Data Gap Investigation Report

Build to Rent, Beinda Street, Bomaderry NSW

304001019

12 June 2024

Prepared for:

Landcom

Prepared by:

Stantec Australia Pty Ltd

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Executive Summary:

Stantec Australia Pty Ltd (Stantec) was engaged by Landcom (the client) to complete a Contamination Data Gap Investigation (DGI) for a property located at 53-57 Bolong Road & 4 Beinda Street, Bomaderry, NSW 2541 (the site).

The purpose of the DGI report is to support a Development Application (DA) for the proposed medium-density residential development at the site, and the objective of the DGI is to provide a more complete and definitive assessment of contamination at the site to assess the suitability for the proposed future land use.

Following completion of the DGI, the following conclusions have been drawn:

- Naturally occurring methane and carbon dioxide gases, and probable naturally occurring hydrogen sulfide gas are currently detected at the site underlying the proposed development area at concentrations that could pose risk to workers and occupiers of a proposed development unless managed and mitigated appropriately.
- In regard to this potential gas risk, Stantec consider that sufficient monitoring data has been gathered to determine that the site can be made suitable for the proposed development through implementation of a standard gas mitigation approach that does not significantly alter the current concept design prepared for Development Application (DA) and that would render the source-pathway-receptor linkage incomplete for future occupants.
- Based on current information, the most likely gas mitigation system would include a sub-slab ventilation layer and potential vapour barrier where potential gas accumulation is vented to the atmosphere via pipework and a barrier is placed to mitigate odour. An independent assessment of site conditions and management advice was sought from BGL Nominees Pty Ltd, a specialist consultancy responsible for design and installation of hazardous ground gas protection systems. A copy of the Ground Gas Protection System – Conceptual Advice memo prepared by BGL is available in **Appendix I** and states the following in relation to the site:
  - *Consideration for sub-slab ventilation and/or an independently tested gas membrane are commonplace to the presented risk profile at the site and BGL provide an example cross section for illustrative purposes (*see **Appendix I***).*
  - *These types of mitigation approaches have been performed within the Australian market over the last 20 years and can be integrated into the built form without significant changes to the building design.*
  - *On the available information, BGL consider the scenario presented as typical of those we commonly encounter and by adoption of similar protection measures to those outlined above, a solution can be integrated into the built form without significant change.*
- Where the source of hydrogen sulfide gas is identified as a leaking sewer, rather than naturally occurring, the leaking sewer can be fixed to mitigate the problem. This would remove the need for a vapour barrier while the ventilation layer in response to methane and carbon dioxide would remain.

- The preferred and most suitable mitigation strategy will be incorporated into the project design, post-DA, and be considerate of the planned further gas monitoring targeted at the ground floor receptors and design features that could be affected by hazardous ground gas. The ground gas protection system would be designed in conjunction with the detailed design with specialist inputs provided by a suitably qualified and experienced ground gas specialist, such as BGL Nominees Pty Ltd. As shown within the cross-sectional illustration of a typical ground gas protection system typically applied under a scenario comparable with the site (see **Appendix I**), the sub-slab design is relatively basic and would not significantly alter the current design.
- Further gas monitoring will continue during the DA assessment period and during early stages of the detailed design phase of the development. The findings of continued gas monitoring will inform the mitigation system design and ultimately be incorporated into the detailed design.
- No contaminant concentrations in soil were detected above the adopted human health criteria.
- Bonded fragments of asbestos cement sheeting were observed at the following locations:
  - A single fragment was observed within a pile of waste with the centre of the site, a location historically utilised by the former sawmill. Based on observations and laboratory testing, the asbestos appeared to be localised to this area.
  - Fragments of asbestos cement sheeting were observed near the exterior of the existing residential dwelling at the corner of Beinda Street and Bolong Road. The fragments appeared to be resultant from recent damage to the cement sheeting façade of the dwelling.
- Groundwater conditions on site, from a chemical contaminant perspective, are not expected to preclude the proposed medium-density residential land use as per the current concept design. Based on the current design (refer to Appendix A), deep earthworks that would encounter permanent groundwater are not likely and extraction of groundwater for the protection of future residential building assets (i.e. flooding buildings or hydrostatic pressures) may not be required.
- Groundwater and ground gas impacts generally corelate with each other and indicate the potential presence of Acid Sulfate Rock (ASR) and/or acid sulfate soil (ASS) that are generating acidic and reducing groundwater conditions and gas production of methane, hydrogen sulfide and carbon dioxide. The presence of ASR has not been confirmed, however, the lines of evidence point to this possibility. Investigation of the potential for ASR should be conducted.
- Alternative sources may include leaking sewage infrastructure, but this is less likely based on Council review and comment.
- Further investigation across the site is warranted so that sources can be resolved and/or mitigation for the proposed development designed. Elevated carbon dioxide would similarly be mitigated by treatment of the other gases. Where not mitigated or resolved, both gases at the current maximum measured concentrations would require notification to the NSW Environment Protection Authority (EPA) should they be detected within infrastructure. The proposed mitigation system would resolve the gas risk such that notification to the NSW EPA would not be required.
- In a workplace environment the noted gases would be considered to represent hazardous or unsafe environments for workers at concentrations that exceed 0.25% v/v (methane), 5 ppm (hydrogen sulfide), 0.1% v/v (carbon dioxide in an accessible space for workers), 25 ppm (carbon monoxide) and less than 19.5% v/v (oxygen). As such control measures for construction workers and works would require consideration during future construction activities.

- The investigations completed at the site have been undertaken to support the development approval for the proposed medium density residential development at the site. Section 4.6 of the State Environmental Planning Policy (Resilience and Hazards) 2021 specifies the considerations for determining a development application. Based on the works completed, Stantec consider that the SEPP requirements have been met through demonstration that the ground gas identified at the site can be appropriately managed through incorporation of a ground gas protection system into the detailed design (see **Appendix I**), such that the site would be suitable for the proposed medium density residential land use, as per the current design.

Abbreviations

ACM	Asbestos Containing Material
AST	Above-ground Storage Tank
BoM	Bureau of Meteorology
BTEX	Benzene, Toluene, Ethylbenzene, Xylene
CBD	Central Business District
CLM	Contaminated Land Management
CSM	Conceptual Site Model
DBYD	Dial Before You Dig
DCP	Development Control Plan
DQI	Data Quality Indicators
DQO	Data Quality Objectives
EIL	Ecological Investigation Level
EPA	Environmental Protection Authority
ESL	Ecological Screening Level
GGPS	Ground Gas Protection System
HIL	Health Investigation Level

HSL	Health Screening Level
km	Kilometers
LEP	Local Environmental Plan
LGA	Local Government Authority
LOR	Limit of Reporting
m	Meters
mAHD	Meters Australian Height Datum
mBGL	meters Below Ground Level
NATA	National Association of Testing Authorities, Australia
NEMP	National Environmental Management Plan
NEPC	National Environmental Protection Council
NEPM	National Environmental Protection Measure
NSW	New South Wales
OCP	Organochlorine Pesticides
OEH	Office of Environment & Heritage
OPP	Organophosphorus Pesticides
PAH	Polycyclic Aromatic Hydrocarbons

PCB	Polychlorinated Biphenyls
PID	Photoionization Detector
PoEO	Protection of the Environment Operations
ppm	parts per million
QA/QC	Quality Assurance / Quality Control
RL	Reduced Level
RPD	Relative Percentage Difference
SEPP	State Environmental Planning Policy
SPR	Source – Pathway – Receptor
SWL	Static / Standing Water Level
SWMS	Safe Work Method Statement
TfNSW	Transport for NSW
TRH	Total Recoverable Hydrocarbons
UST	Underground Storage Tank
VOC	Volatile Organic Compound

1.0 INTRODUCTION

Stantec Australia Pty Ltd (Stantec) was engaged by Landcom (the client) to complete a Contamination Data Gap Investigation (DGI) for a property located at 53-57 Bolong Road & 4 Beinda Street, Bomaderry, NSW 2541 (the site). The site locality and boundary are shown on **Figure 1** in **Appendix A** and the site definition provided in **Section 2.1**.

The DGI was prepared in accordance with the scope of works specified in Variation letters to Landcom on the 7 December 2023 and 6 February 2024.

1.1 BACKGROUND

This DGI was requested by Landcom to support a Development Application (DA) submission for the proposed development of a medium-density residential land use at the site. Architectural drawings showing the building layout and concept design for the proposed development are provided in **Appendix A**.

The DGI is a supplementary investigation following completion of a Due Diligence Assessment (Stantec 2023a) and an Intrusive Contamination Investigation Report (Stantec 2023b). A detailed summary of the previous reports is provided in **Section 3.1**.

1.2 PURPOSE AND OBJECTIVES

The purpose of the DGI report is to support a DA for the proposed development, and the objective of the DGI is to provide a more complete and definitive assessment of contamination to assess the suitability of the site for the proposed future land use.

1.3 SCOPE OF WORKS

A high-level summary of the scope of works undertaken during the DGI is provided below, consistent with that specified within the proposal (Stantec 2023). In addition, a detailed summary of the investigation methodology is provided in **Section 5.0**.

