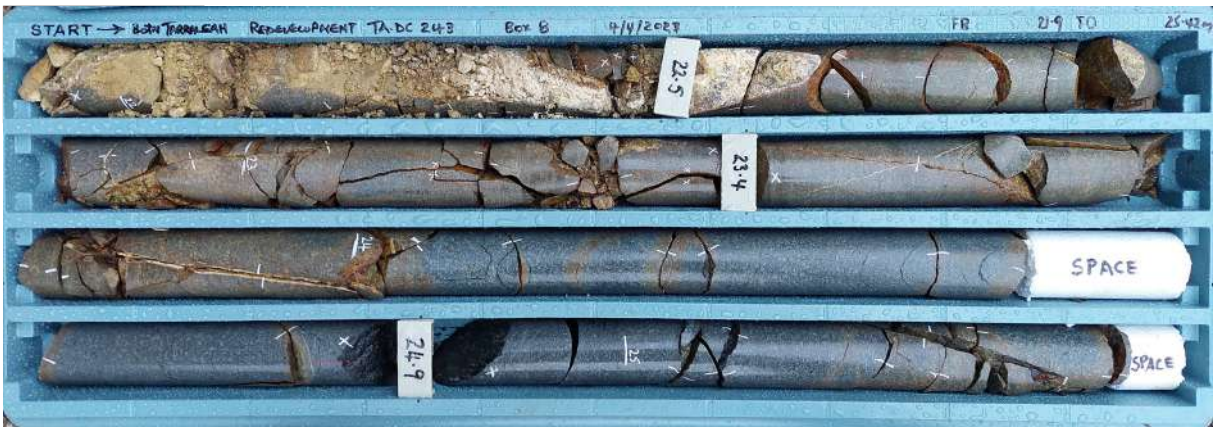
1. Photos not to scale

Hydro Tasmania
BoTN - Tarraleah Redevelopment
Tarraleah Switchyard
Reference Design - Site Investigation
TA-DC243

TA-DC243 Tray 7 Depth Range: 18.35 - 21.90 m



TA-DC243 Tray 8 Depth Range: 21.90 - 25.45 m



TA-DC243 Tray 9 Depth Range: 25.45 - 28.85 m

Notes:

1. Photos not to scale

Hydro Tasmania
BoTN - Tarraleah Redevelopment
Tarraleah Switchyard
Reference Design - Site Investigation
TA-DC243

TA-DC243 Tray 10 Depth Range: 28.85 - 32.25 m

TA-DC243 Tray 11 Depth Range: 32.25 - 35.80 m

TA-DC243 Tray 12 Depth Range: 35.80 - 39.30 m

Notes:

1. Photos not to scale

Hydro Tasmania
BoTN - Tarraleah Redevelopment
Tarraleah Switchyard
Reference Design - Site Investigation
TA-DC243

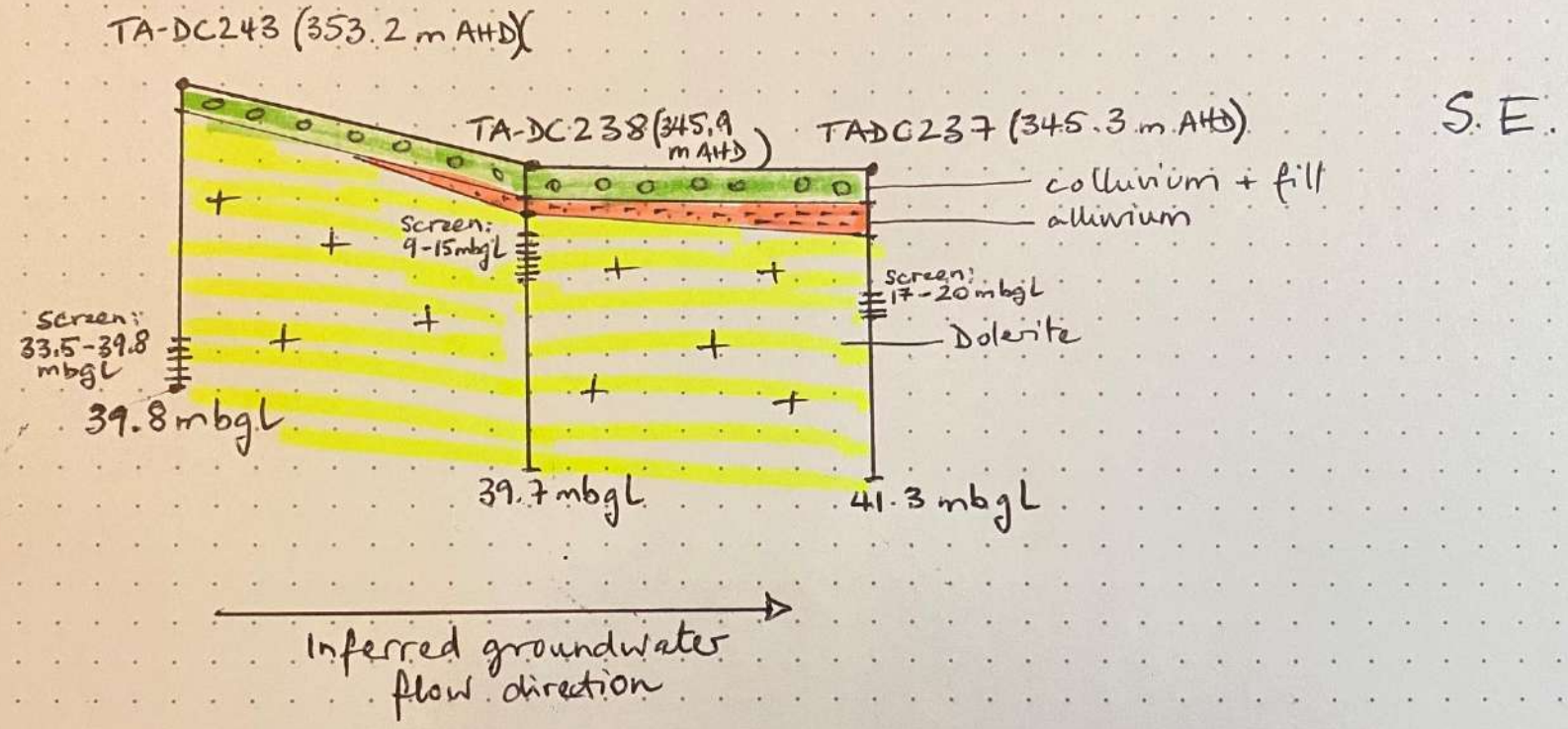
TA-DC243 Tray 13 Depth Range: 39.30 - 39.8 m

Notes:

1. Photos not to scale

Hydro Tasmania
BoTN - Tarraleah Redevelopment
Tarraleah Switchyard
Reference Design - Site Investigation
TA-DC243

SECTION A - Schematic



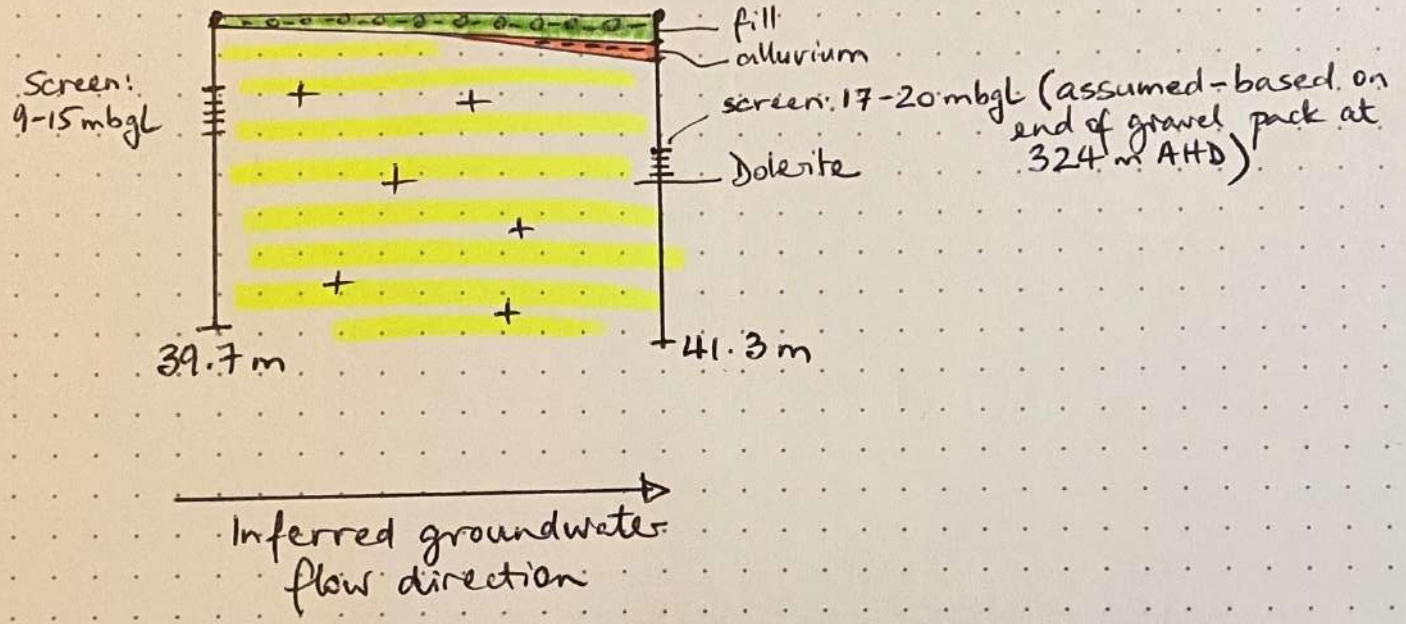
SECTION B - Schematic

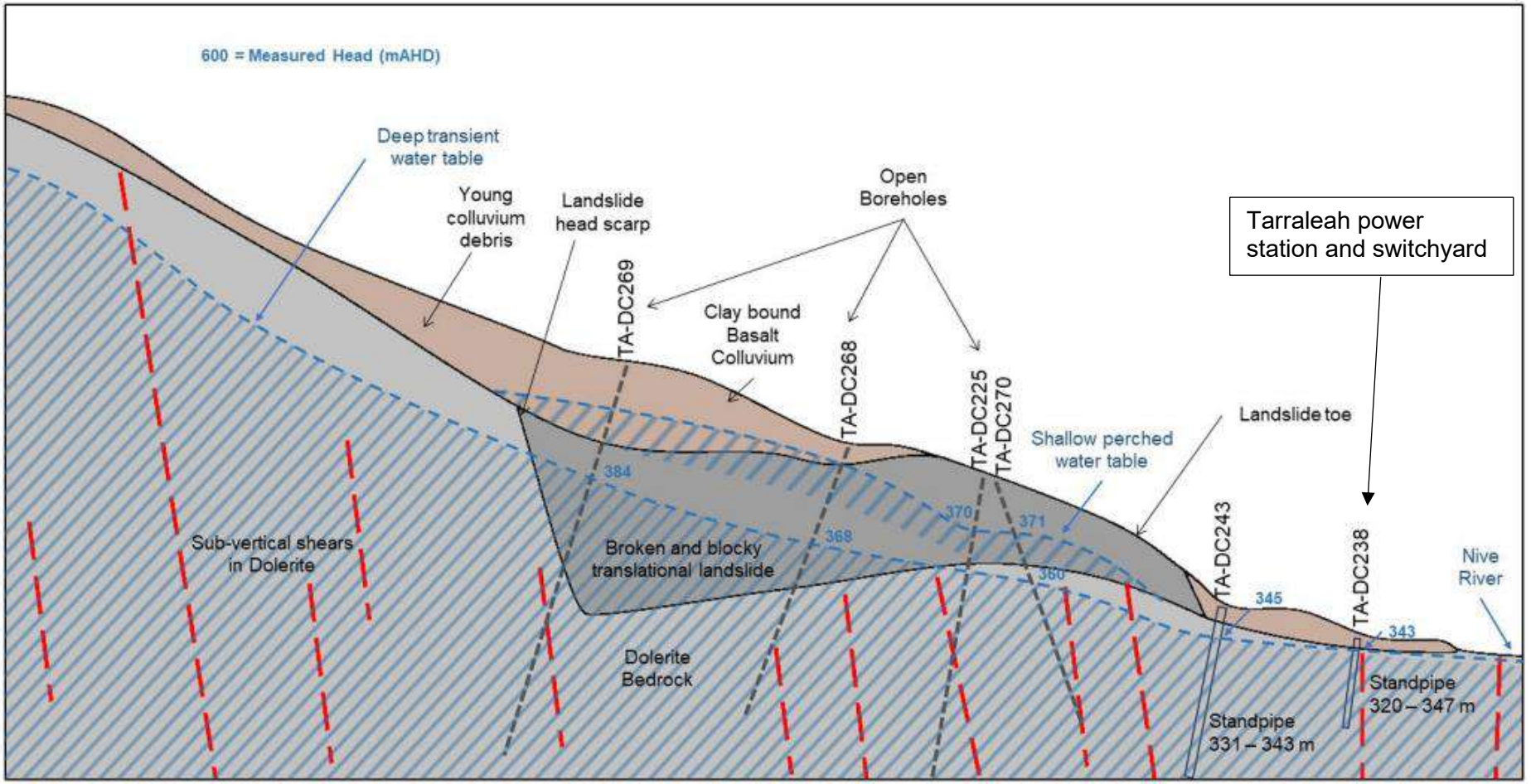
NW

TA-DC234 (344.2m AHD)

TADC235 (344m AHD)

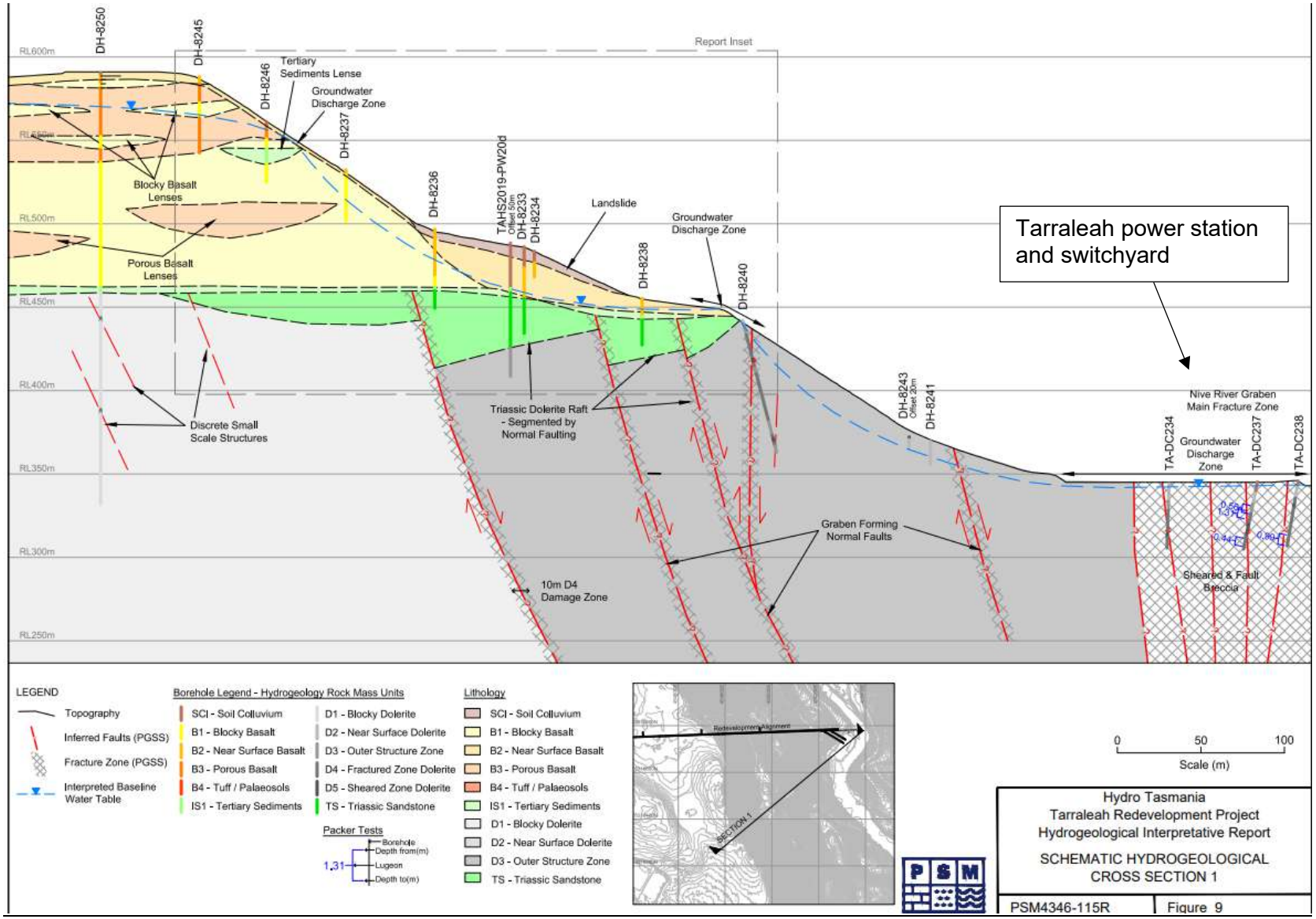
SE





Inset 13: Schematic cross section of the disturbed dolerite zone within the lower Tarraleah hillside showing inferred groundwater table.

Source: PSM, 2024



Source: PSM, 2024

Land Contamination Survey 1995, figures

Attachment G

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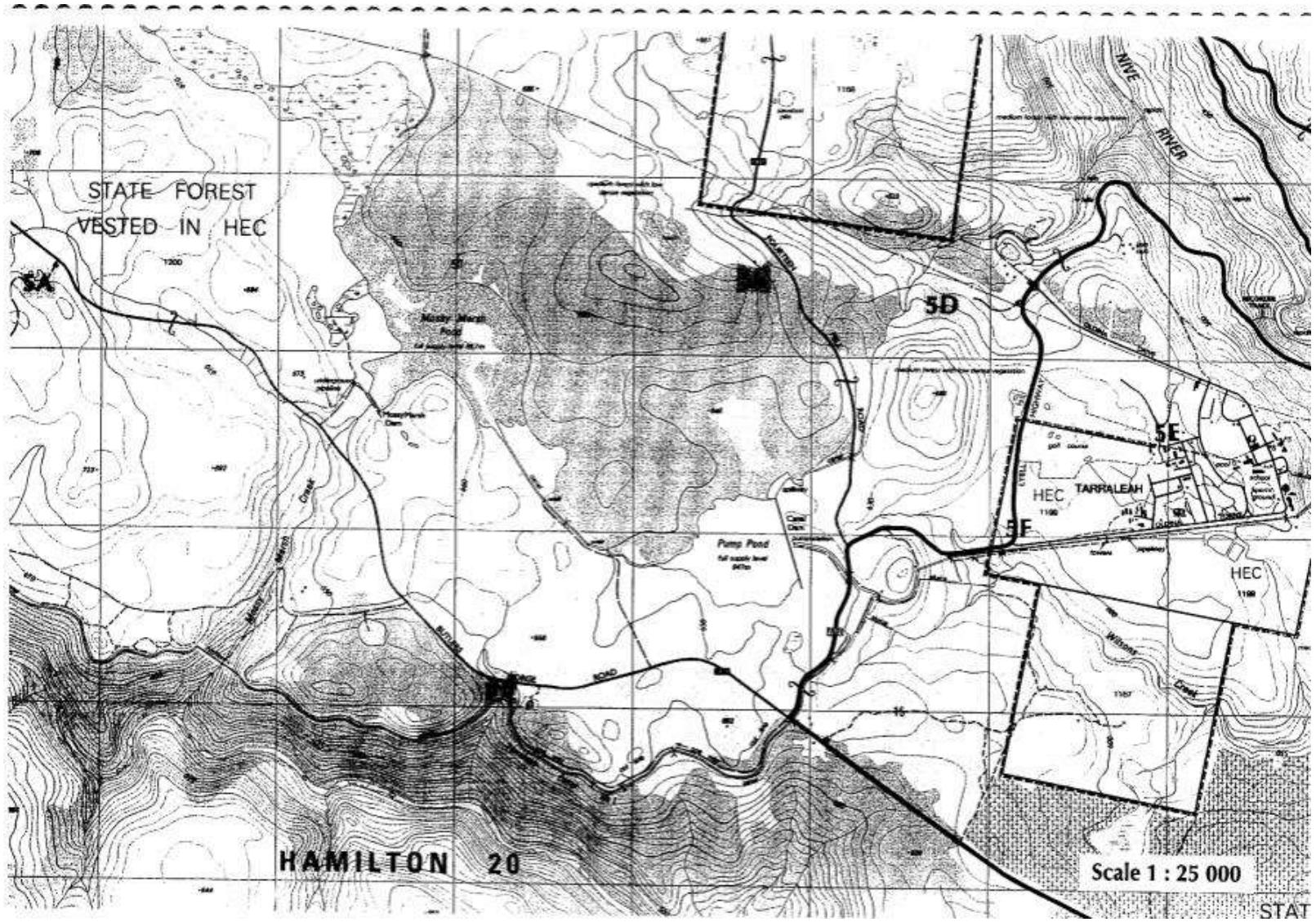

Figure 1 – Locations of Tarraleah PCAs (source: Land Contamination Survey, 1995)

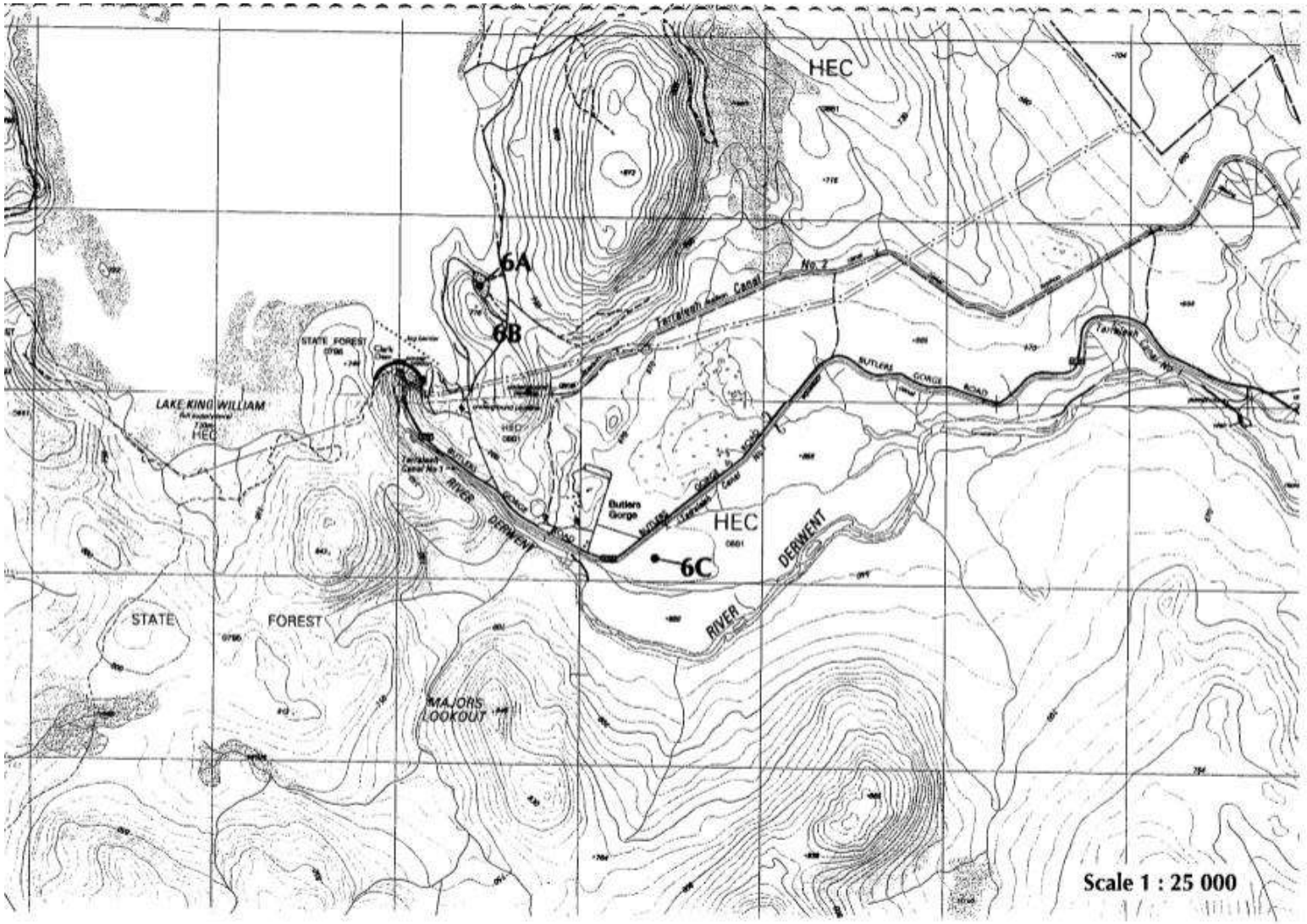

Figure 2 – Locations of Butler's Gorge PCAs (source: Land Contamination Survey, 1995)

Proposed sampling locations figures

Attachment H

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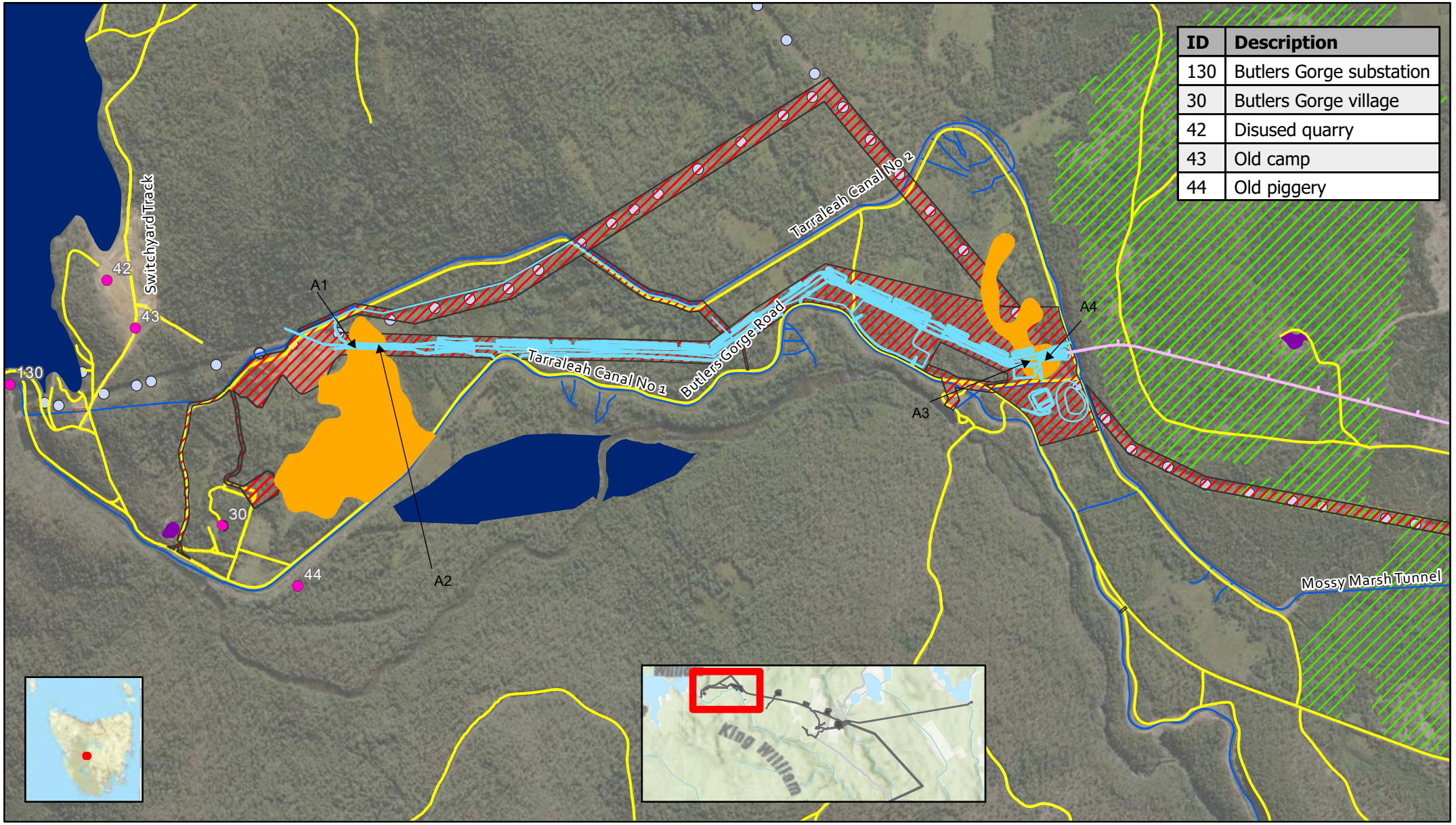

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Figure 2A Tarraleah Power Scheme PSI Proposed Soil Sample Locations - Area A

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N

0 0.25 0.5 1 km

Coordinate System: GDA2020 MGA Zone 55

1:25,000 When Printed at A4

MAP REF	P.24.1136
AUTHOR	JH
REVISION	D
DATE	13/12/2024

DATA SOURCES	Base map from ESRI Base data from The LIST Tasmanian Government Project specific data

Legend

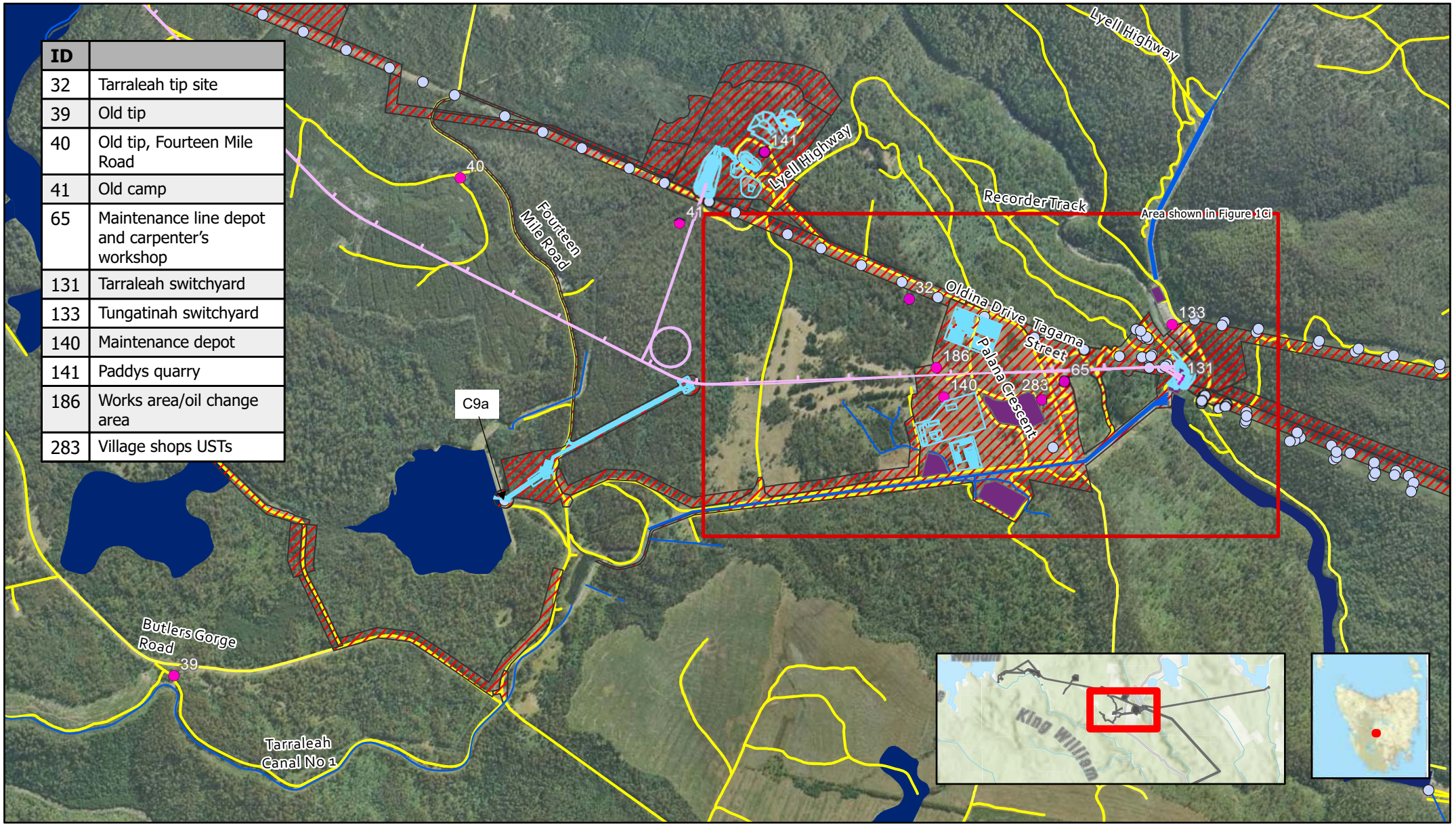
- TARDEV - Reference Design (Lines) Above ground
- TARDEV - Reference Design (Lines) Underground
- Tarraleah EIS footprint for Approval - August 2024

Inland Acid Sulfate Soils [more 20m AHD]

- High
- Low
- Extremely Low

Potential contamination

- Fill - roads
- Fill - canals
- Forestry
- Fill - infrastructure area
- Fill - infrastructure points
- Contaminated Sites



Hydro-Electric Corporation

Figure 2C Tarraleah Power Scheme PSI Proposed Soil Sample Locations - Area C

pitt&sherry

N

0 0.25 0.5 1 km

Coordinate System: GDA2020 MGA Zone 55

1:25,000 When Printed at A4

MAP REF	P.24.1136
AUTHOR	JH
REVISION	C
DATE	13/12/2024

DATA SOURCES	Base map from ESRI Base data from The LIST Tasmanian Government Project specific data

Legend

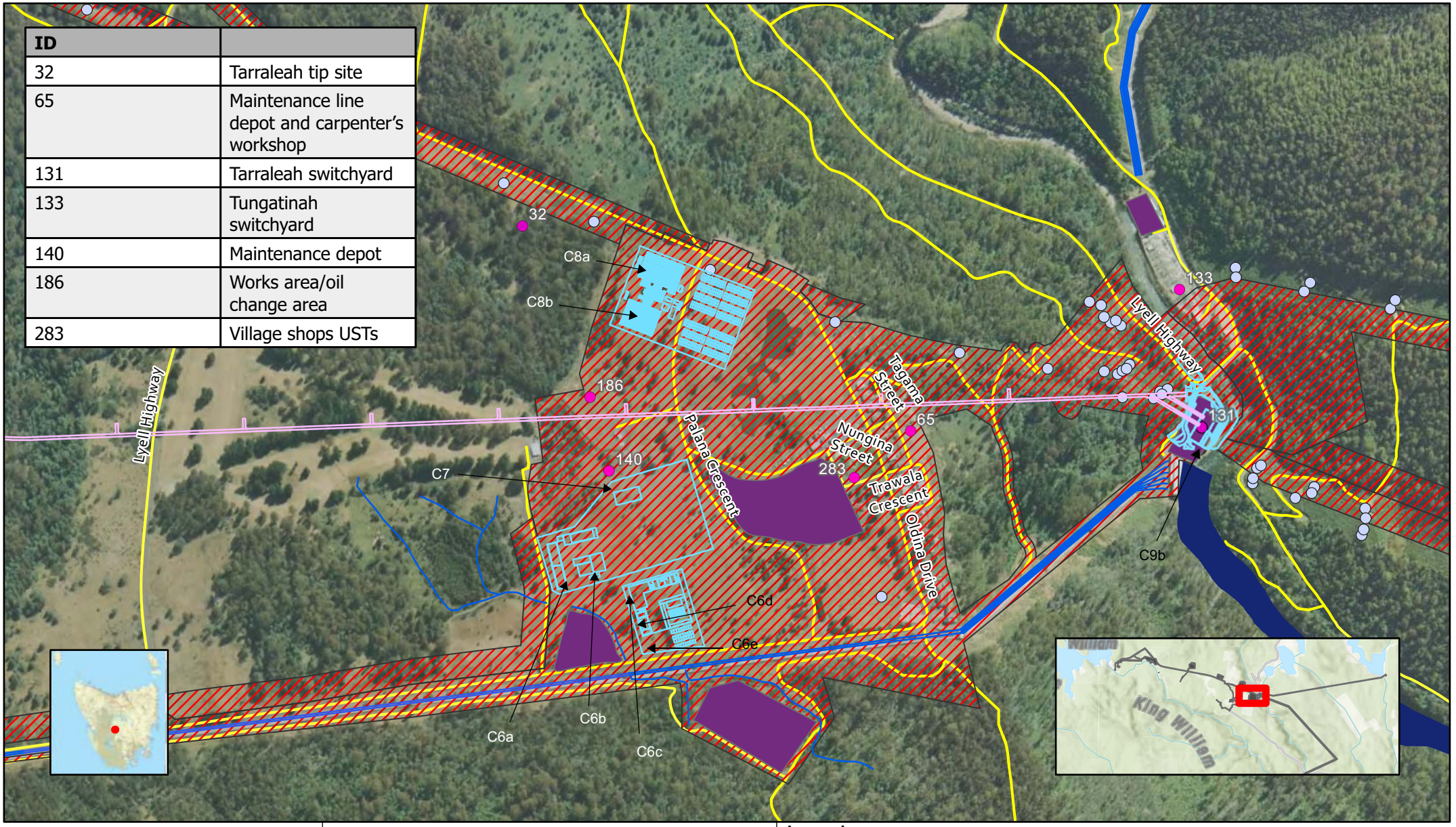
- TARDEV - Reference Design (Lines) Underground
- TARDEV - Reference Design (Lines) Above ground
- Tarraleah EIS footprint for Approval

Inland Acid Sulfate Soils [more 20m AHD]

- High
- Low
- Extremely Low

Potential contamination

- Contaminated Sites
- Fill - infrastructure points
- Contaminated areas
- Fill - canals
- Fill - roads



Hydro-Electric Corporation

Figure 2Ci Tarraleah Power Scheme PSI Proposed Soil Sample Locations - Area C (Tarraleah Village and Power Station)

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N

0 0.1 0.2 0.4 km

Coordinate System: GDA2020 MGA Zone 55

1:10,000 When Printed at A4

MAP REF	P.24.1136
AUTHOR	JH
REVISION	B
DATE	13/12/2024

DATA SOURCES	Base map from ESRI
	Base data from The LIST Tasmanian Government
	Project specific data

Legend

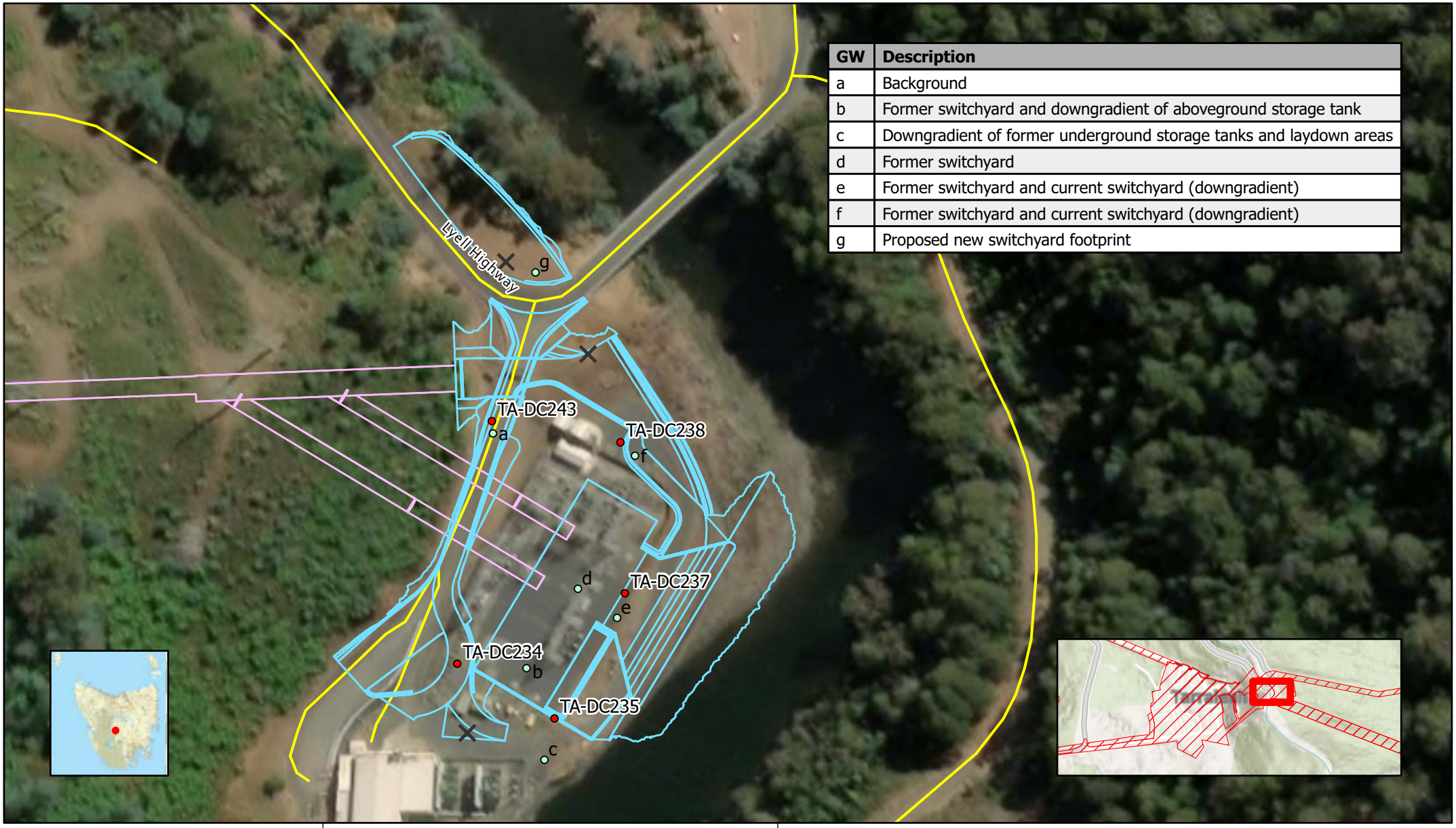
- TARDEV - Reference Design (Lines) Underground
- TARDEV - Reference Design (Lines) Above ground
- Tarraleah EIS footprint for Approval

Inland Acid Sulfate Soils [more 20m AHD]

- High
- Low
- Extremely Low

Potential contamination

- Contaminated Sites
- Fill - infrastructure points
- Contaminated areas
- Fill - canals
- Fill - roads



GW	Description
a	Background
b	Former switchyard and downgradient of aboveground storage tank
c	Downgradient of former underground storage tanks and laydown areas
d	Former switchyard
e	Former switchyard and current switchyard (downgradient)
f	Former switchyard and current switchyard (downgradient)
g	Proposed new switchyard footprint

Hydro-Electric Corporation

Figure 2Cii Tarraleah Power Scheme
Proposed sampling locations- Area C
(Tarraleah switchyard)

pitt&sherry

N

0 0.01 0.03 0.06 km

Coordinate System: GDA2020 MGA Zone 55

1:1,500 When Printed at A4

MAP REF	P.24.1136
AUTHOR	JH
REVISION	B
DATE	19/02/2025

DATA SOURCES	Base map from ESRI Base data from The LIST Tasmanian Government Project specific data

Legend

- TARDEV - Reference Design (Lines) Underground
- TARDEV - Reference Design (Lines) Above ground
- Proposed new groundwater well and soil investigation locations
- Proposed soil only investigation locations
- Existing groundwater wells

Inland Acid Sulfate Soils [more 20m AHD]

- High
- Low
- Extremely Low

Field sheets

Appendix C

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SOIL SAMPLING FIELD DATA SHEET

Site I.D	**Tarraleah Power Station - Village**
Date	**31/03 and 01/04 2025**
Personnel	**EPM**
Client	**Entura / Hydro Tasmania**
Weather	**Fine / drizzling**

Project number:	**P.24.1136**
Project name:	**Tarraleah Power Station ESA**

ID	Coordinates		Date	Material	Moisture (D, M, W)	PID (ppm)	Colour	Odour	Sampled? (Y/N)	Comments
TA-TP449/0.0-0.2	454073.6	5316407.85	31/03/2025	Sandy SILT with gravel	D	0.2m = 0.2 ppm	Brown	No	No	Sandy topsoil with some gravel (from underlaying layer). Thin coat of grass on top. Light grey material from 0.2mbgl
TA-TP449/0.2-0.4			31/03/2025	Sandy GRAVEL	D	0.4m = 0.4 ppm	Light brown / grey	No	449/0.4	Fill material comprising re-worked soils and basalt rock (gravel, cobbles and boulders).
TA-TP449/0.4-1.0			31/03/2025	Clayey SILT / basalt cobbles	M	0.8m = 1.2 ppm	Dark brown (silt)	No	449/0.8 QCP01 QCS01	Moderately weathered basalt rock with clayey SILT material around it. Moisture present within the silt.
TA-TP449/1.0-1.4			31/03/2025	Clayey SILT	M	1.0m = 0.2 ppm	Orange/Brown with black	No	No	Darker silt material under fill layer. Transitioning from imported material to natural soils (weathered basalt)
TA-TP449/1.4-3.0			31/03/2025	Weathered basalt rock with silty CLAY	M	2.4m = 0.2 ppm 3.0m = 0.4 ppm	Orange/Brown with black	No	449/3.0	Very weathered basalt rock, with silty CLAY material around it. Cobbles and boulders increasing with depth, refusal reached in hard basalt at 3.0 mbgl
TA-TP450/0.0-0.2	454125.67	5316433.31	31/03/2025	Sandy SILT with gravel	D	0.2m = 0.2 ppm	Brown	No	450/0.2 Soil characterisation	Sandy topsoil with some gravel (from underlaying layer). Thin coat of grass on top. Light grey material from 0.2mbgl. Some sand patches present.
TA-TP450/0.2-1.4			31/03/2025	Sandy GRAVEL	D	0.9m = 0.2 ppm	Light brown / grey	No	No	Fill material comprising re-worked soils and basalt rock (gravel, cobbles and boulders).
TA-TP450/1.4-1.8			31/03/2025	Clayey SILT / basalt cobbles	M	1.4m = 0.9 ppm	Dark brown / black (silt)	Organic odour	450/1.4	Darker silt material under fill layer. Transitioning from imported material to natural soils (weathered basalt). Refusal hit in hard basalt rock at 1.8 mbgl.
TA-TP451/0.0-0.2	454197.41	5316398.6	1/04/2025	Sandy SILT with gravel	D	0.2m = 0.3 ppm	Brown	No	No	Sandy topsoil with some gravel (from underlaying layer). Thin coat of grass on top. Light grey material from 0.2mbgl
TA-TP451/0.2-1.5			1/04/2025	Sandy GRAVEL	D	0.8m = 0.4 ppm	Brown/orange	No	451/0.8	Fill material comprising re-worked soils and basalt rock (gravel, cobbles and boulders). Old irrigation pipe present and dead power cables present at 1.0 mbgl
TA-TP451/1.5-3.0			1/04/2025	Weathered basalt rock with silty CLAY	D	2.0m = 0.1 ppm 3.0m = 0.2 ppm	Dark brown / orange	No	451/2.0 451/3.0	Very weathered basalt rock, with silty CLAY material around it. Cobbles and boulders increasing with depth, refusal reached in hard basalt at 3.0 mbgl
TA-TP452/0.0-1.1	454219.39	5316333.8	1/04/2025	Sandy GRAVEL	D	0.2m = 0.1 ppm	Light brown / grey	No	452/0.2	Little to no topsoil present. Fill material comprising re-worked soils and basalt rock (gravel and cobbles).
TA-TP452/1.1-2.5			1/04/2025	Clayey SILT / basalt cobbles	M	2.0m = 0.3 ppm	Dark brown / black (silt)	No	452/2.0	Darker silt material under fill layer. Transitioning from imported material to natural soils (weathered basalt).
TA-TP452/2.5-3.2			1/04/2025	Weathered basalt rock with silty CLAY	W	3.2m = 0.2 ppm	Orange/Dark Brown/Black	No	452/3.2	Very weathered basalt rock, with silty CLAY material around it. Cobbles and boulders increasing with depth. Water ingress observed from 3.0 mbgl, with reasonable flow. Water seems to be flowing under clayey silt layer and within the shallow portion of the harder basalt rock layer.
TA-TP452 at 3.0m	454219.39	5316333.8	1/04/2025	-	-	0.1 ppm	-	No	452/W	Grab sample from water flowing into the test pit. Very turbid water, but no sheen nor odour present.
TA-TP453/0.0-0.6			1/04/2025	Sandy SILT	D	0.2m = 0.2 ppm	Brown / Red	No	453/0.2	Loamy topsoil, little to no presence of gravel

ID	Coordinates		Date	Material	Moisture (D, M, W)	PID (ppm)	Colour	Odour	Sampled? (Y/N)	Comments
TA-TP453/0.6-2.1	454228.65	5316287.52	1/04/2025	Clayey SILT / basalt cobbles	M	1.5m = 0.1 ppm	Orange/Brown with black	No	453/1.5 Soil characterisation	Moderately weathered basalt rock with clayey SILT material around it. Moisture present within the silt.
TA-TP453/2.1-2.8			1/04/2025	Weathered basalt rock with silty CLAY	W	2.2m = 0.1 ppm	Dark brown / orange	No	453/2.2	Very weathered basalt rock, with silty CLAY material around it. Cobbles and boulders increasing with depth. Water ingress observed from 2.1 mbgl, with reasonable flow. Water seems to be flowing under clayey silt layer and within the shallow portion of the harder basalt rock layer.
TA-TP454 at 3.0m			1/04/2025	-	-	0.3 ppm	-	No	452/W	Grab sample from water flowing into the test pit. Very turbid water, but no sheen nor odour present.

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SOIL SAMPLING FIELD DATA SHEET

Site I.D	Tarraleah Power Station - Switchyard
Date	7-15 April 2025
Personnel	EPM
Client	Entura / Hydro Tasmania
Weather	Fine

Project number:	P.24.1136
Project name:	Tarraleah Power Station ESA

ID	Coordinates		Date	Material	Moisture (D, M, W)	PID (ppm)	Colour	Odour	Sampled? (Y/N)	Comments
TA-MB412/0.0-0.2			7/04/2025	Blue Gravel	D	-	Blue/grey	No	No	Dug with NDD
TA-MB412/0.2-2.5			7/04/2025	Clayey SAND with cobbles	D	0.4m = 1.8ppm 1.2m = 1.7ppm 1.5m = 0.3ppm 2.3m = 4.0ppm	Brown	No	TA-MB412/0.4 QCP02 QCS02	Fill material, dug with NDD down to 1.0 mbgl. Clay seems to be re-worked natural (from weathered dolerite) and cobbles comprise dolerite and alluvial cobbles.
TA-MB412/2.5-3.3			7/04/2025	Clayey SAND with minor gravel	M	2.6m = 4.0ppm 3.0m = 2.3ppm	Brown	No	TA-MB412/1.5 TA-MB412/2.3 TA-MB412/3.0	Fill material, similar to layer above but with smaller gravel present. Moisture present from 3.0 mbgl (DWS). Refusal to auger at 3.3 mbgl, changed to HQ drilling method.
TA-MB412/3.3-4.4			7/04/2025	Cobbles and boulders	W	-	Blue/grey	No	No	Alluvial cobbles and boulders, with little to no soil (residual from layer above). Rounded alluvial pebbles stop at 4.4 mbgl (top of bedrock)
TA-MB412/4.4-5.0			7/04/2025	Weathered dolerite rock	W	-	Blue/grey and brown (weathered)	No	No	dolerite bedrock, highly weathered in surface layers. Lost 200mm due to fall in upon removing rods. Bottom of well installed at 4.8 mbgl with 3m screen (screening section from 1.8m to 4.8 mbgl). Note: water from HQ drilling not draining into formation, suggesting low permeability of the formation at this location.
TA-MB414/0.0-0.2			8/04/2025	Blue Gravel	D	-	Blue/grey	No	No	Dug with NDD
TA-MB414/0.2-2.0			8/04/2025	Clayey SAND with cobbles	D	0.4m = 0.6 ppm 1.5m = 0.4 ppm 2.0m = 0.4 ppm	Brown	No	TA-MB414/0.4 TA-MB414/1.5 TA-MB414/2.0	Fill material, dug with NDD down to 1.4 mbgl. Darker clay material present. Refusal to auger at 2.0 mbgl, changed to HQ drilling method.
TA-MB414/2.0-3.3			8/04/2025	Cobbles and boulders	-	-	Blue/grey	No	No	Alluvial cobbles and boulders, with little to no soil (residual from layer above). Rounded alluvial pebbles stop at 3.3 mbgl (top of bedrock)
TA-MB414/3.3-6.5			8/04/2025	Weathered dolerite rock	-	-	Blue/grey and brown (weathered)	No	No	dolerite bedrock, highly weathered in surface layers. Lost 0.5m due to fall in when removing rods. Drillhole sealed with grout from 5 to 6 mbgl and plugged with bentonite from 3.3 to 5 mbgl, bottom of well installed at 3.3 mbgl with 2.5m screen (screening section from 0.8 to 3.3 mbgl).
TA-MB415/0.0-0.2			9/04/2025	Sandy CLAY	D	0.1m = 0 ppm	Brown	No	No	Clayey topsoil. Similar material to the fill layer, only with little to no gravel present
TA-MB415/0.2-2.7			9/04/2025	Clayey SAND with cobbles	D	0.3m = 0.4 ppm 1.3m = 0.0 ppm 1.8m = 0.0 ppm 2.5m = 0.1 ppm	Brown	No	TA-MB415/0.3 TA-MB415/1.8	Fill layer. Little moisture at ~2.0 mbgl, potentially residual from NDD above.
TA-MB-415/2.7-2.8			9/04/2025	Sandy CLAY with gravel	D	2.8 = 0.5 ppm	Dark brown/black	No	TA-MB415/2.8	Thin layer of dark clay material
TA-MB415/2.8-3.5			9/04/2025	Clayey SAND with cobbles	D/M	3.3m = 0.4 ppm	Brown	No	TAMB415/3.3	Change back to more sandy material. Moisture present at 3.3 mbgl. Refusal to auger at 3.5 mbgl.
TA-MB415/3.5-7.3			9/04/2025	Cobbles and boulders	-	-	Blue/grey	No	No	Alluvial cobbles and boulders, with little to no soil (residual from layer above). Rounded alluvial pebbles stop at 7.3 mbgl (top of bedrock)
TA-MB415/7.3-9.0			9/04/2025	Weathered dolerite rock	-	-	Blue/grey and brown (weathered)	No	No	dolerite bedrock, highly weathered in surface layers. Weathered layer of zeolite present at top of bedrock. Drillhole plugged with bentonite from 7.3 to 9 mbgl. Lost ~ 200 mm due to fall in when removing rods. Bottom of well installed at 7.0 mbgl with 4.5m screen (screening section from 2.5 to 7.0 mbgl).
TA-MB416/0.0-0.1			10/04/2025	Blue Gravel	D	-	Blue/grey	No	No	Dug with NDD
TA-MB416/0.1-1.5			10/04/2025	Clayey SAND with cobbles	D	0.4m = 0.0 ppm 1.3m = 1.7 ppm	Brown	No	TA-MB416/0.4	Fill material, dug with NDD down to 1.0 mbgl.

ID	Coordinates		Date	Material	Moisture (D, M, W)	PID (ppm)	Colour	Odour	Sampled? (Y/N)	Comments
TA-MB416/1.5-3.2			10/04/2025	Clayey SAND with minor gravel	M	1.8m = 2.9 ppm 2.3m = 3.6 ppm 2.8m = 4.2 ppm 3.2m = 5.0 ppm	Brown/Dark Brown	No	TA-MB416/2.3 TA-MB416/2.8 TA-MB416/3.2	Very sandy fill with minor fines. Little to no gravel present. Until top of alluvial layer. Moisture observed from ~1.5 mbgl and material slightly wet at 3.2 mbgl. Refusal to auger at 3.2 mbgl.
TA-MB416/3.2-6.1			10/04/2025	Cobbles and boulders	-	-	Blue/grey	No	No	Alluvial cobbles and boulders, with little to no soil (residual from layer above). Rounded alluvial pebbles stop at 6.1 mbgl (top of bedrock)
TA-MB416/6.1-7.3			10/04/2025	Weathered dolerite rock	-	-	Blue/grey and brown (weathered)	No	No	Dolerite bedrock, highly weathered in interface with alluvial material. Zeolite layers (weathered) across rock profile. Lost 0.8m due to fall in when removing rods. Drillhole plugged with bentonite from 5.8 to 6.5 mbgl, bottom of well installed at 5.8 mbgl with 3.0m screen (screening section from 2.8 to 5.8 mbgl).
TA-TP456/0.0-0.6			10/04/2025	Clayey SAND with cobbles	D	0.3m = 0.6 ppm	Brown	No	TA-TP456/0.3 Soil characterisation sample QCP03 QCS03	Uncompacted fill material. Some cobbles present and very little extraneous materials (metal bar, wood, plastic), though no BDR.
TA-TP456/0.6-1.1			10/04/2025	Sandy CLAY with cobbles	D	0.8m = 0.8 ppm	Light brown	No	TA-TP456/0.8	Uncompacted fill material, similar to layer above, only more clayey with depth and slight colour change to light brown.
TA-MB411/0.0-0.3			11/04/2025	Clayey SAND with cobles	D	0.2m = 1.4 ppm	Dark brown	No	TA-MB411/0.2	Topsoil (fill). Cobbles present at sub-surface.
TA-MB411/0.3-0.5			11/04/2025	Sandy GRAVEL	D	0.3m = 1.9 ppm	Brown/Blue grey	No	No	Thin layer of road base material (FCR) with some of the fill topsoil.
TA-MB411/0.5-2.8			11/04/2025	Sandy CLAY with cobbles	D	0.6m = 2.1 ppm 1.2m = 2.6 ppm 1.7m = 2.7 ppm 2.2m = 2.3 ppm 2.8m = 1.4 ppm	Brown	No	TA-MB411/2.2 TA-MB411/2.8	Clayey layer beneath the road base material, lots of grave present at the top and larger cobbles deeper. Refusal to auger at 2.8 mbgl. Assumed to be bedrock (consistent with adjacent well log info).
TA-MB418/0.0-0.1			14/04/2025	Sandy GRAVEL	D	0.1m = 1.0 ppm	Brown/Blue grey	No	No	FCR (road base)
TA-MB418/0.1-0.5			14/04/2025	Gravely SAND with fines and boulders	D	0.3m = 1.0 ppm 0.5m = 33.9 ppm	Brown	No	TA-MB418/0.3 TA-MB418/0.5	Sandy fill. Refusal to auger at 0.5 mbgl on large boulder. Tried 4 different locations, with similar depth to refusal (deepest location was 0.7 mbgl). Likely that large boulders were used along with the fill material (mixed or interbedded).
TA-MB418/0.5-1.0			14/04/2025	Dolerite	-	-	Blue/grey	No	No	Dolerite boulder. Drilling with HQ method
TA-MB418/1.0-1.4			14/04/2025	Clayey SAND with cobbles	-	1.3m = 1.8 ppm	Brown	No	TA-MB418/1.3	Seemingly natural clayey soil. Note: Sample taken from middle of Dilling core, with no evidence of washdown from the water/drilling mud being used during HQ drilling.
TA-MB418/1.4-5.3			14/04/2025	Cobbles and boulders	-	-	Blue/grey	No	No	Alluvial boulders layer. Rounded river pebbles visible from 1.8 mbgl.
TA-MB418/5.3-8.0			15/05/2025	Dolerite	-	-	Blue/grey	No	No	Hard dolerite rock (bedrock). No weathered layers visible and no zeolite present (different from other drilling locations). Uncertain whether bedrock started at 5.3 mbgl or 5.7 mbgl due to fall in from alluvial layer. Assumed 5.3 mbgl as a conservative approach.

Groundwater sampling field data sheet

Project Number: P.24.1136	Project Name: Hydro Tarraleah ESA

Client	Hydro Tasmania
Site ID	Tarraleah Switchyard
Completed by	Alex Hibberd
Date	29/4/2025
Weather	Fine and sunny
Meter serial #	AquaTROLL 500 1053764

Bore volumes calculations

Diameter of Casing (mm)	Factor (L)
32	0.8
50	2
75	4.5
100	8

Bore details					C	A	B	A-B*2	x3		Field assessment			To be completed post fieldwork from RAW DATA					
Bore ID	**Date**	**Time**	**Extraction method**	**Bore casing diameter (mm)**	**Factor Level (L)**	**Top of casing to bore bottom (m)**	**Top of casing to GW (m)**	**One well volume (L)**	**3x well volumes (L)**	**Vol. purged (L)**	**Odour**	**Clarity (turbid, clear, opaque)**	**Comment**	**DO (% satur-ation)**	**EC (µS/cm)**	**pH (pH units)**	**ORP (mV)**	**TDS (ppt)**	**Temp. (^{0}C)**
MB411	29/04			50	2	2.56							DRY						
MB418	29/04	08:45	Bailer	50	2	4.87	2.97	3.8	11.4	4	N	Opaque	Orange colour. Some sediment. Purged until dry, then sampled	54.14	48.79	6.49	221.78	41.75	12.41

Bore details					C	A	B	A-B*2	x3		Field assessment			To be completed post fieldwork from RAW DATA					
MB415	29/04	09:45	Hydrasleeve	50	2	7.10	3.87				N	Opaque	Slight orange colour. Very small amount of sediment. Triplicate taken	81.59	102.85	6.77	269.07	89.42	11.79
MB416	29/04	11:00	Hydrasleeve	50	2	5.88	3.67				N	Clear	Clear with very small amount of sediment / particles	66.71	203.84	6.92	292.14	178.18	11.58
MB412	29/04	11:45	Bailer	50	2	4.79	2.99	3.6	10.8	4	N	Turbid	Purged until dry and then sampled	73.54	132.74	6.79	294.71	113.31	12.52
MB414	29/04			50	2	3.27	2.87						Not enough water to sample						

QAQC1 – Triplicate of MB415
QAQC2 – Triplicate of MB415 – sent to Eurofins
QAQC3 – water dipper rinsate
QAQC4 – water beaker rinsate

Groundwater well logs

Appendix D

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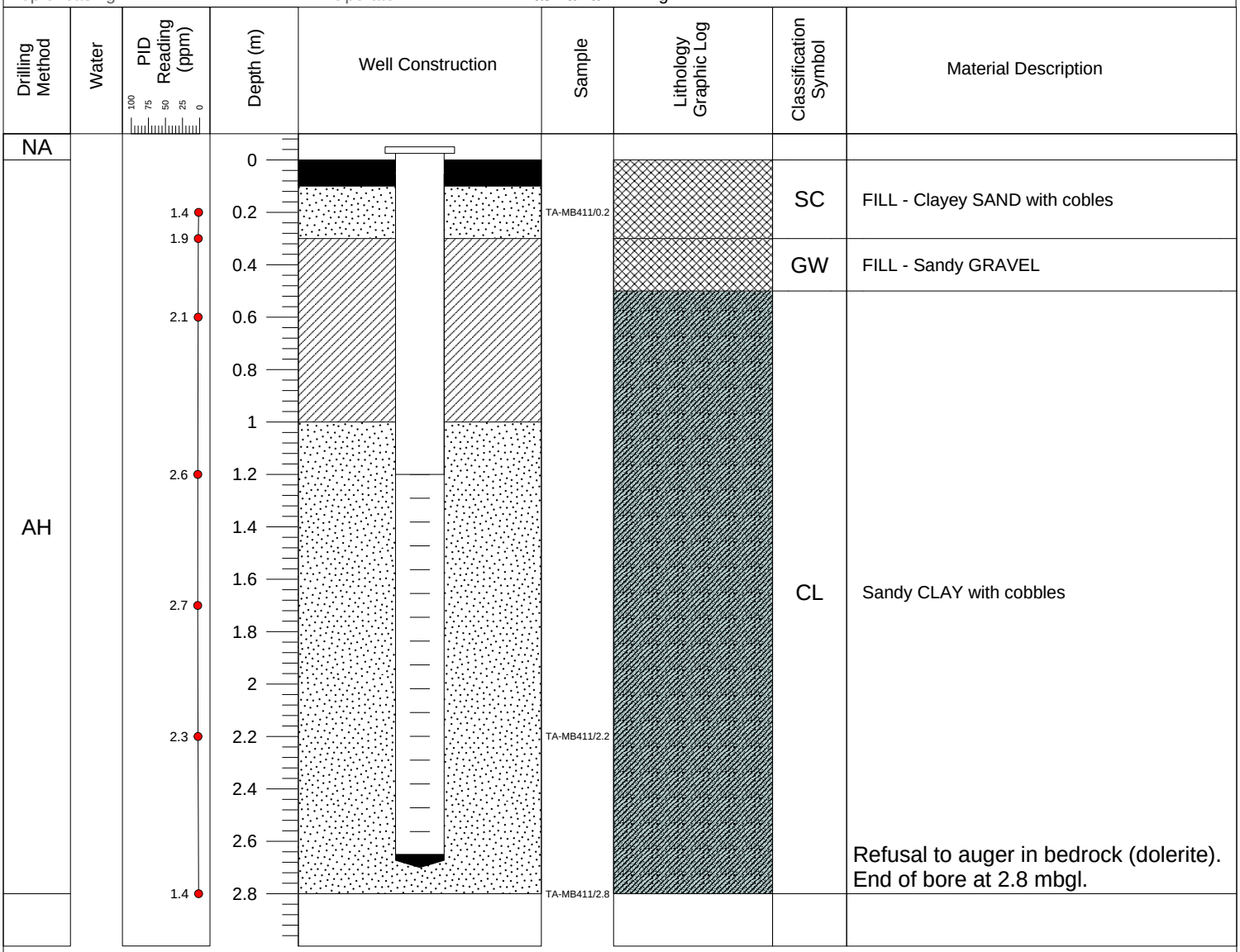
Bore Log & Well Construction Log

Location ID
TA-MB411

Client:	HydroTasmania			Project Number:	P.24.1136.002		
Project Name:	Tarraleah Redevelopment - Contamination Assessment			Date Commenced:	11/04/25		
Hole Location:	Switchyard			Date Completed:	11/04/25		
Easting:	455293.569 mE	Northing:	5316777.625 mN	Logged By:	EPM	Date:	16/04/2025
Ground level:	352.718 mAHD	Datum:	GDA94 MGA 55	Checked By:	CC	Date:	16/04/2025
Top of casing:	352.618 mAHD	Operator:	Tasmanian Drilling				



Legend

Drilling Method

AH	Auger hollow flight
AS	Auger screwing
CC	Concrete coring
HD	Hammer Drilling
HQTT	HQ size triple tube diamond drilling
NQTT	NQ size triple tube diamond drilling
PQTT	PQ size triple tube diamond drilling
R	Roller / tricone
SO	Sonic
VC	Vibrocore
W	Wash boring
HA	Hand Auger

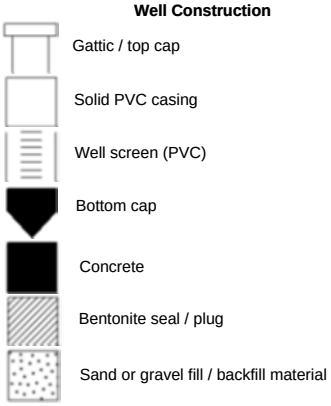
Water

- ▼ - Water Level
- ▶ - Water Strike

Lithology

GW	Gravel and gravel-sand mixtures, little or no fines
GP	Gravel and gravel-sand mixtures, little or no fines, uniform gravels
GM	Gravel-silt mixtures and gravel-sand-silt mixtures
GC	Gravel-clay mixtures and gravel-sand-clay mixtures
SW	Sand and gravel-sand mixtures, little or no fines
SP	Sand and gravel-sand mixtures, little or no fines, uniform sands
SM	Sand-silt mixtures
SC	Sand-clay mixtures
ML	Inorganic silt and very fine sand, rock flour, silty or clayey fine sand or silt with low plasticity
CI	Inorganic clay of medium plasticity, gravelly clay, sandy clay
OL	Organic silt
MH	Inorganic silt
CH	Inorganic clay of high plasticity
OH	Organic clays of medium to high plasticity, organic silt
Pt	Peat, highly organic soil
CL	Inorganic clay of low plasticity, gravelly clay, sandy clay

Well Construction



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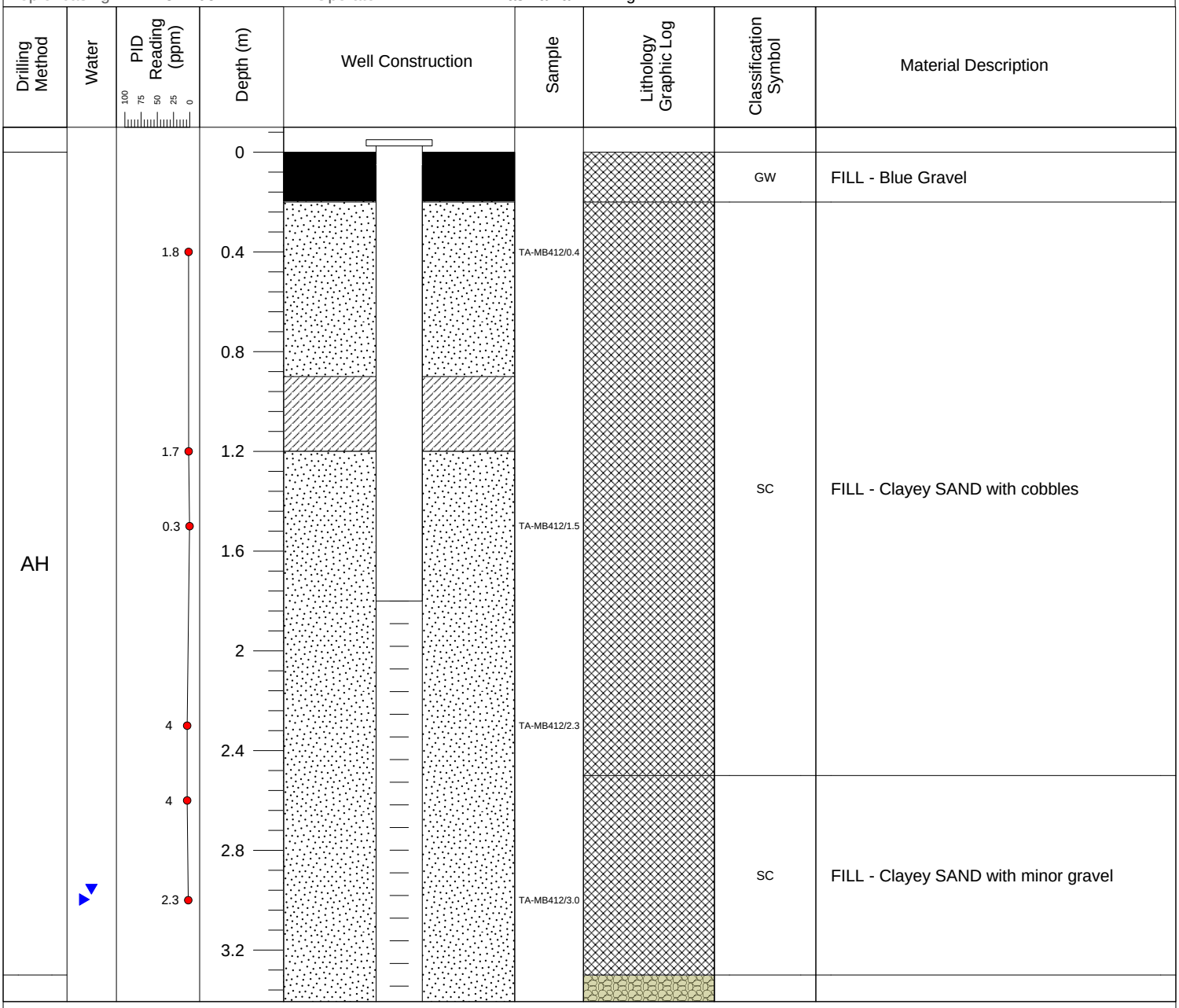
Bore Log & Well Construction Log

Location ID
TA-MB412

Client:	HydroTasmania			Project Number:	P.24.1136.002		
Project Name:	Tarraleah Redevelopment - Contamination Assessment			Date Commenced:	7/04/25		
Hole Location:	Switchyard			Date Completed:	8/04/25		
Easting:	455303.336 mE	Northing:	5316700.211 mN	Logged By:	EPM	Date:	16/04/2025
Ground level:	344.130 mAHD	Datum:	GDA94 MGA 55	Checked By:	CC	Date:	16/04/2025
Top of casing:	344.054 mAHD	Operator:	Tasmanian Drilling				



Legend

Drilling Method

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OL	Organic silt
MH	Inorganic silt
CH	Inorganic clay of high plasticity
OH	Organic clays of medium to high plasticity, organic silt
Pt	Peat, highly organic soil
CL	Inorganic clay of low plasticity, gravelly clay, sandy clay

Well Construction

- Gattic / top cap
- Solid PVC casing
- Well screen (PVC)
- Bottom cap
- Concrete
- Bentonite seal / plug
- Sand or gravel fill / backfill material

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Bore Log & Well Construction Log

Location ID
TA-MB412

Client:	HydroTasmania			Project Number:	P.24.1136.002		
Project Name:	Tarraleah Redevelopment - Contamination Assessment			Date Commenced:	7/04/25		
Hole Location:	Switchyard			Date Completed:	8/04/25		
Easting:	455303.336 mE	Northing:	5316700.211 mN	Logged By:	EPM	Date:	16/04/2025
Ground level:	344.130 mAHD	Datum:	GDA94 MGA 55	Checked By:	CC	Date:	16/04/2025
Top of casing:	344.054 mAHD	Operator:	Tasmanian Drilling				

Drilling Method	Water	PID Reading (ppm)	Depth (m)	Well Construction	Sample	Lithology Graphic Log	Classification Symbol	Material Description
HQ TT			3.6				GW	Cobbles and boulders - Aluvial layer
			4					
			4.4				DOLERITE	Weathered dolerite rock
			4.8					End of bore at 5.0 mbgl.

Legend

Drilling Method

AH	Auger hollow flight
AS	Auger screwing
CC	Concrete coring
HD	Hammer Drilling
HQTT	HQ size triple tube diamond drilling
NQTT	NQ size triple tube diamond drilling
PQTT	PQ size triple tube diamond drilling
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SO	Sonic
VC	Vibrocore
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HA	Hand Auger

Water

- ▼ - Water Level
- ▶ - Water Strike

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SP	Sand and gravel-sand mixtures, little or no fines, uniform sands
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SC	Sand-clay mixtures
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CI	Inorganic clay of medium plasticity, gravelly clay, sandy clay
OL	Organic silt
MH	Inorganic silt
CH	Inorganic clay of high plasticity
OH	Organic clays of medium to high plasticity, organic silt
Pt	Peat, highly organic soil
CL	Inorganic clay of low plasticity, gravelly clay, sandy clay

Well Construction

- Gattic / top cap
- Solid PVC casing
- Well screen (PVC)
- Bottom cap
- Concrete
- Bentonite seal / plug
- Sand or gravel fill / backfill material

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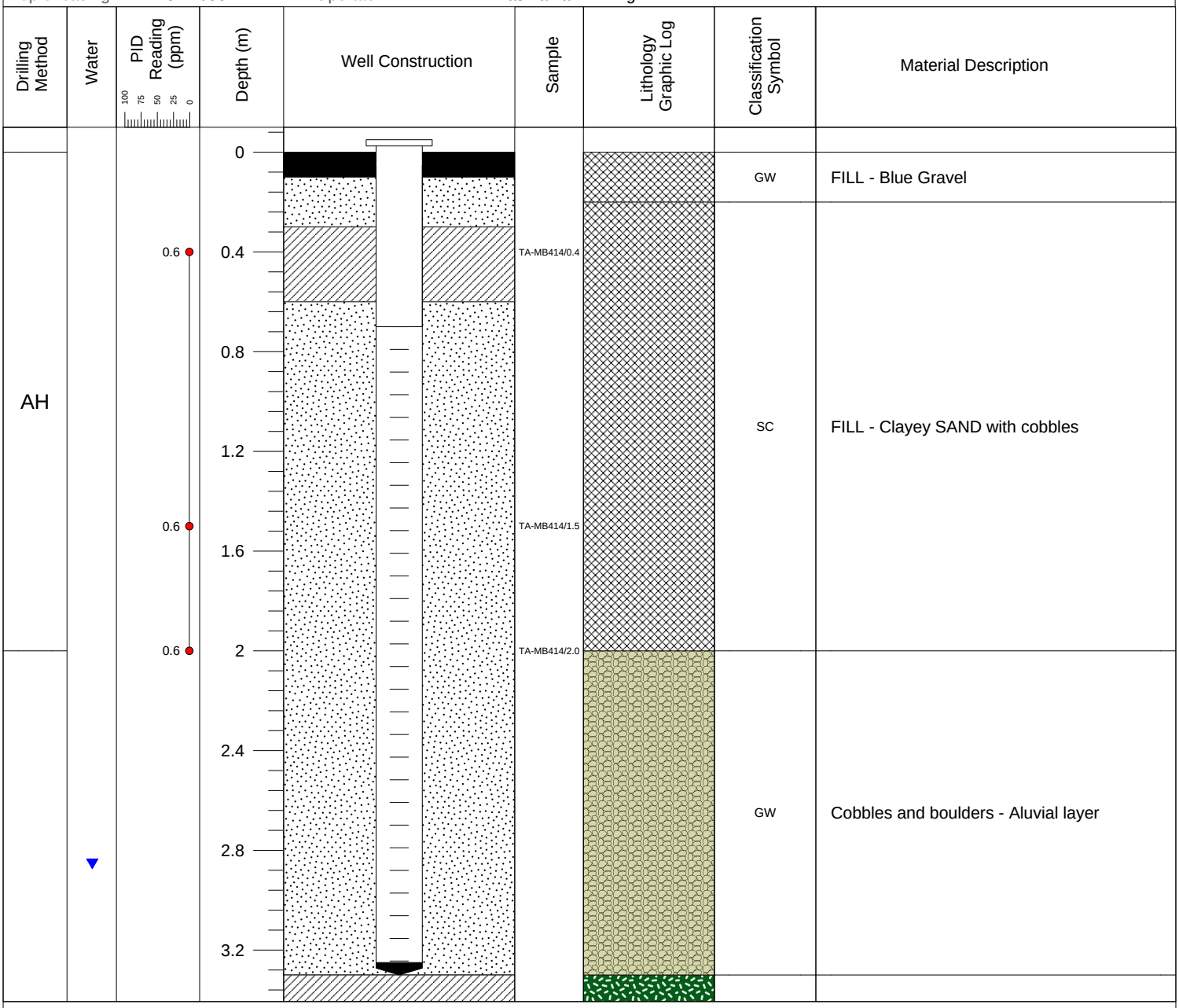
Bore Log & Well Construction Log

Location ID
TA-MB414

Client:	HydroTasmania			Project Number:	P.24.1136.002		
Project Name:	Tarraleah Redevelopment - Contamination Assessment			Date Commenced:	8/4/25		
Hole Location:	Switchyard			Date Completed:	9/4/25		
Easting:	455320.02 mE	Northing:	5316731.029 mN	Logged By:	EPM	Date:	16/04/2025
Ground level:	344.122 mAHD	Datum:	GDA94 MGA 55	Checked By:	CC	Date:	16/04/2025
Top of casing:	344.053 mAHD	Operator:	Tasmanian Drilling				



Legend

Drilling Method

AH	Auger hollow flight
AS	Auger screwing
CC	Concrete coring
HD	Hammer Drilling
HQTT	HQ size triple tube diamond drilling
NQTT	NQ size triple tube diamond drilling
PQTT	PQ size triple tube diamond drilling
R	Roller / tricone
SO	Sonic
VC	Vibrocore
W	Wash boring
HA	Hand Auger

Water

- ▼ - Water Level
- ▶ - Water Strike

Lithology

GW	Gravel and gravel-sand mixtures, little or no fines
GP	Gravel and gravel-sand mixtures, little or no fines, uniform gravels
GM	Gravel-silt mixtures and gravel-sand-silt mixtures
GC	Gravel-clay mixtures and gravel-sand-clay mixtures
SW	Sand and gravel-sand mixtures, little or no fines
SP	Sand and gravel-sand mixtures, little or no fines, uniform sands
SM	Sand-silt mixtures
SC	Sand-clay mixtures
ML	Inorganic silt and very fine sand, rock flour, silty or clayey fine sand or silt with low plasticity
CI	Inorganic clay of medium plasticity, gravelly clay, sandy clay
OL	Organic silt
MH	Inorganic silt
CH	Inorganic clay of high plasticity
OH	Organic clays of medium to high plasticity, organic silt
Pt	Peat, highly organic soil
CL	Inorganic clay of low plasticity, gravelly clay, sandy clay

Well Construction

- Gattic / top cap
- Solid PVC casing
- Well screen (PVC)
- Bottom cap
- Concrete
- Bentonite seal / plug
- Sand or gravel fill / backfill material

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Bore Log & Well Construction Log

Location ID
TA-MB414

Client:	HydroTasmania			Project Number:	P.24.1136.002		
Project Name:	Tarraleah Redevelopment - Contamination Assessment			Date Commenced:	8/4/25		
Hole Location:	Switchyard			Date Completed:	9/4/25		
Easting:	455320.02 mE	Northing:	5316731.029 mN	Logged By:	EPM	Date:	16/04/2025
Ground level:	344.122 mAHD	Datum:	GDA94 MGA 55	Checked By:	CC	Date:	16/04/2025
Top of casing:	344.053 mAHD	Operator:	Tasmanian Drilling				

Drilling Method	Water	PID Reading (ppm)	Depth (m)	Well Construction	Sample	Lithology Graphic Log	Classification Symbol	Material Description
HQ TT			3.6 4 4.4 4.8 5.2 5.6 6 6.4				DOLERITE	Weathered dolerite rock End of bore at 6.5 mbgl.