1.3.1 Preliminaries

Prior to the commencement of fieldwork, the following was completed:

- Preparation of Risk Management Strategy (RMS), a SWMS equivalent, defining the works to be completed, the hazards and risks, and the mitigation measures to manage the hazards and risks that may occur during the DGI;
- Lodgement of a Before You Dig Australia (BYDA) (formerly Dial-Before-You-Dig) underground utilities search and the plans were reviewed for services and utilities;

- A Telstra accredited underground service locater was engaged and carried out locating and marking of underground services;
- Appropriately qualified contractors for intrusive investigation (licensed driller and civil earthworks operator) were engaged;
- Rental of all required field equipment and order required sampling consumables prior to the commencement of fieldwork.

1.3.2 Fieldwork

The fieldwork component of the DGI comprised the following key elements:

- Excavation of nine (9) test pits utilising a track mounted excavator, operated by a licensed operator;
- Drilling of four (4) boreholes utilising a track mounted drill rig with a drilling method including solid auger and air hammer percussion.
- Installation of one (1) groundwater monitoring well (BH04) and three (3) ground gas bores (GG1 – GG3) within the boreholes specified above.
- Soil sampling at each test pit location at the following depths: near-surface and 0.5 meter until 0.3m into natural soil or upon refusal. Soil sampling from boreholes was generally prohibited by the presence of shallow rock requiring air-hammer drilling method, which does not provide suitable samples for collection and analysis.
- Field screening of soil samples for volatile organic compound (VOC) content using a calibrated photo-ionisation detector (PID).
- Logging of the geological profile and observations of each test pit and borehole (where possible) in accordance with Australian Standard AS 1726:2017 – Geotechnical Site Investigations. All excavated materials were also inspected for potential indicators of contamination including odour, sheen, staining and the presence of asbestos containing materials (ACM).
- Two (2) rounds of groundwater monitoring utilising three (3) groundwater wells installed at the site. Groundwater samples were collected with a low-flow sampling methodology and groundwater quality parameters were measured in the field;
- Laboratory testing of soil and groundwater samples was undertaken at a National Association of Testing Authorities, Australia (NATA) accredited laboratory for analysis of the following contaminants:
  - Soil
    - Total Recoverable Hydrocarbons (TRH);
    - Benzene, Toluene, Ethylbenzene and Xylenes (BTEX);
    - Metals (arsenic, cadmium, chromium copper, lead, mercury, nickel and zinc);
    - Polycyclic Aromatic Hydrocarbons (PAHs);
    - Polychlorinated biphenyls (PCBs);
    - Organochlorine Pesticides (OCP) / Organophosphate Pesticides (OPP);
    - Perfluoroalkyl substances; and
    - Asbestos quantification (ASC NEPM 2013) and asbestos identification (presence / absence).
  - Groundwater
    - TRH;

- BTEX;
- Total and dissolved metals (arsenic, cadmium, chromium copper, lead, mercury, nickel and zinc);
- PAHs;
- PCBs;
- OCP / OPP;
- Perfluoroalkyl substances;
- Sulfate;
- pH / electrical conductivity (EC);
- Biochemical Oxygen Demand (BOD);
- Chemical Oxygen Demand (COD);
- Nitrate;
- Dissolved methane;
- Hydrogen sulphide; and
- Ammonia.

- Four (4) rounds of sub-surface ground gas monitoring utilising a calibrated GA5000 landfill gas analyser. Ground gas monitoring was conducted at three (3) ground gas bores and one (1) groundwater well within the site.
- Deployment of a calibrated GasClam continuous ground gas monitor, which monitored ground gas bore GG1 for a three (3) day monitoring period, and ground gas bore GG3 for a fifteen (15) day monitoring period.

1.3.3 Reporting

Preparation of a Data Gap Investigation (DGI) report, prepared in consideration of the NSW EPA Consultants Reporting on Contaminated Land Guidelines (EPA 2020) and the National Environment Protection (Assessment of Site Contamination) Measure (1999) (NEPC 2013).

1.4 APPLICABLE GUIDELINE AND LEGISLATION

The scope of this DGI report was developed in accordance with the following guidelines and legislation:

- NSW Contaminated Land Management Act 1997 (CLM Act 1997);
- NSW Department of Urban Affairs and Planning (2022) Managing Land Contamination: Planning Guidelines: Hazards and Resilience SEPP, 2022;
- NEPC National Environment Protection (Assessment of Site Contamination) Measure 1999. National Environmental Protection Council (NEPC 2013);
- NSW EPA Consultants Reporting on Contaminated Land - Contaminated Land Guidelines, NSW Environment Protection Authority, April 2020, Updated 5 May 2020 (EPA 2020);
- NSW EPA Contaminated Land Guidelines Sampling design part 1 – application. New South Wales Environment Protection Authority (EPA, August 2022).

- NSW EPA Contaminated Land Guidelines Sampling design part 2 – interpretation. New South Wales Environment Protection Authority (EPA, August 2022).
- ANZG Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, 2018 (ANZG 2018);
- NSW EPA Assessment and management of hazardous ground gases, Contaminated Land Guidelines, amended May 2020;
- Standards Australia (2005) Australian Standard AS 4482.1-2005 – Guide to the investigation and sampling of sites with potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds.
- Standards Australia (1999) Australian Standard AS 4482.2-1999 - Guide to the sampling and investigation of potentially contaminated soil. Part 2: Volatile substances.

2.0 SITE DESCRIPTION IDENTIFICATION

2.1 SITE DETAILS

Information defining the site are provided in **Table 2-1** below, and a site plan is presented in **Appendix A** that shows the site boundary, surface contours and significant features.

Table 2-1 Site Identification Details

Item	Details		
Site Address	53-57 Bolong Road & 4 Beinda Street, Bomaderry, NSW 2541		
Local Government Area (LGA)	Shoalhaven City Council		
Current Land Zoning	Under Shoalhaven Local Environmental Plan 2014 the site is current zoned as *R3 – Medium Density Residential*. The following objectives are identified for R3: • *To provide for the housing needs of the community within a medium density residential environment.* • *To provide a variety of housing types within a medium density residential environment.* • *To enable other land uses that provide facilities or services to meet the day to day needs of residents.* • *To provide opportunities for development for the purposes of tourist and visitor accommodation where this does not conflict with the residential environment.*		
Current land use	The site is currently disused and comprises the following parcels: • A portion of land to the west that was formerly associated with a nearby sawmill to the west. This area is free of buildings and structures except for a small metal shed toward the eastern boundary. • Two low density residential houses are situated along Bolong Road in the eastern portion of the site: - 57 Bolong Road comprises of three lots and contains one residential dwelling with associated car ports and landscaping. - 53 Bolong Road comprises of one lot and contains one dwelling with landscaping. A sewer vent was noted at the western side of the dwelling in the southeast. The orientation of the sewer ventilation infrastructure is not known.		
Proposed Land Use	Medium density residential comprising of two buildings that will be built on-grade requiring up to 1 metre of cut at some locations to achieve a level ground surface. The current design shows that the ground floor of each building will predominantly be occupied by car parking with some plant / storage rooms and facilities, approximately three dwellings that have a courtyard area. The large proportion of dwellings will be located on the levels above the ground floor.		
Approximate Coordinates	**Boundary**	**Easting**	**Northing**
	North	280995.933	6140105.551
	South	280977.165	6140069.397
	West	280933.113	6140105.475
	East	281032.183	6140067.293
Title Details and Ownership	The site is comprised of eight (8) lots:		

Item	Details
	• Lot 1 DP 25566 • Lot 2 DP 25566 • Lot 3 DP 25566 • Lot 4 DP 25566 • Lot 5 DP 25566 • Lot 6 DP 25566 • Lot 7 DP 25566 • Lot 1 DP 329959
Site Area (approximate)	0.6 ha

2.2 SURROUNDING LAND USE

The land uses immediately surrounding the site were visually assessed during site visits that took place between December 2023 and January, February 2024. The site and surrounding land uses identified during the DGI are summarised below in **Table 2-2** and shown in **Appendix A.**

Table 2-2 Surrounding Land Use

Direction	Land Use or Activity
North	Beinda Street is directly north and the general land use low-density residential with dwellings observed. Further north is public open space approximately 100m north of the site.
East	Bolong Road is east of the site with a commercial precinct further east. North east of the site is a commercial petrol station at the intersection of Beinda Road and Bolong Road.
South	A low density residential land use is located immediately south, with Bolong Road further south as well as the commercial precinct noted above.
West	A disused sawmill with associated structures, shed and cottage, is located directly west and north west. Further west is a moderately sloped embankment sloping northward to a wetland located approximately 70m from the site.

2.3 REGIONAL AND SITE SETTING

Site setting information, as listed within publicly available data sets, is summarised below in **Table 2-3**.

Table 2-3 Site Setting Information

Item	Details
Regional Soil Landscape	The NSW DPIE eSPADE v2.2 website indicates that the site is overlying the fluvial Shoalhaven (sf) soil landscape. The Shoalhaven soil landscape is described as: • *Level to gently undulating. Present riverbed and banks, active floodplain with levees and backwater swamps on alluvium. Flat to gently undulating terrace surfaces of the Shoalhaven River. Relief <5 m and slopes <3%. Completely cleared.* • *Soils are described as moderately deep (50–100 cm) Prairie Soils (Gn4.31) occur on levees. Red Earths (Gn2.11) and Yellow and Red Podzolic Soils (Dy.2.51, Dr2.21) occur on terraces. Alluvial Soils (Uc1.22, Uc1.23) and Gleyed Podzolic (potential Acid Sulphate) Soils (Dg1.41) occur on the floodplain.* • *Development limitations of the Shoalhaven soil landscape include flood hazards, seasonal waterlogging, permanently high-water table, hard setting, acid sulphate potential (subsoil), strongly acid, sodicity.*
Regional Geology	The NSW Minview Online Mapping Seamless Geology indicated that the site is underlain by Nowra Sandstone which is described as:

Item	Details
	• *Fine- to very coarse grained quartzose sandstone, with a three-fold subdivision: a very coarse-grained base with minor pebbly lenses, a central siltstone zone and a cross bedded medium-grained quartz sandstone up sequence.*
Topography	Following review of the topographic map provided in Lotsearch Report LS045079, the highest elevations are within the northern portion of the site at an approximate elevation of 14 meters Australian height datum (m AHD), with lowest elevations are in the southern and north-eastern portions of the site at approximately 8 m AHD. The site has a moderate fall from the centre to the eastern corner and a gentle fall from north-east to south-west along the western boundary.
Regional Groundwater	A search of registered groundwater bores identified five (5) registered bores within a 500m radius. Information is provided below: • Bore ID GW109969 (442m, west), listed as monitoring bore, drilled in 2007 to a total depth of 15.2m. • Bore ID GW110605 (442m, west), listed as monitoring bore, drilled in 2007 to a total depth of 15.2m • Bore ID GW109970 (458m, west), listed as monitoring bore, drilled in 2007 to a total depth of 1.8m. Standing water level (SWL) was recorded at 1.33 metres below ground level (m BGL) on 27/09/2007. • Bore ID GW110606 (458m, west), listed as monitoring bore, drilled in 2007 to a total depth of 1.8m. • Bore ID GW114453 (482m, north-east), listed as monitoring bore, drilled in 2011 to a total depth of 6.0m. SWL recorded at 2.5 mBGL on 21/11/2011. Due to the distance between the site and monitoring bores, it is considered unlikely that the bores are representative of local hydrogeological conditions underlying the site. The Hydrogeology Map of Australia identifies that the hydrogeological setting beneath the site comprises of fractured or fissured, extensive aquifers of low to moderate productivity.
Surface Water Body	An unnamed tributary is located approximately 90m west of the site. The tributary runs in a north to south direction and flows into Bomaderry Creek running into Shoalhaven River. Bomaderry Creek is located approximately 125m south-east from the south-eastern corner of the site. The Shoalhaven River is located approximately 347m from the south-east of the site.
Acid Sulfate Soils	The acid sulfate soil risk map, accessed utilising eSPADE version 2.2, indicates that the site is mapped within an area of no known occurrence, however, approximately 40 meters to the west and east are mapped as having a 'high' probability of occurrence.
Acid Sulfate Rock	A check of the site location against Figure 1, Managing The Risks Associated With Acid Sulfate Rock In NSW Road Projects (Nicholas Bridgement) indicates that the site is located within or at the boundary of areas mapped as having very high probability of acid sulfate rock. Due to the poor resolution of the map, it is not possible to confirm if the site is within the high probability zone with 100% accuracy.
Salinity	The site and surrounds have not been assessed for dryland salinity according to the Lotsearch Report LS045079.

2.4 SITE DESCRIPTION

A site inspection was undertaken by an experienced Environmental Scientist and contaminated land professional from Stantec. Detailed observations made during the inspection are provided below in **Table 2-4**, whilst photographs taken during the inspection are provided in **Appendix B**.

Table 2-4 Site Inspection Details

Item	Details
Weather conditions	The site was inspected on 26th of February 2024. At the time of the inspection, the temperature was approximately 24 degrees Celsius under dry conditions, however, the site had received light rain the night prior.
Site topography and drainage features	The site topography is characterised by higher elevations within the western portions at an approximate elevation of 11 metres Australian Height Datum (AHD), with the eastern portion sitting at a lower elevation of approximately 6 metres AHD. The general slope of the site is gentle to moderate from west to east / south-east. No drainage features were identified within the site, with surface water inferred to infiltrate and transport within the underlying geology.
Nearby water bodies	No surface water bodies were observed within the site. The closest waterbodies to the site include: • An unnamed tributary and associated wetland located approximately 90m west of the site, inferred to flow into Bomaderry Creek. • An unnamed tributary located approximately 170m north east of the site, inferred to flow into Bomaderry Creek. • Bomaderry Creek, located approximately 185m south east of the site, inferred to flow into the Shoalhaven River, which is situated approximately 360m south east of the site.
Site surface coverings	The site surface coverings comprised of the following: • Open space covered with grass and areas of exposed rock. This was observed mostly within the central and western portions of the site. • Stands of mature trees, generally along the northern and eastern boundaries. • Two existing dwellings in the eastern portion of the site with associated sheds and car ports. Both dwellings appeared to be constructed on brick piers, one with a brick veneer and the other with asbestos cement sheeting cladding.
Surface soils	Visibility of surface soils was limited due to vegetation and the presence of structures, however, where observations were possible, surface soils consisted of predominantly silty sands and sandy clays with some areas of exposed sandstone rock, particularly in the north and western portions of the site.
Site cut and fill	Due to shallow rock across much of the site, widespread cut and filling was not evident, however, the greatest soil thickness was evident within the eastern portion.
Buildings	Two existing residential dwellings are located in the eastern portion of the site along Bolong Road, as described below: • One dwelling was constructed of brick with a ceramic tile roof and had an attached car port to the south and a metal garden shed to the west. The subfloor was not visible, but it is inferred that the building is constructed on brick piers based on the observation of sub-floor ventilation within the brickwork. • One dwelling was constructed of fibre cement sheeting with a metal sheeting roof and had an attached car port constructed of metal. The building appeared to be constructed on brick piers and damage to the fibre cement sheet external wall cladding was observed. • On the western side of the fibre cement dwelling, there was terracotta pipe vent visible, presumably a sewer vent as it was located below the bathroom of the dwelling.
Hazardous materials	Suspected asbestos cement sheeting was observed within all buildings and structures at the site. Sheeting was generally in sound condition; however, some areas of damage were noted, with fragments on the ground surface at those locations. No other hazardous materials were observed; however, the assessment was limited to observations and did not constitute a hazardous building material (HAZMAT) assessment.
Manufacturing, industrial or chemical processes and infrastructure	The western portion of the site was historically utilised for operations associated with a former timber mill, however, this appears to be limited to use as a storage area. A pile of waste was observed within the western portion of the site, appearing to comprise predominantly of vegetative matter with some small quantities of concrete, wire and building materials including a single fragment of cement sheeting.

Item	Details
Fuel Storage (USTs/ASTs)	None observed.
Dangerous Goods	None observed.
Solid Waste Deposition	Solid waste deposition observed at the site was limited to the following: • Within the residential lots in the east, disused furniture, garden pots and other miscellaneous objects were observed throughout each lot. Fragments of fibre cement sheeting were also observed on the ground surface beneath areas of damage to the external cladding of the residence, though the surface impact appeared surficial and localised. • Within the central and western portion of the site, a pile of waste was observed that comprised of mostly vegetative matter, timber offcuts and some concrete, wire and building materials. Due to the shallow rock profile, the pile of material was not buried but rather placed on the existing ground surface. A single fragment of cement sheeting was also observed on the ground surface within the pile.
Liquid Waste Disposal features	None confirmed at the site, however, due to the inferred age of the residential dwellings it is considered that the dwellings may have historically been connected to a septic tank. A domestic sewer connection was confirmed along the western side of the dwelling in the far southeast.
Evidence of previous contamination investigations	A number of groundwater monitoring wells were observed at the site, installed by Stantec during investigation of the site performed on behalf of Landcom.
Evidence of land contamination (staining or odours)	During the inspection, staining and odours were not observed at ground surface.
Evidence of groundwater contamination	A sulfuric odour, thought to be attributable to the surrounding acid sulfate soil/rock environment, was noted in water collected from groundwater wells BH02 and BH04 located within the residential lot in the far southeast, and from ground gas bore GG3 located in the residential lot in the far south west. No other odours were noted during the investigation.
Groundwater Use	None observed.
Vegetation	Vegetation cover within the generally comprised of grass outside of paved areas. Trees and shrubs were also observed within the residential lots in the eastern portion of the site and along the northern site boundary. Plant stress and vegetation dieback was not observed during the inspection.
Services	Overhead power, electrical boxes and water meters were observed within the residential lots. A before you dig, Australia (BYDA) search identifies the presence of water, sewer and power utilities at the residential properties within the site. Sewer vent line was located at the western side of the dwelling in the far southeast.
Site fencing	With the exception of the eastern boundary of the residential lots and the western boundary, the site is fenced comprising of chain-mesh (approx. 2 m high) along the northern boundary and timber palings along the southern boundary.

3.0 SITE HISTORY

3.1 PREVIOUS INVESTIGATIONS

Stantec have undertaken the following previous investigations pertaining to the site:

- Due Diligence Assessment (Stantec 2023)
- Contamination Investigation Report – Ref. 304001019-Nowra BtR_Contamination Investigation Report dated 15 August 2023 (Stantec 2023).

A summary of the findings from the previous investigations are provided below in **Table 3-1**.