Legend

Drilling Method

AH	Auger hollow flight
AS	Auger screwing
CC	Concrete coring
HD	Hammer Drilling
HQTT	HQ size triple tube diamond drilling
NQTT	NQ size triple tube diamond drilling
PQTT	PQ size triple tube diamond drilling
R	Roller / tricone
SO	Sonic
VC	Vibrocore
W	Wash boring
HA	Hand Auger

Water

- ▼ - Water Level
- ▶ - Water Strike

Lithology

GW	Gravel and gravel-sand mixtures, little or no fines
GP	Gravel and gravel-sand mixtures, little or no fines, uniform gravels
GM	Gravel-silt mixtures and gravel-sand-silt mixtures
GC	Gravel-clay mixtures and gravel-sand-clay mixtures
SW	Sand and gravel-sand mixtures, little or no fines
SP	Sand and gravel-sand mixtures, little or no fines, uniform sands
SM	Sand-silt mixtures
SC	Sand-clay mixtures
ML	Inorganic silt and very fine sand, rock flour, silty or clayey fine sand or silt with low plasticity
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OL	Organic silt
MH	Inorganic silt
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OH	Organic clays of medium to high plasticity, organic silt
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CL	Inorganic clay of low plasticity, gravelly clay, sandy clay

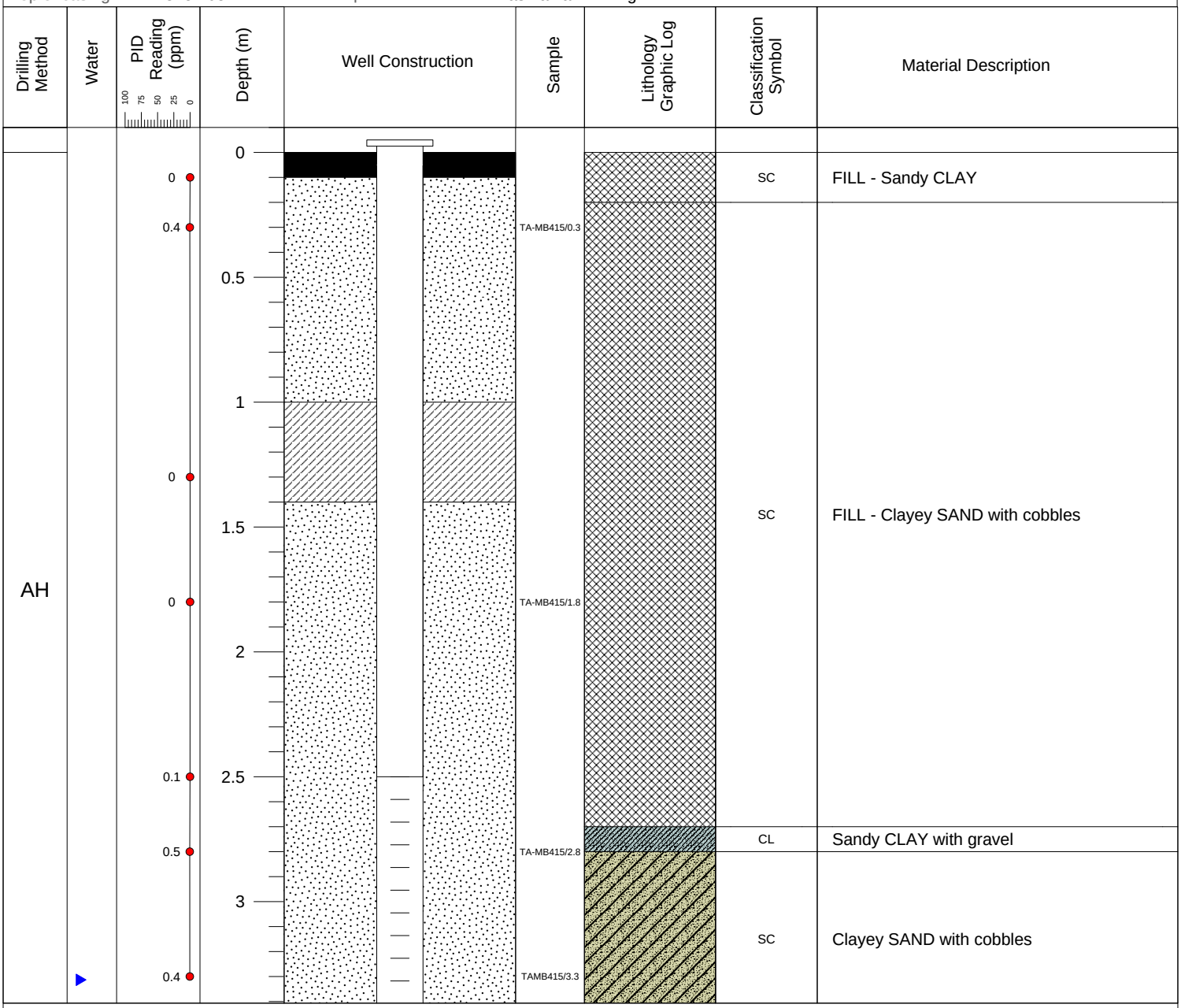
Well Construction

- Gattic / top cap
- Solid PVC casing
- Well screen (PVC)
- Bottom cap
- Concrete
- Bentonite seal / plug
- Sand or gravel fill / backfill material

Bore Log & Well Construction Log

Location ID
TA-MB415

Client:	HydroTasmania			Project Number:	P.24.1136.002		
Project Name:	Tarraleah Redevelopment - Contamination Assessment			Date Commenced:	9/4/25		
Hole Location:	Switchyard			Date Completed:	10/04/25		
Easting:	455333.334 mE	Northing:	5316715.61 mN	Logged By:	EPM	Date:	16/04/2025
Ground level:	345.227 mAHD	Datum:	GDA94 MGA 55	Checked By:	CC	Date:	16/04/2025
Top of casing:	345.103 mAHD	Operator:	Tasmanian Drilling				



Legend

Drilling Method

AH	Auger hollow flight
AS	Auger screwing
CC	Concrete coring
HD	Hammer Drilling
HQTT	HQ size triple tube diamond drilling
NQTT	NQ size triple tube diamond drilling
PQTT	PQ size triple tube diamond drilling
R	Roller / tricone
SO	Sonic
VC	Vibrocore
W	Wash boring
HA	Hand Auger

Water

- ▼ - Water Level
- ▶ - Water Strike

Lithology

GW	Gravel and gravel-sand mixtures, little or no fines
GP	Gravel and gravel-sand mixtures, little or no fines, uniform gravels
GM	Gravel-silt mixtures and gravel-sand-silt mixtures
GC	Gravel-clay mixtures and gravel-sand-clay mixtures
SW	Sand and gravel-sand mixtures, little or no fines
SP	Sand and gravel-sand mixtures, little or no fines, uniform sands
SM	Sand-silt mixtures
SC	Sand-clay mixtures
ML	Inorganic silt and very fine sand, rock flour, silty or clayey fine sand or silt with low plasticity
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MH	Inorganic silt
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OH	Organic clays of medium to high plasticity, organic silt
Pt	Peat, highly organic soil
CL	Inorganic clay of low plasticity, gravelly clay, sandy clay

Well Construction

- Gattic / top cap
- Solid PVC casing
- Well screen (PVC)
- Bottom cap
- Concrete
- Bentonite seal / plug
- Sand or gravel fill / backfill material

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Bore Log & Well Construction Log

Location ID
TA-MB415

Client:	HydroTasmania			Project Number:	P.24.1136.002		
Project Name:	Tarraleah Redevelopment - Contamination Assessment			Date Commenced:	9/4/25		
Hole Location:	Switchyard			Date Completed:	10/04/25		
Easting:	455333.334 mE	Northing:	5316715.61 mN	Logged By:	EPM	Date:	16/04/2025
Ground level:	345.227 mAHD	Datum:	GDA94 MGA 55	Checked By:	CC	Date:	16/04/2025
Top of casing:	345.103 mAHD	Operator:	Tasmanian Drilling				

Drilling Method	Water	PID Reading (ppm)	Depth (m)	Well Construction	Sample	Lithology Graphic Log	Classification Symbol	Material Description
HQ TT	▼	100 75 50 25 0	3.5 – 6.5				GW	Cobbles and boulders - Aluvial layer

Legend

Drilling Method

AH	Auger hollow flight
AS	Auger screwing
CC	Concrete coring
HD	Hammer Drilling
HQTT	HQ size triple tube diamond drilling
NQTT	NQ size triple tube diamond drilling
PQTT	PQ size triple tube diamond drilling
R	Roller / tricone
SO	Sonic
VC	Vibrocore
W	Wash boring
HA	Hand Auger

Water

▼ - Water Level
▶ - Water Strike

Lithology

GW	Gravel and gravel-sand mixtures, little or no fines
GP	Gravel and gravel-sand mixtures, little or no fines, uniform gravels
GM	Gravel-silt mixtures and gravel-sand-silt mixtures
GC	Gravel-clay mixtures and gravel-sand-clay mixtures
SW	Sand and gravel-sand mixtures, little or no fines
SP	Sand and gravel-sand mixtures, little or no fines, uniform sands
SM	Sand-silt mixtures
SC	Sand-clay mixtures
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Well Construction

- Gattic / top cap
- Solid PVC casing
- Well screen (PVC)
- Bottom cap
- Concrete
- Bentonite seal / plug
- Sand or gravel fill / backfill material

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Bore Log & Well Construction Log

Location ID
TA-MB415

Client:	HydroTasmania			Project Number:	P.24.1136.002		
Project Name:	Tarraleah Redevelopment - Contamination Assessment			Date Commenced:	9/4/25		
Hole Location:	Switchyard			Date Completed:	10/04/25		
Easting:	455333.334 mE	Northing:	5316715.61 mN	Logged By:	EPM	Date:	16/04/2025
Ground level:	345.227 mAHD	Datum:	GDA94 MGA 55	Checked By:	CC	Date:	16/04/2025
Top of casing:	345.103 mAHD	Operator:	Tasmanian Drilling				

Drilling Method	Water	PID Reading (ppm)	Depth (m)	Well Construction	Sample	Lithology Graphic Log	Classification Symbol	Material Description
			7					
			7.5				DOLERITE	Weathered dolerite rock
			8					
			8.5					
			9					End of bore at 9.0 mbgl.

Legend

Drilling Method

AH	Auger hollow flight
AS	Auger screwing
CC	Concrete coring
HD	Hammer Drilling
HQTT	HQ size triple tube diamond drilling
NQTT	NQ size triple tube diamond drilling
PQTT	PQ size triple tube diamond drilling
R	Roller / tricone
SO	Sonic
VC	Vibrocore
W	Wash boring
HA	Hand Auger

Water

- ▼ - Water Level
- ▶ - Water Strike

Lithology

GW	Gravel and gravel-sand mixtures, little or no fines
GP	Gravel and gravel-sand mixtures, little or no fines, uniform gravels
GM	Gravel-silt mixtures and gravel-sand-silt mixtures
GC	Gravel-clay mixtures and gravel-sand-clay mixtures
SW	Sand and gravel-sand mixtures, little or no fines
SP	Sand and gravel-sand mixtures, little or no fines, uniform sands
SM	Sand-silt mixtures
SC	Sand-clay mixtures
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OL	Organic silt
MH	Inorganic silt
CH	Inorganic clay of high plasticity
OH	Organic clays of medium to high plasticity, organic silt
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Well Construction

- Gattic / top cap
- Solid PVC casing
- Well screen (PVC)
- Bottom cap
- Concrete
- Bentonite seal / plug
- Sand or gravel fill / backfill material

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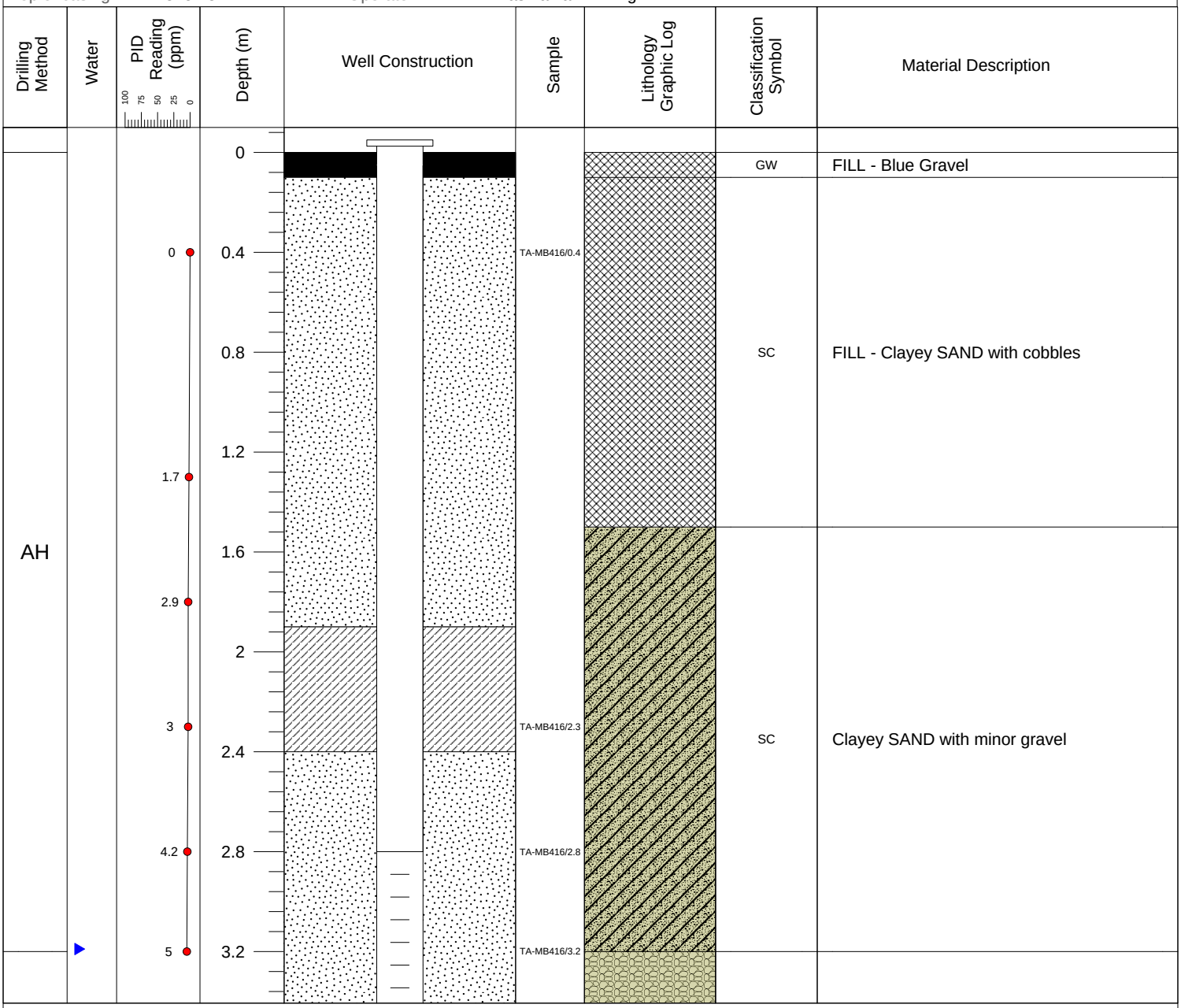
Bore Log & Well Construction Log

Location ID
TA-MB416

Client:	HydroTasmania			Project Number:	P.24.1136.002		
Project Name:	Tarraleah Redevelopment - Contamination Assessment			Date Commenced:	10/04/25		
Hole Location:	Switchyard			Date Completed:	14/04/25		
Easting:	455340.855 mE	Northing:	5316760.198 mN	Logged By:	EPM	Date:	16/04/2025
Ground level:	345.760 mAHD	Datum:	GDA94 MGA 55	Checked By:	CC	Date:	16/04/2025
Top of casing:	345.732 mAHD	Operator:	Tasmanian Drilling				



Legend

Drilling Method

AH	Auger hollow flight
AS	Auger screwing
CC	Concrete coring
HD	Hammer Drilling
HQTT	HQ size triple tube diamond drilling
NQTT	NQ size triple tube diamond drilling
PQTT	PQ size triple tube diamond drilling
R	Roller / tricone
SO	Sonic
VC	Vibrocore
W	Wash boring
HA	Hand Auger

Water

- ▼ - Water Level
- ▶ - Water Strike

Lithology

GW	Gravel and gravel-sand mixtures, little or no fines
GP	Gravel and gravel-sand mixtures, little or no fines, uniform gravels
GM	Gravel-silt mixtures and gravel-sand-silt mixtures
GC	Gravel-clay mixtures and gravel-sand-clay mixtures
SW	Sand and gravel-sand mixtures, little or no fines
SP	Sand and gravel-sand mixtures, little or no fines, uniform sands
SM	Sand-silt mixtures
SC	Sand-clay mixtures
ML	Inorganic silt and very fine sand, rock flour, silty or clayey fine sand or silt with low plasticity
CI	Inorganic clay of medium plasticity, gravelly clay, sandy clay
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MH	Inorganic silt
CH	Inorganic clay of high plasticity
OH	Organic clays of medium to high plasticity, organic silt
Pt	Peat, highly organic soil
CL	Inorganic clay of low plasticity, gravelly clay, sandy clay

Well Construction

- Gattic / top cap
- Solid PVC casing
- Well screen (PVC)
- Bottom cap
- Concrete
- Bentonite seal / plug
- Sand or gravel fill / backfill material

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Bore Log & Well Construction Log

Location ID
TA-MB416

Client:	HydroTasmania			Project Number:	P.24.1136.002		
Project Name:	Tarraleah Redevelopment - Contamination Assessment			Date Commenced:	10/04/25		
Hole Location:	Switchyard			Date Completed:	14/04/25		
Easting:	455340.855 mE	Northing:	5316760.198 mN	Logged By:	EPM	Date:	16/04/2025
Ground level:	345.760 mAHD	Datum:	GDA94 MGA 55	Checked By:	CC	Date:	16/04/2025
Top of casing:	345.732 mAHD	Operator:	Tasmanian Drilling				

Drilling Method	Water	PID Reading (ppm)	Depth (m)	Well Construction	Sample	Lithology Graphic Log	Classification Symbol	Material Description
HQ TT	▼	100 75 50 25 0	3.6, 4, 4.4, 4.8, 5.2, 5.6, 6, 6.4, 6.8				GW	Cobbles and boulders - Aluvial layer
							DOLERITE	Weathered dolerite rock

Legend

Drilling Method

AH	Auger hollow flight
AS	Auger screwing
CC	Concrete coring
HD	Hammer Drilling
HQTT	HQ size triple tube diamond drilling
NQTT	NQ size triple tube diamond drilling
PQTT	PQ size triple tube diamond drilling
R	Roller / tricone
SO	Sonic
VC	Vibrocore
W	Wash boring
HA	Hand Auger

Water

▼ - Water Level
▶ - Water Strike

Lithology

GW	Gravel and gravel-sand mixtures, little or no fines
GP	Gravel and gravel-sand mixtures, little or no fines, uniform gravels
GM	Gravel-silt mixtures and gravel-sand-silt mixtures
GC	Gravel-clay mixtures and gravel-sand-clay mixtures
SW	Sand and gravel-sand mixtures, little or no fines
SP	Sand and gravel-sand mixtures, little or no fines, uniform sands
SM	Sand-silt mixtures
SC	Sand-clay mixtures
ML	Inorganic silt and very fine sand, rock flour, silty or clayey fine sand or silt with low plasticity
CI	Inorganic clay of medium plasticity, gravelly clay, sandy clay
OL	Organic silt
MH	Inorganic silt
CH	Inorganic clay of high plasticity
OH	Organic clays of medium to high plasticity, organic silt
Pt	Peat, highly organic soil
CL	Inorganic clay of low plasticity, gravelly clay, sandy clay

Well Construction

- Gattic / top cap
- Solid PVC casing
- Well screen (PVC)
- Bottom cap
- Concrete
- Bentonite seal / plug
- Sand or gravel fill / backfill material

Bore Log & Well Construction Log

Location ID
TA-MB416

Client:	HydroTasmania			Project Number:	P.24.1136.002		
Project Name:	Tarraleah Redevelopment - Contamination Assessment			Date Commenced:	10/04/25		
Hole Location:	Switchyard			Date Completed:	14/04/25		
Easting:	455340.855 mE	Northing:	5316760.198 mN	Logged By:	EPM	Date:	16/04/2025
Ground level:	345.760 mAHD	Datum:	GDA94 MGA 55	Checked By:	CC	Date:	16/04/2025
Top of casing:	345.732 mAHD	Operator:	Tasmanian Drilling				

Drilling Method	Water	PID Reading (ppm)	Depth (m)	Well Construction	Sample	Lithology Graphic Log	Classification Symbol	Material Description
			7.2					End of bore at 7.3 mbgl.

Legend

Drilling Method

AH	Auger hollow flight
AS	Auger screwing
CC	Concrete coring
HD	Hammer Drilling
HQTT	HQ size triple tube diamond drilling
NQTT	NQ size triple tube diamond drilling
PQTT	PQ size triple tube diamond drilling
R	Roller / tricone
SO	Sonic
VC	Vibrocore
W	Wash boring
HA	Hand Auger

Water

- ▼ - Water Level
- ▶ - Water Strike

Lithology

GW	Gravel and gravel-sand mixtures, little or no fines
GP	Gravel and gravel-sand mixtures, little or no fines, uniform gravels
GM	Gravel-silt mixtures and gravel-sand-silt mixtures
GC	Gravel-clay mixtures and gravel-sand-clay mixtures
SW	Sand and gravel-sand mixtures, little or no fines
SP	Sand and gravel-sand mixtures, little or no fines, uniform sands
SM	Sand-silt mixtures
SC	Sand-clay mixtures
ML	Inorganic silt and very fine sand, rock flour, silty or clayey fine sand or silt with low plasticity
CI	Inorganic clay of medium plasticity, gravelly clay, sandy clay
OL	Organic silt
MH	Inorganic silt
CH	Inorganic clay of high plasticity
OH	Organic clays of medium to high plasticity, organic silt
Pt	Peat, highly organic soil
CL	Inorganic clay of low plasticity, gravelly clay, sandy clay

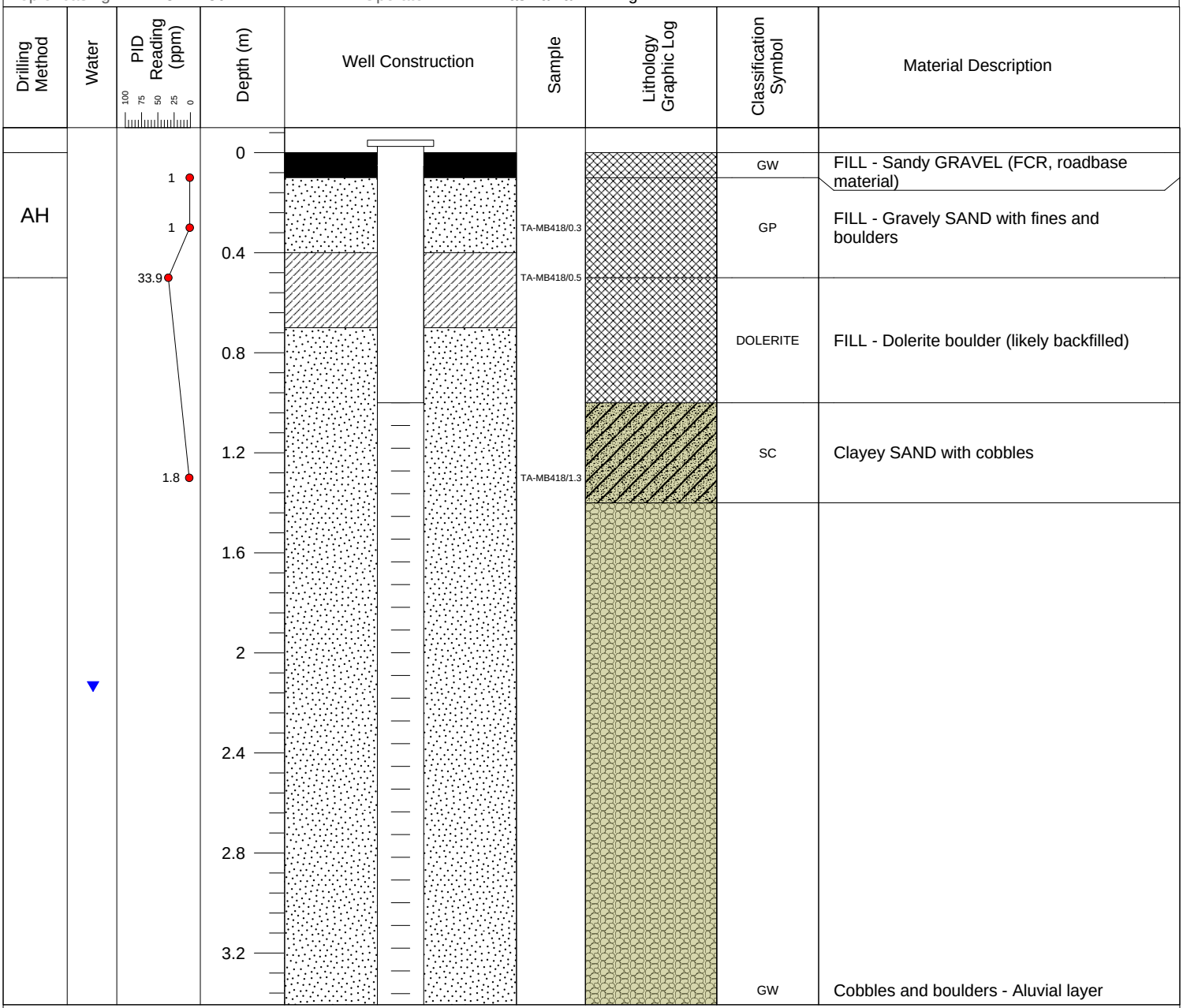
Well Construction

- Gattic / top cap
- Solid PVC casing
- Well screen (PVC)
- Bottom cap
- Concrete
- Bentonite seal / plug
- Sand or gravel fill / backfill material

Bore Log & Well Construction Log

Location ID
TA-MB418

Client:	HydroTasmania			Project Number:	P.24.1136.002		
Project Name:	Tarraleah Redevelopment - Contamination Assessment			Date Commenced:	14/04/25		
Hole Location:	Switchyard			Date Completed:	15/04/25		
Easting:	455287.092 mE	Northing:	5316679.332 mN	Logged By:	EPM	Date:	16/04/2025
Ground level:	344.242 mAHD	Datum:	GDA94 MGA 55	Checked By:	CC	Date:	16/04/2025
Top of casing:	344.136 mAHD	Operator:	Tasmanian Drilling				



Legend

Drilling Method

AH	Auger hollow flight
AS	Auger screwing
CC	Concrete coring
HD	Hammer Drilling
HQTT	HQ size triple tube diamond drilling
NQTT	NQ size triple tube diamond drilling
PQTT	PQ size triple tube diamond drilling
R	Roller / tricone
SO	Sonic
VC	Vibrocore
W	Wash boring
HA	Hand Auger

Water

- ▼ - Water Level
- ▶ - Water Strike

Lithology

GW	Gravel and gravel-sand mixtures, little or no fines
GP	Gravel and gravel-sand mixtures, little or no fines, uniform gravels
GM	Gravel-silt mixtures and gravel-sand-silt mixtures
GC	Gravel-clay mixtures and gravel-sand-clay mixtures
SW	Sand and gravel-sand mixtures, little or no fines
SP	Sand and gravel-sand mixtures, little or no fines, uniform sands
SM	Sand-silt mixtures
SC	Sand-clay mixtures
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Well Construction

- Gattic / top cap
- Solid PVC casing
- Well screen (PVC)
- Bottom cap
- Concrete
- Bentonite seal / plug
- Sand or gravel fill / backfill material

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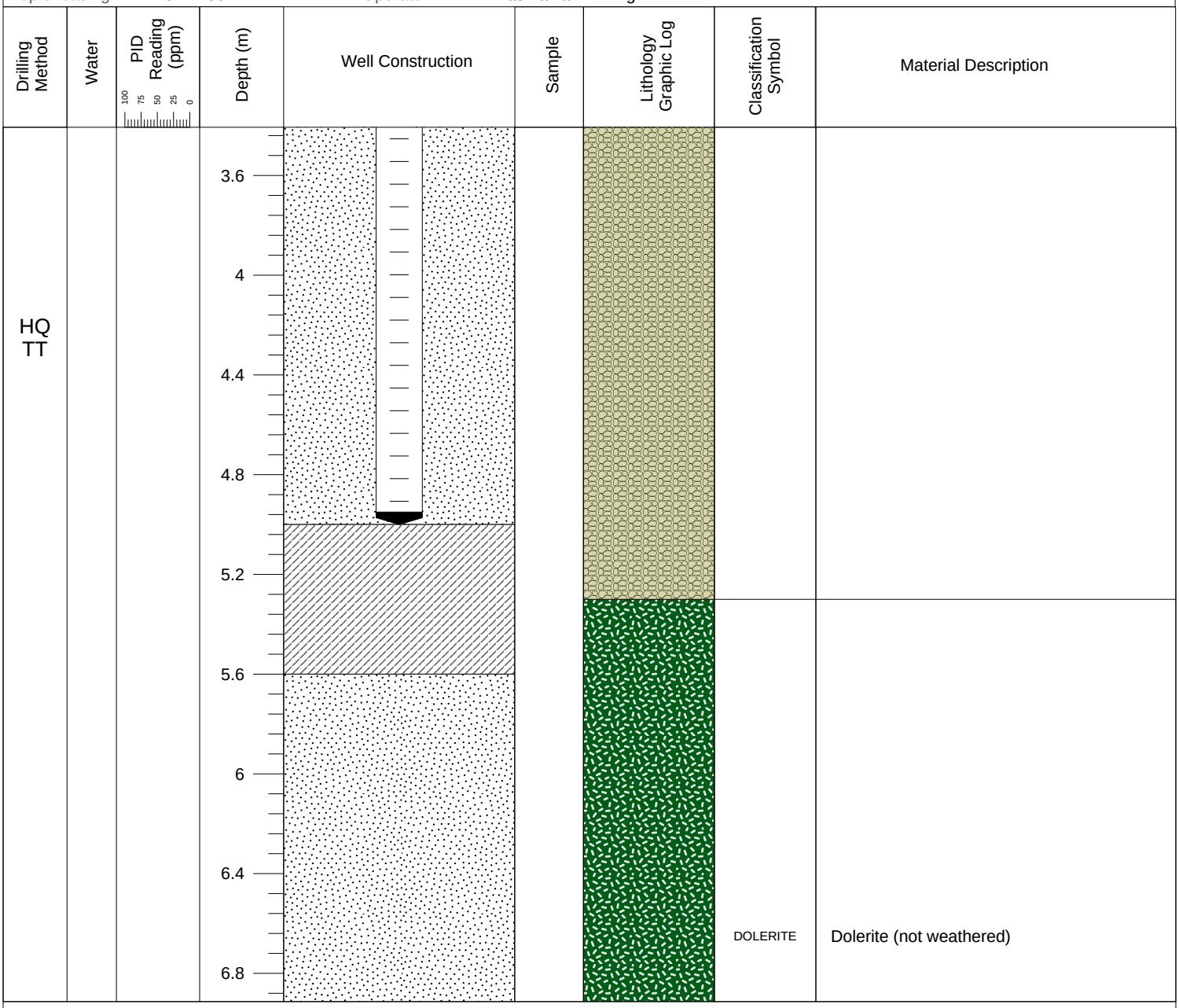
Bore Log & Well Construction Log

Location ID
TA-MB418

Client:	HydroTasmania			Project Number:	P.24.1136.002		
Project Name:	Tarraleah Redevelopment - Contamination Assessment			Date Commenced:	14/04/25		
Hole Location:	Switchyard			Date Completed:	15/04/25		
Easting:	455287.092 mE	Northing:	5316679.332 mN	Logged By:	EPM	Date:	16/04/2025
Ground level:	344.242 mAHD	Datum:	GDA94 MGA 55	Checked By:	CC	Date:	16/04/2025
Top of casing:	344.136 mAHD	Operator:	Tasmanian Drilling				



Legend

Drilling Method

AH	Auger hollow flight
AS	Auger screwing
CC	Concrete coring
HD	Hammer Drilling
HQTT	HQ size triple tube diamond drilling
NQTT	NQ size triple tube diamond drilling
PQTT	PQ size triple tube diamond drilling
R	Roller / tricone
SO	Sonic
VC	Vibrocore
W	Wash boring
HA	Hand Auger

Water

- ▼ - Water Level
- ▶ - Water Strike

Lithology

GW	Gravel and gravel-sand mixtures, little or no fines
GP	Gravel and gravel-sand mixtures, little or no fines, uniform gravels
GM	Gravel-silt mixtures and gravel-sand-silt mixtures
GC	Gravel-clay mixtures and gravel-sand-clay mixtures
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- Bottom cap
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- Bentonite seal / plug
- Sand or gravel fill / backfill material

Bore Log & Well Construction Log

Location ID
TA-MB418

Client:	HydroTasmania			Project Number:	P.24.1136.002		
Project Name:	Tarraleah Redevelopment - Contamination Assessment			Date Commenced:	14/04/25		
Hole Location:	Switchyard			Date Completed:	15/04/25		
Easting:	455287.092 mE	Northing:	5316679.332 mN	Logged By:	EPM	Date:	16/04/2025
Ground level:	344.242 mAHD	Datum:	GDA94 MGA 55	Checked By:	CC	Date:	16/04/2025
Top of casing:	344.136 mAHD	Operator:	Tasmanian Drilling				

Drilling Method	Water	PID Reading (ppm)	Depth (m)	Well Construction	Sample	Lithology Graphic Log	Classification Symbol	Material Description
		100 75 50 25 0	7.2 7.6					End of bore at 8.0 mbgl.

Legend

Drilling Method

AH	Auger hollow flight
AS	Auger screwing
CC	Concrete coring
HD	Hammer Drilling
HQTT	HQ size triple tube diamond drilling
NQTT	NQ size triple tube diamond drilling
PQTT	PQ size triple tube diamond drilling
R	Roller / tricone
SO	Sonic
VC	Vibrocore
W	Wash boring
HA	Hand Auger

Water

- ▼ - Water Level
- ▶ - Water Strike

Lithology

GW	Gravel and gravel-sand mixtures, little or no fines
GP	Gravel and gravel-sand mixtures, little or no fines, uniform gravels
GM	Gravel-silt mixtures and gravel-sand-silt mixtures
GC	Gravel-clay mixtures and gravel-sand-clay mixtures
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- Concrete
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- Sand or gravel fill / backfill material

Photographic log

Appendix E

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Tarraleah Power Scheme Upgrade ESA – Photographic Log

Activities description		
Test pitting and associated soil sampling at village area Drilling and associated soil sampling at switch station area Groundwater monitoring	Project:	**Tarraleah Power Scheme Upgrade ESA**
	Date:	From 31/03/2025 to 29/04/2025
	p&s staff:	Eduardo Pereira Maes; Alex Hibberd

Contents

1. Test pitting and soil sampling at Tarraleah Village

Date: 31/03/25 to 01/04/25

Photo	**Comment**
	Overview of the intersection and road separating the historic location of the service station (left-hand side) to the Area C Village footprint area (right-hand side).

Photo	Comment
	Overview of historic service station area.
	Test pitting at TA-TP449 • Fill material comprising re-worked soils and basalt rock (gravel, cobbles and boulders) • Darker silt material under fill layer. Transitioning from imported material to natural soils (weathered basalt)

Photo	Comment
	
	

Photo	Comment
 	Test pitting at TA-TP450 • Fill material comprising re-worked soils and basalt rock (gravel, cobbles and boulders) • Darker silt material under fill layer. Transitioning from imported material to natural soils (weathered basalt). Refusal hit in hard basalt rock at 1.8 m bgl.

Photo	Comment
	Detail of basalt cobble.
	Test pitting at TA-TP451 • Fill material comprising re-worked soils and basalt rock (gravel, cobbles and boulders) • Darker silt material under fill layer. • Very weathered basalt rock, with silty CLAY material around it. Cobbles and boulders increasing with depth, refusal reached in hard basalt at 3.0 m bgl

Photo	Comment
	Test pitting at TA-TP452 • Little to no topsoil present. Fill material comprising re-worked soils and basalt rock (gravel and cobbles) • Very weathered basalt rock, with silty CLAY material around it. Cobbles and boulders increasing with depth. • Water ingress observed from 3.0 m bgl, with reasonable flow. Water seems to be flowing under clayey silt layer and within the shallow portion of the harder basalt rock layer.
	Detail of weathered basalt rocks.

Photo	Comment
 	Test pitting at TA-TP453 • Little to no topsoil present. No presence of gravel • Moderately weathered basalt rock with clayey SILT material around it. Moisture present within the silt • At the bottom, very weathered basalt rock, with silty CLAY material around it. Cobbles and boulders increasing with depth • Water ingress observed from 2.1 m bgl, with reasonable flow. Water seems to be flowing under clayey silt layer and within the shallow portion of the harder basalt rock layer

Photo	Comment
	Grab sample from water within test pit TA- TP453. Very turbid water, but no sheen or odour present

2. Drilling, well installation and soil sampling at Tarraleah Switchyard

Date: 7/04/2025 to 15/04/2025

Photo	Comment
 	Underground asset location and NDD completed by Archers Underground Services Locations.

Photo	Comment
 	Drilling and well installation of monitoring well at TA- MB411. • No NDD completed due to its location near existing groundwater well • Sampling completed from top layers of fill and natural materials • End of bore at refusal to auger upon reaching bedrock.

Photo	Comment
	
	

Photo	Comment
	Core sample obtained from drilling at TA- MB411
	Drilling and well installation of monitoring well at TA- MB412. • Initial drilling with NDD (by Archers) • Sampling completed from top layers of fill and natural materials • Refusal to auger upon reaching natural alluvial layer. Switched to HQ drilling • Drilling extended through alluvial layer and only slightly into bedrock • Groundwater monitoring well installed.

Photo	Comment
	
	Core sample obtained from drilling at TA- MB412

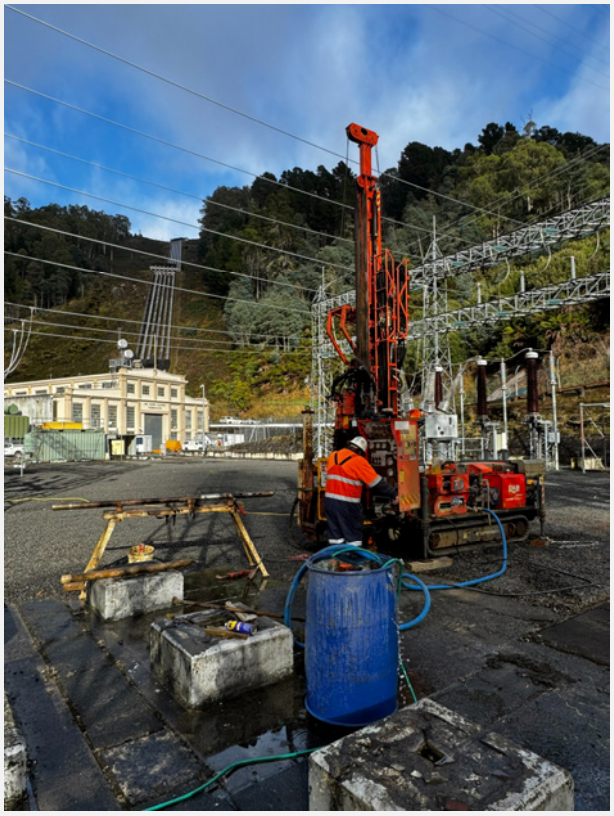
Photo	Comment
	Drilling and well installation of monitoring well at TA- MB414. • Initial drilling with NDD (by Archers) • Sampling completed from top layers of fill and natural materials • Refusal to auger upon reaching natural alluvial layer. Switched to HQ drilling • Drilling extended into bedrock • Drillhole plugged with bentonite to top of bedrock layer prior to installation of groundwater monitoring well
	Core sample obtained from drilling at TA- MB414

Photo	Comment
 	Drilling and well installation of monitoring well at TA- MB415 • Initial drilling with NDD (by Archers) • Sampling completed from top layers of fill and natural materials • Refusal to auger upon reaching natural alluvial layer. Switched to HQ drilling • Drilling extended into bedrock • Drillhole plugged with bentonite to top of bedrock layer prior to installation of groundwater monitoring well

Photo	Comment
	Core sample obtained from drilling at TA- MB415
	Detail of very weathered bedrock (dolerite) layer, with presence of zeolite Bedrock was observed to be weathered in all locations except TA-MB418 (hard dolerite rock) No drilling through bedrock was completed at location TA- MB411

Photo	Comment
	Drilling and well installation of monitoring well at TA- MB416. • Initial drilling with NDD (by Archers) • Sampling completed from top layers of fill and natural materials • Refusal to auger upon reaching natural alluvial layer. Switched to HQ drilling • Drilling extended into bedrock • Drillhole plugged with bentonite to top of bedrock layer prior to installation of groundwater monitoring well
	Core sample obtained from drilling at TA- MB416

Photo	Comment
 	Drilling and well installation of monitoring well at TA- MB418 • Archers completed service location, but no NDD drilling at this location • Refusal to auger in either concrete or large boulder was found, so drilling was attempted in 4 different locations • Sampling completed from top layers of fill and natural materials • Refusal to auger in large boulder relatively shallow in the soil profile. Switched to HQ drilling • Drilling extended into bedrock • Drillhole plugged with bentonite to top of bedrock layer prior to installation of groundwater monitoring well

Photo	Comment
	
	Core sample obtained from drilling at TA- MB418

Photo	Comment
 	Test pitting at location TA-TP456: • Uncompacted fill material. Some cobbles present and very little extraneous materials (metal bar, wood, plastic) • No building demolition rubble present • Fill material becoming increasingly clayey with depth

Photo	Comment
	

Laboratory documentation

Appendix F

pitt&sherry

ALS Environmental

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ADELAIDE 21 Burma Road Pooraka SA 5095 · ☐BRISBANE 32 Shand Street Stafford QLD 4053
☐GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph 07 7471 5600 E gladstone@alsglobal.com
☐MACKAY 78 Harbour Road Mackay QLD 4740
☐MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph 03 8549 9600 E samples.melbourne@alsglobal.com
☐MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph 02 6372 6735 E mudgee.mail@alsglobal.com
☐NEWCASTLE 5 Rose Gum Road Warabrook NSW 2304
☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph 024423 2063 E nowra@alsglobal.com
☐PERTH 10 Hod Way Malaga WA 6090 Ph 08 9209 7655 E samples.perth@alsglobal.com
☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph 02 8784 8555 E samples.sydney@alsglobal.com
☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph 07 4796 0600 E townsville.environmental@alsglobal.com
☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph 02 4225 3125 E portkembla@alsglobal.com

FREIGHT

CLIENT: pitt&sherry operations	TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ☒ Standard or urgent TAT (List due date): ☐ Non Standard or urgent TAT (List due date):
OFFICE: Hobart	
PROJECT: Tarraleah Village Soil Sampling	ALS QUOTE NO.: EM24PITSHE0004_V3_P.24.1136
ORDER NUMBER: P.24.1136	COC SEQUENCE NUMBER (Circle) COC: (1) 2 3 4 5 6 7 — 8
PROJECT MANAGER: Carly Clark · CONTACT PH: 0490 942 344	OF: (1) 2 3 4 5 6 7 — 8
SAMPLER: Eduardo Maes · SAMPLER MOBILE: 0414 023 658	
COC emailed to ALS? (YES / NO) · EDD FORMAT (or default): ENMRG	
Email Reports to: cclark@pittsh.com.au; emaes@pittsh.com.au	
Email Invoice to: cclark@pittsh.com.au; accounts@pittsh.com.au	

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:	°C		
Other comment:			

RELINQUISHED BY: Alex Hibberd	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY: BL
EPM			
DATE/TIME: 01.04	DATE/TIME:	DATE/TIME:	DATE/TIME: 2/4/25. 13:50

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).						Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	Suite B	Suite D	ASC NEPM Soil Classification	Rinsate 3	Trip Blank	W-25T TRH/BTEXN/PAH/Phenols/Pb	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	449/0.4	31.03	S	Soil JAR	1	X						
2	449/0.8	"	S	"	1	X						
3	449/3.0	"	S	"	1	X						
4	450/0.2	"	S	Soil JAR + BAG	2	X		X				
5	450/1.4	"	S	Soil JAR	1	X						
6	451/0.8	01.04	S	"	1	X						
7	451/2.0	"	S	"	1	X						
8	451/3.0	"	S	"	1	X						
9	452/0.2	"	S	"	1	X						
10	452/2.0	"	S	"	1	X						
11	452/3.2	"	S	"	1	X						
12	453/0.2	"	S	"	1	X						
13	453/1.5	"	S	Soil JAR + BAG	2	X		X				
14	453/2.2	"	S	Soil JAR	1							
15	QCP01	31.03	S	"	1							
→	QCS01	31.03	S	"	1							forward to Eurofins
16	452/W	01.04	W	AG + 2VS + P	4						X	
17	453/W	01.04	W	"	4						X	
				TOTAL	0							
18	TB01	01.04	S	Soil JAR						X		

FREIGHT

Environmental Division
Melbourne
Work Order Reference
EM2505614

Telephone: +61-3-8549 9600

3/4, BL

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

From: Eduardo Pereira Maes <EPereiraMaes@pittsh.com.au>
Sent: Wednesday, 2 April 2025 8:34 AM
To: Hannah White <hannah.white@ALSGlobal.com>; ALS Enviro Melbourne <ALSEnviroMelbourne@ALSGlobal.com>
Cc: Fiona Keserue-Ponte <FKeseruePonte@pittsh.com.au>
Subject: [EXTERNAL] - RE: P.24.1136 CoC

Hi Hannah,
Further to my last email, I was requested to add a prefix to the sample IDs so it matches the client's format in their database.
Could you please amend the sample ID's to include the prefix **TA-TP** before the current ID when you issue the report? E.g. sample **449/0.4** will become **TA-TP449/0.4** and so on.
This is only for primary samples, so no need to adjust the IDs for QCP, QCS and TB samples.
Thanks!

pitt&sherry

Eduardo Pereira Maes
B.Eng Environmental (Hons)
PostGradDip WHS Engineering

Associate Environmental Consultant

+61 414 023 658
epereiramaes@pittsh.com.au

Connect on LinkedIn

From: Eduardo Pereira Maes
Sent: Tuesday, 1 April 2025 3:18 PM
To: Hannah White <hannah.white@ALSGlobal.com>; ALS Enviro Melbourne <ALSEnviroMelbourne@ALSGlobal.com>
Cc: Fiona Keserue-Ponte <FKeseruePonte@pittsh.com.au>
Subject: P.24.1136 CoC

Hi Hannah,
Please find attached the CoC for samples sent today.
A hard copy is also within the esky.
Regards,

pitt&sherry

Eduardo Pereira Maes
B.Eng Environmental (Hons)
PostGradDip WHS Engineering

Associate Environmental Consultant

+61 414 023 658
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SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **EM2505614**		
Client	: **PITT & SHERRY (OPERATIONS) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: CARLY CLARK	Contact	: Hannah White
Address	: 199 MACQUARIE STREET HOBART 7001	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: cclark@pittsh.com.au	E-mail	: Hannah.White@alsglobal.com
Telephone	: 03 9674 4163	Telephone	: +61-3-8549 9600
Facsimile	: ----	Facsimile	: +61-3-8549 9626
Project	: Tarraleah Village Soil Sampling	Page	: 1 of 3
Order number	: P.24.1136	Quote number	: EM2024PITSHE0004 (EM24PITSHE0004)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: EM		

Dates

Date Samples Received	: 02-Apr-2025 13:00	Issue Date	: 03-Apr-2025
Client Requested Due Date	: 14-Apr-2025	Scheduled Reporting Date	: **14-Apr-2025**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 4.3°C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 18 / 16

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- Analytical work for this work order will be conducted at ALS Newcastle and ALS Melbourne, NATA accreditation no. 825, site no. 13778.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP075 SIM Phenols only SIM - Phenols only	SOIL - EP075-TAS Benzo(a)pyrene and other PAHs - Waste	SOIL - P-22 (Melb) Soil Characterisation Package	SOIL - S-04 TRH/BTEXN
EM2505614-001	31-Mar-2025 00:00	TA-TP449/0.4		✓	✓	✓	✓		✓
EM2505614-002	31-Mar-2025 00:00	TA-TP449/0.8		✓	✓	✓	✓		✓
EM2505614-003	31-Mar-2025 00:00	TA-TP449/3.0		✓	✓	✓	✓		✓
EM2505614-004	31-Mar-2025 00:00	TA-TP450/0.2		✓	✓	✓	✓	✓	✓
EM2505614-005	31-Mar-2025 00:00	TA-TP450/1.4		✓	✓	✓	✓		✓
EM2505614-006	01-Apr-2025 00:00	TA-TP451/0.8		✓	✓	✓	✓		✓
EM2505614-007	01-Apr-2025 00:00	TA-TP451/2.0		✓	✓	✓	✓		✓
EM2505614-008	01-Apr-2025 00:00	TA-TP451/3.0		✓	✓	✓	✓		✓
EM2505614-009	01-Apr-2025 00:00	TA-TP452/0.2		✓	✓	✓	✓		✓
EM2505614-010	01-Apr-2025 00:00	TA-TP452/2.0		✓	✓	✓	✓		✓
EM2505614-011	01-Apr-2025 00:00	TA-TP452/3.2		✓	✓	✓	✓		✓
EM2505614-012	01-Apr-2025 00:00	TA-TP453/0.2		✓	✓	✓	✓		✓
EM2505614-013	01-Apr-2025 00:00	TA-TP453/1.5		✓	✓	✓	✓	✓	✓
EM2505614-014	01-Apr-2025 00:00	TA-TP453/2.2	✓						
EM2505614-015	31-Mar-2025 00:00	QCP01	✓						
EM2505614-018	01-Apr-2025 00:00	TB01		✓					

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - S-18 TRH(C6-C9)/BTEXN
EM2505614-018	01-Apr-2025 00:00	TB01	✓

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - W-25T TRH/BTEXN/PAH/Phenols/Total Pb
EM2505614-016	01-Apr-2025 00:00	TA-TP452/W	✓
EM2505614-017	01-Apr-2025 00:00	TA-TP453/W	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ALL ACCOUNTS

- A4 - AU Tax Invoice (INV)	Email	accounts@pittsh.com.au

CARLY CLARK

- *AU Certificate of Analysis - NATA (COA)	Email	cclark@pittsh.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	cclark@pittsh.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	cclark@pittsh.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	cclark@pittsh.com.au
- A4 - AU Tax Invoice (INV)	Email	cclark@pittsh.com.au
- Attachment - Report (SUBCO)	Email	cclark@pittsh.com.au
- Chain of Custody (CoC) (COC)	Email	cclark@pittsh.com.au
- EDI Format - ENMRG (ENMRG)	Email	cclark@pittsh.com.au

Eduardo Pereira Maes

- *AU Certificate of Analysis - NATA (COA)	Email	emaes@pittsh.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	emaes@pittsh.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	emaes@pittsh.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	emaes@pittsh.com.au
- Attachment - Report (SUBCO)	Email	emaes@pittsh.com.au
- Chain of Custody (CoC) (COC)	Email	emaes@pittsh.com.au
- EDI Format - ENMRG (ENMRG)	Email	emaes@pittsh.com.au

Inter-Laboratory Testing

Analysis conducted by ALS Newcastle, NATA accreditation no. 825, site no. 1656 (Chemistry / Biology).

(SOIL) EA150: Soil Classification based on Particle Size

(SOIL) EA152: Soil Particle Density

CERTIFICATE OF ANALYSIS

Work Order	: **EM2505614**	Page	: 1 of 17
Client	: **PITT & SHERRY (OPERATIONS) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: CARLY CLARK	Contact	: Hannah White
Address	: 199 MACQUARIE STREET HOBART 7001	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: 03 9674 4163	Telephone	: +61-3-8549 9600
Project	: Tarraleah Village Soil Sampling	Date Samples Received	: 02-Apr-2025 13:00
Order number	: P.24.1136	Date Analysis Commenced	: 04-Apr-2025
C-O-C number	: ----	Issue Date	: 14-Apr-2025 17:37
Sampler	: EM		
Site	: ----		
Quote number	: EM24PITSHE0004		
No. of samples received	: 18		
No. of samples analysed	: 16		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

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*
Aleksandar Vujkovic	Laboratory Technician	Newcastle - Inorganics, Mayfield West, NSW
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC
Nikki Stepniewski	Senior Inorganic Instrument 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 Contract 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.

- ALS is not NATA accredited for the analysis of Exchangeable Cations on Alkaline Soils when performed under ALS Method ED006.
- EP075 (SIM): Where reported, Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- EP071: Poor duplicate precision observed for sample EP2504943-001. Insufficient sample remains to confirm sample heterogeneity via re-extraction and re-analysis
- ED007 and ED008: When Exchangeable Al is reported from these methods, it should be noted that Rayment & Lyons (2011) suggests Exchange Acidity by 1M KCl - Method 15G1 (ED005) is a more suitable method for the determination of exchange acidity (H+ + Al3+).

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TA-TP449/0.4	TA-TP449/0.8	TA-TP449/3.0	TA-TP450/0.2	TA-TP450/1.4
			Sampling date / time	31-Mar-2025 00:00	31-Mar-2025 00:00	31-Mar-2025 00:00	31-Mar-2025 00:00	31-Mar-2025 00:00
Compound	CAS Number	LOR	Unit	EM2505614-001	EM2505614-002	EM2505614-003	EM2505614-004	EM2505614-005
				Result	Result	Result	Result	Result
EA001: pH in soil using 0.01M CaCl extract								
pH (CaCl2)	----	0.1	pH Unit	----	----	----	6.0	----
EA002-AD: pH (Soils) dried at 40°C								
pH Value	----	0.1	pH Unit	----	----	----	6.6	----
EA010-AD: Conductivity (Soils) dried at 40°C								
Electrical Conductivity @ 25°C	----	1	µS/cm	----	----	----	45	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	10.5	47.1	30.9	----	44.5
Moisture Content	----	1.0	%	----	----	----	14.0	----
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	----	----	----	20	----
EA152: Soil Particle Density								
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	----	----	----	2.58	----
ED007: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	----	----	----	10.2	----
Exchangeable Magnesium	----	0.1	meq/100g	----	----	----	1.3	----
Exchangeable Potassium	----	0.1	meq/100g	----	----	----	0.3	----
Exchangeable Sodium	----	0.1	meq/100g	----	----	----	0.1	----
Cation Exchange Capacity	----	0.1	meq/100g	----	----	----	12.0	----
EG005(ED093)T: Total Metals by ICP-AES								
Iron	7439-89-6	0.005	%	----	----	----	6.91	----
Lead	7439-92-1	5	mg/kg	<5	10	5	5	5
EP004: Organic Matter								
Organic Matter	----	0.5	%	----	----	----	3.2	----
Total Organic Carbon	----	0.5	%	----	----	----	1.8	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TA-TP449/0.4	TA-TP449/0.8	TA-TP449/3.0	TA-TP450/0.2	TA-TP450/1.4
			Sampling date / time	31-Mar-2025 00:00	31-Mar-2025 00:00	31-Mar-2025 00:00	31-Mar-2025 00:00	31-Mar-2025 00:00
Compound	CAS Number	LOR	Unit	EM2505614-001	EM2505614-002	EM2505614-003	EM2505614-004	EM2505614-005
				Result	Result	Result	Result	Result
EP075(SIM)A: Phenolic Compounds - Continued								
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2
EP075B: Polynuclear Aromatic Hydrocarbons								
Benzo(a)pyrene	50-32-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1.0	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
^ **Benzo(a)pyrene TEQ (zero)**	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.05	mg/kg	**0.76**	**0.76**	**0.76**	**0.76**	**0.76**
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.05	mg/kg	**0.38**	**0.38**	**0.38**	**0.38**	**0.38**
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TA-TP449/0.4	TA-TP449/0.8	TA-TP449/3.0	TA-TP450/0.2	TA-TP450/1.4
				Sampling date / time	31-Mar-2025 00:00	31-Mar-2025 00:00	31-Mar-2025 00:00	31-Mar-2025 00:00	31-Mar-2025 00:00
Compound	CAS Number	LOR	Unit		EM2505614-001	EM2505614-002	EM2505614-003	EM2505614-004	EM2505614-005
					Result	Result	Result	Result	Result
EP075B: Polynuclear Aromatic Hydrocarbons - Continued									
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		<50	<50	<50	<50	<50
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ **Total Xylenes**	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TA-TP449/0.4	TA-TP449/0.8	TA-TP449/3.0	TA-TP450/0.2	TA-TP450/1.4
			Sampling date / time	31-Mar-2025 00:00	31-Mar-2025 00:00	31-Mar-2025 00:00	31-Mar-2025 00:00	31-Mar-2025 00:00
Compound	CAS Number	LOR	Unit	EM2505614-001	EM2505614-002	EM2505614-003	EM2505614-004	EM2505614-005
				Result	Result	Result	Result	Result
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	85.1	89.6	80.3	86.2	82.3
2-Chlorophenol-D4	93951-73-6	0.5	%	86.2	90.2	81.4	86.7	81.7
2.4.6-Tribromophenol	118-79-6	0.5	%	88.4	95.4	83.6	89.6	84.5
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	94.8	99.1	89.4	96.9	90.0
Anthracene-d10	1719-06-8	0.5	%	120	123	115	124	109
4-Terphenyl-d14	1718-51-0	0.5	%	92.6	98.0	88.5	95.0	89.6
EP075T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.025	%	102	98.6	115	93.8	106
Anthracene-d10	1719-06-8	0.025	%	102	102	115	94.9	108
4-Terphenyl-d14	1718-51-0	0.025	%	108	107	123	99.7	112
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	91.6	54.6	70.9	71.7	70.4
Toluene-D8	2037-26-5	0.2	%	101	56.5	73.6	75.5	82.3
4-Bromofluorobenzene	460-00-4	0.2	%	104	59.9	78.0	78.2	80.6

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TA-TP451/0.8	TA-TP451/2.0	TA-TP451/3.0	TA-TP452/0.2	TA-TP452/2.0
			Sampling date / time	01-Apr-2025 00:00	01-Apr-2025 00:00	01-Apr-2025 00:00	01-Apr-2025 00:00	01-Apr-2025 00:00
Compound	CAS Number	LOR	Unit	EM2505614-006	EM2505614-007	EM2505614-008	EM2505614-009	EM2505614-010
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**25.9**	**28.3**	**15.4**	**11.4**	**38.2**
EG005(ED093)T: Total Metals by ICP-AES								
Lead	7439-92-1	5	mg/kg	**5**	<5	<5	<5	<5
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2
EP075B: Polynuclear Aromatic Hydrocarbons								
Benzo(a)pyrene	50-32-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of polycyclic aromatic hydrocarbons	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TA-TP451/0.8	TA-TP451/2.0	TA-TP451/3.0	TA-TP452/0.2	TA-TP452/2.0
			Sampling date / time	01-Apr-2025 00:00	01-Apr-2025 00:00	01-Apr-2025 00:00	01-Apr-2025 00:00	01-Apr-2025 00:00
Compound	CAS Number	LOR	Unit	EM2505614-006	EM2505614-007	EM2505614-008	EM2505614-009	EM2505614-010
				Result	Result	Result	Result	Result
EP075B: Polynuclear Aromatic Hydrocarbons - Continued								
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1.0	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
^ Benzo(a)pyrene TEQ (zero)	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Benzo(a)pyrene TEQ (LOR)	----	0.05	mg/kg	**0.76**	**0.76**	**0.76**	**0.76**	**0.76**
^ Benzo(a)pyrene TEQ (half LOR)	----	0.05	mg/kg	**0.38**	**0.38**	**0.38**	**0.38**	**0.38**
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TA-TP451/0.8	TA-TP451/2.0	TA-TP451/3.0	TA-TP452/0.2	TA-TP452/2.0
			Sampling date / time	01-Apr-2025 00:00	01-Apr-2025 00:00	01-Apr-2025 00:00	01-Apr-2025 00:00	01-Apr-2025 00:00
Compound	CAS Number	LOR	Unit	EM2505614-006	EM2505614-007	EM2505614-008	EM2505614-009	EM2505614-010
				Result	Result	Result	Result	Result
EP080: BTEXN - Continued								
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ **Sum of BTEX**	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ **Total Xylenes**	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**82.9**	**79.9**	**83.9**	**79.2**	**77.8**
2-Chlorophenol-D4	93951-73-6	0.5	%	**83.4**	**81.1**	**86.2**	**79.2**	**74.8**
2.4.6-Tribromophenol	118-79-6	0.5	%	**83.8**	**88.6**	**89.8**	**86.0**	**84.7**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	**94.5**	**91.5**	**94.4**	**92.1**	**88.7**
Anthracene-d10	1719-06-8	0.5	%	**115**	**122**	**126**	**113**	**118**
4-Terphenyl-d14	1718-51-0	0.5	%	**93.5**	**89.7**	**92.5**	**90.6**	**89.6**
EP075T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.025	%	**90.5**	**100**	**104**	**91.0**	**80.1**
Anthracene-d10	1719-06-8	0.025	%	**91.8**	**101**	**106**	**92.4**	**83.8**
4-Terphenyl-d14	1718-51-0	0.025	%	**97.2**	**105**	**112**	**97.1**	**85.6**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**86.5**	**78.1**	**77.2**	**85.8**	**79.6**
Toluene-D8	2037-26-5	0.2	%	**88.6**	**86.7**	**83.4**	**93.9**	**86.6**
4-Bromofluorobenzene	460-00-4	0.2	%	**89.9**	**89.5**	**84.6**	**110**	**91.0**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TA-TP452/3.2	TA-TP453/0.2	TA-TP453/1.5	TB01	----
			Sampling date / time	01-Apr-2025 00:00	01-Apr-2025 00:00	01-Apr-2025 00:00	01-Apr-2025 00:00	----
Compound	CAS Number	LOR	Unit	EM2505614-011	EM2505614-012	EM2505614-013	EM2505614-018	--------
				Result	Result	Result	Result	----
EA001: pH in soil using 0.01M CaCl extract								
pH (CaCl2)	----	0.1	pH Unit	----	----	5.6	----	----
EA002-AD: pH (Soils) dried at 40°C								
pH Value	----	0.1	pH Unit	----	----	6.6	----	----
EA010-AD: Conductivity (Soils) dried at 40°C								
Electrical Conductivity @ 25°C	----	1	µS/cm	----	----	34	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	39.0	34.8	----	----	----
Moisture Content	----	1.0	%	----	----	38.0	<1.0	----
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	----	----	30	----	----
EA152: Soil Particle Density								
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	----	----	2.53	----	----
ED007: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	----	----	17.8	----	----
Exchangeable Magnesium	----	0.1	meq/100g	----	----	21.1	----	----
Exchangeable Potassium	----	0.1	meq/100g	----	----	0.5	----	----
Exchangeable Sodium	----	0.1	meq/100g	----	----	0.6	----	----
Cation Exchange Capacity	----	0.1	meq/100g	----	----	40.2	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Iron	7439-89-6	0.005	%	----	----	8.08	----	----
Lead	7439-92-1	5	mg/kg	<5	6	<5	----	----
EP004: Organic Matter								
Organic Matter	----	0.5	%	----	----	1.2	----	----
Total Organic Carbon	----	0.5	%	----	----	0.7	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TA-TP452/3.2	TA-TP453/0.2	TA-TP453/1.5	TB01	----
			Sampling date / time	01-Apr-2025 00:00	01-Apr-2025 00:00	01-Apr-2025 00:00	01-Apr-2025 00:00	----
Compound	CAS Number	LOR	Unit	EM2505614-011	EM2505614-012	EM2505614-013	EM2505614-018	--------
				Result	Result	Result	Result	----
EP075(SIM)A: Phenolic Compounds - Continued								
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	----	----
EP075B: Polynuclear Aromatic Hydrocarbons								
Benzo(a)pyrene	50-32-8	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1.0	mg/kg	<1.0	<1.0	<1.0	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.05	mg/kg	**0.76**	**0.76**	**0.76**	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.05	mg/kg	**0.38**	**0.38**	**0.38**	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TA-TP452/3.2	TA-TP453/0.2	TA-TP453/1.5	TB01	----
			Sampling date / time	01-Apr-2025 00:00	01-Apr-2025 00:00	01-Apr-2025 00:00	01-Apr-2025 00:00	----
Compound	CAS Number	LOR	Unit	EM2505614-011	EM2505614-012	EM2505614-013	EM2505614-018	--------
				Result	Result	Result	Result	----
EP075B: Polynuclear Aromatic Hydrocarbons - Continued								
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	----
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	----
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TA-TP452/3.2	TA-TP453/0.2	TA-TP453/1.5	TB01	----
				Sampling date / time	01-Apr-2025 00:00	01-Apr-2025 00:00	01-Apr-2025 00:00	01-Apr-2025 00:00	----
Compound	CAS Number	LOR	Unit		EM2505614-011	EM2505614-012	EM2505614-013	EM2505614-018	--------
					Result	Result	Result	Result	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**78.5**	**83.9**	**78.2**	**----**	**----**
2-Chlorophenol-D4	93951-73-6	0.5	%		**79.5**	**86.0**	**77.9**	**----**	**----**
2.4.6-Tribromophenol	118-79-6	0.5	%		**80.9**	**87.2**	**81.9**	**----**	**----**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**86.4**	**93.0**	**87.7**	**----**	**----**
Anthracene-d10	1719-06-8	0.5	%		**114**	**120**	**118**	**----**	**----**
4-Terphenyl-d14	1718-51-0	0.5	%		**86.0**	**92.2**	**88.4**	**----**	**----**
EP075T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.025	%		**87.1**	**124**	**116**	**----**	**----**
Anthracene-d10	1719-06-8	0.025	%		**89.0**	**125**	**119**	**----**	**----**
4-Terphenyl-d14	1718-51-0	0.025	%		**92.5**	**132**	**126**	**----**	**----**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**84.5**	**75.3**	**77.3**	**96.7**	**----**
Toluene-D8	2037-26-5	0.2	%		**78.8**	**69.6**	**82.4**	**94.0**	**----**
4-Bromofluorobenzene	460-00-4	0.2	%		**97.1**	**86.9**	**86.4**	**92.5**	**----**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	TA-TP452/W	TA-TP453/W	----	----	----
			Sampling date / time	01-Apr-2025 00:00	01-Apr-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EM2505614-016	EM2505614-017	--------	--------	--------
				Result	Result	----	----	----
EG020T: Total Metals by ICP-MS								
Lead	7439-92-1	0.001	mg/L	**0.008**	**0.008**	----	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	----	----	----
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	----	----	----
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	----	----	----
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	----	----	----
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	----	----	----
2.4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	----	----	----
2.4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	----	----	----
2.6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	----	----	----
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	----	----	----
2.4.6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	----	----	----
2.4.5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	----	----	----
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	----	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	----	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	----	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	----	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	----	----	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	----	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	----	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	<1.0	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	TA-TP452/W	TA-TP453/W	----	----	----
				Sampling date / time	01-Apr-2025 00:00	01-Apr-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EM2505614-016	EM2505614-017	--------	--------	--------
					Result	Result	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L		<1.0	<1.0	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	<1.0	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L		<1.0	<1.0	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L		<0.5	<0.5	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	µg/L		<0.5	<0.5	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	----	----	----
C10 - C14 Fraction	----	50	µg/L		<50	<50	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	<100	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	<50	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L		<50	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L		<20	<20	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	<100	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	<100	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L		<100	<100	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L		<100	<100	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	----	----	----
Toluene	108-88-3	2	µg/L		<2	<2	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	TA-TP452/W	TA-TP453/W	----	----	----
				Sampling date / time	01-Apr-2025 00:00	01-Apr-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EM2505614-016	EM2505614-017	--------	--------	--------
					Result	Result	----	----	----
EP080: BTEXN - Continued									
^ **Total Xylenes**	----	2	µg/L		<2	<2	----	----	----
^ **Sum of BTEX**	----	1	µg/L		<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		**24.1**	**30.3**	----	----	----
2-Chlorophenol-D4	93951-73-6	1.0	%		**61.7**	**75.3**	----	----	----
2.4.6-Tribromophenol	118-79-6	1.0	%		**68.9**	**87.1**	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		**73.0**	**91.6**	----	----	----
Anthracene-d10	1719-06-8	1.0	%		**70.9**	**87.8**	----	----	----
4-Terphenyl-d14	1718-51-0	1.0	%		**79.9**	**103**	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**99.4**	**91.6**	----	----	----
Toluene-D8	2037-26-5	2	%		**107**	**99.8**	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**105**	**99.4**	----	----	----

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	54	125
2-Chlorophenol-D4	93951-73-6	65	123
2.4.6-Tribromophenol	118-79-6	34	122
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	61	125
Anthracene-d10	1719-06-8	62	130
4-Terphenyl-d14	1718-51-0	67	133
EP075T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	35	126
Anthracene-d10	1719-06-8	40	135
4-Terphenyl-d14	1718-51-0	42	133
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

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	51
2-Chlorophenol-D4	93951-73-6	30	114
2.4.6-Tribromophenol	118-79-6	26	133
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	35	127
Anthracene-d10	1719-06-8	44	122
4-Terphenyl-d14	1718-51-0	44	124
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	129
Toluene-D8	2037-26-5	70	125
4-Bromofluorobenzene	460-00-4	71	129

Inter-Laboratory Testing

Analysis conducted by ALS Newcastle, NATA accreditation no. 825, site no. 1656 (Chemistry / Biology).

(SOIL) EA150: Soil Classification based on Particle Size

(SOIL) EA152: Soil Particle Density

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2505614**	Page	: 1 of 12
Client	: **PITT & SHERRY (OPERATIONS) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: CARLY CLARK	Telephone	: +61-3-8549 9600
Project	: Tarraleah Village Soil Sampling	Date Samples Received	: 02-Apr-2025
Site	: ----	Issue Date	: 14-Apr-2025
Sampler	: EM	No. of samples received	: 18
Order number	: P.24.1136	No. of samples analysed	: 16

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.**
- **NO Matrix Spike outliers occur.**
- **Duplicate outliers exist - please see following pages for full details.**
- **For all regular sample matrices, where applicable to the methodology, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP080/071: Total Petroleum Hydrocarbons	EP2504943--001	Anonymous	**C10 - C14 Fraction**	----	26.3 %	0% - 20%	**RPD exceeds LOR based limits**
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	EP2504943--001	Anonymous	**>C10 - C16 Fraction**	----	24.5 %	0% - 20%	**RPD exceeds LOR based limits**

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA002-AD: pH (Soils) dried at 40°C						
Soil Glass Jar - Unpreserved TA-TP453/1.5	09-Apr-2025	08-Apr-2025	1	----	----	----
Soil Glass Jar - Unpreserved TA-TP450/0.2	09-Apr-2025	07-Apr-2025	2	----	----	----
EA010-AD: Conductivity (Soils) dried at 40°C						
Soil Glass Jar - Unpreserved TA-TP453/1.5	09-Apr-2025	08-Apr-2025	1	----	----	----
Soil Glass Jar - Unpreserved TA-TP450/0.2	09-Apr-2025	07-Apr-2025	2	----	----	----

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Analytical Methods	Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)						
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	6	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	11	9.09	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	6	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	11	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

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.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA001: pH in soil using 0.01M CaCl extract							
Soil Glass Jar - Unpreserved (EA001) TA-TP453/1.5	**01-Apr-2025**	**07-Apr-2025**	08-Apr-2025	✓	**07-Apr-2025**	07-Apr-2025	✓
Soil Glass Jar - Unpreserved (EA001) TA-TP450/0.2	**31-Mar-2025**	**07-Apr-2025**	07-Apr-2025	✓	**07-Apr-2025**	07-Apr-2025	✓
EA002-AD: pH (Soils) dried at 40°C							
Soil Glass Jar - Unpreserved (EA002-AD) TA-TP453/1.5	**01-Apr-2025**	**09-Apr-2025**	08-Apr-2025	×	**09-Apr-2025**	09-Apr-2025	✓
Soil Glass Jar - Unpreserved (EA002-AD) TA-TP450/0.2	**31-Mar-2025**	**09-Apr-2025**	07-Apr-2025	×	**09-Apr-2025**	09-Apr-2025	✓
EA010-AD: Conductivity (Soils) dried at 40°C							
Soil Glass Jar - Unpreserved (EA010-AD) TA-TP453/1.5	**01-Apr-2025**	**09-Apr-2025**	08-Apr-2025	×	**09-Apr-2025**	07-May-2025	✓
Soil Glass Jar - Unpreserved (EA010-AD) TA-TP450/0.2	**31-Mar-2025**	**09-Apr-2025**	07-Apr-2025	×	**09-Apr-2025**	07-May-2025	✓
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) TA-TP451/0.8, TA-TP451/2.0, TA-TP451/3.0, TA-TP452/0.2, TA-TP452/2.0, TA-TP452/3.2, TA-TP453/0.2, TA-TP453/1.5, TB01	**01-Apr-2025**	**----**	----	----	**09-Apr-2025**	15-Apr-2025	✓
Soil Glass Jar - Unpreserved (EA055) TA-TP449/0.4, TA-TP449/0.8, TA-TP449/3.0, TA-TP450/0.2, TA-TP450/1.4	**31-Mar-2025**	**----**	----	----	**09-Apr-2025**	14-Apr-2025	✓
EA150: Soil Classification based on Particle Size							
Snap Lock Bag - Friable Asbestos/PSD Bag (EA150H) TA-TP453/1.5	**01-Apr-2025**	**----**	----	----	**11-Apr-2025**	28-Sep-2025	✓
Snap Lock Bag - Friable Asbestos/PSD Bag (EA150H) TA-TP450/0.2	**31-Mar-2025**	**----**	----	----	**11-Apr-2025**	27-Sep-2025	✓
EA152: Soil Particle Density							
Snap Lock Bag - Friable Asbestos/PSD Bag (EA152) TA-TP453/1.5	**01-Apr-2025**	**----**	----	----	**10-Apr-2025**	28-Sep-2025	✓
Snap Lock Bag - Friable Asbestos/PSD Bag (EA152) TA-TP450/0.2	**31-Mar-2025**	**----**	----	----	**10-Apr-2025**	27-Sep-2025	✓
ED006: Exchangeable Cations on Alkaline Soils							
Soil Glass Jar - Unpreserved (ED006) TA-TP453/1.5	**01-Apr-2025**	**07-Apr-2025**	29-Apr-2025	✓	**11-Apr-2025**	29-Apr-2025	✓
Soil Glass Jar - Unpreserved (ED006) TA-TP450/0.2	**31-Mar-2025**	**07-Apr-2025**	28-Apr-2025	✓	**11-Apr-2025**	28-Apr-2025	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED007: Exchangeable Cations							
Soil Glass Jar - Unpreserved (ED007)							
TA-TP453/1.5	**01-Apr-2025**	**07-Apr-2025**	29-Apr-2025	✓	**11-Apr-2025**	29-Apr-2025	✓
Soil Glass Jar - Unpreserved (ED007)							
TA-TP450/0.2	**31-Mar-2025**	**07-Apr-2025**	28-Apr-2025	✓	**11-Apr-2025**	28-Apr-2025	✓
ED008: Exchangeable Cations							
Soil Glass Jar - Unpreserved (ED008)							
TA-TP453/1.5	**01-Apr-2025**	**07-Apr-2025**	29-Apr-2025	✓	**11-Apr-2025**	29-Apr-2025	✓
Soil Glass Jar - Unpreserved (ED008)							
TA-TP450/0.2	**31-Mar-2025**	**07-Apr-2025**	28-Apr-2025	✓	**11-Apr-2025**	28-Apr-2025	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
TA-TP451/0.8, TA-TP451/2.0, TA-TP451/3.0, TA-TP452/0.2, TA-TP452/2.0, TA-TP452/3.2, TA-TP453/0.2, TA-TP453/1.5	**01-Apr-2025**	**10-Apr-2025**	28-Sep-2025	✓	**10-Apr-2025**	28-Sep-2025	✓
Soil Glass Jar - Unpreserved (EG005T)							
TA-TP449/0.4, TA-TP449/0.8, TA-TP449/3.0, TA-TP450/0.2, TA-TP450/1.4	**31-Mar-2025**	**10-Apr-2025**	27-Sep-2025	✓	**10-Apr-2025**	27-Sep-2025	✓
EP004: Organic Matter							
Soil Glass Jar - Unpreserved (EP004)							
TA-TP453/1.5	**01-Apr-2025**	**11-Apr-2025**	29-Apr-2025	✓	**14-Apr-2025**	29-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP004)							
TA-TP450/0.2	**31-Mar-2025**	**11-Apr-2025**	28-Apr-2025	✓	**14-Apr-2025**	28-Apr-2025	✓
EP075(SIM)A: Phenolic Compounds							
Soil Glass Jar - Unpreserved (EP075(SIM))							
TA-TP451/0.8, TA-TP451/2.0, TA-TP451/3.0, TA-TP452/0.2, TA-TP452/2.0, TA-TP452/3.2, TA-TP453/0.2, TA-TP453/1.5	**01-Apr-2025**	**10-Apr-2025**	15-Apr-2025	✓	**10-Apr-2025**	20-May-2025	✓
Soil Glass Jar - Unpreserved (EP075(SIM))							
TA-TP449/0.4, TA-TP449/0.8, TA-TP449/3.0, TA-TP450/0.2, TA-TP450/1.4	**31-Mar-2025**	**10-Apr-2025**	14-Apr-2025	✓	**10-Apr-2025**	20-May-2025	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075-TAS) TA-TP451/0.8, TA-TP451/2.0, TA-TP451/3.0, TA-TP452/0.2, TA-TP452/2.0, TA-TP452/3.2, TA-TP453/0.2, TA-TP453/1.5	**01-Apr-2025**	**10-Apr-2025**	15-Apr-2025	✓	**11-Apr-2025**	20-May-2025	✓
Soil Glass Jar - Unpreserved (EP075-TAS) TA-TP449/0.4, TA-TP449/0.8, TA-TP449/3.0, TA-TP450/0.2, TA-TP450/1.4	**31-Mar-2025**	**10-Apr-2025**	14-Apr-2025	✓	**11-Apr-2025**	20-May-2025	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080) TA-TP453/1.5	**01-Apr-2025**	**07-Apr-2025**	15-Apr-2025	✓	**10-Apr-2025**	15-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP080) TB01	**01-Apr-2025**	**09-Apr-2025**	15-Apr-2025	✓	**09-Apr-2025**	15-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP080) TA-TP451/0.8, TA-TP451/2.0, TA-TP451/3.0, TA-TP452/0.2, TA-TP452/2.0, TA-TP452/3.2, TA-TP453/0.2	**01-Apr-2025**	**09-Apr-2025**	15-Apr-2025	✓	**10-Apr-2025**	15-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP071) TA-TP451/0.8, TA-TP451/2.0, TA-TP451/3.0, TA-TP452/0.2, TA-TP452/2.0, TA-TP452/3.2, TA-TP453/0.2, TA-TP453/1.5	**01-Apr-2025**	**10-Apr-2025**	15-Apr-2025	✓	**11-Apr-2025**	20-May-2025	✓
Soil Glass Jar - Unpreserved (EP080) TA-TP450/0.2	**31-Mar-2025**	**07-Apr-2025**	14-Apr-2025	✓	**10-Apr-2025**	14-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP080) TA-TP449/0.4, TA-TP449/0.8, TA-TP449/3.0, TA-TP450/1.4	**31-Mar-2025**	**09-Apr-2025**	14-Apr-2025	✓	**10-Apr-2025**	14-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP071) TA-TP449/0.4, TA-TP449/0.8, TA-TP449/3.0, TA-TP450/0.2, TA-TP450/1.4	**31-Mar-2025**	**10-Apr-2025**	14-Apr-2025	✓	**11-Apr-2025**	20-May-2025	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080) TA-TP453/1.5	**01-Apr-2025**	**07-Apr-2025**	15-Apr-2025	✓	**10-Apr-2025**	15-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP080) TB01	**01-Apr-2025**	**09-Apr-2025**	15-Apr-2025	✓	**09-Apr-2025**	15-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP080) TA-TP451/0.8, TA-TP451/2.0, TA-TP451/3.0, TA-TP452/0.2, TA-TP452/2.0, TA-TP452/3.2, TA-TP453/0.2	**01-Apr-2025**	**09-Apr-2025**	15-Apr-2025	✓	**10-Apr-2025**	15-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP071) TA-TP451/0.8, TA-TP451/2.0, TA-TP451/3.0, TA-TP452/0.2, TA-TP452/2.0, TA-TP452/3.2, TA-TP453/0.2, TA-TP453/1.5	**01-Apr-2025**	**10-Apr-2025**	15-Apr-2025	✓	**11-Apr-2025**	20-May-2025	✓
Soil Glass Jar - Unpreserved (EP080) TA-TP450/0.2	**31-Mar-2025**	**07-Apr-2025**	14-Apr-2025	✓	**10-Apr-2025**	14-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP080) TA-TP449/0.4, TA-TP449/0.8, TA-TP449/3.0, TA-TP450/1.4	**31-Mar-2025**	**09-Apr-2025**	14-Apr-2025	✓	**10-Apr-2025**	14-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP071) TA-TP449/0.4, TA-TP449/0.8, TA-TP449/3.0, TA-TP450/0.2, TA-TP450/1.4	**31-Mar-2025**	**10-Apr-2025**	14-Apr-2025	✓	**11-Apr-2025**	20-May-2025	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080) TA-TP453/1.5	**01-Apr-2025**	**07-Apr-2025**	15-Apr-2025	✓	**10-Apr-2025**	15-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP080) TB01	**01-Apr-2025**	**09-Apr-2025**	15-Apr-2025	✓	**09-Apr-2025**	15-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP080) TA-TP451/0.8, TA-TP451/2.0, TA-TP451/3.0, TA-TP452/0.2, TA-TP452/2.0, TA-TP452/3.2, TA-TP453/0.2	**01-Apr-2025**	**09-Apr-2025**	15-Apr-2025	✓	**10-Apr-2025**	15-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP080) TA-TP450/0.2	**31-Mar-2025**	**07-Apr-2025**	14-Apr-2025	✓	**10-Apr-2025**	14-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP080) TA-TP449/0.4, TA-TP449/0.8, TA-TP449/3.0, TA-TP450/1.4	**31-Mar-2025**	**09-Apr-2025**	14-Apr-2025	✓	**10-Apr-2025**	14-Apr-2025	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
TA-TP452/W, TA-TP453/W	**01-Apr-2025**	**11-Apr-2025**	28-Sep-2025	✓	**11-Apr-2025**	28-Sep-2025	✓
EP075(SIM)A: Phenolic Compounds							
Amber Glass Bottle - Unpreserved (EP075(SIM))							
TA-TP452/W, TA-TP453/W	**01-Apr-2025**	**04-Apr-2025**	08-Apr-2025	✓	**07-Apr-2025**	14-May-2025	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM))							
TA-TP452/W, TA-TP453/W	**01-Apr-2025**	**04-Apr-2025**	08-Apr-2025	✓	**07-Apr-2025**	14-May-2025	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
TA-TP452/W, TA-TP453/W	**01-Apr-2025**	**04-Apr-2025**	08-Apr-2025	✓	**07-Apr-2025**	14-May-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
TA-TP452/W, TA-TP453/W	**01-Apr-2025**	**09-Apr-2025**	15-Apr-2025	✓	**09-Apr-2025**	15-Apr-2025	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071)							
TA-TP452/W, TA-TP453/W	**01-Apr-2025**	**04-Apr-2025**	08-Apr-2025	✓	**07-Apr-2025**	14-May-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
TA-TP452/W, TA-TP453/W	**01-Apr-2025**	**09-Apr-2025**	15-Apr-2025	✓	**09-Apr-2025**	15-Apr-2025	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080)							
TA-TP452/W, TA-TP453/W	**01-Apr-2025**	**09-Apr-2025**	15-Apr-2025	✓	**09-Apr-2025**	15-Apr-2025	✓

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)							
Benzo(a)pyrene and other PAHs - Waste Classification (TAS requirements)	EP075-TAS	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5) on 40°C dried soil	EA010-AD	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations	ED007	1	2	**50.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	6	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5) on 40°C dried soil	EA002-AD	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH in soil using a 0.01M CaCl2 extract	EA001	2	11	**18.18**	**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	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Benzo(a)pyrene and other PAHs - Waste Classification (TAS requirements)	EP075-TAS	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5) on 40°C dried soil	EA010-AD	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations	ED007	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5) on 40°C dried soil	EA002-AD	2	3	**66.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH in soil using a 0.01M CaCl2 extract	EA001	2	11	**18.18**	**10.00**	✓	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	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Benzo(a)pyrene and other PAHs - Waste Classification (TAS requirements)	EP075-TAS	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5) on 40°C dried soil	EA010-AD	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations	ED007	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	13	**7.69**	**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	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							

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*	
Matrix Spikes (MS) - Continued							
Benzo(a)pyrene and other PAHs - Waste Classification (TAS requirements)	EP075-TAS	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	13	**7.69**	**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	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

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)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	6	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	9	**22.22**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	11	**9.09**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	6	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	11	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**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
pH in soil using a 0.01M CaCl2 extract	EA001	SOIL	In house: Referenced to Rayment and Lyons 4B3 (mod.) or 4B4 (mod.) 10 g of soil is mixed with 50 mL of 0.01M CaCl2 and tumbled end over end for 1 hour. pH is measured from the continuous suspension. This method is compliant with NEPM Schedule B(3).
pH (1:5) on 40°C dried soil	EA002-AD	SOIL	In house: Referenced to Rayment and Lyons 4A1 and APHA 4500H+. pH is determined on 40°C dried soil after a 1:5 soil/water leach. This method is compliant with NEPM Schedule B(3)
Electrical Conductivity (1:5) on 40°C dried soil	EA010-AD	SOIL	In house: Referenced to Rayment and Lyons 3A1 and APHA 2510. Conductivity is determined on soil samples dried at 40°C using a 1:5 soil/water leach. This method is compliant with NEPM Schedule B(3).
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).
Particle Size Analysis by Hydrometer	EA150H	SOIL	Particle Size Analysis by Hydrometer according to AS1289.3.6.3
Soil Particle Density	EA152	SOIL	Soil Particle Density by AS 1289.3.5.1: Methods of testing soils for engineering purposes - Soil classification tests - Determination of the soil particle density of a soil - Standard method
Exchangeable Cations on Alkaline Soils	* ED006	SOIL	In house: Referenced to Soil Survey Test Method C5. Soluble salts are removed from the sample prior to analysis. Cations are exchanged from the sample by contact with alcoholic ammonium chloride at pH 8.5. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil.
Exchangeable Cations	ED007	SOIL	In house: Referenced to Rayment & Lyons Method 15A1. Cations are exchanged from the sample by contact with Ammonium Chloride. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil. This method is compliant with NEPM Schedule B(3).
Exchangeable Cations with pre-treatment	ED008	SOIL	In house: Referenced to Rayment & Lyons Method 15A2. Soluble salts are removed from the sample prior to analysis. Cations are exchanged from the sample by contact with Ammonium Chloride. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil. 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)
Organic Matter	EP004	SOIL	In house: Referenced to AS1289.4.1.1. Dichromate oxidation method after Walkley and Black. 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).
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
Benzo(a)pyrene and other PAHs - Waste Classification (TAS requirements)	EP075-TAS	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM Schedule B(3).

Analytical Methods	Method	Matrix	Method Descriptions
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.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
pH in soil using a 0.01M CaCl2 extract	EA001-PR	SOIL	In house: Referenced to Rayment and Lyons 4B1, 10 g of soil is mixed with 50 mL of 0.01M CaCl2 and tumbled end over end for 1 hour. pH is measured from the continuous suspension. This method is compliant with NEPM Schedule B(3).
Exchangeable Cations Preparation Method (Alkaline Soils)	* ED006PR	SOIL	In house: Referenced to Rayment and Lyons method 15C1.
Exchangeable Cations Preparation Method	ED007PR	SOIL	In house: Referenced to Rayment & Lyons method 15A1. A 1M NH4Cl extraction by end over end tumbling at a ratio of 1:20. There is no pretreatment for soluble salts. Extracts can be run by ICP for cations.
1:5 solid / water leach following drying at 40°C	EN34-AD	SOIL	10 g of 40°C dried soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
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).
Organic Matter	EP004-PR	SOIL	In house: Referenced to AS1289.4.1.1. Dichromate oxidation method after Walkley and Black. 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, Na2SO4 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.

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
Tumbler Extraction of Solids - VIC EPA Screen	ORG17-EM	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 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.
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.