Table 3-1 Summary of Previous Investigations

Sections	Details
Due Diligence Assessment, Stantec 2023	
Objectives	A desktop review was undertaken to assess whether contamination has the potential to exist on the site and whether further investigation is needed. The assessment included the substantive elements of a Preliminary Site Investigation as defined by the NSW EPA (2020) guidelines. It is noted that this investigation also assessed a portion of land to the west of the site where a former timber mill was situated, however, that portion of land does not form part of the current site.
Scope of Works	A review of the following; • Historical aerial photographs of the site; • Historical land title information for the site; • Section 10.7 Certificates for the site; • Geological maps of the area; • Groundwater data available for the area; • Acid Sulfate Soil Risk Maps and Salinity Risk Maps for the area; • NSW EPA records for the site, including searching the Contaminated Land Public Record and “List of NSW Contaminated Sites Reported to the NSW EPA” online; and The preparation of a brief technical memorandum style report summarising the findings of the desktop assessment.
Key Findings	Key findings of the Due Diligence Assessment included seven (7) Areas of Environmental Concern (AEC) as follows; 1. Industrial land use- Activities involved with commercial sawmill works. 2. Bulk filling and recontouring in the southern portion- Filling and ground disturbance visible in the 1963 aerial image. 3. Structures and former laydown- Evidence of structures being demolished and vacant portions of the site previously used for storage and laydown of materials. 4. Hazardous building materials- Building within the site appeared to contain asbestos cement sheeting and potentially lead based paint. 5. Off-site commercial service station- Service station located north of the southern portion of the site and is within proximity for potential groundwater contamination downgradient. 6. Subsurface utility infrastructure- Subsurface utility infrastructure may contain hazardous materials such as asbestos cement. 7. Septic system - unknown connection to the local public sewerage network or if wastewater is directed to a septic system. Evidence of a septic system was not observed.

Sections	Details
Conclusions	It was concluded that the site has been historically used for industrial land uses including a commercial sawmill to the west, and a laydown / storage area within the central and western portions of the site. The eastern portion of the site was used for a low-density residential land use. The lands surrounding the site were generally not considered to present a significant risk of contamination that could mobilise onto the site, such as through migration of contaminated groundwater. It was noted that a commercial service station is located north of the site, and whilst the groundwater flow direction from that location is expected to be east toward the Shoalhaven River, there was a risk of impacting the site. Several areas of AEC were identified that may present a risk of contamination that could render the site unsuitable for the proposed land use and potential contamination, if present, could require remediation or management.
Recommendations	The following was recommended; • An intrusive investigation should be completed at the site to assess the ground conditions (soil and groundwater) in consideration of the proposed land use, proposed construction features and the AEC identified. • For completeness, it was recommended that historical titles documents be obtained for all lots within the site, and a SafeWork NSW Schedule 11 Hazardous chemicals on premises searched be conducted on industrial lots within the site. • A hazardous building materials assessment should be considered to identify the presence and extent of hazardous materials and substances that may exist within site structures.

Sections	Details
Contamination Investigation Report, Stantec August 2023	
Objectives	The objectives of the intrusive investigation, which was limited in nature, were to assess potential impact of soil contamination at the site, and identify the associated risks related to future purchase and redevelopment of the site from soil impact perspectives.
Scope of Works	The general scope of works for the investigation included the following: • Underground utility location was undertaken at each proposed sampling point to clear for the presence of services • An intrusive investigation was to meet the requirements of both a geotechnical investigation and the achieve the contamination objectives. The works comprised of the following: • Excavation of six (6) test pits, TP101 to TP106, to a maximum depth of 2.4m upon refusal. Test pits were advanced utilizing a tracked 5 tonne excavator. Note that test pits TP101, TP102 and TP103 were situated in a lot that does not form part of the current site boundary. • Drilling of three (3) boreholes, BH01 to BH03, utilising a track mounted drill rig. The drilling method included solid auger and coring, and upon completion, each borehole was converted to a groundwater monitoring well. Not that BH01 was situated in a lot that does not form the current site boundary. • Following installation, each groundwater well was developed by removal of three (3) well volumes of water or until the well was purged dry. • One groundwater monitoring event was completed and samples were collected utilising a low-flow technique, with water quality parameters recorded on site during sampling. • Collected samples were submitted to a national associated testing authority, Australia (NATA) accredited laboratory analysis of a broad suite of contaminants.: • Preparation of a due diligence contamination investigation report based off limited / targeted sampling, prepared in consideration of the NSW EPA (2020)

<table>
<tr><th>Sections</th><th>Details</th></tr>
<tr><td></td><td>Consultants Reporting on Contaminated Land Guidelines and the NEPC (1999) National Environmental Protection (Assessment of Site Contamination) Measure, as amended 2013 (ASC NEPM). The report considered information gathered during the desktop review, site walkover and sampling and laboratory analysis, and provided statements on the following:
- Whether the land, at the locations investigated, is contaminated or potentially contaminated.
- Comparison of data against the applicable Health Investigation Limits, Health Screening Levels, Ecological Investigation Limits and Ecological Screening Levels derived from the ASC NEPM, which were informed by the proposed land uses and environmental properties of the site and surrounds.
- Identification of contamination risks and constraints for construction.
- Recommendations for further actions and controls, including additional investigation and/or remediation.
- Preliminary and indicative waste classification with results compared against the NSW EPA (2014) Waste Classification Guidelines and NSW EPA (2014) Excavated Natural Material Order.</td></tr>
<tr><td>Conclusions</td><td>A summary of key findings and conclusions are provided below:
• Sheen, odour and discolouration indicating the potential presence of contamination was not observed during the investigation, and elevated VOCs measurement were not recorded in the field with a PID.
• The fill material profile had a thickness ranging from 0.2m to 0.7m, with the shallowest fill observed in the northern portion and the deepest fill (outside of TP101) observed in the eastern portion. Waste inclusions and indicators of contamination (visual, olfactory) were not observed at these locations.
• The soils assessed from within the site, at the points of sample collection, did not contain concentrations of chemical contaminants that would preclude a future residential land use.
• The site did not appear to contain a significant quantity of fill. And the fill encountered did not appear to contain frequent inclusions of waste or anthropogenic materials.
• The groundwater wells installed during the investigation were screened against a deep aquifer, generally between 7 to 10m BGL. The contaminants present in groundwater were considered to potentially be representative of background concentrations or from upgradient sources. Due to the absence of elevated contaminants in soil, such as metals and PFAS, the contaminant concentrations detected in groundwater were considered unlikely to be attributable to an on-site source. It was noted that the Shoalhaven River is known to contain PFAS, with the NSW EPA undertaking ongoing investigations in relation to the matter. Borehole BH02, situated toward the eastern boundary of the site, encountered a sulfuric and organic odour during drilling. This was considered to be potentially attributable to the alluvial deposits and sulfidic conditions associated with Bomaderry Creek and the Shoalhaven River, located 185m and 430m south east of the site, respectively.
• The groundwater conditions on site were not considered to preclude a future residential land use. However, if deep excavations were required for redevelopment and construction, appropriate dewatering of groundwater may be necessary including management, treatment and disposal may be necessary.</td></tr>
<tr><td>Recommendations</td><td>The following recommendations were included:
• Prior to consideration of purchase, Landcom should seek legal advice in relation to the potential offsite filling and associated impacts to adjoining landowners. This recommendation was in relation to a lot that does not form part of the current site. Agreement was in place to utilise off-site locations for sawmill operations.
• Negotiation of purchase price should be considerate of potential costs associated with remediation and management of the identified contamination. Particularly the asbestos impacted fill in AEC2, as well as wastes and residual latent asbestos on ground surfaces associated with the former commercial / industrial land use. Note that the lot containing AEC2 does not form part of the current site.</td></tr>
</table>

Sections	Details
	• Due to the shallow depth to bedrock, opportunities for cost-effective encapsulation would be limited, with sub-surface encapsulation requiring excavation of rock. Retention of contaminated materials on site as a remedial option would also require implementation of a long-term environmental plan (LTEMP), which could impact the dwelling yield and limit or prohibit certain activities on the site post-construction. An assessment of remedial options must consider the site constraints and would also require consent from the applicable authorities (e.g. Council). • If Landcom were to purchase the site (inclusive of the former sawmill), it is likely that a detailed site investigation (DSI) and remediation action plan (RAP) would be required to support development approval. It is noted that the recommendation for a RAP was applicable to AEC2, which does not form part of the current site. • Contamination that was not identified during this investigation may also exist at the site, including beneath on-site structures.

4.0 CONCEPTUAL SITE MODEL

Outlined within NEPM (2013) Schedule B2 – Guideline on Site Characterisation, a Conceptual Site Model is required to aid the assessment of data collected for the site.

4.1 PRELIMINARY CSM

A Conceptual Site Model (CSM) provides an assessment of the fate and transport of contaminants of potential concern within the context of site-specific subsurface conditions with regard to their potential risk to human health and the environment. Risk to human health and the environment is identified through complete Source – Pathway – Receptor (SPR) linkages. In order to identify SPR linkages the CSM considers site specific factors including:

- Source(s) of contamination;
- Identification of contaminants of concern associated with past (and present) source(s);
- Site specific information including soil type(s), rock type, depth to groundwater;
- Locations of any identified sources relative to the proposed site development; and
- Actual or potential receptors considering both current and future land use both for the site, adjacent properties and any sensitive ecological receptors.

4.1.1 Identified Contamination Sources

Based on a review of the historical site use and surrounding land uses, the site walkover inspection and data gathered during the Contamination Investigation (Stantec 2023), Stantec identified the following sources of contamination that may be encountered on the broader site:

- Localised contamination on site associated with waste storage.
- Weathered and structurally compromised hazardous building materials, including the potential for asbestos cement sheeting.
- Standing structures that may contain hazardous building materials.
- Offsite sources of contamination with potential to impact groundwater and ground gas beneath the site, including an active service station approximately 25 meters north of the site at the corner of Beinda Street and Bolong Road, and the natural geologic environment that may contain acid sulfate soils and acid sulfate rocks.

4.1.2 Identified Receptors

A high-level summary of potential receptors considered to be susceptible to site contamination include:

- Human:
  - Current site workers, including landscaping and maintenance workers;
  - Future site workers (consistent with above); and
  - Future residents following redevelopment.
- Ecological:
  - Vegetation and biota; and
  - Downgradient waterbodies contaminated environmental media originating from the site.

The preliminary CSM applicable for the site during this investigation, which is inclusive of a more detailed list of receptors, is summarised in **Table 4-1** and applies to the potential future land use setting, assumed to be medium density residential with some public open space.

Conceptual Site Model

Contaminant Source	Potential Impacted Media	Contaminants of Potential Concern	Potential Exposure Pathways	Receptors
Potential contamination resultant from historical waste storage and commercial activities, including the western and central portions of the site historically being utilised by a commercial sawmill.	Soil	Metals; TRH; PAH; BTEX; OCP; OPP; PCB; Asbestos; PFAS.	• Direct contact • Incidental ingestion • Incidental inhalation dust and/or fibres (asbestos) • Vapour intrusion (volatiles only)	**Human:** • Current site users • Future Site workers (including maintenance workers • Future site occupants **Ecological:** • Existing and future plant-based biota within the site • Offsite receptors including vegetation and waterways
Weathered and structurally compromised hazardous building materials within current site structures, including sheds and dwellings.	Soil	Metals; Asbestos; PCB; Synthetic mineral fibres.	• Direct contact • Incidental ingestion • Incidental inhalation dust and/or fibres (asbestos)	
Materials with potential to impact groundwater and ground gas beneath the site including an active commercial service station north of the site, subsurface infrastructure within and adjoining the site including wastewater assets and utilities, and the natural alluvial geologic and acid sulfate soil and rock environment.	Groundwater Ground gas	TRH; BTEX; Methane; Carbon dioxide; Hydrogen sulphide; Carbon monoxide; trace gases; corrosive/acidic waters (pH)	• Asphyxiation • Explosive potential	**Human:** ▪ Future Site workers (including maintenance workers ▪ Future site occupants **Ecological:** ▪ Existing and future plant-based biota within the site ▪ Offsite receptors including vegetation and waterways

Table 4-1 Conceptual Site Model

4.2 DATA GAPS

Based on Stantec's assessment of the site historical information, which included desktop searches, site history review, site walkover and targeted soil assessment, the following data gaps were identified:

- Ground surfaces at the site were generally unable to be visually assessed due to the presence of vegetation cover and standing buildings and structures.
- Prior to completion of the DGI, the soil, groundwater assessment at the site was limited in nature, and ground gas had not been assessed.

5.0 METHODOLOGY

5.1 ASSESSMENT CRITERIA

5.1.1 Soil Assessment Criteria

The soil assessment criteria have been adopted from guidelines made or approved by NSW EPA under the Contaminated Land Management Act 1997 (CLM Act) for human health and ecological exposure settings for the site. The adopted criteria are provided in the data summary tables in **Appendix C**, and the laboratory certificates are provided in **Appendix E**. The current land use low-residential has not been assessed in this investigation. The human health and ecological assessment criteria were adopted from NEPC (2013) and PFAS NEMP 2.0 (2020) to consider the potential risk to future on-stie receptors under the following land use scenarios that apply to the site:

- Human: Medium to high residential (minimal access to soil) – applicable to the proposed land use; and
- Ecological: Urban residential / public open space – applicable to the current and proposed land use.

5.1.1.1 Human Health Criteria

The Tier 1 Screening Values that have been compared to the soil analytical data are included on the summary data tables in **Appendix C**. The criteria for human health exposure settings at the site has been specified below in **Table 5-1**, along with the rationale behind the application of each criterion.

Table 5-1 Adopted Human Health Criteria - Soil Assessment Criteria

Guidelines	Specific Criteria	Justification
NEPM (2013)	HIL-B, Schedule B1, Section 6, Tables 1A(1)	Health Investigation Level (HIL) B has been adopted to assess the risk to site users under the proposed land use of medium density residential.
	HSL-B, Schedule B1, Section 6, and 1A(3);	Health Screening Level (HSL) B thresholds for soil vapour have also been adopted for low to high density residential settings, based on the proposed medium density residential land use. It is also noted that where ground floor use is restricted to car-park or commercial uses, the HSL-D criteria apply.
	For asbestos: Section 4, Table 7.	The following criteria for asbestos have been adopted and include: • No visible asbestos for surface soils; • HSL-A (low-density residential): 0.01% for bonded ACM in residential settings; • HSL-B (medium-density residential): 0.04%; and • 0.001% w/w for friable asbestos in soil.
NEMP 2.0 (2020)	Soil: HIL-B, Table 2	Due to the presence of potential PFAS contamination, the following guideline values for human health guideline values which have been derived from the ASC NEPM for medium density residential (HIL-B): • Sum of PFOS and PFHxS (HIL-B: 2 mg/kg). • PFOA (HIL-B: 20 mg/kg).

5.1.1.2 Ecological Soil Criteria

The ecological criteria adopted from NEPC 2013 are summarised below in **Table 5-2** have been adopted to assess the risk to current and future ecological receptors (i.e. terrestrial flora and fauna) under a low to medium density residential and public open space scenarios. Assessment against the ecological criteria is also used for assessment of potential leachability of soils and sediment to groundwater.

Table 5-2 Adopted Ecological Criteria - Soil Assessment Criteria

Guidelines	Specific Criteria	Justification
NEPM (2013)	ESL, Schedule B1	The generic ecological screening levels (ESL) thresholds for urban residential and public open space apply to the current and future land use at the site. The assessment of ESL assumes a fine-grained soil for natural soils.
NEMP 2.0 (2020)	Interim ecological guideline values	For PFAS, the interim ecological soil guideline values consider direct exposure (i.e. close contact with soil) and indirect exposure (i.e. exposure through the food chain). The interim guideline values apply to all land uses. Ecological Direct exposure values: • PFOS = 1 mg/kg • PFOA = 10 mg/kg Ecological Indirect exposure values: PFOS = 0.01 mg/kg

5.1.2 Groundwater Assessment Criteria

The environmental quality of groundwater has been assessed against relevant environmental values that are applicable to the type of water use and potential human health and ecological exposures that could occur from its use.

The water quality analytical results are compared to Tier 1 assessment criteria as made or approved under s105 of the CLM Act 1997 by NSW EPA. A Tier 1 assessment is a risk-based analysis comparing site data with generic investigation levels and screening levels for various land uses to determine the need for further assessment or development of an appropriate management strategy.

The applicable environmental values and Groundwater Assessment Criteria (GAC) are outlined in **Table 5-3** below.

Table 5-3 Groundwater Assessment Criteria

Environmental value	Guideline or Standard	Criteria
Protection of aquatic ecosystems	ANZG 2018	Fresh water, 95% level of protection, toxicant default guideline values (DGVs). The 95% level of protection is the default value, however, for bio accumulative contaminants, the 99% level of protection is adopted in accordance with ANZG guidance. Groundwater underlying the site is inferred to flow into the Shoalhaven River, which is a freshwater river. (Sourced from www.environemnt.nsw.gov.au)

Environmental value	Guideline or Standard	Criteria
	For PFAS: HEPA NEMP 2018 (Ver. 2.0), Table 5	Fresh water, 95% level of protection. The 95% level of protection defaults to the 99% level of protection as PFAS are bio accumulative.
Non-use scenarios (i.e. vapour inhalation and intrusion)	NEPC 2013, Schedule B1, Table 1A(4)	HSL-A&B, residential
Recreation	ANZG 2018	ANZG 2018 refers ANZECC & NHMRC 2008, Guidelines for Managing Risk in Recreational Waters, Chapter 9, Table 9.3 Criteria is to be taken as the lowest value of the (Health Criteria x 10) or the Aesthetic criteria.
	For PFAS: HEPA NEMP 2018 (Ver. 2.0), Table 5	Health based guidance value (HGV) for recreational use
Buildings and structures	Australian Standard 2159-2009 Piling-Design and Installation (AS2159)	Section 6 – Durability Design

5.1.2.1 Rationale for Groundwater Assessment Criteria

In accordance with the Guidelines for the Assessment and Management of Groundwater Contamination (Ref. DEC, 2007), groundwater acceptance criteria are based on environmental values considered relevant for groundwater use at the site and surrounding uses of groundwater and surface waters that may be effected by the site. Environmental values include:

- Aquatic ecosystems: surface water and groundwater ecosystems;
- Human uses: these include but are not limited to potable water supply, agricultural water supply (irrigation and stock watering), industrial water use, aquaculture and human consumption of aquatic foods, recreational use (primary and secondary contact with surface waters) and visual amenity of surface waters;
- Human health in non-use scenarios: this includes consideration of health risks that may arise without direct contact between humans and the groundwater, for example, exposure to volatile contaminants above groundwater contaminant plumes; and
- Buildings and structures: this includes protection from groundwater contaminants that can degrade building materials through contact; for example, the weakening of building footings resulting from chemically aggressive groundwater.