QUALITY CONTROL REPORT

Work Order	: **EM2505614**	Page	: 1 of 13
Client	: **PITT & SHERRY (OPERATIONS) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: CARLY CLARK	Contact	: Hannah White
Address	: 199 MACQUARIE STREET HOBART 7001	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: 03 9674 4163	Telephone	: +61-3-8549 9600
Project	: Tarraleah Village Soil Sampling	Date Samples Received	: 02-Apr-2025
Order number	: P.24.1136	Date Analysis Commenced	: 04-Apr-2025
C-O-C number	: ----	Issue Date	: 14-Apr-2025
Sampler	: EM		
Site	: ----		
Quote number	: EM24PITSHE0004		
No. of samples received	: 18		
No. of samples analysed	: 16		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

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.

Signatories	*Position*	*Accreditation Category*
Aleksandar Vujkovic	Laboratory Technician	Newcastle - Inorganics, Mayfield West, NSW
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC
Nikki Stepniewski	Senior Inorganic Instrument Chemist	Melbourne Inorganics, Springvale, VIC
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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
* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

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: 6496681)									
EM2505614-001	TA-TP449/0.4	EG005T: Lead	7439-92-1	5	mg/kg	<5	6	0.0	No Limit
		EG005T: Iron	7439-89-6	50	mg/kg	43800	49600	12.3	0% - 20%
EM2505994-002	Anonymous	EG005T: Lead	7439-92-1	5	mg/kg	36	38	4.4	No Limit
		EG005T: Iron	7439-89-6	50	mg/kg	15600	13400	15.1	0% - 20%
EA001: pH in soil using 0.01M CaCl extract (QC Lot: 6490015)									
EM2505534-014	Anonymous	EA001: pH (CaCl2)	----	0.1	pH Unit	5.6	5.7	0.0	0% - 20%
EM2505614-013	TA-TP453/1.5	EA001: pH (CaCl2)	----	0.1	pH Unit	5.6	5.6	0.0	0% - 20%
EA002-AD: pH (Soils) dried at 40°C (QC Lot: 6492554)									
EM2505492-002	Anonymous	EA002-AD: pH Value	----	0.1	pH Unit	8.3	8.3	0.0	0% - 20%
EA010-AD: Conductivity (Soils) dried at 40°C (QC Lot: 6492553)									
EM2505492-002	Anonymous	EA010-AD: Electrical Conductivity @ 25°C	----	1	µS/cm	968	996	2.9	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 6497048)									
EM2505614-001	TA-TP449/0.4	EA055: Moisture Content	----	0.1	%	10.5	10.2	3.3	0% - 20%
EM2505614-011	TA-TP452/3.2	EA055: Moisture Content	----	0.1	%	39.0	38.3	2.0	0% - 20%
ED007: Exchangeable Cations (QC Lot: 6492566)									
EM2505614-004	TA-TP450/0.2	ED007: Exchangeable Calcium	----	0.1	meq/100g	10.2	9.5	7.2	0% - 20%
		ED007: Exchangeable Magnesium	----	0.1	meq/100g	1.3	1.2	9.4	0% - 50%
		ED007: Exchangeable Potassium	----	0.1	meq/100g	0.3	0.3	0.0	No Limit
		ED007: Exchangeable Sodium	----	0.1	meq/100g	0.1	0.1	0.0	No Limit
		ED007: Cation Exchange Capacity	----	0.1	meq/100g	12.0	11.2	7.2	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 (%)*
EP004: Organic Matter (QC Lot: 6500432)									
EM2505492-002	Anonymous	EP004: Organic Matter	----	0.5	%	18.2	17.9	1.6	0% - 20%
		EP004: Total Organic Carbon	----	0.5	%	10.5	10.4	1.7	0% - 20%
EP075(SIM)A: Phenolic Compounds (QC Lot: 6496760)									
EM2505614-001	TA-TP449/0.4	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
EM2505614-011	TA-TP452/3.2	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
EP075B: Polynuclear Aromatic Hydrocarbons (QC Lot: 6496637)									
EM2505614-001	TA-TP449/0.4	EP075-TAS: Benzo(a)pyrene	50-32-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP075-TAS: Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

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 (%)
EP075B: Polynuclear Aromatic Hydrocarbons (QC Lot: 6496637) - continued									
EM2505614-001	TA-TP449/0.4	EP075-TAS: Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1	mg/kg	<1.0	<1.0	0.0	No Limit
EM2505614-011	TA-TP452/3.2	EP075-TAS: Benzo(a)pyrene	50-32-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP075-TAS: Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1	mg/kg	<1.0	<1.0	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6495028)									
EM2505868-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EM2505677-024	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6495030)									
EM2505614-001	TA-TP449/0.4	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EM2505614-011	TA-TP452/3.2	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6496759)									
EM2505614-001	TA-TP449/0.4	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
EM2505614-011	TA-TP452/3.2	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
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6495028)									

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 (%)*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6495028) - continued									
EM2505868-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EM2505677-024	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: 6495030)									
EM2505614-001	TA-TP449/0.4	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EM2505614-011	TA-TP452/3.2	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: 6496759)									
EM2505614-001	TA-TP449/0.4	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
EM2505614-011	TA-TP452/3.2	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
EP080: BTEXN (QC Lot: 6495028)									
EM2505868-001	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	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		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
EM2505677-024	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	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		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
EP080: BTEXN (QC Lot: 6495030)									
EM2505614-001	TA-TP449/0.4	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	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		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
EM2505614-011	TA-TP452/3.2	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

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP080: BTEXN (QC Lot: 6495030) - continued									
EM2505614-011	TA-TP452/3.2	EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		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

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020T: Total Metals by ICP-MS (QC Lot: 6503806)									
EM2505614-016	TA-TP452/W	EG020A-T: Lead	7439-92-1	0.001	mg/L	0.008	0.009	0.0	No Limit
EM2505736-015	Anonymous	EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6486022)									
EP2504943-001	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	1260	1660	27.5	0% - 50%
		EP071: C10 - C14 Fraction	----	50 (60)*	µg/L	25600	# 33400	26.3	0% - 20%
		EP071: C29 - C36 Fraction	----	50 (60)*	µg/L	<60	<60	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6499367)									
EM2505614-016	TA-TP452/W	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EM2505720-006	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	980	920	6.7	0% - 20%
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6486022)									
EP2504943-001	Anonymous	EP071: >C10 - C16 Fraction	----	100	µg/L	20600	# 26400	24.5	0% - 20%
		EP071: >C16 - C34 Fraction	----	100	µg/L	700	940	28.9	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6499367)									
EM2505614-016	TA-TP452/W	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EM2505720-006	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	960	900	6.9	0% - 20%
EP080: BTEXN (QC Lot: 6499367)									
EM2505614-016	TA-TP452/W	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
EM2505720-006	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit

Sub-Matrix: **WATER**

				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: 6499367) - continued									
EM2505720-006	Anonymous	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	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**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 6496681)								
EG005T: Iron	7439-89-6	50	mg/kg	<50	33227 mg/kg	98.2	70.0	130
EG005T: Lead	7439-92-1	5	mg/kg	<5	62.4 mg/kg	81.7	70.0	130
EA001: pH in soil using 0.01M CaCl extract (QCLot: 6490015)								
EA001: pH (CaCl2)	----	----	pH Unit	----	4 pH Unit	100	98.8	101
				----	7 pH Unit	100	99.3	101
EA002-AD: pH (Soils) dried at 40°C (QCLot: 6492554)								
EA002-AD: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.8	101
				----	7 pH Unit	100	99.3	101
EA010-AD: Conductivity (Soils) dried at 40°C (QCLot: 6492553)								
EA010-AD: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1413 µS/cm	100	90.0	110
ED007: Exchangeable Cations (QCLot: 6492566)								
ED007: Exchangeable Calcium	----	0.1	meq/100g	<0.1	24.13 meq/100g	91.1	80.0	130
ED007: Exchangeable Magnesium	----	0.1	meq/100g	<0.1	1.96 meq/100g	94.7	72.2	130
ED007: Exchangeable Potassium	----	0.1	meq/100g	<0.1	1.01 meq/100g	110	77.4	130
ED007: Exchangeable Sodium	----	0.1	meq/100g	<0.1	0.86 meq/100g	121	89.2	130
ED007: Cation Exchange Capacity	----	0.1	meq/100g	<0.1	----	----	----	----
EP004: Organic Matter (QCLot: 6500432)								
EP004: Organic Matter	----	0.5	%	<0.5	77 %	120	70.0	130
EP004: Total Organic Carbon	----	0.5	%	<0.5	43.5 %	123	70.0	130
EP075(SIM)A: Phenolic Compounds (QCLot: 6496760)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	3 mg/kg	92.4	81.2	121
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	3 mg/kg	93.2	83.2	120
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	3 mg/kg	94.3	81.6	123
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	6 mg/kg	90.8	79.7	129
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	3 mg/kg	88.0	49.8	129
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	3 mg/kg	88.8	81.5	127
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	3 mg/kg	87.8	74.2	125
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	3 mg/kg	91.0	79.8	121
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	3 mg/kg	81.5	71.5	121
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	3 mg/kg	87.1	67.8	119

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP075(SIM)A: Phenolic Compounds (QCLot: 6496760) - continued								
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	3 mg/kg	91.8	64.5	126
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	6 mg/kg	83.2	10.0	118
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 6496637)								
EP075-TAS: Pyrene	129-00-0	0.5	mg/kg	<0.5	2 mg/kg	91.4	75.4	130
EP075-TAS: Phenanthrene	85-01-8	0.5	mg/kg	<0.5	2 mg/kg	88.0	73.3	130
EP075-TAS: Naphthalene	91-20-3	0.5	mg/kg	<0.5	2 mg/kg	93.9	73.0	131
EP075-TAS: Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	2 mg/kg	96.2	72.1	134
EP075-TAS: Fluorene	86-73-7	0.5	mg/kg	<0.5	2 mg/kg	90.6	74.4	131
EP075-TAS: Fluoranthene	206-44-0	0.5	mg/kg	<0.5	2 mg/kg	89.6	75.3	132
EP075-TAS: Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	2 mg/kg	95.9	72.9	135
EP075-TAS: Chrysene	218-01-9	0.5	mg/kg	<0.5	2 mg/kg	90.9	75.0	133
EP075-TAS: Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	2 mg/kg	93.5	71.3	134
EP075-TAS: Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1	mg/kg	<1.0	4 mg/kg	94.6	75.8	133
EP075-TAS: Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	2 mg/kg	88.6	69.6	133
EP075-TAS: Anthracene	120-12-7	0.5	mg/kg	<0.5	2 mg/kg	92.2	78.4	127
EP075-TAS: Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	2 mg/kg	89.3	72.0	135
EP075-TAS: Acenaphthene	83-32-9	0.5	mg/kg	<0.5	2 mg/kg	88.5	76.3	130
EP075-TAS: Benzo(a)pyrene	50-32-8	0.05	mg/kg	<0.05	2 mg/kg	94.2	77.5	134
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6495028)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	90.1	58.6	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6495030)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	108	58.6	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6496759)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	810 mg/kg	91.2	80.0	120
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	2880 mg/kg	93.2	80.0	120
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1460 mg/kg	97.0	80.0	120
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6495028)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	88.4	59.3	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6495030)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	104	59.3	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6496759)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	1120 mg/kg	93.2	80.0	120
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	3800 mg/kg	93.9	80.0	120

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6496759) - continued								
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	260 mg/kg	101	80.0	120
EP080: BTEXN (QCLot: 6495028)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	85.4	61.6	117
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	91.1	65.8	125
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	89.5	65.8	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	88.6	64.8	134
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	88.6	68.7	132
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	77.0	61.8	123
EP080: BTEXN (QCLot: 6495030)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	97.3	61.6	117
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	111	65.8	125
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	105	65.8	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	113	64.8	134
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	111	68.7	132
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	98.9	61.8	123

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG020T: Total Metals by ICP-MS (QCLot: 6503806)								
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	101	88.3	112
EP075(SIM)A: Phenolic Compounds (QCLot: 6486024)								
EP075(SIM): Phenol	108-95-2	1	µg/L	<1.0	5 µg/L	31.0	17.8	51.1
EP075(SIM): 2-Chlorophenol	95-57-8	1	µg/L	<1.0	5 µg/L	66.7	43.2	107
EP075(SIM): 2-Methylphenol	95-48-7	1	µg/L	<1.0	5 µg/L	64.0	39.2	98.7
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	2	µg/L	<2.0	10 µg/L	56.8	35.5	91.3
EP075(SIM): 2-Nitrophenol	88-75-5	1	µg/L	<1.0	5 µg/L	71.8	34.4	124
EP075(SIM): 2.4-Dimethylphenol	105-67-9	1	µg/L	<1.0	5 µg/L	68.7	44.4	112
EP075(SIM): 2.4-Dichlorophenol	120-83-2	1	µg/L	<1.0	5 µg/L	70.2	45.3	115
EP075(SIM): 2.6-Dichlorophenol	87-65-0	1	µg/L	<1.0	5 µg/L	70.4	44.3	116
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	1	µg/L	<1.0	5 µg/L	72.9	46.6	117
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	1	µg/L	<1.0	5 µg/L	66.0	38.2	122
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	1	µg/L	<1.0	5 µg/L	70.2	43.2	123
EP075(SIM): Pentachlorophenol	87-86-5	2	µg/L	<2.0	10 µg/L	49.4	48.1	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 6486024)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	69.5	42.8	114
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	73.7	48.6	119
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	70.9	47.0	117
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	74.7	49.5	119
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	81.8	49.4	121
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	86.0	48.4	122
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	93.2	50.3	124
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	97.6	50.0	126
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	94.3	49.4	127
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	109	48.7	126
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	93.1	54.5	134
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	90.3	56.1	134
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	89.8	55.6	135
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	90.7	54.4	126
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	100	54.5	126
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	88.5	54.4	126
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6486022)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	4421 µg/L	94.4	47.2	122
EP071: C15 - C28 Fraction	----	100	µg/L	<100	15219 µg/L	98.6	52.9	131
EP071: C29 - C36 Fraction	----	50	µg/L	<50	7904 µg/L	95.4	50.4	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6499367)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	114	66.2	134
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6486022)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	6085 µg/L	96.9	49.1	125
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	20300 µg/L	96.2	51.6	128
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1456 µg/L	102	47.2	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6499367)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	113	66.2	132
EP080: BTEXN (QCLot: 6499367)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	110	68.8	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	112	72.9	129
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	112	71.7	130
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	118	72.3	136

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP080: BTEXN (QCLot: 6499367) - continued								
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	118	75.9	134
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	112	68.3	131

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**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 6496681)							
EM2505994-003	Anonymous	EG005T: Lead	7439-92-1	250 mg/kg	89.6	80.0	120
EP004: Organic Matter (QCLot: 6500432)							
EM2505614-004	TA-TP450/0.2	EP004: Organic Matter	----	5.88 %	113	70.0	120
		EP004: Total Organic Carbon	----	3.41 %	113	70.0	120
EP075(SIM)A: Phenolic Compounds (QCLot: 6496760)							
EM2505614-002	TA-TP449/0.8	EP075(SIM): Phenol	108-95-2	3 mg/kg	86.5	77.1	119
		EP075(SIM): 2-Chlorophenol	95-57-8	3 mg/kg	79.3	78.9	123
		EP075(SIM): 2-Nitrophenol	88-75-5	3 mg/kg	69.6	43.8	136
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	3 mg/kg	66.5	61.5	120
		EP075(SIM): Pentachlorophenol	87-86-5	3 mg/kg	83.2	15.3	139
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 6496637)							
EM2505614-002	TA-TP449/0.8	EP075-TAS: Pyrene	129-00-0	3 mg/kg	107	37.8	152
		EP075-TAS: Acenaphthene	83-32-9	3 mg/kg	87.2	42.6	138
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6495028)							
EM2505677-026	Anonymous	EP080: C6 - C9 Fraction	----	28 mg/kg	71.0	33.4	124
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6495030)							
EM2505614-002	TA-TP449/0.8	EP080: C6 - C9 Fraction	----	28 mg/kg	66.8	33.4	124
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6496759)							
EM2505614-002	TA-TP449/0.8	EP071: C10 - C14 Fraction	----	810 mg/kg	79.8	70.0	130
		EP071: C15 - C28 Fraction	----	2880 mg/kg	80.7	70.0	130
		EP071: C29 - C36 Fraction	----	1460 mg/kg	83.2	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6495028)							
EM2505677-026	Anonymous	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	69.0	30.8	120
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6495030)							
EM2505614-002	TA-TP449/0.8	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	65.0	30.8	120

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6496759)							
EM2505614-002	TA-TP449/0.8	EP071: >C10 - C16 Fraction	----	1120 mg/kg	82.6	70.0	130
		EP071: >C16 - C34 Fraction	----	3800 mg/kg	81.0	70.0	130
		EP071: >C34 - C40 Fraction	----	260 mg/kg	85.9	70.0	130
EP080: BTEXN (QCLot: 6495028)							
EM2505677-026	Anonymous	EP080: Benzene	71-43-2	2 mg/kg	87.9	54.4	127
		EP080: Toluene	108-88-3	2 mg/kg	91.5	57.1	131
EP080: BTEXN (QCLot: 6495030)							
EM2505614-002	TA-TP449/0.8	EP080: Benzene	71-43-2	2 mg/kg	76.4	54.4	127
		EP080: Toluene	108-88-3	2 mg/kg	83.0	57.1	131

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 6503806)							
EM2505614-016	TA-TP452/W	EG020A-T: Lead	7439-92-1	1 mg/L	106	80.5	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6499367)							
EM2505720-001	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	97.8	33.9	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6499367)							
EM2505720-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	94.3	34.0	122
EP080: BTEXN (QCLot: 6499367)							
EM2505720-001	Anonymous	EP080: Benzene	71-43-2	20 µg/L	110	56.3	133
		EP080: Toluene	108-88-3	20 µg/L	109	60.4	132

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
ALBURY 31 Dalton Street Albury NSW 2640 Ph: 02 6043 0468 E: albury@alsglobal.com
BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
CAIRNS 4 Sleeman Court Bungalow QLD 4870 Ph: 07 4796 0600 E: cairns@alsglobal.com
GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com
MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
MELBOURNE 2 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee@alsglobal.com
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PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com
WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: [illegible]

FREIGHT

CLIENT: pitt&sherry operations	TURNAROUND REQUIREMENTS: ⊗ Standard or urgent TAT (List due date):	FOR LABORATORY USE ONLY (Circle)	
OFFICE: Hobart	(Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact?	Yes / No / N/A
PROJECT: Tarraleah Village Soil Sampling	ALS QUOTE NO.: EM24PITSHE0004_V3_P.24.1136	Free ice / frozen ice bricks present upon receipt?	Yes / No / N/A
ORDER NUMBER: P.24.1136	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt:	°C
PROJECT MANAGER: Carly Clark CONTACT PH: 0490 942 344		Other comment:	
SAMPLER: Eduardo Maes SAMPLER MOBILE: 0414 023 658	RELINQUISHED BY: Alex Hibberd	RECEIVED BY: 4/4 16:42	RELINQUISHED BY:
COC emailed to ALS? (YES / NO) EDD FORMAT (or default): ENMRG	DATE/TIME: EPM 01.04	DATE/TIME: 4/4 0113	DATE/TIME:
Email Reports to: cclark@pittsh.com.au; emaes@pittsh.com.au			RECEIVED BY: BL
Email Invoice to: cclark@pittsh.com.au; accounts@pittsh.com.au			DATE/TIME: 2/4/25. 13:00

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).							Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	Suite B	Suite D	ASC NEPM Soil Classification	Rinsate 3	Trip Blank	W-25T TRH/BTEXN/ PAH/PHENOLS/PB	FREIGHT	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	449/0.4	31.03	S	soil JAR	1	X							
2	449/0.8	"	S	"	1	X							
3	449/3.0	"	S	"	1	X							
4	450/0.2	"	S	soil JAR + BAG	2	X		X					
5	450/1.4	"	S	soil JAR	1	X							
6	451/0.8	01.04	S	"	1	X							
7	451/2.0	"	S	"	1	X							
8	451/3.0	"	S	"	1	X							
9	452/0.2	"	S	"	1	X							
10	452/2.0	"	S	"	1	X							
11	452/3.2	"	S	"	1	X							
12	453/0.2	"	S	"	1	X							
13	453/1.5	"	S	soil JAR + BAG	2	X		X					
14	453/2.2	"	S	soil JAR	1								
15	QCP01	31.03	S	"	1								
→	QCS01	31.03	S	"	1								
16	452/W	01.04	W	AG + 2VS + P	4						X		
17	453/W	01.04	W	"	4						X		
				TOTAL	0								

Environmental Division
Melbourne
Work Order Reference
EM2505614

Telephone : +61-3-8549 9600

3/4, BL

#1206225
4/4/25

52

forward to Envirolab

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

18.	TB01	01.04	S	soil JAR						X			

Outlook

RE: Eurofins Sample Receipt Advice - Report 1206225 : Site TARRALEAH VILLAGE SOIL SAMPLING (P.24.1136)

From Savini Suduweli Kondage <Savini.SuduweliKondage@eurofinsanz.com>
Date Tue 15/4/25 10:13 AM
To Carly Clark <CClark@pittsh.com.au>; SH_AU_CAU001_EnviroSampleVic <EnviroSampleVic@eurofinsanz.com>
Cc Eduardo Pereira Maes <EPereiraMaes@pittsh.com.au>

Verified Sender: This email is from an internal and/or verified domain which passed security verifications. Remember to still be cautious with personal data and follow company policies.

Hi Carly,

We will get this analysis organised ASAP.

@SH_AU_CAU001_EnviroSampleVic – Please see below for analysis on hold samples.

Kind Regards,

Savini Suduweli
Phone : +61 3 8564 5051
Mobile : +61 447 222 760
Email : Savini.Suduwelikondage@eurofinsanz.com

From: Carly Clark <CClark@pittsh.com.au>
Sent: Tuesday, 15 April 2025 9:57 AM
To: Savini Suduweli Kondage <Savini.SuduweliKondage@eurofinsanz.com>
Cc: Eduardo Pereira Maes <EPereiraMaes@pittsh.com.au>
Subject: RE: Eurofins Sample Receipt Advice - Report 1206225 : Site TARRALEAH VILLAGE SOIL SAMPLING (P.24.1136)

Unverified Sender: The sender of this email has not been verified. Review the content of the message carefully and verify the identity of the sender before acting on this email: replying, opening attachments or clicking links.

Hi Savini,

Apologies, please analyse for total concentrations of the following:

- Asbestos (presence / absence)
- PCBs
- Phenols
- PAHs (with lower LOR for BaP to allow comparison to IB105 0.08 mg/kg criterion)
- PFAS (short suite)
- BTEXN
- TPH / TRH
- 8 metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg)

Thanks
Carly

pitt&sherry

Carly Clark
CEnvP SC | CEnvP | BSc | MEIANZ | MALGA

Senior Principal
Environmental Consultant

+61 490 942 344
cclark@pittsh.com.au

Connect on LinkedIn

From: Savini Suduweli <EET-ELVIS@eurofinsanz.com>
Sent: Monday, 14 April 2025 2:38 PM
To: Carly Clark <CClark@pittsh.com.au>
Subject: Eurofins Sample Receipt Advice - Report 1206225 : Site TARRALEAH VILLAGE SOIL SAMPLING (P.24.1136)

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Carly,

Please advise of analysis if needed. Thank you.

Kind regards,

Savini Suduweli Kondage
Analytical Services Manager

Eurofins Environment Testing
6 Monterey Road
DANDENONG SOUTH VIC 3175
AUSTRALIA
Phone: +61 385 645 051
Mobile : +61 447 222 760
Email: Savini.suduwelikondage@eurofinsanz.com
Website:[http://]environment.eurofins.com.au
View our latest EnviroNotes

eurofins | Environment Testing

www.eurofins.com.au EnviroSales@eurofinsanz.com

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	+61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

Eurofins ARL Pty Ltd

ABN: 91 05 0159 898

Perth
46-48 Banksia Road
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NATA# 2377
Site# 2370 & 2554

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

Auckland	Auckland (Focus)	Christchurch	Tauranga
35 O'Rorke Road	Unit C1/4 Pacific Rise	43 Detroit Drive	1277 Cameron Road
Penrose	Mount Wellington	Rolleston	Gate Pa
Auckland 1061	Auckland 1061	Christchurch 7675	Tauranga 3112
+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Sample Receipt Advice

Company name:	Pitt & Sherry (Operations) Pty Ltd
Contact name:	Carly Clark
Project name:	TARRALEAH VILLAGE SOIL SAMPLING
Project ID:	P.24.1136
Turnaround time:	5 Day
Date/Time received	Apr 15, 2025 9:57 AM
Eurofins reference	1206225

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.
X	Split sample sent to requested external lab.
X	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 : +61 3 8564 5051 or by email: Savini.Suduwelikondage@eurofinsanz.com

Results will be delivered electronically via email to Carly Clark - CClark@pittsh.com.au.

Note: A copy of these results will also be delivered to the general Pitt & Sherry (Operations) Pty Ltd email address.

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofinsanz.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	+61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

Eurofins ARL Pty Ltd
ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
+61 8 6253 4444
NATA# 2377
Site# 2370 & 2554

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

Auckland	Auckland (Focus)	Christchurch	Tauranga
35 O'Rorke Road	Unit C1/4 Pacific Rise	43 Detroit Drive	1277 Cameron Road
Penrose	Mount Wellington	Rolleston	Gate Pa
Auckland 1061	Auckland 1061	Christchurch 7675	Tauranga 3112
+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: Pitt & Sherry (Operations) Pty Ltd
Address: 4th Floor, 113 Cimitiere Street
Launceston
Tasmania 7250

Project Name: TARRALEAH VILLAGE SOIL SAMPLING
Project ID: P.24.1136

Order No.: P.24.1136
Report #: 1206225
Phone: 03 6323 1900
Fax: 03 6334 4651

Received: Apr 15, 2025 9:57 AM
Due: Apr 24, 2025
Priority: 5 Day
Contact Name: Carly Clark

Eurofins Analytical Services Manager : Savini Suduweli

Sample Detail						Asbestos - AS4964*	Benzo(a)pyrene - low level	Polycyclic Aromatic Hydrocarbons	Polychlorinated Biphenyls	Metals M8	Phenols (Speciated)	BTEX and Naphthalene	Moisture Set	Total Recoverable Hydrocarbons	Per- and Polyfluoroalkyl Substances (PFASs) - Short
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X
External Laboratory															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	QCS01	Mar 31, 2025		Soil	M25-Ap0015643	X	X	X	X	X	X	X	X	X	X
Test Counts						1	1	1	1	1	1	1	1	1	1

Pitt & Sherry (Operations) Pty Ltd
4th Floor, 113 Cimitiere Street
Launceston
Tasmania 7250

Attention: **Carly Clark**

Report **1206225-S**
Project name TARRALEAH VILLAGE SOIL SAMPLING
Received Date Apr 15, 2025

Client Sample ID			**QCS01**
Sample Matrix			**Soil**
Eurofins Sample No.			**M25-Ap0015643**
Date Sampled			**Mar 31, 2025**
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
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	%	53
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene[N02]	0.5	mg/kg	< 0.5
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

Client Sample ID			QCS01
Sample Matrix			Soil
Eurofins Sample No.			M25-Ap0015643
Date Sampled			Mar 31, 2025
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
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	%	113
p-Terphenyl-d14 (surr.)	1	%	79
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	%	89
Tetrachloro-m-xylene (surr.)	1	%	79
Phenols (Halogenated)			
2-Chlorophenol	0.5	mg/kg	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1
Pentachlorophenol	1	mg/kg	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10
Total Halogenated Phenol*	1	mg/kg	< 1
Phenols (non-Halogenated)			
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5
2-Nitrophenol	1.0	mg/kg	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4
Total cresols*	0.5	mg/kg	< 0.5
4-Nitrophenol	5	mg/kg	< 5
Dinoseb	20	mg/kg	< 20
Phenol	0.5	mg/kg	< 0.5
Phenol-d6 (surr.)	1	%	76
Total Non-Halogenated Phenol*	20	mg/kg	< 20
Semivolatile Organics			
Benzo(a)pyrene - low level	0.005	mg/kg	< 0.005

Client Sample ID			QCS01
Sample Matrix			**Soil**
Eurofins Sample No.			**M25-Ap0015643**
Date Sampled			**Mar 31, 2025**
Test/Reference	LOR	Unit	
Heavy Metals			
Arsenic	2	mg/kg	< 2
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	380
Copper	5	mg/kg	56
Lead	5	mg/kg	13
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	140
Zinc	5	mg/kg	140
Sample Properties			
% Moisture	1	%	42
Per- and Polyfluoroalkyl Substances (PFASs) - Short			
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10
13C2-6:2 FTSA (surr.)	1	%	95
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5
18O2-PFHxS (surr.)	1	%	130
13C8-PFOS (surr.)	1	%	136
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5
13C8-PFOA (surr.)	1	%	101
Sum (PFHxS + PFOS)*	5	ug/kg	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5

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
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Apr 16, 2025	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Apr 16, 2025	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Apr 16, 2025	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX and Naphthalene			
BTEX	Melbourne	Apr 16, 2025	14 Days
- Method: LTM-ORG-2010 BTEX and Volatile TRH			
Polycyclic Aromatic Hydrocarbons	Melbourne	Apr 16, 2025	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Polychlorinated Biphenyls	Melbourne	Apr 16, 2025	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8082)			
Semivolatile Organics	Melbourne	Apr 16, 2025	14 Days
- Method: USEPA SW 846 8270			
Metals M8	Melbourne	Apr 16, 2025	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Per- and Polyfluoroalkyl Substances (PFASs) - Short	Melbourne	Apr 16, 2025	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Phenols (Speciated)			
Phenols (Halogenated)	Melbourne	Apr 16, 2025	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (non-Halogenated)	Melbourne	Apr 16, 2025	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
% Moisture	Melbourne	Apr 15, 2025	14 Days
- Method: LTM-GEN-7080 Moisture			

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Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	+61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

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Company Name: Pitt & Sherry (Operations) Pty Ltd
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Tasmania 7250

Project Name: TARRALEAH VILLAGE SOIL SAMPLING
Project ID: P.24.1136

Order No.: P.24.1136
Report #: 1206225
Phone: 03 6323 1900
Fax: 03 6334 4651

Received: Apr 15, 2025 9:57 AM
Due: Apr 24, 2025
Priority: 5 Day
Contact Name: Carly Clark

Eurofins Analytical Services Manager : Savini Suduweli

Sample Detail						Asbestos - AS4964*	Benzo(a)pyrene - low level	Polycyclic Aromatic Hydrocarbons	Polychlorinated Biphenyls	Metals M8	Phenols (Speciated)	BTEX and Naphthalene	Moisture Set	Total Recoverable Hydrocarbons	Per- and Polyfluoroalkyl Substances (PFASs) - Short
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X
External Laboratory															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	QCS01	Mar 31, 2025		Soil	M25-Ap0015643	X	X	X	X	X	X	X	X	X	X
Test Counts						1	1	1	1	1	1	1	1	1	1

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Internal Quality Control Review and Glossary

General

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

Holding Times

Please refer to the '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 before sample receipt deadlines as stated on the SRA.

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

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

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

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
ppm: parts per million
µg/L: micrograms per litre
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
CFU: Colony Forming Unit
Colour: Pt-Co Units (CU)

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
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 moisture has been determined on a solid sample, the result is expressed on a dry weight 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 represents 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 similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (*bis*-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 6.0
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 only be used as a guide 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. SVOCs recoveries 20 – 150%, VOC recoveries 50 – 150%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 6.0, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as 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 are 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	
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							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	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							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	
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							
Phenols (Halogenated)							
2-Chlorophenol	mg/kg	< 0.5			0.5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2.4-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4.5-Trichlorophenol	mg/kg	< 1			1	Pass	
2.4.6-Trichlorophenol	mg/kg	< 1			1	Pass	
2.6-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
4-Chloro-3-methylphenol	mg/kg	< 1			1	Pass	
Pentachlorophenol	mg/kg	< 1			1	Pass	
Tetrachlorophenols - Total	mg/kg	< 10			10	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	< 20			20	Pass	
2-Methyl-4.6-dinitrophenol	mg/kg	< 5			5	Pass	
2-Nitrophenol	mg/kg	< 1			1.0	Pass	
2.4-Dimethylphenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dinitrophenol	mg/kg	< 5			5	Pass	
2-Methylphenol (o-Cresol)	mg/kg	< 0.2			0.2	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 0.4			0.4	Pass	
4-Nitrophenol	mg/kg	< 5			5	Pass	
Dinoseb	mg/kg	< 20			20	Pass	
Phenol	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Semivolatile Organics							
Benzo(a)pyrene - low level	mg/kg	< 0.005			0.005	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
Method Blank							
Per- and Polyfluoroalkyl Substances (PFASs) - Short							
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/kg	< 10			10	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	125			70-130	Pass	
TRH C10-C14	%	78			70-130	Pass	
TRH C6-C10	%	120			70-130	Pass	
TRH >C10-C16	%	76			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	120			70-130	Pass	
Toluene	%	124			70-130	Pass	
Ethylbenzene	%	125			70-130	Pass	
m&p-Xylenes	%	122			70-130	Pass	
Xylenes - Total*	%	122			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	99			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	99			70-130	Pass	
Acenaphthylene	%	93			70-130	Pass	
Anthracene	%	100			70-130	Pass	
Benz(a)anthracene	%	99			70-130	Pass	
Benzo(a)pyrene	%	76			70-130	Pass	
Benzo(b&j)fluoranthene	%	120			70-130	Pass	
Benzo(g.h.i)perylene	%	81			70-130	Pass	
Benzo(k)fluoranthene	%	95			70-130	Pass	
Chrysene	%	104			70-130	Pass	
Dibenz(a.h)anthracene	%	84			70-130	Pass	
Fluoranthene	%	121			70-130	Pass	
Fluorene	%	108			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	101			70-130	Pass	
Naphthalene	%	99			70-130	Pass	
Phenanthrene	%	108			70-130	Pass	
Pyrene	%	124			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	92			70-130	Pass	
LCS - % Recovery							
Phenols (Halogenated)							
2-Chlorophenol	%	93			25-140	Pass	
2.4-Dichlorophenol	%	65			25-140	Pass	
2.4.5-Trichlorophenol	%	76			25-140	Pass	
2.4.6-Trichlorophenol	%	56			25-140	Pass	
2.6-Dichlorophenol	%	63			25-140	Pass	
4-Chloro-3-methylphenol	%	66			25-140	Pass	
Pentachlorophenol	%	31			25-140	Pass	
Tetrachlorophenols - Total	%	47			25-140	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	%	60			25-140	Pass	
2-Methyl-4.6-dinitrophenol	%	39			25-140	Pass	
2-Nitrophenol	%	67			25-140	Pass	
2.4-Dimethylphenol	%	78			25-140	Pass	
2.4-Dinitrophenol	%	39			25-140	Pass	
2-Methylphenol (o-Cresol)	%	105			25-140	Pass	
3&4-Methylphenol (m&p-Cresol)	%	85			25-140	Pass	
4-Nitrophenol	%	92			25-140	Pass	
Dinoseb	%	55			25-140	Pass	
Phenol	%	97			25-140	Pass	
LCS - % Recovery							
Semivolatile Organics							
Benzo(a)pyrene - low level	%	76			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	101			80-120	Pass	
Cadmium	%	105			80-120	Pass	
Chromium	%	103			80-120	Pass	
Copper	%	102			80-120	Pass	
Lead	%	101			80-120	Pass	
Mercury	%	87			80-120	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Nickel			%	102			80-120	Pass	
Zinc			%	100			80-120	Pass	
LCS - % Recovery									
Per- and Polyfluoroalkyl Substances (PFASs) - Short									
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)			%	90			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)			%	83			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)			%	76			50-150	Pass	
Perfluorooctanoic acid (PFOA)			%	97			50-150	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	M25-Ap0041727	NCP	%	89			70-130	Pass	
TRH C10-C14	M25-Ap0044709	NCP	%	83			70-130	Pass	
TRH C6-C10	M25-Ap0041727	NCP	%	87			70-130	Pass	
TRH >C10-C16	M25-Ap0044709	NCP	%	82			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M25-Ap0041727	NCP	%	80			70-130	Pass	
Toluene	M25-Ap0041727	NCP	%	88			70-130	Pass	
Ethylbenzene	M25-Ap0041727	NCP	%	93			70-130	Pass	
m&p-Xylenes	M25-Ap0041727	NCP	%	94			70-130	Pass	
o-Xylene	M25-Ap0041727	NCP	%	98			70-130	Pass	
Xylenes - Total*	M25-Ap0041727	NCP	%	95			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M25-Ap0041727	NCP	%	72			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M25-Ap0044179	NCP	%	88			70-130	Pass	
Acenaphthylene	M25-Ap0044179	NCP	%	86			70-130	Pass	
Anthracene	M25-Ap0044179	NCP	%	110			70-130	Pass	
Benz(a)anthracene	M25-Ap0044179	NCP	%	70			70-130	Pass	
Benzo(a)pyrene	M25-Ap0044179	NCP	%	96			70-130	Pass	
Benzo(b&j)fluoranthene	M25-Ap0044179	NCP	%	120			70-130	Pass	
Benzo(g.h.i)perylene	M25-Ap0044179	NCP	%	128			70-130	Pass	
Benzo(k)fluoranthene	M25-Ap0044179	NCP	%	97			70-130	Pass	
Chrysene	M25-Ap0044179	NCP	%	97			70-130	Pass	
Dibenz(a.h)anthracene	M25-Ap0044179	NCP	%	87			70-130	Pass	
Fluoranthene	M25-Ap0044179	NCP	%	95			70-130	Pass	
Fluorene	M25-Ap0044179	NCP	%	111			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M25-Ap0044179	NCP	%	91			70-130	Pass	
Naphthalene	M25-Ap0044179	NCP	%	84			70-130	Pass	
Phenanthrene	M25-Ap0044179	NCP	%	111			70-130	Pass	
Pyrene	M25-Ap0044179	NCP	%	98			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1016	M25-Ap0022481	NCP	%	102			70-130	Pass	
Aroclor-1260	M25-Ap0022481	NCP	%	100			70-130	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
2-Chlorophenol	M25-Ap0044179	NCP	%	86			30-130	Pass	
2.4-Dichlorophenol	M25-Ap0044179	NCP	%	82			30-130	Pass	
2.4.5-Trichlorophenol	M25-Ap0044179	NCP	%	88			30-130	Pass	
2.4.6-Trichlorophenol	M25-Ap0044179	NCP	%	60			30-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2.6-Dichlorophenol	M25-Ap0044179	NCP	%	75			30-130	Pass	
4-Chloro-3-methylphenol	M25-Ap0044179	NCP	%	64			30-130	Pass	
Pentachlorophenol	M25-Ap0044179	NCP	%	30			30-130	Pass	
Tetrachlorophenols - Total	M25-Ap0044179	NCP	%	51			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Nitrophenol	M25-Ap0044179	NCP	%	66			30-130	Pass	
2.4-Dimethylphenol	M25-Ap0044179	NCP	%	74			30-130	Pass	
2-Methylphenol (o-Cresol)	M25-Ap0044179	NCP	%	87			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	M25-Ap0044179	NCP	%	69			30-130	Pass	
4-Nitrophenol	M25-Ap0044179	NCP	%	34			30-130	Pass	
Phenol	M25-Ap0044179	NCP	%	69			30-130	Pass	
Spike - % Recovery									
Semivolatile Organics				Result 1					
Benzo(a)pyrene - low level	M25-Ap0044179	NCP	%	96			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M25-Ap0044208	NCP	%	76			75-125	Pass	
Cadmium	M25-Ap0044208	NCP	%	101			75-125	Pass	
Chromium	M25-Ap0044208	NCP	%	90			75-125	Pass	
Copper	M25-Ap0044208	NCP	%	83			75-125	Pass	
Lead	M25-Ap0044208	NCP	%	83			75-125	Pass	
Mercury	M25-Ap0044208	NCP	%	86			75-125	Pass	
Nickel	M25-Ap0044208	NCP	%	84			75-125	Pass	
Zinc	M25-Ap0044208	NCP	%	84			75-125	Pass	
Spike - % Recovery									
Per- and Polyfluoroalkyl Substances (PFASs) - Short				Result 1					
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M25-Ap0042775	NCP	%	94			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M25-Ap0042775	NCP	%	65			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M25-Ap0042775	NCP	%	85			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M25-Ap0042775	NCP	%	102			50-150	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 C6-C9	M25-Ap0035452	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M25-Ap0044708	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M25-Ap0044708	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M25-Ap0044708	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C6-C10	M25-Ap0035452	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	M25-Ap0044708	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M25-Ap0044708	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M25-Ap0044708	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M25-Ap0035452	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M25-Ap0035452	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M25-Ap0035452	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M25-Ap0035452	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M25-Ap0035452	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	M25-Ap0035452	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M25-Ap0035452	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M25-Ap0044666	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	M25-Ap0044666	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	M25-Ap0044666	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	M25-Ap0044666	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	M25-Ap0044666	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	M25-Ap0044666	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	M25-Ap0044666	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	M25-Ap0044666	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	M25-Ap0044666	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	M25-Ap0044666	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	M25-Ap0044666	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	M25-Ap0044666	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M25-Ap0044666	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	M25-Ap0044666	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	M25-Ap0044666	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	M25-Ap0044666	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	M25-Ap0044666	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	M25-Ap0044666	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	M25-Ap0044666	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	M25-Ap0044666	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	M25-Ap0044666	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	M25-Ap0044666	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	M25-Ap0044666	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB*	M25-Ap0044666	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	M25-Ap0044666	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	M25-Ap0044666	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	M25-Ap0044666	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	M25-Ap0044666	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	M25-Ap0044666	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	M25-Ap0044666	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	M25-Ap0044666	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	M25-Ap0044666	NCP	mg/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	M25-Ap0044666	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	M25-Ap0044666	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Nitrophenol	M25-Ap0044666	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	M25-Ap0044666	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	M25-Ap0044666	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	M25-Ap0044666	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	M25-Ap0044666	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	M25-Ap0044666	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	M25-Ap0044666	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	M25-Ap0044666	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Semivolatile Organics				Result 1	Result 2	RPD			
Benzo(a)pyrene - low level	M25-Ap0044666	NCP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M25-Ap0044678	NCP	mg/kg	88	86	3.0	30%	Pass	
Cadmium	M25-Ap0044678	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M25-Ap0044678	NCP	mg/kg	54	57	4.0	30%	Pass	
Copper	M25-Ap0044678	NCP	mg/kg	8.7	8.7	<1	30%	Pass	
Lead	M25-Ap0044678	NCP	mg/kg	19	20	4.0	30%	Pass	
Mercury	M25-Ap0044678	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	M25-Ap0044678	NCP	mg/kg	17	18	6.0	30%	Pass	
Zinc	M25-Ap0044678	NCP	mg/kg	10	9.9	1.0	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	M25-Ap0042547	NCP	%	33	31	6.0	30%	Pass	
Duplicate									
Per- and Polyfluoroalkyl Substances (PFASs) - Short				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M25-Ap0044666	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M25-Ap0044666	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M25-Ap0044666	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M25-Ap0044666	NCP	ug/kg	< 5	< 5	<1	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
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.

Authorised by:

Catherine Wilson	Analytical Services Manager
Edward Lee	Senior Analyst-Organic
Joseph Edouard	Senior Analyst-Organic
Joseph Edouard	Senior Analyst-PFAS
Joseph Edouard	Senior Analyst-Volatile
Mary Makarios	Senior Analyst-Metal
Mary Makarios	Senior Analyst-Sample Properties

Glenn Jackson
Managing Director

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.

Certificate of Analysis

Pitt & Sherry (Operations) Pty Ltd
4th Floor, 113 Cimitiere Street
Launceston
Tasmania 7250

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:	Carly Clark
Report	1206225-AID
Project Name	TARRALEAH VILLAGE SOIL SAMPLING
Received Date	Apr 15, 2025
Date Reported	Apr 24, 2025

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 5370:2024* Sampling and qualitative identification of asbestos in bulk materials (ISO 22262-1:2012, MOD), formerly AS 4964-2004 and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Man-made vitreous fibre (MMVF)	Fibres exhibiting isotropic characteristics, including glass fibres, glass wool, rock wool, slag wool, ceramic fibres and bio-soluble fibres. NOTE: previously known as "synthetic mineral fibre" (SMF). Simple analytical procedures such as polarised light microscopy cannot detect or reliably identify asbestos in some types of commercial products containing asbestos, either because the fibres are below the resolution of optical microscopy or because the matrix material adheres too strongly to the fibres. For these types of products, electron microscopy may be necessary.
Subsampling Soil Samples	The sample submitted is dried and passed through a 10 mm sieve followed by a 2 mm sieve. All fibrous matter greater than 10 mm and greater than 2 mm and the material passing through the 2 mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 g to 60 g, then a subsampling routine based on ISO 3082:2017(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be subsampled for trace analysis, in accordance with AS 5370:2024*.*
Bonded asbestos-containing material (ACM)	The material is first examined, and any fibres are isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination. The resultant material is then further examined in accordance with AS 5370:2024*. *NOTE: Even after disintegration, it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting (LOR)	The performance limitation of the AS 5370:2024* method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory limit of reporting, per se. Examination of large sample size (e.g., 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 5370:2024*, and hence, NATA Accreditation does not cover the performance of this service (non-NATA results are shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964-2004: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos". This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

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Project Name TARRALEAH VILLAGE SOIL SAMPLING
Project ID
Date Sampled Mar 31, 2025
Report 1206225-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
QCS01	25-Ap0015643	Mar 31, 2025	Approximate Sample 25g Sample consisted of: Sandy soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibres detected. No trace asbestos detected.

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
Asbestos - LTM-ASB-8020	Melbourne	Apr 16, 2025	Indefinite

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofinsanz.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	+61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

Eurofins ARL Pty Ltd
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46-48 Banksia Road
Welshpool
WA 6106
+61 8 6253 4444
NATA# 2377
Site# 2370 & 2554

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

Auckland	Auckland (Focus)	Christchurch	Tauranga
35 O'Rorke Road	Unit C1/4 Pacific Rise	43 Detroit Drive	1277 Cameron Road
Penrose	Mount Wellington	Rolleston	Gate Pa
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IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: Pitt & Sherry (Operations) Pty Ltd
Address: 4th Floor, 113 Cimitiere Street
Launceston
Tasmania 7250

Project Name: TARRALEAH VILLAGE SOIL SAMPLING

Order No.: P.24.1136
Report #: 1206225
Phone: 03 6323 1900
Fax: 03 6334 4651

Received: Apr 15, 2025 9:57 AM
Due: Apr 24, 2025
Priority: 5 Day
Contact Name: Carly Clark

Eurofins Analytical Services Manager : Savini Suduweli

Sample Detail						Asbestos - AS4964*	Benzo(a)pyrene - low level	Polycyclic Aromatic Hydrocarbons	Polychlorinated Biphenyls	Metals M8	Phenols (Speciated)	BTEX and Naphthalene	Moisture Set	Total Recoverable Hydrocarbons	Per- and Polyfluoroalkyl Substances (PFASs) - Short
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X
External Laboratory															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	QCS01	Mar 31, 2025		Soil	M25-Ap0015643	X	X	X	X	X	X	X	X	X	X
Test Counts						1	1	1	1	1	1	1	1	1	1

Internal Quality Control Review and Glossary General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report in blue indicates data provided by the customer that may impact the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to the most recent version of the 'Sample Preservation and Container Guide' for holding times (QS3001).

Units

% w/w:	Percentage weight-for-weight basis, e.g. of asbestos in asbestos-containing finds in soil samples (**% w/w**)
F/fld	Airborne fibre filter loading as Fibres (**N**) per Fields counted (**n**)
F/mL	Airborne fibre reported concentration as Fibres per millilitre of air drawn over the sampler membrane (**C**)
g, kg	Mass, e.g. of whole sample (**M**) or asbestos-containing find within the sample (**m**)
g/kg	Concentration in grams per kilogram
L, mL	Volume, e.g. of air as measured in AFM (**V** = **r** x **t**)
L/min	Airborne fibre sampling Flowrate as litres per minute of air drawn over the sampler membrane (**r**)
min	Time (**t**), e.g. of air sample collection period

Calculations

Airborne Fibre Concentration: $C = \left(\frac{A}{a}\right) \times \left(\frac{N}{n}\right) \times \left(\frac{1}{r}\right) \times \left(\frac{1}{t}\right) = K \times \left(\frac{N}{n}\right) \times \left(\frac{1}{V}\right)$

Asbestos Content (as asbestos): $\%\, w/w = \frac{(m \times P_A)}{M}$

Weighted Average (of asbestos): $\%_{WA} = \sum \frac{(m \times P_A)_x}{x}$

Terms

%Asbestos	Estimated percentage of asbestos in a given matrix may be derived from knowledge or experience of the material, informed by HSG264 *Appendix 2*, else assumed to be 15% in accordance with WA DOH *Appendix 2* (**P_A**). This estimate is not NATA-accredited.
ACM	Asbestos Containing Materials. Asbestos in a non-asbestos matrix is typically presented in bonded (non-friable) condition. For the NEPM and WA DOH, ACM corresponds to material larger than 7 mm x 7 mm.
AF	Asbestos Fines. Asbestos contamination within a soil sample, as defined by WA DOH. Includes loose fibre bundles and small pieces of friable and non-friable material, such as asbestos cement fragments mixed with soil. Considered under the NEPM as equivalent to “non-bonded / friable”.
AFM	Airborne Fibre Monitoring, e.g., by the MFM.
Amosite	Amosite Asbestos Detected. Amosite may also refer to Fibrous Grunerite or Brown Asbestos. Identified in accordance with AS 5370:2024* Sampling and qualitative identification of asbestos in bulk materials (ISO 22262-1:2012, MOD), formerly AS 4964-2004.
AS	Australian Standard.
Asbestos Content (as asbestos)	Total %w/w asbestos content in asbestos-containing finds in a soil sample (**% w/w**).
Chrysotile	Chrysotile Asbestos Detected. Chrysotile may also refer to Fibrous Serpentine or White Asbestos. Identified in accordance with AS 5370:2024* Sampling and qualitative identification of asbestos in bulk materials (ISO 22262-1:2012, MOD), formerly AS 4964-2004.
COC	Chain of Custody.
Crocidolite	Crocidolite Asbestos Detected. Crocidolite may also refer to Fibrous Riebeckite or Blue Asbestos. Identified in accordance with AS 5370:2024* Sampling and qualitative identification of asbestos in bulk materials (ISO 22262-1:2012, MOD), formerly AS 4964-2004.
Dry	Sample is dried by heating before analysis.
DS	Dispersion Staining. The technique required for unequivocal identification of asbestos fibres by PLM.
FA	Fibrous Asbestos. Asbestos-containing material that is wholly or in part friable, including materials with higher asbestos content with a propensity to become friable with handling, and any material previously non-friable and severely degraded. For the NEPM and WA DOH, FA generally corresponds to material larger than 7 mm x 7 mm, although FA may be more difficult to distinguish visibly and may be assessed as AF.
Fibre Count	Total of all fibres (whether asbestos or not) meeting the counting criteria set out in the NOHSC:3003
Fibre ID	Fibre Identification. Unequivocal identification of asbestos fibres according to AS 5370:2024* Sampling and qualitative identification of asbestos in bulk materials (ISO 22262-1:2012, MOD), formerly AS 4964-2004. Includes Chrysotile, Amosite (Grunerite) or Crocidolite asbestos.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess the degree of friability.
HSG248	UK HSE HSG248, *Asbestos: The Analysts Guide*, 2nd Edition (2021), ISBN: 9780616667079.
HSG264	UK HSE HSG264, *Asbestos: The Survey Guide* (2012), ISBN: 9780717665020
ISO (also ISO/IEC)	International Organization for Standardization / International Electrotechnical Commission.
K Factor	Microscope constant (**K**) as derived from the effective filter area of the given AFM membrane used for collecting the sample (**A**) and the projected eyepiece graticule area of the specific microscope used for the analysis (**a**).
LOR	Limit of Reporting.
MFM (also NOHSC:3003)	Membrane Filter Method. As described by the Australian Government National Occupational Health and Safety Commission, *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres*, 2nd Edition [NOHSC:3003(2005)].
MMVF	Man-Made Vitreous Fibre - exhibiting isotropic characteristics, including glass fibres, glass wool, rock wool, slag wool, ceramic fibres and “bio-soluble fibres. NOTE: previously known as “synthetic mineral fibre” (SMF).
NEPM (also ASC NEPM)	National Environment Protection (Assessment of Site Contamination) Measure, (2013, as amended).
Organic	Organic Fibres Detected. Organic may refer to Natural or Man-Made Polymeric Fibres. Identified per AS 5370:2024* Sampling and qualitative identification of asbestos in bulk materials (ISO 22262-1:2012, MOD), formerly AS 4964-2004.
PCM	Phase Contrast Microscopy. This is used for fibre counting, according to the MFM.
PLM	Polarised Light Microscopy. It is used for fibre identification and residual analysis according to AS 5370:2024* Sampling and qualitative identification of asbestos in bulk materials (ISO 22262-1:2012, MOD), formerly AS 4964-2004.
Sampling	Unless otherwise stated, Eurofins are not responsible for sampling equipment or the sampling process.
SRA	Sample Receipt Advice.
Residual Analysis	An analytical procedure is used to detect the presence of respirable fibres (particularly asbestos) in a given sample matrix according to AS 5370:2024* Sampling and qualitative identification of asbestos in bulk materials (ISO 22262-1:2012, MOD), formerly Trace Analysis in AS 4964-2004.
UK HSE HSG	United Kingdom, Health and Safety Executive, Health and Safety Guidance, publication.
Inconclusive	Fibrous minerals that are detected but have not been unequivocally identified by PLM with DS according to AS 5370:2024* Sampling and qualitative identification of asbestos in bulk materials (ISO 22262-1:2012, MOD), formerly AS 4964-2004. It may include (but is not limited to) actinolite, anthophyllite, or tremolite asbestos. SEM/TEM is required for definitive identification.
WA DOH	Reference document for the NEPM. Government of Western Australia, *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia* (updated 2021), including Appendix Four: *Laboratory analysis*
Weighted Average	Combined average %w/w asbestos content of all asbestos-containing finds in the given aliquot or total soil sample (**$\%_{WA}$**).

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

Asbestos Counter/Identifier:

Modhurika De	Senior Analyst-Asbestos

Authorised by:

Zoe Burke	Senior Analyst-Asbestos

Glenn Jackson
Managing Director

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.

Outlook

Re: P.24.1136 - Report 1206225 : Site TARRALEAH VILLAGE SOIL SAMPLING

From Catherine Wilson <Catherine.Wilson@eurofinsanz.com>
Date Wed 7/5/25 2:58 PM
To Carly Clark <CClark@pittsh.com.au>; SH_AU_CAU001_EnviroSampleVic <EnviroSampleVic@eurofinsanz.com>
Cc Savini Suduweli Kondage <Savini.SuduweliKondage@eurofinsanz.com>

Verified Sender: This email is from an internal and/or verified domain which passed security verifications. Remember to still be cautious with personal data and follow company policies.

Thanks Carly

@ SR - STD TAT please

Thanks

Catherine Wilson
Assistant ASM
Hours : 2:00PM – 10:00PM

Email : Catherine.Wilson@eurofinsanz.com
Website : http://www.eurofins.com.au/environmental-testing

From: Carly Clark <CClark@pittsh.com.au>
Sent: Wednesday, May 7, 2025 2:44 PM
To: Catherine Wilson <Catherine.Wilson@eurofinsanz.com>; SH_AU_CAU001_EnviroSampleVic <EnviroSampleVic@eurofinsanz.com>
Cc: Savini Suduweli Kondage <Savini.SuduweliKondage@eurofinsanz.com>
Subject: RE: P.24.1136 - Report 1206225 : Site TARRALEAH VILLAGE SOIL SAMPLING

Unverified Sender: The sender of this email has not been verified. Review the content of the message carefully and verify the identity of the sender before acting on this email: replying, opening attachments or clicking links.

Yes please

pitt&sherry

Carly Clark
CEnvP SC | CEnvP | BSc | MEIANZ | MALGA

Senior Principal
Environmental Consultant

+61 490 942 344
cclark@pittsh.com.au

Connect on LinkedIn

From: Catherine Wilson <Catherine.Wilson@eurofinsanz.com>
Sent: Wednesday, 7 May 2025 2:18 PM
To: Carly Clark <CClark@pittsh.com.au>; SH_AU_CAU001_EnviroSampleVic <EnviroSampleVic@eurofinsanz.com>
Cc: Savini Suduweli Kondage <Savini.SuduweliKondage@eurofinsanz.com>
Subject: Re: P.24.1136 - Report 1206225 : Site TARRALEAH VILLAGE SOIL SAMPLING

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Sure Carly

For Std TAT - $30.80

Would you like to login as STD TAT?

@ SR - Additional analysis

Thanks

Catherine Wilson
Assistant ASM
Hours : 2:00PM – 10:00PM

Email : Catherine.Wilson@eurofinsanz.com
Website : http://www.eurofins.com.au/environmental-testing

From: Carly Clark <CClark@pittsh.com.au>
Sent: Wednesday, May 7, 2025 7:33 AM
To: EnviroSampleVic <EnviroSampleVic@eurofins.com>
Cc: Catherine Wilson <Catherine.Wilson@eurofinsanz.com>; Rhonda Chouman <Rhonda.Chouman@eurofinsanz.com>
Subject: P.24.1136 - Report 1206225 : Site TARRALEAH VILLAGE SOIL SAMPLING

Unverified Sender: The sender of this email has not been verified. Review the content of the message carefully and verify the identity of the sender before acting on this email: replying, opening attachments or clicking links.

Hi,

Could you please run speciated chromium testing (trivalent and hexavalent) on the single sample in this batch.

Please confirm cost.

7/5/25 126797

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www.eurofins.com.au EnviroSales@eurofinsanz.com

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
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Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	+61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

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NATA# 2377
Site# 2370 & 2554

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

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Penrose	Mount Wellington	Rolleston	Gate Pa
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+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Sample Receipt Advice

Company name: Pitt & Sherry (Operations) Pty Ltd
Contact name: Carly Clark
Project name: TARRALEAH VILLAGE SOIL SAMPLING
Project ID: Not provided
Turnaround time: 5 Day
Date/Time received May 7, 2025 12:00 AM
Eurofins reference 1216797

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.
X	Split sample sent to requested external lab.
X	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 : +61 3 8564 5051 or by email: Savini.Suduwelikondage@eurofinsanz.com

Results will be delivered electronically via email to Carly Clark - CClark@pittsh.com.au.

Note: A copy of these results will also be delivered to the general Pitt & Sherry (Operations) Pty Ltd email address.

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web: www.eurofins.com.au
email: EnviroSales@eurofinsanz.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
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+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: Pitt & Sherry (Operations) Pty Ltd
Address: 4th Floor, 113 Cimitiere Street
Launceston
Tasmania 7250

Project Name: TARRALEAH VILLAGE SOIL SAMPLING

Order No.:
Report #: 1216797
Phone: 03 6323 1900
Fax: 03 6334 4651

Received: May 7, 2025 12:00 AM
Due: May 14, 2025
Priority: 5 Day
Contact Name: Carly Clark

Eurofins Analytical Services Manager : Savini Suduweli

Sample Detail						Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	QCS01	Mar 31, 2025		Soil	M25-My0018132	X	X
Test Counts						1	1

Pitt & Sherry (Operations) Pty Ltd
4th Floor, 113 Cimitiere Street
Launceston
Tasmania 7250

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: **Carly Clark**

Report **1216797-S**
Project name TARRALEAH VILLAGE SOIL SAMPLING
Received Date May 07, 2025

Client Sample ID			**QCS01**
Sample Matrix			**Soil**
Eurofins Sample No.			**M25-My0018132**
Date Sampled			**Mar 31, 2025**
Test/Reference	LOR	Unit	
Chromium (hexavalent)	1	mg/kg	< 1
Chromium (trivalent)	5	mg/kg	240
Heavy Metals			
Chromium	5	mg/kg	240
Sample Properties			
% Moisture	1	%	34

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
Chromium (speciated)			
Chromium (hexavalent)	Melbourne	May 07, 2025	28 Days
- Method: LTM-INO-4100 Hexavalent Chromium by Spectrometric detection			
Heavy Metals	Melbourne	May 07, 2025	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Melbourne	May 07, 2025	14 Days
- Method: LTM-GEN-7080 Moisture			

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web: www.eurofins.com.au
email: EnviroSales@eurofinsanz.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

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Eurofins Environment Testing NZ Ltd
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Company Name: Pitt & Sherry (Operations) Pty Ltd
Address: 4th Floor, 113 Cimitiere Street
Launceston
Tasmania 7250

Project Name: TARRALEAH VILLAGE SOIL SAMPLING

Order No.:
Report #: 1216797
Phone: 03 6323 1900
Fax: 03 6334 4651

Received: May 7, 2025 12:00 AM
Due: May 14, 2025
Priority: 5 Day
Contact Name: Carly Clark

Eurofins Analytical Services Manager : Savini Suduweli

Sample Detail						Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	QCS01	Mar 31, 2025		Soil	M25-My0018132	X	X
Test Counts						1	1

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Internal Quality Control Review and Glossary

General

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

Holding Times

Please refer to the '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 before sample receipt deadlines as stated on the SRA.

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

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

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

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ppm:** parts per million
µg/L: micrograms per litre	**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
CFU: Colony Forming Unit	**Colour:** Pt-Co Units (CU)	

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
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 moisture has been determined on a solid sample, the result is expressed on a dry weight 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 represents 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 similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (*bis*-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 6.0
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 only be used as a guide 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. SVOCs recoveries 20 – 150%, VOC recoveries 50 – 150%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 6.0, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as 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 are 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							
Chromium (hexavalent)	mg/kg	< 1			1	Pass	
Method Blank							
Heavy Metals							
Chromium	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Chromium (hexavalent)	%	113			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Chromium	%	84			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Chromium	M25-My0019076	NCP	%	81			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Chromium (hexavalent)	M25-My0014591	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Chromium	M25-My0019076	NCP	mg/kg	36	49	30	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	M25-My0018187	NCP	%	9.9	11	10	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:

Catherine Wilson	Analytical Services Manager
Luke Holt	Senior Analyst-Inorganic
Mary Makarios	Senior Analyst-Metal

Glenn Jackson
Managing Director

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.

ALS Environmental

CHAIN OF CUSTODY

ALS Laboratory: please tick →

BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com

MACKAY 78 Harbour Road Mackay QLD 4740

MELBOURNE 24 Woorarra Ave Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com

MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com

NEWCASTLE 5 Rose Gum Road Warabrook NSW 2304 Ph: 02 4423 2063 E: newcastle@alsglobal.com

PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com

FREIGHT

CLIENT: pitt&sherry operations	TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	(28) Standard or urgent TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: Hobart		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
PROJECT: Tarraleah Switchyard Soil Sampling	ALS QUOTE NO.: EM24PITSHE0004_V3_P.24.1136	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: P.24.1136		COC: (1) 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Carly Clark	CONTACT PH: 0490 942 344	OF: 1 (2) 3 4 5 6 7	Other comment:
SAMPLER: Eduardo Pereira Maes	SAMPLER MOBILE: 0414 023 658	RELINQUISHED BY: ~~Alex Hibberd~~ Eduardo Maes	RECEIVED BY:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default): ENMRG	DATE/TIME: 11.04	DATE/TIME:
Email Reports to: cclark@pittsh.com.au; EPereiraMaes@pittsh.com.au		RELINQUISHED BY:	RECEIVED BY: RICHARD BAEZ
Email Invoice to: cclark@pittsh.com.au; accounts@pittsh.com.au		DATE/TIME:	DATE/TIME: 14/04/25 - 10:45

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).												Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	Suite C	Suite D	TCLP Leaching	ASLP Leaching	ASC NEPM Soil Classification	Rinsate 2	Trip Blank						Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	TA-MB411/0.2	11.04	S	GAMMA JAR + P. + B	3	X												
2	TA-MB411/2.2	11.04			3	X												
3	TA-MB411/2.8	11.04			3	X												
4	TA-MB412/0.4	07.04			3	X												
5	TA-MB412/1.5	07.04			3	X												
6	TA-MB412/2.3	07.04			3	X												
7	TA-MB412/3.0	07.04			3	X												
8	TA-MB414/0.4	08.04			3	X												
9	TA-MB414/1.5	08.04			3	X												
10	TA-MB414/2.0	08.04			3	X												
11	TA-MB415/0.3	09.04			3	X												
12	TA-MB415/1.8	09.04			3	X												
13	TA-MB415/2.8	09.04			3	X												
14	TA-MB415/3.3	09.04			3	X												
15	TA-MB416/0.4	10.04			3	X												
16	TA-MB416/2.3	10.04			3	X												
17	TA-MB416/2.8	10.04			3	X												
18	TA-MB416/3.2	10.04			3	X												
				TOTAL	0													

Environmental Division
Melbourne
Work Order Reference
EM2506417

Telephone : + 61-3-8549 9600

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

ALS Environmental

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ADELAIDE 21 Burma Road Pooraka SA 5095
Ph: 08 8359 0890 E: adelaide@alsglobal.com

BRISBANE 32 Shand Street Stafford QLD 4053
Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

GLADSTONE 46 Callemondah Drive Clinton QLD 4680
Ph: 07 7471 5600 E: gladstone@alsglobal.com

MACKAY 78 Harbour Road Mackay QLD 4740
Ph: 07 4944 0177 E: samples.mackay@alsglobal.com

MELBOURNE 24 Woorite Court Scoresby VIC 3179
Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com

MUDGEE 27 Sydney Road Mudgee NSW 2850
Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com

NEWCASTLE 5 Rose Gum Road Warabrook NSW 2304
Ph: 02 4423 2063 E: newcastle@alsglobal.com

NORMANHURST 16 Mars Road Lane Cove West NSW 2066
Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

PERTH 10 Hod Way Malaga WA 6090
Ph: 08 9209 7655 E: samples.perth@alsglobal.com

SYDNEY 277-289 Woodpark Road Smithfield NSW 2164
Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

TOWNSVILLE 14-15 Desma Court Bohle QLD 4818
Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com

WOLLONGONG 99 Kenny Street Wollongong NSW 2500
Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: pitt&sherry operations	**TURNAROUND REQUIREMENTS:** (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☒ Standard or urgent TAT (List due date):	**FOR LABORATORY USE ONLY (Circle)**
OFFICE: Hobart		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes / No / N/A
PROJECT: Tarraleah Switchyard Soil Sampling	**ALS QUOTE NO.:** EM24PITSHE0004_V3_P.24.1136	**COC SEQUENCE NUMBER (Circle)**	Free Ice / frozen ice bricks present upon receipt? Yes / No / N/A
ORDER NUMBER: P.24.1136		COC: 1 (2) 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Carly Clark	**CONTACT PH:** 0490 942 344	OF: 1 (2) 3 4 5 6 7	Other comment:
SAMPLER: Eduardo Pereira Maes	**SAMPLER MOBILE:** 0414 023 658	**RELINQUISHED BY:** Alex Hibberd	**RECEIVED BY:**
COC emailed to ALS? (YES / NO)	**EDD FORMAT (or default):** ENMRG	DATE/TIME:	DATE/TIME:
Email Reports to: cclark@pittsh.com.au; EPereiraMaes@pittsh.com.au		**RELINQUISHED BY:**	**RECEIVED BY:**
Email Invoice to: cclark@pittsh.com.au; accounts@pittsh.com.au		DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).												Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	Suite C	Suite D	TCLP Leaching	ASLP Leaching	ASC NEPM Soil Classification	Rinsate 2	Trip Blank						Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
19	TA-TP456/0.3	10.04	S	Glass jar + P + 2x B	4	X				X								
20	TA-TP456/0.8	10.04	S	Glass jar + P + B	3	X												
21	QCP02		S	"	3	X												
22	QCP03		S	"	3	X												
23	QCS02		S	"	3	X												
24	QCS03		S	"	3	X												
25	TB02	11.04	S	Glass jar	1							X						
				TOTAL	0													

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **EM2506417**		
Client	: **PITT & SHERRY (OPERATIONS) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: CARLY CLARK	Contact	: Hannah White
Address	: 199 MACQUARIE STREET HOBART 7001	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: cclark@pittsh.com.au	E-mail	: Hannah.White@alsglobal.com
Telephone	: 03 9674 4163	Telephone	: +61-3-8549 9600
Facsimile	: ----	Facsimile	: +61-3-8549 9626
Project	: Tarraleah Switchyard Soil Sampling	Page	: 1 of 3
Order number	: P.24.1136	Quote number	: EM2024PITSHE0004 (EM24PITSHE0004)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: Eduardo Pereira Maes		

Dates

Date Samples Received	: 14-Apr-2025 10:45	Issue Date	: 14-Apr-2025
Client Requested Due Date	: 29-Apr-2025	Scheduled Reporting Date	: **29-Apr-2025**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 11.4°C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 25 / 23

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- Unless otherwise stated, analytical work for this work order will be conducted at ALS Melbourne, NATA accreditation no. 825, site no. 13778.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EP066 (solids) Polychlorinated Biphenyls by GCMS	SOIL - EP075 SIM Phenols only SIM - Phenols only	SOIL - EP075-TAS Benzo(a)pyrene and other PAHs - Waste	SOIL - P-22 (Melb) Soil Characterisation Package	SOIL - S-04 TRH/BTEXN
EM2506417-001	11-Apr-2025 00:00	TA-MB411/0.2		✓	✓	✓	✓		✓
EM2506417-002	11-Apr-2025 00:00	TA-MB411/2.2		✓	✓	✓	✓		✓
EM2506417-003	11-Apr-2025 00:00	TA-MB411/2.8		✓	✓	✓	✓		✓
EM2506417-004	07-Apr-2025 00:00	TA-MB412/0.4		✓	✓	✓	✓		✓
EM2506417-005	07-Apr-2025 00:00	TA-MB412/1.5		✓	✓	✓	✓		✓
EM2506417-006	07-Apr-2025 00:00	TA-MB412/2.3		✓	✓	✓	✓		✓
EM2506417-007	07-Apr-2025 00:00	TA-MB412/3.0		✓	✓	✓	✓		✓
EM2506417-008	08-Apr-2025 00:00	TA-MB414/0.4		✓	✓	✓	✓		✓
EM2506417-009	08-Apr-2025 00:00	TA-MB414/1.5		✓	✓	✓	✓		✓
EM2506417-010	08-Apr-2025 00:00	TA-MB414/2.0		✓	✓	✓	✓		✓
EM2506417-011	09-Apr-2025 00:00	TA-MB415/0.3		✓	✓	✓	✓		✓
EM2506417-012	09-Apr-2025 00:00	TA-MB415/1.8		✓	✓	✓	✓		✓
EM2506417-013	09-Apr-2025 00:00	TA-MB415/2.8		✓	✓	✓	✓		✓
EM2506417-014	09-Apr-2025 00:00	TA-MB415/3.3		✓	✓	✓	✓		✓
EM2506417-015	10-Apr-2025 00:00	TA-MB416/0.4		✓	✓	✓	✓		✓
EM2506417-016	10-Apr-2025 00:00	TA-MB416/2.3		✓	✓	✓	✓		✓
EM2506417-017	10-Apr-2025 00:00	TA-MB416/2.8		✓	✓	✓	✓		✓
EM2506417-018	10-Apr-2025 00:00	TA-MB416/3.2		✓	✓	✓	✓		✓
EM2506417-019	10-Apr-2025 00:00	TA-TP456/0.3		✓	✓	✓	✓	✓	✓
EM2506417-020	10-Apr-2025 00:00	TA-TP456/0.8		✓	✓	✓	✓		✓
EM2506417-021	07-Apr-2025 00:00	QCP02		✓	✓	✓	✓		✓
EM2506417-022	10-Apr-2025 00:00	QCP03		✓	✓	✓	✓		✓
EM2506417-023	07-Apr-2025 00:00	QCS02	✓						
EM2506417-024	10-Apr-2025 00:00	QCS03	✓						
EM2506417-025	14-Apr-2025 00:00	TB02		✓					

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - S-18 TRH(C6-C9)/BTEXN
EM2506417-025	14-Apr-2025 00:00	TB02	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ALL ACCOUNTS

- A4 - AU Tax Invoice (INV)	Email	accounts@pittsh.com.au

CARLY CLARK

- *AU Certificate of Analysis - NATA (COA)	Email	cclark@pittsh.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	cclark@pittsh.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	cclark@pittsh.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	cclark@pittsh.com.au
- A4 - AU Tax Invoice (INV)	Email	cclark@pittsh.com.au
- Attachment - Report (SUBCO)	Email	cclark@pittsh.com.au
- Chain of Custody (CoC) (COC)	Email	cclark@pittsh.com.au
- EDI Format - ENMRG (ENMRG)	Email	cclark@pittsh.com.au

Eduardo Pereira Maes

- *AU Certificate of Analysis - NATA (COA)	Email	epereiramaes@pittsh.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	epereiramaes@pittsh.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	epereiramaes@pittsh.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	epereiramaes@pittsh.com.au
- Attachment - Report (SUBCO)	Email	epereiramaes@pittsh.com.au
- Chain of Custody (CoC) (COC)	Email	epereiramaes@pittsh.com.au
- EDI Format - ENMRG (ENMRG)	Email	epereiramaes@pittsh.com.au

Inter-Laboratory Testing

Analysis conducted by ALS Newcastle, NATA accreditation no. 825, site no. 1656 (Chemistry / Biology).

(SOIL) EA150: Soil Classification based on Particle Size

(SOIL) EA152: Soil Particle Density

CERTIFICATE OF ANALYSIS

Work Order	: **EM2506417**	Page	: 1 of 30
Client	: **PITT & SHERRY (OPERATIONS) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: CARLY CLARK	Contact	: Hannah White
Address	: 199 MACQUARIE STREET HOBART 7001	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: 03 9674 4163	Telephone	: +61-3-8549 9600
Project	: Tarraleah Switchyard Soil Sampling	Date Samples Received	: 14-Apr-2025 10:45
Order number	: P.24.1136	Date Analysis Commenced	: 17-Apr-2025
C-O-C number	: ----	Issue Date	: 30-Apr-2025 12:14
Sampler	: Eduardo Pereira Maes		
Site	: ----		
Quote number	: EM25PITSHE0004_V4		
No. of samples received	: 23		
No. of samples analysed	: 23		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

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
- Descriptive 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*
Aleksandar Vujkovic	Laboratory Technician	Newcastle - Inorganics, Mayfield West, NSW
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC
Tim Kuo	Approved Asbestos Identifier	Melbourne Asbestos, 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 Contract 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.