Cultural and spiritual values that are associated with the environment, including groundwater, should also be protected. Cultural and spiritual values may include spiritual relationships, sacred sites, customary uses, the plants and animals associated with the water, drinking water supplies and recreational activities. In managing groundwater contamination, it is generally considered that cultural and spiritual values will be protected where groundwater quality protects all other relevant environmental values on a site.

As identified in **Table 2-3**, **Section 2.3**, a search of registered groundwater bores within a 500 m radius of each of the sites on the WaterNSW website (realtimedata.waternsw.com.au) was completed. The search indicated that there were five (5) identified bores for monitoring purposes only, within a 500m radius of the site. Based on this information, an assessment of the applicability of groundwater environmental values, both on-site and off-site, is provided in **Table 5-4**.

Table 5-4 Assessment of Groundwater Environmental Values

Environmental Value	Applicable	Rationale / Comment
Protection of aquatic ecosystems	Yes	The potential receiving water body for the site is Shoalhaven River fresh waters approximately 380m southeast of the site. This environmental value is considered to be relevant and should be assessed.
Drinking water	No	A bore search did not identify domestic bores within 500m radius of the site. The nearest registered groundwater monitoring bore was located upgradient of the site, approximately 442m to the west. The bore was installed for monitoring purposes and no standing water level (SWL) was recorded. As such, this environmental value is not considered to be directly relevant. Stantec were advised by the client that the site did not hold ecological or cultural / heritage significance, and that no known indigenous values were present at the site. As such, this was also not considered to be directly relevant.
Irrigation	No	On-site use of groundwater for irrigation purposes is not currently practiced at the site. A bore search did not identify domestic bores within 500m radius of the site. It is not considered to be a relevant environmental value for the site.
Stock Watering	No	On-site use of groundwater for stock watering purposes is not currently practiced. A bore search did not identify domestic bores within 500m of the site. This environmental value is not considered relevant for the site.
Industrial Use	No	On-site use of groundwater for industrial purposes is not currently practiced. Specific industrial processes would require separate assessment and is not considered further in this report.
Aquaculture and human consumption of aquatic foods	No	A review of the NSW Department of Primary Industries NSW Aquaculture Industry Directory 2019 did not list an aquaculture producer on or in close proximity to the site. This environmental value is not considered relevant. The closest oyster beds to the site are located in Crookhaven River, 13km to the southwest, which are considered not close proximity to the site. It is noted that the Shoalhaven River discharges into the south Pacific Ocean at a final distance of 13km, at 10.4km the river divides into delta pattern with two distinct tributaries. Crookhaven River is south of the starting point of the delta.
Recreational Use	Yes	This environmental value may be relevant within the closest surface water bodies which is the Shoalhaven River where secondary or primary exposure to the public occurs. As such, this environmental value should be assessed.
Non-use scenarios (i.e. vapour inhalation and intrusion)	Yes	Groundwater health screening levels for vapour intrusion (HSLs) are published in the NEPC 2013, Schedule B1 for selected petroleum compounds and fractions and are applicable to assessing human health risk via the inhalation and direct contact pathways. Workers and future users/occupiers of the land may be exposed to vapour emanating from contaminated groundwater if present. This environmental value should be assessed.
Buildings and Structures	Yes	Groundwater may come in contact with building and infrastructure. Corrosive waters if present may be a cause of concern for buildings and infrastructure and so this environmental value should be assessed.
Visual amenity and aesthetics	No	Surface waters are not present on the site. This groundwater environmental has not been assessed.

Based on the above assessment, the environmental values (REVs) for the groundwater to be assessed are:

- Protection of aquatic ecosystems;
- Recreational purposes;
- Non-use scenarios (Vapour); and
- Buildings and structures;

Results should therefore be assessed against the assessment criteria outlined in **Table 5-3**.

5.1.3 Ground Gas Assessment Methodology

Ground gas risk assessment methodology and assessment criteria are based on various guideline and legislative requirements including:

- National Environment Protection (Assessment of Site Contamination) Measure (NEPM). National Environment Protection Council (NEPC) 1999, amended 2013 (NEPC 2013);
- NSW EPA Assessment and Management of Hazardous Ground Gases, Contaminated Land Guidelines, NSW EPA, December 2019, Amended May 2020. (EPA 2020a);
- NSW EPA Consultants Reporting on Contaminated Land, Contaminated Land Guidelines. NSW EPA, April 2020, Updated May 2020 (EPA 2020b);
- NSW EPA Environmental Guidelines: Solid Waste Landfills, Second edition, New South Wales NSW EPA, April 2016 (EPA 2016);
- NSW EPA Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997 (EPA 2015);
- Protection of the Environment Operations Act 1997, and
- NSW Work Health and Safety Regulation 2017.

Ground gas concentrations in themselves may not constitute a potential risk and so ground gas measurements must be considered in the context of a valid CSM and a gas risk assessment, if warranted.

Preliminary screening as outlined in EPA 2020a uses a simple risk model developed from the initial CSM. The screening level risk model identifies:

- Potential sources of ground gas;
- Receptors that could be affected; and,
- Possible pathways (linkages) by which gas could reach receptors.

The preliminary screening process should include desk study, site reconnaissance, formulation of an initial or Preliminary Conceptual Site Model followed by evaluation of the following three questions:

1. Is the screening model based on sufficient, reliable site information to allow its use for screening purposes?
2. Is there a potential source of bulk ground gas?
3. Is there a credible pathway between the source and the receptors?

If the answer to question 1 is ‘no’, additional information must be obtained before screening can proceed. If the answer to question 1 is ‘yes’, and the answer to either question 2 or question 3 is ‘no’, there should be no risk, meaning further risk assessment is unnecessary and no action to manage bulk ground gas risk is required. In these circumstances, it is only necessary to document the findings of the preliminary screening assessment; no further data collection or assessment is required. If the answer to all three questions is ‘yes’, the risk assessment should proceed to Level 1.

The preliminary ground gas assessment criteria in subsurface wells as outlined in **Table 5-5** below is to be considered for preliminary assessment purposes. Should ground gas conditions exceed the preliminary assessment criteria below, further ground gas risk assessment would likely be warranted.

Table 5-5 Summary of Preliminary Ground Gas Assessment Criteria

Gas and Measurement Type	Proposed Assessment Criteria
Methane – Subsurface well	> 1% v/v (10,000 ppm)
Carbon dioxide – Subsurface well	> 1.5% v/v (15,000 ppm)
Carbon monoxide – Subsurface well	> 25 ppm
Hydrogen sulphide – Subsurface well	> 5 ppm

6.0 SITE INVESTIGATION

6.1 SAMPLING LOCATIONS

The number of sampling locations to investigate the site were determined in accordance with NSW EPA (2022) Sampling Design Guidelines, based on a judgmental and targeted approach for investigating the site as a single parcel of land.

The number of sampling points situated within each AEC that apply to the site have been outlined below in **Table 6-1** and are consistent with the AEC identified in the Contamination Investigation (Stantec 2023). It is noted that the following AEC were applicable to the former sawmill operational area, assessed by Stantec (2023), however, do not form part of the current site:

- AEC1 – former sawmill operational area
- AEC 2 –filling south-west of former sawmill operational area

The AEC applicable to the current site investigation are indicatively shown in **Appendix A**.

Table 6-1 Sampling Locations and Site Distribution

Target Location	Location Description	Sampling Points, Contamination Investigation Report (Stantec 2023)	Additional DGI Locations
AEC 3 former sawmill laydown	The vacant central and western portions of the site appear to have been historically utilised for storage and laydown associated with the former sawmill. A residual pile of waste, containing variable waste types, was observed within this portion of the site.	BH03, TP104, TP105	TP107, TP108, TP109, TP110, TP111, TP112, TP113, TP114, TP115
AEC 4 hazardous building materials	General waste observed including plastic, domestic waste and discarded equipment. Extent of impacts unknown due to dense vegetation.	TP106, BH02	TP12, TP14
AEC 5 off-site commercial service station	A commercial service station is located north of the site at the intersection of Bolong Road and Beinda Street. The service station is within proximity to the site (approximately 25 metres) but is inferred to be down-gradient.	BH02	BH04, GG1, GG2, GG3
AEC6 subsurface utility infrastructure	Subsurface utility infrastructure may contain hazardous materials such as asbestos cement and be a source and conduit for contaminant migration, including water and gas. A Before You Dig (BYD) Australia search shows utilities adjoining the site to the east along Bolong Road	BH02, TP106	TP113, TP114, TP115, BH04, GG1, GG2, GG3

Target Location	Location Description	Sampling Points, Contamination Investigation Report (Stantec 2023)	Additional DGI Locations
	including water, sewer, reclaimed water management scheme (REMS – treated wastewater reuse) and electrical. Gas assets appear to be present east of the site on the eastern side of Bolong Road.		
AEC7 septic system	A BYD Australia search indicates that the two dwellings appear to have a connection to the local sewerage network, however, this is unconfirmed. Due to the era of the dwelling construction, legacy on-site wastewater treatment systems (ie septic systems) could be present.	BH02, TP106	TP113, TP114, TP115, BH04, GG1, GG2, GG3
AEC 8 Ground gas	Indicators of ground gas have been noted during the investigation including sulfuric odours during installation and sampling of monitoring points. This has generally been identified at locations toward the intersection of Bolong Road and Beinda Street and in that general vicinity.	-	BH04, GG1, GG2, GG3
	Total number of sampling points	18	

6.2 SITE INVESTIGATION PROGRAM

The field sampling investigation program was undertaken as outlined in **Table 6-2**, which was undertaken in general accordance with NEPC 2013 guidelines and **Section 1.3**.