- EA150H: Soil particle density results fell outside the scope of AS1289.3.6.3. Results should be scrutinised accordingly.
- ALS is not NATA accredited for the analysis of Exchangeable Cations on Alkaline Soils when performed under ALS Method ED006.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- EP075-TAS: Particular samples required dilution prior to analysis due to matrix interferences. LOR values have been adjusted accordingly.
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2
- ED007 and ED008: When Exchangeable Al is reported from these methods, it should be noted that Rayment & Lyons (2011) suggests Exchange Acidity by 1M KCl - Method 15G1 (ED005) is a more suitable method for the determination of exchange acidity (H+ + Al3+).
- EA200: 'Yes' - Asbestos detected by polarised light microscopy including dispersion staining.
- EA200: 'No*' - No asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining. Asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg.
- EA200: 'No' - No asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration or as per USEPA 1633 limits where listed. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS and also conform to QSM 5.4 (US DoD) requirements.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TA-MB411/0.2	TA-MB411/2.2	TA-MB411/2.8	TA-MB412/0.4	TA-MB412/1.5
			Sampling date / time	11-Apr-2025 00:00	11-Apr-2025 00:00	11-Apr-2025 00:00	07-Apr-2025 00:00	07-Apr-2025 00:00
Compound	CAS Number	LOR	Unit	EM2506417-001	EM2506417-002	EM2506417-003	EM2506417-004	EM2506417-005
				Result	Result	Result	Result	Result
EA055: Moisture Content								
Moisture Content	----	1.0	%	32.8	29.9	22.2	28.1	12.6
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No
Asbestos (Trace)	1332-21-4	-	-	No	No	No	No	No
Asbestos Type	1332-21-4	-	--	-	-	-	-	-
Sample weight (dry)	----	0.01	g	33.3	35.8	43.3	31.5	69.8
APPROVED IDENTIFIER:	----	-	--	T. KUO	T. KUO	T. KUO	T. KUO	T. KUO
Synthetic Mineral Fibre	----	-	--	No	No	No	No	No
Organic Fibre	----	-	--	Yes	No	No	No	No
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	31	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	2	<1
Chromium	7440-47-3	2	mg/kg	206	76	84	84	23
Copper	7440-50-8	5	mg/kg	46	58	64	62	51
Lead	7439-92-1	5	mg/kg	16	<5	<5	20	<5
Nickel	7440-02-0	2	mg/kg	85	42	46	46	27
Zinc	7440-66-6	5	mg/kg	122	73	74	297	40
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	0.1	<0.1	<0.1	0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TA-MB411/0.2	TA-MB411/2.2	TA-MB411/2.8	TA-MB412/0.4	TA-MB412/1.5
				Sampling date / time	11-Apr-2025 00:00	11-Apr-2025 00:00	11-Apr-2025 00:00	07-Apr-2025 00:00	07-Apr-2025 00:00
Compound	CAS Number	LOR	Unit		EM2506417-001	EM2506417-002	EM2506417-003	EM2506417-004	EM2506417-005
					Result	Result	Result	Result	Result
EP075(SIM)A: Phenolic Compounds - Continued									
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg		<2	<2	<2	<2	<2
EP075B: Polynuclear Aromatic Hydrocarbons									
Benzo(a)pyrene	50-32-8	0.05	mg/kg		<0.14	<0.13	<0.14	<0.05	<0.05
^ Sum of polycyclic aromatic hydrocarbons	----	0.05	mg/kg		<0.14	<0.13	<0.14	<0.05	<0.05
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1.0	mg/kg		<1.0	<1.0	<1.0	<1.0	<1.0
^ Benzo(a)pyrene TEQ (zero)	----	0.05	mg/kg		<0.14	<0.13	<0.14	<0.05	<0.05
^ Benzo(a)pyrene TEQ (LOR)	----	0.05	mg/kg		**0.85**	**0.84**	**0.85**	**0.76**	**0.76**
^ Benzo(a)pyrene TEQ (half LOR)	----	0.05	mg/kg		**0.38**	**0.38**	**0.38**	**0.38**	**0.38**
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TA-MB411/0.2	TA-MB411/2.2	TA-MB411/2.8	TA-MB412/0.4	TA-MB412/1.5
				Sampling date / time	11-Apr-2025 00:00	11-Apr-2025 00:00	11-Apr-2025 00:00	07-Apr-2025 00:00	07-Apr-2025 00:00
Compound	CAS Number	LOR	Unit		EM2506417-001	EM2506417-002	EM2506417-003	EM2506417-004	EM2506417-005
					Result	Result	Result	Result	Result
EP075B: Polynuclear Aromatic Hydrocarbons - Continued									
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		**170**	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		**420**	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		**590**	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		**470**	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		**330**	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		**800**	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TA-MB411/0.2	TA-MB411/2.2	TA-MB411/2.8	TA-MB412/0.4	TA-MB412/1.5
				Sampling date / time	11-Apr-2025 00:00	11-Apr-2025 00:00	11-Apr-2025 00:00	07-Apr-2025 00:00	07-Apr-2025 00:00
Compound	CAS Number	LOR	Unit		EM2506417-001	EM2506417-002	EM2506417-003	EM2506417-004	EM2506417-005
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		**107**	**123**	**126**	**89.8**	**86.4**
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**97.5**	**78.0**	**89.3**	**88.2**	**80.6**
2-Chlorophenol-D4	93951-73-6	0.5	%		**100**	**104**	**86.9**	**89.5**	**95.8**
2.4.6-Tribromophenol	118-79-6	0.5	%		**71.7**	**76.9**	**68.8**	**63.5**	**69.7**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**104**	**111**	**112**	**87.2**	**90.0**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TA-MB411/0.2	TA-MB411/2.2	TA-MB411/2.8	TA-MB412/0.4	TA-MB412/1.5
				Sampling date / time	11-Apr-2025 00:00	11-Apr-2025 00:00	11-Apr-2025 00:00	07-Apr-2025 00:00	07-Apr-2025 00:00
Compound	CAS Number	LOR	Unit		EM2506417-001	EM2506417-002	EM2506417-003	EM2506417-004	EM2506417-005
					Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates - Continued									
Anthracene-d10	1719-06-8	0.5	%		111	115	111	105	114
4-Terphenyl-d14	1718-51-0	0.5	%		116	119	120	95.4	99.3
EP075T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.025	%		98.1	120	112	104	109
Anthracene-d10	1719-06-8	0.025	%		113	133	105	104	107
4-Terphenyl-d14	1718-51-0	0.025	%		104	112	114	116	120
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		72.3	85.3	81.4	73.9	79.4
Toluene-D8	2037-26-5	0.2	%		77.7	90.6	87.5	75.0	80.4
4-Bromofluorobenzene	460-00-4	0.2	%		79.8	95.5	88.0	85.6	94.0
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		101	101	95.5	97.3	106
13C8-PFOA	----	0.0002	%		119	112	116	113	120

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TA-MB412/2.3	TA-MB412/3.0	TA-MB414/0.4	TA-MB414/1.5	TA-MB414/2.0
			Sampling date / time	07-Apr-2025 00:00	07-Apr-2025 00:00	08-Apr-2025 00:00	08-Apr-2025 00:00	08-Apr-2025 00:00
Compound	CAS Number	LOR	Unit	EM2506417-006	EM2506417-007	EM2506417-008	EM2506417-009	EM2506417-010
				Result	Result	Result	Result	Result
EA055: Moisture Content								
Moisture Content	----	1.0	%	17.4	25.3	35.0	23.7	24.5
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No
Asbestos (Trace)	1332-21-4	-	-	No	No	No	No	No
Asbestos Type	1332-21-4	-	--	-	-	-	-	-
Sample weight (dry)	----	0.01	g	58.1	48.9	46.1	66.6	42.1
APPROVED IDENTIFIER:	----	-	--	T. KUO	T. KUO	T. KUO	T. KUO	T. KUO
Synthetic Mineral Fibre	----	-	--	No	No	No	No	No
Organic Fibre	----	-	--	No	Yes	Yes	Yes	No
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	42	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	22	59	45	46	50
Copper	7440-50-8	5	mg/kg	44	49	38	39	51
Lead	7439-92-1	5	mg/kg	<5	<5	<5	<5	<5
Nickel	7440-02-0	2	mg/kg	21	33	29	36	37
Zinc	7440-66-6	5	mg/kg	38	51	77	54	53
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TA-MB412/2.3	TA-MB412/3.0	TA-MB414/0.4	TA-MB414/1.5	TA-MB414/2.0
				Sampling date / time	07-Apr-2025 00:00	07-Apr-2025 00:00	08-Apr-2025 00:00	08-Apr-2025 00:00	08-Apr-2025 00:00
Compound	CAS Number	LOR	Unit		EM2506417-006	EM2506417-007	EM2506417-008	EM2506417-009	EM2506417-010
					Result	Result	Result	Result	Result
EP075(SIM)A: Phenolic Compounds - Continued									
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg		<2	<2	<2	<2	<2
EP075B: Polynuclear Aromatic Hydrocarbons									
Benzo(a)pyrene	50-32-8	0.05	mg/kg		<0.05	<0.05	<0.14	<0.13	<0.13
^ Sum of polycyclic aromatic hydrocarbons	----	0.05	mg/kg		<0.05	<0.05	<0.14	<0.13	<0.13
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1.0	mg/kg		<1.0	<1.0	<1.0	<1.0	<1.0
^ Benzo(a)pyrene TEQ (zero)	----	0.05	mg/kg		<0.05	<0.05	<0.14	<0.13	<0.13
^ Benzo(a)pyrene TEQ (LOR)	----	0.05	mg/kg		**0.76**	**0.76**	**0.85**	**0.84**	**0.84**
^ Benzo(a)pyrene TEQ (half LOR)	----	0.05	mg/kg		**0.38**	**0.38**	**0.38**	**0.38**	**0.38**
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TA-MB412/2.3	TA-MB412/3.0	TA-MB414/0.4	TA-MB414/1.5	TA-MB414/2.0
				Sampling date / time	07-Apr-2025 00:00	07-Apr-2025 00:00	08-Apr-2025 00:00	08-Apr-2025 00:00	08-Apr-2025 00:00
Compound	CAS Number	LOR	Unit		EM2506417-006	EM2506417-007	EM2506417-008	EM2506417-009	EM2506417-010
					Result	Result	Result	Result	Result
EP075B: Polynuclear Aromatic Hydrocarbons - Continued									
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		<50	<50	<50	<50	<50
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ **Total Xylenes**	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TA-MB412/2.3	TA-MB412/3.0	TA-MB414/0.4	TA-MB414/1.5	TA-MB414/2.0
				Sampling date / time	07-Apr-2025 00:00	07-Apr-2025 00:00	08-Apr-2025 00:00	08-Apr-2025 00:00	08-Apr-2025 00:00
Compound	CAS Number	LOR	Unit		EM2506417-006	EM2506417-007	EM2506417-008	EM2506417-009	EM2506417-010
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		**106**	**110**	**131**	**134**	**137**
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**86.7**	**93.9**	**96.9**	**66.8**	**73.6**
2-Chlorophenol-D4	93951-73-6	0.5	%		**85.7**	**89.7**	**90.5**	**75.7**	**98.5**
2.4.6-Tribromophenol	118-79-6	0.5	%		**64.6**	**66.1**	**71.6**	**70.0**	**77.8**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**82.1**	**88.4**	**116**	**101**	**117**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TA-MB412/2.3	TA-MB412/3.0	TA-MB414/0.4	TA-MB414/1.5	TA-MB414/2.0
				Sampling date / time	07-Apr-2025 00:00	07-Apr-2025 00:00	08-Apr-2025 00:00	08-Apr-2025 00:00	08-Apr-2025 00:00
Compound	CAS Number	LOR	Unit		EM2506417-006	EM2506417-007	EM2506417-008	EM2506417-009	EM2506417-010
					Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates - Continued									
Anthracene-d10	1719-06-8	0.5	%		108	113	108	114	118
4-Terphenyl-d14	1718-51-0	0.5	%		91.9	98.2	124	113	122
EP075T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.025	%		108	106	111	99.5	114
Anthracene-d10	1719-06-8	0.025	%		105	104	118	114	112
4-Terphenyl-d14	1718-51-0	0.025	%		118	118	101	106	110
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		73.8	73.1	76.0	74.9	68.2
Toluene-D8	2037-26-5	0.2	%		72.1	73.5	73.4	72.0	67.5
4-Bromofluorobenzene	460-00-4	0.2	%		85.8	85.3	85.7	82.7	76.9
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		90.0	116	109	104	109
13C8-PFOA	----	0.0002	%		118	123	116	116	120

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TA-MB415/0.3	TA-MB415/1.8	TA-MB415/2.8	TA-MB415/3.3	TA-MB416/0.4
			Sampling date / time	09-Apr-2025 00:00	09-Apr-2025 00:00	09-Apr-2025 00:00	09-Apr-2025 00:00	10-Apr-2025 00:00
Compound	CAS Number	LOR	Unit	EM2506417-011	EM2506417-012	EM2506417-013	EM2506417-014	EM2506417-015
				Result	Result	Result	Result	Result
EA055: Moisture Content								
Moisture Content	----	1.0	%	26.6	23.0	23.0	23.2	25.9
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No
Asbestos (Trace)	1332-21-4	-	-	No	No	No	No	No
Asbestos Type	1332-21-4	-	--	-	-	-	-	-
Sample weight (dry)	----	0.01	g	45.9	47.5	28.4	48.5	55.5
APPROVED IDENTIFIER:	----	-	--	T. KUO	T. KUO	T. KUO	T. KUO	T. KUO
Synthetic Mineral Fibre	----	-	--	No	No	No	No	No
Organic Fibre	----	-	--	No	No	No	No	No
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	122	41	31	39	94
Copper	7440-50-8	5	mg/kg	53	77	37	40	59
Lead	7439-92-1	5	mg/kg	<5	<5	<5	<5	17
Nickel	7440-02-0	2	mg/kg	66	32	25	30	43
Zinc	7440-66-6	5	mg/kg	88	48	49	57	428
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TA-MB415/0.3	TA-MB415/1.8	TA-MB415/2.8	TA-MB415/3.3	TA-MB416/0.4
				Sampling date / time	09-Apr-2025 00:00	09-Apr-2025 00:00	09-Apr-2025 00:00	09-Apr-2025 00:00	10-Apr-2025 00:00
Compound	CAS Number	LOR	Unit		EM2506417-011	EM2506417-012	EM2506417-013	EM2506417-014	EM2506417-015
					Result	Result	Result	Result	Result
EP075(SIM)A: Phenolic Compounds - Continued									
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg		<2	<2	<2	<2	<2
EP075B: Polynuclear Aromatic Hydrocarbons									
Benzo(a)pyrene	50-32-8	0.05	mg/kg		<0.14	<0.14	<0.13	<0.14	<0.14
^ Sum of polycyclic aromatic hydrocarbons	----	0.05	mg/kg		<0.14	<0.14	<0.13	<0.14	<0.14
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1.0	mg/kg		<1.0	<1.0	<1.0	<1.0	<1.0
^ Benzo(a)pyrene TEQ (zero)	----	0.05	mg/kg		<0.14	<0.14	<0.13	<0.14	<0.14
^ Benzo(a)pyrene TEQ (LOR)	----	0.05	mg/kg		**0.85**	**0.85**	**0.84**	**0.85**	**0.85**
^ Benzo(a)pyrene TEQ (half LOR)	----	0.05	mg/kg		**0.38**	**0.38**	**0.38**	**0.38**	**0.38**
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TA-MB415/0.3	TA-MB415/1.8	TA-MB415/2.8	TA-MB415/3.3	TA-MB416/0.4
				Sampling date / time	09-Apr-2025 00:00	09-Apr-2025 00:00	09-Apr-2025 00:00	09-Apr-2025 00:00	10-Apr-2025 00:00
Compound	CAS Number	LOR	Unit		EM2506417-011	EM2506417-012	EM2506417-013	EM2506417-014	EM2506417-015
					Result	Result	Result	Result	Result
EP075B: Polynuclear Aromatic Hydrocarbons - Continued									
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TA-MB415/0.3	TA-MB415/1.8	TA-MB415/2.8	TA-MB415/3.3	TA-MB416/0.4
				Sampling date / time	09-Apr-2025 00:00	09-Apr-2025 00:00	09-Apr-2025 00:00	09-Apr-2025 00:00	10-Apr-2025 00:00
Compound	CAS Number	LOR	Unit		EM2506417-011	EM2506417-012	EM2506417-013	EM2506417-014	EM2506417-015
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		**133**	**126**	**117**	**121**	**122**
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**101**	**106**	**104**	**91.3**	**111**
2-Chlorophenol-D4	93951-73-6	0.5	%		**93.8**	**96.1**	**92.7**	**92.6**	**103**
2.4.6-Tribromophenol	118-79-6	0.5	%		**67.9**	**66.4**	**73.5**	**66.5**	**67.4**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**101**	**90.2**	**102**	**105**	**105**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TA-MB415/0.3	TA-MB415/1.8	TA-MB415/2.8	TA-MB415/3.3	TA-MB416/0.4
				Sampling date / time	09-Apr-2025 00:00	09-Apr-2025 00:00	09-Apr-2025 00:00	09-Apr-2025 00:00	10-Apr-2025 00:00
Compound	CAS Number	LOR	Unit		EM2506417-011	EM2506417-012	EM2506417-013	EM2506417-014	EM2506417-015
					Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates - Continued									
Anthracene-d10	1719-06-8	0.5	%		104	107	104	108	116
4-Terphenyl-d14	1718-51-0	0.5	%		116	125	114	102	121
EP075T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.025	%		97.9	117	116	108	106
Anthracene-d10	1719-06-8	0.025	%		126	128	129	128	134
4-Terphenyl-d14	1718-51-0	0.025	%		122	112	105	100	118
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		75.0	79.6	74.2	73.8	80.6
Toluene-D8	2037-26-5	0.2	%		80.5	86.7	78.4	77.8	82.8
4-Bromofluorobenzene	460-00-4	0.2	%		81.7	86.3	79.3	80.1	84.0
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		96.6	90.0	104	109	105
13C8-PFOA	----	0.0002	%		112	110	117	122	118

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TA-MB416/2.3	TA-MB416/2.8	TA-MB416/3.2	TA-TP456/0.3	TA-TP456/0.8
			Sampling date / time	10-Apr-2025 00:00	10-Apr-2025 00:00	10-Apr-2025 00:00	10-Apr-2025 00:00	10-Apr-2025 00:00
Compound	CAS Number	LOR	Unit	EM2506417-016	EM2506417-017	EM2506417-018	EM2506417-019	EM2506417-020
				Result	Result	Result	Result	Result
EA001: pH in soil using 0.01M CaCl extract								
pH (CaCl2)	----	0.1	pH Unit	----	----	----	5.2	----
EA002-AD: pH (Soils) dried at 40°C								
pH Value	----	0.1	pH Unit	----	----	----	5.6	----
EA010-AD: Conductivity (Soils) dried at 40°C								
Electrical Conductivity @ 25°C	----	1	µS/cm	----	----	----	76	----
EA055: Moisture Content								
Moisture Content	----	1.0	%	23.0	18.1	21.0	----	28.9
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	----	----	----	34.4	----
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	----	----	----	38	----
EA152: Soil Particle Density								
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	----	----	----	2.35	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No
Asbestos (Trace)	1332-21-4	-	-	No	No	No	No	No
Asbestos Type	1332-21-4	-	--	-	-	-	-	-
Sample weight (dry)	----	0.01	g	61.1	44.1	33.6	40.3	50.2
APPROVED IDENTIFIER:	----	-	--	T. KUO	T. KUO	T. KUO	T. KUO	T. KUO
Synthetic Mineral Fibre	----	-	--	No	No	No	No	No
Organic Fibre	----	-	--	No	Yes	No	Yes	No
ED007: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	----	----	----	12.6	----
Exchangeable Magnesium	----	0.1	meq/100g	----	----	----	5.7	----
Exchangeable Potassium	----	0.1	meq/100g	----	----	----	1.1	----
Exchangeable Sodium	----	0.1	meq/100g	----	----	----	0.2	----
Cation Exchange Capacity	----	0.1	meq/100g	----	----	----	19.6	----
EG005(ED093)T: Total Metals by ICP-AES								

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TA-MB416/2.3	TA-MB416/2.8	TA-MB416/3.2	TA-TP456/0.3	TA-TP456/0.8
				Sampling date / time	10-Apr-2025 00:00	10-Apr-2025 00:00	10-Apr-2025 00:00	10-Apr-2025 00:00	10-Apr-2025 00:00
Compound	CAS Number	LOR	Unit		EM2506417-016	EM2506417-017	EM2506417-018	EM2506417-019	EM2506417-020
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Iron	7439-89-6	0.005	%		----	----	----	**9.35**	----
Arsenic	7440-38-2	5	mg/kg		<5	<5	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		**42**	**58**	**43**	**239**	**115**
Copper	7440-50-8	5	mg/kg		**38**	**40**	**46**	**52**	**67**
Lead	7439-92-1	5	mg/kg		<5	<5	<5	**7**	<5
Nickel	7440-02-0	2	mg/kg		**28**	**43**	**33**	**79**	**42**
Zinc	7440-66-6	5	mg/kg		**46**	**48**	**52**	**93**	**58**
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	**0.2**	<0.1
EP004: Organic Matter									
Organic Matter	----	0.5	%		----	----	----	**7.8**	----
Total Organic Carbon	----	0.5	%		----	----	----	**4.5**	----
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg		<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TA-MB416/2.3	TA-MB416/2.8	TA-MB416/3.2	TA-TP456/0.3	TA-TP456/0.8
				Sampling date / time	10-Apr-2025 00:00	10-Apr-2025 00:00	10-Apr-2025 00:00	10-Apr-2025 00:00	10-Apr-2025 00:00
Compound	CAS Number	LOR	Unit		EM2506417-016	EM2506417-017	EM2506417-018	EM2506417-019	EM2506417-020
					Result	Result	Result	Result	Result
EP075(SIM)A: Phenolic Compounds - Continued									
Pentachlorophenol	87-86-5	2	mg/kg		<2	<2	<2	<2	<2
EP075B: Polynuclear Aromatic Hydrocarbons									
Benzo(a)pyrene	50-32-8	0.05	mg/kg		<0.13	<0.14	<0.13	<0.13	<0.14
^ Sum of polycyclic aromatic hydrocarbons	----	0.05	mg/kg		<0.13	<0.14	<0.13	<0.13	<0.14
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1.0	mg/kg		<1.0	<1.0	<1.0	<1.0	<1.0
^ Benzo(a)pyrene TEQ (zero)	----	0.05	mg/kg		<0.13	<0.14	<0.13	<0.13	<0.14
^ Benzo(a)pyrene TEQ (LOR)	----	0.05	mg/kg		**0.84**	**0.85**	**0.84**	**0.84**	**0.85**
^ Benzo(a)pyrene TEQ (half LOR)	----	0.05	mg/kg		**0.38**	**0.38**	**0.38**	**0.38**	**0.38**
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TA-MB416/2.3	TA-MB416/2.8	TA-MB416/3.2	TA-TP456/0.3	TA-TP456/0.8
				Sampling date / time	10-Apr-2025 00:00	10-Apr-2025 00:00	10-Apr-2025 00:00	10-Apr-2025 00:00	10-Apr-2025 00:00
Compound	CAS Number	LOR	Unit		EM2506417-016	EM2506417-017	EM2506417-018	EM2506417-019	EM2506417-020
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		<50	<50	<50	<50	<50
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ **Total Xylenes**	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TA-MB416/2.3	TA-MB416/2.8	TA-MB416/3.2	TA-TP456/0.3	TA-TP456/0.8
				Sampling date / time	10-Apr-2025 00:00	10-Apr-2025 00:00	10-Apr-2025 00:00	10-Apr-2025 00:00	10-Apr-2025 00:00
Compound	CAS Number	LOR	Unit		EM2506417-016	EM2506417-017	EM2506417-018	EM2506417-019	EM2506417-020
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		**125**	**127**	**134**	**132**	**139**
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**88.7**	**98.6**	**104**	**76.0**	**72.1**
2-Chlorophenol-D4	93951-73-6	0.5	%		**93.2**	**92.7**	**98.2**	**113**	**85.0**
2.4.6-Tribromophenol	118-79-6	0.5	%		**71.7**	**60.8**	**65.3**	**75.5**	**65.2**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**111**	**111**	**116**	**114**	**111**
Anthracene-d10	1719-06-8	0.5	%		**109**	**109**	**117**	**112**	**106**
4-Terphenyl-d14	1718-51-0	0.5	%		**112**	**116**	**109**	**119**	**115**
EP075T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.025	%		**104**	**118**	**97.4**	**114**	**96.7**
Anthracene-d10	1719-06-8	0.025	%		**107**	**106**	**105**	**109**	**119**
4-Terphenyl-d14	1718-51-0	0.025	%		**116**	**110**	**110**	**120**	**114**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TA-MB416/2.3	TA-MB416/2.8	TA-MB416/3.2	TA-TP456/0.3	TA-TP456/0.8
				Sampling date / time	10-Apr-2025 00:00	10-Apr-2025 00:00	10-Apr-2025 00:00	10-Apr-2025 00:00	10-Apr-2025 00:00
Compound	CAS Number	LOR	Unit		EM2506417-016	EM2506417-017	EM2506417-018	EM2506417-019	EM2506417-020
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		74.2	76.1	74.9	88.2	79.6
Toluene-D8	2037-26-5	0.2	%		76.6	76.4	78.0	93.2	82.9
4-Bromofluorobenzene	460-00-4	0.2	%		77.7	78.2	77.1	95.5	81.0
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		95.8	106	105	101	95.9
13C8-PFOA	----	0.0002	%		116	118	121	115	118

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	QCP02	QCP03	TB02	----	----
			Sampling date / time	07-Apr-2025 00:00	10-Apr-2025 00:00	14-Apr-2025 00:00	----	----
Compound	CAS Number	LOR	Unit	EM2506417-021	EM2506417-022	EM2506417-025	--------	--------
				Result	Result	Result	----	----
EA055: Moisture Content								
Moisture Content	----	1.0	%	**30.4**	**34.7**	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	----	----	<1.0	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	**No**	**No**	----	----	----
Asbestos (Trace)	1332-21-4	-	-	**No**	**No**	----	----	----
Asbestos Type	1332-21-4	-	--	**-**	**-**	----	----	----
Sample weight (dry)	----	0.01	g	**36.7**	**38.2**	----	----	----
APPROVED IDENTIFIER:	----	-	--	**T. KUO**	**T. KUO**	----	----	----
Synthetic Mineral Fibre	----	-	--	**No**	**No**	----	----	----
Organic Fibre	----	-	--	**No**	**Yes**	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**17**	<5	----	----	----
Cadmium	7440-43-9	1	mg/kg	**1**	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	**96**	**242**	----	----	----
Copper	7440-50-8	5	mg/kg	**56**	**51**	----	----	----
Lead	7439-92-1	5	mg/kg	**18**	**11**	----	----	----
Nickel	7440-02-0	2	mg/kg	**48**	**72**	----	----	----
Zinc	7440-66-6	5	mg/kg	**222**	**92**	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	**0.1**	**0.2**	----	----	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	----	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	----	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	----	----	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	QCP02	QCP03	TB02	----	----
			Sampling date / time	07-Apr-2025 00:00	10-Apr-2025 00:00	14-Apr-2025 00:00	----	----
Compound	CAS Number	LOR	Unit	EM2506417-021	EM2506417-022	EM2506417-025	--------	--------
				Result	Result	Result	----	----
EP075(SIM)A: Phenolic Compounds - Continued								
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	----	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	----	----	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	----	----	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	----	----	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	----	----	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	----	----	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	----	----	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	----	----	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	----	----	----
EP075B: Polynuclear Aromatic Hydrocarbons								
Benzo(a)pyrene	50-32-8	0.05	mg/kg	<0.05	<0.13	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.05	mg/kg	<0.05	<0.13	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1.0	mg/kg	<1.0	<1.0	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.05	mg/kg	<0.05	<0.13	----	----	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.05	mg/kg	**0.76**	**0.84**	----	----	----
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.05	mg/kg	**0.38**	**0.38**	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	QCP02	QCP03	TB02	----	----
				Sampling date / time	07-Apr-2025 00:00	10-Apr-2025 00:00	14-Apr-2025 00:00	----	----
Compound	CAS Number	LOR	Unit		EM2506417-021	EM2506417-022	EM2506417-025	--------	--------
					Result	Result	Result	----	----
EP075B: Polynuclear Aromatic Hydrocarbons - Continued									
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	----	----
C10 - C14 Fraction	----	50	mg/kg		<50	<50	----	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	<100	----	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	<100	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg		<50	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	<10	<10	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		<50	<50	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg		<50	<50	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	<0.2	<0.2	----	----
^ **Total Xylenes**	----	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	QCP02	QCP03	TB02	----	----
			Sampling date / time	07-Apr-2025 00:00	10-Apr-2025 00:00	14-Apr-2025 00:00	----	----
Compound	CAS Number	LOR	Unit	EM2506417-021	EM2506417-022	EM2506417-025	--------	--------
				Result	Result	Result	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
EP231P: PFAS Sums								
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	**101**	**138**	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**90.8**	**86.3**	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	**87.7**	**86.4**	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	**66.4**	**63.1**	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	QCP02	QCP03	TB02	----	----
				Sampling date / time	07-Apr-2025 00:00	10-Apr-2025 00:00	14-Apr-2025 00:00	----	----
Compound	CAS Number	LOR	Unit		EM2506417-021	EM2506417-022	EM2506417-025	--------	--------
					Result	Result	Result	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		82.5	113	----	----	----
Anthracene-d10	1719-06-8	0.5	%		100	96.4	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		89.8	115	----	----	----
EP075T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.025	%		103	97.7	----	----	----
Anthracene-d10	1719-06-8	0.025	%		101	99.3	----	----	----
4-Terphenyl-d14	1718-51-0	0.025	%		112	96.7	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		74.3	64.3	85.0	----	----
Toluene-D8	2037-26-5	0.2	%		72.4	65.3	87.8	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		82.9	69.1	108	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		93.3	101	----	----	----
13C8-PFOA	----	0.0002	%		104	101	----	----	----

Analytical Results

Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	Sample ID - Sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in Soils		
EA200: Description	TA-MB411/0.2 - 11-Apr-2025 00:00	Brown soil with rock and organic matter.
EA200: Description	TA-MB411/2.2 - 11-Apr-2025 00:00	Brown soil with rock matter.
EA200: Description	TA-MB411/2.8 - 11-Apr-2025 00:00	Brown soil with rock matter.
EA200: Description	TA-MB412/0.4 - 07-Apr-2025 00:00	Brown soil.
EA200: Description	TA-MB412/1.5 - 07-Apr-2025 00:00	Brown soil with rock matter.
EA200: Description	TA-MB412/2.3 - 07-Apr-2025 00:00	Brown soil with rock matter.
EA200: Description	TA-MB412/3.0 - 07-Apr-2025 00:00	Brown soil with rock and organic matter.
EA200: Description	TA-MB414/0.4 - 08-Apr-2025 00:00	Brown soil with rock and organic matter.
EA200: Description	TA-MB414/1.5 - 08-Apr-2025 00:00	Brown soil with rock and organic matter.
EA200: Description	TA-MB414/2.0 - 08-Apr-2025 00:00	Brown soil with rock matter.
EA200: Description	TA-MB415/0.3 - 09-Apr-2025 00:00	Brown soil with rock matter.
EA200: Description	TA-MB415/1.8 - 09-Apr-2025 00:00	Brown soil with rock matter.
EA200: Description	TA-MB415/2.8 - 09-Apr-2025 00:00	Brown soil with rock matter.
EA200: Description	TA-MB415/3.3 - 09-Apr-2025 00:00	Brown soil with rock matter.
EA200: Description	TA-MB416/0.4 - 10-Apr-2025 00:00	Brown soil with rock matter.
EA200: Description	TA-MB416/2.3 - 10-Apr-2025 00:00	Brown soil with rock matter.
EA200: Description	TA-MB416/2.8 - 10-Apr-2025 00:00	Brown soil with organic matter.
EA200: Description	TA-MB416/3.2 - 10-Apr-2025 00:00	Brown soil with rock matter.
EA200: Description	TA-TP456/0.3 - 10-Apr-2025 00:00	Brown soil with rock and organic matter.
EA200: Description	TA-TP456/0.8 - 10-Apr-2025 00:00	Brown clay like soil.
EA200: Description	QCP02 - 07-Apr-2025 00:00	Brown soil with rock matter.
EA200: Description	QCP03 - 10-Apr-2025 00:00	Brown soil with rock and organic matter.

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	36	140
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	54	125
2-Chlorophenol-D4	93951-73-6	65	123
2.4.6-Tribromophenol	118-79-6	34	122
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	61	125
Anthracene-d10	1719-06-8	62	130
4-Terphenyl-d14	1718-51-0	67	133
EP075T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	35	126
Anthracene-d10	1719-06-8	40	135
4-Terphenyl-d14	1718-51-0	42	133
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
EP231S: PFAS Surrogate			
13C4-PFOS	----	68	136
13C8-PFOA	----	69	133

Inter-Laboratory Testing

Analysis conducted by ALS Newcastle, NATA accreditation no. 825, site no. 1656 (Chemistry / Biology).

(SOIL) EA150: Soil Classification based on Particle Size

(SOIL) EA152: Soil Particle Density

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2506417**	Page	: 1 of 17
Client	: **PITT & SHERRY (OPERATIONS) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: CARLY CLARK	Telephone	: +61-3-8549 9600
Project	: Tarraleah Switchyard Soil Sampling	Date Samples Received	: 14-Apr-2025
Site	: ----	Issue Date	: 30-Apr-2025
Sampler	: Eduardo Pereira Maes	No. of samples received	: 23
Order number	: P.24.1136	No. of samples analysed	: 23

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 Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, where applicable to the methodology, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA002-AD: pH (Soils) dried at 40°C						
Soil Glass Jar - Unpreserved TA-TP456/0.3	22-Apr-2025	17-Apr-2025	**5**	----	----	----
EA010-AD: Conductivity (Soils) dried at 40°C						
Soil Glass Jar - Unpreserved TA-TP456/0.3	22-Apr-2025	17-Apr-2025	**5**	----	----	----

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 / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA001: pH in soil using 0.01M CaCl extract							
Soil Glass Jar - Unpreserved (EA001) TA-TP456/0.3	**10-Apr-2025**	**17-Apr-2025**	17-Apr-2025	✓	**17-Apr-2025**	17-Apr-2025	✓
EA002-AD: pH (Soils) dried at 40°C							
Soil Glass Jar - Unpreserved (EA002-AD) TA-TP456/0.3	**10-Apr-2025**	**22-Apr-2025**	17-Apr-2025	×	**22-Apr-2025**	22-Apr-2025	✓
EA010-AD: Conductivity (Soils) dried at 40°C							
Soil Glass Jar - Unpreserved (EA010-AD) TA-TP456/0.3	**10-Apr-2025**	**22-Apr-2025**	17-Apr-2025	×	**22-Apr-2025**	20-May-2025	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content							
Soil Glass Jar - Unpreserved (EA055) TA-MB412/0.4, TA-MB412/1.5, TA-MB412/2.3, TA-MB412/3.0, QCP02	**07-Apr-2025**	**----**	----	**----**	**17-Apr-2025**	21-Apr-2025	✓
Soil Glass Jar - Unpreserved (EA055) TA-MB414/0.4, TA-MB414/1.5, TA-MB414/2.0	**08-Apr-2025**	**----**	----	**----**	**17-Apr-2025**	22-Apr-2025	✓
Soil Glass Jar - Unpreserved (EA055) TA-MB415/0.3, TA-MB415/1.8, TA-MB415/2.8, TA-MB415/3.3	**09-Apr-2025**	**----**	----	**----**	**17-Apr-2025**	23-Apr-2025	✓
Soil Glass Jar - Unpreserved (EA055) TA-MB416/0.4, TA-MB416/2.3, TA-MB416/2.8, TA-MB416/3.2, TA-TP456/0.8, QCP03	**10-Apr-2025**	**----**	----	**----**	**17-Apr-2025**	24-Apr-2025	✓
Soil Glass Jar - Unpreserved (EA055) TA-MB411/0.2, TA-MB411/2.2, TA-MB411/2.8	**11-Apr-2025**	**----**	----	**----**	**17-Apr-2025**	25-Apr-2025	✓
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) TA-TP456/0.3	**10-Apr-2025**	**----**	----	**----**	**17-Apr-2025**	24-Apr-2025	✓
Soil Glass Jar - Unpreserved (EA055) TB02	**14-Apr-2025**	**----**	----	**----**	**17-Apr-2025**	28-Apr-2025	✓
EA150: Soil Classification based on Particle Size							
Snap Lock Bag (EA150H) TA-TP456/0.3	**10-Apr-2025**	**----**	----	**----**	**30-Apr-2025**	07-Oct-2025	✓
EA152: Soil Particle Density							
Snap Lock Bag (EA152) TA-TP456/0.3	**10-Apr-2025**	**----**	----	**----**	**29-Apr-2025**	07-Oct-2025	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA200: AS 4964 - 2004 Identification of Asbestos in Soils							
Snap Lock Bag - ACM/Asbestos Grab Bag (EA200) TA-MB412/0.4, TA-MB412/1.5, TA-MB412/2.3, TA-MB412/3.0, QCP02	**07-Apr-2025**	**----**	----	**----**	**17-Apr-2025**	04-Oct-2025	✓
Snap Lock Bag - ACM/Asbestos Grab Bag (EA200) TA-MB414/0.4, TA-MB414/1.5, TA-MB414/2.0	**08-Apr-2025**	**----**	----	**----**	**17-Apr-2025**	05-Oct-2025	✓
Snap Lock Bag - ACM/Asbestos Grab Bag (EA200) TA-MB415/0.3, TA-MB415/1.8, TA-MB415/2.8, TA-MB415/3.3	**09-Apr-2025**	**----**	----	**----**	**17-Apr-2025**	06-Oct-2025	✓
Snap Lock Bag - ACM/Asbestos Grab Bag (EA200) TA-MB416/0.4, TA-MB416/2.3, TA-MB416/2.8, TA-MB416/3.2, TA-TP456/0.3, TA-TP456/0.8, QCP03	**10-Apr-2025**	**----**	----	**----**	**17-Apr-2025**	07-Oct-2025	✓
Snap Lock Bag - ACM/Asbestos Grab Bag (EA200) TA-MB411/0.2, TA-MB411/2.2, TA-MB411/2.8	**11-Apr-2025**	**----**	----	**----**	**17-Apr-2025**	08-Oct-2025	✓
ED006: Exchangeable Cations on Alkaline Soils							
Soil Glass Jar - Unpreserved (ED006) TA-TP456/0.3	**10-Apr-2025**	**17-Apr-2025**	08-May-2025	✓	**23-Apr-2025**	08-May-2025	✓
ED007: Exchangeable Cations							
Soil Glass Jar - Unpreserved (ED007) TA-TP456/0.3	**10-Apr-2025**	**17-Apr-2025**	08-May-2025	✓	**23-Apr-2025**	08-May-2025	✓
ED008: Exchangeable Cations							
Soil Glass Jar - Unpreserved (ED008) TA-TP456/0.3	**10-Apr-2025**	**17-Apr-2025**	08-May-2025	✓	**23-Apr-2025**	08-May-2025	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) TA-MB412/0.4, TA-MB412/1.5, TA-MB412/2.3, TA-MB412/3.0, QCP02	**07-Apr-2025**	**24-Apr-2025**	04-Oct-2025	✓	**24-Apr-2025**	04-Oct-2025	✓
Soil Glass Jar - Unpreserved (EG005T) TA-MB414/0.4, TA-MB414/1.5, TA-MB414/2.0	**08-Apr-2025**	**24-Apr-2025**	05-Oct-2025	✓	**24-Apr-2025**	05-Oct-2025	✓
Soil Glass Jar - Unpreserved (EG005T) TA-MB415/0.3, TA-MB415/1.8, TA-MB415/2.8, TA-MB415/3.3	**09-Apr-2025**	**24-Apr-2025**	06-Oct-2025	✓	**24-Apr-2025**	06-Oct-2025	✓
Soil Glass Jar - Unpreserved (EG005T) TA-MB416/0.4, TA-MB416/2.3, TA-MB416/2.8, TA-MB416/3.2, TA-TP456/0.3, TA-TP456/0.8, QCP03	**10-Apr-2025**	**24-Apr-2025**	07-Oct-2025	✓	**24-Apr-2025**	07-Oct-2025	✓
Soil Glass Jar - Unpreserved (EG005T) TA-MB411/0.2, TA-MB411/2.2, TA-MB411/2.8	**11-Apr-2025**	**24-Apr-2025**	08-Oct-2025	✓	**24-Apr-2025**	08-Oct-2025	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) TA-MB412/0.4, TA-MB412/1.5, TA-MB412/2.3, TA-MB412/3.0, QCP02	**07-Apr-2025**	**24-Apr-2025**	05-May-2025	✓	**27-Apr-2025**	05-May-2025	✓
Soil Glass Jar - Unpreserved (EG035T) TA-MB414/0.4, TA-MB414/1.5, TA-MB414/2.0	**08-Apr-2025**	**24-Apr-2025**	06-May-2025	✓	**27-Apr-2025**	06-May-2025	✓
Soil Glass Jar - Unpreserved (EG035T) TA-MB415/0.3, TA-MB415/1.8, TA-MB415/2.8, TA-MB415/3.3	**09-Apr-2025**	**24-Apr-2025**	07-May-2025	✓	**27-Apr-2025**	07-May-2025	✓
Soil Glass Jar - Unpreserved (EG035T) TA-MB416/0.4, TA-MB416/2.3, TA-MB416/2.8, TA-MB416/3.2, TA-TP456/0.3, TA-TP456/0.8, QCP03	**10-Apr-2025**	**24-Apr-2025**	08-May-2025	✓	**27-Apr-2025**	08-May-2025	✓
Soil Glass Jar - Unpreserved (EG035T) TA-MB411/0.2, TA-MB411/2.2, TA-MB411/2.8	**11-Apr-2025**	**24-Apr-2025**	09-May-2025	✓	**27-Apr-2025**	09-May-2025	✓
EP004: Organic Matter							
Soil Glass Jar - Unpreserved (EP004) TA-TP456/0.3	**10-Apr-2025**	**24-Apr-2025**	08-May-2025	✓	**28-Apr-2025**	08-May-2025	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP066: Polychlorinated Biphenyls (PCB)							
Soil Glass Jar - Unpreserved (EP066) TA-MB412/0.4, TA-MB412/1.5, TA-MB412/2.3, TA-MB412/3.0, QCP02	**07-Apr-2025**	**17-Apr-2025**	21-Apr-2025	✓	**19-Apr-2025**	27-May-2025	✓
Soil Glass Jar - Unpreserved (EP066) TA-MB414/0.4, TA-MB414/1.5, TA-MB414/2.0	**08-Apr-2025**	**22-Apr-2025**	22-Apr-2025	✓	**23-Apr-2025**	01-Jun-2025	✓
Soil Glass Jar - Unpreserved (EP066) TA-MB415/0.3, TA-MB415/1.8, TA-MB415/2.8, TA-MB415/3.3	**09-Apr-2025**	**22-Apr-2025**	23-Apr-2025	✓	**23-Apr-2025**	01-Jun-2025	✓
Soil Glass Jar - Unpreserved (EP066) TA-MB416/0.4, TA-MB416/2.3	**10-Apr-2025**	**22-Apr-2025**	24-Apr-2025	✓	**23-Apr-2025**	01-Jun-2025	✓
Soil Glass Jar - Unpreserved (EP066) TA-MB416/2.8, TA-MB416/3.2, TA-TP456/0.3, TA-TP456/0.8, QCP03	**10-Apr-2025**	**22-Apr-2025**	24-Apr-2025	✓	**24-Apr-2025**	01-Jun-2025	✓
Soil Glass Jar - Unpreserved (EP066) TA-MB411/0.2, TA-MB411/2.2, TA-MB411/2.8	**11-Apr-2025**	**22-Apr-2025**	25-Apr-2025	✓	**23-Apr-2025**	01-Jun-2025	✓
EP075(SIM)A: Phenolic Compounds							
Soil Glass Jar - Unpreserved (EP075(SIM)) TA-MB412/0.4	**07-Apr-2025**	**17-Apr-2025**	21-Apr-2025	✓	**17-Apr-2025**	27-May-2025	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) TA-MB412/1.5, TA-MB412/2.3, TA-MB412/3.0, QCP02	**07-Apr-2025**	**17-Apr-2025**	21-Apr-2025	✓	**22-Apr-2025**	27-May-2025	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) TA-MB414/0.4, TA-MB414/1.5, TA-MB414/2.0	**08-Apr-2025**	**22-Apr-2025**	22-Apr-2025	✓	**24-Apr-2025**	01-Jun-2025	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) TA-MB415/0.3, TA-MB415/1.8	**09-Apr-2025**	**22-Apr-2025**	23-Apr-2025	✓	**23-Apr-2025**	01-Jun-2025	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) TA-MB415/2.8, TA-MB415/3.3	**09-Apr-2025**	**22-Apr-2025**	23-Apr-2025	✓	**24-Apr-2025**	01-Jun-2025	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) TA-MB416/0.4, TA-MB416/2.3, TA-MB416/2.8, TA-MB416/3.2, TA-TP456/0.3, TA-TP456/0.8, QCP03	**10-Apr-2025**	**22-Apr-2025**	24-Apr-2025	✓	**24-Apr-2025**	01-Jun-2025	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) TA-MB411/0.2, TA-MB411/2.2, TA-MB411/2.8	**11-Apr-2025**	**22-Apr-2025**	25-Apr-2025	✓	**24-Apr-2025**	01-Jun-2025	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075-TAS) TA-MB412/0.4, TA-MB412/1.5, TA-MB412/2.3, TA-MB412/3.0, QCP02	**07-Apr-2025**	**17-Apr-2025**	21-Apr-2025	✓	**18-Apr-2025**	27-May-2025	✓
Soil Glass Jar - Unpreserved (EP075-TAS) TA-MB414/0.4, TA-MB414/1.5, TA-MB414/2.0	**08-Apr-2025**	**22-Apr-2025**	22-Apr-2025	✓	**25-Apr-2025**	01-Jun-2025	✓
Soil Glass Jar - Unpreserved (EP075-TAS) TA-MB415/0.3, TA-MB415/1.8, TA-MB415/2.8, TA-MB415/3.3	**09-Apr-2025**	**22-Apr-2025**	23-Apr-2025	✓	**25-Apr-2025**	01-Jun-2025	✓
Soil Glass Jar - Unpreserved (EP075-TAS) TA-MB416/0.4, TA-MB416/2.3, TA-MB416/2.8, TA-MB416/3.2, TA-TP456/0.3, TA-TP456/0.8, QCP03	**10-Apr-2025**	**22-Apr-2025**	24-Apr-2025	✓	**25-Apr-2025**	01-Jun-2025	✓
Soil Glass Jar - Unpreserved (EP075-TAS) TA-MB411/0.2, TA-MB411/2.2, TA-MB411/2.8	**11-Apr-2025**	**22-Apr-2025**	25-Apr-2025	✓	**25-Apr-2025**	01-Jun-2025	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080) TA-MB412/0.4, TA-MB412/1.5, TA-MB412/2.3, TA-MB412/3.0, QCP02	**07-Apr-2025**	**17-Apr-2025**	21-Apr-2025	✓	**17-Apr-2025**	21-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP071) TA-MB412/0.4, TA-MB412/1.5, TA-MB412/2.3, TA-MB412/3.0, QCP02	**07-Apr-2025**	**17-Apr-2025**	21-Apr-2025	✓	**22-Apr-2025**	27-May-2025	✓
Soil Glass Jar - Unpreserved (EP080) TA-MB414/0.4, TA-MB414/1.5, TA-MB414/2.0	**08-Apr-2025**	**17-Apr-2025**	22-Apr-2025	✓	**17-Apr-2025**	22-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP071) TA-MB414/0.4, TA-MB414/1.5, TA-MB414/2.0	**08-Apr-2025**	**22-Apr-2025**	22-Apr-2025	✓	**23-Apr-2025**	01-Jun-2025	✓
Soil Glass Jar - Unpreserved (EP080) TA-MB415/0.3, TA-MB415/1.8, TA-MB415/2.8, TA-MB415/3.3	**09-Apr-2025**	**22-Apr-2025**	23-Apr-2025	✓	**23-Apr-2025**	23-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP080) TA-TP456/0.3	**10-Apr-2025**	**19-Apr-2025**	24-Apr-2025	✓	**23-Apr-2025**	24-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP080) TA-MB416/0.4, TA-MB416/2.3, TA-MB416/2.8, TA-MB416/3.2, TA-TP456/0.3, TA-TP456/0.8, QCP03	**10-Apr-2025**	**22-Apr-2025**	24-Apr-2025	✓	**23-Apr-2025**	24-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP080) TA-MB411/0.2, TA-MB411/2.2, TA-MB411/2.8	**11-Apr-2025**	**22-Apr-2025**	25-Apr-2025	✓	**23-Apr-2025**	25-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP080) TB02	**14-Apr-2025**	**22-Apr-2025**	28-Apr-2025	✓	**24-Apr-2025**	28-Apr-2025	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080) TA-MB412/0.4, TA-MB412/1.5, TA-MB412/2.3, TA-MB412/3.0, QCP02	**07-Apr-2025**	**17-Apr-2025**	21-Apr-2025	✓	**17-Apr-2025**	21-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP071) TA-MB412/0.4, TA-MB412/1.5, TA-MB412/2.3, TA-MB412/3.0, QCP02	**07-Apr-2025**	**17-Apr-2025**	21-Apr-2025	✓	**22-Apr-2025**	27-May-2025	✓
Soil Glass Jar - Unpreserved (EP080) TA-MB414/0.4, TA-MB414/1.5, TA-MB414/2.0	**08-Apr-2025**	**17-Apr-2025**	22-Apr-2025	✓	**17-Apr-2025**	22-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP071) TA-MB414/0.4, TA-MB414/1.5, TA-MB414/2.0	**08-Apr-2025**	**22-Apr-2025**	22-Apr-2025	✓	**23-Apr-2025**	01-Jun-2025	✓
Soil Glass Jar - Unpreserved (EP080) TA-MB415/0.3, TA-MB415/1.8, TA-MB415/2.8, TA-MB415/3.3	**09-Apr-2025**	**22-Apr-2025**	23-Apr-2025	✓	**23-Apr-2025**	23-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP080) TA-TP456/0.3	**10-Apr-2025**	**19-Apr-2025**	24-Apr-2025	✓	**23-Apr-2025**	24-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP080) TA-MB416/0.4, TA-MB416/2.3, TA-MB416/2.8, TA-MB416/3.2, TA-TP456/0.3, TA-TP456/0.8, QCP03	**10-Apr-2025**	**22-Apr-2025**	24-Apr-2025	✓	**23-Apr-2025**	24-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP080) TA-MB411/0.2, TA-MB411/2.2, TA-MB411/2.8	**11-Apr-2025**	**22-Apr-2025**	25-Apr-2025	✓	**23-Apr-2025**	25-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP080) TB02	**14-Apr-2025**	**22-Apr-2025**	28-Apr-2025	✓	**24-Apr-2025**	28-Apr-2025	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080) TA-MB412/0.4, TA-MB412/1.5, TA-MB412/2.3, TA-MB412/3.0, QCP02	**07-Apr-2025**	**17-Apr-2025**	21-Apr-2025	✓	**17-Apr-2025**	21-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP080) TA-MB414/0.4, TA-MB414/1.5, TA-MB414/2.0	**08-Apr-2025**	**17-Apr-2025**	22-Apr-2025	✓	**17-Apr-2025**	22-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP080) TA-MB415/0.3, TA-MB415/1.8, TA-MB415/2.8, TA-MB415/3.3	**09-Apr-2025**	**22-Apr-2025**	23-Apr-2025	✓	**23-Apr-2025**	23-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP080) TA-TP456/0.3	**10-Apr-2025**	**19-Apr-2025**	24-Apr-2025	✓	**23-Apr-2025**	24-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP080) TA-MB416/0.4, TA-MB416/2.3, TA-MB416/2.8, TA-MB416/3.2, TA-TP456/0.8, QCP03	**10-Apr-2025**	**22-Apr-2025**	24-Apr-2025	✓	**23-Apr-2025**	24-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP080) TA-MB411/0.2, TA-MB411/2.2, TA-MB411/2.8	**11-Apr-2025**	**22-Apr-2025**	25-Apr-2025	✓	**23-Apr-2025**	25-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP080) TB02	**14-Apr-2025**	**22-Apr-2025**	28-Apr-2025	✓	**24-Apr-2025**	28-Apr-2025	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X) TA-MB412/0.4, TA-MB412/1.5, TA-MB412/2.3, TA-MB412/3.0, QCP02	**07-Apr-2025**	**28-Apr-2025**	04-Oct-2025	✓	**28-Apr-2025**	07-Jun-2025	✓
HDPE Soil Jar (EP231X) TA-MB414/0.4, TA-MB414/1.5, TA-MB414/2.0	**08-Apr-2025**	**28-Apr-2025**	05-Oct-2025	✓	**28-Apr-2025**	07-Jun-2025	✓
HDPE Soil Jar (EP231X) TA-MB415/0.3, TA-MB415/1.8, TA-MB415/2.8, TA-MB415/3.3	**09-Apr-2025**	**28-Apr-2025**	06-Oct-2025	✓	**28-Apr-2025**	07-Jun-2025	✓
HDPE Soil Jar (EP231X) TA-MB416/0.4, TA-MB416/2.3, TA-MB416/2.8, TA-MB416/3.2, TA-TP456/0.3, TA-TP456/0.8, QCP03	**10-Apr-2025**	**28-Apr-2025**	07-Oct-2025	✓	**28-Apr-2025**	07-Jun-2025	✓
HDPE Soil Jar (EP231X) TA-MB411/0.2, TA-MB411/2.2, TA-MB411/2.8	**11-Apr-2025**	**28-Apr-2025**	08-Oct-2025	✓	**28-Apr-2025**	07-Jun-2025	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X) TA-MB412/0.4, TA-MB412/1.5, TA-MB412/2.3, TA-MB412/3.0, QCP02	**07-Apr-2025**	**28-Apr-2025**	04-Oct-2025	✓	**28-Apr-2025**	07-Jun-2025	✓
HDPE Soil Jar (EP231X) TA-MB414/0.4, TA-MB414/1.5, TA-MB414/2.0	**08-Apr-2025**	**28-Apr-2025**	05-Oct-2025	✓	**28-Apr-2025**	07-Jun-2025	✓
HDPE Soil Jar (EP231X) TA-MB415/0.3, TA-MB415/1.8, TA-MB415/2.8, TA-MB415/3.3	**09-Apr-2025**	**28-Apr-2025**	06-Oct-2025	✓	**28-Apr-2025**	07-Jun-2025	✓
HDPE Soil Jar (EP231X) TA-MB416/0.4, TA-MB416/2.3, TA-MB416/2.8, TA-MB416/3.2, TA-TP456/0.3, TA-TP456/0.8, QCP03	**10-Apr-2025**	**28-Apr-2025**	07-Oct-2025	✓	**28-Apr-2025**	07-Jun-2025	✓
HDPE Soil Jar (EP231X) TA-MB411/0.2, TA-MB411/2.2, TA-MB411/2.8	**11-Apr-2025**	**28-Apr-2025**	08-Oct-2025	✓	**28-Apr-2025**	07-Jun-2025	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X) TA-MB412/0.4, TA-MB412/1.5, TA-MB412/2.3, TA-MB412/3.0, QCP02	**07-Apr-2025**	**28-Apr-2025**	04-Oct-2025	✓	**28-Apr-2025**	07-Jun-2025	✓
HDPE Soil Jar (EP231X) TA-MB414/0.4, TA-MB414/1.5, TA-MB414/2.0	**08-Apr-2025**	**28-Apr-2025**	05-Oct-2025	✓	**28-Apr-2025**	07-Jun-2025	✓
HDPE Soil Jar (EP231X) TA-MB415/0.3, TA-MB415/1.8, TA-MB415/2.8, TA-MB415/3.3	**09-Apr-2025**	**28-Apr-2025**	06-Oct-2025	✓	**28-Apr-2025**	07-Jun-2025	✓
HDPE Soil Jar (EP231X) TA-MB416/0.4, TA-MB416/2.3, TA-MB416/2.8, TA-MB416/3.2, TA-TP456/0.3, TA-TP456/0.8, QCP03	**10-Apr-2025**	**28-Apr-2025**	07-Oct-2025	✓	**28-Apr-2025**	07-Jun-2025	✓
HDPE Soil Jar (EP231X) TA-MB411/0.2, TA-MB411/2.2, TA-MB411/2.8	**11-Apr-2025**	**28-Apr-2025**	08-Oct-2025	✓	**28-Apr-2025**	07-Jun-2025	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X) TA-MB412/0.4, TA-MB412/1.5, TA-MB412/2.3, TA-MB412/3.0, QCP02	**07-Apr-2025**	**28-Apr-2025**	04-Oct-2025	✓	**28-Apr-2025**	07-Jun-2025	✓
HDPE Soil Jar (EP231X) TA-MB414/0.4, TA-MB414/1.5, TA-MB414/2.0	**08-Apr-2025**	**28-Apr-2025**	05-Oct-2025	✓	**28-Apr-2025**	07-Jun-2025	✓
HDPE Soil Jar (EP231X) TA-MB415/0.3, TA-MB415/1.8, TA-MB415/2.8, TA-MB415/3.3	**09-Apr-2025**	**28-Apr-2025**	06-Oct-2025	✓	**28-Apr-2025**	07-Jun-2025	✓
HDPE Soil Jar (EP231X) TA-MB416/0.4, TA-MB416/2.3, TA-MB416/2.8, TA-MB416/3.2, TA-TP456/0.3, TA-TP456/0.8, QCP03	**10-Apr-2025**	**28-Apr-2025**	07-Oct-2025	✓	**28-Apr-2025**	07-Jun-2025	✓
HDPE Soil Jar (EP231X) TA-MB411/0.2, TA-MB411/2.2, TA-MB411/2.8	**11-Apr-2025**	**28-Apr-2025**	08-Oct-2025	✓	**28-Apr-2025**	07-Jun-2025	✓

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)							
Benzo(a)pyrene and other PAHs - Waste Classification (TAS requirements)	EP075-TAS	3	22	**13.64**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5) on 40°C dried soil	EA010-AD	1	4	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations	ED007	1	4	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	3	23	**13.04**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	3	22	**13.64**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5) on 40°C dried soil	EA002-AD	1	4	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH in soil using a 0.01M CaCl2 extract	EA001	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	3	22	**13.64**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	3	22	**13.64**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	5	46	**10.87**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Benzo(a)pyrene and other PAHs - Waste Classification (TAS requirements)	EP075-TAS	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5) on 40°C dried soil	EA010-AD	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations	ED007	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5) on 40°C dried soil	EA002-AD	2	4	**50.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH in soil using a 0.01M CaCl2 extract	EA001	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	3	46	**6.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Benzo(a)pyrene and other PAHs - Waste Classification (TAS requirements)	EP075-TAS	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5) on 40°C dried soil	EA010-AD	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations	ED007	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

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*	
Method Blanks (MB) - Continued							
PAH/Phenols (SIM)	EP075(SIM)	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	3	46	**6.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Benzo(a)pyrene and other PAHs - Waste Classification (TAS requirements)	EP075-TAS	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	3	46	**6.52**	**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
pH in soil using a 0.01M CaCl2 extract	EA001	SOIL	In house: Referenced to Rayment and Lyons 4B3 (mod.) or 4B4 (mod.) 10 g of soil is mixed with 50 mL of 0.01M CaCl2 and tumbled end over end for 1 hour. pH is measured from the continuous suspension. This method is compliant with NEPM Schedule B(3).
pH (1:5) on 40°C dried soil	EA002-AD	SOIL	In house: Referenced to Rayment and Lyons 4A1 and APHA 4500H+. pH is determined on 40°C dried soil after a 1:5 soil/water leach. This method is compliant with NEPM Schedule B(3)
Electrical Conductivity (1:5) on 40°C dried soil	EA010-AD	SOIL	In house: Referenced to Rayment and Lyons 3A1 and APHA 2510. Conductivity is determined on soil samples dried at 40°C using a 1:5 soil/water leach. This method is compliant with NEPM Schedule B(3).
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).
Particle Size Analysis by Hydrometer	EA150H	SOIL	Particle Size Analysis by Hydrometer according to AS1289.3.6.3
Soil Particle Density	EA152	SOIL	Soil Particle Density by AS 1289.3.5.1: Methods of testing soils for engineering purposes - Soil classification tests - Determination of the soil particle density of a soil - Standard method
Asbestos Identification in Soils	EA200	SOIL	AS 4964 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining
Exchangeable Cations on Alkaline Soils	* ED006	SOIL	In house: Referenced to Soil Survey Test Method C5. Soluble salts are removed from the sample prior to analysis. Cations are exchanged from the sample by contact with alcoholic ammonium chloride at pH 8.5. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil.
Exchangeable Cations	ED007	SOIL	In house: Referenced to Rayment & Lyons Method 15A1. Cations are exchanged from the sample by contact with Ammonium Chloride. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil. This method is compliant with NEPM Schedule B(3).
Exchangeable Cations with pre-treatment	ED008	SOIL	In house: Referenced to Rayment & Lyons Method 15A2. Soluble salts are removed from the sample prior to analysis. Cations are exchanged from the sample by contact with Ammonium Chloride. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil. 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 (SnCl2) (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 SnCl2 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)
Organic Matter	EP004	SOIL	In house: Referenced to AS1289.4.1.1. Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM Schedule B(3)

Analytical Methods	Method	Matrix	Method Descriptions
Polychlorinated Biphenyls (PCB)	EP066	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point 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).
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
Benzo(a)pyrene and other PAHs - Waste Classification (TAS requirements)	EP075-TAS	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is 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.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by negative mode LC-ESI-MS/MS using MRM and isotope dilution or internal standard quantitation. A portion of homogenised sample is extracted along with isotope dilution standards (where commercially available) in a solution of ammonium acetate in acetonitrile/methanol. Where relevant, interferences from co-extracted organics are removed using dispersive clean-up media (dSPE). A portion of extract is combined with an equal volume of reagent water and filtered for instrumental analysis.

Preparation Methods	Method	Matrix	Method Descriptions
pH in soil using a 0.01M CaCl2 extract	EA001-PR	SOIL	In house: Referenced to Rayment and Lyons 4B1, 10 g of soil is mixed with 50 mL of 0.01M CaCl2 and tumbled end over end for 1 hour. pH is measured from the continuous suspension. This method is compliant with NEPM Schedule B(3).
Exchangeable Cations Preparation Method (Alkaline Soils)	* ED006PR	SOIL	In house: Referenced to Rayment and Lyons method 15C1.
Exchangeable Cations Preparation Method	ED007PR	SOIL	In house: Referenced to Rayment & Lyons method 15A1. A 1M NH4Cl extraction by end over end tumbling at a ratio of 1:20. There is no pretreatment for soluble salts. Extracts can be run by ICP for cations.
1:5 solid / water leach following drying at 40°C	EN34-AD	SOIL	10 g of 40°C dried soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
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).
Organic Matter	EP004-PR	SOIL	In house: Referenced to AS1289.4.1.1. Dichromate oxidation method after Walkley and Black. 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.

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 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.
Tumbler Extraction of Solids - VIC EPA Screen	ORG17-EM	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 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.
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

QUALITY CONTROL REPORT

Work Order	: **EM2506417**	Page	: 1 of 19
Client	: **PITT & SHERRY (OPERATIONS) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: CARLY CLARK	Contact	: Hannah White
Address	: 199 MACQUARIE STREET HOBART 7001	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: 03 9674 4163	Telephone	: +61-3-8549 9600
Project	: Tarraleah Switchyard Soil Sampling	Date Samples Received	: 14-Apr-2025
Order number	: P.24.1136	Date Analysis Commenced	: 17-Apr-2025
C-O-C number	: ----	Issue Date	: 30-Apr-2025
Sampler	: Eduardo Pereira Maes		
Site	: ----		
Quote number	: EM25PITSHE0004_V4		
No. of samples received	: 23		
No. of samples analysed	: 23		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

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.

Signatories	*Position*	*Accreditation Category*
Aleksandar Vujkovic	Laboratory Technician	Newcastle - Inorganics, Mayfield West, NSW
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC
Tim Kuo	Approved Asbestos Identifier	Melbourne Asbestos, 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
* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

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: 6526694)									
EM2506417-001	TA-MB411/0.2	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	206	213	3.5	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	85	85	0.0	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	46	53	14.2	0% - 50%
		EG005T: Lead	7439-92-1	5	mg/kg	16	14	14.8	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	122	128	5.1	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	107000	101000	5.6	0% - 20%
EM2506417-010	TA-MB414/2.0	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	50	48	4.5	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	37	36	3.3	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	51	51	0.0	0% - 50%
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	53	53	0.0	0% - 50%
		EG005T: Iron	7439-89-6	50	mg/kg	60600	59400	2.2	0% - 20%
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 6526696)									
EM2506417-021	QCP02	EG005T: Cadmium	7440-43-9	1	mg/kg	1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	96	91	5.2	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	48	48	0.0	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	17	19	9.9	No Limit

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: 6526696) - continued									
EM2506417-021	QCP02	EG005T: Copper	7440-50-8	5	mg/kg	56	55	3.0	0% - 50%
		EG005T: Lead	7439-92-1	5	mg/kg	18	12	35.9	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	222	192	14.3	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	63700	68800	7.6	0% - 20%
EM2506618-009	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	28	26	7.6	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	8	8	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	16	15	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	23	22	7.4	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	63	66	4.5	0% - 50%
		EG005T: Iron	7439-89-6	50	mg/kg	27900	26200	6.2	0% - 20%
EA001: pH in soil using 0.01M CaCl extract (QC Lot: 6515513)									
EM2506397-049	Anonymous	EA001: pH (CaCl2)	----	0.1	pH Unit	6.5	6.5	0.0	0% - 20%
EM2506478-032	Anonymous	EA001: pH (CaCl2)	----	0.1	pH Unit	7.7	7.6	0.0	0% - 20%
EA002-AD: pH (Soils) dried at 40°C (QC Lot: 6520027)									
EM2506417-019	TA-TP456/0.3	EA002-AD: pH Value	----	0.1	pH Unit	5.6	5.6	0.0	0% - 20%
EA010-AD: Conductivity (Soils) dried at 40°C (QC Lot: 6520026)									
EM2506417-019	TA-TP456/0.3	EA010-AD: Electrical Conductivity @ 25°C	----	1	µS/cm	76	74	1.7	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 6518730)									
EM2506417-001	TA-MB411/0.2	EA055: Moisture Content	----	0.1 (1.0)*	%	32.8	33.4	1.7	0% - 20%
EM2506417-011	TA-MB415/0.3	EA055: Moisture Content	----	0.1 (1.0)*	%	26.6	27.5	3.2	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 6518731)									
EM2506417-021	QCP02	EA055: Moisture Content	----	0.1 (1.0)*	%	30.4	30.8	1.4	0% - 20%
ED007: Exchangeable Cations (QC Lot: 6520031)									
EM2506417-019	TA-TP456/0.3	ED007: Exchangeable Calcium	----	0.1	meq/100g	12.6	12.2	3.1	0% - 20%
		ED007: Exchangeable Magnesium	----	0.1	meq/100g	5.7	5.6	1.8	0% - 20%
		ED007: Exchangeable Potassium	----	0.1	meq/100g	1.1	1.1	0.0	0% - 50%
		ED007: Exchangeable Sodium	----	0.1	meq/100g	0.2	0.2	0.0	No Limit
		ED007: Cation Exchange Capacity	----	0.1	meq/100g	19.6	19.1	2.6	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 6526693)									
EM2506417-001	TA-MB411/0.2	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.1	0.1	0.0	No Limit
EM2506417-010	TA-MB414/2.0	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 6526695)									
EM2506417-021	QCP02	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.1	0.1	0.0	No Limit
EM2506618-009	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit

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 (%)*
EP004: Organic Matter (QC Lot: 6530035)									
EM2506417-019	TA-TP456/0.3	EP004: Organic Matter	----	0.5	%	7.8	8.0	2.5	0% - 50%
		EP004: Total Organic Carbon	----	0.5	%	4.5	4.6	2.5	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 6517129)									
EM2506417-004	TA-MB412/0.4	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 6521709)									
EM2506417-001	TA-MB411/0.2	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EM2506417-015	TA-MB416/0.4	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 6517130)									
EM2506417-004	TA-MB412/0.4	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 6521710)									
EM2506417-001	TA-MB411/0.2	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
EM2506417-015	TA-MB416/0.4	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

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 (%)*
EP075(SIM)A: Phenolic Compounds (QC Lot: 6521710) - continued									
EM2506417-015	TA-MB416/0.4	EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
EP075B: Polynuclear Aromatic Hydrocarbons (QC Lot: 6517135)									
EM2506417-004	TA-MB412/0.4	EP075-TAS: Benzo(a)pyrene	50-32-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP075-TAS: Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1	mg/kg	<1.0	<1.0	0.0	No Limit
EP075B: Polynuclear Aromatic Hydrocarbons (QC Lot: 6521662)									
EM2506417-001	TA-MB411/0.2	EP075-TAS: Benzo(a)pyrene	50-32-8	0.05 (0.14)*	mg/kg	<0.14	<0.14	0.0	No Limit
		EP075-TAS: Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

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 (%)*
EP075B: Polynuclear Aromatic Hydrocarbons (QC Lot: 6521662) - continued									
EM2506417-001	TA-MB411/0.2	EP075-TAS: Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1	mg/kg	<1.0	<1.0	0.0	No Limit
EM2506417-015	TA-MB416/0.4	EP075-TAS: Benzo(a)pyrene	50-32-8	0.05 (0.14)*	mg/kg	<0.14	<0.14	0.0	No Limit
		EP075-TAS: Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1	mg/kg	<1.0	<1.0	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6517093)									
EM2506417-004	TA-MB412/0.4	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6517131)									
EM2506417-004	TA-MB412/0.4	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
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6521711)									
EM2506417-001	TA-MB411/0.2	EP071: C15 - C28 Fraction	----	100	mg/kg	170	<100	53.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	420	240	53.7	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EM2506417-015	TA-MB416/0.4	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
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6522161)									
EM2506417-001	TA-MB411/0.2	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EM2506417-018	TA-MB416/3.2	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6523880)									

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 (%)*
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6523880) - continued									
EM2506505-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EM2506793-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6517093)									
EM2506417-004	TA-MB412/0.4	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: 6517131)									
EM2506417-004	TA-MB412/0.4	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
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6521711)									
EM2506417-001	TA-MB411/0.2	EP071: >C16 - C34 Fraction	----	100	mg/kg	470	260	56.2	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	330	200	50.2	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EM2506417-015	TA-MB416/0.4	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
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6522161)									
EM2506417-001	TA-MB411/0.2	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EM2506417-018	TA-MB416/3.2	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: 6523880)									
EM2506505-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EM2506793-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 6517093)									
EM2506417-004	TA-MB412/0.4	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	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		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
EP080: BTEXN (QC Lot: 6522161)									
EM2506417-001	TA-MB411/0.2	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	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		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

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: 6522161) - continued									
EM2506417-018	TA-MB416/3.2	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	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		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
EP080: BTEXN (QC Lot: 6523880)									
EM2506505-001	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	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		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
EM2506793-001	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	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		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
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 6534987)									
EM2506417-001	TA-MB411/0.2	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EM2506417-011	TA-MB415/0.3	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 6534994)									
EM2506417-021	QCP02	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EM2506778-003	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 6534987)									
EM2506417-001	TA-MB411/0.2	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

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 (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 6534987) - continued									
EM2506417-001	TA-MB411/0.2	EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EM2506417-011	TA-MB415/0.3	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 6534994)									
EM2506417-021	QCP02	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EM2506778-003	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 6534987)									
EM2506417-001	TA-MB411/0.2	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EM2506417-011	TA-MB415/0.3	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 6534994)									

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 (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 6534994) - continued									
EM2506417-021	QCP02	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EM2506778-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 6534987)									
EM2506417-001	TA-MB411/0.2	EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EM2506417-011	TA-MB415/0.3	EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 6534994)									
EM2506417-021	QCP02	EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EM2506778-003	Anonymous	EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	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**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 6526694)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	123 mg/kg	99.0	70.0	130
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	1.23 mg/kg	65.1	50.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	20.2 mg/kg	94.1	70.0	130
EG005T: Copper	7440-50-8	5	mg/kg	<5	55.9 mg/kg	88.3	70.0	130
EG005T: Iron	7439-89-6	50	mg/kg	<50	33227 mg/kg	102	70.0	130
EG005T: Lead	7439-92-1	5	mg/kg	<5	62.4 mg/kg	88.2	70.0	130
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.4 mg/kg	92.5	70.0	130
EG005T: Zinc	7440-66-6	5	mg/kg	<5	162 mg/kg	75.7	70.0	130
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 6526696)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	123 mg/kg	96.2	70.0	130
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	1.23 mg/kg	62.4	50.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	20.2 mg/kg	95.2	70.0	130
EG005T: Copper	7440-50-8	5	mg/kg	<5	55.9 mg/kg	85.9	70.0	130
EG005T: Iron	7439-89-6	----	mg/kg	----	33227 mg/kg	100	70.0	130
EG005T: Lead	7439-92-1	5	mg/kg	<5	62.4 mg/kg	85.6	70.0	130
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.4 mg/kg	91.9	70.0	130
EG005T: Zinc	7440-66-6	5	mg/kg	<5	162 mg/kg	76.9	70.0	130
EA001: pH in soil using 0.01M CaCl extract (QCLot: 6515513)								
EA001: pH (CaCl2)	----	----	pH Unit	----	4 pH Unit	100	98.8	101
				----	7 pH Unit	100	99.3	101
EA002-AD: pH (Soils) dried at 40°C (QCLot: 6520027)								
EA002-AD: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.8	101
				----	7 pH Unit	100	99.3	101
EA010-AD: Conductivity (Soils) dried at 40°C (QCLot: 6520026)								
EA010-AD: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1413 µS/cm	99.8	90.0	110
ED007: Exchangeable Cations (QCLot: 6520031)								
ED007: Exchangeable Calcium	----	0.1	meq/100g	<0.1	24.13 meq/100g	93.4	80.0	130
ED007: Exchangeable Magnesium	----	0.1	meq/100g	<0.1	1.96 meq/100g	91.0	72.2	130
ED007: Exchangeable Potassium	----	0.1	meq/100g	<0.1	1.01 meq/100g	106	77.4	130
ED007: Exchangeable Sodium	----	0.1	meq/100g	<0.1	0.86 meq/100g	117	89.2	130

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED007: Exchangeable Cations (QCLot: 6520031) - continued								
ED007: Cation Exchange Capacity	----	0.1	meq/100g	<0.1	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6526693)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.64 mg/kg	112	69.0	128
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6526695)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.64 mg/kg	106	69.0	128
EP004: Organic Matter (QCLot: 6530035)								
EP004: Organic Matter	----	0.5	%	<0.5	77 %	83.3	70.0	130
EP004: Total Organic Carbon	----	0.5	%	<0.5	43.5 %	85.5	70.0	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 6517129)								
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	120	68.0	133
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 6521709)								
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	124	68.0	133
EP075(SIM)A: Phenolic Compounds (QCLot: 6517130)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	3 mg/kg	81.8	81.2	121
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	3 mg/kg	93.9	83.2	120
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	3 mg/kg	83.1	81.6	123
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	6 mg/kg	106	79.7	129
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	3 mg/kg	81.6	49.8	129
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	3 mg/kg	91.1	81.5	127
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	3 mg/kg	89.5	74.2	125
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	3 mg/kg	82.6	79.8	121
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	3 mg/kg	90.4	71.5	121
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	3 mg/kg	84.8	67.8	119
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	3 mg/kg	80.7	64.5	126
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	6 mg/kg	42.9	10.0	118
EP075(SIM)A: Phenolic Compounds (QCLot: 6521710)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	3 mg/kg	112	81.2	121
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	3 mg/kg	116	83.2	120
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	3 mg/kg	89.6	81.6	123
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	6 mg/kg	95.7	79.7	129
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	3 mg/kg	69.8	49.8	129
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	3 mg/kg	84.5	81.5	127
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	3 mg/kg	82.3	74.2	125
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	3 mg/kg	90.8	79.8	121

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP075(SIM)A: Phenolic Compounds (QCLot: 6521710) - continued								
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	3 mg/kg	93.1	71.5	121
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	3 mg/kg	92.2	67.8	119
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	3 mg/kg	100	64.5	126
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	6 mg/kg	43.1	10.0	118
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 6517135)								
EP075-TAS: Pyrene	129-00-0	0.5	mg/kg	<0.5	2 mg/kg	107	75.4	130
EP075-TAS: Phenanthrene	85-01-8	0.5	mg/kg	<0.5	2 mg/kg	106	73.3	130
EP075-TAS: Naphthalene	91-20-3	0.5	mg/kg	<0.5	2 mg/kg	103	73.0	131
EP075-TAS: Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	2 mg/kg	118	72.1	134
EP075-TAS: Fluorene	86-73-7	0.5	mg/kg	<0.5	2 mg/kg	101	74.4	131
EP075-TAS: Fluoranthene	206-44-0	0.5	mg/kg	<0.5	2 mg/kg	105	75.3	132
EP075-TAS: Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	2 mg/kg	119	72.9	135
EP075-TAS: Chrysene	218-01-9	0.5	mg/kg	<0.5	2 mg/kg	112	75.0	133
EP075-TAS: Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	2 mg/kg	113	71.3	134
EP075-TAS: Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1	mg/kg	<1.0	4 mg/kg	111	75.8	133
EP075-TAS: Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	2 mg/kg	113	69.6	133
EP075-TAS: Anthracene	120-12-7	0.5	mg/kg	<0.5	2 mg/kg	105	78.4	127
EP075-TAS: Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	2 mg/kg	101	72.0	135
EP075-TAS: Acenaphthene	83-32-9	0.5	mg/kg	<0.5	2 mg/kg	99.2	76.3	130
EP075-TAS: Benzo(a)pyrene	50-32-8	0.05	mg/kg	<0.05	2 mg/kg	112	77.5	134
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 6521662)								
EP075-TAS: Pyrene	129-00-0	0.5	mg/kg	<0.5	2 mg/kg	103	75.4	130
EP075-TAS: Phenanthrene	85-01-8	0.5	mg/kg	<0.5	2 mg/kg	98.7	73.3	130
EP075-TAS: Naphthalene	91-20-3	0.5	mg/kg	<0.5	2 mg/kg	99.7	73.0	131
EP075-TAS: Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	2 mg/kg	103	72.1	134
EP075-TAS: Fluorene	86-73-7	0.5	mg/kg	<0.5	2 mg/kg	102	74.4	131
EP075-TAS: Fluoranthene	206-44-0	0.5	mg/kg	<0.5	2 mg/kg	97.0	75.3	132
EP075-TAS: Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	2 mg/kg	104	72.9	135
EP075-TAS: Chrysene	218-01-9	0.5	mg/kg	<0.5	2 mg/kg	105	75.0	133
EP075-TAS: Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	2 mg/kg	99.3	71.3	134
EP075-TAS: Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1	mg/kg	<1.0	4 mg/kg	106	75.8	133
EP075-TAS: Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	2 mg/kg	106	69.6	133
EP075-TAS: Anthracene	120-12-7	0.5	mg/kg	<0.5	2 mg/kg	101	78.4	127

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)
				Result	Concentration	LCS	Low	High
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 6521662) - continued								
EP075-TAS: Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	2 mg/kg	97.8	72.0	135
EP075-TAS: Acenaphthene	83-32-9	0.5	mg/kg	<0.5	2 mg/kg	83.2	76.3	130
EP075-TAS: Benzo(a)pyrene	50-32-8	0.05	mg/kg	<0.05	2 mg/kg	104	77.5	134
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6517093)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	102	58.6	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6517131)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	810 mg/kg	96.0	80.0	120
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	2880 mg/kg	96.1	80.0	120
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1460 mg/kg	97.6	80.0	120
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6521711)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	810 mg/kg	100	80.0	120
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	2880 mg/kg	97.3	80.0	120
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1460 mg/kg	98.3	80.0	120
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6522161)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	81.1	58.6	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6523880)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	101	58.6	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6517093)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	95.6	59.3	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6517131)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	1120 mg/kg	98.7	80.0	120
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	3800 mg/kg	94.6	80.0	120
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	260 mg/kg	107	80.0	120
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6521711)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	1120 mg/kg	97.5	80.0	120
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	3800 mg/kg	98.2	80.0	120
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	260 mg/kg	95.6	80.0	120
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6522161)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	77.0	59.3	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6523880)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	97.4	59.3	128
EP080: BTEXN (QCLot: 6517093)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	90.0	61.6	117
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	92.1	65.8	125

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)
				Result	Concentration	LCS	Low	High
EP080: BTEXN (QCLot: 6517093) - continued								
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	90.9	65.8	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	80.0	64.8	134
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	92.7	68.7	132
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	75.5	61.8	123
EP080: BTEXN (QCLot: 6522161)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	81.7	61.6	117
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	89.5	65.8	125
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	86.5	65.8	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	91.0	64.8	134
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	89.9	68.7	132
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	90.1	61.8	123
EP080: BTEXN (QCLot: 6523880)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	93.2	61.6	117
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	99.1	65.8	125
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	96.0	65.8	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	101	64.8	134
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	107	68.7	132
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	103	61.8	123
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 6534987)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00111 mg/kg	120	72.0	128
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00114 mg/kg	129	67.0	130
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	118	68.0	136
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 6534994)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00111 mg/kg	97.5	72.0	128
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00114 mg/kg	109	67.0	130
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	97.4	68.0	136
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 6534987)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	128	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	122	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	121	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	122	69.0	133

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 6534994)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	111	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.0	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	69.0	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 6534987)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	128	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00119 mg/kg	126	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	133	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00121 mg/kg	116	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 6534994)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	109	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00119 mg/kg	120	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	108	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00121 mg/kg	82.8	70.0	130
EP231P: PFAS Sums (QCLot: 6534987)								
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231P: PFAS Sums (QCLot: 6534994)								
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

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**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 6526694)							
EM2506417-002	TA-MB411/2.2	EG005T: Arsenic	7440-38-2	50 mg/kg	87.2	78.0	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	94.9	79.7	116
		EG005T: Chromium	7440-47-3	50 mg/kg	88.2	79.0	121
		EG005T: Copper	7440-50-8	250 mg/kg	97.9	80.0	120

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: 6526694) - continued							
EM2506417-002	TA-MB411/2.2	EG005T: Lead	7439-92-1	250 mg/kg	95.0	80.0	120
		EG005T: Nickel	7440-02-0	50 mg/kg	95.8	78.0	120
		EG005T: Zinc	7440-66-6	250 mg/kg	92.0	80.0	120
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 6526696)							
EM2506417-022	QCP03	EG005T: Arsenic	7440-38-2	50 mg/kg	87.5	78.0	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	94.2	79.7	116
		EG005T: Chromium	7440-47-3	50 mg/kg	120	79.0	121
		EG005T: Copper	7440-50-8	250 mg/kg	96.3	80.0	120
		EG005T: Lead	7439-92-1	250 mg/kg	93.9	80.0	120
		EG005T: Nickel	7440-02-0	50 mg/kg	94.9	78.0	120
		EG005T: Zinc	7440-66-6	250 mg/kg	92.1	80.0	120
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6526693)							
EM2506417-002	TA-MB411/2.2	EG035T: Mercury	7439-97-6	0.5 mg/kg	111	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6526695)							
EM2506417-022	QCP03	EG035T: Mercury	7439-97-6	0.5 mg/kg	119	70.0	130
EP004: Organic Matter (QCLot: 6530035)							
EM2506778-002	Anonymous	EP004: Organic Matter	----	5.3 %	70.8	70.0	120
		EP004: Total Organic Carbon	----	3.08 %	70.7	70.0	120
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 6517129)							
EM2506417-005	TA-MB412/1.5	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	129	63.2	144
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 6521709)							
EM2506417-002	TA-MB411/2.2	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	123	63.2	144
EP075(SIM)A: Phenolic Compounds (QCLot: 6517130)							
EM2506417-006	TA-MB412/2.3	EP075(SIM): Phenol	108-95-2	3 mg/kg	90.4	77.1	119
		EP075(SIM): 2-Chlorophenol	95-57-8	3 mg/kg	86.9	78.9	123
		EP075(SIM): 2-Nitrophenol	88-75-5	3 mg/kg	74.3	43.8	136
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	3 mg/kg	74.9	61.5	120
		EP075(SIM): Pentachlorophenol	87-86-5	3 mg/kg	51.0	15.3	139
EP075(SIM)A: Phenolic Compounds (QCLot: 6521710)							
EM2506417-002	TA-MB411/2.2	EP075(SIM): Phenol	108-95-2	3 mg/kg	102	77.1	119
		EP075(SIM): 2-Chlorophenol	95-57-8	3 mg/kg	108	78.9	123
		EP075(SIM): 2-Nitrophenol	88-75-5	3 mg/kg	61.0	43.8	136
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	3 mg/kg	102	61.5	120
		EP075(SIM): Pentachlorophenol	87-86-5	3 mg/kg	47.2	15.3	139
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 6517135)							
EM2506417-005	TA-MB412/1.5	EP075-TAS: Pyrene	129-00-0	3 mg/kg	106	37.8	152

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 6517135) - continued							
EM2506417-005	TA-MB412/1.5	EP075-TAS: Acenaphthene	83-32-9	3 mg/kg	89.1	42.6	138
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 6521662)							
EM2506417-002	TA-MB411/2.2	EP075-TAS: Pyrene	129-00-0	3 mg/kg	108	37.8	152
		EP075-TAS: Acenaphthene	83-32-9	3 mg/kg	90.8	42.6	138
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6517093)							
EM2506417-005	TA-MB412/1.5	EP080: C6 - C9 Fraction	----	28 mg/kg	82.9	33.4	124
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6517131)							
EM2506417-007	TA-MB412/3.0	EP071: C10 - C14 Fraction	----	810 mg/kg	91.6	70.0	130
		EP071: C15 - C28 Fraction	----	2880 mg/kg	92.1	70.0	130
		EP071: C29 - C36 Fraction	----	1460 mg/kg	94.1	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6521711)							
EM2506417-003	TA-MB411/2.8	EP071: C10 - C14 Fraction	----	810 mg/kg	96.0	70.0	130
		EP071: C15 - C28 Fraction	----	2880 mg/kg	93.4	70.0	130
		EP071: C29 - C36 Fraction	----	1460 mg/kg	95.6	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6522161)							
EM2506417-002	TA-MB411/2.2	EP080: C6 - C9 Fraction	----	28 mg/kg	59.5	33.4	124
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6523880)							
EM2506505-001	Anonymous	EP080: C6 - C9 Fraction	----	28 mg/kg	86.7	33.4	124
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6517093)							
EM2506417-005	TA-MB412/1.5	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	76.2	30.8	120
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6517131)							
EM2506417-007	TA-MB412/3.0	EP071: >C10 - C16 Fraction	----	1120 mg/kg	94.1	70.0	130
		EP071: >C16 - C34 Fraction	----	3800 mg/kg	90.9	70.0	130
		EP071: >C34 - C40 Fraction	----	260 mg/kg	104	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6521711)							
EM2506417-003	TA-MB411/2.8	EP071: >C10 - C16 Fraction	----	1120 mg/kg	93.3	70.0	130
		EP071: >C16 - C34 Fraction	----	3800 mg/kg	94.6	70.0	130
		EP071: >C34 - C40 Fraction	----	260 mg/kg	95.7	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6522161)							
EM2506417-002	TA-MB411/2.2	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	55.1	30.8	120
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6523880)							
EM2506505-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	82.2	30.8	120
EP080: BTEXN (QCLot: 6517093)							
EM2506417-005	TA-MB412/1.5	EP080: Benzene	71-43-2	2 mg/kg	77.6	54.4	127
		EP080: Toluene	108-88-3	2 mg/kg	83.4	57.1	131

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP080: BTEXN (QCLot: 6522161)							
EM2506417-002	TA-MB411/2.2	EP080: Benzene	71-43-2	2 mg/kg	76.1	54.4	127
		EP080: Toluene	108-88-3	2 mg/kg	82.2	57.1	131
EP080: BTEXN (QCLot: 6523880)							
EM2506505-001	Anonymous	EP080: Benzene	71-43-2	2 mg/kg	106	54.4	127
		EP080: Toluene	108-88-3	2 mg/kg	113	57.1	131
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 6534987)							
EM2506417-002	TA-MB411/2.2	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00111 mg/kg	99.1	72.0	128
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00114 mg/kg	99.0	67.0	130
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	95.0	68.0	136
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 6534994)							
EM2506417-022	QCP03	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00111 mg/kg	96.8	72.0	128
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00114 mg/kg	99.0	67.0	130
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	93.2	68.0	136
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 6534987)							
EM2506417-002	TA-MB411/2.2	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	116	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	103	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	100.0	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	103	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	101	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 6534994)							
EM2506417-022	QCP03	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	108	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	98.8	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	90.2	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	98.7	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	99.8	69.0	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 6534987)							
EM2506417-002	TA-MB411/2.2	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	112	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00119 mg/kg	116	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	123	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00121 mg/kg	123	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 6534994)							
EM2506417-022	QCP03	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	103	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00119 mg/kg	112	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	107	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00121 mg/kg	78.6	70.0	130

CHAIN OF CUSTODY

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207 1/2

CLIENT: pitt&sherry operations	TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☒ Standard or urgent TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: Hobart		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes / No / N/A
PROJECT: Tarraleah Switchyard Soil Sampling	ALS QUOTE NO.: EM24PITSHE0004_V3_P.24.1136	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes / No / N/A
ORDER NUMBER: P.24.1136		COC: 1 (2) 3 4 5 6 7	Random Sample Temperature on Receipt: 15.0 °C
PROJECT MANAGER: Carly Clark	CONTACT PH: 0490 942 344	OF: 1 (2) 3 4 5 6 7	Other comment:
SAMPLER: Eduardo Pereira Maes	SAMPLER MOBILE: 0414 023 658		
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default): ENMRG		
Email Reports to: cclark@pittsh.com.au; EPereiraMaes@pittsh.com.au			
Email Invoice to: cclark@pittsh.com.au; accounts@pittsh.com.au			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Alex Hibberd		CAITLIN (ALS)	Declan M
DATE/TIME:	DATE/TIME:	DATE/TIME: 15/4/25 13:24	DATE/TIME: 15/4 16:20

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	Suite C	Suite D	TCLP Leaching	ASLP Leaching	ASC NEPM Soil Classification	Rinsate 2	Trip Blank		Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
19	TA-TP456/0.3	10.04	S	Glass jar + P + 2x B	4	X				X				
20	TA-TP456/0.8	10.04	S	Glass jar + P + B	3	X								
21	QCP02		S	"	3	X								
22	QCP03		S	"	3	X								
23	QCS02		S	"	3	X								
24	QCS03		S	"	3	X								
25	TB02	11.04	S	Glass jar	1							X		
				TOTAL	0									

A12100 BM 13/4/25

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Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

207 2/2

Caitlin Walker

From: Carly Clark <CClark@pittsh.com.au>
Sent: Tuesday, 15 April 2025 10:02 AM
To: Hannah White
Cc: Eduardo Pereira Maes
Subject: [EXTERNAL] - RE: EM2506417 - PITSHE - P.24.1136

Hi Hannah,

QCP samples are to be analysed by ALS for Suite C please.

QCS samples are to be onforwarded to Eurofins for analysis for Suite C (total concentrations) please:

- Asbestos (presence / absence)
- PCBs
- Phenols
- PAHs (with lower LOR for BaP to allow comparison to IB105 0.08 mg/kg criterion)
- PFAS (short suite)
- BTEXN
- TPH / TRH
- 8 metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg)

Thanks
Carly

pitt&sherry

Carly Clark
CEnvP SC | CEnvP | BSc | MEIANZ | MALGA

Senior Principal
Environmental Consultant

+61 490 942 344
cclark@pittsh.com.au

Connect on LinkedIn

Relinquished by:
CAITLIN (ALS)
15/4/25 13:24

From: Hannah White <hannah.white@ALSGlobal.com>
Sent: Monday, 14 April 2025 2:12 PM
To: Carly Clark <CClark@pittsh.com.au>
Cc: Eduardo Pereira Maes <EPereiraMaes@pittsh.com.au>
Subject: EM2506417 - PITSHE - P.24.1136

Hi Carly and Eduardo,

We received some Tarraleah samples today taken last week, and we have noticed samples with the prefix IDs "QCP" and "QCS" listed.

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www.eurofins.com.au EnviroSales@eurofinsanz.com

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	+61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

Eurofins ARL Pty Ltd

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NATA# 2377
Site# 2370 & 2554

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

Auckland	Auckland (Focus)	Christchurch	Tauranga
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Penrose	Mount Wellington	Rolleston	Gate Pa
Auckland 1061	Auckland 1061	Christchurch 7675	Tauranga 3112
+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Sample Receipt Advice

Company name:	Pitt & Sherry (Operations) Pty Ltd
Contact name:	Carly Clark
Project name:	Tarraleah Switchyard Soil Sampling
Project ID:	P.24. 1136
Turnaround time:	5 Day
Date/Time received	Apr 15, 2025 4:20 PM
Eurofins reference	1210100

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.
X	Split sample sent to requested external lab.
X	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 : +61 3 8564 5051 or by email: Savini.Suduwelikondage@eurofinsanz.com

Results will be delivered electronically via email to Carly Clark - CClark@pittsh.com.au.

Note: A copy of these results will also be delivered to the general Pitt & Sherry (Operations) Pty Ltd email address.

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web: www.eurofins.com.au
email: EnviroSales@eurofinsanz.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

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IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: Pitt & Sherry (Operations) Pty Ltd
Address: 4th Floor, 113 Cimitiere Street
Launceston
Tasmania 7250

Project Name: Tarraleah Switchyard Soil Sampling
Project ID: P.24. 1136

Order No.:
Report #: 1210100
Phone: 03 6323 1900
Fax: 03 6334 4651

Received: Apr 15, 2025 4:20 PM
Due: Apr 24, 2025
Priority: 5 Day
Contact Name: Carly Clark

Eurofins Analytical Services Manager : Savini Suduweli

Sample Detail						Asbestos - AS4964*	Polychlorinated Biphenyls	Metals M8	Phenols (Speciated)	BTEX and Naphthalene	Moisture Set	Total Recoverable Hydrocarbons	Per- and Polyfluoroalkyl Substances (PFASs) - Short
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X
External Laboratory													
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	QC502	Apr 10, 2025		Soil	M25-Ap0044665	X	X	X	X	X	X	X	X
2	QC503	Apr 10, 2025		Soil	M25-Ap0044666	X	X	X	X	X	X	X	X
Test Counts						2	2	2	2	2	2	2	2

Pitt & Sherry (Operations) Pty Ltd
4th Floor, 113 Cimitiere Street
Launceston
Tasmania 7250

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: **Carly Clark**

Report **1210100-S**
Project name Tarraleah Switchyard Soil Sampling
Received Date Apr 15, 2025

Client Sample ID			**QCS02**	**QCS03**
Sample Matrix			**Soil**	**Soil**
Eurofins Sample No.			**M25-Ap0044665**	**M25-Ap0044666**
Date Sampled			**Apr 10, 2025**	**Apr 10, 2025**
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
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	%	81	68
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5
Polychlorinated Biphenyls				
Aroclor-1016	0.1	mg/kg	< 0.1	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	52	52
Tetrachloro-m-xylene (surr.)	1	%	51	145

Client Sample ID			QCS02	QCS03
Sample Matrix			Soil	Soil
Eurofins Sample No.			M25-Ap0044665	M25-Ap0044666
Date Sampled			Apr 10, 2025	Apr 10, 2025
Test/Reference	LOR	Unit		
Phenols (Halogenated)				
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10	< 10
Total Halogenated Phenol*	1	mg/kg	< 1	< 1
Phenols (non-Halogenated)				
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5
2-Nitrophenol	1.0	mg/kg	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4
Total cresols*	0.5	mg/kg	< 0.5	< 0.5
4-Nitrophenol	5	mg/kg	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5
Phenol-d6 (surr.)	1	%	146	51
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20
Polycyclic Aromatic Hydrocarbons (Trace level)				
Acenaphthene	0.005	mg/kg	< 0.005	< 0.005
Acenaphthylene	0.005	mg/kg	< 0.005	< 0.005
Anthracene	0.005	mg/kg	< 0.005	< 0.005
Benz(a)anthracene	0.005	mg/kg	< 0.005	< 0.005
Benzo(a)pyrene - low level	0.005	mg/kg	< 0.005	< 0.005
Benzo(b&j)fluoranthene	0.005	mg/kg	< 0.005	< 0.005
Benzo(g.h.i)perylene	0.005	mg/kg	< 0.005	< 0.005
Benzo(k)fluoranthene	0.005	mg/kg	< 0.005	< 0.005
Chrysene	0.005	mg/kg	< 0.005	< 0.005
Dibenz(a.h)anthracene	0.005	mg/kg	< 0.005	< 0.005
Fluoranthene	0.005	mg/kg	< 0.005	< 0.005
Fluorene	0.005	mg/kg	< 0.005	< 0.005
Indeno(1.2.3-cd)pyrene	0.005	mg/kg	< 0.005	< 0.005
Naphthalene	0.005	mg/kg	< 0.005	< 0.005
Phenanthrene	0.005	mg/kg	< 0.005	< 0.005
Pyrene	0.005	mg/kg	< 0.005	< 0.005
Total PAH*	0.005	mg/kg	< 0.005	< 0.005
2-Fluorobiphenyl (surr.)	1	%	70	71
p-Terphenyl-d14 (surr.)	1	%	90	82
Benzo(a)pyrene TEQ (lower bound) *	0.001	mg/kg	< 0.005	< 0.005
Benzo(a)pyrene TEQ (medium bound) *	0.001	mg/kg	0.006	0.006
Benzo(a)pyrene TEQ (upper bound) *	0.001	mg/kg	0.012	0.012

Client Sample ID			QCS02	QCS03
Sample Matrix			Soil	Soil
Eurofins Sample No.			M25-Ap0044665	M25-Ap0044666
Date Sampled			Apr 10, 2025	Apr 10, 2025
Test/Reference	LOR	Unit		
Heavy Metals				
Arsenic	2	mg/kg	14	< 2
Cadmium	0.4	mg/kg	1.9	< 0.4
Chromium	5	mg/kg	86	260
Copper	5	mg/kg	56	65
Lead	5	mg/kg	17	18
Mercury	0.1	mg/kg	< 0.1	< 0.1
Nickel	5	mg/kg	56	110
Zinc	5	mg/kg	200	110
Sample Properties				
% Moisture	1	%	29	31
Per- and Polyfluoroalkyl Substances (PFASs) - Short				
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10
13C2-6:2 FTSA (surr.)	1	%	98	123
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5
18O2-PFHxS (surr.)	1	%	109	72
13C8-PFOS (surr.)	1	%	109	37
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5
13C8-PFOA (surr.)	1	%	109	56
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5

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
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Apr 16, 2025	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Apr 16, 2025	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Apr 16, 2025	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX and Naphthalene			
BTEX	Melbourne	Apr 16, 2025	14 Days
- Method: LTM-ORG-2010 BTEX and Volatile TRH			
Polychlorinated Biphenyls	Melbourne	Apr 16, 2025	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8082)			
Polycyclic Aromatic Hydrocarbons (Trace level)	Melbourne	Apr 24, 2025	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water (trace)			
Metals M8	Melbourne	Apr 17, 2025	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Per- and Polyfluoroalkyl Substances (PFASs) - Short	Melbourne	Apr 16, 2025	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Phenols (Speciated)			
Phenols (Halogenated)	Melbourne	Apr 16, 2025	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (non-Halogenated)	Melbourne	Apr 16, 2025	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
% Moisture	Melbourne	Apr 15, 2025	14 Days
- Method: LTM-GEN-7080 Moisture			

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Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

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IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: Pitt & Sherry (Operations) Pty Ltd
Address: 4th Floor, 113 Cimitiere Street
Launceston
Tasmania 7250

Project Name: Tarraleah Switchyard Soil Sampling

Order No.: P.24. 1136
Report #: 1210100
Phone: 03 6323 1900
Fax: 03 6334 4651

Received: Apr 15, 2025 4:20 PM
Due: Apr 24, 2025
Priority: 5 Day
Contact Name: Carly Clark

Eurofins Analytical Services Manager : Savini Suduweli

Sample Detail						Asbestos - AS4964*	Polychlorinated Biphenyls	Metals M8	Phenols (Speciated)	BTEX and Naphthalene	Moisture Set	Total Recoverable Hydrocarbons	Per- and Polyfluoroalkyl Substances (PFASs) - Short	Polycyclic Aromatic Hydrocarbons (Trace level)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X
External Laboratory														
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**									
1	QCS02	Apr 10, 2025		Soil	M25-Ap0044665	X	X	X	X	X	X	X	X	X
2	QCS03	Apr 10, 2025		Soil	M25-Ap0044666	X	X	X	X	X	X	X	X	X
Test Counts						2	2	2	2	2	2	2	2	2

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Internal Quality Control Review and Glossary

General

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

Holding Times

Please refer to the '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 before sample receipt deadlines as stated on the SRA.

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

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

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

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
ppm: parts per million
µg/L: micrograms per litre
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
CFU: Colony Forming Unit
Colour: Pt-Co Units (CU)

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
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 moisture has been determined on a solid sample, the result is expressed on a dry weight 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 represents 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 similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (*bis*-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 6.0
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 only be used as a guide 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. SVOCs recoveries 20 – 150%, VOC recoveries 50 – 150%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 6.0, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as 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 are 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	
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							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	
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							
Phenols (Halogenated)							
2-Chlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4.5-Trichlorophenol	mg/kg	< 1			1	Pass	
2.4.6-Trichlorophenol	mg/kg	< 1			1	Pass	
2.6-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
4-Chloro-3-methylphenol	mg/kg	< 1			1	Pass	
Pentachlorophenol	mg/kg	< 1			1	Pass	
Tetrachlorophenols - Total	mg/kg	< 10			10	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	< 20			20	Pass	
2-Methyl-4.6-dinitrophenol	mg/kg	< 5			5	Pass	
2-Nitrophenol	mg/kg	< 1			1.0	Pass	
2.4-Dimethylphenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dinitrophenol	mg/kg	< 5			5	Pass	
2-Methylphenol (o-Cresol)	mg/kg	< 0.2			0.2	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 0.4			0.4	Pass	
4-Nitrophenol	mg/kg	< 5			5	Pass	
Dinoseb	mg/kg	< 20			20	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Phenol	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
Method Blank							
Per- and Polyfluoroalkyl Substances (PFASs) - Short							
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/kg	< 10			10	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons (Trace level)							
Acenaphthene	mg/kg	< 0.005			0.005	Pass	
Acenaphthylene	mg/kg	< 0.005			0.005	Pass	
Anthracene	mg/kg	< 0.005			0.005	Pass	
Benz(a)anthracene	mg/kg	< 0.005			0.005	Pass	
Benzo(a)pyrene - low level	mg/kg	< 0.005			0.005	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.005			0.005	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.005			0.005	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.005			0.005	Pass	
Chrysene	mg/kg	< 0.005			0.005	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.005			0.005	Pass	
Fluoranthene	mg/kg	< 0.005			0.005	Pass	
Fluorene	mg/kg	< 0.005			0.005	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.005			0.005	Pass	
Naphthalene	mg/kg	< 0.005			0.005	Pass	
Phenanthrene	mg/kg	< 0.005			0.005	Pass	
Pyrene	mg/kg	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	91			70-130	Pass	
TRH C10-C14	%	89			70-130	Pass	
TRH C6-C10	%	93			70-130	Pass	
TRH >C10-C16	%	87			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	105			70-130	Pass	
Toluene	%	110			70-130	Pass	
Ethylbenzene	%	110			70-130	Pass	
m&p-Xylenes	%	111			70-130	Pass	
Xylenes - Total*	%	107			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	100			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	92			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Phenols (Halogenated)							
2-Chlorophenol	%	93			25-140	Pass	
2.4-Dichlorophenol	%	65			25-140	Pass	
2.4.5-Trichlorophenol	%	76			25-140	Pass	
2.4.6-Trichlorophenol	%	56			25-140	Pass	
2.6-Dichlorophenol	%	63			25-140	Pass	
4-Chloro-3-methylphenol	%	66			25-140	Pass	
Pentachlorophenol	%	31			25-140	Pass	
Tetrachlorophenols - Total	%	47			25-140	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	%	60			25-140	Pass	
2-Methyl-4.6-dinitrophenol	%	39			25-140	Pass	
2-Nitrophenol	%	67			25-140	Pass	
2.4-Dimethylphenol	%	78			25-140	Pass	
2.4-Dinitrophenol	%	39			25-140	Pass	
2-Methylphenol (o-Cresol)	%	105			25-140	Pass	
3&4-Methylphenol (m&p-Cresol)	%	85			25-140	Pass	
4-Nitrophenol	%	92			25-140	Pass	
Dinoseb	%	55			25-140	Pass	
Phenol	%	97			25-140	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	105			80-120	Pass	
Cadmium	%	108			80-120	Pass	
Chromium	%	113			80-120	Pass	
Copper	%	112			80-120	Pass	
Lead	%	103			80-120	Pass	
Mercury	%	105			80-120	Pass	
Nickel	%	109			80-120	Pass	
Zinc	%	104			80-120	Pass	
LCS - % Recovery							
Per- and Polyfluoroalkyl Substances (PFASs) - Short							
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	90			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	83			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	76			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	97			50-150	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons (Trace level)							
Acenaphthene	%	92			70-130	Pass	
Acenaphthylene	%	93			70-130	Pass	
Anthracene	%	106			70-130	Pass	
Benz(a)anthracene	%	79			70-130	Pass	
Benzo(a)pyrene - low level	%	106			70-130	Pass	
Benzo(b&j)fluoranthene	%	111			70-130	Pass	
Benzo(g.h.i)perylene	%	85			70-130	Pass	
Benzo(k)fluoranthene	%	117			70-130	Pass	
Chrysene	%	112			70-130	Pass	
Dibenz(a.h)anthracene	%	91			70-130	Pass	
Fluoranthene	%	85			70-130	Pass	
Fluorene	%	110			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	99			70-130	Pass	
Naphthalene	%	95			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Phenanthrene			%	111			70-130	Pass	
Pyrene			%	91			70-130	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	M25-Ap0043584	NCP	%	98			70-130	Pass	
TRH C6-C10	M25-Ap0043584	NCP	%	99			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M25-Ap0043584	NCP	%	97			70-130	Pass	
Toluene	M25-Ap0043584	NCP	%	100			70-130	Pass	
Ethylbenzene	M25-Ap0043584	NCP	%	98			70-130	Pass	
m&p-Xylenes	M25-Ap0043584	NCP	%	100			70-130	Pass	
o-Xylene	M25-Ap0043584	NCP	%	101			70-130	Pass	
Xylenes - Total*	M25-Ap0043584	NCP	%	100			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M25-Ap0043584	NCP	%	97			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1016	M25-Ap0022481	NCP	%	102			70-130	Pass	
Aroclor-1260	M25-Ap0022481	NCP	%	100			70-130	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
2-Chlorophenol	M25-Ap0044179	NCP	%	86			30-130	Pass	
2.4-Dichlorophenol	M25-Ap0044179	NCP	%	82			30-130	Pass	
2.4.5-Trichlorophenol	M25-Ap0044179	NCP	%	88			30-130	Pass	
2.4.6-Trichlorophenol	M25-Ap0044179	NCP	%	60			30-130	Pass	
2.6-Dichlorophenol	M25-Ap0044179	NCP	%	75			30-130	Pass	
4-Chloro-3-methylphenol	M25-Ap0044179	NCP	%	64			30-130	Pass	
Pentachlorophenol	M25-Ap0044179	NCP	%	30			30-130	Pass	
Tetrachlorophenols - Total	M25-Ap0044179	NCP	%	51			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Nitrophenol	M25-Ap0044179	NCP	%	66			30-130	Pass	
2.4-Dimethylphenol	M25-Ap0044179	NCP	%	74			30-130	Pass	
2-Methylphenol (o-Cresol)	M25-Ap0044179	NCP	%	87			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	M25-Ap0044179	NCP	%	69			30-130	Pass	
4-Nitrophenol	M25-Ap0044179	NCP	%	34			30-130	Pass	
Phenol	M25-Ap0044179	NCP	%	69			30-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons (Trace level)				Result 1					
Benzo(a)pyrene - low level	M25-Ap0044179	NCP	%	96			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M25-Ap0039612	NCP	%	97			75-125	Pass	
Cadmium	M25-Ap0039612	NCP	%	123			75-125	Pass	
Chromium	M25-Ap0039612	NCP	%	121			75-125	Pass	
Copper	M25-Ap0039612	NCP	%	112			75-125	Pass	
Mercury	M25-Ap0039612	NCP	%	120			75-125	Pass	
Nickel	M25-Ap0039612	NCP	%	116			75-125	Pass	
Zinc	M25-Ap0039606	NCP	%	91			75-125	Pass	
Spike - % Recovery									

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Per- and Polyfluoroalkyl Substances (PFASs) - Short				Result 1					
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M25-Ap0042775	NCP	%	94			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M25-Ap0042775	NCP	%	65			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M25-Ap0042775	NCP	%	85			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M25-Ap0042775	NCP	%	102			50-150	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH C10-C14	M25-Ap0044666	CP	%	86			70-130	Pass	
TRH >C10-C16	M25-Ap0044666	CP	%	84			70-130	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 C6-C9	M25-Ap0044717	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M25-Ap0044665	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M25-Ap0044665	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M25-Ap0044665	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C6-C10	M25-Ap0044717	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	M25-Ap0044665	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M25-Ap0044665	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M25-Ap0044665	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M25-Ap0044717	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M25-Ap0044717	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M25-Ap0044717	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M25-Ap0044717	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M25-Ap0044717	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	M25-Ap0044717	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M25-Ap0044717	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	M25-Ap0044665	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	M25-Ap0044665	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	M25-Ap0044665	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	M25-Ap0044665	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	M25-Ap0044665	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	M25-Ap0044665	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	M25-Ap0044665	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB*	M25-Ap0044665	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	M25-Ap0044665	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	M25-Ap0044665	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	M25-Ap0044665	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	M25-Ap0044665	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	M25-Ap0044665	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	M25-Ap0044665	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	M25-Ap0044665	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	M25-Ap0044665	CP	mg/kg	< 10	< 10	<1	30%	Pass	

Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	M25-Ap0044665	CP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	M25-Ap0044665	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Nitrophenol	M25-Ap0044665	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	M25-Ap0044665	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	M25-Ap0044665	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	M25-Ap0044665	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	M25-Ap0044665	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	M25-Ap0044665	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	M25-Ap0044665	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	M25-Ap0044665	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons (Trace level)				Result 1	Result 2	RPD			
Acenaphthene	M25-Ap0044665	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Acenaphthylene	M25-Ap0044665	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Anthracene	M25-Ap0044665	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Benz(a)anthracene	M25-Ap0044665	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Benzo(a)pyrene - low level	M25-Ap0044665	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Benzo(b&j)fluoranthene	M25-Ap0044665	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Benzo(g.h.i)perylene	M25-Ap0044665	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Benzo(k)fluoranthene	M25-Ap0044665	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Chrysene	M25-Ap0044665	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Dibenz(a.h)anthracene	M25-Ap0044665	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Fluoranthene	M25-Ap0044665	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Fluorene	M25-Ap0044665	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M25-Ap0044665	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Naphthalene	M25-Ap0044665	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Phenanthrene	M25-Ap0044665	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Pyrene	M25-Ap0044665	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M25-Ap0044676	NCP	mg/kg	13	16	20	30%	Pass	
Cadmium	M25-Ap0044676	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M25-Ap0044676	NCP	mg/kg	23	26	12	30%	Pass	
Copper	M25-Ap0044676	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Lead	M25-Ap0044676	NCP	mg/kg	7.0	7.2	3.0	30%	Pass	
Mercury	M25-Ap0044676	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	M25-Ap0044676	NCP	mg/kg	7.0	8.1	15	30%	Pass	
Zinc	M25-Ap0044676	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	M25-Ap0044674	NCP	%	19	16	16	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C10-C14	M25-Ap0044666	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M25-Ap0044666	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M25-Ap0044666	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C10-C16	M25-Ap0044666	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M25-Ap0044666	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M25-Ap0044666	CP	mg/kg	< 100	< 100	<1	30%	Pass	

Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	M25-Ap0044666	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	M25-Ap0044666	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	M25-Ap0044666	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	M25-Ap0044666	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	M25-Ap0044666	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	M25-Ap0044666	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	M25-Ap0044666	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB*	M25-Ap0044666	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	M25-Ap0044666	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	M25-Ap0044666	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	M25-Ap0044666	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	M25-Ap0044666	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	M25-Ap0044666	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	M25-Ap0044666	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	M25-Ap0044666	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	M25-Ap0044666	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	M25-Ap0044666	CP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	M25-Ap0044666	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Nitrophenol	M25-Ap0044666	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	M25-Ap0044666	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	M25-Ap0044666	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	M25-Ap0044666	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	M25-Ap0044666	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	M25-Ap0044666	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	M25-Ap0044666	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	M25-Ap0044666	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons (Trace level)				Result 1	Result 2	RPD			
Acenaphthene	M25-Ap0044666	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Acenaphthylene	M25-Ap0044666	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Anthracene	M25-Ap0044666	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Benz(a)anthracene	M25-Ap0044666	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Benzo(a)pyrene - low level	M25-Ap0044666	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Benzo(b&j)fluoranthene	M25-Ap0044666	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Benzo(g.h.i)perylene	M25-Ap0044666	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Benzo(k)fluoranthene	M25-Ap0044666	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Chrysene	M25-Ap0044666	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Dibenz(a.h)anthracene	M25-Ap0044666	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Fluoranthene	M25-Ap0044666	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Fluorene	M25-Ap0044666	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M25-Ap0044666	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Naphthalene	M25-Ap0044666	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Phenanthrene	M25-Ap0044666	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Pyrene	M25-Ap0044666	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	

Duplicate									
Per- and Polyfluoroalkyl Substances (PFASs) - Short				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M25-Ap0044666	CP	ug/kg	< 10	< 10	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M25-Ap0044666	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M25-Ap0044666	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M25-Ap0044666	CP	ug/kg	< 5	< 5	<1	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.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.

Authorised by:

Catherine Wilson	Analytical Services Manager
Carroll Lee	Senior Analyst-Organic
Edward Lee	Senior Analyst-Organic
Joseph Edouard	Senior Analyst-Organic
Joseph Edouard	Senior Analyst-PFAS
Joseph Edouard	Senior Analyst-Volatile
Mary Makarios	Senior Analyst-Metal

Glenn Jackson
Managing Director

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.

Certificate of Analysis

Pitt & Sherry (Operations) Pty Ltd
4th Floor, 113 Cimitiere Street
Launceston
Tasmania 7250

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:	Carly Clark
Report	1210100-AID
Project Name	Tarraleah Switchyard Soil Sampling
Received Date	Apr 15, 2025
Date Reported	Apr 24, 2025

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 5370:2024* Sampling and qualitative identification of asbestos in bulk materials (ISO 22262-1:2012, MOD), formerly AS 4964-2004 and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Man-made vitreous fibre (MMVF)	Fibres exhibiting isotropic characteristics, including glass fibres, glass wool, rock wool, slag wool, ceramic fibres and bio-soluble fibres. NOTE: previously known as "synthetic mineral fibre" (SMF). Simple analytical procedures such as polarised light microscopy cannot detect or reliably identify asbestos in some types of commercial products containing asbestos, either because the fibres are below the resolution of optical microscopy or because the matrix material adheres too strongly to the fibres. For these types of products, electron microscopy may be necessary.
Subsampling Soil Samples	The sample submitted is dried and passed through a 10 mm sieve followed by a 2 mm sieve. All fibrous matter greater than 10 mm and greater than 2 mm and the material passing through the 2 mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 g to 60 g, then a subsampling routine based on ISO 3082:2017(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be subsampled for trace analysis, in accordance with AS 5370:2024*.*
Bonded asbestos-containing material (ACM)	The material is first examined, and any fibres are isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination. The resultant material is then further examined in accordance with AS 5370:2024*. *NOTE: Even after disintegration, it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting (LOR)	The performance limitation of the AS 5370:2024* method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory limit of reporting, per se. Examination of large sample size (e.g., 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 5370:2024*, and hence, NATA Accreditation does not cover the performance of this service (non-NATA results are shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964-2004: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos". This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Project Name Tarraleah Switchyard Soil Sampling
Project ID
Date Sampled Apr 10, 2025
Report 1210100-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
QCS02	25-Ap0044665	Apr 10, 2025	Approximate Sample 38g Sample consisted of: Clay-like soil	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibres detected. No trace asbestos detected.
QCS03	25-Ap0044666	Apr 10, 2025	Approximate Sample 49g Sample consisted of: Clay-like soil	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibres detected. No trace asbestos detected.

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
Asbestos - LTM-ASB-8020	Melbourne	Apr 16, 2025	Indefinite

eurofins

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Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	+61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

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Company Name: Pitt & Sherry (Operations) Pty Ltd
Address: 4th Floor, 113 Cimitiere Street
Launceston
Tasmania 7250

Project Name: Tarraleah Switchyard Soil Sampling

Order No.: P.24. 1136
Report #: 1210100
Phone: 03 6323 1900
Fax: 03 6334 4651

Received: Apr 15, 2025 4:20 PM
Due: Apr 24, 2025
Priority: 5 Day
Contact Name: Carly Clark

Eurofins Analytical Services Manager : Savini Suduweli

Sample Detail						Asbestos - AS4964*	Polychlorinated Biphenyls	Metals M8	Phenols (Speciated)	BTEX and Naphthalene	Moisture Set	Total Recoverable Hydrocarbons	Per- and Polyfluoroalkyl Substances (PFASs) - Short	Polycyclic Aromatic Hydrocarbons (Trace level)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X
External Laboratory														
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**									
1	QCS02	Apr 10, 2025		Soil	M25-Ap0044665	X	X	X	X	X	X	X	X	X
2	QCS03	Apr 10, 2025		Soil	M25-Ap0044666	X	X	X	X	X	X	X	X	X
Test Counts						2	2	2	2	2	2	2	2	2

Internal Quality Control Review and Glossary General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report in blue indicates data provided by the customer that may impact the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to the most recent version of the 'Sample Preservation and Container Guide' for holding times (QS3001).

Units

% w/w:	Percentage weight-for-weight basis, e.g. of asbestos in asbestos-containing finds in soil samples (**% w/w**)
F/fld	Airborne fibre filter loading as Fibres (**N**) per Fields counted (**n**)
F/mL	Airborne fibre reported concentration as Fibres per millilitre of air drawn over the sampler membrane (**C**)
g, kg	Mass, e.g. of whole sample (**M**) or asbestos-containing find within the sample (**m**)
g/kg	Concentration in grams per kilogram
L, mL	Volume, e.g. of air as measured in AFM (**V** = **r** x **t**)
L/min	Airborne fibre sampling Flowrate as litres per minute of air drawn over the sampler membrane (**r**)
min	Time (**t**), e.g. of air sample collection period

Calculations

Airborne Fibre Concentration: $C = \left(\frac{A}{a}\right) \times \left(\frac{N}{n}\right) \times \left(\frac{1}{r}\right) \times \left(\frac{1}{t}\right) = K \times \left(\frac{N}{n}\right) \times \left(\frac{1}{V}\right)$

Asbestos Content (as asbestos): $\%\, w/w = \frac{(m \times P_A)}{M}$

Weighted Average (of asbestos): $\%_{WA} = \sum \frac{(m \times P_A)_x}{x}$

Terms

%Asbestos	Estimated percentage of asbestos in a given matrix may be derived from knowledge or experience of the material, informed by HSG264 *Appendix 2*, else assumed to be 15% in accordance with WA DOH *Appendix 2* (**P_A**). This estimate is not NATA-accredited.
ACM	Asbestos Containing Materials. Asbestos in a non-asbestos matrix is typically presented in bonded (non-friable) condition. For the NEPM and WA DOH, ACM corresponds to material larger than 7 mm x 7 mm.
AF	Asbestos Fines. Asbestos contamination within a soil sample, as defined by WA DOH. Includes loose fibre bundles and small pieces of friable and non-friable material, such as asbestos cement fragments mixed with soil. Considered under the NEPM as equivalent to “non-bonded / friable”.
AFM	Airborne Fibre Monitoring, e.g., by the MFM.
Amosite	Amosite Asbestos Detected. Amosite may also refer to Fibrous Grunerite or Brown Asbestos. Identified in accordance with AS 5370:2024* Sampling and qualitative identification of asbestos in bulk materials (ISO 22262-1:2012, MOD), formerly AS 4964-2004.
AS	Australian Standard.
Asbestos Content (as asbestos)	Total %w/w asbestos content in asbestos-containing finds in a soil sample (**% w/w**).
Chrysotile	Chrysotile Asbestos Detected. Chrysotile may also refer to Fibrous Serpentine or White Asbestos. Identified in accordance with AS 5370:2024* Sampling and qualitative identification of asbestos in bulk materials (ISO 22262-1:2012, MOD), formerly AS 4964-2004.
COC	Chain of Custody.
Crocidolite	Crocidolite Asbestos Detected. Crocidolite may also refer to Fibrous Riebeckite or Blue Asbestos. Identified in accordance with AS 5370:2024* Sampling and qualitative identification of asbestos in bulk materials (ISO 22262-1:2012, MOD), formerly AS 4964-2004.
Dry	Sample is dried by heating before analysis.
DS	Dispersion Staining. The technique required for unequivocal identification of asbestos fibres by PLM.
FA	Fibrous Asbestos. Asbestos-containing material that is wholly or in part friable, including materials with higher asbestos content with a propensity to become friable with handling, and any material previously non-friable and severely degraded. For the NEPM and WA DOH, FA generally corresponds to material larger than 7 mm x 7 mm, although FA may be more difficult to distinguish visibly and may be assessed as AF.
Fibre Count	Total of all fibres (whether asbestos or not) meeting the counting criteria set out in the NOHSC:3003
Fibre ID	Fibre Identification. Unequivocal identification of asbestos fibres according to AS 5370:2024* Sampling and qualitative identification of asbestos in bulk materials (ISO 22262-1:2012, MOD), formerly AS 4964-2004. Includes Chrysotile, Amosite (Grunerite) or Crocidolite asbestos.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess the degree of friability.
HSG248	UK HSE HSG248, *Asbestos: The Analysts Guide*, 2nd Edition (2021), ISBN: 9780616667079.
HSG264	UK HSE HSG264, *Asbestos: The Survey Guide* (2012), ISBN: 9780717665020
ISO (also ISO/IEC)	International Organization for Standardization / International Electrotechnical Commission.
K Factor	Microscope constant (**K**) as derived from the effective filter area of the given AFM membrane used for collecting the sample (**A**) and the projected eyepiece graticule area of the specific microscope used for the analysis (**a**).
LOR	Limit of Reporting.
MFM (also NOHSC:3003)	Membrane Filter Method. As described by the Australian Government National Occupational Health and Safety Commission, *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres*, 2nd Edition [NOHSC:3003(2005)].
MMVF	Man-Made Vitreous Fibre - exhibiting isotropic characteristics, including glass fibres, glass wool, rock wool, slag wool, ceramic fibres and “bio-soluble fibres. NOTE: previously known as “synthetic mineral fibre” (SMF).
NEPM (also ASC NEPM)	National Environment Protection (Assessment of Site Contamination) Measure, (2013, as amended).
Organic	Organic Fibres Detected. Organic may refer to Natural or Man-Made Polymeric Fibres. Identified per AS 5370:2024* Sampling and qualitative identification of asbestos in bulk materials (ISO 22262-1:2012, MOD), formerly AS 4964-2004.
PCM	Phase Contrast Microscopy. This is used for fibre counting, according to the MFM.
PLM	Polarised Light Microscopy. It is used for fibre identification and residual analysis according to AS 5370:2024* Sampling and qualitative identification of asbestos in bulk materials (ISO 22262-1:2012, MOD), formerly AS 4964-2004.
Sampling	Unless otherwise stated, Eurofins are not responsible for sampling equipment or the sampling process.
SRA	Sample Receipt Advice.
Residual Analysis	An analytical procedure is used to detect the presence of respirable fibres (particularly asbestos) in a given sample matrix according to AS 5370:2024* Sampling and qualitative identification of asbestos in bulk materials (ISO 22262-1:2012, MOD), formerly Trace Analysis in AS 4964-2004.
UK HSE HSG	United Kingdom, Health and Safety Executive, Health and Safety Guidance, publication.
Inconclusive	Fibrous minerals that are detected but have not been unequivocally identified by PLM with DS according to AS 5370:2024* Sampling and qualitative identification of asbestos in bulk materials (ISO 22262-1:2012, MOD), formerly AS 4964-2004. It may include (but is not limited to) actinolite, anthophyllite, or tremolite asbestos. SEM/TEM is required for definitive identification.
WA DOH	Reference document for the NEPM. Government of Western Australia, *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia* (updated 2021), including Appendix Four: *Laboratory analysis*
Weighted Average	Combined average %w/w asbestos content of all asbestos-containing finds in the given aliquot or total soil sample (**$\%_{WA}$**).

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

Asbestos Counter/Identifier:

Modhurika De	Senior Analyst-Asbestos

Authorised by:

Zoe Burke	Senior Analyst-Asbestos

Glenn Jackson
Managing Director

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.

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

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SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph 02 8784 8555 E samples.sydney@alsglobal.com

TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph 07 4796 0600 E townsville.environmental@alsglobal.com

WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph 02 4225 3125 E wollongong@alsglobal.com

CLIENT: pitt&sherry operations	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☒ Standard or urgent TAT (List due date):	**FOR LABORATORY USE ONLY (Circle)**
OFFICE: Hobart		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
PROJECT: Tarraleah Switchyard Soil Sampling	**ALS QUOTE NO.:** EM24PITSHE0004_V3_P.24.1136 → EM25PITSHE0004 V4	**COC SEQUENCE NUMBER (Circle)** COC: 1 2 3 4 5 6 7	Free Ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: P.24.1136		OF: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Carly Clark	**CONTACT PH:** 0490 942 344		Other comment:
SAMPLER: Eduardo Pereira Maes	**SAMPLER MOBILE:** 0414 023 658		
COC emailed to ALS? (YES / NO)	**EDD FORMAT (or default):** ENMRG		
Email Reports to: cclark@pittsh.com.au; EPereiraMaes@pittsh.com.au			
Email Invoice to: cclark@pittsh.com.au; accounts@pittsh.com.au			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
[redacted] Eduardo Maes	Chris.L		
DATE/TIME: 15.4.25	DATE/TIME: 16/04/25 - 14:15	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	Suite C	Suite D	TCLP Leaching	ASLP Leaching	ASC NEPM Soil Classification	Rinsate 2	Trip Blank		
1	TA-TMB418/0.3	14.04.25	S	Soil JAR + B + P	3	X								
2	TA-MB418/0.5	"	S	"	3	X								
3	TA-MB418/1.3	"	S	"	3	X								
4	TB03	"	S	Soil JAR	1							X		
				TOTAL	0									

FREIGHT

Environmental Division
Melbourne
Work Order Reference
EM2506755

Telephone : + 61-3-8549 9600

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

EnviroMail 150 Australia - Spotlight on emerging contaminants - Triclosan
EnviroMail 151 Australia - Expanding the scope of PFAS analysis in soils and waters
EnviroMail 152 Australia - Analysing Air & Gas with Canisters
EnviroMail 157 Australia - New Analytical Suites to meet EPA Victoria Guideline 1828.3

From: Eduardo Pereira Maes <EPereiraMaes@pittsh.com.au>
Sent: Tuesday, 15 April 2025 2:22 PM
To: Hannah White <hannah.white@ALSGlobal.com>; ALS Enviro Melbourne <ALSEnviroMelbourne@ALSGlobal.com>
Cc: Carly Clark <CClark@pittsh.com.au>; Fiona Keserue-Ponte <FKeseruePonte@pittsh.com.au>
Subject: [EXTERNAL] - P.24.1136 CoC Week 2

Hi Hannah,
Please see attached the CoC for the samples being sent today.
Let me know if you have any questions.
Regards,

pitt&sherry

Eduardo Pereira Maes
B.Eng Environmental (Hons)
PostGradDip WHS Engineering

Associate Environmental Consultant

+61 414 023 658
epereiramaes@pittsh.com.au

Hobart / *nipaluna* — Level 1, Surrey House, 199 Macquarie Street
PO Box 94 Hobart Tasmania 7001 | Phone +61 3 6210 1400

pitt&sherry acknowledges the Traditional Custodians of the many Countries throughout Australia and their connections to land, sea and community. We acknowledge the contributions and sophistication of Aboriginal and/or Torres Strait Islander knowledge.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **EM2506755**		
Client	: **PITT & SHERRY (OPERATIONS) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: CARLY CLARK	Contact	: Hannah White
Address	: 199 MACQUARIE STREET HOBART 7001	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: cclark@pittsh.com.au	E-mail	: Hannah.White@alsglobal.com
Telephone	: 03 9674 4163	Telephone	: +61-3-8549 9600
Facsimile	: ----	Facsimile	: +61-3-8549 9626
Project	: Tarraleah Switchyard Soil Sampling	Page	: 1 of 3
Order number	: P.24.1136	Quote number	: EM2025PITSHE0004 (EM25PITSHE0004_V4)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: Eduardo Pereira Maes		

Dates

Date Samples Received	: 16-Apr-2025 14:15	Issue Date	: 18-Apr-2025
Client Requested Due Date	: 28-Apr-2025	Scheduled Reporting Date	: **28-Apr-2025**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 15.2°C - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 4 / 4

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- Unless otherwise stated, analytical work for this work order will be conducted at ALS Melbourne, NATA accreditation no. 825, site no. 13778.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EA200G Asbestos Identification in Soils -	SOIL - EP066 (solids) Polychlorinated Biphenyls by GCMS	SOIL - EP075 SIM Phenols only SIM - Phenols only	SOIL - EP075-TAS Benzo(a)pyrene and other PAHs - Waste	SOIL - EP231 (solids) PFAS - Short Suite (12 analytes)	SOIL - S-05 TRH/BTEXN/8 Metals
EM2506755-001	14-Apr-2025 00:00	TA-MB418/0.3	✓	✓	✓	✓	✓	✓	✓
EM2506755-002	14-Apr-2025 00:00	TA-MB418/0.5	✓	✓	✓	✓	✓	✓	✓
EM2506755-003	14-Apr-2025 00:00	TA-MB418/1.3	✓	✓	✓	✓	✓	✓	✓
EM2506755-004	14-Apr-2025 00:00	TB03	✓						

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - S-18 TRH(C6-C9)/BTEXN
EM2506755-004	14-Apr-2025 00:00	TB03	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ALL ACCOUNTS

- A4 - AU Tax Invoice (INV)	Email	accounts@pittsh.com.au

CARLY CLARK

- *AU Certificate of Analysis - NATA (COA)	Email	cclark@pittsh.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	cclark@pittsh.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	cclark@pittsh.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	cclark@pittsh.com.au
- A4 - AU Tax Invoice (INV)	Email	cclark@pittsh.com.au
- Chain of Custody (CoC) (COC)	Email	cclark@pittsh.com.au
- EDI Format - ENMRG (ENMRG)	Email	cclark@pittsh.com.au
- EDI Format - ESDAT (ESDAT)	Email	cclark@pittsh.com.au

Eduardo Pereira Maes

- *AU Certificate of Analysis - NATA (COA)	Email	epereiramaes@pittsh.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	epereiramaes@pittsh.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	epereiramaes@pittsh.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	epereiramaes@pittsh.com.au
- Chain of Custody (CoC) (COC)	Email	epereiramaes@pittsh.com.au
- EDI Format - ENMRG (ENMRG)	Email	epereiramaes@pittsh.com.au
- EDI Format - ESDAT (ESDAT)	Email	epereiramaes@pittsh.com.au

CERTIFICATE OF ANALYSIS

Work Order	: **EM2506755**	Page	: 1 of 8
Client	: **PITT & SHERRY (OPERATIONS) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: CARLY CLARK	Contact	: Hannah White
Address	: 199 MACQUARIE STREET HOBART 7001	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: 03 9674 4163	Telephone	: +61-3-8549 9600
Project	: Tarraleah Switchyard Soil Sampling	Date Samples Received	: 16-Apr-2025 14:15
Order number	: P.24.1136	Date Analysis Commenced	: 21-Apr-2025
C-O-C number	: ----	Issue Date	: 28-Apr-2025 16:16
Sampler	: Eduardo Pereira Maes		
Site	: ----		
Quote number	: EM25PITSHE0004_V4		
No. of samples received	: 4		
No. of samples analysed	: 4		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

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
- Descriptive 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*
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
MINNIE TRAN	Approved Asbestos Identifier	Melbourne Asbestos, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, 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 Contract 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.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2
- EA200: 'Yes' - Asbestos detected by polarised light microscopy including dispersion staining.
- EA200: 'No*' - No asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining. Asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg.
- EA200: 'No' - No asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration or as per USEPA 1633 limits where listed. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS and also conform to QSM 5.4 (US DoD) requirements.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TA-MB418/0.3	TA-MB418/0.5	TA-MB418/1.3	TB03	----
			Sampling date / time	14-Apr-2025 00:00	14-Apr-2025 00:00	14-Apr-2025 00:00	14-Apr-2025 00:00	----
Compound	CAS Number	LOR	Unit	EM2506755-001	EM2506755-002	EM2506755-003	EM2506755-004	--------
				Result	Result	Result	Result	----
EA055: Moisture Content								
Moisture Content	----	1.0	%	**10.5**	**17.9**	**23.5**	**----**	**----**
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**----**	**----**	**----**	<1.0	**----**
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	**No**	**No**	**No**	**----**	**----**
Asbestos (Trace)	1332-21-4	-	-	**No**	**No**	**No**	**----**	**----**
Asbestos Type	1332-21-4	-	--	**-**	**-**	**-**	**----**	**----**
Sample weight (dry)	----	0.01	g	**64.3**	**56.0**	**58.1**	**----**	**----**
APPROVED IDENTIFIER:	----	-	--	**M. TRAN**	**M. TRAN**	**M. TRAN**	**----**	**----**
Synthetic Mineral Fibre	----	-	--	**No**	**No**	**No**	**----**	**----**
Organic Fibre	----	-	--	**No**	**No**	**No**	**----**	**----**
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	**----**	**----**
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	**----**	**----**
Chromium	7440-47-3	2	mg/kg	**67**	**101**	**49**	**----**	**----**
Copper	7440-50-8	5	mg/kg	**39**	**44**	**49**	**----**	**----**
Lead	7439-92-1	5	mg/kg	<5	<5	**5**	**----**	**----**
Nickel	7440-02-0	2	mg/kg	**86**	**115**	**32**	**----**	**----**
Zinc	7440-66-6	5	mg/kg	**49**	**63**	**44**	**----**	**----**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	**----**	**----**
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	<0.1	**----**	**----**
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	**----**	**----**
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	**----**	**----**
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	**----**	**----**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TA-MB418/0.3	TA-MB418/0.5	TA-MB418/1.3	TB03	----
			Sampling date / time	14-Apr-2025 00:00	14-Apr-2025 00:00	14-Apr-2025 00:00	14-Apr-2025 00:00	----
Compound	CAS Number	LOR	Unit	EM2506755-001	EM2506755-002	EM2506755-003	EM2506755-004	--------
				Result	Result	Result	Result	----
EP075(SIM)A: Phenolic Compounds - Continued								
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	----	----
EP075B: Polynuclear Aromatic Hydrocarbons								
Benzo(a)pyrene	50-32-8	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1.0	mg/kg	<1.0	<1.0	<1.0	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.05	mg/kg	**0.76**	**0.76**	**0.76**	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.05	mg/kg	**0.38**	**0.38**	**0.38**	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TA-MB418/0.3	TA-MB418/0.5	TA-MB418/1.3	TB03	----
				Sampling date / time	14-Apr-2025 00:00	14-Apr-2025 00:00	14-Apr-2025 00:00	14-Apr-2025 00:00	----
Compound	CAS Number	LOR	Unit		EM2506755-001	EM2506755-002	EM2506755-003	EM2506755-004	--------
					Result	Result	Result	Result	----
EP075B: Polynuclear Aromatic Hydrocarbons - Continued									
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	----
C10 - C14 Fraction	----	50	mg/kg		<50	**90**	<50	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg		<50	**90**	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	----
>C10 - C16 Fraction	----	50	mg/kg		<50	**100**	<50	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	**140**	<100	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		<50	**240**	<50	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg		<50	**100**	<50	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	----
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	----
^ **Total Xylenes**	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TA-MB418/0.3	TA-MB418/0.5	TA-MB418/1.3	TB03	----
			Sampling date / time	14-Apr-2025 00:00	14-Apr-2025 00:00	14-Apr-2025 00:00	14-Apr-2025 00:00	----
Compound	CAS Number	LOR	Unit	EM2506755-001	EM2506755-002	EM2506755-003	EM2506755-004	--------
				Result	Result	Result	Result	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----
EP231P: PFAS Sums								
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	**103**	**123**	**126**	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**86.3**	**86.4**	**78.2**	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	**75.8**	**75.1**	**75.4**	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	**83.1**	**82.9**	**75.7**	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TA-MB418/0.3	TA-MB418/0.5	TA-MB418/1.3	TB03	----
			Sampling date / time	14-Apr-2025 00:00	14-Apr-2025 00:00	14-Apr-2025 00:00	14-Apr-2025 00:00	----
Compound	CAS Number	LOR	Unit	EM2506755-001	EM2506755-002	EM2506755-003	EM2506755-004	--------
				Result	Result	Result	Result	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	108	99.4	89.7	----	----
Anthracene-d10	1719-06-8	0.5	%	117	116	118	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	106	99.4	103	----	----
EP075T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.025	%	96.4	91.6	88.4	----	----
Anthracene-d10	1719-06-8	0.025	%	94.4	91.3	88.6	----	----
4-Terphenyl-d14	1718-51-0	0.025	%	102	93.1	94.6	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	78.7	73.8	75.4	75.8	----
Toluene-D8	2037-26-5	0.2	%	84.3	80.4	81.1	83.6	----
4-Bromofluorobenzene	460-00-4	0.2	%	99.1	96.4	95.3	98.3	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	102	110	107	----	----
13C8-PFOA	----	0.0002	%	116	110	110	----	----

Analytical Results

Descriptive Results

Sub-Matrix: SOIL

Method: Compound	Sample ID - Sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in Soils		
EA200: Description	TA-MB418/0.3 - 14-Apr-2025 00:00	Grey rocky soil.
EA200: Description	TA-MB418/0.5 - 14-Apr-2025 00:00	Grey rocky soil.
EA200: Description	TA-MB418/1.3 - 14-Apr-2025 00:00	Brown soil with rock matter.

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	36	140
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	54	125
2-Chlorophenol-D4	93951-73-6	65	123
2.4.6-Tribromophenol	118-79-6	34	122
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	61	125
Anthracene-d10	1719-06-8	62	130
4-Terphenyl-d14	1718-51-0	67	133
EP075T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	35	126
Anthracene-d10	1719-06-8	40	135
4-Terphenyl-d14	1718-51-0	42	133
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
EP231S: PFAS Surrogate			
13C4-PFOS	----	68	136
13C8-PFOA	----	69	133

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2506755**	Page	: 1 of 7
Client	: **PITT & SHERRY (OPERATIONS) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: CARLY CLARK	Telephone	: +61-3-8549 9600
Project	: Tarraleah Switchyard Soil Sampling	Date Samples Received	: 16-Apr-2025
Site	: ----	Issue Date	: 28-Apr-2025
Sampler	: Eduardo Pereira Maes	No. of samples received	: 4
Order number	: P.24.1136	No. of samples analysed	: 4

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 Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, where applicable to the methodology, 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
Matrix Spike (MS) Recoveries							
EG005(ED093)T: Total Metals by ICP-AES	EM2506646--002	Anonymous	**Arsenic**	7440-38-2	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

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 / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content								
Soil Glass Jar - Unpreserved (EA055)								
TA-MB418/0.3, TA-MB418/1.3	TA-MB418/0.5,	**14-Apr-2025**	**----**	----	----	**21-Apr-2025**	28-Apr-2025	✓
EA055: Moisture Content (Dried @ 105-110°C)								
Soil Glass Jar - Unpreserved (EA055)								
TB03		**14-Apr-2025**	**----**	----	----	**21-Apr-2025**	28-Apr-2025	✓
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Snap Lock Bag - ACM/Asbestos Grab Bag (EA200)								
TA-MB418/0.3, TA-MB418/1.3	TA-MB418/0.5,	**14-Apr-2025**	**----**	----	----	**22-Apr-2025**	11-Oct-2025	✓
EG005(ED093)T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T)								
TA-MB418/0.3, TA-MB418/1.3	TA-MB418/0.5,	**14-Apr-2025**	**22-Apr-2025**	11-Oct-2025	✓	**23-Apr-2025**	11-Oct-2025	✓
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved (EG035T)								
TA-MB418/0.3, TA-MB418/1.3	TA-MB418/0.5,	**14-Apr-2025**	**22-Apr-2025**	12-May-2025	✓	**24-Apr-2025**	12-May-2025	✓
EP066: Polychlorinated Biphenyls (PCB)								
Soil Glass Jar - Unpreserved (EP066)								
TA-MB418/0.3,	TA-MB418/1.3	**14-Apr-2025**	**22-Apr-2025**	28-Apr-2025	✓	**23-Apr-2025**	01-Jun-2025	✓
Soil Glass Jar - Unpreserved (EP066)								
TA-MB418/0.5		**14-Apr-2025**	**22-Apr-2025**	28-Apr-2025	✓	**24-Apr-2025**	01-Jun-2025	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075(SIM)A: Phenolic Compounds							
Soil Glass Jar - Unpreserved (EP075(SIM))							
TA-MB418/0.3, TA-MB418/0.5, TA-MB418/1.3	**14-Apr-2025**	**22-Apr-2025**	28-Apr-2025	✓	**23-Apr-2025**	01-Jun-2025	✓
EP075B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075-TAS)							
TA-MB418/0.3, TA-MB418/0.5, TA-MB418/1.3	**14-Apr-2025**	**22-Apr-2025**	28-Apr-2025	✓	**23-Apr-2025**	01-Jun-2025	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080)							
TA-MB418/0.3, TA-MB418/0.5, TA-MB418/1.3, TB03	**14-Apr-2025**	**22-Apr-2025**	28-Apr-2025	✓	**22-Apr-2025**	28-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP071)							
TA-MB418/0.3, TA-MB418/0.5, TA-MB418/1.3	**14-Apr-2025**	**22-Apr-2025**	28-Apr-2025	✓	**24-Apr-2025**	01-Jun-2025	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080)							
TA-MB418/0.3, TA-MB418/0.5, TA-MB418/1.3, TB03	**14-Apr-2025**	**22-Apr-2025**	28-Apr-2025	✓	**22-Apr-2025**	28-Apr-2025	✓
Soil Glass Jar - Unpreserved (EP071)							
TA-MB418/0.3, TA-MB418/0.5, TA-MB418/1.3	**14-Apr-2025**	**22-Apr-2025**	28-Apr-2025	✓	**24-Apr-2025**	01-Jun-2025	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
TA-MB418/0.3, TA-MB418/0.5, TA-MB418/1.3, TB03	**14-Apr-2025**	**22-Apr-2025**	28-Apr-2025	✓	**22-Apr-2025**	28-Apr-2025	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
TA-MB418/0.3, TA-MB418/0.5, TA-MB418/1.3	**14-Apr-2025**	**24-Apr-2025**	11-Oct-2025	✓	**24-Apr-2025**	03-Jun-2025	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
TA-MB418/0.3, TA-MB418/0.5, TA-MB418/1.3	**14-Apr-2025**	**24-Apr-2025**	11-Oct-2025	✓	**24-Apr-2025**	03-Jun-2025	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
TA-MB418/0.3, TA-MB418/0.5, TA-MB418/1.3	**14-Apr-2025**	**24-Apr-2025**	11-Oct-2025	✓	**24-Apr-2025**	03-Jun-2025	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
TA-MB418/0.3, TA-MB418/0.5, TA-MB418/1.3	**14-Apr-2025**	**24-Apr-2025**	11-Oct-2025	✓	**24-Apr-2025**	03-Jun-2025	✓

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)							
Benzo(a)pyrene and other PAHs - Waste Classification (TAS requirements)	EP075-TAS	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	**10.00**	**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	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	5	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Benzo(a)pyrene and other PAHs - Waste Classification (TAS requirements)	EP075-TAS	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**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	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Benzo(a)pyrene and other PAHs - Waste Classification (TAS requirements)	EP075-TAS	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**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	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Benzo(a)pyrene and other PAHs - Waste Classification (TAS requirements)	EP075-TAS	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

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*	
Matrix Spikes (MS) - Continued							
Total Mercury by FIMS	EG035T	1	20	**5.00**	**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	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	5	**20.00**	**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).
Asbestos Identification in Soils	EA200	SOIL	AS 4964 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining
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 (SnCl2) (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 SnCl2 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)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point 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).
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
Benzo(a)pyrene and other PAHs - Waste Classification (TAS requirements)	EP075-TAS	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is 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.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by negative mode LC-ESI-MS/MS using MRM and isotope dilution or internal standard quantitation. A portion of homogenised sample is extracted along with isotope dilution standards (where commercially available) in a solution of ammonium acetate in acetonitrile/methanol. Where relevant, interferences from co-extracted organics are removed using dispersive clean-up media (dSPE). A portion of extract is combined with an equal volume of reagent water and filtered for instrumental analysis.

Preparation Methods	Method	Matrix	Method Descriptions

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, Na2SO4 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.
Tumbler Extraction of Solids - VIC EPA Screen	ORG17-EM	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 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.
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

QUALITY CONTROL REPORT

Work Order	: **EM2506755**	Page	: 1 of 10
Client	: **PITT & SHERRY (OPERATIONS) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: CARLY CLARK	Contact	: Hannah White
Address	: 199 MACQUARIE STREET HOBART 7001	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: 03 9674 4163	Telephone	: +61-3-8549 9600
Project	: Tarraleah Switchyard Soil Sampling	Date Samples Received	: 16-Apr-2025
Order number	: P.24.1136	Date Analysis Commenced	: 21-Apr-2025
C-O-C number	: ----	Issue Date	: 28-Apr-2025
Sampler	: Eduardo Pereira Maes		
Site	: ----		
Quote number	: EM25PITSHE0004_V4		
No. of samples received	: 4		
No. of samples analysed	: 4		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

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.

Signatories	*Position*	*Accreditation Category*
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
MINNIE TRAN	Approved Asbestos Identifier	Melbourne Asbestos, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, 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
* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

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: 6521963)									
EM2506646-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	6	6	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	14	13	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	552	561	1.5	0% - 20%
		EG005T: Copper	7440-50-8	5	mg/kg	15	14	8.4	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	14	13	12.6	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	57	60	4.9	0% - 50%
EM2506646-010	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	6	7	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	20	18	10.2	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	1020	946	7.3	0% - 20%
		EG005T: Copper	7440-50-8	5	mg/kg	27	22	19.1	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	25	22	11.4	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	100	103	2.6	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 6522010)									
EM2506310-002	Anonymous	EA055: Moisture Content	----	0.1 (1.0)*	%	15.4	14.5	6.3	0% - 50%
EM2506755-003	TA-MB418/1.3	EA055: Moisture Content	----	0.1 (1.0)*	%	23.5	24.6	4.3	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 6521964)									
EM2506646-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.1	0.2	0.0	No Limit
EM2506646-010	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.8	0.8	0.0	No Limit

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 (%)*
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 6521712)									
EM2506755-001	TA-MB418/0.3	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 6521714)									
EM2506755-001	TA-MB418/0.3	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
EP075B: Polynuclear Aromatic Hydrocarbons (QC Lot: 6521669)									
EM2506755-001	TA-MB418/0.3	EP075-TAS: Benzo(a)pyrene	50-32-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP075-TAS: Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1	mg/kg	<1.0	<1.0	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6521574)									
EM2506488-086	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6521713)									
EM2506755-001	TA-MB418/0.3	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

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 (%)*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6521574)									
EM2506488-086	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: 6521713)									
EM2506755-001	TA-MB418/0.3	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
EP080: BTEXN (QC Lot: 6521574)									
EM2506488-086	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	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		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
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 6531851)									
EM2506750-041	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	0.0003	0.0002	35.9	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0047	0.0046	0.0	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0008	0.0006	33.9	No Limit
EM2506750-046	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	0.0016	0.0016	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0007	0.0006	15.6	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 6531851)									
EM2506750-041	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0004	0.0004	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0009	0.0009	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EM2506750-046	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0009	0.0010	11.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 6531851)									
EM2506750-041	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

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 (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 6531851) - continued									
EM2506750-041	Anonymous	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EM2506750-046	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 6531851)									
EM2506750-041	Anonymous	EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0055	0.0052	5.6	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0071	0.0067	5.8	0% - 20%
EM2506750-046	Anonymous	EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0007	0.0006	15.4	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0035	0.0035	0.0	0% - 50%

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**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 6521963)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	123 mg/kg	104	70.0	130
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	1.23 mg/kg	70.8	50.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	20.2 mg/kg	102	70.0	130
EG005T: Copper	7440-50-8	5	mg/kg	<5	55.9 mg/kg	94.0	70.0	130
EG005T: Lead	7439-92-1	5	mg/kg	<5	62.4 mg/kg	95.4	70.0	130
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.4 mg/kg	94.1	70.0	130
EG005T: Zinc	7440-66-6	5	mg/kg	<5	162 mg/kg	76.6	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6521964)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.64 mg/kg	93.0	69.0	128
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 6521712)								
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	128	68.0	133
EP075(SIM)A: Phenolic Compounds (QCLot: 6521714)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	3 mg/kg	114	81.2	121
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	3 mg/kg	111	83.2	120
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	3 mg/kg	113	81.6	123
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	6 mg/kg	99.4	79.7	129
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	3 mg/kg	71.8	49.8	129
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	3 mg/kg	87.0	81.5	127
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	3 mg/kg	86.1	74.2	125
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	3 mg/kg	94.5	79.8	121
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	3 mg/kg	72.0	71.5	121
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	3 mg/kg	81.3	67.8	119
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	3 mg/kg	90.1	64.5	126
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	6 mg/kg	55.3	10.0	118
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 6521669)								
EP075-TAS: Pyrene	129-00-0	0.5	mg/kg	<0.5	2 mg/kg	100.0	75.4	130
EP075-TAS: Phenanthrene	85-01-8	0.5	mg/kg	<0.5	2 mg/kg	97.3	73.3	130
EP075-TAS: Naphthalene	91-20-3	0.5	mg/kg	<0.5	2 mg/kg	95.2	73.0	131
EP075-TAS: Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	2 mg/kg	99.4	72.1	134
EP075-TAS: Fluorene	86-73-7	0.5	mg/kg	<0.5	2 mg/kg	94.7	74.4	131

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 6521669) - continued								
EP075-TAS: Fluoranthene	206-44-0	0.5	mg/kg	<0.5	2 mg/kg	98.9	75.3	132
EP075-TAS: Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	2 mg/kg	99.9	72.9	135
EP075-TAS: Chrysene	218-01-9	0.5	mg/kg	<0.5	2 mg/kg	99.4	75.0	133
EP075-TAS: Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	2 mg/kg	95.6	71.3	134
EP075-TAS: Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1	mg/kg	<1.0	4 mg/kg	95.6	75.8	133
EP075-TAS: Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	2 mg/kg	104	69.6	133
EP075-TAS: Anthracene	120-12-7	0.5	mg/kg	<0.5	2 mg/kg	96.6	78.4	127
EP075-TAS: Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	2 mg/kg	95.4	72.0	135
EP075-TAS: Acenaphthene	83-32-9	0.5	mg/kg	<0.5	2 mg/kg	84.8	76.3	130
EP075-TAS: Benzo(a)pyrene	50-32-8	0.05	mg/kg	<0.05	2 mg/kg	97.3	77.5	134
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6521574)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	95.5	58.6	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6521713)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	810 mg/kg	97.7	80.0	120
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	2880 mg/kg	96.7	80.0	120
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1460 mg/kg	96.4	80.0	120
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6521574)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	92.2	59.3	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6521713)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	1120 mg/kg	105	80.0	120
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	3800 mg/kg	93.8	80.0	120
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	260 mg/kg	106	80.0	120
EP080: BTEXN (QCLot: 6521574)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	91.6	61.6	117
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	97.8	65.8	125
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	95.0	65.8	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	102	64.8	134
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	104	68.7	132
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	87.7	61.8	123
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 6531851)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00111 mg/kg	97.8	72.0	128
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00114 mg/kg	107	67.0	130
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	93.2	68.0	136

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 6531851)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	112	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.4	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.2	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	69.0	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 6531851)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	110	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00119 mg/kg	116	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	112	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00121 mg/kg	84.8	70.0	130
EP231P: PFAS Sums (QCLot: 6531851)								
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

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**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 6521963)							
EM2506646-002	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	# Not Determined	78.0	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	101	79.7	116
		EG005T: Chromium	7440-47-3	50 mg/kg	101	79.0	121
		EG005T: Copper	7440-50-8	250 mg/kg	99.6	80.0	120
		EG005T: Lead	7439-92-1	250 mg/kg	102	80.0	120
		EG005T: Nickel	7440-02-0	50 mg/kg	99.9	78.0	120
		EG005T: Zinc	7440-66-6	250 mg/kg	94.0	80.0	120
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6521964)							
EM2506646-002	Anonymous	EG035T: Mercury	7439-97-6	0.5 mg/kg	70.3	70.0	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 6521712)							
EM2506755-001	TA-MB418/0.3	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	115	63.2	144
EP075(SIM)A: Phenolic Compounds (QCLot: 6521714)							

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP075(SIM)A: Phenolic Compounds (QCLot: 6521714) - continued							
EM2506755-002	TA-MB418/0.5	EP075(SIM): Phenol	108-95-2	3 mg/kg	96.3	77.1	119
		EP075(SIM): 2-Chlorophenol	95-57-8	3 mg/kg	102	78.9	123
		EP075(SIM): 2-Nitrophenol	88-75-5	3 mg/kg	74.1	43.8	136
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	3 mg/kg	87.1	61.5	120
		EP075(SIM): Pentachlorophenol	87-86-5	3 mg/kg	55.6	15.3	139
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 6521669)							
EM2506755-002	TA-MB418/0.5	EP075-TAS: Pyrene	129-00-0	3 mg/kg	96.7	37.8	152
		EP075-TAS: Acenaphthene	83-32-9	3 mg/kg	75.2	42.6	138
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6521574)							
EM2506755-001	TA-MB418/0.3	EP080: C6 - C9 Fraction	----	28 mg/kg	85.0	33.4	124
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6521713)							
EM2506755-002	TA-MB418/0.5	EP071: C10 - C14 Fraction	----	810 mg/kg	92.0	70.0	130
		EP071: C15 - C28 Fraction	----	2880 mg/kg	93.5	70.0	130
		EP071: C29 - C36 Fraction	----	1460 mg/kg	94.1	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6521574)							
EM2506755-001	TA-MB418/0.3	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	80.2	30.8	120
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6521713)							
EM2506755-002	TA-MB418/0.5	EP071: >C10 - C16 Fraction	----	1120 mg/kg	98.6	70.0	130
		EP071: >C16 - C34 Fraction	----	3800 mg/kg	91.2	70.0	130
		EP071: >C34 - C40 Fraction	----	260 mg/kg	106	70.0	130
EP080: BTEXN (QCLot: 6521574)							
EM2506755-001	TA-MB418/0.3	EP080: Benzene	71-43-2	2 mg/kg	105	54.4	127
		EP080: Toluene	108-88-3	2 mg/kg	111	57.1	131
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 6531851)							
EM2506750-042	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00111 mg/kg	103	72.0	128
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00114 mg/kg	127	67.0	130
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	110	68.0	136
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 6531851)							
EM2506750-042	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	114	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	105	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	90.1	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	87.3	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	96.2	69.0	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 6531851)							
EM2506750-042	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	102	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00119 mg/kg	111	64.0	140

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 6531851) - continued							
EM2506750-042	Anonymous	EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	111	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00121 mg/kg	88.1	70.0	130

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory please tick →

ALS BRISBANE 32 Shand Road Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

ALS ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: samples.adelaide@alsglobal.com

ALS PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com

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ALS WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: jenkembla@alsglobal.com

FREIGHT

CLIENT: pitt&sherry operations	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	✱ Standard or urgent TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: Hobart		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes / No / N/A
PROJECT: Tarraleah Switchyard Groundwater Sampling	ALS QUOTE NO.: EM25PITSHE0004_V4_P.24.1136	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes / No / N/A
ORDER NUMBER: P.24.1136		COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Carly Clark	CONTACT PH: 0490 942 344	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: Alex Hibberd	SAMPLER MOBILE: 0429 457 096	RELINQUISHED BY: Alex Hibberd	RECEIVED BY:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default): ENMRG	DATE/TIME: 30/04/25 15:00	DATE/TIME:
Email Reports to: cclark@pittsh.com.au; ahibberd@pittsh.com.au		RECEIVED BY:	RELINQUISHED BY:
Email Invoice to: cclark@pittsh.com.au; accounts@pittsh.com.au		DATE/TIME:	DATE/TIME:
			RECEIVED BY: [signature] DATE/TIME: 1/5 13:00

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Nutrients bottles have been frozen. Please forward QAQC2 to Eurofins for analysis

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED Including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)			Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	Suite H (Area C Groundwater Suite)	Rinsate 2	Trip Blank - (W-18)	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc
1	MB412	29/04/2025 1145	W	11x bottles and ice	11	X			Frozen nutrients bottles
2	MB415	29/04/2025 0945	W	13x bottles and ice	13	X			LAB QC (MS) for PFAS testing provided Frozen nutrients bottles
3	MB416	29/04/2025 1100	W	11x bottles and ice	11	X			Frozen nutrients bottles
4	MB418	29/04/2025 0845	W	13x bottles and ice	13	X			LAB QC (DUP) for PFAS testing provided
5	QAQC1	29/04/2025	W	11x bottles and ice	11	X			Frozen nutrients bottles
	QAQC2	29/04/2025	W	11x bottles and ice	11	X			Please forward QAQC2 to Eurofins for analysis. Frozen nutrients bottles
6	QAQC3	29/04/2025	W	6x bottles and ice	6		X		
7	QAQC4	29/04/2025	W	6x bottles and ice	6		X		
8	Trip blank	29/04/2025	W	2x bottles and ice	2			X	
				TOTAL	84				

Environmental Division
Melbourne
Work Order Reference
EM2507331

Telephone : +61-3-8549 9600

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved, AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved, VB = VOA Vial Sodium Bisulphate Preserved, VS = VOA Vial Sulfuric Preserved, AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass, H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass,
Z = Zinc Acetate Preserved Bottle, E = EDTA Preserved Bottles, ST = Sterile Bottle, ASS = Plastic Bag for Acid Sulphate Soils, B = Unpreserved Bag

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **EM2507331**		
Client	: **PITT & SHERRY (OPERATIONS) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: CARLY CLARK	Contact	: Hannah White
Address	: 199 MACQUARIE STREET HOBART 7001	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: cclark@pittsh.com.au	E-mail	: Hannah.White@alsglobal.com
Telephone	: 03 9674 4163	Telephone	: +61-3-8549 9600
Facsimile	: ----	Facsimile	: +61-3-8549 9626
Project	: Tarraleah Switchyard Groundwater Sampling	Page	: 1 of 3
Order number	: P.24.1136	Quote number	: EM2025PITSHE0004 (EM25PITSHE0004_V4)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: Alex Hibberd		

Dates

Date Samples Received	: 01-May-2025 13:00	Issue Date	: 01-May-2025
Client Requested Due Date	: 09-May-2025	Scheduled Reporting Date	: **09-May-2025**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 2.3-°C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 8 / 8

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- Unless otherwise stated, analytical work for this work order will be conducted at ALS Melbourne, NATA accreditation no. 825, site no. 13778.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- We received broken sample on receipt.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA005P pH (Auto Titrator)	WATER - EA010P Electrical Conductivity (Auto Titrator)	WATER - EA025H Suspended Solids - Standard Level	WATER - EG052G Silica - Reactive	WATER - EP066-PCB-WA Polychlorinated Biphenyls (PCB)	WATER - W-02T 8 metals (Total)	WATER - W-05 TRH/BTEXN/8 Metals
EM2507331-001	29-Apr-2025 11:45	MB412	✓	✓	✓	✓	✓	✓	✓
EM2507331-002	29-Apr-2025 09:45	MB415	✓	✓	✓	✓	✓	✓	✓
EM2507331-003	29-Apr-2025 11:00	MB416	✓	✓	✓	✓	✓	✓	✓
EM2507331-004	29-Apr-2025 08:45	MB418	✓	✓	✓	✓	✓	✓	✓
EM2507331-005	29-Apr-2025 00:00	QAQC1	✓	✓	✓	✓	✓	✓	✓
EM2507331-006	29-Apr-2025 00:00	QAQC3					✓		
EM2507331-007	29-Apr-2025 00:00	QAQC4						✓	

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA015H Total Dissolved Solids - Standard Level	WATER - EP231-SUT PFAS - Super Ultra Trace Waters Short Suite (12	WATER - UTN-4 Ultratrace NO2, NO3, NH3, Nitrogen,	WATER - W-18 TRH(C6 - C9)/BTEXN	WATER - W-23 minus BTEX SVOC/VOC without BTEX	WATER - W-27T TRH/BTEXN/PAH/Phenols/Total 8 Metals
EM2507331-001	29-Apr-2025 11:45	MB412	✓	✓	✓		✓	
EM2507331-002	29-Apr-2025 09:45	MB415	✓	✓	✓		✓	
EM2507331-003	29-Apr-2025 11:00	MB416	✓	✓	✓		✓	
EM2507331-004	29-Apr-2025 08:45	MB418	✓	✓	✓		✓	
EM2507331-005	29-Apr-2025 00:00	QAQC1	✓	✓	✓		✓	
EM2507331-006	29-Apr-2025 00:00	QAQC3		✓				✓
EM2507331-007	29-Apr-2025 00:00	QAQC4		✓		✓		
EM2507331-008	29-Apr-2025 00:00	Trip Blank				✓		

Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

Matrix: **WATER** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Client Sample ID(s)	Container	Due for extraction	Due for analysis	Samples Received Date	Samples Received Evaluation	Instructions Received Date	Instructions Received Evaluation
EA005-P: pH by Auto Titrator							
MB412	Clear Plastic Bottle - Natural	----	29-Apr-2025	01-May-2025	×	----	----

MB415	Clear Plastic Bottle - Natural	----	29-Apr-2025	01-May-2025	✘	----	----
MB416	Clear Plastic Bottle - Natural	----	29-Apr-2025	01-May-2025	✘	----	----
MB418	Clear Plastic Bottle - Natural	----	29-Apr-2025	01-May-2025	✘	----	----
QAQC1	Clear Plastic Bottle - Natural	----	29-Apr-2025	01-May-2025	✘	----	----

Requested Deliverables

Alex Hibberd

- *AU Certificate of Analysis - NATA (COA) — Email — ahibberd@pittsh.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — ahibberd@pittsh.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — ahibberd@pittsh.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — ahibberd@pittsh.com.au
- Chain of Custody (CoC) (COC) — Email — ahibberd@pittsh.com.au
- EDI Format - ENMRG (ENMRG) — Email — ahibberd@pittsh.com.au
- EDI Format - ESDAT (ESDAT) — Email — ahibberd@pittsh.com.au

ALL ACCOUNTS

- A4 - AU Tax Invoice (INV) — Email — accounts@pittsh.com.au

CARLY CLARK

- *AU Certificate of Analysis - NATA (COA) — Email — cclark@pittsh.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — cclark@pittsh.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — cclark@pittsh.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — cclark@pittsh.com.au
- A4 - AU Tax Invoice (INV) — Email — cclark@pittsh.com.au
- Chain of Custody (CoC) (COC) — Email — cclark@pittsh.com.au
- EDI Format - ENMRG (ENMRG) — Email — cclark@pittsh.com.au
- EDI Format - ESDAT (ESDAT) — Email — cclark@pittsh.com.au

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry / Biology).

(WATER) EK255A: Ammonia
(WATER) EK257A: Nitrite
(WATER) EK258A: Nitrate
(WATER) EK261A: Total Kjeldahl Nitrogen
(WATER) EK262A: Total Nitrogen
(WATER) EK267A: Total Phosphorus (Persulfate Digestion)
(WATER) EK271A: Reactive Phosphorus
(WATER) EK259A: Nitrite and Nitrate (NOx)

CERTIFICATE OF ANALYSIS

Work Order	: **EM2507331**	Page	: 1 of 20
Client	: **PITT & SHERRY (OPERATIONS) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: CARLY CLARK	Contact	: Hannah White
Address	: 199 MACQUARIE STREET HOBART 7001	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: 03 9674 4163	Telephone	: +61-3-8549 9600
Project	: Tarraleah Switchyard Groundwater Sampling	Date Samples Received	: 01-May-2025 13:00
Order number	: P.24.1136	Date Analysis Commenced	: 02-May-2025
C-O-C number	: ----	Issue Date	: 09-May-2025 14:46
Sampler	: Alex Hibberd		
Site	: ----		
Quote number	: EM25PITSHE0004_V4		
No. of samples received	: 8		
No. of samples analysed	: 8		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

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*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC 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 Contract 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.

- EA015H: EM2507331 #1-2,5: TDS by method EA-015 may bias high due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.
- EP231X-SUT: Poor matrix spike recovery for sample EM2507331-002 due to sample matrix interference. Confirmed by re-analysis.
- EP231X-SUT: Samples EM2507331-002,007 above LOR for PFOS result has been confirmed by re-exctration and re-analysis using second container.
- EP075 (SIM): Where reported, Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- EP075: Where reported, Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- EK271A-CM: Samples for Ultra-Trace Reactive Phosphorus by FIA should be frozen upon sampling. If not, low-level results (below 0.01 mg/L) may bias low.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP074: Where reported, Total Trihalomethanes is the sum of the reported concentrations of all Trihalomethanes at or above the LOR.
- EP074: Where reported, Total Trimethylbenzenes is the sum of the reported concentrations of 1.2.3-Trimethylbenzene, 1.2.4-Trimethylbenzene and 1.3.5-Trimethylbenzene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- EK259A-CM/EK262PA-CM: It has been noted that NOx is greater than Total Nitrogen on samples 2 & 5, however this difference is confirmed from their respective bottles.
- We received broken sample on receipt.
- EG020-T : EM2507331 #2 and #5 results for total metals have been confirmed by re-digestion and re-analysis.
- EP075: Where reported, 'Sum of PAH' is the sum of the USEPA 16 priority PAHs

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MB412	MB415	MB416	MB418	QAQC1
				Sampling date / time	29-Apr-2025 11:45	29-Apr-2025 09:45	29-Apr-2025 11:00	29-Apr-2025 08:45	29-Apr-2025 00:00
Compound	CAS Number	LOR	Unit		EM2507331-001	EM2507331-002	EM2507331-003	EM2507331-004	EM2507331-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**6.85**	**7.00**	**7.41**	**7.04**	**7.12**
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**170**	**134**	**274**	**214**	**138**
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		**244**	**109**	**171**	**154**	**93**
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		**1470**	**288**	**25**	**499**	**264**
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	<0.001	**0.001**	<0.001
Copper	7440-50-8	0.001	mg/L		**0.001**	**0.003**	**0.003**	**0.003**	**0.003**
Nickel	7440-02-0	0.001	mg/L		**0.002**	**0.005**	**0.002**	**0.004**	**0.005**
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	7440-66-6	0.005	mg/L		**0.007**	**0.009**	**0.016**	<0.005	**0.010**
EG020T: Total Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		**0.004**	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L		**0.0011**	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L		**0.038**	**0.023**	<0.001	**0.027**	**0.010**
Copper	7440-50-8	0.001	mg/L		**0.158**	**0.142**	**0.004**	**0.031**	**0.063**
Nickel	7440-02-0	0.001	mg/L		**0.041**	**0.028**	**0.002**	**0.022**	**0.017**
Lead	7439-92-1	0.001	mg/L		**0.034**	**0.005**	<0.001	**0.004**	**0.003**
Zinc	7440-66-6	0.005	mg/L		**0.354**	**0.049**	**0.021**	**0.033**	**0.034**
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MB412	MB415	MB416	MB418	QAQC1
				Sampling date / time	29-Apr-2025 11:45	29-Apr-2025 09:45	29-Apr-2025 11:00	29-Apr-2025 08:45	29-Apr-2025 00:00
Compound	CAS Number	LOR	Unit		EM2507331-001	EM2507331-002	EM2507331-003	EM2507331-004	EM2507331-005
					Result	Result	Result	Result	Result
EG052G: Silica by Discrete Analyser									
Reactive Silica	----	0.05	mg/L		24.0	26.6	16.7	21.5	26.6
EK255A: Ammonia									
Ammonia as N	7664-41-7	0.005	mg/L		0.008	0.005	0.045	0.010	0.009
EK257A: Nitrite									
Nitrite as N	14797-65-0	0.002	mg/L		0.004	0.003	0.058	0.049	0.003
EK258A: Nitrate									
Nitrate as N	14797-55-8	0.002	mg/L		1.34	1.19	0.257	0.455	1.18
EK259A: Nitrite and Nitrate (NOx)									
Nitrite + Nitrate as N	----	0.002	mg/L		1.34	1.19	0.315	0.504	1.18
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.01	mg/L		0.15	<0.02	0.28	0.13	<0.02
EK262A: Total Nitrogen									
Total Nitrogen as N	----	0.01	mg/L		1.49	1.09	0.60	0.63	1.08
EK267A: Total Phosphorus (Persulfate Digestion)									
Total Phosphorus as P	----	0.005	mg/L		0.446	0.064	0.033	0.080	0.075
EK271A: Reactive Phosphorus									
Reactive Phosphorus as P	14265-44-2	0.001	mg/L		0.023	0.018	0.011	0.008	0.015
EP066: Polychlorinated Biphenyls (PCB)									
^ Total Polychlorinated biphenyls	----	1	µg/L		<1	<1	<1	<1	<1
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	5	µg/L		<5	<5	<5	<5	<5
Isopropylbenzene	98-82-8	5	µg/L		<5	<5	<5	<5	<5
n-Propylbenzene	103-65-1	5	µg/L		<5	<5	<5	<5	<5
1.3.5-Trimethylbenzene	108-67-8	5	µg/L		<5	<5	<5	<5	<5
sec-Butylbenzene	135-98-8	5	µg/L		<5	<5	<5	<5	<5
1.2.4-Trimethylbenzene	95-63-6	5	µg/L		<5	<5	<5	<5	<5
tert-Butylbenzene	98-06-6	5	µg/L		<5	<5	<5	<5	<5
p-Isopropyltoluene	99-87-6	5	µg/L		<5	<5	<5	<5	<5

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MB412	MB415	MB416	MB418	QAQC1
			Sampling date / time	29-Apr-2025 11:45	29-Apr-2025 09:45	29-Apr-2025 11:00	29-Apr-2025 08:45	29-Apr-2025 00:00
Compound	CAS Number	LOR	Unit	EM2507331-001	EM2507331-002	EM2507331-003	EM2507331-004	EM2507331-005
				Result	Result	Result	Result	Result
EP074A: Monocyclic Aromatic Hydrocarbons - Continued								
n-Butylbenzene	104-51-8	5	µg/L	<5	<5	<5	<5	<5
EP074B: Oxygenated Compounds								
Vinyl Acetate	108-05-4	50	µg/L	<50	<50	<50	<50	<50
2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	<50	<50	<50
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	<50	<50	<50
2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	<50	<50	<50
EP074C: Sulfonated Compounds								
Carbon disulfide	75-15-0	5	µg/L	<5	<5	<5	<5	<5
EP074D: Fumigants								
2.2-Dichloropropane	594-20-7	5	µg/L	<5	<5	<5	<5	<5
1.2-Dichloropropane	78-87-5	5	µg/L	<5	<5	<5	<5	<5
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	<5	<5	<5
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	<5	<5	<5
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	<5	<5	<5
EP074E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	<50	<50	<50
Chloromethane	74-87-3	50	µg/L	<50	<50	<50	<50	<50
Vinyl chloride	75-01-4	50	µg/L	<50	<50	<50	<50	<50
Bromomethane	74-83-9	50	µg/L	<50	<50	<50	<50	<50
Chloroethane	75-00-3	50	µg/L	<50	<50	<50	<50	<50
Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	<50	<50	<50
1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	<5	<5	<5
Iodomethane	74-88-4	5	µg/L	<5	<5	<5	<5	<5
trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	<5	<5	<5
1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	<5	<5	<5
cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	<5	<5	<5
1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	<5	<5	<5

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MB412	MB415	MB416	MB418	QAQC1
				Sampling date / time	29-Apr-2025 11:45	29-Apr-2025 09:45	29-Apr-2025 11:00	29-Apr-2025 08:45	29-Apr-2025 00:00
Compound	CAS Number	LOR	Unit		EM2507331-001	EM2507331-002	EM2507331-003	EM2507331-004	EM2507331-005
					Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued									
1.1-Dichloropropylene	563-58-6	5	µg/L		<5	<5	<5	<5	<5
Carbon Tetrachloride	56-23-5	5	µg/L		<5	<5	<5	<5	<5
1.2-Dichloroethane	107-06-2	5	µg/L		<5	<5	<5	<5	<5
Trichloroethene	79-01-6	5	µg/L		<5	<5	<5	<5	<5
Dibromomethane	74-95-3	5	µg/L		<5	<5	<5	<5	<5
1.1.2-Trichloroethane	79-00-5	5	µg/L		<5	<5	<5	<5	<5
1.3-Dichloropropane	142-28-9	5	µg/L		<5	<5	<5	<5	<5
Tetrachloroethene	127-18-4	5	µg/L		<5	<5	<5	<5	<5
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L		<5	<5	<5	<5	<5
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L		<5	<5	<5	<5	<5
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L		<5	<5	<5	<5	<5
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L		<5	<5	<5	<5	<5
1.2.3-Trichloropropane	96-18-4	5	µg/L		<5	<5	<5	<5	<5
Pentachloroethane	76-01-7	5	µg/L		<5	<5	<5	<5	<5
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L		<5	<5	<5	<5	<5
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	5	µg/L		<5	<5	<5	<5	<5
Bromobenzene	108-86-1	5	µg/L		<5	<5	<5	<5	<5
2-Chlorotoluene	95-49-8	5	µg/L		<5	<5	<5	<5	<5
4-Chlorotoluene	106-43-4	5	µg/L		<5	<5	<5	<5	<5
1.2.3-Trichlorobenzene	87-61-6	5	µg/L		<5	<5	<5	<5	<5
EP074G: Trihalomethanes									
Chloroform	67-66-3	5	µg/L		<5	<5	<5	<5	<5
Bromodichloromethane	75-27-4	5	µg/L		<5	<5	<5	<5	<5
Dibromochloromethane	124-48-1	5	µg/L		<5	<5	<5	<5	<5
Bromoform	75-25-2	5	µg/L		<5	<5	<5	<5	<5
EP075A: Phenolic Compounds									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MB412	MB415	MB416	MB418	QAQC1
				Sampling date / time	29-Apr-2025 11:45	29-Apr-2025 09:45	29-Apr-2025 11:00	29-Apr-2025 08:45	29-Apr-2025 00:00
Compound	CAS Number	LOR	Unit		EM2507331-001	EM2507331-002	EM2507331-003	EM2507331-004	EM2507331-005
					Result	Result	Result	Result	Result
EP075A: Phenolic Compounds - Continued									
Phenol	108-95-2	2	µg/L		<2	<2	<2	<2	<2
2-Chlorophenol	95-57-8	2	µg/L		<2	<2	<2	<2	<2
2-Methylphenol	95-48-7	2	µg/L		<2	<2	<2	<2	<2
3- & 4-Methylphenol	1319-77-3	4	µg/L		<4	<4	<4	<4	<4
2-Nitrophenol	88-75-5	2	µg/L		<2	<2	<2	<2	<2
2.4-Dimethylphenol	105-67-9	2	µg/L		<2	<2	<2	<2	<2
2.4-Dichlorophenol	120-83-2	2	µg/L		<2	<2	<2	<2	<2
2.6-Dichlorophenol	87-65-0	2	µg/L		<2	<2	<2	<2	<2
4-Chloro-3-methylphenol	59-50-7	2	µg/L		<2	<2	<2	<2	<2
2.4.6-Trichlorophenol	88-06-2	2	µg/L		<2	<2	<2	<2	<2
2.4.5-Trichlorophenol	95-95-4	2	µg/L		<2	<2	<2	<2	<2
Pentachlorophenol	87-86-5	4	µg/L		<4	<4	<4	<4	<4
EP075B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	2	µg/L		<2	<2	<2	<2	<2
2-Methylnaphthalene	91-57-6	2	µg/L		<2	<2	<2	<2	<2
2-Chloronaphthalene	91-58-7	2	µg/L		<2	<2	<2	<2	<2
Acenaphthylene	208-96-8	2	µg/L		<2	<2	<2	<2	<2
Acenaphthene	83-32-9	2	µg/L		<2	<2	<2	<2	<2
Fluorene	86-73-7	2	µg/L		<2	<2	<2	<2	<2
Phenanthrene	85-01-8	2	µg/L		<2	<2	<2	<2	<2
Anthracene	120-12-7	2	µg/L		<2	<2	<2	<2	<2
Fluoranthene	206-44-0	2	µg/L		<2	<2	<2	<2	<2
Pyrene	129-00-0	2	µg/L		<2	<2	<2	<2	<2
N-2-Fluorenyl Acetamide	53-96-3	2	µg/L		<2	<2	<2	<2	<2
Benz(a)anthracene	56-55-3	2	µg/L		<2	<2	<2	<2	<2
Chrysene	218-01-9	2	µg/L		<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MB412	MB415	MB416	MB418	QAQC1
				Sampling date / time	29-Apr-2025 11:45	29-Apr-2025 09:45	29-Apr-2025 11:00	29-Apr-2025 08:45	29-Apr-2025 00:00
Compound	CAS Number	LOR	Unit		EM2507331-001	EM2507331-002	EM2507331-003	EM2507331-004	EM2507331-005
					Result	Result	Result	Result	Result
EP075B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	4	µg/L		<4	<4	<4	<4	<4
7.12-Dimethylbenz(a)anthracene	57-97-6	2	µg/L		<2	<2	<2	<2	<2
Benzo(a)pyrene	50-32-8	2	µg/L		<2	<2	<2	<2	<2
3-Methylcholanthrene	56-49-5	2	µg/L		<2	<2	<2	<2	<2
Indeno(1.2.3.cd)pyrene	193-39-5	2	µg/L		<2	<2	<2	<2	<2
Dibenz(a.h)anthracene	53-70-3	2	µg/L		<2	<2	<2	<2	<2
Benzo(g.h.i)perylene	191-24-2	2	µg/L		<2	<2	<2	<2	<2
^ Sum of PAHs	----	2	µg/L		<2	<2	<2	<2	<2
^ Benzo(a)pyrene TEQ (zero)	----	2	µg/L		<2	<2	<2	<2	<2
EP075C: Phthalate Esters									
Dimethyl phthalate	131-11-3	2	µg/L		<2	<2	<2	<2	<2
Diethyl phthalate	84-66-2	2	µg/L		<2	<2	<2	<2	<2
Di-n-butyl phthalate	84-74-2	2	µg/L		<2	<2	<2	<2	<2
Butyl benzyl phthalate	85-68-7	2	µg/L		<2	<2	<2	<2	<2
bis(2-ethylhexyl) phthalate	117-81-7	10	µg/L		<10	<10	<10	<10	<10
Di-n-octylphthalate	117-84-0	2	µg/L		<2	<2	<2	<2	<2
EP075D: Nitrosamines									
N-Nitrosomethylethylamine	10595-95-6	2	µg/L		<2	<2	<2	<2	<2
N-Nitrosodiethylamine	55-18-5	2	µg/L		<2	<2	<2	<2	<2
N-Nitrosopyrrolidine	930-55-2	4	µg/L		<4	<4	<4	<4	<4
N-Nitrosomorpholine	59-89-2	2	µg/L		<2	<2	<2	<2	<2
N-Nitrosodi-n-propylamine	621-64-7	2	µg/L		<2	<2	<2	<2	<2
N-Nitrosopiperidine	100-75-4	2	µg/L		<2	<2	<2	<2	<2
N-Nitrosodibutylamine	924-16-3	2	µg/L		<2	<2	<2	<2	<2
N-Nitrosodiphenyl & Diphenylamine	86-30-6 122-39-4	4	µg/L		<4	<4	<4	<4	<4
Methapyrilene	91-80-5	2	µg/L		<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MB412	MB415	MB416	MB418	QAQC1
				Sampling date / time	29-Apr-2025 11:45	29-Apr-2025 09:45	29-Apr-2025 11:00	29-Apr-2025 08:45	29-Apr-2025 00:00
Compound	CAS Number	LOR	Unit		EM2507331-001	EM2507331-002	EM2507331-003	EM2507331-004	EM2507331-005
					Result	Result	Result	Result	Result
EP075E: Nitroaromatics and Ketones									
2-Picoline	109-06-8	2	µg/L		<2	<2	<2	<2	<2
Acetophenone	98-86-2	2	µg/L		<2	<2	<2	<2	<2
Nitrobenzene	98-95-3	2	µg/L		<2	<2	<2	<2	<2
Isophorone	78-59-1	2	µg/L		<2	<2	<2	<2	<2
2.6-Dinitrotoluene	606-20-2	4	µg/L		<4	<4	<4	<4	<4
2.4-Dinitrotoluene	121-14-2	4	µg/L		<4	<4	<4	<4	<4
1-Naphthylamine	134-32-7	2	µg/L		<2	<2	<2	<2	<2
4-Nitroquinoline-N-oxide	56-57-5	2	µg/L		<2	<2	<2	<2	<2
5-Nitro-o-toluidine	99-55-8	2	µg/L		<2	<2	<2	<2	<2
Azobenzene	103-33-3	2	µg/L		<2	<2	<2	<2	<2
1.3.5-Trinitrobenzene	99-35-4	2	µg/L		<2	<2	<2	<2	<2
Phenacetin	62-44-2	2	µg/L		<2	<2	<2	<2	<2
4-Aminobiphenyl	92-67-1	2	µg/L		<2	<2	<2	<2	<2
Pentachloronitrobenzene	82-68-8	2	µg/L		<2	<2	<2	<2	<2
Pronamide	23950-58-5	2	µg/L		<2	<2	<2	<2	<2
Dimethylaminoazobenzene	60-11-7	2	µg/L		<2	<2	<2	<2	<2
Chlorobenzilate	510-15-6	2	µg/L		<2	<2	<2	<2	<2
EP075F: Haloethers									
Bis(2-chloroethyl) ether	111-44-4	2	µg/L		<2	<2	<2	<2	<2
Bis(2-chloroethoxy) methane	111-91-1	2	µg/L		<2	<2	<2	<2	<2
4-Chlorophenyl phenyl ether	7005-72-3	2	µg/L		<2	<2	<2	<2	<2
4-Bromophenyl phenyl ether	101-55-3	2	µg/L		<2	<2	<2	<2	<2
EP075G: Chlorinated Hydrocarbons									
1.3-Dichlorobenzene	541-73-1	2	µg/L		<2	<2	<2	<2	<2
1.4-Dichlorobenzene	106-46-7	2	µg/L		<2	<2	<2	<2	<2
1.2-Dichlorobenzene	95-50-1	2	µg/L		<2	<2	<2	<2	<2
Hexachloroethane	67-72-1	2	µg/L		<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MB412	MB415	MB416	MB418	QAQC1
			Sampling date / time	29-Apr-2025 11:45	29-Apr-2025 09:45	29-Apr-2025 11:00	29-Apr-2025 08:45	29-Apr-2025 00:00
Compound	CAS Number	LOR	Unit	EM2507331-001	EM2507331-002	EM2507331-003	EM2507331-004	EM2507331-005
				Result	Result	Result	Result	Result
EP075G: Chlorinated Hydrocarbons - Continued								
1.2.4-Trichlorobenzene	120-82-1	2	µg/L	<2	<2	<2	<2	<2
Hexachloropropylene	1888-71-7	2	µg/L	<2	<2	<2	<2	<2
Hexachlorobutadiene	87-68-3	2	µg/L	<2	<2	<2	<2	<2
Hexachlorocyclopentadiene	77-47-4	10	µg/L	<10	<10	<10	<10	<10
Pentachlorobenzene	608-93-5	2	µg/L	<2	<2	<2	<2	<2
Hexachlorobenzene (HCB)	118-74-1	4	µg/L	<4	<4	<4	<4	<4
EP075H: Anilines and Benzidines								
Aniline	62-53-3	2	µg/L	<2	<2	<2	<2	<2
4-Chloroaniline	106-47-8	2	µg/L	<2	<2	<2	<2	<2
2-Nitroaniline	88-74-4	4	µg/L	<4	<4	<4	<4	<4
3-Nitroaniline	99-09-2	4	µg/L	<4	<4	<4	<4	<4
Dibenzofuran	132-64-9	2	µg/L	<2	<2	<2	<2	<2
4-Nitroaniline	100-01-6	2	µg/L	<2	<2	<2	<2	<2
Carbazole	86-74-8	2	µg/L	<2	<2	<2	<2	<2
3.3`-Dichlorobenzidine	91-94-1	2	µg/L	<2	<2	<2	<2	<2
EP075I: Organochlorine Pesticides								
alpha-BHC	319-84-6	2	µg/L	<2	<2	<2	<2	<2
beta-BHC	319-85-7	2	µg/L	<2	<2	<2	<2	<2
gamma-BHC - (Lindane)	58-89-9	2	µg/L	<2	<2	<2	<2	<2
delta-BHC	319-86-8	2	µg/L	<2	<2	<2	<2	<2
Heptachlor	76-44-8	2	µg/L	<2	<2	<2	<2	<2
Aldrin	309-00-2	2	µg/L	<2	<2	<2	<2	<2
Heptachlor epoxide	1024-57-3	2	µg/L	<2	<2	<2	<2	<2
alpha-Endosulfan	959-98-8	2	µg/L	<2	<2	<2	<2	<2
4.4`-DDE	72-55-9	2	µg/L	<2	<2	<2	<2	<2
Dieldrin	60-57-1	2	µg/L	<2	<2	<2	<2	<2
Endrin	72-20-8	2	µg/L	<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MB412	MB415	MB416	MB418	QAQC1
				Sampling date / time	29-Apr-2025 11:45	29-Apr-2025 09:45	29-Apr-2025 11:00	29-Apr-2025 08:45	29-Apr-2025 00:00
Compound	CAS Number	LOR	Unit		EM2507331-001	EM2507331-002	EM2507331-003	EM2507331-004	EM2507331-005
					Result	Result	Result	Result	Result
EP075I: Organochlorine Pesticides - Continued									
beta-Endosulfan	33213-65-9	2	µg/L		<2	<2	<2	<2	<2
4.4`-DDD	72-54-8	2	µg/L		<2	<2	<2	<2	<2
Endosulfan sulfate	1031-07-8	2	µg/L		<2	<2	<2	<2	<2
4.4`-DDT	50-29-3	4	µg/L		<4	<4	<4	<4	<4
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	4	µg/L		<4	<4	<4	<4	<4
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	4	µg/L		<4	<4	<4	<4	<4
EP075J: Organophosphorus Pesticides									
Dichlorvos	62-73-7	2	µg/L		<2	<2	<2	<2	<2
Dimethoate	60-51-5	2	µg/L		<2	<2	<2	<2	<2
Diazinon	333-41-5	2	µg/L		<2	<2	<2	<2	<2
Chlorpyrifos-methyl	5598-13-0	2	µg/L		<2	<2	<2	<2	<2
Malathion	121-75-5	2	µg/L		<2	<2	<2	<2	<2
Fenthion	55-38-9	2	µg/L		<2	<2	<2	<2	<2
Chlorpyrifos	2921-88-2	2	µg/L		<2	<2	<2	<2	<2
Pirimphos-ethyl	23505-41-1	2	µg/L		<2	<2	<2	<2	<2
Chlorfenvinphos	470-90-6	2	µg/L		<2	<2	<2	<2	<2
Prothiofos	34643-46-4	2	µg/L		<2	<2	<2	<2	<2
Ethion	563-12-2	2	µg/L		<2	<2	<2	<2	<2
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	<20	<20