Table 6-2 Site Investigation Program

Item	Details
Fieldwork Activity and Dates (Refer to **Appendix A** for sampling location plan)	A summary of fieldwork activities undertaken during the investigation is provided below: • 12th January 2024: - Service clearance of borehole BH04 and test pits TP107 to TP115. - Advancement of BH04 using a track mounted Geoprobe, utilising hand auger and air hammer drilling techniques. Following drilling a groundwater well was installed within BH04. • 15th January 2024: - Nine (9) test pits (numbered TP107 to TP115) were excavated to maximum depths of 0.65mbgl by a 3.5 tonne excavator. - Development of groundwater well BH04. • 18th January 2024: - Groundwater monitoring of BH02, BH03 and BH04. • 23rd January 2024: - A preliminary assessment of ground gas was conducted at groundwater well BH04 due to the presence of a sulphur odour in BH02 and BH04. • 21st February 2024:

Item	Details
	- Service clearance of ground gas bores GG1, GG2, GG3 - Drilling of three (3) boreholes, GG1, GG2, GG3, utilising a track mounted drill rig utilising hand auger and air hammer drilling techniques. Following drilling, a ground gas bore was installed in each borehole. • 27th February 2024: - Ground gas monitoring of GG1, GG2, GG3 and BH04. - Groundwater monitoring of boreholes BH02, BH03, BH04, and ground gas bore GG3. - Deployment of GasClam continuous gas monitoring in ground gas bore GG1 (27-29/02) and GG3 (29/02-14/03). • 5th March 2024: - Ground gas monitoring of GG1, GG2, GG3 and BH04. - Ground gas monitoring of wastewater drains in 2 residential buildings within the site. - Ground gas monitoring of the sub-floor space in 1 residential building within the site. - Ground gas monitoring of any observed drains or service pits within and surrounding the site. • 12th March 2024: - Ground gas monitoring of GG1, GG2, GG3 and BH04. - Ground gas monitoring of drain along the western side of the residential building in the southeast. • 19th March 2024: - Ground gas monitoring of GG1, GG2, GG3 and BH04. - Ground gas monitoring of drain along the western side of the residential building in the southeast. - Advancement of 3 hand auger holes to 0.4m (bedrock) between GG3 and the residential building in the southeast to assess for odour and/or unusual visual traits.
Service locating	A Dial Before You Dig Australia (BYDA) enquiry was lodged prior to the intrusive site investigation. The plans were provided to a Telstra accredited service locater who was engaged to locate and mark underground services in the vicinity of each sampling point and to avoid damage to subsurface utilities.
Drilling	The distribution of boreholes within the site is summarised above in **Table 6-1** and shown in **Appendix A**. Borehole BH04 was drilled in the far southeastern corner of the site and was converted into a combined subsurface gas and groundwater monitoring well. The borehole was drilled to a maximum depth of 5m bgl and the monitoring well installed by a licensed driller utilising a tracked Geoprobe drill rig. Two (2) additional groundwater wells are located at the site and were installed in July 2023 during a previous site investigation. The boreholes were drilled utilising a Hanjin B&B 8D drill rig with solid flight augers and NMLC coring techniques through sandstone rock until target depth was achieved.
Test Pitting	Test pitting within the site was undertaken using a 3.5 tonne track mounted excavator and were advanced by a licensed operator. The distribution of test pits within the site is summarised above in **Table 6-1** and shown in **Appendix A**.
Soil Sampling	• Soil samples were collected from each location at near-surface, 0.5 meters below ground level (m bgl), and every 0.5m thereafter until 0.3m into natural soil or to the depth of either the reach of the excavator or the depth of excavator resistance; • During test pitting, samples were collected directly from the excavator bucket with care taken to ensure material collected had not been in contact with the bucket; • During drilling, a surface sample was collected directly from the hand auger, with care taken to ensure material collected had not been in direct contact with the auger. • Each soil sample (including duplicates) was screened for volatile organic compounds (VOC) content with a calibrated photo-ionisation detector (PID). The methodology for PID headspace testing was to partially fill an airtight container

Item	Details
	with a fresh soil sample and then analyse the headspace vapour using an appropriately calibrated portable PID; • The geological profile and observations of each test pit and borehole were logged onsite in accordance with Australian Standard AS 1726:2017 – Geotechnical Site Investigations. All excavated material was inspected for potential indicators of contamination including odour, sheen, staining and the presence of asbestos containing materials (ACM); • Soil samples were collected using disposable nitrile gloves, transferring soils to the designated sampling containers. All soils were collected on the same days as excavation to ensure that contaminants prone to degradation / weathering (such as pathogens, TRH and BTEX) are representative; • Analytical testing of soil samples generally targeted fill materials, however, where encountered, samples were also collected from the underlying natural soil and assessed for contamination indicators. A select number of natural soil samples were analysed for environmental contamination; • Field duplicate samples were collected for QA/QC purposes, by carefully mixing the material and distributing evenly between sampling containers; and • Primary, duplicate and triplicate soil samples were submitted to Eurofins Environment Testing (primary laboratory) and SGS (secondary laboratory) for analysis. Field procedure for asbestos identification in soils included: • Visual assessment at each sample location; and • To assess for asbestos fines / friable asbestos (AF/FA), a minimum of 500ml of soil was collected from the targeted geological strata.
Groundwater Well Installation	The installation of the groundwater well was undertaken by the licenced driller in accordance with the Minimum Construction Requirements for Water Bores in Australia. Third Edition (NDUC, 2012). The screened intervals were determined on site in consideration of the observed hydrogeological conditions during drilling and site setting.
Ground Gas Bore Installation	Ground gas bore installation was undertaken in accordance with the NSW EPA Assessment and management of hazardous ground gases – contaminated land guidelines (2020). The screened interval of each ground gas bore was targeted at the design of the proposed development, specifically at representative locations where dwellings are proposed on the ground floor and in consideration of the bulk earthworks requirements and proposed utility installation, as advised by Landcom. Each ground gas bore (GG1 to GG3) was excavated utilising a tracked drill rig, with installation conducted by a licensed driller. Each bore was advanced utilising solid auger drilling method, and upon refusal were advanced to target depth utilising percussion drilling. Gas bores were installed so as not to be in contact with the groundwater but with screened intervals below 1.5 m from ground surface, where possible, so as to eliminate interference from ambient air. Gas monitoring bores were fitted with a cap tapped to a quick-connect nipple to allow for measurement of ground gas. To enable deployment of a Gasclam for continuous ground gas monitoring, each bore was finished at surface with a 200mm diameter gatic.
Groundwater Sampling	Groundwater sampling was undertaken as per the methodology below: • The standing water level (SWL) was measured in metres from the top of casing; • The presence or absence of light non-aqueous phase liquids (LNAPL) utilising an interface probe and measurement of the apparent LNAPL thickness (if present) in each monitoring well was checked; • Physicochemical parameters including pH, electrical conductivity (EC), redox potential (ORP), dissolved oxygen (DO), and temperature were measured using a calibrated water quality meter. • Groundwater samples were collected once field parameters had stabilised directly from low-flow sampling techniques.

Item	Details
	• Collection and submission of samples to a National Association of Testing Authorities, Australia (NATA) accredited laboratory for analytical testing.
Subsurface Ground Gas Monitoring Procedure – Discrete Monitoring	For preliminary assessment, four (4) rounds of subsurface ground gas monitoring were undertaken following well construction and the procedure for monitoring is outlined below: 1. For each monitoring point, document the LFG monitoring results on a Stantec form. 2. Run LFG meter pump (GA5000) for one (1) minute in ambient air and record ambient air readings prior to beginning the round of monitoring. If oxygen is outside the range of 20.5 to 21.5%, then reset oxygen concentration to 20.9% (see user's manual). If methane (CH_4) or carbon dioxide (CO_2) are above 0.1% v/v in ambient air, move upwind of site and purge unit. If concentrations persist, contact project manager to discuss approach. 3. Switch LFG Meter on and wait for start-up mode to finish. 4. Zero transducers (see user manual for details). 5. Attach LFG Meter to borehole and record Relative Pressure and Atmospheric Pressure. 6. Detach LFG Meter from the borehole. 7. Plug inlet tube into the LFG meter flow port and zero flow readings. Ensure that tube is blocked whilst zeroing flow pod. 8. Attach inlet tubing directly to borehole and record flow rate. 9. Detach inlet tube from borehole and LFG flow port. 10. Attach inlet tube to LFG Meter gas port to bore and switch LFG Meter pump on. 11. Run pump for a minimum of three (3) minutes, taking readings for CH_4, CO_2, O_2, CO and H_2S at 30 second intervals for large diameter (>25mm diameter) bores (i.e. 0s, 30s, 60s, 90s ….180s) and 10 second intervals for small diameter bores (=<25mm diameter). If concentrations are still fluctuating, continue running pump and recording concentrations at 1min intervals until equilibrium reached. • Repeat Steps 4 to 11 if flow pod readings above 0.5 L/hr recorded pre-purging. • Attach PID and purge for minimum 1 minute; • At completion, purge the equipment in open air until ambient readings are achieved to ensure no cross contamination with next location occurs, and then switch unit off. • Remove gas cap and measure water level in the well.
Subsurface Ground Gas Monitoring Procedure – Continuous Monitoring	A calibrated GasClam is inserted into the nominated ground gas monitoring well and has a built-in rubber seal at the top to prevent ambient air entering the well casing from above. Once the GasCalm is deployed it is connected to a laptop and all necessary set-up data is uploaded and monitoring is started. The GasClam is set up to record ground gas parameters in 1hr intervals and will continue to record until it is plugged into a laptop and manually stopped.
Decontamination Procedure	Reusable sampling equipment such as hand tools (shovel, trowel, mattock), and the interface probe, were decontaminated by washing with PFAS free decon (Liquinox), followed by a rinse with potable water and de-ionised water (rinsate water).
Sample Preservation & Transport	Soil and groundwater samples were placed in laboratory supplied containers. Groundwater sample analysis for metals included total metals and dissolved metals. Other analytes will be collected in laboratory supplied containers with appropriate preservative. All samples were stored on ice in a sealed ice box (esky) while on site and in transit under strict chain of custody (COC) documentation.