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MB412	MB415	MB416	MB418	QAQC1
			Sampling date / time	29-Apr-2025 11:45	29-Apr-2025 09:45	29-Apr-2025 11:00	29-Apr-2025 08:45	29-Apr-2025 00:00
Compound	CAS Number	LOR	Unit	EM2507331-001	EM2507331-002	EM2507331-003	EM2507331-004	EM2507331-005
				Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued								
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L	**110**	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L	**110**	<100	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<100
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	----	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	<0.0005	**0.0008**	<0.0005	<0.0005
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	**0.0024**	**0.0004**	**0.0034**	**0.0020**	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	<0.0005	**0.0011**	**0.0040**	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	<0.0005	<0.0005	**0.0017**	<0.0005
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	<0.0005	<0.0005	**0.0007**	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	<0.0005	<0.0005	**0.0011**	<0.0005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MB412	MB415	MB416	MB418	QAQC1
				Sampling date / time	29-Apr-2025 11:45	29-Apr-2025 09:45	29-Apr-2025 11:00	29-Apr-2025 08:45	29-Apr-2025 00:00
Compound	CAS Number	LOR	Unit		EM2507331-001	EM2507331-002	EM2507331-003	EM2507331-004	EM2507331-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ **Sum of PFHxS and PFOS**	355-46-4/1763-23-1	0.0002	µg/L		**0.0024**	**0.0004**	**0.0042**	**0.0020**	<0.0002
^ **Sum of PFAS (WA DER List)**	----	0.0002	µg/L		**0.0024**	**0.0004**	**0.0053**	**0.0095**	<0.0002
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	1	%		**65.8**	**69.0**	**52.4**	**73.5**	**67.0**
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	5	%		**98.4**	**95.8**	**109**	**106**	**105**
Toluene-D8	2037-26-5	5	%		**105**	**103**	**113**	**112**	**110**
4-Bromofluorobenzene	460-00-4	5	%		**105**	**101**	**112**	**112**	**106**
EP075S: Acid Extractable Surrogates									
2-Fluorophenol	367-12-4	2	%		**42.2**	**47.8**	**36.5**	**43.1**	**48.4**
Phenol-d6	13127-88-3	2	%		**27.8**	**32.4**	**26.9**	**26.6**	**30.7**
2-Chlorophenol-D4	93951-73-6	2	%		**68.9**	**76.9**	**61.0**	**70.4**	**76.5**
2.4.6-Tribromophenol	118-79-6	2	%		**71.2**	**77.4**	**41.5**	**69.1**	**75.9**
EP075T: Base/Neutral Extractable Surrogates									
Nitrobenzene-D5	4165-60-0	2	%		**74.6**	**81.0**	**59.9**	**72.1**	**81.9**
1.2-Dichlorobenzene-D4	2199-69-1	2	%		**65.7**	**73.5**	**54.2**	**64.3**	**74.3**
2-Fluorobiphenyl	321-60-8	2	%		**79.9**	**89.7**	**65.6**	**79.9**	**88.9**
Anthracene-d10	1719-06-8	2	%		**86.0**	**92.0**	**70.4**	**83.2**	**97.5**
4-Terphenyl-d14	1718-51-0	2	%		**97.7**	**98.1**	**72.7**	**89.8**	**104**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MB412	MB415	MB416	MB418	QAQC1
				Sampling date / time	29-Apr-2025 11:45	29-Apr-2025 09:45	29-Apr-2025 11:00	29-Apr-2025 08:45	29-Apr-2025 00:00
Compound	CAS Number	LOR	Unit		EM2507331-001	EM2507331-002	EM2507331-003	EM2507331-004	EM2507331-005
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		94.0	91.3	104	101	100
Toluene-D8	2037-26-5	2	%		104	103	112	112	109
4-Bromofluorobenzene	460-00-4	2	%		103	101	113	109	106
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		109	106	116	110	106
13C8-PFOA	----	0.0005	%		87.2	96.7	87.3	83.1	84.9

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	QAQC3	QAQC4	Trip Blank	----	----
				Sampling date / time	29-Apr-2025 00:00	29-Apr-2025 00:00	29-Apr-2025 00:00	----	----
Compound	CAS Number	LOR	Unit		EM2507331-006	EM2507331-007	EM2507331-008	--------	--------
					Result	Result	Result	----	----
EG020T: Total Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		<0.001	<0.001	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	----	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	----	----	----
Copper	7440-50-8	0.001	mg/L		<0.001	<0.001	----	----	----
Nickel	7440-02-0	0.001	mg/L		<0.001	<0.001	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	----	----	----
Zinc	7440-66-6	0.005	mg/L		<0.005	<0.005	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	----	----	----
EP066: Polychlorinated Biphenyls (PCB)									
^ **Total Polychlorinated biphenyls**	----	1	µg/L		<1	----	----	----	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	1.0	µg/L		<1.0	----	----	----	----
2-Chlorophenol	95-57-8	1.0	µg/L		<1.0	----	----	----	----
2-Methylphenol	95-48-7	1.0	µg/L		<1.0	----	----	----	----
3- & 4-Methylphenol	1319-77-3	2.0	µg/L		<2.0	----	----	----	----
2-Nitrophenol	88-75-5	1.0	µg/L		<1.0	----	----	----	----
2.4-Dimethylphenol	105-67-9	1.0	µg/L		<1.0	----	----	----	----
2.4-Dichlorophenol	120-83-2	1.0	µg/L		<1.0	----	----	----	----
2.6-Dichlorophenol	87-65-0	1.0	µg/L		<1.0	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L		<1.0	----	----	----	----
2.4.6-Trichlorophenol	88-06-2	1.0	µg/L		<1.0	----	----	----	----
2.4.5-Trichlorophenol	95-95-4	1.0	µg/L		<1.0	----	----	----	----
Pentachlorophenol	87-86-5	2.0	µg/L		<2.0	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		<1.0	----	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L		<1.0	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	QAQC3	QAQC4	Trip Blank	----	----
				Sampling date / time	29-Apr-2025 00:00	29-Apr-2025 00:00	29-Apr-2025 00:00	----	----
Compound	CAS Number	LOR	Unit		EM2507331-006	EM2507331-007	EM2507331-008	--------	--------
					Result	Result	Result	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Acenaphthene	83-32-9	1.0	µg/L		<1.0	----	----	----	----
Fluorene	86-73-7	1.0	µg/L		<1.0	----	----	----	----
Phenanthrene	85-01-8	1.0	µg/L		<1.0	----	----	----	----
Anthracene	120-12-7	1.0	µg/L		<1.0	----	----	----	----
Fluoranthene	206-44-0	1.0	µg/L		<1.0	----	----	----	----
Pyrene	129-00-0	1.0	µg/L		<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L		<1.0	----	----	----	----
Chrysene	218-01-9	1.0	µg/L		<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L		<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L		<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L		<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L		<1.0	----	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L		<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	µg/L		<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	----	----
C10 - C14 Fraction	----	50	µg/L		<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L		<20	<20	<20	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	QAQC3	QAQC4	Trip Blank	----	----
				Sampling date / time	29-Apr-2025 00:00	29-Apr-2025 00:00	29-Apr-2025 00:00	----	----
Compound	CAS Number	LOR	Unit		EM2507331-006	EM2507331-007	EM2507331-008	--------	--------
					Result	Result	Result	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
>C16 - C34 Fraction	----	100	µg/L		<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	----	----
Toluene	108-88-3	2	µg/L		<2	<2	<2	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	----	----
^ Total Xylenes	----	2	µg/L		<2	<2	<2	----	----
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		<0.0002	**0.0002**	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0020	<0.0020	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	<0.0005	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	QAQC3	QAQC4	Trip Blank	----	----
				Sampling date / time	29-Apr-2025 00:00	29-Apr-2025 00:00	29-Apr-2025 00:00	----	----
Compound	CAS Number	LOR	Unit		EM2507331-006	EM2507331-007	EM2507331-008	--------	--------
					Result	Result	Result	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	----	----	----
EP231P: PFAS Sums									
^ **Sum of PFHxS and PFOS**	355-46-4/1763-23-1	0.0002	µg/L		<0.0002	**0.0002**	----	----	----
^ **Sum of PFAS (WA DER List)**	----	0.0002	µg/L		<0.0002	**0.0002**	----	----	----
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	1	%		**70.9**	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		**33.2**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1.0	%		**64.0**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	1.0	%		**83.8**	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		**92.8**	----	----	----	----
Anthracene-d10	1719-06-8	1.0	%		**96.6**	----	----	----	----
4-Terphenyl-d14	1718-51-0	1.0	%		**95.5**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**81.8**	**107**	**117**	----	----
Toluene-D8	2037-26-5	2	%		**90.5**	**105**	**114**	----	----
4-Bromofluorobenzene	460-00-4	2	%		**90.2**	**106**	**120**	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**96.4**	**107**	----	----	----
13C8-PFOA	----	0.0005	%		**82.8**	**102**	----	----	----

Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	41	125
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72	132
Toluene-D8	2037-26-5	77	132
4-Bromofluorobenzene	460-00-4	67	131
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	51
2-Chlorophenol-D4	93951-73-6	30	114
2.4.6-Tribromophenol	118-79-6	26	133
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	35	127
Anthracene-d10	1719-06-8	44	122
4-Terphenyl-d14	1718-51-0	44	124
EP075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	6	83
Phenol-d6	13127-88-3	10	65
2-Chlorophenol-D4	93951-73-6	22	112
2.4.6-Tribromophenol	118-79-6	22	125
EP075T: Base/Neutral Extractable Surrogates			
Nitrobenzene-D5	4165-60-0	37	115
1.2-Dichlorobenzene-D4	2199-69-1	32	99
2-Fluorobiphenyl	321-60-8	39	116
Anthracene-d10	1719-06-8	49	123
4-Terphenyl-d14	1718-51-0	47	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	129
Toluene-D8	2037-26-5	70	125
4-Bromofluorobenzene	460-00-4	71	129
EP231S: PFAS Surrogate			
13C4-PFOS	----	70	130
13C8-PFOA	----	70	130

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry / Biology).

(WATER) EK255A: Ammonia

(WATER) EK257A: Nitrite

(WATER) EK258A: Nitrate

(WATER) EK261A: Total Kjeldahl Nitrogen

(WATER) EK262A: Total Nitrogen

(WATER) EK267A: Total Phosphorus (Persulfate Digestion)

(WATER) EK271A: Reactive Phosphorus

(WATER) EK259A: Nitrite and Nitrate (NOx)

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2507331**	Page	: 1 of 14
Client	: **PITT & SHERRY (OPERATIONS) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: CARLY CLARK	Telephone	: +61-3-8549 9600
Project	: Tarraleah Switchyard Groundwater Sampling	Date Samples Received	: 01-May-2025
Site	: ----	Issue Date	: 09-May-2025
Sampler	: Alex Hibberd	No. of samples received	: 8
Order number	: P.24.1136	No. of samples analysed	: 8

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 Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, where applicable to the methodology, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EK259A: Nitrite and Nitrate (NOx)	EM2507331--001	MB412	**Nitrite + Nitrate as N**	----	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EM2507331--002	MB415	**Perfluorobutane sulfonic acid (PFBS)**	375-73-5	61.9 %	70.0-130%	**Recovery less than lower data quality objective**
EP231A: Perfluoroalkyl Sulfonic Acids	EM2507331--002	MB415	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	64.7 %	70.0-130%	**Recovery less than lower data quality objective**
EP231A: Perfluoroalkyl Sulfonic Acids	EM2507331--002	MB415	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	57.6 %	70.0-130%	**Recovery less than lower data quality objective**
EP231B: Perfluoroalkyl Carboxylic Acids	EM2507331--002	MB415	**Perfluoropentanoic acid (PFPeA)**	2706-90-3	69.3 %	70.0-130%	**Recovery less than lower data quality objective**
EP231B: Perfluoroalkyl Carboxylic Acids	EM2507331--002	MB415	**Perfluorohexanoic acid (PFHxA)**	307-24-4	63.8 %	70.0-130%	**Recovery less than lower data quality objective**
EP231B: Perfluoroalkyl Carboxylic Acids	EM2507331--002	MB415	**Perfluoroheptanoic acid (PFHpA)**	375-85-9	57.8 %	70.0-130%	**Recovery less than lower data quality objective**
EP231B: Perfluoroalkyl Carboxylic Acids	EM2507331--002	MB415	**Perfluorooctanoic acid (PFOA)**	335-67-1	63.0 %	70.0-130%	**Recovery less than lower data quality objective**
EP231D: (n:2) Fluorotelomer Sulfonic Acids	EM2507331--002	MB415	**6:2 Fluorotelomer sulfonic acid (6:2 FTS)**	27619-97-2	69.2 %	70.0-130%	**Recovery less than lower data quality objective**
EP231D: (n:2) Fluorotelomer Sulfonic Acids	EM2507331--002	MB415	**8:2 Fluorotelomer sulfonic acid (8:2 FTS)**	39108-34-4	69.4 %	70.0-130%	**Recovery less than lower data quality objective**
EP231D: (n:2) Fluorotelomer Sulfonic Acids	EM2507331--002	MB415	**10:2 Fluorotelomer sulfonic acid (10:2 FTS)**	120226-60-0	54.1 %	70.0-130%	**Recovery less than lower data quality objective**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)	Date extracted	Due for extraction	**Days overdue**	Date analysed	Due for analysis	**Days overdue**
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural						
MB412, MB415, MB416, MB418, QAQC1	----	----	----	07-May-2025	29-Apr-2025	**8**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)						
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	1	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	0	6	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	EP075	0	5	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	0	6	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	EP075	0	5	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

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: **WATER** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / ***Container*** / Client Sample ID(s)	***Sample Date***	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P)							
MB412, MB415, MB416, MB418, QAQC1	**29-Apr-2025**	**----**	----	----	**07-May-2025**	29-Apr-2025	×
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P)							
MB412, MB415, MB416, MB418, QAQC1	**29-Apr-2025**	**----**	----	----	**07-May-2025**	27-May-2025	✓
EA015: Total Dissolved Solids dried at 180 ± 5 °C							
Clear Plastic Bottle - Natural (EA015H)							
MB412, MB415, MB416, MB418, QAQC1	**29-Apr-2025**	**----**	----	----	**02-May-2025**	06-May-2025	✓
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H)							
MB412, MB415, MB416, MB418, QAQC1	**29-Apr-2025**	**----**	----	----	**02-May-2025**	06-May-2025	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F)							
MB412, MB415, MB416, MB418, QAQC1	**29-Apr-2025**	**----**	----	----	**06-May-2025**	26-Oct-2025	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
MB412, MB415, MB416, MB418, QAQC1, QAQC3, QAQC4	**29-Apr-2025**	**05-May-2025**	26-Oct-2025	✓	**05-May-2025**	26-Oct-2025	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG035F)							
MB412, MB415, MB416, MB418, QAQC1	**29-Apr-2025**	**----**	----	----	**07-May-2025**	27-May-2025	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG035T)							
MB412, MB415, MB416, MB418, QAQC1, QAQC3, QAQC4	**29-Apr-2025**	**----**	----	----	**02-May-2025**	27-May-2025	✓
EG052G: Silica by Discrete Analyser							
Clear Plastic Bottle - Natural (EG052G)							
MB412, MB415, MB416, MB418, QAQC1	**29-Apr-2025**	**----**	----	----	**08-May-2025**	27-May-2025	✓
EK255A: Ammonia							
Clear Plastic - Filtered & Frozen (AS/ISO) - UT Nu (EK255A-CM)							
MB412, MB415, MB416, MB418, QAQC1	**29-Apr-2025**	**----**	----	----	**02-May-2025**	27-May-2025	✓
EK257A: Nitrite							
Clear Plastic - Filtered & Frozen (AS/ISO) - UT Nu (EK257A-CM)							
MB412, MB415, MB416, MB418, QAQC1	**29-Apr-2025**	**----**	----	----	**02-May-2025**	03-May-2025	✓
EK259A: Nitrite and Nitrate (NOx)							
Clear Plastic - Filtered & Frozen (AS/ISO) - UT Nu (EK259A-CM)							
MB412, MB415, MB416, MB418, QAQC1	**29-Apr-2025**	**----**	----	----	**02-May-2025**	27-May-2025	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK262A: Total Nitrogen							
Clear Plastic Bottle - Frozen (AS) (EK262PA-CM)							
MB412, MB415, MB416, MB418, QAQC1	**29-Apr-2025**	**02-May-2025**	27-May-2025	✓	**02-May-2025**	27-May-2025	✓
EK267A: Total Phosphorus (Persulfate Digestion)							
Clear Plastic Bottle - Frozen (AS) (EK267PA-CM)							
MB412, MB415, MB416, MB418, QAQC1	**29-Apr-2025**	**02-May-2025**	27-May-2025	✓	**02-May-2025**	27-May-2025	✓
EK271A: Reactive Phosphorus							
Clear Plastic - Filtered & Frozen (AS/ISO) - UT Nu (EK271A-CM)							
MB412, MB415, MB416, MB418, QAQC1	**29-Apr-2025**	**----**	----	----	**02-May-2025**	27-May-2025	✓
EP066: Polychlorinated Biphenyls (PCB)							
Amber Glass Bottle - Unpreserved (EP066)							
MB412, MB415	**29-Apr-2025**	**02-May-2025**	06-May-2025	✓	**05-May-2025**	11-Jun-2025	✓
Amber Glass Bottle - Unpreserved (EP066)							
MB416, MB418, QAQC1, QAQC3	**29-Apr-2025**	**02-May-2025**	06-May-2025	✓	**06-May-2025**	11-Jun-2025	✓
EP074A: Monocyclic Aromatic Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP074)							
MB412, MB415, MB416, MB418, QAQC1	**29-Apr-2025**	**06-May-2025**	13-May-2025	✓	**06-May-2025**	13-May-2025	✓
EP074B: Oxygenated Compounds							
Amber VOC Vial - Sulfuric Acid (EP074)							
MB412, MB415, MB416, MB418, QAQC1	**29-Apr-2025**	**06-May-2025**	13-May-2025	✓	**06-May-2025**	13-May-2025	✓
EP074C: Sulfonated Compounds							
Amber VOC Vial - Sulfuric Acid (EP074)							
MB412, MB415, MB416, MB418, QAQC1	**29-Apr-2025**	**06-May-2025**	13-May-2025	✓	**06-May-2025**	13-May-2025	✓
EP074D: Fumigants							
Amber VOC Vial - Sulfuric Acid (EP074)							
MB412, MB415, MB416, MB418, QAQC1	**29-Apr-2025**	**06-May-2025**	13-May-2025	✓	**06-May-2025**	13-May-2025	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP074E: Halogenated Aliphatic Compounds							
Amber VOC Vial - Sulfuric Acid (EP074)							
MB412, MB415, MB416, MB418, QAQC1	**29-Apr-2025**	**06-May-2025**	13-May-2025	✓	**06-May-2025**	13-May-2025	✓
EP074F: Halogenated Aromatic Compounds							
Amber VOC Vial - Sulfuric Acid (EP074)							
MB412, MB415, MB416, MB418, QAQC1	**29-Apr-2025**	**06-May-2025**	13-May-2025	✓	**06-May-2025**	13-May-2025	✓
EP074G: Trihalomethanes							
Amber VOC Vial - Sulfuric Acid (EP074)							
MB412, MB415, MB416, MB418, QAQC1	**29-Apr-2025**	**06-May-2025**	13-May-2025	✓	**06-May-2025**	13-May-2025	✓
EP075(SIM)A: Phenolic Compounds							
Amber Glass Bottle - Unpreserved (EP075(SIM))							
QAQC3	**29-Apr-2025**	**02-May-2025**	06-May-2025	✓	**05-May-2025**	11-Jun-2025	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM))							
QAQC3	**29-Apr-2025**	**02-May-2025**	06-May-2025	✓	**05-May-2025**	11-Jun-2025	✓
EP075A: Phenolic Compounds							
Amber Glass Bottle - Unpreserved (EP075)							
MB412, MB415, MB416, MB418, QAQC1	**29-Apr-2025**	**02-May-2025**	06-May-2025	✓	**06-May-2025**	11-Jun-2025	✓
EP075B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075)							
MB412, MB415, MB416, MB418, QAQC1	**29-Apr-2025**	**02-May-2025**	06-May-2025	✓	**06-May-2025**	11-Jun-2025	✓
EP075C: Phthalate Esters							
Amber Glass Bottle - Unpreserved (EP075)							
MB412, MB415, MB416, MB418, QAQC1	**29-Apr-2025**	**02-May-2025**	06-May-2025	✓	**06-May-2025**	11-Jun-2025	✓
EP075D: Nitrosamines							
Amber Glass Bottle - Unpreserved (EP075)							
MB412, MB415, MB416, MB418, QAQC1	**29-Apr-2025**	**02-May-2025**	06-May-2025	✓	**06-May-2025**	11-Jun-2025	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075E: Nitroaromatics and Ketones							
Amber Glass Bottle - Unpreserved (EP075)							
MB412, MB415, MB416, MB418, QAQC1	**29-Apr-2025**	**02-May-2025**	06-May-2025	✓	**06-May-2025**	11-Jun-2025	✓
EP075F: Haloethers							
Amber Glass Bottle - Unpreserved (EP075)							
MB412, MB415, MB416, MB418, QAQC1	**29-Apr-2025**	**02-May-2025**	06-May-2025	✓	**06-May-2025**	11-Jun-2025	✓
EP075G: Chlorinated Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075)							
MB412, MB415, MB416, MB418, QAQC1	**29-Apr-2025**	**02-May-2025**	06-May-2025	✓	**06-May-2025**	11-Jun-2025	✓
EP075H: Anilines and Benzidines							
Amber Glass Bottle - Unpreserved (EP075)							
MB412, MB415, MB416, MB418, QAQC1	**29-Apr-2025**	**02-May-2025**	06-May-2025	✓	**06-May-2025**	11-Jun-2025	✓
EP075I: Organochlorine Pesticides							
Amber Glass Bottle - Unpreserved (EP075)							
MB412, MB415, MB416, MB418, QAQC1	**29-Apr-2025**	**02-May-2025**	06-May-2025	✓	**06-May-2025**	11-Jun-2025	✓
EP075J: Organophosphorus Pesticides							
Amber Glass Bottle - Unpreserved (EP075)							
MB412, MB415, MB416, MB418, QAQC1	**29-Apr-2025**	**02-May-2025**	06-May-2025	✓	**06-May-2025**	11-Jun-2025	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
MB412, MB415, MB416, MB418, QAQC1, QAQC3	**29-Apr-2025**	**02-May-2025**	06-May-2025	✓	**05-May-2025**	11-Jun-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
MB412, MB415, MB416, MB418, QAQC1, QAQC3, QAQC4, Trip Blank	**29-Apr-2025**	**06-May-2025**	13-May-2025	✓	**06-May-2025**	13-May-2025	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Amber Glass Bottle - Unpreserved (EP071)								
MB412,	MB415,	**29-Apr-2025**	**02-May-2025**	06-May-2025	✓	**05-May-2025**	11-Jun-2025	✓
MB416,	MB418,							
QAQC1,	QAQC3							
Amber VOC Vial - Sulfuric Acid (EP080)								
MB412,	MB415,	**29-Apr-2025**	**06-May-2025**	13-May-2025	✓	**06-May-2025**	13-May-2025	✓
MB416,	MB418,							
QAQC1,	QAQC3,							
QAQC4,	Trip Blank							
EP080: BTEXN								
Amber VOC Vial - Sulfuric Acid (EP080)								
MB412,	MB415,	**29-Apr-2025**	**06-May-2025**	13-May-2025	✓	**06-May-2025**	13-May-2025	✓
MB416,	MB418,							
QAQC1,	QAQC3,							
QAQC4,	Trip Blank							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X-SUT)								
MB412,	MB415,	**29-Apr-2025**	**07-May-2025**	26-Oct-2025	✓	**07-May-2025**	26-Oct-2025	✓
MB416,	MB418,							
QAQC1,	QAQC3,							
QAQC4								
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X-SUT)								
MB412,	MB415,	**29-Apr-2025**	**07-May-2025**	26-Oct-2025	✓	**07-May-2025**	26-Oct-2025	✓
MB416,	MB418,							
QAQC1,	QAQC3,							
QAQC4								
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X-SUT)								
MB412,	MB415,	**29-Apr-2025**	**07-May-2025**	26-Oct-2025	✓	**07-May-2025**	26-Oct-2025	✓
MB416,	MB418,							
QAQC1,	QAQC3,							
QAQC4								
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X-SUT)								
MB412,	MB415,	**29-Apr-2025**	**07-May-2025**	26-Oct-2025	✓	**07-May-2025**	26-Oct-2025	✓
MB416,	MB418,							
QAQC1,	QAQC3,							
QAQC4								

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: **WATER**

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)							
Ammonia as N - Ultra-Trace for Catchment Monitoring	EK255A-CM	1	5	**20.00**	**9.09**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) - Ultra-Trace for Catchment M	EK259A-CM	1	5	**20.00**	**9.52**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N - Ultra-Trace for Catchment Monitoring	EK257A-CM	1	5	**20.00**	**9.52**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	1	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	0	6	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P - Ultra-Trace for Catchment M	EK271A-CM	1	5	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	EP075	0	5	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Silica (Reactive) by Discrete Analyser	EG052G	1	5	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	3	22	**13.64**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	3	30	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	4	37	**10.81**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Nitrogen as N (Persulfate digestion)-Ultra-Trace - CM	EK262PA-CM	1	5	**20.00**	**9.52**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus(Persulfate Digestion) - Ultra-Trace for CM	EK267PA-CM	1	5	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	3	27	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Ammonia as N - Ultra-Trace for Catchment Monitoring	EK255A-CM	1	5	**20.00**	**4.55**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) - Ultra-Trace for Catchment M	EK259A-CM	1	5	**20.00**	**4.76**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N - Ultra-Trace for Catchment Monitoring	EK257A-CM	1	5	**20.00**	**4.76**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

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 Control Samples (LCS) - Continued							
Reactive Phosphorus as P - Ultra-Trace for Catchment M	EK271A-CM	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	EP075	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Silica (Reactive) by Discrete Analyser	EG052G	2	5	**40.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	3	22	**13.64**	**7.50**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	3	30	**10.00**	**7.50**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Nitrogen as N (Persulfate digestion)-Ultra-Trace - CM	EK262PA-CM	1	5	**20.00**	**4.76**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus(Persulfate Digestion) - Ultra-Trace for CM	EK267PA-CM	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	27	**7.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N - Ultra-Trace for Catchment Monitoring	EK255A-CM	1	5	**20.00**	**4.55**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) - Ultra-Trace for Catchment M	EK259A-CM	1	5	**20.00**	**4.76**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N - Ultra-Trace for Catchment Monitoring	EK257A-CM	1	5	**20.00**	**4.76**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P - Ultra-Trace for Catchment M	EK271A-CM	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	EP075	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Silica (Reactive) by Discrete Analyser	EG052G	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Nitrogen as N (Persulfate digestion)-Ultra-Trace - CM	EK262PA-CM	1	5	**20.00**	**4.76**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus(Persulfate Digestion) - Ultra-Trace for CM	EK267PA-CM	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	27	**7.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N - Ultra-Trace for Catchment Monitoring	EK255A-CM	1	5	**20.00**	**4.55**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

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*	
Matrix Spikes (MS) - Continued							
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) - Ultra-Trace for Catchment M	EK259A-CM	1	5	**20.00**	**4.76**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N - Ultra-Trace for Catchment Monitoring	EK257A-CM	1	5	**20.00**	**4.76**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	0	6	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P - Ultra-Trace for Catchment M	EK271A-CM	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	EP075	0	5	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Silica (Reactive) by Discrete Analyser	EG052G	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Nitrogen as N (Persulfate digestion)-Ultra-Trace - CM	EK262PA-CM	1	5	**20.00**	**4.76**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus(Persulfate Digestion) - Ultra-Trace for CM	EK267PA-CM	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	27	**7.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	12	**8.33**	**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
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Total Dissolved Solids (High Level)	EA015H	WATER	In house: Referenced to APHA 2540C. A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM Schedule B(3)
Suspended Solids (High Level)	EA025H	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of `non-filterable` residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C . This method is compliant with NEPM Schedule B(3)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 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).
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 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).
Silica (Reactive) by Discrete Analyser	EG052G	WATER	In house: Referenced to APHA 4500-SiO2 D: Under Acdic conditions reactive silicon combines with ammonium molybdate to form a yellow molybdosilicic acid complex. This is reduced by 1-amino-2-naphthol-4-sulfonic acid to a silicomolybdenum blue complex which is measured by discrete analyser at 670 nm. This method is compliant with NEPM Schedule B(3).
Ammonia as N - Ultra-Trace for Catchment Monitoring	EK255A-CM	WATER	In house: Referenced to APHA 4500-NH3 H. Ammonia is determined by direct colorimetry by FIA. This method is compliant with NEPM Schedule B(3)

Analytical Methods	Method	Matrix	Method Descriptions
Nitrite as N - Ultra-Trace for Catchment Monitoring	EK257A-CM	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by FIA.
Nitrate as N - Ultra-Trace for Catchment Monitoring	EK258A-CM	WATER	In house: Referenced to APHA 4500-NO3- I Nitrate is reduced to nitrite by way of a cadmium reduction column followed by quantification by FIA. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results.
Nitrite and Nitrate as N (NOx) - Ultra-Trace for Catchment M	EK259A-CM	WATER	In house: Referenced to APHA 4500-NO3- I. Combined oxidised Nitrogen (NO2+NO3) is determined by Cadmium Reduction and direct colourimetry by FIA.
TKN (Total N - NOx-N). (FIA - UT) for Catchment Monitoring	EK261PA-CM	WATER	In house: Referenced to APHA 4500-N C & 4500-NO3- I. Calculated by difference from total Nitrogen and NOx. Contributing method parameters are determined by FIA. This method is compliant with NEPM Schedule B(3)
Total Nitrogen as N (Persulfate digestion)-Ultra-Trace - CM	EK262PA-CM	WATER	In house: Referenced to APHA 4500-N B and APHA 4500-P I. Persulfate Method for Simultaneous Determination of Total Nitrogen and Total Phosphorus. As sample is digested with persulfate under alkaline conditions yielding orthophosphate and nitrate. Following digestion, analytes are determined by flow injection analysis. This method is compliant with NEPM Schedule B(3)
Total Phosphorus(Persulfate Digestion) - Ultra-Trace for CM	EK267PA-CM	WATER	In house: Referenced to APHA 4500-N B and APHA 4500-P I. Persulfate Method for Simultaneous Determination of Total Nitrogen and Total Phosphorus. As sample is digested with persulfate under alkaline conditions yielding orthophosphate and nitrate. Following digestion, analytes are determined by flow injection analysis. This method is compliant with NEPM Schedule B(3)
Reactive Phosphorus as P - Ultra-Trace for Catchment M	EK271A-CM	WATER	In house: Referenced to APHA 4500-P E Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by FIA. This method is compliant with NEPM Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
Volatile Organic Compounds	EP074	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
Semivolatile Organic Compounds	EP075	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)

Analytical Methods	Method	Matrix	Method Descriptions
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	WATER	In-house: Analysis of fresh and saline waters by solid phase extraction (SPE) followed by negative mode LC-ESI-MS/MS using MRM and isotope dilution or internal standard quantitation. Isotope dilution standards (where commercially available) and surrogates are added to the sample container. The entire contents are transferred to a weak anion exchange (WAX) solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Data quality objectives for internal standard recoveries are based on US EPA method 1633.

Preparation Methods	Method	Matrix	Method Descriptions
Persulfate Digestion for UT TN and TP for FIA finish.	EK262/267-PA Prep	WATER	In house: Referenced to APHA 4500-N B and APHA 4500-P I. This method is compliant with NEPM Schedule B(3)
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

QUALITY CONTROL REPORT

Work Order	: **EM2507331**	Page	: 1 of 21
Client	: **PITT & SHERRY (OPERATIONS) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: CARLY CLARK	Contact	: Hannah White
Address	: 199 MACQUARIE STREET HOBART 7001	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: 03 9674 4163	Telephone	: +61-3-8549 9600
Project	: Tarraleah Switchyard Groundwater Sampling	Date Samples Received	: 01-May-2025
Order number	: P.24.1136	Date Analysis Commenced	: 02-May-2025
C-O-C number	: ----	Issue Date	: 09-May-2025
Sampler	: Alex Hibberd		
Site	: ----		
Quote number	: EM25PITSHE0004_V4		
No. of samples received	: 8		
No. of samples analysed	: 8		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

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.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC 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
* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

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: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA005P: pH by PC Titrator (QC Lot: 6553080)									
EM2507347-002	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.97	7.99	0.3	0% - 20%
EM2507357-009	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	6.56	6.58	0.3	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 6553079)									
EM2507347-002	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	12300	12300	0.2	0% - 20%
EM2507357-009	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	24700	23500	5.0	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 6548237)									
EM2507179-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	66100	64700	2.2	0% - 20%
EM2507181-008	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	347	326	6.3	0% - 20%
EM2507360-002	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	2610	2240	15.2	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 6548238)									
EM2507180-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	106	108	2.1	0% - 20%
EM2507181-010	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	134	127	5.7	0% - 20%
EM2507360-005	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	232	224	3.6	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6553419)									
EM2507331-001	MB412	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6553419) - continued									
EM2507331-001	MB412	EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.007	0.007	0.0	No Limit
EM2507469-007	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 6552173)									
EM2507290-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.003	0.003	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.010	0.009	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
EM2507331-002	MB415	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.023	0.024	4.6	0% - 20%
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.142	0.143	0.0	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.005	0.005	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.028	0.029	0.0	0% - 20%
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.049	0.048	3.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 6553420)									
EM2507331-001	MB412	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EM2507469-007	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 6546967)									
EM2507201-023	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EM2507277-003	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 6546968)									
EM2507331-003	MB416	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EM2507363-004	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG052G: Silica by Discrete Analyser (QC Lot: 6552713)									
EM2507331-001	MB412	EG052G: Reactive Silica	----	0.05	mg/L	24.0	23.8	0.7	0% - 20%
EK255A: Ammonia (QC Lot: 6549464)									
EM2507331-001	MB412	EK255A-CM: Ammonia as N	7664-41-7	0.005	mg/L	0.008	0.009	12.6	No Limit
EK257A: Nitrite (QC Lot: 6549462)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EK257A: Nitrite (QC Lot: 6549462) - continued									
EM2507331-001	MB412	EK257A-CM: Nitrite as N	14797-65-0	0.002	mg/L	0.004	0.005	0.0	No Limit
EK259A: Nitrite and Nitrate (NOx) (QC Lot: 6549461)									
EM2507331-001	MB412	EK259A-CM: Nitrite + Nitrate as N	----	0.002 (0.004) *	mg/L	1.34	1.32	1.7	0% - 20%
EK262A: Total Nitrogen (QC Lot: 6549490)									
EM2507331-001	MB412	EK262PA-CM: Total Nitrogen as N	----	0.01 (0.05)*	mg/L	1.49	1.44	3.2	0% - 20%
EK267A: Total Phosphorus (Persulfate Digestion) (QC Lot: 6549489)									
EM2507331-001	MB412	EK267PA-CM: Total Phosphorus as P	----	0.005 (0.050) *	mg/L	0.446	0.615	31.9	0% - 50%
EK271A: Reactive Phosphorus (QC Lot: 6549463)									
EM2507331-001	MB412	EK271A-CM: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.023	0.022	6.3	0% - 20%
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 6553196)									
EM2507331-004	MB418	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
EM2507288-001	Anonymous	EP074: Styrene	100-42-5	5 (10)*	µg/L	21	19	6.4	No Limit
		EP074: Isopropylbenzene	98-82-8	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5 (10)*	µg/L	24	24	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5 (10)*	µg/L	62	61	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5 (10)*	µg/L	<10	<10	0.0	No Limit
EP074B: Oxygenated Compounds (QC Lot: 6553196)									
EM2507331-004	MB418	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
EM2507288-001	Anonymous	EP074: Vinyl Acetate	108-05-4	50 (100)*	µg/L	<100	<100	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50 (100)*	µg/L	380	340	12.1	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP074B: Oxygenated Compounds (QC Lot: 6553196) - continued									
EM2507288-001	Anonymous	EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50 (100)*	µg/L	<100	<100	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50 (100)*	µg/L	140	120	13.0	No Limit
EP074C: Sulfonated Compounds (QC Lot: 6553196)									
EM2507331-004	MB418	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
EM2507288-001	Anonymous	EP074: Carbon disulfide	75-15-0	5 (10)*	µg/L	<10	<10	0.0	No Limit
EP074D: Fumigants (QC Lot: 6553196)									
EM2507331-004	MB418	EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
EM2507288-001	Anonymous	EP074: 2.2-Dichloropropane	594-20-7	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	5 (10)*	µg/L	<10	<10	0.0	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 6553196)									
EM2507331-004	MB418	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP074E: Halogenated Aliphatic Compounds (QC Lot: 6553196) - continued									
EM2507331-004	MB418	EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit
EM2507288-001	Anonymous	EP074: 1.1-Dichloroethene	75-35-4	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: Iodomethane	74-88-4	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50 (100)*	µg/L	<100	<100	0.0	No Limit
		EP074: Chloromethane	74-87-3	50 (100)*	µg/L	<100	<100	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50 (100)*	µg/L	<100	<100	0.0	No Limit
		EP074: Bromomethane	74-83-9	50 (100)*	µg/L	<100	<100	0.0	No Limit
		EP074: Chloroethane	75-00-3	50 (100)*	µg/L	<100	<100	0.0	No Limit
		EP074: Trichlorofluoromethane	75-69-4	50 (100)*	µg/L	<100	<100	0.0	No Limit
EP074F: Halogenated Aromatic Compounds (QC Lot: 6553196)									
EM2507331-004	MB418	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP074F: Halogenated Aromatic Compounds (QC Lot: 6553196) - continued									
EM2507331-004	MB418	EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit
EM2507288-001	Anonymous	EP074: Chlorobenzene	108-90-7	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	5 (10)*	µg/L	<10	<10	0.0	No Limit
EP074G: Trihalomethanes (QC Lot: 6553196)									
EM2507331-004	MB418	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
EM2507288-001	Anonymous	EP074: Chloroform	67-66-3	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	5 (10)*	µg/L	<10	<10	0.0	No Limit
		EP074: Bromoform	75-25-2	5 (10)*	µg/L	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6546702)									
EM2507311-001	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	<100	100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6553197)									
EM2507331-002	MB415	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EM2507288-001	Anonymous	EP080: C6 - C9 Fraction	----	20 (200)*	µg/L	13900	12900	7.4	0% - 20%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6553217)									
EM2507275-013	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	200	210	0.0	0% - 50%
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6546702)									
EM2507311-001	Anonymous	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	120	14.4	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6553197)									
EM2507331-002	MB415	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EM2507288-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20 (200)*	µg/L	13600	12600	7.4	0% - 20%
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6553217)									
EM2507275-013	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	250	260	4.5	0% - 50%
EP080: BTEXN (QC Lot: 6553197)									
EM2507331-002	MB415	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit

Sub-Matrix: **WATER**

				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: 6553197) - continued									
EM2507331-002	MB415	EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
EM2507288-001	Anonymous	EP080: Benzene	71-43-2	1 (100)*	µg/L	8730	8480	2.8	0% - 20%
		EP080: Toluene	108-88-3	2 (10)*	µg/L	2410	2230	7.8	0% - 20%
		EP080: Ethylbenzene	100-41-4	2 (10)*	µg/L	131	124	5.4	0% - 50%
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2 (20)*	µg/L	663	629	5.3	0% - 20%
		EP080: ortho-Xylene	95-47-6	2 (10)*	µg/L	349	336	3.8	0% - 20%
		EP080: Naphthalene	91-20-3	5 (10)*	µg/L	1500	1520	1.4	0% - 20%
EP080: BTEXN (QC Lot: 6553217)									
EM2507275-013	Anonymous	EP080: Benzene	71-43-2	1	µg/L	16	16	0.0	0% - 50%
		EP080: Toluene	108-88-3	2	µg/L	16	16	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	15	16	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	31	33	5.8	0% - 50%
		EP080: ortho-Xylene	95-47-6	2	µg/L	17	17	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 6555951)									
EM2507331-004	MB418	EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	0.0020	0.0020	0.0	No Limit
		EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 6555951)									
EM2507331-004	MB418	EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	0.0040	0.0037	6.6	No Limit
		EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	0.0017	0.0018	6.0	No Limit
		EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	0.0007	0.0008	18.0	No Limit
		EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	0.0011	0.0010	0.0	No Limit
		EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	<0.0020	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 6555951)									
EM2507331-004	MB418	EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	<0.001	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 6555951) - continued									
EM2507331-004	MB418	EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	<0.001	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 6555951)									
EM2507331-004	MB418	EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L	0.0020	0.0020	0.0	0% - 50%
		EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	0.0095	0.0093	2.1	0% - 20%

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: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 6553080)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	99.5	98.8	101
				----	7 pH Unit	100	99.3	101
EA010P: Conductivity by PC Titrator (QCLot: 6553079)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	103	85.0	119
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 6548237)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	102	91.0	110
				<10	2340 mg/L	114	80.8	119
				<10	293 mg/L	101	91.0	110
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 6548238)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	106	91.0	109
				<5	825 mg/L	104	84.7	116
				<5	1000 mg/L	94.5	90.3	109
EG020F: Dissolved Metals by ICP-MS (QCLot: 6553419)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	102	89.0	111
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	95.3	83.5	111
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	97.1	83.2	109
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	99.0	83.1	107
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	94.7	84.6	108
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	98.1	84.3	110
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	102	86.3	112
EG020T: Total Metals by ICP-MS (QCLot: 6552173)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	103	89.2	110
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	91.3	86.4	115
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	98.6	89.0	112
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	97.9	88.3	111
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	103	88.3	112
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	97.5	88.8	113
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	102	90.0	115
EG035F: Dissolved Mercury by FIMS (QCLot: 6553420)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	111	71.6	116

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6546967)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	106	73.4	119
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6546968)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	110	73.4	119
EG052G: Silica by Discrete Analyser (QCLot: 6552713)								
EG052G: Reactive Silica	----	0.05	mg/L	<0.05	0.5 mg/L	101	80.0	120
				<0.05	25 mg/L	100	80.0	120
EK255A: Ammonia (QCLot: 6549464)								
EK255A-CM: Ammonia as N	7664-41-7	0.005	mg/L	<0.005	0.1 mg/L	109	80.0	122
EK257A: Nitrite (QCLot: 6549462)								
EK257A-CM: Nitrite as N	14797-65-0	0.002	mg/L	<0.002	0.1 mg/L	114	87.0	129
EK259A: Nitrite and Nitrate (NOx) (QCLot: 6549461)								
EK259A-CM: Nitrite + Nitrate as N	----	0.002	mg/L	<0.002	0.1 mg/L	98.7	89.0	123
EK262A: Total Nitrogen (QCLot: 6549490)								
EK262PA-CM: Total Nitrogen as N	----	0.01	mg/L	<0.01	1 mg/L	99.5	78.0	112
EK267A: Total Phosphorus (Persulfate Digestion) (QCLot: 6549489)								
EK267PA-CM: Total Phosphorus as P	----	0.005	mg/L	<0.005	0.44 mg/L	97.1	88.0	114
EK271A: Reactive Phosphorus (QCLot: 6549463)								
EK271A-CM: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	<0.001	0.1 mg/L	80.5	78.0	120
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 6546703)								
EP066: Total Polychlorinated biphenyls	----	1	µg/L	<1	10 µg/L	110	52.0	136
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 6553196)								
EP074: Styrene	100-42-5	5	µg/L	<5	20 µg/L	102	80.9	116
EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	20 µg/L	101	76.6	117
EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	20 µg/L	98.7	69.5	116
EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	20 µg/L	96.9	72.1	114
EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	20 µg/L	96.9	71.4	115
EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	20 µg/L	96.6	74.2	114
EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	20 µg/L	96.8	73.4	116
EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	20 µg/L	98.4	70.4	116
EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	20 µg/L	98.1	64.1	115
EP074B: Oxygenated Compounds (QCLot: 6553196)								
EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	200 µg/L	92.7	70.7	128
EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	200 µg/L	113	58.0	134
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	200 µg/L	84.2	70.8	136

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP074B: Oxygenated Compounds (QCLot: 6553196) - continued								
EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	200 µg/L	116	67.1	132
EP074C: Sulfonated Compounds (QCLot: 6553196)								
EP074: Carbon disulfide	75-15-0	5	µg/L	<5	20 µg/L	109	56.9	132
EP074D: Fumigants (QCLot: 6553196)								
EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	20 µg/L	95.2	71.1	118
EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	20 µg/L	92.2	78.5	117
EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	20 µg/L	88.0	75.7	115
EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	20 µg/L	86.5	76.4	115
EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	20 µg/L	99.8	77.1	118
EP074E: Halogenated Aliphatic Compounds (QCLot: 6553196)								
EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	200 µg/L	109	51.9	140
EP074: Chloromethane	74-87-3	50	µg/L	<50	200 µg/L	103	63.2	134
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	200 µg/L	114	58.1	135
EP074: Bromomethane	74-83-9	50	µg/L	<50	200 µg/L	116	54.4	130
EP074: Chloroethane	75-00-3	50	µg/L	<50	200 µg/L	108	69.4	129
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	200 µg/L	109	70.1	126
EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	20 µg/L	102	68.4	125
EP074: Iodomethane	74-88-4	5	µg/L	<5	20 µg/L	84.8	30.9	126
EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	20 µg/L	98.8	70.8	122
EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	20 µg/L	96.8	76.6	121
EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	20 µg/L	94.3	79.1	120
EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	20 µg/L	92.4	72.5	120
EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	20 µg/L	95.6	69.4	120
EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	20 µg/L	92.5	67.8	120
EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	20 µg/L	90.7	78.4	120
EP074: Trichloroethene	79-01-6	5	µg/L	<5	20 µg/L	92.3	73.1	120
EP074: Dibromomethane	74-95-3	5	µg/L	<5	20 µg/L	88.3	78.3	119
EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	20 µg/L	100	81.1	120
EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	20 µg/L	102	80.3	120
EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	20 µg/L	105	73.1	118
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	20 µg/L	97.0	76.9	111
EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	20 µg/L	98.1	70.0	122
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	20 µg/L	91.8	62.4	118
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	20 µg/L	97.4	77.9	128

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP074E: Halogenated Aliphatic Compounds (QCLot: 6553196) - continued								
EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	20 µg/L	96.1	78.5	124
EP074: Pentachloroethane	76-01-7	5	µg/L	<5	20 µg/L	91.9	68.5	110
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	20 µg/L	88.1	70.7	116
EP074F: Halogenated Aromatic Compounds (QCLot: 6553196)								
EP074: Chlorobenzene	108-90-7	5	µg/L	<5	20 µg/L	102	82.6	116
EP074: Bromobenzene	108-86-1	5	µg/L	<5	20 µg/L	98.3	79.3	115
EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	20 µg/L	99.1	75.5	116
EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	20 µg/L	97.8	75.0	115
EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	20 µg/L	102	70.4	124
EP074G: Trihalomethanes (QCLot: 6553196)								
EP074: Chloroform	67-66-3	5	µg/L	<5	20 µg/L	92.9	79.6	120
EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	20 µg/L	89.2	76.3	117
EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	20 µg/L	94.5	73.5	113
EP074: Bromoform	75-25-2	5	µg/L	<5	20 µg/L	92.2	68.5	113
EP075(SIM)A: Phenolic Compounds (QCLot: 6546705)								
EP075(SIM): Phenol	108-95-2	1	µg/L	<1.0	5 µg/L	34.2	17.8	51.1
EP075(SIM): 2-Chlorophenol	95-57-8	1	µg/L	<1.0	5 µg/L	78.4	43.2	107
EP075(SIM): 2-Methylphenol	95-48-7	1	µg/L	<1.0	5 µg/L	74.3	39.2	98.7
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	2	µg/L	<2.0	10 µg/L	67.8	35.5	91.3
EP075(SIM): 2-Nitrophenol	88-75-5	1	µg/L	<1.0	5 µg/L	76.1	34.4	124
EP075(SIM): 2.4-Dimethylphenol	105-67-9	1	µg/L	<1.0	5 µg/L	81.3	44.4	112
EP075(SIM): 2.4-Dichlorophenol	120-83-2	1	µg/L	<1.0	5 µg/L	76.4	45.3	115
EP075(SIM): 2.6-Dichlorophenol	87-65-0	1	µg/L	<1.0	5 µg/L	79.9	44.3	116
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	1	µg/L	<1.0	5 µg/L	116	46.6	117
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	1	µg/L	<1.0	5 µg/L	70.4	38.2	122
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	1	µg/L	<1.0	5 µg/L	86.0	43.2	123
EP075(SIM): Pentachlorophenol	87-86-5	2	µg/L	<2.0	10 µg/L	52.6	48.1	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 6546705)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	78.4	42.8	114
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	80.6	48.6	119
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	81.8	47.0	117
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	82.2	49.5	119
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	87.1	49.4	121
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	83.5	48.4	122

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 6546705) - continued								
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	85.8	50.3	124
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	89.5	50.0	126
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	84.6	49.4	127
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	103	48.7	126
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	77.2	54.5	134
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	81.7	56.1	134
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	80.5	55.6	135
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	83.1	54.4	126
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	91.5	54.5	126
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	81.5	54.4	126
EP075A: Phenolic Compounds (QCLot: 6546704)								
EP075: Phenol	108-95-2	2	µg/L	<2	10 µg/L	37.4	19.5	48.1
EP075: 2-Chlorophenol	95-57-8	2	µg/L	<2	10 µg/L	88.1	46.3	101
EP075: 2-Methylphenol	95-48-7	2	µg/L	<2	10 µg/L	72.6	41.1	94.4
EP075: 3- & 4-Methylphenol	1319-77-3	2	µg/L	<2	10 µg/L	62.3	35.1	88.8
EP075: 2-Nitrophenol	88-75-5	2	µg/L	<2	10 µg/L	85.3	45.3	113
EP075: 2.4-Dimethylphenol	105-67-9	2	µg/L	<2	10 µg/L	94.2	47.6	108
EP075: 2.4-Dichlorophenol	120-83-2	2	µg/L	<2	10 µg/L	98.6	48.2	110
EP075: 2.6-Dichlorophenol	87-65-0	2	µg/L	<2	10 µg/L	90.3	48.9	107
EP075: 4-Chloro-3-methylphenol	59-50-7	2	µg/L	<2	10 µg/L	94.4	47.2	110
EP075: 2.4.6-Trichlorophenol	88-06-2	2	µg/L	<2	10 µg/L	75.2	45.2	112
EP075: 2.4.5-Trichlorophenol	95-95-4	2	µg/L	<2	10 µg/L	84.3	42.4	113
EP075: Pentachlorophenol	87-86-5	4	µg/L	<4	10 µg/L	16.1	14.2	124
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 6546704)								
EP075: Naphthalene	91-20-3	2	µg/L	<2	10 µg/L	93.4	50.9	107
EP075: 2-Methylnaphthalene	91-57-6	2	µg/L	<2	10 µg/L	95.6	50.3	111
EP075: 2-Chloronaphthalene	91-58-7	2	µg/L	<2	10 µg/L	91.5	50.8	110
EP075: Acenaphthylene	208-96-8	2	µg/L	<2	10 µg/L	98.2	52.9	111
EP075: Acenaphthene	83-32-9	2	µg/L	<2	10 µg/L	95.9	54.5	109
EP075: Fluorene	86-73-7	2	µg/L	<2	10 µg/L	97.8	55.7	110
EP075: Phenanthrene	85-01-8	2	µg/L	<2	10 µg/L	92.4	55.4	112
EP075: Anthracene	120-12-7	2	µg/L	<2	10 µg/L	96.7	55.9	111
EP075: Fluoranthene	206-44-0	2	µg/L	<2	10 µg/L	102	55.9	112

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 6546704) - continued								
EP075: Pyrene	129-00-0	2	µg/L	<2	10 µg/L	95.1	56.5	112
EP075: N-2-Fluorenyl Acetamide	53-96-3	2	µg/L	<2	10 µg/L	93.6	50.0	118
EP075: Benz(a)anthracene	56-55-3	2	µg/L	<2	10 µg/L	100	55.5	114
EP075: Chrysene	218-01-9	2	µg/L	<2	10 µg/L	102	56.0	114
EP075: Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	4	µg/L	<4	20 µg/L	103	55.4	120
EP075: 7.12-Dimethylbenz(a)anthracene	57-97-6	2	µg/L	<2	10 µg/L	100	54.4	121
EP075: Benzo(a)pyrene	50-32-8	2	µg/L	<2	10 µg/L	97.5	53.9	121
EP075: 3-Methylcholanthrene	56-49-5	2	µg/L	<2	10 µg/L	83.6	51.9	121
EP075: Indeno(1.2.3.cd)pyrene	193-39-5	2	µg/L	<2	10 µg/L	97.8	54.4	114
EP075: Dibenz(a.h)anthracene	53-70-3	2	µg/L	<2	10 µg/L	94.3	54.0	115
EP075: Benzo(g.h.i)perylene	191-24-2	2	µg/L	<2	10 µg/L	86.5	51.7	116
EP075C: Phthalate Esters (QCLot: 6546704)								
EP075: Dimethyl phthalate	131-11-3	2	µg/L	<2	10 µg/L	97.0	56.5	115
EP075: Diethyl phthalate	84-66-2	2	µg/L	<2	10 µg/L	100	58.0	113
EP075: Di-n-butyl phthalate	84-74-2	2	µg/L	<2	10 µg/L	99.5	57.6	120
EP075: Butyl benzyl phthalate	85-68-7	2	µg/L	<2	10 µg/L	96.0	56.3	119
EP075: bis(2-ethylhexyl) phthalate	117-81-7	10	µg/L	<10	10 µg/L	100	57.6	122
EP075: Di-n-octylphthalate	117-84-0	2	µg/L	<2	10 µg/L	97.3	56.5	122
EP075D: Nitrosamines (QCLot: 6546704)								
EP075: N-Nitrosomethylethylamine	10595-95-6	2	µg/L	<2	10 µg/L	79.0	23.9	106
EP075: N-Nitrosodiethylamine	55-18-5	2	µg/L	<2	10 µg/L	88.1	46.1	108
EP075: N-Nitrosopyrrolidine	930-55-2	4	µg/L	<4	10 µg/L	68.8	36.6	83.2
EP075: N-Nitrosomorpholine	59-89-2	2	µg/L	<2	10 µg/L	63.3	34.6	79.0
EP075: N-Nitrosodi-n-propylamine	621-64-7	2	µg/L	<2	10 µg/L	93.0	53.1	114
EP075: N-Nitrosopiperidine	100-75-4	2	µg/L	<2	10 µg/L	91.0	51.0	111
EP075: N-Nitrosodibutylamine	924-16-3	2	µg/L	<2	10 µg/L	97.8	37.0	111
EP075: N-Nitrosodiphenyl & Diphenylamine	86-30-6 122-39-4	4	µg/L	<4	10 µg/L	96.0	51.3	113
EP075: Methapyrilene	91-80-5	2	µg/L	<2	10 µg/L	70.0	10.0	125
EP075E: Nitroaromatics and Ketones (QCLot: 6546704)								
EP075: 2-Picoline	109-06-8	2	µg/L	<2	10 µg/L	74.0	18.8	108
EP075: Acetophenone	98-86-2	2	µg/L	<2	10 µg/L	94.1	52.5	111
EP075: Nitrobenzene	98-95-3	2	µg/L	<2	10 µg/L	93.9	50.6	109
EP075: Isophorone	78-59-1	2	µg/L	<2	10 µg/L	95.6	53.7	113

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP075E: Nitroaromatics and Ketones (QCLot: 6546704) - continued								
EP075: 2.6-Dinitrotoluene	606-20-2	4	µg/L	<4	10 µg/L	94.9	54.0	115
EP075: 2.4-Dinitrotoluene	121-14-2	4	µg/L	<4	10 µg/L	94.4	53.3	109
EP075: 1-Naphthylamine	134-32-7	2	µg/L	<2	10 µg/L	78.8	10.9	119
EP075: 4-Nitroquinoline-N-oxide	56-57-5	2	µg/L	<2	10 µg/L	32.9	27.3	147
EP075: 5-Nitro-o-toluidine	99-55-8	2	µg/L	<2	10 µg/L	105	44.6	119
EP075: Azobenzene	103-33-3	2	µg/L	<2	10 µg/L	91.6	55.6	110
EP075: 1.3.5-Trinitrobenzene	99-35-4	2	µg/L	<2	10 µg/L	72.3	37.6	124
EP075: Phenacetin	62-44-2	2	µg/L	<2	10 µg/L	90.5	44.8	101
EP075: 4-Aminobiphenyl	92-67-1	2	µg/L	<2	10 µg/L	93.1	24.0	149
EP075: Pentachloronitrobenzene	82-68-8	2	µg/L	<2	10 µg/L	95.3	54.6	111
EP075: Pronamide	23950-58-5	2	µg/L	<2	10 µg/L	95.1	56.5	113
EP075: Dimethylaminoazobenzene	60-11-7	2	µg/L	<2	10 µg/L	89.7	53.8	112
EP075: Chlorobenzilate	510-15-6	2	µg/L	<2	10 µg/L	102	55.0	113
EP075F: Haloethers (QCLot: 6546704)								
EP075: Bis(2-chloroethyl) ether	111-44-4	2	µg/L	<2	10 µg/L	92.1	45.3	112
EP075: Bis(2-chloroethoxy) methane	111-91-1	2	µg/L	<2	10 µg/L	90.7	52.7	111
EP075: 4-Chlorophenyl phenyl ether	7005-72-3	2	µg/L	<2	10 µg/L	98.4	55.8	110
EP075: 4-Bromophenyl phenyl ether	101-55-3	2	µg/L	<2	10 µg/L	97.4	55.7	114
EP075G: Chlorinated Hydrocarbons (QCLot: 6546704)								
EP075: 1.4-Dichlorobenzene	106-46-7	2	µg/L	<2	10 µg/L	87.2	43.2	104
EP075: 1.3-Dichlorobenzene	541-73-1	2	µg/L	<2	10 µg/L	85.4	42.7	103
EP075: 1.2-Dichlorobenzene	95-50-1	2	µg/L	<2	10 µg/L	87.0	44.4	104
EP075: Hexachloroethane	67-72-1	2	µg/L	<2	10 µg/L	93.1	41.5	105
EP075: 1.2.4-Trichlorobenzene	120-82-1	2	µg/L	<2	10 µg/L	88.8	46.1	107
EP075: Hexachloropropylene	1888-71-7	2	µg/L	<2	10 µg/L	85.8	41.4	109
EP075: Hexachlorobutadiene	87-68-3	2	µg/L	<2	10 µg/L	96.8	43.9	108
EP075: Hexachlorocyclopentadiene	77-47-4	10	µg/L	<10	10 µg/L	65.6	14.6	133
EP075: Pentachlorobenzene	608-93-5	2	µg/L	<2	10 µg/L	99.8	53.3	109
EP075: Hexachlorobenzene (HCB)	118-74-1	4	µg/L	<4	10 µg/L	98.9	48.4	116
EP075H: Anilines and Benzidines (QCLot: 6546704)								
EP075: Aniline	62-53-3	2	µg/L	<2	10 µg/L	81.9	21.2	116
EP075: 4-Chloroaniline	106-47-8	2	µg/L	<2	10 µg/L	88.9	14.5	126
EP075: 2-Nitroaniline	88-74-4	4	µg/L	<4	10 µg/L	96.4	49.5	111
EP075: 3-Nitroaniline	99-09-2	4	µg/L	<4	10 µg/L	84.3	28.4	125

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)
				Result	Concentration	LCS	Low	High
EP075H: Anilines and Benzidines (QCLot: 6546704) - continued								
EP075: Dibenzofuran	132-64-9	2	µg/L	<2	10 µg/L	98.1	55.4	110
EP075: 4-Nitroaniline	100-01-6	2	µg/L	<2	10 µg/L	86.7	37.3	112
EP075: Carbazole	86-74-8	2	µg/L	<2	10 µg/L	94.4	51.6	116
EP075: 3.3`-Dichlorobenzidine	91-94-1	2	µg/L	<2	10 µg/L	118	42.3	142
EP075I: Organochlorine Pesticides (QCLot: 6546704)								
EP075: alpha-BHC	319-84-6	2	µg/L	<2	10 µg/L	101	56.2	112
EP075: beta-BHC	319-85-7	2	µg/L	<2	10 µg/L	97.5	56.2	113
EP075: gamma-BHC - (Lindane)	58-89-9	2	µg/L	<2	10 µg/L	99.4	55.2	113
EP075: delta-BHC	319-86-8	2	µg/L	<2	10 µg/L	89.7	52.6	117
EP075: Heptachlor	76-44-8	2	µg/L	<2	10 µg/L	95.5	53.4	111
EP075: Aldrin	309-00-2	2	µg/L	<2	10 µg/L	94.9	54.0	112
EP075: Heptachlor epoxide	1024-57-3	2	µg/L	<2	10 µg/L	103	54.2	113
EP075: alpha-Endosulfan	959-98-8	2	µg/L	<2	10 µg/L	98.9	49.3	122
EP075: 4.4`-DDE	72-55-9	2	µg/L	<2	10 µg/L	103	56.0	121
EP075: Dieldrin	60-57-1	2	µg/L	<2	10 µg/L	104	55.2	118
EP075: Endrin	72-20-8	2	µg/L	<2	10 µg/L	87.7	52.7	121
EP075: beta-Endosulfan	33213-65-9	2	µg/L	<2	10 µg/L	101	55.1	119
EP075: 4.4`-DDD	72-54-8	2	µg/L	<2	10 µg/L	112	55.4	120
EP075: Endosulfan sulfate	1031-07-8	2	µg/L	<2	10 µg/L	85.5	49.6	123
EP075: 4.4`-DDT	50-29-3	4	µg/L	<4	10 µg/L	66.9	47.8	127
EP075J: Organophosphorus Pesticides (QCLot: 6546704)								
EP075: Dichlorvos	62-73-7	2	µg/L	<2	10 µg/L	85.5	50.1	115
EP075: Dimethoate	60-51-5	2	µg/L	<2	10 µg/L	70.4	40.8	108
EP075: Diazinon	333-41-5	2	µg/L	<2	10 µg/L	94.8	55.4	118
EP075: Chlorpyrifos-methyl	5598-13-0	2	µg/L	<2	10 µg/L	92.8	53.0	118
EP075: Malathion	121-75-5	2	µg/L	<2	10 µg/L	98.2	54.6	122
EP075: Fenthion	55-38-9	2	µg/L	<2	10 µg/L	101	55.1	119
EP075: Chlorpyrifos	2921-88-2	2	µg/L	<2	10 µg/L	95.7	55.3	118
EP075: Pirimphos-ethyl	23505-41-1	2	µg/L	<2	10 µg/L	96.1	55.8	118
EP075: Chlorfenvinphos	470-90-6	2	µg/L	<2	10 µg/L	76.0	45.8	118
EP075: Prothiofos	34643-46-4	2	µg/L	<2	10 µg/L	96.0	56.1	118
EP075: Ethion	563-12-2	2	µg/L	<2	10 µg/L	97.9	57.7	119
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6546702)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	4421 µg/L	84.7	47.2	122

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6546702) - continued								
EP071: C15 - C28 Fraction	----	100	µg/L	<100	15219 µg/L	88.7	52.9	131
EP071: C29 - C36 Fraction	----	50	µg/L	<50	7904 µg/L	90.4	50.4	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6553197)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	111	66.2	134
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6553217)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	110	66.2	134
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6546702)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	6085 µg/L	84.3	49.1	125
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	20300 µg/L	88.8	51.6	128
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1456 µg/L	90.1	47.2	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6553197)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	109	66.2	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6553217)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	109	66.2	132
EP080: BTEXN (QCLot: 6553197)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	107	68.8	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	109	72.9	129
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	107	71.7	130
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	111	72.3	136
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	111	75.9	134
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	106	68.3	131
EP080: BTEXN (QCLot: 6553217)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	109	68.8	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	110	72.9	129
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	107	71.7	130
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	109	72.3	136
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	111	75.9	134
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	104	68.3	131
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 6555951)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	80.1	72.0	130
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	79.4	68.0	131
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	104	65.0	140
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 6555951)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 6555951) - continued								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	86.7	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	84.5	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	79.0	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	78.0	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	80.5	71.0	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 6555951)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	84.2	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	85.1	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	87.0	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	70.9	70.0	130
EP231P: PFAS Sums (QCLot: 6555951)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----

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: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG020F: Dissolved Metals by ICP-MS (QCLot: 6553419)							
EM2507331-001	MB412	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	95.1	76.6	124
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	92.4	74.6	118
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	96.8	71.0	135
		EG020A-F: Copper	7440-50-8	0.2 mg/L	97.4	76.0	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	95.3	75.0	133
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	95.1	73.0	131
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	95.9	75.0	131
EG020T: Total Metals by ICP-MS (QCLot: 6552173)							
EM2507290-001	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	104	82.0	123
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	95.1	81.8	123
		EG020A-T: Chromium	7440-47-3	1 mg/L	97.5	78.9	119
		EG020A-T: Copper	7440-50-8	1 mg/L	101	80.4	118
		EG020A-T: Lead	7439-92-1	1 mg/L	104	80.5	121
		EG020A-T: Nickel	7440-02-0	1 mg/L	98.6	80.0	118

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 6552173) - continued							
EM2507290-001	Anonymous	EG020A-T: Zinc	7440-66-6	1 mg/L	103	74.0	120
EG035F: Dissolved Mercury by FIMS (QCLot: 6553420)							
EM2507331-002	MB415	EG035F: Mercury	7439-97-6	0.01 mg/L	120	70.0	120
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6546967)							
EM2507272-001	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	94.6	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6546968)							
EM2507331-004	MB418	EG035T: Mercury	7439-97-6	0.01 mg/L	95.0	70.0	130
EG052G: Silica by Discrete Analyser (QCLot: 6552713)							
EM2507331-002	MB415	EG052G: Reactive Silica	----	25 mg/L	89.8	80.0	120
EK255A: Ammonia (QCLot: 6549464)							
EM2507331-001	MB412	EK255A-CM: Ammonia as N	7664-41-7	0.1 mg/L	116	70.0	130
EK257A: Nitrite (QCLot: 6549462)							
EM2507331-002	MB415	EK257A-CM: Nitrite as N	14797-65-0	0.1 mg/L	104	70.0	130
EK259A: Nitrite and Nitrate (NOx) (QCLot: 6549461)							
EM2507331-001	MB412	EK259A-CM: Nitrite + Nitrate as N	----	0.1 mg/L	# Not Determined	70.0	130
EK262A: Total Nitrogen (QCLot: 6549490)							
EM2507331-001	MB412	EK262PA-CM: Total Nitrogen as N	----	2.5 mg/L	88.9	70.0	130
EK267A: Total Phosphorus (Persulfate Digestion) (QCLot: 6549489)							
EM2507331-001	MB412	EK267PA-CM: Total Phosphorus as P	----	5 mg/L	83.1	70.0	130
EK271A: Reactive Phosphorus (QCLot: 6549463)							
EM2507331-001	MB412	EK271A-CM: Reactive Phosphorus as P	14265-44-2	0.1 mg/L	87.8	70.0	130
EP074E: Halogenated Aliphatic Compounds (QCLot: 6553196)							
EM2507331-001	MB412	EP074: 1.1-Dichloroethene	75-35-4	20 µg/L	99.8	33.0	150
		EP074: Trichloroethene	79-01-6	20 µg/L	87.1	51.4	124
EP074F: Halogenated Aromatic Compounds (QCLot: 6553196)							
EM2507331-001	MB412	EP074: Chlorobenzene	108-90-7	20 µg/L	99.3	63.6	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6546702)							
EM2507311-002	Anonymous	EP071: C10 - C14 Fraction	----	4421 µg/L	77.9	48.0	126
		EP071: C15 - C28 Fraction	----	15219 µg/L	80.3	51.7	132
		EP071: C29 - C36 Fraction	----	7904 µg/L	82.5	50.5	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6553197)							
EM2507331-001	MB412	EP080: C6 - C9 Fraction	----	280 µg/L	83.1	33.9	126
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6553217)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6553217) - continued							
EM2507288-010	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	70.0	33.9	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6546702)							
EM2507311-002	Anonymous	EP071: >C10 - C16 Fraction	----	6085 µg/L	77.1	48.0	128
		EP071: >C16 - C34 Fraction	----	20300 µg/L	80.6	50.4	130
		EP071: >C34 - C40 Fraction	----	1456 µg/L	82.4	47.4	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6553197)							
EM2507331-001	MB412	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	80.0	34.0	122
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6553217)							
EM2507288-010	Anonymous	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	68.2	34.0	122
EP080: BTEXN (QCLot: 6553197)							
EM2507331-001	MB412	EP080: Benzene	71-43-2	20 µg/L	99.1	56.3	133
		EP080: Toluene	108-88-3	20 µg/L	100	60.4	132
EP080: BTEXN (QCLot: 6553217)							
EM2507288-010	Anonymous	EP080: Benzene	71-43-2	20 µg/L	88.6	56.3	133
		EP080: Toluene	108-88-3	20 µg/L	91.4	60.4	132
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 6555951)							
EM2507331-002	MB415	EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00355 µg/L	# 61.9	70.0	130
		EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00379 µg/L	# 64.7	70.0	130
		EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00371 µg/L	# 57.6	70.0	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 6555951)							
EM2507331-002	MB415	EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.02 µg/L	91.5	70.0	130
		EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.004 µg/L	# 69.3	70.0	130
		EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.004 µg/L	# 63.8	70.0	130
		EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.004 µg/L	# 57.8	70.0	130
		EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.004 µg/L	# 63.0	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 6555951)							
EM2507331-002	MB415	EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00374 µg/L	71.5	70.0	130
		EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0038 µg/L	# 69.2	70.0	130
		EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00384 µg/L	# 69.4	70.0	130
		EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00386 µg/L	# 54.1	70.0	130

CHAIN OF CUSTODY RECORD

Eurofins | Environment Testing ABN 50 005 085 521

☐ Sydney Laboratory
Unit F3 Bld.F 16 Mars Road Lane Cove West NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

☐ Brisbane Laboratory
Unit 1 21 Smallwood Place Murarrie QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

☐ Perth Laboratory
Unit 2 91 Leach Highway Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ Melbourne Laboratory
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Pitt and Sherry	Project №	P.24.1136	Project Manager	Carly Clark
Address	199 Macquarie Street Hobart	Project Name	Hydro Tarraleah ESA	EDD Format (ESdat, EQuIS etc)	
Contact Name	Alex Hibberd				
Phone №	0429 457 096				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Alex Hibberd
Handed over by	Alex Hibberd
Email for Invoice	cclark@pittsh.com.au; accounts@pittsh.c
Email for Results	cclark@pittsh.com.au; ahibberd@pittsh.c

Analyses (Where metals are required, please specify 'Total' or 'Filtered'. SUITE code must be used to attract SUITE pricing)

Containers (Change container type & size if necessary)

Required Turnaround Time (TAT) (Default will be 5 days if not ticked)

♦Surcharge will apply
☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☒ 5 days (Standard)
Other( )

№	Client Sample ID	Sampled Date/Time (dd mm/yy hh:mm)	Matrix (Solid (S), Water (W))	pH, EC, TDS, SS	Silica - Reactive	Polychlorinated Biphenyls (PCB)	PFAS - Super Ultra trace waters - short suite (12 analytes)	Ultratrace NO2, NO3, NOx, NH3, Nitrogen, Phosphorus, TKN, Reactive Phosphorous	TRH/BTEXN/8 Metals dissolved:As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	8 Metals total: As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	SVOC/VOC without BTEX Including PAGs and Phenols									500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
11	QAQC2	29/04/25	W	X	X	X	X	X	X	X	X																	11 samples. Nutrients bottles frozen prior to sending.
12																												
13																												
14																												
15																												
16																												
17																												
18																												
19																												
20																												
	Total Counts			1	1	1	1	1	1	1	1																

Anion 01/05/2025 12:47:57

Method of Shipment	☐ Courier (#)	☐ Hand Delivered	☐ Postal	Name		Signature		Date		Time	

Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Report №	

Eurofins Environment Testing Australia Pty Ltd

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | Environment Testing Standard Terms and Conditions unless agreed otherwise. A copy is available on request.

Incoming ALS Splits

Outlook

P.24.1136 CoC

From Alex Hibberd <ahibberd@pittsh.com.au>
Date Wed 30/4/25 4:39 PM
To EnviroSampleVic <EnviroSampleVic@eurofins.com>
Cc Carly Clark <CClark@pittsh.com.au>

1 attachment (44 KB)
P.24.1136 Eurofins Chain Of Custody Record.xlsx;

Hi,

Please find attached the CoC for samples which will be forwarded to you from ALS tomorrow.

Please let me know if you have any queries.

Many thanks,

Alex

pitt&sherry

Alex Hibberd

BSc | MEIANZ

Experienced Environmental Consultant

+ 61 3 6451 5517
ahibberd@pittsh.com.au

Hobart / *nipaluna* — Level 1, Surrey House, 199 Macquarie Street, Hobart TAS 7001
PO Box 94, Hobart TAS 7001 | Phone +61 3 6210 1400

Freezer 3

13 1/1

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ALS Environmental
Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

FREIGHT

CLIENT: pitt&sherry operations	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	✻ Standard or urgent TAT (List due date): ☐ Non Standard or urgent TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE:	ALS QUOTE NO.: EM25PITSHE0004_V4_P.24.1136		Custody Seal Intact? Yes No N/A
PROJECT: Tarraleah Switchyard Groundwater Sampling		COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: P.24.1136		COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: 6.2 °C
PROJECT MANAGER: Carly Clark	CONTACT PH: 0490 942 344	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: Alex Hibberd	SAMPLER MOBILE: 0429 457 096		
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default): ENMRG		
Email Reports to: cclark@pittsh.com.au; ahibberd@pittsh.com.au			
Email Invoice to: cclark@pittsh.com.au; accounts@pittsh.com.au			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Alex Hibberd	Declan M		
DATE/TIME: 30/04/25 15:00	DATE/TIME: 1/5 16:49	DATE/TIME:	DATE/TIME: 1/5 13:00

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: **Nutrients bottles have been frozen. Please forward QAQC2 to Eurofins for analysis**

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).			Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	Suite H (Area C Groundwater Suite)	Rinsate 2	Trip Blank - (W-18)	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	MB412	29/04/2025 1145	W	11x bottles and ice	11	X			Frozen nutrients bottles
2	MB415	29/04/2025 0945	W	13x bottles and ice	13	X			LAB QC (MS) for PFAS testing provided Frozen nutrients bottles
3	MB416	29/04/2025 1100	W	11x bottles and ice	11	X			Frozen nutrients bottles
4	MB418	29/04/2025 0845	W	13x bottles and ice	13	X			LAB QC (DUP) for PFAS testing provided
5	QAQC1	29/04/2025	W	11x bottles and ice	11	X			Frozen nutrients bottles
	QAQC2	29/04/2025	W	11x bottles and ice	11	X			Please forward QAQC2 to Eurofins for analysis. Frozen nutrients bottles
6	QAQC3	29/04/2025	W	6x bottles and ice	6		X		
7	QAQC4	29/04/2025	W	6x bottles and ice	6		X		
8	Trip blank	29/04/2025	W	2x bottles and ice	2			X	
				TOTAL	84				

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

RELINQUISHED BY

eurofins | Environment Testing

www.eurofins.com.au EnviroSales@eurofinsanz.com

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	+61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

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Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

Auckland	Auckland (Focus)	Christchurch	Tauranga
35 O'Rorke Road	Unit C1/4 Pacific Rise	43 Detroit Drive	1277 Cameron Road
Penrose	Mount Wellington	Rolleston	Gate Pa
Auckland 1061	Auckland 1061	Christchurch 7675	Tauranga 3112
+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Sample Receipt Advice

Company name:	Pitt & Sherry (Operations) Pty Ltd
Contact name:	Carly Clark
Project name:	HYDRO TARRALEAH ESA
Project ID:	P.24.1136
Turnaround time:	5 Day
Date/Time received	May 1, 2025 4:49 PM
Eurofins reference	1214755

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.
X	Split sample sent to requested external lab.
X	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 : +61 3 8564 5051 or by email: Savini.Suduwelikondage@eurofinsanz.com

Results will be delivered electronically via email to Carly Clark - CClark@pittsh.com.au.

Note: A copy of these results will also be delivered to the general Pitt & Sherry (Operations) Pty Ltd email address.

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofinsanz.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	+61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

Eurofins ARL Pty Ltd
ABN: 91 05 0159 898

Perth
46-48 Banksia Road
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WA 6106
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NATA# 2377
Site# 2370 & 2554

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

Auckland	Auckland (Focus)	Christchurch	Tauranga
35 O'Rorke Road	Unit C1/4 Pacific Rise	43 Detroit Drive	1277 Cameron Road
Penrose	Mount Wellington	Rolleston	Gate Pa
Auckland 1061	Auckland 1061	Christchurch 7675	Tauranga 3112
+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: Pitt & Sherry (Operations) Pty Ltd
Address: 4th Floor, 113 Cimitiere Street
Launceston
Tasmania 7250

Project Name: HYDRO TARRALEAH ESA
Project ID: P.24.1136

Order No.:
Report #: 1214755
Phone: 03 6323 1900
Fax: 03 6334 4651

Received: May 1, 2025 4:49 PM
Due: May 8, 2025
Priority: 5 Day
Contact Name: Carly Clark

Eurofins Analytical Services Manager : Savini Suduweli

Sample Detail						Conductivity (at 25 °C)	pH (at 25 °C)	Reactive Silica (as SiO2)	Total Suspended Solids Dried at 103°C to 105°C	Polychlorinated Biphenyls	Metals M8	Metals M8 filtered	BTEX and Naphthalene	Total Recoverable Hydrocarbons	Eurofins Suite SVV: SVOC/VOC	Total Dissolved Solids Dried at 180 °C ± 2 °C	Per- and Polyfluoroalkyl Substances (PFASs) - Short (Ultra trace)	Eurofins Suite B19D: Total N, TKN, NOx, NO2, NO3, NH3, PO4 (low level)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X	X	X	X
External Laboratory																		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
1	QAQC2	Apr 29, 2025		Water	M25-My0002978	X	X	X	X	X	X	X	X	X	X	X	X	X
Test Counts						1	1	1	1	1	1	1	1	1	1	1	1	1

Pitt & Sherry (Operations) Pty Ltd
4th Floor, 113 Cimitiere Street
Launceston
Tasmania 7250

Attention: **Carly Clark**

Report **1214755-W**
Project name HYDRO TARRALEAH ESA
Project ID P.24.1136
Received Date May 01, 2025

Client Sample ID			**QAQC2**
Sample Matrix			**Water**
Eurofins Sample No.			**M25-My0002978**
Date Sampled			**Apr 29, 2025**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons			
TRH C6-C9	0.02	mg/L	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1
TRH C6-C10	0.02	mg/L	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05
TRH >C10-C16 less Naphthalene (F2)*[N01]	0.05	mg/L	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1
BTEX			
Benzene	0.001	mg/L	< 0.001
Toluene	0.001	mg/L	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002
o-Xylene	0.001	mg/L	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003
4-Bromofluorobenzene (surr.)	1	%	112
Volatile Organics			
1.1-Dichloroethane	0.001	mg/L	< 0.001
1.1-Dichloroethene	0.001	mg/L	< 0.001
1.1.1-Trichloroethane	0.001	mg/L	< 0.001
1.1.1.2-Tetrachloroethane	0.001	mg/L	< 0.001
1.1.2-Trichloroethane	0.001	mg/L	< 0.001
1.1.2.2-Tetrachloroethane	0.001	mg/L	< 0.001
1.2-Dibromoethane	0.001	mg/L	< 0.001
1.2-Dichlorobenzene	0.001	mg/L	< 0.001
1.2-Dichloroethane	0.001	mg/L	< 0.001
1.2-Dichloropropane	0.001	mg/L	< 0.001
1.2.3-Trichloropropane	0.001	mg/L	< 0.001
1.2.4-Trimethylbenzene	0.001	mg/L	< 0.001
1.3-Dichlorobenzene	0.001	mg/L	< 0.001
1.3-Dichloropropane	0.001	mg/L	< 0.001

Client Sample ID			QAQC2
Sample Matrix			**Water**
Eurofins Sample No.			**M25-My0002978**
Date Sampled			**Apr 29, 2025**
Test/Reference	LOR	Unit	
Volatile Organics			
1.3.5-Trimethylbenzene	0.001	mg/L	< 0.001
1.4-Dichlorobenzene	0.001	mg/L	< 0.001
2-Butanone (MEK)	0.005	mg/L	< 0.005
2-Propanone (Acetone)	0.005	mg/L	< 0.005
4-Chlorotoluene	0.001	mg/L	< 0.001
4-Methyl-2-pentanone (MIBK)	0.005	mg/L	< 0.005
Allyl chloride	0.001	mg/L	< 0.001
Benzene	0.001	mg/L	< 0.001
Bromobenzene	0.001	mg/L	< 0.001
Bromochloromethane	0.001	mg/L	< 0.001
Bromodichloromethane	0.001	mg/L	< 0.001
Bromoform	0.001	mg/L	< 0.001
Bromomethane	0.005	mg/L	< 0.005
Carbon disulfide	0.001	mg/L	< 0.001
Carbon Tetrachloride	0.001	mg/L	< 0.001
Chlorobenzene	0.001	mg/L	< 0.001
Chloroethane	0.005	mg/L	< 0.005
Chloroform	0.005	mg/L	< 0.005
Chloromethane	0.005	mg/L	< 0.005
cis-1.2-Dichloroethene	0.001	mg/L	< 0.001
cis-1.3-Dichloropropene	0.001	mg/L	< 0.001
Dibromochloromethane	0.001	mg/L	< 0.001
Dibromomethane	0.001	mg/L	< 0.001
Dichlorodifluoromethane	0.005	mg/L	< 0.005
Ethylbenzene	0.001	mg/L	< 0.001
Iodomethane	0.001	mg/L	< 0.001
Isopropyl benzene (Cumene)	0.001	mg/L	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002
Methylene Chloride	0.005	mg/L	< 0.005
o-Xylene	0.001	mg/L	< 0.001
Styrene	0.001	mg/L	< 0.001
Tetrachloroethene	0.001	mg/L	< 0.001
Toluene	0.001	mg/L	< 0.001
trans-1.2-Dichloroethene	0.001	mg/L	< 0.001
trans-1.3-Dichloropropene	0.001	mg/L	< 0.001
Trichloroethene	0.001	mg/L	< 0.001
Trichlorofluoromethane	0.005	mg/L	< 0.005
Vinyl chloride	0.005	mg/L	< 0.005
Xylenes - Total*	0.003	mg/L	< 0.003
Total MAH*	0.003	mg/L	< 0.003
Vic EPA IWRG 621 CHC (Total)*	0.005	mg/L	< 0.005
Vic EPA IWRG 621 Other CHC (Total)*	0.005	mg/L	< 0.005
4-Bromofluorobenzene (surr.)	1	%	112
Toluene-d8 (surr.)	1	%	117
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene[N02]	0.01	mg/L	< 0.01

Client Sample ID			QAQC2
Sample Matrix			**Water**
Eurofins Sample No.			**M25-My0002978**
Date Sampled			**Apr 29, 2025**
Test/Reference	LOR	Unit	
Polychlorinated Biphenyls			
Aroclor-1016	0.005	mg/L	< 0.005
Aroclor-1221	0.005	mg/L	< 0.005
Aroclor-1232	0.005	mg/L	< 0.005
Aroclor-1242	0.005	mg/L	< 0.005
Aroclor-1248	0.005	mg/L	< 0.005
Aroclor-1254	0.005	mg/L	< 0.005
Aroclor-1260	0.005	mg/L	< 0.005
Total PCB*	0.005	mg/L	< 0.005
Dibutylchlorendate (surr.)	1	%	54
Tetrachloro-m-xylene (surr.)	1	%	84
Semivolatile Organics			
Aldrin and Dieldrin (Total)*	0.0001	mg/L	< 0.005
DDT + DDE + DDD (Total)*	0.0001	mg/L	< 0.005
Total PAH*	0.001	mg/L	< 0.001
2-Methyl-4.6-dinitrophenol	0.03	mg/L	< 0.03
1-Chloronaphthalene	0.005	mg/L	< 0.005
1-Naphthylamine	0.005	mg/L	< 0.005
1.2-Dichlorobenzene	0.005	mg/L	< 0.005
1.2.3-Trichlorobenzene	0.005	mg/L	< 0.005
1.2.3.4-Tetrachlorobenzene	0.005	mg/L	< 0.005
1.2.3.5-Tetrachlorobenzene	0.005	mg/L	< 0.005
1.2.4-Trichlorobenzene	0.005	mg/L	< 0.005
1.2.4.5-Tetrachlorobenzene	0.005	mg/L	< 0.005
1.3-Dichlorobenzene	0.005	mg/L	< 0.005
1.3.5-Trichlorobenzene	0.005	mg/L	< 0.005
1.4-Dichlorobenzene	0.005	mg/L	< 0.005
2-Chloronaphthalene	0.005	mg/L	< 0.005
2-Chlorophenol	0.003	mg/L	< 0.003
2-Fluorobiphenyl (surr.)	1	%	60
2-Methylnaphthalene	0.005	mg/L	< 0.005
2-Methylphenol (o-Cresol)	0.003	mg/L	< 0.003
2-Naphthylamine	0.005	mg/L	< 0.005
2-Nitroaniline	0.005	mg/L	< 0.005
2-Nitrophenol	0.01	mg/L	< 0.01
2-Picoline	0.005	mg/L	< 0.005
2.3.4.6-Tetrachlorophenol	0.01	mg/L	< 0.01
2.4-Dichlorophenol	0.003	mg/L	< 0.003
2.4-Dimethylphenol	0.003	mg/L	< 0.003
2.4-Dinitrophenol	0.03	mg/L	< 0.03
2.4.5-Trichlorophenol	0.01	mg/L	< 0.01
2.4.6-Tribromophenol (surr.)	1	%	62
2.4.6-Trichlorophenol	0.01	mg/L	< 0.01
2.6-Dichlorophenol	0.003	mg/L	< 0.003
2.4-Dinitrotoluene	0.005	mg/L	< 0.005
2.6-Dinitrotoluene	0.005	mg/L	< 0.005
2.4-Dinitrotoluene + 2.6-Dinitrotoluene*	0.005	mg/L	< 0.005
3&4-Methylphenol (m&p-Cresol)	0.006	mg/L	< 0.006
3-Methylcholanthrene	0.005	mg/L	< 0.005
3.3'-Dichlorobenzidine	0.005	mg/L	< 0.005

Client Sample ID			QAQC2
Sample Matrix			Water
Eurofins Sample No.			M25-My0002978
Date Sampled			Apr 29, 2025
Test/Reference	LOR	Unit	
Semivolatile Organics			
4-Aminobiphenyl	0.005	mg/L	< 0.005
4-Chloro-3-methylphenol	0.01	mg/L	< 0.01
4-Nitrophenol	0.03	mg/L	< 0.03
4.4'-DDD	0.005	mg/L	< 0.005
4.4'-DDE	0.005	mg/L	< 0.005
4.4'-DDT	0.005	mg/L	< 0.005
7.12-Dimethylbenz(a)anthracene	0.005	mg/L	< 0.005
a-HCH	0.005	mg/L	< 0.005
Acenaphthene	0.001	mg/L	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001
Acetophenone	0.005	mg/L	< 0.005
Aldrin	0.005	mg/L	< 0.005
Aniline	0.005	mg/L	< 0.005
Anthracene	0.001	mg/L	< 0.001
b-HCH	0.005	mg/L	< 0.005
Benz(a)anthracene	0.001	mg/L	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	< 0.001
Benzo(g.h.i)perylene	0.001	mg/L	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001
Benzyl chloride	0.005	mg/L	< 0.005
Bis(2-ethylhexyl)phthalate	0.005	mg/L	< 0.005
Butyl benzyl phthalate	0.005	mg/L	< 0.005
Chrysene	0.001	mg/L	< 0.001
d-HCH	0.005	mg/L	< 0.005
Di-n-butyl phthalate	0.005	mg/L	< 0.005
Di-n-octyl phthalate	0.005	mg/L	< 0.005
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001
Dibenz(a.j)acridine	0.005	mg/L	< 0.005
Dibenzofuran	0.005	mg/L	< 0.005
Dieldrin	0.005	mg/L	< 0.005
Diethyl phthalate	0.005	mg/L	< 0.005
Dimethyl phthalate	0.005	mg/L	< 0.005
Dimethylaminoazobenzene	0.005	mg/L	< 0.005
Diphenylamine	0.005	mg/L	< 0.005
Endosulfan I	0.005	mg/L	< 0.005
Endosulfan II	0.005	mg/L	< 0.005
Endosulfan sulphate	0.005	mg/L	< 0.005
Endrin	0.005	mg/L	< 0.005
Endrin aldehyde	0.005	mg/L	< 0.005
Endrin ketone	0.005	mg/L	< 0.005
Fluoranthene	0.001	mg/L	< 0.001
Fluorene	0.001	mg/L	< 0.001
g-HCH (Lindane)	0.005	mg/L	< 0.005
Heptachlor	0.005	mg/L	< 0.005
Heptachlor epoxide	0.005	mg/L	< 0.005
Hexachlorobenzene	0.005	mg/L	< 0.005
Hexachlorobutadiene	0.005	mg/L	< 0.005
Hexachlorocyclopentadiene	0.005	mg/L	< 0.005

Client Sample ID			QAQC2
Sample Matrix			**Water**
Eurofins Sample No.			**M25-My0002978**
Date Sampled			**Apr 29, 2025**
Test/Reference	LOR	Unit	
Semivolatile Organics			
Hexachloroethane	0.005	mg/L	< 0.005
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001
Methoxychlor	0.005	mg/L	< 0.005
N-Nitrosodibutylamine	0.005	mg/L	< 0.005
N-Nitrosodipropylamine	0.005	mg/L	< 0.005
N-Nitrosopiperidine	0.005	mg/L	< 0.005
Naphthalene	0.001	mg/L	< 0.001
Nitrobenzene	0.05	mg/L	< 0.05
Nitrobenzene-d5 (surr.)	1	%	80
Pentachlorobenzene	0.005	mg/L	< 0.005
Pentachloronitrobenzene	0.005	mg/L	< 0.005
Pentachlorophenol	0.01	mg/L	< 0.01
Phenanthrene	0.001	mg/L	< 0.001
Phenol	0.003	mg/L	< 0.003
Phenol-d6 (surr.)	1	%	59
Pronamide	0.005	mg/L	< 0.005
Pyrene	0.001	mg/L	< 0.001
Trifluralin	0.005	mg/L	< 0.005
Haloethers			
4-Bromophenyl phenyl ether	0.005	mg/L	< 0.005
4-Chlorophenyl phenyl ether	0.005	mg/L	< 0.005
Bis(2-chloroethoxy)methane	0.005	mg/L	< 0.005
Bis(2-chloroisopropyl)ether	0.005	mg/L	< 0.005
Ammonia (as N) - low level*	0.005	mg/L	0.010
Conductivity (at 25 °C)	10	uS/cm	120
Nitrate & Nitrite (as N) - low level	0.002	mg/L	1.4
Nitrate (as N) - low level	0.002	mg/L	1.8
Nitrite (as N) - low level	0.002	mg/L	0.002
pH (at 25 °C)	0.1	pH Units	6.5
Phosphate total (as P) - low level	0.005	mg/L	0.024
Phosphorus reactive (as P) - low level*	0.001	mg/L	0.024
Reactive Silica (as SiO2)	2	mg/L	18
Total Dissolved Solids Dried at 180 °C ± 2 °C	10	mg/L	90
Total Kjeldahl Nitrogen (as N)	0.1	mg/L	0.4
Total Nitrogen (as N)	0.01	mg/L	1.8
Total Suspended Solids Dried at 103°C to 105°C	5	mg/L	350
Heavy Metals			
Arsenic	0.001	mg/L	< 0.001
Arsenic (filtered)	0.001	mg/L	< 0.001
Cadmium	0.0002	mg/L	< 0.0002
Cadmium (filtered)	0.0002	mg/L	< 0.0002
Chromium	0.001	mg/L	< 0.001
Chromium (filtered)	0.001	mg/L	< 0.001
Copper	0.001	mg/L	0.003
Copper (filtered)	0.001	mg/L	0.003
Lead	0.001	mg/L	< 0.001
Lead (filtered)	0.001	mg/L	< 0.001
Mercury	0.0001	mg/L	< 0.0001

Client Sample ID			QAQC2
Sample Matrix			**Water**
Eurofins Sample No.			**M25-My0002978**
Date Sampled			**Apr 29, 2025**
Test/Reference	LOR	Unit	
Heavy Metals			
Mercury (filtered)	0.0001	mg/L	< 0.0001
Nickel	0.001	mg/L	0.005
Nickel (filtered)	0.001	mg/L	0.005
Zinc	0.005	mg/L	0.010
Zinc (filtered)	0.005	mg/L	0.010
Per- and Polyfluoroalkyl Substances (PFASs) - Short (Ultra trace)			
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.005	ug/L	< 0.005
Perfluorooctanesulfonic acid (PFOS)[N11]	0.0001	ug/L	0.0002
13C2-6:2 FTSA (surr.)	1	%	80
Perfluorooctanoic acid (PFOA)[N11]	0.001	ug/L	< 0.001
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.001	ug/L	< 0.001
18O2-PFHxS (surr.)	1	%	127
13C8-PFOS (surr.)	1	%	108
13C8-PFOA (surr.)	1	%	97
Sum (PFHxS + PFOS)*	0.001	ug/L	< 0.001
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.001	ug/L	< 0.001
Sum of US EPA PFAS (PFOS + PFOA)*	0.001	ug/L	< 0.001

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
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	May 05, 2025	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	May 05, 2025	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	May 05, 2025	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX and Naphthalene			
BTEX	Melbourne	May 05, 2025	14 Days
- Method: LTM-ORG-2010 BTEX and Volatile TRH			
Volatile Organics	Melbourne	May 05, 2025	7 Days
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices (USEPA 8260)			
Semivolatile Organics	Melbourne	May 05, 2025	7 Days
- Method: USEPA SW 846 8270			
Polychlorinated Biphenyls	Melbourne	May 05, 2025	7 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8082)			
Conductivity (at 25 °C)	Melbourne	May 05, 2025	28 Days
- Method: LTM-INO-4030 Conductivity			
pH (at 25 °C)	Melbourne	May 05, 2025	6 Hours
- Method: LTM-GEN-7090 pH in water by ISE			
Phosphorus reactive (as P) - low level	Melbourne	May 07, 2025	28 Days
- Method: LTM-INO-4290 Phophate by Discrete Analyser			
Reactive Silica (as SiO2)	Melbourne	May 07, 2025	5 Days
- Method: APHA 4500-SiO2 C			
Total Suspended Solids Dried at 103°C to 105°C	Melbourne	May 05, 2025	7 Days
- Method: LTM-INO-4070 Analysis of Suspended Solids in Water by Gravimetry			
Metals M8	Melbourne	May 05, 2025	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Metals M8 filtered	Melbourne	May 05, 2025	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Per- and Polyfluoroalkyl Substances (PFASs) - Short (Ultra trace)	Melbourne	May 05, 2025	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) - ultra trace			
Eurofins Suite B19D: Total N, TKN, NOx, NO2, NO3, NH3, PO4 (low level)			
Ammonia (as N) - low level	Melbourne	May 05, 2025	28 Days
- Method: LTM-INO-4450 Nitrogens by DA			
Nitrate & Nitrite (as N) - low level	Melbourne	May 05, 2025	28 Days
- Method: LTM-INO-4450 Nitrogens by Discrete Analyser			
Nitrate (as N) - low level	Melbourne	May 05, 2025	28 Days
- Method: LTM-INO-4450 Nitrogens by Discrete Analyser (low level)			
Nitrite (as N) - low level	Melbourne	May 05, 2025	2 Days
- Method: LTM-INO-4450 Nitrogens by Discrete Analyser (low level)			
Phosphate total (as P) - low level	Melbourne	May 05, 2025	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Total Kjeldahl Nitrogen (as N)	Melbourne	May 05, 2025	28 Days
- Method: LTM-INO-4310 TKN by FIA			
Total Nitrogen (as N)	Melbourne	May 05, 2025	7 Days
- Method: LTM-INO-4040 Phosphate and Nitrogen in waters (low level)			
Total Dissolved Solids Dried at 180 °C ± 2 °C	Melbourne	May 05, 2025	28 Days
- Method: LTM-INO-4170 Total Dissolved Solids in Water			

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Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

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Project Name: HYDRO TARRALEAH ESA
Project ID: P.24.1136

Order No.:
Report #: 1214755
Phone: 03 6323 1900
Fax: 03 6334 4651

Received: May 1, 2025 4:49 PM
Due: May 8, 2025
Priority: 5 Day
Contact Name: Carly Clark

Eurofins Analytical Services Manager : Savini Suduweli

Sample Detail						Conductivity (at 25 °C)	pH (at 25 °C)	Phosphorus reactive (as P) - low level*	Reactive Silica (as SiO2)	Total Suspended Solids Dried at 103°C to 105°C	Polychlorinated Biphenyls	Metals M8	Metals M8 filtered	BTEX and Naphthalene	Total Recoverable Hydrocarbons	Eurofins Suite SVV: SVOC/VOC	Total Dissolved Solids Dried at 180 °C ± 2 °C	Per- and Polyfluoroalkyl Substances (PFASs) - Short (Ultra trace)	Eurofins Suite B19D: Total N, TKN, NOx, NO2, NO3, NH3, PO4 (low level)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X	X	X	X	X
External Laboratory																			
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**														
1	QAQC2	Apr 29, 2025		Water	M25-My0002978	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Test Counts						1	1	1	1	1	1	1	1	1	1	1	1	1	1

Internal Quality Control Review and Glossary

General

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

Holding Times

Please refer to the '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 before sample receipt deadlines as stated on the SRA.

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

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

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

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ppm:** parts per million
µg/L: micrograms per litre	**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
CFU: Colony Forming Unit	**Colour:** Pt-Co Units (CU)	

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
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 moisture has been determined on a solid sample, the result is expressed on a dry weight 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 represents 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 similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (*bis*-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 6.0
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 only be used as a guide 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. SVOCs recoveries 20 – 150%, VOC recoveries 50 – 150%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 6.0, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as 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 are 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/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
Method Blank							
Volatile Organics							
1.1-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.1-Dichloroethene	mg/L	< 0.001			0.001	Pass	
1.1.1-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.1.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dibromoethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.2-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.3-Trichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.4-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.3.5-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.4-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
2-Butanone (MEK)	mg/L	< 0.005			0.005	Pass	
2-Propanone (Acetone)	mg/L	< 0.005			0.005	Pass	
4-Chlorotoluene	mg/L	< 0.001			0.001	Pass	
4-Methyl-2-pentanone (MIBK)	mg/L	< 0.005			0.005	Pass	
Allyl chloride	mg/L	< 0.001			0.001	Pass	
Bromobenzene	mg/L	< 0.001			0.001	Pass	
Bromochloromethane	mg/L	< 0.001			0.001	Pass	
Bromodichloromethane	mg/L	< 0.001			0.001	Pass	
Bromoform	mg/L	< 0.001			0.001	Pass	
Bromomethane	mg/L	< 0.005			0.005	Pass	
Carbon disulfide	mg/L	< 0.001			0.001	Pass	
Carbon Tetrachloride	mg/L	< 0.001			0.001	Pass	
Chlorobenzene	mg/L	< 0.001			0.001	Pass	
Chloroethane	mg/L	< 0.005			0.005	Pass	
Chloroform	mg/L	< 0.005			0.005	Pass	
Chloromethane	mg/L	< 0.005			0.005	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
cis-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
cis-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Dibromochloromethane	mg/L	< 0.001			0.001	Pass	
Dibromomethane	mg/L	< 0.001			0.001	Pass	
Dichlorodifluoromethane	mg/L	< 0.005			0.005	Pass	
Iodomethane	mg/L	< 0.001			0.001	Pass	
Isopropyl benzene (Cumene)	mg/L	< 0.001			0.001	Pass	
Methylene Chloride	mg/L	< 0.005			0.005	Pass	
Styrene	mg/L	< 0.001			0.001	Pass	
Tetrachloroethene	mg/L	< 0.001			0.001	Pass	
trans-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
trans-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Trichloroethene	mg/L	< 0.001			0.001	Pass	
Trichlorofluoromethane	mg/L	< 0.005			0.005	Pass	
Vinyl chloride	mg/L	< 0.005			0.005	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/L	< 0.005			0.005	Pass	
Aroclor-1221	mg/L	< 0.005			0.005	Pass	
Aroclor-1232	mg/L	< 0.005			0.005	Pass	
Aroclor-1242	mg/L	< 0.005			0.005	Pass	
Aroclor-1248	mg/L	< 0.005			0.005	Pass	
Aroclor-1254	mg/L	< 0.005			0.005	Pass	
Aroclor-1260	mg/L	< 0.005			0.005	Pass	
Total PCB*	mg/L	< 0.005			0.005	Pass	
Method Blank							
Semivolatile Organics							
2-Methyl-4.6-dinitrophenol	mg/L	< 0.03			0.03	Pass	
1-Chloronaphthalene	mg/L	< 0.005			0.005	Pass	
1-Naphthylamine	mg/L	< 0.005			0.005	Pass	
1.2-Dichlorobenzene	mg/L	< 0.005			0.005	Pass	
1.2.3-Trichlorobenzene	mg/L	< 0.005			0.005	Pass	
1.2.3.4-Tetrachlorobenzene	mg/L	< 0.005			0.005	Pass	
1.2.3.5-Tetrachlorobenzene	mg/L	< 0.005			0.005	Pass	
1.2.4-Trichlorobenzene	mg/L	< 0.005			0.005	Pass	
1.2.4.5-Tetrachlorobenzene	mg/L	< 0.005			0.005	Pass	
1.3-Dichlorobenzene	mg/L	< 0.005			0.005	Pass	
1.3.5-Trichlorobenzene	mg/L	< 0.005			0.005	Pass	
1.4-Dichlorobenzene	mg/L	< 0.005			0.005	Pass	
2-Chloronaphthalene	mg/L	< 0.005			0.005	Pass	
2-Chlorophenol	mg/L	< 0.003			0.003	Pass	
2-Methylnaphthalene	mg/L	< 0.005			0.005	Pass	
2-Methylphenol (o-Cresol)	mg/L	< 0.003			0.003	Pass	
2-Naphthylamine	mg/L	< 0.005			0.005	Pass	
2-Nitroaniline	mg/L	< 0.005			0.005	Pass	
2-Nitrophenol	mg/L	< 0.01			0.01	Pass	
2-Picoline	mg/L	< 0.005			0.005	Pass	
2.3.4.6-Tetrachlorophenol	mg/L	< 0.01			0.01	Pass	
2.4-Dichlorophenol	mg/L	< 0.003			0.003	Pass	
2.4-Dimethylphenol	mg/L	< 0.003			0.003	Pass	
2.4-Dinitrophenol	mg/L	< 0.03			0.03	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2.4.5-Trichlorophenol	mg/L	< 0.01			0.01	Pass	
2.4.6-Trichlorophenol	mg/L	< 0.01			0.01	Pass	
2.6-Dichlorophenol	mg/L	< 0.003			0.003	Pass	
2.4-Dinitrotoluene	mg/L	< 0.005			0.005	Pass	
2.6-Dinitrotoluene	mg/L	< 0.005			0.005	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/L	< 0.006			0.006	Pass	
3-Methylcholanthrene	mg/L	< 0.005			0.005	Pass	
3.3'-Dichlorobenzidine	mg/L	< 0.005			0.005	Pass	
4-Aminobiphenyl	mg/L	< 0.005			0.005	Pass	
4-Chloro-3-methylphenol	mg/L	< 0.01			0.01	Pass	
4-Nitrophenol	mg/L	< 0.03			0.03	Pass	
4.4'-DDD	mg/L	< 0.005			0.005	Pass	
4.4'-DDE	mg/L	< 0.005			0.005	Pass	
4.4'-DDT	mg/L	< 0.005			0.005	Pass	
7.12-Dimethylbenz(a)anthracene	mg/L	< 0.005			0.005	Pass	
a-HCH	mg/L	< 0.005			0.005	Pass	
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Acetophenone	mg/L	< 0.005			0.005	Pass	
Aldrin	mg/L	< 0.005			0.005	Pass	
Aniline	mg/L	< 0.005			0.005	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
b-HCH	mg/L	< 0.005			0.005	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzyl chloride	mg/L	< 0.005			0.005	Pass	
Bis(2-ethylhexyl)phthalate	mg/L	< 0.005			0.005	Pass	
Butyl benzyl phthalate	mg/L	< 0.005			0.005	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
d-HCH	mg/L	< 0.005			0.005	Pass	
Di-n-butyl phthalate	mg/L	< 0.005			0.005	Pass	
Di-n-octyl phthalate	mg/L	< 0.005			0.005	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.001			0.001	Pass	
Dibenz(a.j)acridine	mg/L	< 0.005			0.005	Pass	
Dibenzofuran	mg/L	< 0.005			0.005	Pass	
Dieldrin	mg/L	< 0.005			0.005	Pass	
Diethyl phthalate	mg/L	< 0.005			0.005	Pass	
Dimethyl phthalate	mg/L	< 0.005			0.005	Pass	
Dimethylaminoazobenzene	mg/L	< 0.005			0.005	Pass	
Diphenylamine	mg/L	< 0.005			0.005	Pass	
Endosulfan I	mg/L	< 0.005			0.005	Pass	
Endosulfan II	mg/L	< 0.005			0.005	Pass	
Endosulfan sulphate	mg/L	< 0.005			0.005	Pass	
Endrin	mg/L	< 0.005			0.005	Pass	
Endrin aldehyde	mg/L	< 0.005			0.005	Pass	
Endrin ketone	mg/L	< 0.005			0.005	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
g-HCH (Lindane)	mg/L	< 0.005			0.005	Pass	
Heptachlor	mg/L	< 0.005			0.005	Pass	
Heptachlor epoxide	mg/L	< 0.005			0.005	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Hexachlorobenzene	mg/L	< 0.005			0.005	Pass	
Hexachlorobutadiene	mg/L	< 0.005			0.005	Pass	
Hexachlorocyclopentadiene	mg/L	< 0.005			0.005	Pass	
Hexachloroethane	mg/L	< 0.005			0.005	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Methoxychlor	mg/L	< 0.005			0.005	Pass	
N-Nitrosodibutylamine	mg/L	< 0.005			0.005	Pass	
N-Nitrosodipropylamine	mg/L	< 0.005			0.005	Pass	
N-Nitrosopiperidine	mg/L	< 0.005			0.005	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Nitrobenzene	mg/L	< 0.05			0.05	Pass	
Pentachlorobenzene	mg/L	< 0.005			0.005	Pass	
Pentachloronitrobenzene	mg/L	< 0.005			0.005	Pass	
Pentachlorophenol	mg/L	< 0.01			0.01	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Phenol	mg/L	< 0.003			0.003	Pass	
Pronamide	mg/L	< 0.005			0.005	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Trifluralin	mg/L	< 0.005			0.005	Pass	
Method Blank							
Haloethers							
4-Bromophenyl phenyl ether	mg/L	< 0.005			0.005	Pass	
4-Chlorophenyl phenyl ether	mg/L	< 0.005			0.005	Pass	
Bis(2-chloroethoxy)methane	mg/L	< 0.005			0.005	Pass	
Bis(2-chloroisopropyl)ether	mg/L	< 0.005			0.005	Pass	
Method Blank							
Ammonia (as N) - low level*	mg/L	< 0.005			0.005	Pass	
Conductivity (at 25 °C)	uS/cm	< 10			10	Pass	
Nitrate & Nitrite (as N) - low level	mg/L	< 0.002			0.002	Pass	
Nitrate (as N) - low level	mg/L	-			0.002	N/A	
Nitrite (as N) - low level	mg/L	< 0.002			0.002	Pass	
Phosphate total (as P) - low level	mg/L	< 0.005			0.005	Pass	
Reactive Silica (as SiO2)	mg/L	< 2			2	Pass	
Total Dissolved Solids Dried at 180 °C ± 2 °C	mg/L	< 10			10	Pass	
Total Kjeldahl Nitrogen (as N)	mg/L	< 0.1			0.1	Pass	
Total Suspended Solids Dried at 103°C to 105°C	mg/L	< 5			5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.001			0.001	Pass	
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Per- and Polyfluoroalkyl Substances (PFASs) - Short (Ultra trace)							
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.005			0.005	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.0001			0.0001	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.001			0.001	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.001			0.001	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	105			70-130	Pass	
TRH C10-C14	%	84			70-130	Pass	
TRH C6-C10	%	115			70-130	Pass	
TRH >C10-C16	%	84			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	114			70-130	Pass	
Toluene	%	113			70-130	Pass	
Ethylbenzene	%	110			70-130	Pass	
m&p-Xylenes	%	116			70-130	Pass	
Xylenes - Total*	%	111			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethene	%	102			70-130	Pass	
1.2-Dichlorobenzene	%	110			70-130	Pass	
1.2-Dichloroethane	%	98			70-130	Pass	
Trichloroethene	%	117			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	121			70-130	Pass	
LCS - % Recovery							
Phosphate total (as P) - low level	%	103			70-130	Pass	
Reactive Silica (as SiO2)	%	117			70-130	Pass	
Total Kjeldahl Nitrogen (as N)	%	103			70-130	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	M25-My0001347	NCP	%	94			70-130	Pass	
TRH C10-C14	M25-My0010113	NCP	%	107			70-130	Pass	
TRH C6-C10	M25-My0001347	NCP	%	106			70-130	Pass	
TRH >C10-C16	M25-My0010113	NCP	%	106			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M25-My0001347	NCP	%	83			70-130	Pass	
Toluene	M25-My0001347	NCP	%	72			70-130	Pass	
Ethylbenzene	M25-My0001347	NCP	%	81			70-130	Pass	
m&p-Xylenes	M25-My0001347	NCP	%	75			70-130	Pass	
o-Xylene	M25-My0001347	NCP	%	71			70-130	Pass	
Xylenes - Total*	M25-My0001347	NCP	%	74			70-130	Pass	
Spike - % Recovery									
Volatile Organics				Result 1					
1.1-Dichloroethene	M25-My0001347	NCP	%	72			70-130	Pass	
1.2-Dichlorobenzene	M25-My0001347	NCP	%	117			70-130	Pass	
1.2-Dichloroethane	M25-My0001347	NCP	%	81			70-130	Pass	
Trichloroethene	M25-My0001347	NCP	%	97			70-130	Pass	
Spike - % Recovery									

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M25-My0001347	NCP	%	97			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1016	M25-My0018279	NCP	%	86			70-130	Pass	
Aroclor-1260	M25-My0018279	NCP	%	96			70-130	Pass	
Spike - % Recovery									
Semivolatile Organics				Result 1					
2-Methyl-4.6-dinitrophenol	M25-My0018279	NCP	%	43			30-130	Pass	
2-Chlorophenol	M25-My0018279	NCP	%	57			30-130	Pass	
2-Methylphenol (o-Cresol)	M25-My0018279	NCP	%	46			30-130	Pass	
2-Nitrophenol	M25-My0018279	NCP	%	57			30-130	Pass	
2.4-Dichlorophenol	M25-My0018279	NCP	%	56			30-130	Pass	
2.4-Dimethylphenol	M25-Ap0052953	NCP	%	47			30-130	Pass	
2.4-Dinitrophenol	M25-Ap0073118	NCP	%	47			30-130	Pass	
2.4.5-Trichlorophenol	M25-My0018279	NCP	%	55			30-130	Pass	
2.4.6-Trichlorophenol	M25-My0018279	NCP	%	42			30-130	Pass	
2.6-Dichlorophenol	M25-My0018279	NCP	%	72			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	M25-My0018279	NCP	%	46			30-130	Pass	
4-Chloro-3-methylphenol	M25-My0018279	NCP	%	62			30-130	Pass	
4-Nitrophenol	M25-My0022785	NCP	%	31			30-130	Pass	
Acenaphthene	M25-My0018279	NCP	%	101			70-130	Pass	
Acenaphthylene	M25-My0018279	NCP	%	106			70-130	Pass	
Anthracene	M25-My0018279	NCP	%	72			70-130	Pass	
Benz(a)anthracene	M25-My0018279	NCP	%	96			70-130	Pass	
Benzo(a)pyrene	M25-My0018279	NCP	%	106			70-130	Pass	
Benzo(b&j)fluoranthene	M25-My0018279	NCP	%	82			70-130	Pass	
Benzo(g.h.i)perylene	M25-My0018279	NCP	%	100			70-130	Pass	
Benzo(k)fluoranthene	M25-My0018279	NCP	%	79			70-130	Pass	
Chrysene	M25-My0018279	NCP	%	73			70-130	Pass	
Dibenz(a.h)anthracene	M25-My0018279	NCP	%	96			70-130	Pass	
Fluoranthene	M25-My0018279	NCP	%	99			70-130	Pass	
Fluorene	M25-My0018279	NCP	%	98			70-130	Pass	
Hexachlorobenzene	M25-My0018279	NCP	%	118			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M25-My0018279	NCP	%	97			70-130	Pass	
Naphthalene	M25-My0018279	NCP	%	101			70-130	Pass	
Pentachlorophenol	M25-My0018279	NCP	%	37			30-130	Pass	
Phenanthrene	M25-My0018279	NCP	%	88			70-130	Pass	
Phenol	M25-My0018279	NCP	%	63			30-130	Pass	
Pyrene	M25-My0018279	NCP	%	100			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M25-My0010337	NCP	%	97			75-125	Pass	
Arsenic (filtered)	M25-My0005763	NCP	%	95			75-125	Pass	
Cadmium	M25-My0010337	NCP	%	99			75-125	Pass	
Cadmium (filtered)	M25-My0005753	NCP	%	92			75-125	Pass	
Chromium	M25-My0010337	NCP	%	98			75-125	Pass	
Chromium (filtered)	M25-My0005753	NCP	%	97			75-125	Pass	
Copper	M25-My0010337	NCP	%	97			75-125	Pass	
Copper (filtered)	M25-My0005753	NCP	%	92			75-125	Pass	
Lead	M25-My0010337	NCP	%	98			75-125	Pass	
Lead (filtered)	M25-My0005753	NCP	%	93			75-125	Pass	
Mercury	M25-My0010337	NCP	%	94			75-125	Pass	
Mercury (filtered)	M25-My0005753	NCP	%	90			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Nickel	M25-My0010337	NCP	%	97			75-125	Pass	
Nickel (filtered)	M25-My0005753	NCP	%	86			75-125	Pass	
Zinc	M25-My0010337	NCP	%	98			75-125	Pass	
Zinc (filtered)	M25-My0005753	NCP	%	89			75-125	Pass	
Spike - % Recovery									
Per- and Polyfluoroalkyl Substances (PFASs) - Short (Ultra trace)				Result 1					
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	S25-Ap0066626	NCP	%	95			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	S25-Ap0066626	NCP	%	60			50-150	Pass	
Perfluorooctanoic acid (PFOA)	S25-Ap0066626	NCP	%	84			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	S25-Ap0066626	NCP	%	60			50-150	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 C6-C9	M25-My0001349	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	M25-My0002980	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	M25-My0002980	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	M25-My0002980	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C6-C10	M25-My0001349	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH >C10-C16	M25-My0002980	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	M25-My0002980	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	M25-My0002980	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M25-My0001349	NCP	mg/L	0.004	0.004	4.0	30%	Pass	
Toluene	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	M25-My0001349	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total*	M25-My0001349	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.1-Dichloroethane	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1-Dichloroethene	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1.1-Trichloroethane	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1.1.2-Tetrachloroethane	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1.2-Trichloroethane	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1.2.2-Tetrachloroethane	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2-Dibromoethane	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2-Dichlorobenzene	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2-Dichloroethane	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2-Dichloropropane	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2.3-Trichloropropane	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2.4-Trimethylbenzene	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.3-Dichlorobenzene	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.3-Dichloropropane	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.3.5-Trimethylbenzene	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.4-Dichlorobenzene	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
2-Butanone (MEK)	M25-My0001349	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
2-Propanone (Acetone)	M25-My0001349	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
4-Chlorotoluene	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
4-Methyl-2-pentanone (MIBK)	M25-My0001349	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	

Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
Allyl chloride	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromobenzene	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromochloromethane	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromodichloromethane	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromoform	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromomethane	M25-My0001349	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Carbon disulfide	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Carbon Tetrachloride	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chlorobenzene	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chloroethane	M25-My0001349	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Chloroform	M25-My0001349	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Chloromethane	M25-My0001349	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
cis-1.2-Dichloroethene	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
cis-1.3-Dichloropropene	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibromochloromethane	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibromomethane	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dichlorodifluoromethane	M25-My0001349	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Iodomethane	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Isopropyl benzene (Cumene)	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Methylene Chloride	M25-My0001349	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Styrene	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Tetrachloroethene	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
trans-1.2-Dichloroethene	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
trans-1.3-Dichloropropene	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Trichloroethene	M25-My0001349	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Trichlorofluoromethane	M25-My0001349	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Vinyl chloride	M25-My0001349	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M25-My0001349	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Aroclor-1221	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Aroclor-1232	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Aroclor-1242	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Aroclor-1248	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Aroclor-1254	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Aroclor-1260	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Total PCB*	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Duplicate									
Semivolatile Organics				Result 1	Result 2	RPD			
2-Methyl-4.6-dinitrophenol	M25-My0002980	NCP	mg/L	< 0.03	< 0.03	<1	30%	Pass	
1-Chloronaphthalene	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
1-Naphthylamine	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
1.2-Dichlorobenzene	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
1.2.3-Trichlorobenzene	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
1.2.3.4-Tetrachlorobenzene	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
1.2.3.5-Tetrachlorobenzene	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
1.2.4-Trichlorobenzene	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
1.2.4.5-Tetrachlorobenzene	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
1.3-Dichlorobenzene	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
1.3.5-Trichlorobenzene	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
1.4-Dichlorobenzene	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	

Duplicate									
Semivolatile Organics				Result 1	Result 2	RPD			
2-Chloronaphthalene	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
2-Chlorophenol	M25-My0002980	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
2-Methylnaphthalene	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
2-Methylphenol (o-Cresol)	M25-My0002980	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
2-Naphthylamine	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
2-Nitroaniline	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
2-Nitrophenol	M25-My0002980	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
2-Picoline	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
2.3.4.6-Tetrachlorophenol	M25-My0002980	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
2.4-Dichlorophenol	M25-My0002980	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
2.4-Dimethylphenol	M25-My0002980	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
2.4-Dinitrophenol	M25-My0002980	NCP	mg/L	< 0.03	< 0.03	<1	30%	Pass	
2.4.5-Trichlorophenol	M25-My0002980	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
2.4.6-Trichlorophenol	M25-My0002980	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
2.6-Dichlorophenol	M25-My0002980	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
2.4-Dinitrotoluene	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
2.6-Dinitrotoluene	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	M25-My0002980	NCP	mg/L	< 0.006	< 0.006	<1	30%	Pass	
3-Methylcholanthrene	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
3.3'-Dichlorobenzidine	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
4-Aminobiphenyl	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
4-Chloro-3-methylphenol	M25-My0002980	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
4-Nitrophenol	M25-My0002980	NCP	mg/L	< 0.03	< 0.03	<1	30%	Pass	
4.4'-DDD	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
4.4'-DDE	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
4.4'-DDT	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
7.12-Dimethylbenz(a)anthracene	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
a-HCH	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Acenaphthene	M25-My0002980	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	M25-My0002980	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acetophenone	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Aldrin	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Aniline	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Anthracene	M25-My0002980	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
b-HCH	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Benz(a)anthracene	M25-My0002980	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	M25-My0002980	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b&j)fluoranthene	M25-My0002980	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g.h.i)perylene	M25-My0002980	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(k)fluoranthene	M25-My0002980	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzyl chloride	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Bis(2-ethylhexyl)phthalate	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Butyl benzyl phthalate	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Chrysene	M25-My0002980	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
d-HCH	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Di-n-butyl phthalate	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Di-n-octyl phthalate	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Dibenz(a.h)anthracene	M25-My0002980	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a.j)acridine	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Dibenzofuran	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Dieldrin	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Diethyl phthalate	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Dimethyl phthalate	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Dimethylaminoazobenzene	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	

Duplicate									
Semivolatile Organics				Result 1	Result 2	RPD			
Diphenylamine	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Endosulfan I	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Endosulfan II	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Endosulfan sulphate	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Endrin	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Endrin aldehyde	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Endrin ketone	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Fluoranthene	M25-My0002980	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	M25-My0002980	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
g-HCH (Lindane)	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Heptachlor	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Heptachlor epoxide	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Hexachlorobenzene	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Hexachlorobutadiene	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Hexachlorocyclopentadiene	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Hexachloroethane	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M25-My0002980	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Methoxychlor	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
N-Nitrosodibutylamine	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
N-Nitrosodipropylamine	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
N-Nitrosopiperidine	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Naphthalene	M25-My0002980	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Nitrobenzene	M25-My0002980	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Pentachlorobenzene	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Pentachloronitrobenzene	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Pentachlorophenol	M25-My0002980	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Phenanthrene	M25-My0002980	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phenol	M25-My0002980	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Pronamide	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Pyrene	M25-My0002980	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Trifluralin	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Duplicate									
Haloethers				Result 1	Result 2	RPD			
4-Bromophenyl phenyl ether	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
4-Chlorophenyl phenyl ether	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Bis(2-chloroethoxy)methane	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Bis(2-chloroisopropyl)ether	M25-My0002980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Ammonia (as N) - low level*	M25-My0002978	CP	mg/L	0.010	0.012	25	30%	Pass	
Conductivity (at 25 °C)	M25-My0005757	NCP	uS/cm	4200	4200	2.1	30%	Pass	
Nitrate & Nitrite (as N) - low level	M25-My0002978	CP	mg/L	1.4	1.4	<1	30%	Pass	
Nitrite (as N) - low level	M25-My0002978	CP	mg/L	0.002	0.002	22	30%	Pass	
pH (at 25 °C)	M25-My0005757	NCP	pH Units	7.3	6.9	pass	30%	Pass	
Reactive Silica (as SiO2)	B25-My0000906	NCP	mg/L	64	64	<1	30%	Pass	
Total Dissolved Solids Dried at 180 °C ± 2 °C	M25-My0003177	NCP	mg/L	140	160	14	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M25-My0010337	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Arsenic (filtered)	M25-My0005753	NCP	mg/L	0.65	0.64	1.0	30%	Pass	
Cadmium	M25-My0010337	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Cadmium (filtered)	M25-My0005753	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	M25-My0010337	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Chromium (filtered)	M25-My0005753	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper	M25-My0010337	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	M25-My0005753	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead	M25-My0010337	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead (filtered)	M25-My0005753	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury	M25-My0010337	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Mercury (filtered)	M25-My0005753	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	M25-My0010337	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Nickel (filtered)	M25-My0005753	NCP	mg/L	0.066	0.067	2.0	30%	Pass	
Zinc	M25-My0010337	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Zinc (filtered)	M25-My0005753	NCP	mg/L	0.027	0.027	1.0	30%	Pass	
Duplicate									
Per- and Polyfluoroalkyl Substances (PFASs) - Short (Ultra trace)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M25-My0000865	NCP	ug/L	0.014	0.018	24	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M25-My0000865	NCP	ug/L	0.0004	0.0004	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M25-My0000865	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M25-My0000865	NCP	ug/L	< 0.001	< 0.001	<1	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
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.

Authorised by:

Savini Suduweli	Analytical Services Manager
Caitlin Breeze	Senior Analyst-Metal
Carroll Lee	Senior Analyst-Volatile
Edward Lee	Senior Analyst-Organic
Joseph Edouard	Senior Analyst-PFAS
Luke Holt	Senior Analyst-Inorganic
Mary Makarios	Senior Analyst-Inorganic

Glenn Jackson
Managing Director

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.

Tabulated analytical results and comparison to guideline criteria

Appendix G

pitt&sherry

SUMMARY RESULTS - SOIL / FILL MATERIAL - VILLAGE

Project No: P.24.1136
Project Name: Tarraleah Power Scheme ESA

Analyte Grouping							Total Heavy Metals										Total Petroleum Hydrocarbons (TPH)					Total Recoverable Hydrocarbons (TRH)					BTEXN					Polycyclic Aromatic Hydrocarbons (PAH)			Phenols			Per- and Poly-fluoroalkyl Substances (PFAS)				F T S [6]	Polychlorinated Biphenyls	Asbestos and Other Fibres		
Analyte							Arsenic	Cadmium	Chromium (VI) (1:100)	Chromium (trivalent)	Chromium (hexavalent)	Copper	Lead	Nickel	Zinc	Mercury (total)	C6-C9	C10-C14	C15-C28	C29-C36	Sum (C10-C36)	>C6-C10 minus BTEX (F1)	>C10-C16 minus Naphthalene (F2)	>C16-C34 (F3)	>C34-C40 (F4)	Sum (>C10-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	Benzo(a)pyrene	Carcinogenic PAHs (as BaP TEQ)	Total PAHs	Phenol	Pentachlorophenol	Phenols (sum)	PFOS	PFOA	PFHxS	PFOS+PFHxS	Total 6 FTS	TCBs	Synthetic Mineral Fibres	Organic Fibres	Organic Fibres
ASC NEPM - HIL/HSL A (vapour intrusion)							100	20	100 Cr(VI)			100	6,000	300	400	7,400	40 (inorganic)					45-200 (sand) 40-190 (silt) 50-290 (clay) (C6-C10) NL (all soil types and depths)	110-NL (sand) 230-NL (silt) 280-NL (clay) (>C10-C16) NL (all soil types and depths)				0.5 (sand) 0.6-2 (silt) 0.7-3 (clay)	160-540 (sand) 380-NL (silt) 480-NL (clay)	55-NL (sand) NL (silt) NL (clay)	40-170 (sand) 95-NL (silt) 110-NL (clay)	3-NL (sand) 4-NL (silt) 5-NL (clay)		3	300									1			
CRC CARE - HSL (vapour intrusion, intrusive maintenance worker - shallow trench)																										77-NL (sand) 250-NL (silt) 350-NL (clay)	NL (all soil types)	NL (all soil types)	NL (all soil types)	NL (all soil types)															
CRC CARE - HSL A (vapour intrusion)																										0.5 (sand) 0.6-2 (silt) 0.7-3 (clay)	160-540 (sand) 380-NL (silt) 480-NL (clay)	57-NL (sand) NL (silt) NL (clay)	40-170 (sand) 93-NL (silt) 110-NL (clay)	3-NL (sand) 4-NL (silt) 5-NL (clay)															
CRC CARE - HSL (direct contact)																						4,400 (C6-C10)	3,300 (>C10-C16)	4,500	6,300		100	14,000	4,500	12,000	1,400															
CRC CARE - HSL (direct contact, intrusive maintenance worker - shallow trench)																						82,000 (C6-C10)	62,000 (>C10-C16)	85,000	120,000		1,100	120,000	85,000	130,000	29,000															
PFAS NEMP 3.0 HIL A (direct contact)																																				0.1		0.003						
ASC NEPM - EIL/ESL (urban residential / public open space)							100[A]		510[B] Cr(III)	510[B]		110[A]	1,100[C]	190[B]	330[B]							50 (coarse) 65 (fine)	120 (coarse / fine)	300 (coarse) 1,300 (fine)	2,800 (coarse) 5,600 (fine)		50 (coarse) 65 (fine)	85 (coarse) 105 (fine)	70 (coarse) 125 (fine)	105 (coarse) 45 (fine)	170[A]	0.7 (coarse / fine)															
PFAS NEMP 3.0 - ecological direct exposure (all land uses)																																		1	10[I]								
PFAS NEMP 3.0 - ecological indirect exposure (all land uses)																																		0.003	0.003								
IB105 - Level 1 (fill material)							20	3	50			1	100	300	60	200	1	65				1,000	65 (C6-C9)				1,000 (C10-C36)	1	1	3	14		0.08		20		25						2			
IB105 - Level 2 (low level contaminated soil)							200	40	500			200	2,000	1,200	600	14,000	30	650				5,000	650 (C6-C9)				5,000 (C10-C36)	5	100	100	180		2		40		500						20			
IB105 - Level 3 (contaminated soil)							750	400	5,000			2,000	7,500	3,000	3,000	50,000	110	1,000				10,000	1,000 (C6-C9)				10,000 (C10-C36)	50	1,000	1,080	1,800		20		200		2,000						50			
PFAS NEMP 3.0 - unlined landfill																																			50		20						
PFAS NEMP 3.0 - clay / single composite lined landfill																																			50		50						
PFAS NEMP 3.0 - double composite lined landfill																																			50		50						

Sample ID	Location	Sampled By	Date Sampled	Sample Depth (m bgl)	Lab	Soil Type / Units	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	g/kg	g/kg	g/kg
TARRALEAH VILLAGE																																												
TA-TP449/0.4	Test Pit TP449	pitt&cherry	31-Mar-25	0.4	ALS	Sandy GRAVEL							<5				<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2	<0.5									
TA-TP449/0.8	Test Pit TP449	pitt&cherry	31-Mar-25	0.8	ALS	Clayey SILT / basalt							10				<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2	<0.5									
QCP01	Duplicate of TA-TP449/0.8	pitt&cherry	31-Mar-25	0.8	ALS (not tested)	Clayey SILT / basalt cobbles											<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2	<0.5									
QCS01	Triplicate of TA-TP449/0.8	pitt&cherry	31-Mar-25	0.8	Eurofins	Clayey SILT / basalt	<2	<0.4	380				56	13	140	140	<0.1	<10	<20	<50	<50	<50	<20	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.3	<0.5	<0.005	<0.5	<0.5	<0.5	<1	<1	<0.005	<0.005	<0.005	<0.005		<0.1	No[G]	No	Yes
QCS01 (Cr speciation)	Triplicate of TA-TP449/0.8	pitt&cherry	31-Mar-25	0.8	Eurofins	Clayey SILT / basalt cobbles			240	240	<1																																			
TA-TP449/3.0	Test Pit TP449	pitt&cherry	31-Mar-25	3.0	ALS	Weathered basalt rock with silty CLAY							5				<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2	<0.5									
TA-TP450/0.2	Test Pit TP450	pitt&cherry	31-Mar-25	0.2	ALS	Sandy SILT with gravel							5				<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2	<0.5									
TA-TP450/1.4	Test Pit TP450	pitt&cherry	31-Mar-25	1.4	ALS	Clayey SILT / basalt							5				<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2	<0.5									
TA-TP451/0.8	Test Pit TP451	pitt&cherry	01-Apr-25	0.8	ALS	Sandy GRAVEL							5				<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2	<0.5									
TA-TP451/2.0	Test Pit TP451	pitt&cherry	01-Apr-25	2.0	ALS	Weathered basalt rock with silty CLAY							<5				<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2	<0.5									
TA-TP451/3.0	Test Pit TP451	pitt&cherry	01-Apr-25	3.0	ALS	Weathered basalt rock with silty CLAY							<5				<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2	<0.5									
TA-TP452/0.2	Test Pit TP452	pitt&cherry	01-Apr-25	0.2	ALS	Sandy GRAVEL							<5				<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2	<0.5									
TA-TP452/2.0	Test Pit TP452	pitt&cherry	01-Apr-25	2.0	ALS	Clayey SILT / basalt cobbles							<5				<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2	<0.5									
TA-TP452/3.2	Test Pit TP452	pitt&cherry	01-Apr-25	3.2	ALS	Weathered basalt rock with silty CLAY							<5				<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2	<0.5									
TA-TP453/0.2	Test Pit TP453	pitt&cherry	01-Apr-25	0.2	ALS	Sandy SILT							6				<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2	<0.5									
TA-TP453/1.5	Test Pit TP453	pitt&cherry	01-Apr-25	1.5	ALS	Clayey SILT / basalt cobbles							<5				<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2	<0.5									
TA-TP453/2.2	Test Pit TP453	pitt&cherry	01-Apr-25	2.2	ALS (not tested)	Weathered basalt rock with silty CLAY																																								

Summary Statistics																																												
Number of Data Points							1	1	1	1	1	1	14	1	1	1	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	0	1	1	1	1
Number of Detects							0	0	2	1	1	1	7	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Minimum							<2	<0.4	240	240	<1	56	<5	140	140	<0.1	<10	<20	<50	<100	<50	<10	<50	<100	<100	<50	<0.1	<0.1	<0.1	<0.3	<0.5	<0.005	<0.05	<0.05	<0.5	<1	<0.5	<0.005	<0.005	<0.005	<0.005	-	<0.1	-	-	-
Maximum							<2	<0.4	380	240	<1	56	13	140	140	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<100	<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.5	<0.5	<0.5	<2	<1	<0.005	<0.005	<0.005	<0.005	-	<0.1	-	-	-
Median							<2	<0.4	310	240	<1	56	2.50	140	140	<0.1	<10	-	-	<100	-	<10	<50	<100	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-
Arithmetic Mean							<2	<0.4	380	240	<1	56	4.33	140	140	<0.1	<10	-	-	<100	-	<10	<50	<100	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-
Geometric Mean							<2	<0.4	380	240	<1	56	3.71	140	140	<0.1	<10	-	-	<100	-	<10	<50	<100	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-
Standard Deviation							-	-	-	-	-	-	2.73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
90th Percentile							-	-	-	-	-	-	8.80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
95th Percentile							-	-	-	-	-	-	11.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
95% Confidence Interval							-	-	-	-	-	-	1.43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
95% UCL (mean + 95% confidence interval)							-	-	-	-	-	-	5.76	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Values <LOR are assigned 1/2 LOR for calculation of arithmetic mean except where all values are <LOR

Legend:

	Human health criteria (National)
	Ecological criteria (National)
	Management limits (National)
	Disposal criteria (Tasmania)
Bold	Reported concentration equals or exceeds at least one of the human health criteria
Bold	Reported concentration equals or exceeds at least one of the ecological criteria
Bold	Reported concentration equals or exceeds at least one of the human health criteria plus at least one of the ecological criteria
	Reported concentration equals or exceeds IB105 Level 1 - fill material and/or PFAS unlined landfill criterion
	Reported concentration equals or exceeds IB105 - Level 2 - low-level contaminated soil and/or PFAS single lined landfill criterion
	Reported concentration equals or exceeds IB105 - Level 3 - contaminated soil and/or PFAS double lined landfill criterion
Bold	Reported concentration is greater than the LOR
Grey	Reported concentration is below the LOR
Red Text	Guideline criterion is less than the standard LOR
A	Generic EIL
B	Site-specific most conservative ACL calculated from two ASC NEPM classification samples (refer to EIL calculations tab for details)
C	Generic ACL
D	Carcinogenic PAHs (as BaP TEQ at zero)
E	Total fluorotelomer (FTS) is the sum of 4:2FTS + 6:2FTS + 8:2FTS + 10:2FTS
F	Yes - asbestos detected by polarised light microscopy including dispersion staining
G	No - asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining
H	No - asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining; asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg
I	0.005 mg/kg as interim screening value if reptiles may be exposed
<	Less than value indicates result is less than the LOR
HIL / HSL	Health Investigation Level / Health Screening Level
EIL / ESL	Ecological Investigation Level / Ecological Screening Level
LOR	Limit of reporting
NL	Not limiting
TEQ	Toxicity equivalent quotient
BaP	Benzo(a)pyrene
ADL	Added contaminant limit
PFOS	Perfluorooctane sulfonic acid
PFOA	Perfluorooctanoic acid
PFHxS	Perfluorohexane sulfonic acid
FTS	Fluorotelomer
IB105	Does not apply to material classified as potential acid sulphate soil (PASS) or per - and poly – fluoroalkyl substances (PFAS)

References:

ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure 1999, amended 2013
CRC CARE	Technical Report No. 10 Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater September 2011, including errata August 2012
IB105	Information Bulletin No. 105 - Classification and Management of Contaminated Soil for Disposal, Version 3, 2018, Environment Protection Authority Tasmania
PFAS NEMP 3.0	PFAS National Environmental Management Plan 3.0, 2025

SUMMARY RESULTS - SOIL / FILL MATERIAL - SWITCHYARD

Project No: P.24.1136
Project Name: Tarraleah Power Scheme ESA

Analyte Grouping	Total Heavy Metals								Total Petroleum Hydrocarbons (TPH)					Total Recoverable Hydrocarbons (TRH)					BTEXN					Polycyclic Aromatic Hydrocarbons (PAH)			Phenols			Per- and Poly-fluroalkyl Substances (PFAS)					FTS[6]	Polychlorinated Biphenyls	Asbestos and Other Fibres		
Analyte	Arsenic	Cadmium	Chromium (total)	Copper	Lead	Nickel	Zinc	Mercury (Weak)	C6-C9	C10-C14	C15-C28	C29-C36	Sum (C10-C36)	C6-C10 minus BTEX (F1)	>C10-C16 minus Naphthalene (F2)	>C16-C34 (F3)	>C34-C40 (F4)	Sum (>C10-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	Benzo[a]pyrene	Carcinogenic PAHs (as BaP TEQ) [7]	Total PAHs	Phenol	Pentachlorophenol	Phenols (sum)	PFOS	PFOA	PFHxS	PFOS+PFHxS	Total FTS	PCBs	Synthetic Mineral Fibres	Organic Fibres
ASC NEPM - HIL/HSL D (vapour intrusion)	3,000	900	3,600 Cr(VI)	240,000	1,500	6,000	400,000	730 (inorganic)						260-NL (sand) 250-NL (silt) 310-NL (clay)	NL (all soil types)				3 (sand) 4-10 (silt) 4-20 (clay)	NL (all soil types)	NL (all soil types)	NL (all soil types)	NL (all soil types)	40	4,000		240,000								7			
CRC CARE - HSL (vapour intrusion, intrusive maintenance worker - shallow trench)														NL (all soil types and depths) (C6-C10)	NL (all soil types and depths) (>C10-C16)				77-NL (sand) 250-NL (silt) 350-NL (clay)	NL (all soil types)	NL (all soil types)	NL (all soil types)	NL (all soil types)														
CRC CARE - HSL D (vapour intrusion)														260-NL (sand) 250-590 (silt) 310-NL (clay)	NL (all soil types and depths) (C6-C10)				3 (sand) 4-6 (silt) 4-9 (clay)	NL (all soil types)	NL (all soil types)	230-NL (sand) NL (silt) NL (clay)	NL (all soil types)														
CRC CARE - HSL D (direct contact)														26,000 (C6-C10)	20,000 (>C10-C16)	27,000	38,000		430	99,000	27,000	81,000	11,000														
CRC CARE - HSL (direct contact, intrusive maintenance worker - shallow trench)														82,000 (C6-C10)	82,000 (>C10-C16)	85,000	120,000		1,100	120,000	85,000	130,000	29,000														
PFAS NEMP 3.0 HIL D (direct contact)																														50		20					
ASC NEPM - EIL/ESL (commercial / industrial)	160[A]		1,000[B] Cr(III)	160[D]	1,800[C]	460[E]	390[D]							215 (coarse / fine)	170 (coarse / fine)	1,700 (coarse) 2,500 (fine)	3,300 (coarse) 6,600 (fine)		75 (coarse) 95 (fine)	135 (coarse / fine)	165 (coarse) 185 (fine)	180 (coarse) 95 (fine)	370[D]	1.4 (coarse / fine)													
PFAS NEMP 3.0 - ecological direct exposure (all land uses)																														1	10[I]						
PFAS NEMP 3.0 - ecological indirect exposure (all land uses)																														0.003	0.003						
IB105 - Level 1 (fill material)	20	3	50	100	300	60	200	1	65				1,000					1,000 (C10-C36)	1	1	3	14		0.08		20			25					2			
IB105 - Level 2 (low level contaminated soil)	200	40	500	2,000	1,200	600	14,000	30	650				5,000	650 (C6-C9)				5,000 (C10-C36)	5	100	100	180		2		40			500					20			
IB105 - Level 3 (contaminated soil)	750	400	5,000	7,500	3,000	3,000	50,000	110	1,000				10,000	1,000 (C6-C9)				10,000 (C10-C36)	50	1,000	1,080	1,800		20		200			2,000					50			
PFAS NEMP 3.0 - unlined landfill																														50		20					
PFAS NEMP 3.0 - clay / single composite lined landfill																														50		50					
PFAS NEMP 3.0 - double composite lined landfill																														50		50					

Sample ID	Location	Sampled By	Date Sampled	Sample Depth (m bgl)	Lab	Soil Type / Units	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	g/kg	g/kg	g/kg
TARRALEAH SWITCHYARD																																								
TA-MB412/0.4	Southern side of switchyard	pitt&cherry	07-Apr-25	0.4	ALS	Clayey SAND with cobbles	31	2	84	62	20	46	297	0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[5]	No	No
QDP02	Duplicate of TA-MB412/0.4	pitt&cherry	07-Apr-25	0.4	ALS	Clayey SAND with cobbles	17	1	96	56	18	48	222	0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[5]	No	No
QCS02	Triplicate of TA-MB412/0.4	pitt&cherry	07-Apr-25	0.4	Eurofins	Clayey SAND with cobbles	14	1.9	86	56	17	56	200	<0.1	<10	<20	<50	<50	<50	<20	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.3	<0.5	<0.005	<0.005	<0.005	<0.5	<1	<1	<0.005	<0.005	<0.005	<0.005	<0.002	<0.1	No[5]	No	Yes
TA-MB412/1.5	Southern side of switchyard	pitt&cherry	07-Apr-25	1.5	ALS	Clayey SAND with minor gravel	<5	<1	51	<5	27	40	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[5]	No	No
TA-MB412/2.3	Southern side of switchyard	pitt&cherry	07-Apr-25	2.3	ALS	Clayey SAND with minor gravel	<5	<1	22	44	<5	21	38	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[5]	No	No
TA-MB412/3.0	Southern side of switchyard	pitt&cherry	07-Apr-25	3.0	ALS	Clayey SAND with minor gravel	<5	<1	59	49	<5	33	51	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[5]	No	Yes
TA-MB414/0.4	Central part of switchyard	pitt&cherry	08-Apr-25	0.4	ALS	Clayey SAND with cobbles	42	<1	45	38	<5	29	77	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.14	<0.14	<0.14	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[5]	No	Yes
TA-MB414/1.5	Central part of switchyard	pitt&cherry	08-Apr-25	1.5	ALS	Clayey SAND with minor gravel	<5	<1	46	39	<5	36	54	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.13	<0.13	<0.13	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[5]	No	Yes
TA-MB414/2.0	Central part of switchyard	pitt&cherry	08-Apr-25	2.0	ALS	Clayey SAND with cobbles	<5	<1	50	51	<5	37	53	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.13	<0.13	<0.13	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[5]	No	No
TA-MB415/0.3	Eastern side of switchyard	pitt&cherry	09-Apr-25	0.3	ALS	Clayey SAND with cobbles	<5	<1	53	53	<5	66	88	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.14	<0.14	<0.14	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[5]	No	No
TA-MB415/1.8	Eastern side of switchyard	pitt&cherry	09-Apr-25	1.8	ALS	Clayey SAND with cobbles	<5	<1	41	77	<5	32	48	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.14	<0.14	<0.14	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[5]	No	No
TA-MB415/2.8	Eastern side of switchyard	pitt&cherry	09-Apr-25	2.8	ALS	Sandy CLAY with gravel	<5	<1	31	37	<5	25	49	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.13	<0.13	<0.13	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[5]	No	No
TA-MB415/3.3	Eastern side of switchyard	pitt&cherry	09-Apr-25	3.3	ALS	Clayey SAND with cobbles	<5	<1	39	40	<5	30	57	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.14	<0.14	<0.14	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[5]	No	No
TA-MB416/0.4	North-east of switchyard	pitt&cherry	10-Apr-25	0.4	ALS	Clayey SAND with minor gravel	<5	<1	94	59	17	43	429	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.14	<0.14	<0.14	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[5]	No	No
TA-MB416/2.3	North-east of switchyard	pitt&cherry	10-Apr-25	2.3	ALS	Clayey SAND with minor gravel	<5	<1	42	38	<5	28	40	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.13	<0.13	<0.13	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[5]	No	No
TA-MB416/2.8	North-east of switchyard	pitt&cherry	10-Apr-25	2.8	ALS	Clayey SAND with minor gravel	<5	<1	68	40	<5	43	48	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.14	<0.14	<0.14	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[5]	No	Yes
TA-MB416/3.2	North-east of switchyard	pitt&cherry	10-Apr-25	3.2	ALS	Clayey SAND with minor gravel	<5	<1	63	46	<5	33	52	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.13	<0.13	<0.13	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[5]	No	No
TA-TP456/0.3	North of the switchyard	pitt&cherry	10-Apr-25	0.3	ALS	Clayey SAND with cobbles	<5	<1	239	52	7	76	93	0.2	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.13	<0.13	<0.13	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[5]	No	Yes
QCP03	Duplicate of TA-TP456/0.3	pitt&cherry	10-Apr-25	0.3	ALS	Clayey SAND with cobbles	<5	<1	242	51	11	72	92	0.2	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.13	<0.13	<0.13	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[5]	No	Yes
QCS03	Triplicate of TA-TP456/0.3	pitt&cherry	10-Apr-25	0.3	Eurofins	Clayey SAND with cobbles	<2	<0.4	260	65	18	110	110	<0.1	<10	<20	<50	<50	<50	<20	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.3	<0.5	<0.005	<0.005	<0.005	<0.5	<1	<1	<0.005	<0.005	<0.005	<0.005	<0.002	<0.1	No[5]	No	Yes
TA-TP456/0.8	North of the switchyard	pitt&cherry	10-Apr-25	0.8	ALS	Sandy CLAY with cobbles	<5	<1	115	67	<5	42	58	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.14	<0.14	<0.14	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[5]	No	No
TA-MB411/0.2	North-west of switchyard	pitt&cherry	11-Apr-25	0.2	ALS	Clayey SAND with cobbles	<5	<1	76	46	16	85	122	0.1	<10	<50	170	420	590	<10	<50	470	330	800	<0.2	<0.5	<0.5	<0.5	<1	<0.14	<0.14	<0.14	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[5]	No	Yes
TA-MB411/2.2	North-west of switchyard	pitt&cherry	11-Apr-25	2.2	ALS	Sandy CLAY with cobbles	<5	<1	76	58	<5	42	72	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.13	<0.13	<0.13	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[5]	No	No
TA-MB411/2.8	North-west of switchyard	pitt&cherry	11-Apr-25	2.8	ALS	Sandy CLAY with cobbles	<5	<1	64	54	<5	46	74	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.14	<0.14	<0.14	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[5]	No	No
TA-MB418/0.3	South-west of switchyard	pitt&cherry	14-Apr-25	0.3	ALS	Gravelly SAND with fines and boulders	<5	<1	67	39	<5	86	49	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[5]	No	No
TA-MB418/0.5	South-west of switchyard	pitt&cherry	14-Apr-25	0.5	ALS	Gravelly SAND with fines and boulders	<5	<1	101	44	<5	115	63	<0.1	<10	90	<100	<100	90	<10	100	140	<100	240	<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[5]	No	No
TA-MB418/1.3	South-west of switchyard	pitt&cherry	14-Apr-25	1.3	ALS	Clayey SAND with cobbles	<5	<1	89	49	5	32	44	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[5]	No	No

Summary Statistics																																							
Number of Data Points	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	2	27	27	27	27	25	27	27	27	27
Number of Detects	4	3	27	27	9	27	27	5	0	1	1	1	2	0	1	2	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
Minimum	<5	<0.4	22	37	<5	22	37	<0.1	<10	<20	<50	<50	<50	<10	<50	<100	<100	<50	<0.1	<0.1	<0.1	<0.3	<0.5	<0.005	<0.005	<0.005	<0.5	<2	<1	<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	-	-	-
Maximum	42	2	260	77	20	115	428	0.2	<10	90	170	420	590	<10	100	470	330	800	<0.1	<0.1	<0.1	<0.3	<0.5	<0.14	<0.14	<0.14	<0.5	<2	<1	<0.005	<0.005	<0.005	<0.005	<0.002	<0.1	-	-	-
Median	3	1	47	38	3	32	49	0.1	<10	25	50	50	25	<10	25	50	50	25	<0.1	<0.1	<0.1	<0.3	<0.5	-	-	-	<0.5	<2	<1	-	-	-	-	<0.002	<0.1	-	-	-
Arithmetic Mean	6.8	1	67	38	7	37	73	0.1	<10	27	54	67	57	<10	29	75	64	77	<0.1	<0.1	<0.1	<0.3	<0.5	-	-	-	<0.5	<2	<1	-	-	-	-	<0.002	<0.1	-	-	-
Geometric Mean	4.0	0.57	56.20	35.21	4.82	31.50	53.85	0.06	<10	25	51	54	32	<10	27	60	56	37	<0.1	<0.1	<0.1	<0.3	<0.5	-	-	-	<0.5	<2	<1	-	-	-	-	<0.002	<0.1	-	-	-
Standard Deviation	9.3	0.4	57.6	15.0	5.6	23.5	74.1	0.0	-	13	24	75	113	-	15	83	55	157	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
90th Percentile	15.2	0.7	219.2	64.4	17.4	85.4	208.8	0.1	-	25	50	50	25	-	25	50	50	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
95th Percentile	26.8	1.6	241.1	66.4	18.0	102.8	274.5	0.2	-	25	50	50	71	-	25	113	50	183	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
95% Confidence Interval	3.5	0.1	22.7	6.7	2.1	8.9	28.0	0.0	-	5	9	28	42	-	5	31	21	59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
95% UCL (mean + 95% confidence interval	10.4	0.8	89.9	43.8	8.7	46.1	100.9	0.1	-	32	63	95	99	-	34	106	85	136	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Values <LOR are assigned 1/2 LOR for calculation of arithmetic mean except where all values are <LOR

Legend:

- Human health criteria (National)
- Ecological criteria (National)
- Management limits (National)
- Disposal criteria (Tasmania)
- **Bold** — Reported concentration equals or exceeds at least one of the human health criteria
- **Bold** — Reported concentration equals or exceeds at least one of the ecological criteria
- **Bold** — Reported concentration equals or exceeds at least one of the human health criteria plus at least one of the ecological criteria
- Reported concentration equals or exceeds IB105 Level 1 - fill material and/or PFAS unlined landfill criterion
- Reported concentration equals or exceeds IB105 - Level 2 - low-level contaminated soil and/or PFAS single lined landfill criterion
- Reported concentration equals or exceeds IB105 - Level 3 - contaminated soil and/or PFAS double lined landfill criterion
- **Bold** — Reported concentration is greater than the LOR
- Grey — Reported concentration is below the LOR
- Red Text — Guideline criterion is less than the standard LOR

A	Generic EIL
B	Site-specific ACL calculated from a single ASC NEPM classification sample (refer to EIL calculations tab for details)
C	Generic ACL
D	Carcinogenic PAHs (as BaP TEQ at zero)
E	Total fluorotelomer (FTS) is the sum of 4:2FTS + 6:2FTS + 8:2FTS + 10:2FTS
F	Yes - asbestos detected by polarised light microscopy including dispersion staining
G	No - asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining
H	No - asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining; asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg
I	0.005 mg/kg as interim screening value if reptiles may be exposed
<	Less than value indicates result is less than the LOR
HIL / HSL	Health Investigation Level / Health Screening Level
EIL / ESL	Ecological Investigation Level / Ecological Screening Level
LOR	Limit of reporting
NL	Not limiting
TEQ	Toxicity equivalent quotient
BaP	Benzo(a)pyrene
ACL	Added contaminant limit
PFOS	Perfluorooctane sulfonic acid
PFOA	Perfluorooctanoic acid
PFHxS	Perfluorohexane sulfonic acid
FTS	Fluorotelomer
IB105	Does not apply to material classified as potential acid sulphate soil (PASS) or per - and poly – fluoroalkyl substances (PFAS)

References:

ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure 1999, amended 2013
CRC CARE	Technical Report No. 10 Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater September 2011, including errata August 2012
IB105	Information Bulletin No. 105 - Classification and Management of Contaminated Soil for Disposal', Version 3, 2018, Environment Protection Authority Tasmania
PFAS NEMP 3.0	PFAS National Environmental Management Plan 3.0, 2025

SUMMARY RESULTS - SOIL / FILL MATERIAL - SWITCHYARD (AES CRITERIA)

Project No: P.24.1136
Project Name: Tarraleah Power Scheme ESA

Analyte Grouping							Total Heavy Metals								Total Petroleum Hydrocarbons (TPH)					Total Recoverable Hydrocarbons (TRH)					BTEXN					Polycyclic Aromatic Hydrocarbons (PAH)			Phenols			Per- and Poly-fluoroalkyl Substances (PFAS)				FTS[C]	Polychlorinated Biphenyls	Asbestos and Other Fibres		
Analyte							Arsenic	Cadmium	Chromium (VI+III)	Copper	Lead	Nickel	Zinc	Mercury (total)	C6-C9	C10-C14	C15-C28	C29-C36	Sum (C10-C36)	C6-C10 minus BTEX (F1)	>C10-C16 minus Naphthalene (F2)	>C16-C34 (F3)	>C34-C40 (F4)	Sum (C10-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	Benzo[a]pyrene	Carcinogenic PAHs (as BaP TEQ)[F]	Total PAHs	Phenol	Pentachlorophenol	Phenols (sum)	PFOS	PFOA	PFHxS	PFOS+PFHxS	Total FTS	PCBs	Presence / Absence of Asbestos Fibres	Synthetic Mineral Fibres	Organic Fibres
						ASC NEPM - EIL/ESL (AES)	40[A]		210[A] Cr(III)	45[B]	470[C]	55[B]	100[B]							125 (coarse / fine)	25 (coarse / fine)				8 (coarse) 10 (fine)	10 (coarse) 65 (fine)	1.5 (coarse) 4 (fine)	10 (coarse) 1.6 (fine)	10[C]	0.7[C] (coarse/ fine)														
Sample ID	Location	Sampled By	Date Sampled	Sample Depth (m bgl)	Lab	Soil Type / Units	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	g/kg	g/kg	g/kg
TARRALEAH SWITCHYARD																																										
TA-MB412/0.4	Southern side of switchyard	pitt&sherry	07-Apr-25	0.4	ALS	Clayey SAND with cobbles	31	2	84	62	20	46	297	0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[G]	No	No
QCP02	Duplicate of TA-MB412/0.4	pitt&sherry	07-Apr-25	0.4	ALS	Clayey SAND with cobbles	17	1	96	56	18	48	222	0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[G]	No	No
QCS02	Triplicate of TA-MB412/0.4	pitt&sherry	07-Apr-25	0.4	Eurofins	Clayey SAND with cobbles	14	2	86	56	17	56	200	<0.1	<10	<20	<50	<50	<50	<20	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.3	<0.5	<0.005	<0.005	<0.005	<0.5	<1	<1	<0.005	<0.005	<0.005	<0.005		<0.1	No[G]	No	Yes
TA-MB412/1.5	Southern side of switchyard	pitt&sherry	07-Apr-25	1.5	ALS	Clayey SAND with minor gravel	<5	<1	23	51	<5	27	40	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[G]	No	No
TA-MB412/2.3	Southern side of switchyard	pitt&sherry	07-Apr-25	2.3	ALS	Clayey SAND with minor gravel	<5	<1	22	44	<5	21	38	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[G]	No	No
TA-MB412/3.0	Southern side of switchyard	pitt&sherry	07-Apr-25	3.0	ALS	Clayey SAND with minor gravel	<5	<1	59	49	<5	33	51	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[G]	No	Yes
TA-MB414/0.4	Central part of switchyard	pitt&sherry	08-Apr-25	0.4	ALS	Clayey SAND with cobbles	42	<1	45	38	<5	29	77	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.14	<0.14	<0.14	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[G]	No	Yes
TA-MB414/1.5	Central part of switchyard	pitt&sherry	08-Apr-25	1.5	ALS	Clayey SAND with cobbles	<5	<1	46	39	<5	36	54	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.13	<0.13	<0.13	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[G]	No	Yes
TA-MB414/2.0	Central part of switchyard	pitt&sherry	08-Apr-25	2.0	ALS	Clayey SAND with cobbles	<5	<1	50	51	<5	37	53	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.13	<0.13	<0.13	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[G]	No	No
TA-MB415/0.3	Eastern side of switchyard	pitt&sherry	09-Apr-25	0.3	ALS	Clayey SAND with cobbles	<5	<1	122	53	<5	66	88	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.14	<0.14	<0.14	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[G]	No	No
TA-MB415/1.8	Eastern side of switchyard	pitt&sherry	09-Apr-25	1.8	ALS	Clayey SAND with cobbles	<5	<1	41	77	<5	32	48	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.14	<0.14	<0.14	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[G]	No	No
TA-MB415/2.8	Eastern side of switchyard	pitt&sherry	09-Apr-25	2.8	ALS	Sandy CLAY with gravel	<5	<1	31	37	<5	25	49	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.13	<0.13	<0.13	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[G]	No	No
TA-MB415/3.3	Eastern side of switchyard	pitt&sherry	09-Apr-25	3.3	ALS	Clayey SAND with cobbles	<5	<1	39	40	<5	30	57	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.14	<0.14	<0.14	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[G]	No	No
TA-MB416/0.4	North-east of switchyard	pitt&sherry	10-Apr-25	0.4	ALS	Clayey SAND with cobbles	<5	<1	94	59	17	43	428	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.14	<0.14	<0.14	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[G]	No	No
TA-MB416/2.3	North-east of switchyard	pitt&sherry	10-Apr-25	2.3	ALS	Clayey SAND with minor gravel	<5	<1	42	38	<5	28	46	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.13	<0.13	<0.13	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[G]	No	No
TA-MB416/2.8	North-east of switchyard	pitt&sherry	10-Apr-25	2.8	ALS	Clayey SAND with minor gravel	<5	<1	58	40	<5	43	48	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.14	<0.14	<0.14	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[G]	No	Yes
TA-MB416/3.2	North-east of switchyard	pitt&sherry	10-Apr-25	3.2	ALS	Clayey SAND with minor gravel	<5	<1	43	46	<5	33	52	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.13	<0.13	<0.13	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[G]	No	No
TA-TP456/0.3	North of the switchyard	pitt&sherry	10-Apr-25	0.3	ALS	Clayey SAND with cobbles	<5	<1	239	52	7	79	93	0.2	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.13	<0.13	<0.13	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[G]	No	Yes
QCP03	Duplicate of TA-TP456/0.3	pitt&sherry	10-Apr-25	0.3	ALS	Clayey SAND with cobbles	<5	<1	242	51	11	72	92	0.2	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.13	<0.13	<0.13	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[G]	No	Yes
QCS03	Triplicate of TA-TP456/0.3	pitt&sherry	10-Apr-25	0.3	Eurofins	Clayey SAND with cobbles	<2	<0.4	260	65	18	110	110	<0.1	<10	<20	<50	<50	<50	<20	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.3	<0.5	<0.005	<0.005	<0.005	<0.5	<1	<1	<0.005	<0.005	<0.005	<0.005		<0.1	No[G]	No	Yes
TA-TP456/0.8	North of the switchyard	pitt&sherry	10-Apr-25	0.8	ALS	Sandy CLAY with cobbles	<5	<1	115	67	<5	42	58	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.14	<0.14	<0.14	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[G]	No	No
TA-MB411/0.2	North-west of switchyard	pitt&sherry	11-Apr-25	0.2	ALS	Clayey SAND with cobbles	<5	<1	206	46	16	85	122	0.1	<10	<50	170	420	590	<10	<50	470	330	800	<0.2	<0.5	<0.5	<0.5	<1	<0.14	<0.14	<0.14	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[G]	No	Yes
TA-MB411/2.2	North-west of switchyard	pitt&sherry	11-Apr-25	2.2	ALS	Sandy CLAY with cobbles	<5	<1	76	58	<5	42	73	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.13	<0.13	<0.13	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[G]	No	No
TA-MB411/2.8	North-west of switchyard	pitt&sherry	11-Apr-25	2.8	ALS	Sandy CLAY with cobbles	<5	<1	84	64	<5	46	74	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.14	<0.14	<0.14	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[G]	No	No
TA-MB418/0.3	South-west of switchyard	pitt&sherry	14-Apr-25	0.3	ALS	Gravelly SAND with fines and boulders	<5	<1	67	39	<5	86	49	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[G]	No	No
TA-MB418/0.5	South-west of switchyard	pitt&sherry	14-Apr-25	0.5	ALS	Gravelly SAND with fines and boulders	<5	<1	101	44	<5	115	63	<0.1	<10	90	<100	<100	90	<10	100	140	<100	240	<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[G]	No	No
TA-MB418/1.3	South-west of switchyard	pitt&sherry	14-Apr-25	1.3	ALS	Clayey SAND with cobbles	<5	<1	49	49	5	32	44	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2		<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[G]	No	No
Summary Statistics	Number of Data Points						27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	25	27	27	27	27
	Number of Detects						4	3	27	27	9	27	27	5	0	1	1	1	2	0	1	2	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
	Minimum						<5	<0.4	11	19	<5	11	19	<0.1	<10	<20	<50	<100	<50	<10	<50	<100	<100	<50	<0.1	<0.1	<0.1	<0.3	<0.5	<0.005	<0.005	<0.005	<0.5	<2	<1	<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	-	-	-
	Maximum						42	2	260	77	20	115	428	0.2	<10	90	170	420	590	<10	100	470	330	800	<0.1	<0.1	<0.1	<0.3	<0.5	<0.14	<0.14	<0.14	<0.5	<2	<1	<0.005	<0.005	<0.005	<0.005	<0.002	<0.1	-	-	-
	Median						3	1	47	38	3	32	49	0.1	<10	25	50	50	25	<10	25	50	50	25	<0.1	<0.1	<0.1	<0.3	<0.5	-	-	-	<0.5	<2	<1	-	-	-	-	<0.002	<0.1	-	-	-
	Arithmetic Mean						6.8	1	67	38	7	37	73	0.1	<10	27	54	67	57	<10	29	75	64	77	<0.1	<0.1	<0.1	<0.3	<0.5	-	-	-	<0.5	<2	<1	-	-	-	-	<0.002	<0.1	-	-	-
	Geometric Mean						4.0	0.57	50.20	35.21	4.82	31.50	53.85	0.06	<10	25	51	54	32	<10	27	60	56	37	<0.1	<0.1	<0.1	<0.3	<0.5	-	-	-	<0.5	<2	<1	-	-	-	-	<0.002	<0.1	-	-	-
	Standard Deviation						9.3	0.4	57.6	15.0	5.6	23.5	74.1	0.0	-	13	24	75	113	-	15	83	55	157	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	90th Percentile						15.2	0.7	219.2	64.4	17.4	85.4	208.8	0.1	-	25	50	50	25	-	25	50	50	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	95th Percentile						26.8	1.6	241.1	66.4	18.0	102.8	274.5	0.2	-	25	50	50	71	-	25	113	50	183	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	95% Confidence Interval						3.5	0.1	21.7	5.7	2.1	8.9	28.0	0.0	-	5	9	28	42	-	5	31	21	59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	95% UCL (mean + 95% confidence interval)						10.4	0.8	88.9	43.8	8.7	46.1	100.9	0.1	-	32	63	95	99	-	34	106	85	136	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Values <LOR are assigned 1/2 LOR for calculation of arithmetic mean except where all values are <LOR

Legend:

	Ecological criteria (National)
Bold	Reported concentration equals or exceeds AES ecological criteria
Bold	Reported concentration is greater than the LOR
Grey	Reported concentration is below the LOR
Red Text	Guideline criterion is less than the standard LOR
A	Generic EIL
B	Site-specific ACL calculated from a single ASC NEPM classification sample (refer to EIL calculations tab for details)
C	Generic ACL
D	Carcinogenic PAHs (as BaP TEQ at zero)
E	Total fluorotelomer (FTS) is the sum of 4:2FTS + 6:2FTS + 8:2FTS + 10:2FTS
F	Yes - asbestos detected by polarised light microscopy including dispersion staining
G	No - asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining
H	No - asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining; asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg
I	0.005 mg/kg as interim screening value if reptiles may be exposed
<	Less than value indicates result is less than the LOR
AES	Areas of Ecological Significance
EIL / ESL	Ecological Investigation Level / Ecological Screening Level
LOR	Limit of reporting
NL	Not limiting
TEQ	Toxicity equivalent quotient
BaP	Benzo(a)pyrene
ACL	Added contaminant limit
PFOS	Perfluorooctane sulfonic acid
PFOA	Perfluorooctanoic acid
PFHxS	Perfluorohexane sulfonic acid
FTS	Fluorotelomer

References:

ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure 1999, amended 2013

SUMMARY RESULTS - INFLOW WATER - VILLAGE

Project No: P.24.1136
Project Name: Tarraleah Power Scheme ESA

Sample ID / Criteria	Location	Sampled By	Date Sampled	Sample Depth (m)	Lab	Water Type / Units	Metals: Lead (total)	TPH: C6-C9	TPH: C10-C14	TPH: C15-C28	TPH: C29-C36	TPH: Sum (C10-C36)	TRH: C6-C10 minus BTEX (F1)	TRH: >C10-C16 minus Naphthalene (F2)	TRH: >C16-C34 (F3)	TRH: >C34-C40 (F4)	TRH: Sum (>C10-C40)
ASC NEPM - HSL A (vapour intrusion)													1,000 (sand) 6,000 (silt) NL (clay)	1,000 (sand) NL (silt) NL (clay)			
CRC CARE - HSL A (vapour intrusion)													980-1,000 (sand) 5,700-5,900 (silt) NL (clay)	1,100-1,200 (sand) NL (silt) NL (clay)			
NHMRC recreational criteria[C]							0.2										
ANZG freshwater TV (95% of species protection)							0.0034										
Units							mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
TARRALEAH VILLAGE - TEST PITS WATER INFLOW																	
TA-TP452/W	Test Pit 452	pitt&sherry	01-Apr-25	3.0	ALS	Water inflow	0.008	<20	<50	<100	<50	<50	<20	<100	<100	<100	<100
TA-TP454/W	Test Pit 454	pitt&sherry	01-Apr-25	3.0	ALS	Water inflow	0.008	<20	<50	<100	<50	<50	<20	<100	<100	<100	<100

Sample ID / Criteria	BTEXN: Benzene	BTEXN: Toluene	BTEXN: Ethylbenzene	BTEXN: Total Xylenes	BTEXN: Naphthalene	PAH: Anthracene	PAH: Benzo(a)pyrene	PAH: Fluoranthene	PAH: Phenanthrene	PAH: Total PAHs (as TEQ)[B]	Phenols: 2,4,6-Trichlorophenol	Phenols: 2,4-Dichlorophenol	Phenols: 2,4-Dimethylphenol	Phenols: 2-Chlorophenol	Phenols: Pentachlorophenol	Phenols: Phenol
ASC NEPM - HSL A (vapour intrusion)	800-900 (sand) 4,000-5,000 (silt) 5,000 (clay)	NL (all soil types)	NL (all soil types)	NL (all soil types)	NL (all soil types)											
CRC CARE - HSL A (vapour intrusion)	780-850 (sand) 4,300-4,700 (silt) 4,600-5,200 (clay)	NL (all soil types)	NL (all soil types)	NL (all soil types)	NL (all soil types)											
NHMRC recreational criteria[C]	20	16000	6000	12000			0.2			0.2 (BaP)	400	4000		6000	200	
ANZG freshwater TV (95% of species protection)	950	180	80	75 (m-xylene) 350 (o-xylene) 200 (p-xylene)	16	0.4	0.2	1.4	2.0		20	160	2[A]	490	10	320
Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
TARRALEAH VILLAGE - TEST PITS WATER INFLOW																
TA-TP452/W	<1	<2	<2	<2	<1.0	<1.0	<0.5	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<1.0	<2.0	<10
TA-TP454/W	<1	<2	<2	<2	<1.0	<1.0	<0.5	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0

Legend:

(yellow)	Human health criteria (National)
(green)	Ecological freshwater criteria (National)
Bold	Reported concentration equals or exceeds at least one of the human health criteria
Bold	Reported concentration equals or exceeds at least one of the ecological criteria
Bold	Reported concentration equals or exceeds at least one of the human health criteria plus at least one of the ecological criteria
Bold	Reported concentration is greater than the LOR
Grey <	Reported concentration is below the LOR (note sample required dilution due to high level contaminants and LORs were adjusted accordingly)
Red Text	Guideline criterion is less than the standard LOR
A	Level of species protection is unknown
B	Total PAHs (as TEQ)
C	Based on 20 x the ADWG criteria which are based on daily consumption of 2 L of water; consumption in a recreational setting is more likely to be 0.1 L per day
HSL	Health Screening Level
LOR	Limit of reporting
NL	Not limiting
TEQ	Toxicity equivalent quotient
TV	Trigger Value

References:

ASC NEPM — National Environment Protection (Assessment of Site Contamination) Measure 1999, amended 2013

CRC CARE — Technical Report No. 10 Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater September 2011, including errata August 2012

PFAS NEMP 3.0 — PFAS National Environmental Management Plan 3.0, 2025

ANZG 2018 — Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2018

EPA 2021 — Default Guideline Values (DGVs) for Aquatic Ecosystems of the Upper Derwent Catchment, EPA Tasmania, 2021 (modified not pristine)

NHMRC — National Water Quality Management Strategy – Australian Drinking Water Guidelines 2011, updated September 2022

SUMMARY RESULTS - GROUNDWATER - SWITCHYARD

Project No: P.24.1136
Project Name: Tarraleah Power Scheme ESA

Table 1 – Sample details and Physical Parameters

Sample ID	Location	Sampled By	Date Sampled	Sample Depth (m btoc)	Lab	Water Type / Units	pH	Electrical Conductivity	Total Dissolved Solids	Total Suspended Solids
						ASC NEPM - HSL D (vapour intrusion)				
						CRC CARE - HSL D (vapour intrusion)				
						PFAS NEMP - recreational water quality				
						NHMRC recreational criteria[C]				
						ANZG freshwater TV (95% of species protection)				
						PFAS NEMP 3.0 freshwater criteria (95% of species protection)				
						EPA 2021 - Aquatic Ecosystems of the Upper Derwent Catchment (modified; full year)	5.7-8.1	43.8-307.6		0.5-33.75
						Units	pH units	µS/cm	mg/L	mg/L
TARRALEAH SWITCHYARD - GROUNDWATER WELLS (previously installed)										
TA-DC234	Southwestern corner of switchyard	Hydro	14/03/2024		AST	Groundwater	7.2	192	165	2
TA-DC234	Southwestern corner of switchyard	Hydro	7/05/2024		AST	Groundwater	7.2	202	154	2
TA-DC234_d	Southwestern corner of switchyard	Hydro	7/05/2024		AST	Groundwater				
TA-DC234_d FieldFilt	Southwestern corner of switchyard	Hydro	8/05/2024		AST	Groundwater				
TA-DC234	Southwestern corner of switchyard	Hydro	25/06/2024		AST	Groundwater	7.2	160	146	6
TA-DC234	Southwestern corner of switchyard	Hydro	23/07/2024		AST	Groundwater	7.2	200	148	11
TA-DC234	Southwestern corner of switchyard	Hydro	28/08/2024		AST	Groundwater	7.2	203	143	2
TA-DC234	Southwestern corner of switchyard	Hydro	25/09/2024		AST	Groundwater	7.2	210	155	
TA-DC234	Southwestern corner of switchyard	Hydro	22/10/2024		AST	Groundwater	7.3	211	148	
TA-DC234	Southwestern corner of switchyard	Hydro	26/11/2024		AST	Groundwater	7.3	211	153	2
TA-DC234	Southwestern corner of switchyard	Hydro	18/12/2024		AST	Groundwater	7.4	208	154	
TA-DC234	Southwestern corner of switchyard	Hydro	22/01/2025		AST	Groundwater	7.3	213	153	2
TA-DC234_d1	Southwestern corner of switchyard	Hydro	22/01/2025		AST	Groundwater				
TA-DC234_d2	Southwestern corner of switchyard	Hydro	22/01/2025		AST	Groundwater				
TA-DC234_b	Southwestern corner of switchyard	Hydro	22/01/2025		AST	Groundwater				
TA-DC234	Southwestern corner of switchyard	Hydro	19/02/2025		AST	Groundwater	7.2	215	155	
TA-DC234	Southwestern corner of switchyard	Hydro	18/03/2025		AST	Groundwater	7.2	212	151	2
TA-DC234	Southwestern corner of switchyard	Hydro	3/04/2025		AST	Groundwater				
TA-DC235	Southeastern corner of switchyard	Hydro	14/03/2024		AST	Groundwater				2
TA-DC235	Southeastern corner of switchyard	Hydro	7/05/2024		AST	Groundwater	7.5	218	184	2
TA-DC235_d	Southeastern corner of switchyard	Hydro	7/05/2024		AST	Groundwater				
TA-DC235_d FieldFilt	Southeastern corner of switchyard	Hydro	8/05/2024		AST	Groundwater				
TA-DC235	Southeastern corner of switchyard	Hydro	25/06/2024		AST	Groundwater	7.5	167	157	19
TA-DC235	Southeastern corner of switchyard	Hydro	23/07/2024		AST	Groundwater	7.6	224	164	9
TA-DC235	Southeastern corner of switchyard	Hydro	28/08/2024		AST	Groundwater	7.5	222	152	4
TA-DC235	Southeastern corner of switchyard	Hydro	25/09/2024		AST	Groundwater	7.5	221	155	
TA-DC235	Southeastern corner of switchyard	Hydro	22/10/2024		AST	Groundwater	7.5	220	157	
TA-DC235	Southeastern corner of switchyard	Hydro	26/11/2024		AST	Groundwater	7.6	224	140	58
TA-DC235	Southeastern corner of switchyard	Hydro	18/12/2024		AST	Groundwater	7.6	221	160	
TA-DC235	Southeastern corner of switchyard	Hydro	22/01/2025		AST	Groundwater	7.5	224	166	2
TA-DC235_d1	Southeastern corner of switchyard	Hydro	22/01/2025		AST	Groundwater				
TA-DC235_d2	Southeastern corner of switchyard	Hydro	22/01/2025		AST	Groundwater				
TA-DC235_b	Southeastern corner of switchyard	Hydro	22/01/2025		AST	Groundwater				
TA-DC235	Southeastern corner of switchyard	Hydro	19/02/2025		AST	Groundwater	7.5	224	163	
TA-DC235	Southeastern corner of switchyard	Hydro	18/03/2025		AST	Groundwater	7.5	234	164	2
TA-DC235	Southeastern corner of switchyard	Hydro	3/04/2025		AST	Groundwater				
TA-DC237	Eastern side of switchyard	Hydro	14/03/2024		AST	Groundwater	7.9	1,650	1,390	80
TA-DC237	Eastern side of switchyard	Hydro	7/05/2024		AST	Groundwater	8	581	423	28
TA-DC237	Eastern side of switchyard	Hydro	25/06/2024		AST	Groundwater	8	444	363	516
TA-DC237	Eastern side of switchyard	Hydro	23/07/2024		AST	Groundwater	8	911	642	357
TA-DC237	Eastern side of switchyard	Hydro	27/08/2024		AST	Groundwater	8	4,810	3,920	123
TA-DC237	Eastern side of switchyard	Hydro	25/09/2024		AST	Groundwater	8.1	289	207	
TA-DC237	Eastern side of switchyard	Hydro	22/10/2024		AST	Groundwater	8.1	287	195	
TA-DC237	Eastern side of switchyard	Hydro	25/11/2024		AST	Groundwater	8.1	276	181	9
TA-DC237	Eastern side of switchyard	Hydro	18/12/2024		AST	Groundwater	8.1	282	204	
TA-DC237	Eastern side of switchyard	Hydro	22/01/2025		AST	Groundwater	8.1	270	196	34
TA-DC237	Eastern side of switchyard	Hydro	19/02/2025		AST	Groundwater				
TA-DC237_d1	Eastern side of switchyard	Hydro	19/02/2025		AST	Groundwater				
TA-DC237_d2	Eastern side of switchyard	Hydro	19/02/2025		AST	Groundwater				
TA-DC237_b	Eastern side of switchyard	Hydro	19/02/2025		AST	Groundwater	8	271	192	
TA-DC237	Eastern side of switchyard	Hydro	18/03/2025		AST	Groundwater	8.1	276	190	7
TA-DC237	Eastern side of switchyard	Hydro	3/04/2025		AST	Groundwater				
TA-DC238	North of switchyard	Hydro	14/03/2024		AST	Groundwater	7.4	235	189	74
TA-DC238	North of switchyard	Hydro	7/05/2024		AST	Groundwater	7.3	257	199	5
TA-DC238	North of switchyard	Hydro	30/05/2024		AST	Groundwater	7.3	230	187	9
TA-DC238	North of switchyard	Hydro	25/06/2024		AST	Groundwater	7.5	192	182	18
TA-DC238	North of switchyard	Hydro	23/07/2024		AST	Groundwater	7.4	246	173	8
TA-DC238	North of switchyard	Hydro	28/08/2024		AST	Groundwater	7.3	254	178	8
TA-DC238	North of switchyard	Hydro	25/09/2024		AST	Groundwater	7.2	252	180	
TA-DC238	North of switchyard	Hydro	22/10/2024		AST	Groundwater	7.2	256	175	
TA-DC238_d1	North of switchyard	Hydro	22/10/2024		AST	Groundwater				
TA-DC238_d2	North of switchyard	Hydro	22/10/2024		AST	Groundwater				
TA-DC238_b	North of switchyard	Hydro	22/10/2024		AST	Groundwater				
TA-DC238	North of switchyard	Hydro	25/11/2024		AST	Groundwater	7.3	254	176	3
TA-DC238	North of switchyard	Hydro	18/12/2024		AST	Groundwater	7.3	253	184	3
TA-DC238	North of switchyard	Hydro	22/01/2025		AST	Groundwater	7.3	255	181	2
TA-DC238	North of switchyard	Hydro	19/02/2025		AST	Groundwater	7.4	248	180	
TA-DC238_d1	North of switchyard	Hydro	19/02/2025		AST	Groundwater				
TA-DC238_d2	North of switchyard	Hydro	19/02/2025		AST	Groundwater				
TA-DC238_b	North of switchyard	Hydro	19/02/2025		AST	Groundwater				
TA-DC238	North of switchyard	Hydro	18/03/2025		AST	Groundwater	7.4	248	171	4
TA-DC238	North of switchyard	Hydro	3/04/2025		AST	Groundwater				
TA-DC243	West of switchyard	Hydro	14/03/2024		AST	Groundwater	7	180	166	2
TA-DC243	West of switchyard	Hydro	7/05/2024		AST	Groundwater	6.8	194	175	2
TA-DC243_d	West of switchyard	Hydro	7/05/2024		AST	Groundwater				
TA-DC243_d FieldFilt	West of switchyard	Hydro	8/05/2024		AST	Groundwater				
TA-DC243	West of switchyard	Hydro	30/05/2024		AST	Groundwater	6.8	180	182	2
TA-DC243	West of switchyard	Hydro	25/06/2024		AST	Groundwater	6.9	164	141	2
TA-DC243	West of switchyard	Hydro	23/07/2024		AST	Groundwater	6.9	216	164	2
TA-DC243	West of switchyard	Hydro	28/08/2024		AST	Groundwater	6.8	227	168	2
TA-DC243	West of switchyard	Hydro	25/09/2024		AST	Groundwater	6.8	218	176	
TA-DC243	West of switchyard	Hydro	23/10/2024		AST	Groundwater	6.8	213	158	
TA-DC243	West of switchyard	Hydro	26/11/2024		AST	Groundwater	6.8	206	147	2
TA-DC243_d1	West of switchyard	Hydro	26/11/2024		AST	Groundwater				
TA-DC243_d2	West of switchyard	Hydro	26/11/2024		AST	Groundwater				
TA-DC243_b	West of switchyard	Hydro	26/11/2024		AST	Groundwater				
TA-DC243	West of switchyard	Hydro	18/12/2024		AST	Groundwater	6.8	212	178	2
TA-DC243	West of switchyard	Hydro	22/01/2025		AST	Groundwater	6.8	206	165	2
TA-DC243	West of switchyard	Hydro	19/02/2025		AST	Groundwater	6.8	206	167	
TA-DC243	West of switchyard	Hydro	18/03/2025		AST	Groundwater	6.9	208	156	2
TA-DC243	West of switchyard	Hydro	3/04/2025		AST	Groundwater				
TAH2019	South-west of the switchyard, north-west of the canals	Hydro	7/05/2024		AST	Groundwater	7	132	121	214
TAH2019 (shallow)	South-west of the switchyard, north-west of the canals	Hydro	25/09/2024		AST	Groundwater	6.9	124	109	
TAH2019 (shallow)	South-west of the switchyard, north-west of the canals	Hydro	22/10/2024		AST	Groundwater	6.8	126	108	
TAH2019 (shallow)	South-west of the switchyard, north-west of the canals	Hydro	26/11/2024		AST	Groundwater	6.8	125	88	60
TARRALEAH SWITCHYARD - GROUNDWATER WELLS (installed as a component of this ESA)										
TA-MB411	North-west of switchyard	pitt&sherry	29/04/2025	DRY	ALS	Groundwater				
TA-MB412	Southern side of switchyard	pitt&sherry	29/04/2025	2.99	ALS	Groundwater	6.85	170	244	1,470
TA-MB414	Central part of switchyard	pitt&sherry	29/04/2025	2.87	ALS	Groundwater				
TA-MB415	Eastern side of switchyard	pitt&sherry	29/04/2025	3.87	ALS	Groundwater	7.00	134	109	288
QAQC1	Duplicate of MB415	pitt&sherry	29/04/2025	3.87	ALS	Groundwater	7.12	138	93	264
QAQC2	Triplicate of MB415	pitt&sherry	29/04/2025	3.87	Eurofins	Groundwater	6.5	120	90	350
TA-MB416	North-east of switchyard	pitt&sherry	29/04/2025	3.67	ALS	Groundwater	7.41	274	171	25
TA-MB418	South-west of switchyard	pitt&sherry	29/04/2025	2.97	ALS	Groundwater	7.04	214	154	499

Table 2 – Heavy Metals (mg/L)

Sample ID	Date Sampled	Arsenic (total)	Arsenic (dissolved)	Cadmium (total)	Cadmium (dissolved)	Chromium (total)	Chromium (dissolved)	Copper (total)	Copper (dissolved)	Lead (total)	Lead (dissolved)	Nickel (total)	Nickel (dissolved)	Zinc (total)	Zinc (dissolved)	Mercury (total)	Mercury (dissolved)
NHMRC recreational criteria[C]		0.2	0.2	0.04	0.04	1 (CrVI)	1 (CrVI)	40	40	0.2	0.2	0.4	0.4	60	60		
ANZG freshwater TV (95% of species protection)		0.024 (AsIII) 0.013 (AsV)	0.024 (AsIII) 0.013 (AsV)	0.0002	0.0002	0.0033[A] (CrIII) 0.001 (CrVI)	0.0033[A] (CrIII) 0.001 (CrVI)	0.0014	0.0014	0.0034	0.0034	0.011	0.011	0.008	0.008	0.0006 (inorganic)	0.0006 (inorganic)
TA-DC234	14/03/2024	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	0.005	0.004	0.0047	0.0022	0.0038	0.0013	0.075	0.065		
TA-DC234	7/05/2024	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.002	<0.002		
TA-DC234_d	7/05/2024	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.002	<0.002		
TA-DC234_d FieldFilt	8/05/2024		<0.001		<0.0001		<0.001		<0.001		<0.0005		<0.0005		<0.002		
TA-DC234	25/06/2024	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	0.0007	<0.0005	<0.002	<0.002		
TA-DC234	23/07/2024	<0.001	<0.001	<0.0001	<0.0001	0.002	<0.001	0.006	<0.001	<0.0005	<0.0005	0.0039	<0.0005	0.018	0.008		
TA-DC234	28/08/2024	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.002	<0.002		
TA-DC234	26/11/2024		<0.001		<0.0001		<0.001		<0.001		<0.0005		<0.0005		<0.002		
TA-DC234	22/01/2025		<0.001		<0.0001		<0.001		<0.001		<0.0005		<0.0005		<0.002		
TA-DC234_d1	22/01/2025	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.002	<0.002		
TA-DC234_d2	22/01/2025	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.002	<0.002		
TA-DC234_b	22/01/2025	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.002	<0.002		
TA-DC234	19/02/2025		<0.001		<0.0001		<0.001		<0.001		<0.0005		<0.0005		<0.002		
TA-DC235	14/03/2024	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.002	<0.002		
TA-DC235	7/05/2024	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.002	<0.002		
TA-DC235_d	7/05/2024	<0.001	<0.001	<0.0001	<0.0001	<0.001	0.002	<0.001	<0.001	<0.0005	<0.0005	<0.0005	0.0007	<0.002	<0.002		
TA-DC235_d FieldFilt	8/05/2024		<0.001		<0.0001		<0.001		<0.001		<0.0005		<0.0005		<0.002		
TA-DC235	25/06/2024	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.002	<0.002		
TA-DC235	23/07/2024	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	0.008	0.005		
TA-DC235	28/08/2024	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.002	<0.002		
TA-DC235	26/11/2024		<0.001		<0.0001		<0.001		<0.001		<0.0005		<0.0005		<0.002		
TA-DC235	22/01/2025		<0.001		<0.0001		<0.001		<0.001		<0.0005		<0.0005		<0.002		
TA-DC235	18/03/2025		<0.001		<0.0001		<0.001		<0.001		<0.0005		<0.0005		<0.002		
TA-DC237	14/03/2024	<0.001	<0.001	<0.0001	<0.0001	0.002	<0.001	0.004	<0.001	0.0016	<0.0005	0.0018	<0.0005	0.295	0.004		
TA-DC237	7/05/2024	<0.001	<0.001	<0.0001	<0.0001	0.003	<0.001	0.003	<0.001	0.0008	<0.0005	0.0014	0.0008	0.019	0.004		
TA-DC237	25/06/2024	0.002	<0.001	<0.0001	<0.0001	0.003	<0.001	0.006	<0.001	0.012	<0.0005	0.0029	<0.0005	0.024	<0.002		
TA-DC237	23/07/2024	<0.001	<0.001	<0.0001	<0.0001	0.002	<0.001	0.003	<0.001	0.0054	<0.0005	0.0017	<0.0005	0.014	<0.002		
TA-DC237	27/08/2024	0.005	0.003	<0.0001	<0.0001	<0.001	<0.001	<0.001	<0.001	0.0035	<0.0005	0.0029	0.0018	0.010	<0.002		
TA-DC237	25/11/2024		<0.001		<0.0001		<0.001		<0.001		<0.0005		<0.0005		<0.002		
TA-DC237	22/01/2025		<0.001		<0.0001		<0.001		<0.001		<0.0005		<0.0005		0.003		
TA-DC237	18/03/2025		<0.001		<0.0001		<0.001		<0.001		<0.0005		<0.0005		0.007		
TA-DC238	14/03/2024	<0.001	<0.001	<0.0001	<0.0001	0.003	<0.001	0.014	<0.001	<0.0005	<0.0005	0.0018	<0.0005	0.008	0.005		
TA-DC238	7/05/2024	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	0.003	<0.001	<0.0005	<0.0005	0.0006	<0.0005	<0.002	<0.002		
TA-DC238	30/05/2024	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	0.002	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.002	<0.002		
TA-DC238	25/06/2024	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	0.003	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.002	<0.002		
TA-DC238	23/07/2024	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	0.002	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.002	<0.002		
TA-DC238	28/08/2024	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	0.002	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.002	<0.002		
TA-DC238	22/10/2024	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	0.002	<0.001	<0.0005	<0.0005	0.0011	<0.0005	0.005	0.003		
TA-DC238_d1	22/10/2024	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	0.002	<0.001	<0.0005	<0.0005	0.0007	<0.0005	0.003	<0.002		
TA-DC238_d2	22/10/2024	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	0.002	<0.001	<0.0005	<0.0005	0.0010	<0.0005	0.003	<0.002		
TA-DC238_b	22/10/2024	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	0.002	<0.002		
TA-DC238	25/11/2024		<0.001		<0.0001		<0.001		<0.001		<0.0005		<0.0005		<0.002		
TA-DC238	18/12/2024		<0.001		<0.0001		<0.001		<0.001		<0.0005		<0.0005		<0.002		
TA-DC238	22/01/2025		<0.001		<0.0001		<0.001		<0.001		<0.0005		<0.0005		<0.002		
TA-DC238	18/03/2025		<0.001		<0.0001		<0.001		<0.001		<0.0005		<0.0005		<0.002		
TA-DC243	14/03/2024	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	0.0011	0.0008	0.006	0.005		
TA-DC243	7/05/2024	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	0.0011	0.001	0.004	<0.002		
TA-DC243_d	7/05/2024	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	0.0013	0.001	<0.002	<0.002		
TA-DC243_d FieldFilt	8/05/2024		<0.001		<0.0001		<0.001		<0.001		<0.0005		0.0011		<0.002		
TA-DC243	30/05/2024	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	0.0007	0.0007	<0.002	<0.002		
TA-DC243	25/06/2024	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	0.0008	0.0007	<0.002	<0.002		
TA-DC243	23/07/2024	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	0.0009	0.0009	<0.002	<0.002		
TA-DC243	28/08/2024	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	0.0008	0.0008	<0.002	<0.002		
TA-DC243	23/10/2024	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	0.0022	<0.0005	<0.002	<0.002		
TA-DC243	26/11/2024		<0.001		<0.0001		<0.001		<0.001		<0.0005		0.0006		<0.002		
TA-DC243	18/12/2024		<0.001		<0.0001		<0.001		<0.001		<0.0005		0.0006		<0.002		
TA-DC243	22/01/2025		<0.001		<0.0001		<0.001		<0.001		<0.0005		0.0006		<0.002		
TA-DC243	18/03/2025		<0.001		<0.0001		<0.001		<0.001		<0.0005		0.0007		<0.002		
TAH2019	7/05/2024	<0.001	<0.001	<0.0001	<0.0001	0.019	0.002	0.012	0.002	0.0071	<0.0005	0.011	0.0021	0.053	0.016		
TAH2019 (shallow)	26/11/2024		<0.001		<0.0001		0.002		0.001		<0.0005		<0.0005		0.005		
TA-MB412	29/04/2025	0.004	<0.001	0.0011	<0.0001	0.038	<0.001	0.158	0.001	0.034	<0.001	0.041	0.002	0.354	0.007	<0.0001	<0.0001
TA-MB415	29/04/2025	<0.001	<0.001	<0.0001	<0.0001	0.023	<0.001	0.142	0.003	0.005	<0.001	0.028	0.005	0.049	0.009	<0.0001	<0.0001
QAQC1	29/04/2025	<0.001	<0.001	<0.0001	<0.0001	0.010	<0.001	0.063	0.003	0.003	<0.001	0.017	0.005	0.034	0.010	<0.0001	<0.0001
QAQC2	29/04/2025	<0.001	<0.001	<0.0002	<0.0002	<0.001	<0.001	0.003	0.003	<0.001	<0.001	0.005	0.005	0.010	0.010	<0.0001	<0.0001
TA-MB416	29/04/2025	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	0.004	0.003	<0.001	<0.001	0.002	0.002	0.021	0.016	<0.0001	<0.0001
TA-MB418	29/04/2025	<0.001	<0.001	<0.0001	<0.0001	0.027	0.001	0.031	0.003	0.004	<0.001	0.022	0.004	0.033	<0.005	<0.0001	<0.0001

Table 3 – Total Petroleum Hydrocarbons (TPH), Total Recoverable Hydrocarbons (TRH), BTEXN and Polycyclic Aromatic Hydrocarbons (PAH) (µg/L)

Sample ID	Date Sampled	TPH C6-C9	TPH C10-C14	TPH C15-C28	TPH C29-C36	TPH Sum (C10-C36)	TRH C6-C10 minus BTEX (F1)	TRH >C10-C16 minus Naphthalene (F2)	TRH >C16-C34 (F3)	TRH >C34-C40 (F4)	TRH Sum (>C10-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	Anthracene	Benzo(a)pyrene	Fluoranthene	Phenanthrene	Total PAHs (as TEQ)[B]
ASC NEPM - HSL D (vapour intrusion)							6,000-7,000 (sand) NL (silt) NL (clay)	NL (all soil types)				5,000 (sand) 30,000 (silt) 30,000-35,000 (clay)	NL (all soil types)	NL (all soil types)	NL (all soil types)	NL (all soil types)					
CRC CARE - HSL D (vapour intrusion)							6,200-6,500 (sand) NL (silt) NL (clay)	NL (all soil types)				4,900-5,400 (sand) 28,000-30,000 (silt) 29,000-33,000 (clay)	NL (all soil types)	NL (all soil types)	NL (all soil types)	NL (all soil types)					
NHMRC recreational criteria[C]												20	16000	6000	12000			0.2			0.2 (BaP)
ANZG freshwater TV (95% of species protection)												950	180	80	75 (m-xylene) 350 (o-xylene) 200 (p-xylene)	16	0.4	0.2	1.4	2.0	
TA-DC234	14/03/2024	<50	<50	<100	<100	<100	<75	<50	<100	<100	<100	<0.4	3	<0.4	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	
TA-DC234	18/03/2025	<50	<50	<100	<100	<100						<0.4	<0.4	<0.4	<1.0	<0.01	<0.01	<0.005	<0.02	<0.01	
TA-DC234	3/04/2025	<50	<50	<100	<100	<100						<0.4	<0.4	<0.4	<1.0	<0.01	<0.01	<0.005	<0.02	<0.01	
TA-DC235	18/03/2025	<50	<50	<100	<100	<100						<0.4	<0.4	<0.4	<1.0	<0.01	<0.01	<0.005	<0.02	<0.01	
TA-DC235	3/04/2025	<50	<50	<100	<100	<100						<0.4	<0.4	<0.4	<1.0	<0.01	<0.01	<0.005	<0.02	<0.01	
TA-DC237	14/03/2024	1,200	<50	<100	<100	1,200	1,100	<50	220	<100	240	<0.4	690	<0.4	<1.0	2.4	<0.5	<0.5	<0.5	<0.5	
TA-DC237	18/03/2025	<50	<50	<100	<100	<100						<0.4	3.1	<0.4	<1.0	0.05	<0.01	<0.005	<0.02	<0.01	
TA-DC237	3/04/2025	<50	<50	<100	<100	<100						<0.4	<0.4	<0.4	<1.0	<0.01	<0.01	<0.005	<0.02	<0.01	
TA-DC238	14/03/2024	<50	<50	<100	<100	<100	<75	<50	<100	<100	<100	<0.4	0.6	<0.4	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	
TA-DC238	18/03/2025	<50	<50	<100	<100	<100						<0.4	0.4	<0.4	<1.0	<0.01	<0.01	<0.005	<0.02	<0.01	
TA-DC238	3/04/2025	<50	<50	<100	<100	<100						<0.4	<0.4	<0.4	<1.0	<0.01	<0.01	<0.005	<0.02	<0.01	
TA-DC243	14/03/2024	<50	<50	<100	<100	<100	<75	<50	<100	<100	<100	<0.4	0.9	<0.4	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	
TA-DC243	18/03/2025	<50	<50	<100	<100	<100						<0.4	<0.4	<0.4	<1.0	<0.01	<0.01	<0.005	<0.02	<0.01	
TA-DC243	3/04/2025	<50	<50	<100	<100	<100						<0.4	<0.4	<0.4	<1.0	<0.01	<0.01	<0.005	<0.02	<0.01	
TA-MB412	29/04/2025	<20	<50	<100	<50	<50	<20	<100	110	<100	110	<1	<2	<2	<2	<5	<2	<2	<2	<2	<2
TA-MB415	29/04/2025	<20	<50	<100	<50	<50	<20	<100	<100	<100	<100	<1	<2	<2	<2	<5	<2	<2	<2	<2	<2
QAQC1	29/04/2025	<20	<50	<100	<50	<50	<20	<100	<100	<100	<100	<1	<2	<2	<2	<5	<2	<2	<2	<2	<2
QAQC2	29/04/2025	<20	<50	<100	<100	<100	<20	<50	<100	<100	<100	<1	<1	<1	<3	<10	<1	<1	<1	<1	<1
TA-MB416	29/04/2025	<20	<50	<100	<50	<50	<20	<100	<100	<100	<100	<1	<2	<2	<2	<5	<2	<2	<2	<2	<2
TA-MB418	29/04/2025	<20	<50	<100	<50	<50	<20	<100	<100	<100	<100	<1	<2	<2	<2	<5	<2	<2	<2	<2	<2

Table 4 – Phenols, Per- and Poly-fluroalkyl Substances (PFAS) and FTS[E] (µg/L)

Sample ID	Date Sampled	2,3,4,6-Tetrachlorophenol	2,3,5,6-Tetrachlorophenol	2,3-Dichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,6-Dichlorophenol	2-Chlorophenol	4-Chlorophenol	Pentachlorophenol	Phenol	PFOS	PFOA	PFHxS	PFOS+PFHxS	Total FTS
PFAS NEMP - recreational water quality														10		2	
NHMRC recreational criteria[C]					400	4000			6000		200			11.2		1.4	
ANZG freshwater TV (95% of species protection)		20	0.2[A]	31[A]	20	160	2[A]	34[A]	490	220	10	320					
PFAS NEMP 3.0 freshwater criteria (95% of species protection)													0.13	220			
TA-DC234	18/03/2025				<1.0	<1.0	<1.0		<1.0		<1.0	<1.0	<0.01	<0.01	<0.02		
TA-DC234	3/04/2025				<1.0	<1.0	<1.0		<1.0		<1.0	<1.0	<0.01	<0.01	<0.02		
TA-DC235	18/03/2025				<1.0	<1.0	<1.0		<1.0		<1.0	<1.0	<0.01	<0.01	<0.02		
TA-DC235	3/04/2025				<1.0	<1.0	<1.0		<1.0		<1.0	<1.0	<0.01	<0.01	<0.02		
TA-DC237	18/03/2025				<1.0	<1.0	<1.0		<1.0		<1.0	<1.0	<0.01	<0.01	<0.02		
TA-DC237	3/04/2025				<1.0	<1.0	<1.0		<1.0		<1.0	<1.0	<0.01	<0.01	<0.02		
TA-DC238	18/03/2025				<1.0	<1.0	<1.0		<1.0		<1.0	<1.0	<0.01	<0.01	<0.02		
TA-DC238	3/04/2025				<1.0	<1.0	<1.0		<1.0		<1.0	<1.0	<0.01	<0.01	<0.02		
TA-DC243	18/03/2025				<1.0	<1.0	<1.0		<1.0		<1.0	<1.0	<0.01	<0.01	<0.02		
TA-DC243	3/04/2025				<1.0	<1.0	<1.0		<1.0		<1.0	<1.0	<0.01	<0.01	<0.02		
TA-MB412	29/04/2025				<2	<2	<2	<2	<2		<4	<2	0.0024	<0.0005	<0.0005	0.0024	<0.001
TA-MB415	29/04/2025				<2	<2	<2	<2	<2		<4	<2	0.0004	<0.0005	<0.0005	0.0004	<0.001
QAQC1	29/04/2025				<2	<2	<2	<2	<2		<4	<2	<0.0002	<0.0005	<0.0005	<0.0002	<0.001
QAQC2	29/04/2025	<10			<10	<3	<3	<3	<3		<10	<3	0.0002	<0.001	<0.001	<0.001	
TA-MB416	29/04/2025				<2	<2	<2	<2	<2		<4	<2	0.0034	<0.0005	0.0008	0.0042	<0.001
TA-MB418	29/04/2025				<2	<2	<2	<2	<2		<4	<2	0.0020	0.0011	<0.0005	0.0020	<0.001

Table 5 – Organochlorine Pesticides, Organophosphorus Pesticides, Herbicides and Polychlorinated Biphenyls (µg/L)

Sample ID	Date Sampled	Aldrin	Chlordane	DDT	Dicofol	Dieldrin	Endosulfan	Endrin	Heptachlor	Lindane	Methoxychlor	Mirex	Toxaphene	Aldrin + Dieldrin	Azinphos methyl	Chlorpyrifos	Diazinon	Dimethoate	Fenitrothion	Malathion	Parathion	Profenofos	Temephos	Picloram	Aroclor 1242	Aroclor 1254	Total PCBs
NHMRC recreational criteria[C]			40	180	80		400		6	200	6000			6	600	200	80	140	140	1400	400	6	8000	6000			
ANZG freshwater TV (95% of species protection)		0.001[A]	0.08	0.01	0.5[A]	0.01[A]	0.2	0.02	0.09	0.2	0.005[A]	0.04[A]	0.2		0.02	0.01	0.01	0.15	0.2	0.05	0.004	0.02[A]	0.05[A]	87	0.6	0.03	
TA-DC234	14/03/2024																								<0.1	<0.1	<0.1
TA-DC234	18/03/2025	<0.01	<0.02	<0.01		<0.02	<0.02	<0.02	<0.01							<0.01	<0.02	<0.04		<0.01					<0.1	<0.1	<0.1
TA-DC234	3/04/2025	<0.01	<0.02	<0.01		<0.02	<0.02	<0.02	<0.01																<0.1	<0.1	<0.1
TA-DC235	18/03/2025	<0.01	<0.02	<0.01		<0.02	<0.02	<0.02	<0.01							<0.01	<0.02	<0.04		<0.01					<0.1	<0.1	<0.1
TA-DC235	3/04/2025	<0.01	<0.02	<0.01		<0.02	<0.02	<0.02	<0.01																<0.1	<0.1	<0.1
TA-DC237	14/03/2024																								<0.1	<0.1	<0.1
TA-DC237	18/03/2025	<0.01	<0.02	<0.01		<0.02	<0.02	<0.02	<0.01							<0.01	<0.02	<0.04		<0.01					<0.1	<0.1	<0.1
TA-DC237	3/04/2025	<0.01	<0.02	<0.01		<0.02	<0.02	<0.02	<0.01																<0.1	<0.1	<0.1
TA-DC238	14/03/2024																								<0.1	<0.1	<0.1
TA-DC238	18/03/2025	<0.01	<0.02	<0.01		<0.02	<0.02	<0.02	<0.01							<0.01	<0.02	<0.04		<0.01					<0.1	<0.1	<0.1
TA-DC238	3/04/2025	<0.01	<0.02	<0.01		<0.02	<0.02	<0.02	<0.01																<0.1	<0.1	<0.1
TA-DC243	14/03/2024																								<0.1	<0.1	<0.1
TA-DC243	18/03/2025	<0.01	<0.02	<0.01		<0.02	<0.02	<0.02	<0.01							<0.01	<0.02	<0.04		<0.01					<0.1	<0.1	<0.1
TA-DC243	3/04/2025	<0.01	<0.02	<0.01		<0.02	<0.02	<0.02	<0.01																<0.1	<0.1	<0.1
TA-MB412	29/04/2025	<2		<4		<2	<2	<2	<2					<4		<2	<2	<2		<2		<2					<1
TA-MB415	29/04/2025	<2		<4		<2	<2	<2	<2					<4		<2	<2	<2		<2		<2					<1
QAQC1	29/04/2025	<2		<4		<2	<2	<2	<2					<4		<2	<2	<2		<2		<2					<1
QAQC2	29/04/2025	<5		<5		<5	<5	<5	<5					<5											<5	<5	<5
TA-MB416	29/04/2025	<2		<4		<2	<2	<2	<2					<4		<2	<2	<2		<2		<2					<1
TA-MB418	29/04/2025	<2		<4		<2	<2	<2	<2					<4		<2	<2	<2		<2		<2					<1

Table 6 – Nutrients and Silica (mg/L)

Sample ID	Date Sampled	Ammonia as N (NH_3-N)	Ammonia (NH_3 = NH_3-N x 1.21)	Nitrate as N (NO_3-N)	Nitrate (NO_3 = NO_3-N x 4.43)	Nitrite as N (NO_2-N)	Nitrite (NO_2 = NO_2-N x 3.29)	Total Nitrogen	Total Kjeldahl Nitrogen	Total Phosphorus	Reactive Phosphorus	Reactive Silica
NHMRC recreational criteria[C]			10		1000		60					
ANZG freshwater TV (95% of species protection)			0.900									
EPA 2021 - Aquatic Ecosystems of the Upper Derwent Catchment (modified; full year)		0.003-0.018		0.001-0.073		0.001-0.006		0.095-0.718		0.003-0.041	0.001-0.005	
TA-DC234	14/03/2024	0.062	0.075	1.51	6.69	<0.02	<0.02			0.029		38
TA-DC234	7/05/2024	<0.05	<0.05	1.08	4.78	<0.02	<0.02			0.013		36.2
TA-DC234_d	7/05/2024	<0.05	<0.05	1.52	6.73	<0.02	<0.02			0.017		36.5
TA-DC234_d FieldFilt	8/05/2024	<0.05	<0.05	1.53	6.78	<0.02	<0.02					
TA-DC234	25/06/2024	<0.05	<0.05	1.46	6.47	<0.02	<0.02			0.029		38.5
TA-DC234	23/07/2024	<0.05	<0.05	1.33	5.89	<0.02	<0.02			0.035		32.7
TA-DC234	28/08/2024	<0.05	<0.05	1.36	6.02	<0.02	<0.02			0.018		36.9
TA-DC234	26/11/2024	<0.05	<0.05	1.45	6.42	<0.02	<0.02	1.55	<0.1	0.024	0.03	
TA-DC234	22/01/2025	<0.05	<0.05	1.3	5.76	<0.02	<0.02	1.32	<0.1	0.026		41.1
TA-DC234	18/03/2025	<0.05	<0.05	1.64		<0.02		1.73	<0.1	0.023	0.03	38.3
TA-DC235	14/03/2024	0.009	0.011	0.008	0.04	0.002		0.19	0.18	<0.01	<0.003	
TA-DC235	7/05/2024	<0.05	<0.05	1.18	5.23	<0.02	<0.02			0.027		42.4
TA-DC235_d	7/05/2024	<0.05	<0.05	1.19	5.27	<0.02	<0.02			0.031		42.8
TA-DC235_d FieldFilt	8/05/2024	<0.05	<0.05	1.19	5.27	<0.02	<0.02					
TA-DC235	25/06/2024	<0.05	<0.05	1.18	5.23	<0.02	<0.02			0.039		44
TA-DC235	23/07/2024	<0.05	<0.05	1.08	4.78	<0.02	<0.02			0.037		42.9
TA-DC235	28/08/2024	<0.05	<0.05	1.08	4.78	<0.02	<0.02			0.033		43.6
TA-DC235	26/11/2024	<0.05	<0.05	1.12	4.96	<0.02	<0.02	1.21	<0.1	0.061	0.03	
TA-DC235	22/01/2025	<0.05	<0.05	1.06	4.70	<0.02	<0.02	1.10	<0.1	0.029		40.9
TA-DC235_d1	22/01/2025	<0.05	<0.05	1.07	4.74	<0.02	<0.02	1.13	<0.1	0.033		
TA-DC235_d2	22/01/2025	<0.05	<0.05	1.07	4.74	<0.02	<0.02	1.10	<0.1	0.031		
TA-DC235_b	22/01/2025	<0.05	<0.05	0.02	0.09	<0.02	<0.02	0.10	<0.1	<0.01		
TA-DC235	18/03/2025	<0.05	<0.05	1.09	4.83	<0.02	<0.02	1.11	<0.1	0.031	0.03	42.4
TA-DC237	14/03/2024	<0.05	<0.05	0.076	0.34	<0.02	<0.02			0.061		26.2
TA-DC237	7/05/2024	<0.05	<0.05	0.157	0.70	0.174	0.57			0.033		37.9
TA-DC237	25/06/2024	<0.05	<0.05	0.614	2.72	<0.02	<0.02			0.374		36.2
TA-DC237	23/07/2024	<0.05	<0.05	0.61	2.70	0.05	0.16			0.12		35.6
TA-DC237	27/08/2024	0.15	0.18	0.21	0.93	0.03	0.10			0.102		17.8
TA-DC237	25/11/2024	<0.05	<0.05	1.01	4.47	0.07	0.23	1.14	<0.1	0.036	0.03	
TA-DC237	22/01/2025	<0.05	<0.05	1.29	5.71	<0.02	<0.02	1.38	<0.1	0.044		43.1
TA-DC237	18/03/2025	<0.05		1.02	4.52	0.08	0.26	1.18	<0.1	0.038	0.03	40
TA-DC238	14/03/2024	<0.05	<0.05	1.85	8.20	<0.02	<0.02			0.08		45.3
TA-DC238	7/05/2024	<0.05	<0.05	1.46	6.47	<0.02	<0.02			0.033		44.2
TA-DC238	30/05/2024	<0.05	<0.05	1.65	7.31	<0.02	<0.02			0.041		44
TA-DC238	25/06/2024	<0.05	<0.05	1.82	8.06	<0.02	<0.02			0.045		43
TA-DC238	23/07/2024	<0.05	<0.05	1.74	7.71	<0.02	<0.02			0.036		41.5
TA-DC238	28/08/2024	<0.05	<0.05	1.74	7.71	<0.02	<0.02			0.036		44.8
TA-DC238	22/10/2024	<0.05	<0.05	1.86	8.24	<0.02	<0.02			0.037	0.03	45
TA-DC238_d1	22/10/2024	<0.05	<0.05	1.86	8.24	<0.02	<0.02				0.04	
TA-DC238_d2	22/10/2024	<0.05	<0.05	1.87	8.28	<0.02	<0.02				0.04	
TA-DC238_b	22/10/2024	<0.05	<0.005	0.002	0.01	<0.02	<0.02				<0.003	
TA-DC238	25/11/2024	<0.05	<0.05					1.87	<0.1		0.04	
TA-DC238	18/12/2024	<0.05	<0.05					1.8	<0.1			43.3
TA-DC238	22/01/2025	<0.05	<0.05					1.75	<0.1			43.3
TA-DC238_d1	19/02/2025	<0.05	<0.05	1.58	7.00	<0.02	<0.02	1.84	<0.1	0.032		
TA-DC238_d2	19/02/2025	<0.05	<0.05	1.58	7.00	<0.02	<0.02	1.85	<0.1	0.031		
TA-DC238_b	19/02/2025	<0.05	<0.05	0.02	0.09	<0.02	<0.02	0.1	<0.1	<0.01		
TA-DC238	18/03/2025	<0.05	<0.05	1.59	7.04	<0.02	<0.02	1.81	<0.1	0.036	0.03	41
TA-DC243	14/03/2024	<0.05	<0.05	1.28	5.67	<0.02	<0.02			0.027		52
TA-DC243	7/05/2024	<0.05	<0.05	1.38	6.11	<0.02	<0.02			0.025		51.4
TA-DC243_d	7/05/2024	<0.05	<0.05	1.38	6.11	<0.02	<0.02			0.027		52.2
TA-DC243_d FieldFilt	8/05/2024	<0.05	<0.05	1.38	6.11	<0.02	<0.02					
TA-DC243	30/05/2024	<0.05	<0.05	1.29	5.71	<0.02	<0.02			0.027		52.4
TA-DC243	25/06/2024	<0.05	<0.05	1.54	6.82	<0.02	<0.02			0.026		54.4
TA-DC243	23/07/2024	<0.05	<0.05	1.58	7.00	<0.02	<0.02			0.026		52.4
TA-DC243	28/08/2024	<0.05	<0.05	1.68	7.44	<0.02	<0.02			0.024		53.8
TA-DC243	23/10/2024	<0.05	<0.05	1.41	6.25	<0.02	<0.02			0.028	0.04	53.2
TA-DC243	26/11/2024	<0.05	<0.05	1.47	6.51	<0.02	<0.02	1.5	<0.1	0.031	0.03	
TA-DC243_d1	26/11/2024	<0.05	<0.05	1.46	6.47	<0.02	<0.02	1.5	<0.1	0.03	0.03	
TA-DC243_d2	26/11/2024	<0.05	<0.05	1.46	6.47	<0.02	<0.02	1.49	<0.1	0.028	0.03	
TA-DC243_b	26/11/2024	<0.05	<0.05	0.02	0.09	<0.02	<0.02	0.1	<0.1	<0.01	0.03	
TA-DC243	18/12/2024	<0.05	<0.05	1.49	6.60	<0.02	<0.02	1.52	<0.1	0.027		52.9
TA-DC243	22/01/2025	<0.05	<0.05	1.52	6.73	<0.02	<0.02	1.57	<0.1	0.029		52.3
TA-DC243	18/03/2025	<0.05	<0.05	1.55	6.87	<0.02	<0.02	1.58	<0.1	0.029	0.03	52.4
TAH2019	7/05/2024	<0.05	<0.05	0.437	1.94	<0.02	<0.02			0.099		33.3
TAH2019 (shallow)	26/11/2024	<0.05	<0.05	1.14	5.05	<0.02	<0.02	1.48	0.34	0.055	0.03	
TA-MB412	29/04/2025	0.008	0.010	1.34	5.94	0.004	0.013	1.49	0.15	0.446	0.023	24.0
TA-MB415	29/04/2025	0.005	0.006	1.19	5.27	0.003	0.010	1.09	<0.02	0.064	0.018	26.6
QAQC1	29/04/2025	0.009	0.011	1.18	5.23	0.003	0.010	1.08	<0.02	0.075	0.015	26.6
QAQC2	29/04/2025	0.010	0.012	1.8	7.97	0.002	0.007	1.8	0.4	0.024	0.024	18
TA-MB416	29/04/2025	0.045	0.054	0.257	1.14	0.058	0.191	0.60	0.28	0.033	0.011	16.7
TA-MB418	29/04/2025	0.010	0.012	0.455	2.02	0.049	0.161	0.63	0.13	0.080	0.008	21.5

Legend

(yellow shading)	Human health criteria (National)
(green shading)	Ecological freshwater criteria (National or Catchment-specific)
Bold	Reported concentration equals or exceeds at least one of the human health criteria
Bold	Reported concentration equals or exceeds at least one of the ecological criteria
Bold	Reported concentration equals or exceeds at least one of the human health criteria plus at least one of the ecological criteria
Bold	Reported concentration is greater than the LOR
Grey <	Reported concentration is below the LOR (note sample required dilution due to high level contaminants and LORs were adjusted accordingly)
Red Text	Guideline criterion is less than the standard LOR
A	Level of species protection is unknown
B	Total PAHs (as TEQ)
C	Based on 20 x the ADWG criteria which are based on daily consumption of 2 L of water; consumption in a recreational setting is more likely to be 0.1 L per day
m btoc	Metres below top of casing
HSL	Health Screening Level
LOR	Limit of reporting
NL	Not limiting
TEQ	Toxicity equivalent quotient
TV	Trigger Value
DDT	Dichlorodiphenyltrichloroethane

References

ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure 1999, amended 2013
CRC CARE	Technical Report No. 10 Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater September 2011, including errata August 2012
PFAS NEMP 3.0	PFAS National Environmental Management Plan 3.0, 2025
ANZG 2018	Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2018
EPA 2021	Default Guideline Values (DGVs) for Aquatic Ecosystems of the Upper Derwent Catchment, EPA Tasmania, 2021 (modified not pristine)
NHMRC	National Water Quality Management Strategy – Australian Drinking Water Guidelines 2011, updated September 2022

Site Specific EIL Calculations - using ASC NEPM EIL Calculation Spreadsheet

		TARRALEAH VILLAGE		TARRALEAH SWITCHYARD	
Sample ID	Units	TA-TP450/0.2	TA-TP453/1.5	TA-TP456/0.3	
Inputs					
CEC	cmolc/kg	12.0	40.2	19.6	
pH ($CaCl_2$ method)	pH units	6.0	5.6	5.2	
Organic Carbon Content	%	1.8	0.7	4.5	
Iron Content	%	6.91	8.08	9.35	
Clay Content	%	20	30	38	
State (or nearest State)	--	VIC	Vic	Vic	
Traffic Volume	--	Low	Low	High	

Outputs - Soil-Specific EILs		Fresh	Aged	Fresh	Aged	Fresh	Aged	Fresh	Aged
Chromium III									
National parks and areas of high conservation value	mg/kg	140	170	160	190	170	210		
Urban residential and open public spaces	mg/kg	270	510	310	580	340	630		
Commercial and industrial	mg/kg	410	840	470	960	510	1,000		
Copper									
National parks and areas of high conservation value	mg/kg	70	75	50	45	50	45		
Urban residential and open public spaces	mg/kg	120	200	75	110	80	110		
Commercial and industrial	mg/kg	170	290	100	160	100	160		
Nickel									
National parks and areas of high conservation value	mg/kg	35	35	45	80	45	55		
Urban residential and open public spaces	mg/kg	85	190	160	430	110	270		
Commercial and industrial	mg/kg	140	330	290	730	200	460		
Zinc									
National parks and areas of high conservation value	mg/kg	70	130	65	100	60	100		
Urban residential and open public spaces	mg/kg	190	440	150	330	120	270		
Commercial and industrial	mg/kg	280	670	220	500	170	390		

Notes:

Aged values apply to contamination present for at least two years

ACL - Added contaminant limit

CEC - Cation exchange capacity

EIL - Ecological Investigation Level

Most conservative site-specific ACL (aged contamination)

SUMMARY RESULTS - TRIPLICATES (SOIL)

Project No: P.24.1136
Project Name: Tarraleah Power Scheme ESA

			Analyte Group	Heavy Metals								TPH					TRH				
			Analyte	Arsenic	Cadmium	Chromium (total)	Copper	Lead	Nickel	Zinc	Mercury (total)	C6-C9	C10-C14	C15-C28	C29-C36	Sum (C10-C36)	C6-C10 minus BTEX (F1)	>C10-C16 minus Naphthalene (F2)	>C16-C34 (F3)	>C34-C40 (F4)	Sum (>C10-C40)
			ALS LORs	5	1	2	5	5	2	5	0.1	10	50	100	100	50	10	50	100	100	50
Sample ID	Date sampled	Laboratory	Units	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
TA-TP449/0.8	31-Mar-25	ALS		--	--	--	--	10	--	--	--	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50
QCP01	31-Mar-25	ALS		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
RPD				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TA-TP449/0.8	31-Mar-25	ALS		--	--	--	--	10	--	--	--	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50
QCS01	31-Mar-25	Eurofins		<2	<0.4	380	56	13	140	140	<0.1	<10	<20	<50	<50	<50	<20	<50	<100	<100	<100
RPD				ND	ND	ND	ND	26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TA-MB412/0.4	07-Apr-25	ALS		31	2	84	62	20	46	297	0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50
QCP02	07-Apr-25	ALS		17	1	96	56	18	48	222	0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50
RPD				58	NA	13	10	11	4	29	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TA-MB412/0.4	07-Apr-25	ALS		31	2	84	62	20	46	297	0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50
QCS02	07-Apr-25	Eurofins		14	1.9	86	56	17	56	200	<0.1	<10	<20	<50	<50	<50	<20	<50	<100	<100	<100
RPD				76	NA	2	10	16	20	39	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TA-TP456/0.3	10-Apr-25	ALS		<5	<1	239	52	7	79	93	0.2	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50
QCP03	10-Apr-25	ALS		<5	<1	242	51	11	72	92	0.2	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50
RPD				ND	ND	1	2	NA	9	1	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TA-TP456/0.3	10-Apr-25	ALS		<5	<1	239	52	7	79	93	0.2	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50
QCS03	10-Apr-25	Eurofins		<2	<0.4	260	65	18	110	110	<0.1	<10	<20	<50	<50	<50	<20	<50	<100	<100	<100
RPD				ND	ND	8	22	NA	33	17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

			Analyte Group	BTEXN					PAH			Phenols			Per- and Poly-fluoroalkyl Substances (PFAS)				FTS[A]	PCB	Asbestos and Fibre		
			Analyte	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Naphthalene	Benzo(a)pyrene	Carcinogenic PAHs (as BaP TEQ)	Total PAHs	Phenol	Pentachlorophenol	Phenols (sum)	PFOS	PFOA	PFHxS	PFOS+PFHxS	Total FTS	PCBs	Asbestos (presence / absence)	Synthetic Mineral Fibre (presence / absence)	Organic Fibre (presence / absence)
			ALS LORs	0.2	0.5	0.5	0.5	1	0.5	0.5	0.5	0.5	2	0.5	0.0002	0.0002	0.0002	0.0002	0.0005	0.1	0.1	-	-
Sample ID	Date sampled	Laboratory	Units	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	g/kg	-	-
TA-TP449/0.8	31-Mar-25	ALS		<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2	<0.5	--	--	--	--	--	--	--	--	--
QCP01	31-Mar-25	ALS		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
RPD				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TA-TP449/0.8	31-Mar-25	ALS		<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2	<0.5	--	--	--	--	--	--		--	--
QCS01	31-Mar-25	Eurofins		<0.1	<0.1	<0.1	<0.3	<0.5	<0.005	<0.5	<0.5	<0.5	<1	<1	<0.005	<0.005	<0.005	<0.005	--	<0.1	No[C]	No	Yes
RPD				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TA-MB412/0.4	07-Apr-25	ALS		<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[C]	No	No
QCP02	07-Apr-25	ALS		<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	--	--	--
RPD				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TA-MB412/0.4	07-Apr-25	ALS		<0.2	<0.5	<0.5	<0.5	<1	<0.05	<0.05	<0.05	<0.5	<2	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[C]	No	No
QCS02	07-Apr-25	Eurofins		<0.1	<0.1	<0.1	<0.3	<0.5	<0.005	<0.005	<0.005	<0.5	<1	<1	<0.005	<0.005	<0.005	<0.005	--	<0.1	--	--	--
RPD				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TA-TP456/0.3	10-Apr-25	ALS		<0.2	<0.5	<0.5	<0.5	<1	<0.13	<0.13	<0.13	<0.5	<2	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[C]	No	Yes
QCP03	10-Apr-25	ALS		<0.2	<0.5	<0.5	<0.5	<1	<0.13	<0.13	<0.13	<0.5	<2	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	--	--	--
RPD				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TA-TP456/0.3	10-Apr-25	ALS		<0.2	<0.5	<0.5	<0.5	<1	<0.13	<0.13	<0.13	<0.5	<2	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.1	No[C]	No	Yes
QCS03	10-Apr-25	Eurofins		<0.1	<0.1	<0.1	<0.3	<0.5	<0.005	<0.005	<0.005	<0.5	<1	<1	<0.005	<0.005	<0.005	<0.005	--	<0.1	No[C]	No	Yes
RPD				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0	0	0

Legend:

	Passed criteria
	Could not be determined (e.g. not tested for that analyte)
	Failed criteria
A	Total fluorotelomer (FTS) is the sum of 4:2FTS + 6:2FTS + 8:2FTS + 10:2FTS
B	Yes - asbestos detected by polarised light microscopy including dispersion staining
C	No - asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining
D	No - asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining; asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg
LOR	Limit of reporting
Bold	Value is greater than the LOR
Grey	Reported concentration is below the LOR
--	Not tested
RPD	Relative percentage difference
ND	Not determined as one value is less than LOR
NA	No RPD limit applies
PFOS	Perfluorooctane sulfonic acid
PFOA	Perfluorooctanoic acid
PFHxS	Perfluorohexane sulfonic acid

$$RPD = \frac{Result1 - Result2}{Mean\ Result} * 100$$

No RPD limit applies where values reported by laboratory are less than two times the LOR
Where values reported by laboratory are less than 20 times the LOR, then the calculated RPD should be less than 50%
Where values reported by laboratory are 20 to 100 times the LOR, then the calculated RPD should be less than 30%
Where values reported by laboratory are greater than 100 times the LOR, then the calculated RPD should be less than 15%

SUMMARY RESULTS - TRIPLICATES (SOIL)

Project No: P.24.1136
Project Name: Tarraleah Power Scheme ESA

Analyte Group				Physical Parameters			
Analyte				pH	Electrical Conductivity	Total Dissolved Solids	Total Suspended Solids
ALS LORs				0.01	1	10	5
Sample ID	Date sampled	Laboratory	Units	pH units	µS/cm	mg/L	mg/L
TA-MB415	29-Apr-25	ALS		7.00	134	109	288
QAQC1	29-Apr-25	ALS		7.12	138	93	264
RPD				2	3	16	9
TA-MB415	29-Apr-25	ALS		7.00	134	109	288
QAQC2	29-Apr-25	Eurofins		6.5	120	90	350
RPD				7	11	19	19

Analyte Group	Heavy Metals															
Analyte	Arsenic (total)	Arsenic (dissolved)	Cadmium (total)	Cdmium (dissolved)	Chromium (total)	Chromium (dissolved)	Copper (total)	Copper (dissolved)	Lead (total)	Lead (dissolved)	Nickel (total)	Nickel (dissolved)	Zinc (total)	Zinc (dissolved)	Mercury (total)	Mercury (dissolved)
ALS LORs	0.001	0.001	0.0001	0.0001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.005	0.005	0.0001	0.0001
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
TA-MB415	<0.001	<0.001	<0.0001	<0.0001	0.023	<0.001	0.142	0.003	0.005	<0.001	0.028	0.005	0.049	0.009	<0.0001	<0.0001
QAQC1	<0.001	<0.001	<0.0001	<0.0001	0.010	<0.001	0.063	0.003	0.003	<0.001	0.017	0.005	0.034	0.010	<0.0001	<0.0001
RPD	ND	ND	ND	ND	79	ND	77	0	50	ND	49	0	36	11	ND	ND
TA-MB415	<0.001	<0.001	<0.0001	<0.0001	0.023	<0.001	0.142	0.003	0.005	<0.001	0.028	0.005	0.049	0.009	<0.0001	<0.0001
QAQC2	<0.001	<0.001	<0.0002	<0.0002	<0.001	<0.001	0.003	0.003	<0.001	<0.001	0.005	0.005	0.010	0.010	<0.0001	<0.0001
RPD	ND	ND	ND	ND	ND	ND	192	0	ND	ND	139	0	132	NA	ND	ND

Analyte Group	Total Petroleum Hydrocarbons (TPH)					Total Recoverable Hydrocarbons (TRH)				
Analyte	C6-C9	C10-C14	C15-C28	C29-C36	Sum (C10-C36)	C6-C10 minus BTEX (F1)	>C10-C16 minus Naphthalene (F2)	>C16-C34 (F3)	>C34-C40 (F4)	Sum (>C10-C40)
ALS LORs	20	50	100	50	50	20	100	100	100	100
Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
TA-MB415	<20	<50	<100	<50	<50	<20	<100	<100	<100	<100
QAQC1	<20	<50	<100	<50	<50	<20	<100	<100	<100	<100
RPD	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TA-MB415	<20	<50	<100	<50	<50	<20	<100	<100	<100	<100
QAQC2	<20	<50	<100	<100	<100	<20	<50	<100	<100	<100
RPD	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Analyte Group	BTEXN					Polycyclic Aromatic Hydrocarbons (PAH)				
Analyte	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	Anthracene	Benzo(a)pyrene	Fluoranthene	Phenanthrene	Total PAHs (as TEQ)[B]
ALS LORs	1	2	2	2	5	2	2	2	2	2
Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
TA-MB415	<1	<2	<2	<2	<5	<2	<2	<2	<2	<2
QAQC1	<1	<2	<2	<2	<5	<2	<2	<2	<2	<2
RPD	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TA-MB415	<1	<2	<2	<2	<5	<2	<2	<2	<2	<2
QAQC2	<1	<1	<1	<3	<10	<1	<1	<1	<1	<1
RPD	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Analyte Group	Phenols							
Analyte	2,3,4,6-Tetrachlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,6-Dichlorophenol	2-Chlorophenol	Pentachlorophenol	Phenol
ALS LORs	--	2	2	2	2	2	4	2
Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
TA-MB415	--	<2	<2	<2	<2	<2	<4	<2
QAQC1	--	<2	<2	<2	<2	<2	<4	<2
RPD	ND	ND	ND	ND	ND	ND	ND	ND
TA-MB415	--	<2	<2	<2	<2	<2	<4	<2
QAQC2	<10	<10	<3	<3	<3	<3	<10	<3
RPD	ND	ND	ND	ND	ND	ND	ND	ND

Analyte Group	Per- and Poly-fluroalkyl Substances (PFAS)				FTS[A]
Analyte	PFOS	PFOA	PFHxS	PFOS+PFHxS	Total FTS
ALS LORs	0.0002	0.0005	0.0005	0.0002	0.001
Units	µg/L	µg/L	µg/L	µg/L	µg/L
TA-MB415	0.0004	<0.0005	<0.0005	0.0004	<0.001
QAQC1	<0.0002	<0.0005	<0.0005	<0.0002	<0.001
RPD	ND	ND	ND	ND	ND
TA-MB415	0.0004	<0.0005	<0.0005	0.0004	<0.001
QAQC2	0.0002	<0.001	<0.001	<0.001	--
RPD	NA	ND	ND	ND	ND

Analyte Group	Organochlorine Pesticides							Organophosphorus Pesticides				
Analyte	Aldrin	DDT	Dieldrin	Endosulfan	Endrin	Heptachlor	Aldrin + Dieldrin	Chlorpyrifos	Diazinon	Dimethoate	Malathion	Profenofos
ALS LORs	2	4	2	2	2	2	4	2	2	2	2	2
Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
TA-MB415	<2	<4	<2	<2	<2	<2	<4	<2	<2	<2	<2	<2
QAQC1	<2	<4	<2	<2	<2	<2	<4	<2	<2	<2	<2	<2
RPD	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TA-MB415	<2	<4	<2	<2	<2	<2	<4	<2	<2	<2	<2	<2
QAQC2	<5	<5	<5	<5	<5	<5	<5	--	--	--	--	--
RPD	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Analyte Group	Polychlorinated Biphenyls			Nutrients										Silica
Analyte	Aroclor 1242	Aroclor 1254	Total PCBs	Ammonia as N (NH_3-N)	Ammonia ($NH_3 = NH_3$-N x 1.21)	Nitrate as N (NO_3-N)	Nitrate ($NO_3 = NO_3$-N x 4.43)	Nitrite as N (NO_2-N)	Nitrite ($NO_2 = NO_2$-N x 3.29)	Total Nitrogen	Total Kjeldahl Nitrogen	Total Phosphorus	Reactive Phosphorus	Reactive Silica
ALS LORs	--	--	1	0.005	0.005	0.002	0.002	0.002	0.002	0.01	0.01	0.005	0.001	0.05
Units	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
TA-MB415	--	--	<1	0.005	0.006	1.19	5.27	0.003	0.010	1.09	<0.02	0.064	0.018	26.6
QAQC1	--	--	<1	0.009	0.011	1.18	5.23	0.003	0.010	1.08	<0.02	0.075	0.015	26.6
RPD	NA	NA	ND	ND	ND	1	1	ND	ND	1	ND	16	18	0
TA-MB415	--	--	<1	0.005	0.006	1.19	5.27	0.003	0.010	1.09	<0.02	0.064	0.018	26.6
QAQC2	<5	<5	<5	0.010	0.012	1.8	7.97	0.002	0.007	1.8	0.4	0.024	0.024	18
RPD	ND	ND	ND	ND	ND	41	41	40	40	49	ND	91	29	39

Legend:

(green)	Passed criteria
(blue)	Could not be determined (e.g. not tested for that analyte)
(orange)	Failed criteria
A	Total fluorotelomer (FTS) is the sum of 4:2FTS + 6:2FTS + 8:2FTS + 10:2FTS
LOR	Limit of reporting
Bold	Value is greater than the LOR
Grey	Reported concentration is below the LOR
--	Not tested
RPD	Relative percentage difference
ND	Not determined as one value is less than LOR
NA	No RPD limit applies
PFOS	Perfluorooctane sulfonic acid
PFOA	Perfluorooctanoic acid
PFHxS	Perfluorohexane sulfonic acid

$$RPD = \frac{Result1 - Result2}{Mean\ Result} * 100$$

No RPD limit applies where values reported by laboratory are less than two times the LOR
Where values reported by laboratory are less than 20 times the LOR, then the calculated RPD should be less than 50%
Where values reported by laboratory are 20 to 100 times the LOR, then the calculated RPD should be less than 30%
Where values reported by laboratory are greater than 100 times the LOR, then the calculated RPD should be less than 15%

SUMMARY RESULTS - TRIP BLANKS (SOIL)

Project No:
Project Name:

			Analyte Grouping	Total Petroleum Hydrocarbons (TPH)					Total Recoverable Hydrocarbons (TRH)					BTEXN				
			Analyte	C6-C9	C10-C14	C15-C28	C29-C36	Sum (C10-C36)	C6-C10 minus BTEX (F1)	>C10-C16 minus Naphthalene (F2)	>C16-C34 (F3)	>C34-C40 (F4)	Sum (>C10-C40)	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Naphthalene
			ALS LORs	10	50	100	100	50	10	50	100	100	50	0.2	0.5	0.5	0.5	1
Sample ID	Date sampled	Laboratory	Units	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
TB01	01-Apr-25	ALS		<10	--	--	--	--	<10	--	--	--	--	<0.2	<0.5	<0.5	<0.5	<1
QA/QC Assessment				P	--	--	--	--	P	--	--	--	--	P	P	P	P	P
TB02	14-Apr-25	ALS		<10	--	--	--	--	<10	--	--	--	--	<0.2	<0.5	<0.5	<0.5	<1
QA/QC Assessment				P	--	--	--	--	P	--	--	--	--	P	P	P	P	P
TB03	14-Apr-25	ALS		<10	--	--	--	--	<10	--	--	--	--	<0.2	<0.5	<0.5	<0.5	<1
QA/QC Assessment				P	--	--	--	--	P	--	--	--	--	P	P	P	P	P

Legend:

P	Passed
D	Detected
--	Not tested
Bold	Reported concentration is greater than the laboratory LOR
Grey	Reported concentration is below the LOR
LOR	Limit of reporting

SUMMARY RESULTS - TRIP BLANK (WATER) & RINSATES

Project No:
Project Name:

			Analyte Grouping	Total Heavy Metals								Total Petroleum Hydrocarbons (TPH)					Total Recoverable Hydrocarbons (TRH)					BTEXN					Polycyclic Aromatic Hydrocarbons (PAH)			Phenols	Per- and Poly-fluoroalkyl Substances (PFAS)				FTS[A]	PCB
			Analyte	Arsenic	Cadmium	Chromium (total)	Copper	Lead	Nickel	Zinc	Mercury (total)	C6-C9	C10-C14	C15-C28	C29-C36	Sum (C10-C36)	C6-C10 minus BTEX (F1)	>C10-C16 minus Naphthalene (F2)	>C16-C34 (F3)	>C34-C40 (F4)	Sum (>C10-C40)	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Naphthalene	Benzo[a]pyrene	Carcinogenic PAHs (as BaP TEQ (zero))	Total PAHs	Phenols	PFOS	PFOA	PFHxS	PFOS+PFHxS	Total FTS	PCBs
			ALS LORs	0.001	0.0001	0.001	0.001	0.001	0.001	0.005	0.0001	20	50	100	50	50	20	100	100	100	100	1	2	2	2	5	0.5	0.5	0.5	1	0.01	0.01	0.01	0.01	0.05	1
Sample ID	Date sampled	Laboratory	Units /Description	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
QAQC3	29-Apr-25	ALS	Rinsate from water dipper probe	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.0001	<20	<50	<100	<50	<50	<20	<100	<100	<100	<100	<1	<2	<2	<2	<5	<0.5	<0.5	<0.5	<1.0	<0.0002	<0.0005	<0.0005	<0.0002	<0.001	<1
QA/QC Assessment				P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
QAQC4	29-Apr-25	ALS	Rinsate from water field parameter beaker	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.0001	<20	<50	<100	<50	<50	<20	--	--	--	--	<1	<2	<2	<2	<5	--	--	--	--	0.0002	<0.0005	<0.0005	0.0002	<0.001	--
QA/QC Assessment				P	P	P	P	P	P	P	P	P	P	P	P	P	P	--	--	--	--	P	P	P	P	P	--	--	--	--	D	P	P	D	P	--
Trip Blank	29-Apr-25	ALS		--	--	--	--	--	--	--	--	<20	--	--	--	--	<20	--	--	--	--	<1	<2	<2	<2	<5	--	--	--	--	--	--	--	--	--	--
QA/QC Assessment				--	--	--	--	--	--	--	--	P	--	--	--	--	P	--	--	--	--	P	P	P	P	P	--	--	--	--	--	--	--	--	--	--

Legend:

P	Passed
D	Detected
--	Not tested
A	Total fluorotelomer (FTS) is the sum of 4:2FTS + 6:2FTS + 8:2FTS + 10:2FTS
Bold	Reported concentration is greater than the LOR
Grey	Reported concentration is below the LOR
PFOS	Perfluorooctane sulfonic acid
PFOA	Perfluorooctanoic acid
PFHxS	Perfluorohexane sulfonic acid
LOR	Limit of reporting

Quality assurance / quality control assessment

Appendix H

pitt&sherry

Table H1: Field QA/QC procedures

Quality Control Requirement	Completed / Acceptable	Comments
Appropriate sampling strategy employed, and representative samples collected.	Yes	• Investigations were undertaken in general accordance with the guidelines and standards listed in Section 1.4.
Sampling conducted by appropriately qualified staff.	Yes	• Sampling was conducted by an associate (soils) or experienced (groundwaters) pitt&sherry environmental consultant experienced in contaminated land sampling.
Appropriate and well documented sample collection, handling, logging and transportation.	Yes	• All sample containers and sample chiller boxes were checked prior to use to ensure that no cross-contamination risks were present • Appropriately clean and/or sterile sampling equipment and vessels were used • Samples were immediately transferred to a labelled and laboratory-supplied sampling vessel; and • Samples were placed into a cooled chiller box for sample preservation before transport and delivery to the laboratory.
CoC documentation completed.	Yes	• All samples were transported under appropriate CoC procedures (Appendix F).
Required number of blind duplicates collected (minimum 1 in 20).	Yes	• Soils / fill material samples: o Village – 14 primary and 1 triplicate set collected o Switchyard – 23 primary and 2 triplicate sets collected • Water samples: o Village – 2 primary collected (opportunistically); and o Switchyard – 4 primary and 1 triplicate set collected.
Reported RPDs within limits set in AS 4482.1.	Partial	• Soil / fill materials – where determined, RPDs between the primary and secondary samples were acceptable for all tested CoPCs with the exception of select metals (As, Ni or Zn) in some sample pairs from the Switchyard; variation in metals concentrations are expected given the nature of the fill material and as such these RPD breaches do not change the conclusions of this ESA; and • Groundwaters – where determined, RPDs between the primary and secondary samples were acceptable for all tested CoPCs with the exception of select metals (Cr, Cu, Ni and/or Zn) in both sample pairs and some nutrients in one sample pair; suspended sediment in replicated groundwater samples can cause higher variability in results.
Trip blank samples collected.	Yes	• 4 trip blank samples (3 soil and 1 water) were submitted to the laboratory with the primary samples (at least 1 per batch) for BTEX and TPH (C_6-C_9) / TRH (F1 fractions) analyses; and • Reported concentrations (Appendix G) were below the LORs for the individual parameters in all trip blank samples, indicating cross-contamination during transport is unlikely.

Quality Control Requirement	Completed / Acceptable	Comments
Rinsate sample collected.	Yes	• Soil / fill materials – no reuseable equipment (other than the drill rig and excavator) • Groundwater – 1 rinsate sample from the water level dipper probe and 1 from the beaker used to measure field parameters • Reported concentrations (Appendix G) were below the LORs in both rinsate samples for all tested parameters with the exception of PFOS in the rinsate from the beaker which was reported at the LOR; and • Reported concentrations indicate that cross-contamination from the use of sampling equipment (particularly that which enters the groundwater well) is unlikely.
Samples delivered to laboratory within sample holding times.	Partial	• Soils / fill materials – samples were delivered to the laboratory within the required holding times for the majority of tested analytes, with the exception of pH and EC which cannot be met due to the interstate location of the laboratories; pH and EC were only used to determine conservative ACLs / EILs for select metals and these holding time breaches do not change the conclusions of this ESA; and • Waters – samples were delivered to the laboratory within the required holding times for the majority of tested analytes, with the exception of pH which cannot be met due to the interstate location of the laboratories; pH was also recorded in the field (Appendix C) and these holding time breaches do not change the conclusions of this ESA.

Notes:

A – Australian Standard *Guide to the investigation and sampling of sites with potentially contaminated soil Part 1: Non-volatile and semi-volatile* compounds, Standards Australia, 2005 (AS 4482.1).

Green shading – indicates QA/QC requirement has been met.

Gold shading – indicates QA/QC requirement has been partially met; refer to comment provided.

Red shading – indicates QA/QC requirement has not been met; refer to comment provided.

Table H2: Laboratory QA/QC procedures – ALS laboratory

Quality Control Requirement	Completed / Acceptable				Comments
Report ID	**EM2505614**	**EM2506417**	**EM2506755**	**EM2507331**	
Report Purpose	**Village Soils & Inflow Water**	**Switchyard Soils**	**Switchyard Soils**	**Switchyard Ground-waters**	
Samples extracted and analysed within relevant holding times.	Partial	Partial	Yes	Partial	• EM2505614 – pH and EC were extracted 1 day late in TA-TP453/1.5 and 2 days late in TA-TP450/0.2; pH and EC were only used to determine conservative ACLs / EILs for select metals and these holding time breaches do not change the conclusions of this ESA • EM256417 – pH and EC were extracted 5 days late in TA-456/0.3; pH and EC were only used to determine conservative ACLs / EILs for select metals and these holding time breaches do not change the conclusions of this ESA • EM2506755 – no holding time breaches occurred; and • EM2507331 – pH was analysed 5 days late in all groundwater samples; pH was also recorded in the field (Appendix C) and these holding time breaches do not change the conclusions of this ESA.

Quality Control Requirement	Completed / Acceptable				Comments
Report ID	**EM2505614**	**EM2506417**	**EM2506755**	**EM2507331**	
Report Purpose	**Village Soils & Inflow Water**	**Switchyard Soils**	**Switchyard Soils**	**Switchyard Ground-waters**	
All analyses NATA accredited.	Partial	Partial	Yes	Yes	• EM2505614 and EM2506417 – ALS is not NATA-accredited for cation exchange capacity (CEC); CEC was only used to determine conservative ACLs / EILs for select metals and the lack of NATA accreditation does not change the conclusions of this ESA; and • ALS is NATA accredited for all remaining analyses performed.
Appropriate analytical methodologies used, in accordance with Schedule B(3) of the ASC NEPM.	Yes	Yes	Yes	Yes	• Refer to the ALS Interpretive Quality Control reports in Appendix F for methods used and relevance to Schedule B(3) of the ASC NEPM.

Quality Control Requirement	Completed / Acceptable				Comments
Report ID	**EM2505614**	**EM2506417**	**EM2506755**	**EM2507331**	
Report Purpose	**Village Soils & Inflow Water**	**Switchyard Soils**	**Switchyard Soils**	**Switchyard Ground-waters**	
Acceptable laboratory LORs adopted.	Partial	Partial	Yes	Partial	• EM2505614 – LORs were generally lower than assessment criteria, with the exception of the inflow water LORs for PAHs which were higher than the NHMRC recreational TVs and the ANZG freshwater TVs (95% of species protection) (refer to Section 6.4) • EM2506417 – LORs were generally lower than assessment criteria, with the exception of the soil LOR for BaP which was higher than the IB105 Level 1 criterion; the LOR was raised due to samples requiring dilution prior to analysis due to matrix interference in the majority of samples (refer to Section 6.2.2) • EM2506755 – LORs were lower than assessment criteria • EM2507331 – LORs were generally lower than assessment criteria, with the exception of the groundwater LORs for PAHs which were higher than the NHMRC recreational TVs and the ANZG freshwater TVs (95% of species protection) and OCP / OPP which were higher than the ANZG freshwater TVs (95% of species protection) (refer to Section 6.5.1); and • These LOR outliers do not change the conclusions of this ESA (refer to referenced sections for discussion).
Acceptable laboratory QC results – laboratory duplicates.	Partial	Yes	Yes	Yes	• EM2505614 – duplicate outliers for TPH (C10-C14) and TRH (F3 fractions) in an ‘anonymous sample; not applicable to the sample set as the matrix is different; and • Remaining reports – no laboratory duplicate outliers occurred.
Acceptable laboratory QC results – method blanks.	Yes	Yes	Yes	Yes	• No method blank outliers occurred.

Quality Control Requirement	Completed / Acceptable				Comments
Report ID	**EM2505614**	**EM2506417**	**EM2506755**	**EM2507331**	
Report Purpose	**Village Soils & Inflow Water**	**Switchyard Soils**	**Switchyard Soils**	**Switchyard Ground-waters**	
Acceptable laboratory QC results – matrix spikes.	Yes	Yes	Partial	Partial	• EM2506755 – matrix spike outlier occurred for As in an 'anonymous' sample, with the recovery not determined, background level greater than or equal to 4 x spike level; not applicable to the sample set as the matrix is different • EM2507331 – matrix spike outliers occurred for: o NOx in MB412 – recovery not determined, background level greater than or equal to four times the spike level; NO_2-N consistently exceeded the ANZG freshwater TV (95% of species protection) in all groundwater samples and this outlier does not change the conclusions of this ESA o PFAS (7) and FTS (2) in MB415 – recovery less than lower DQO; PFAS were below all adopted guideline criteria in all groundwater samples and these outliers do not change the conclusions of this ESA; and • Remaining reports – no matrix spike outliers occurred.
Acceptable laboratory QC results – laboratory control spikes.	Yes	Yes	Yes	Yes	• No laboratory control outliers occurred.
Acceptable laboratory QC results – surrogates.	Yes	Yes	Yes	Yes	• No surrogate recovery outliers occurred.

Quality Control Requirement	Completed / Acceptable				Comments
Report ID	**EM2505614**	**EM2506417**	**EM2506755**	**EM2507331**	
Report Purpose	**Village Soils & Inflow Water**	**Switchyard Soils**	**Switchyard Soils**	**Switchyard Ground-waters**	
Acceptable laboratory QC results – QC sample frequency.	Partial	Yes	Yes	Partial	• EM2505614 – less than the expected number of QC samples were provided for PAHs, phenols and TRH (semi volatile fraction) analysis in laboratory duplicates and matrix spikes; reported concentrations of these analytes in primary samples were all below the LORs and this outlier does not change the conclusions of this ESA • EM2507331 – less than the expected number of QC samples were provided for PAHs, phenols and TRH (semi volatile fraction) analysis in laboratory duplicates and matrix spikes; reported concentrations of these analytes in primary samples were below the LORs (with the exception of TRH F3 fractions) and this outlier does not change the conclusions of this ESA; and • Remaining reports – no QC sample frequency outliers occurred.

Notes:

Green shading – indicates QA/QC requirement has been met.

Gold shading – indicates QA/QC requirement has been partially met; refer to comment provided.

Red shading – indicates QA/QC requirement has not been met; refer to comment provided.

Table H3: Laboratory QA/QC procedures – Eurofins laboratory

Quality Control Requirement	Completed / Acceptable				Comments
Report ID	**1206255-S**	**1210100-S**	**1214755-W**	**1216797-S**	
Report Purpose	**Village Soils**	**Switchyard Soils**	**Switchyard Ground-waters**	**Village Soils (Cr speciation)**	
Samples extracted and analysed within relevant holding times.	Yes	Yes	Partial	Partial	• 1214755-W – pH was extracted 7 days late and NO_2-N and reactive silica were extracted 2 days late in the single sample; pH was also recorded in the field (Appendix C) and this holding time breach does not change the conclusions of this ESA; the holding time breach for NO_2-N and reactive silica correlates with the RPD exceedance between the primary and duplicate sample, with the ALS results for these parameters considered to be more accurate • 1216797-S – Cr(VI) was extracted 9 days late; given the Cr(VI) analysis was requested as a follow-up to determine if the reported total Cr was in the Cr(III) or Cr(VI) form small variations in analyte concentrations are not material to this ESA; furthermore, all total Cr was found to be in the Cr(III) form; and • Remaining reports – no holding time breaches.
All analyses NATA accredited.	Yes	Yes	Yes	Yes	• Eurofins is NATA-accredited for all analyses performed.
Appropriate analytical methodologies used, in accordance with Schedule B(3) of the ASC NEPM.	Yes	Yes	Yes	Yes	• Refer to the laboratory reports in Appendix F for methods used and relevance to Schedule B(3) of the ASC NEPM.
Acceptable laboratory LORs adopted.	Yes	Yes	Partial	Yes	• 1214775-W – LORs were generally lower than assessment criteria, with the exception of the groundwater LORs for PAHs which were higher than the NHMRC recreational TVs and the ANZG freshwater TVs (95% of species protection) and 2,4-Dimethylphenol, OCP and PCBs which were higher than the ANZG freshwater TVs (95% of species protection); and • These LOR outliers do not change the conclusions of this ESA (refer to Section 6.5.1 for discussion).

Quality Control Requirement	Completed / Acceptable				Comments
Report ID	**1206255-S**	**1210100-S**	**1214755-W**	**1216797-S**	
Report Purpose	**Village Soils**	**Switchyard Soils**	**Switchyard Ground-waters**	**Village Soils (Cr speciation)**	
Acceptable laboratory QC results – laboratory duplicates.	Yes	Yes	Yes	Yes	• No laboratory duplicate outliers occurred.
Acceptable laboratory QC results – method blanks.	Yes	Yes	Yes	Yes	• No method blank outliers occurred.
Acceptable laboratory QC results – matrix spikes.	Yes	Yes	Yes	Yes	• No matrix spike outliers occurred.
Acceptable laboratory QC results – laboratory control spikes.	Yes	Yes	Yes	Yes	• No laboratory control outliers occurred.
Acceptable laboratory QC results – surrogates.	Yes	Partial	Yes	Yes	• 1210100-S – PFOS recovery in QCS03 of 37% was less than the lower DQO of 50% for PFAS; PFAS were below the LORs and this outlier does not change the conclusions of this ESA; and • Remaining reports – no surrogate recovery outliers occurred.
Acceptable laboratory QC results – QC sample frequency.	Unknown	Unknown	Unknown	Unknown	• QC sample frequency outliers not reported.

Notes:

Green shading – indicates QA/QC requirement has been met.

Gold shading – indicates QA/QC requirement has been partially met; refer to comment provided.

Red shading – indicates QA/QC requirement has not been met; refer to comment provided.