6.3 SAMPLING EQUIPMENT

In order to complete the fieldwork program, as outlined above in **Section 6.0**, the field equipment and sampling consumables specified in **Table 6-3** were required.

Table 6-3 Sampling Equipment

Sampling Method	Field Equipment	Sampling Consumables
Overall	• Field Notes • Waterproof marker pen • Camera • GPS unit • Personal protective equipment (PPE)	• N/A
Soil sampling during test pitting and boreholes	• Photo-ionisation detector (PID) • Tape measure • Eskies with ice • Disposable nitrile gloves • Soil trowel	• Laboratory supplied 250ml glass jars • Laboratory supplied PFAS free containers • Laboratory supplied ACM Ziplock bags • Rinsate water • Liquinox • Rinsate bottles (including amber, PFAS free, HDPE metals bottle and two glass vials)
Groundwater sampling	• Low flow sampler (peristaltic pump and/or bladder pump) • Interface probe • 12v battery • Water quality metre • Eskies with ice • Disposable nitrile gloves	• Consumable (HDPE tubing, syringe and field filters) • Liquinox • Bottles (including amber, PFAS free, HDPE metals bottle and two glass vials)Rinsate water • 10L buckets
Subsurface gas monitoring	• Landfill Gas Analyser- GA5000 • Interface probe • Photo-ionisation detector (PID) • Gasclam for continuous gas monitoring	• N/A

7.0 RESULTS

7.1 SITE OBSERVATIONS

Observations from the site walkover and soil sampling are summarised in **Section 2.4**, with photographs shown in **Appendix B**, and complete borehole and test pit logs provided in **Appendix D**. Details regarding they typical sub-surface soil profile encountered at sampling points are summarised below in **Table 7-1**.

Table 7-1 Typical Soil Profile

Sub-surface Horizon	Typical Depth Range (mBGL)	Description
Fill	-	Not observed.
Natural Residual	0.0-0.6	Silty sandy CLAY; Firm, medium plasticity, uniform, dark greyish brown, medium grained sand.
Extremely Weathered Material	0.2-0.65	Clayey SAND; Loose, fine to coarse grained, uniform, orangey brown, trace gravels.
Bedrock	0.65-5.0	Sandstone

7.2 MONITORING WELL CONSTRUCTION DETAILS

7.2.1 Groundwater Wells

A single monitoring well was installed into a borehole drilled during the DGI. A summary of the construction details in provided in **Table 7-2** below and the cross-sectional illustration of construction is provided with the borehole logs in **Appendix D**.

Table 7-2 Groundwater Well Construction Details

Location	Type	Screen Interval (mBGL)	Gravelly Sand Filter-pack Interval (mBGL)	Bentonite Interval (mBGL)	Backfill Interval (bentonite/grout) (mBGL)
BH04	Groundwater / ground gas	2.2-5.0	1.9-5.0	0.9-1.9	0.0-0.9

7.2.2 Ground Gas Bores

Gas monitoring wells were installed at three locations drilled during the DGI. A summary of the construction details in provided in **Table 7-3** below and the cross-sectional illustration of construction is provided with the borehole logs in **Appendix D**.

Table 7-3 Ground Gas Bore Construction Details

Location	Depth of well (mBGL)	Screen Interval (mBGL)	Filter-pack Interval (mBGL)	Bentonite Interval (mBGL)	Concrete Finish (mBGL)
GG1	1.95	1.15-1.95	0.95-1.95	Cement / bentonite mix: 0.1-0.4 Bentonite slurry: 0.4-0.85 Dry bentonite chips: 0.85-0.95	0.0-0.1
GG2	1.8	1.2-1.8	1.0-1.8	Cement / bentonite mix: 0.1-0.4 Bentonite slurry: 0.4-0.9 Dry bentonite chips: 0.9-1.0	0.0-0.1
GG3	2.0	1.2-2.0	1.0-2.0	Cement / bentonite mix: 0.1-0.4 Bentonite slurry: 0.4-0.9 Dry bentonite chips: 0.9-1.0	0.0-0.1

7.3 SOIL RESULTS

7.3.1 Observations

Nine (9) test pits, TP107-TP115, and three (3) surface scrapes (SS1-SS3) were excavated across the site. Interim findings related to the samples collected from these locations are summarised below. During sampling of soil, the following observations were noted:

- Sheen, odour and discolouration indicating the potential presence of contamination was not observed during soil sampling.
- Soil screened in the field utilising a calibrated PID indicated that all VOC concentrations were below 0.5 ppm, indicating a low likelihood of volatile contaminants adsorbed to soil.
- Deep deposits of fill were not encountered during the investigation with test pits terminating on bedrock (refusal) at depths ranging from 0.15 to 0.65 metres below ground level (bgl). The greatest depth to rock was generally encountered in the central portion of the site within test pits TP110, TP111, TP112 and TP113 (0.5 to 0.65m bgl)
- Anthropogenic materials were not observed within soil excavated from the nine (9) test pits.
- A pile of material was observed toward the western portion of the site adjacent to TP109. The pile is inferred to be associated with the former commercial timber mill land use at that location. Three (3) surface scrapes (SS1-SS3) were cut through the pile with an excavator to characterise the contents, which identified vegetative material as the dominant content with small quantities of brick, concrete and wire, and one fragment of cement sheeting was observed.
- At the time of test pitting, the site experienced heavy rainfall for several days and as such some test pits contained seepage water. Based on previous investigations at the site, the water observed in test pits was not considered indicative of a groundwater aquifer but rather infiltrated water from rainfall. This water was also noted to quickly accumulate at the ground gas wells bores.

7.3.2 Soil Laboratory Analysis

The soil laboratory analytical results obtained during the DGI are presented in the laboratory summary tables provided in **Appendix C**, along with the adopted assessment criteria. Laboratory results for soil were assessed against the land use criteria applicable to a medium density land use setting, as per the current concept design (St Clair Architecture ref. 202312). A summary of results for soil analysis during completion of the DGI is provided below:

- Contaminants were not detected at concentrations that exceeded the applicable human health criteria for a medium density residential land use setting.
- Contaminants were not detected at concentrations that exceeded the applicable ecological criteria for an urban residential and public open space setting.
- A fragment of cement sheeting collected from the pile of material in the western portion of the site was collected and analysed for asbestos identification. The fragment was assessed on site by a competent person, as per the definition of SafeWork NSW, and was categorised as bonded, with no evidence of weathering or malleability. The fragment of cement sheeting was confirmed by the laboratory as containing chrysotile and amosite asbestos and having dimensions of 70 x 40 x 5mm with a mass of 21 grams.
- Asbestos was not detected in any soil sample submitted for analysis.

7.3.3 Aesthetic Considerations

Schedule B1 Section 3.6 of the (NEPC, 1999) provides guidance for the assessment of soils based on aesthetic values as a result of impacts from low concern or non-hazardous inert foreign material in soil or fill as a result of human activity. Below is a summary of the aesthetic conditions within the site.

Soil assessed during the investigation containing aesthetic properties that would preclude it from remaining on the site under the proposed development were limited to the pile of miscellaneous wastes in the western portion of the site. The pile, observed to contain concrete, brick, wire, a single fragment of asbestos cement sheeting, and offcuts of vegetative materials, was generally considered surficial but may also be present locally within the topsoil profile. Under the proposed development, these materials would be considered aesthetically unsuitable to remain, and therefore offsite disposal would be required.

7.4 GROUNDWATER RESULTS

7.4.1 Groundwater Field Parameters

Stabilised groundwater quality parameters recorded during two sampling events and are summarised in **Table 7-4** below with groundwater purging and sampling records presented in **Appendix F**. Calibration certificates are provided in **Appendix G**.

The following observations are of note:

- Groundwater levels observed immediately following the geotechnical investigation indicated a groundwater level at approximately 4 m AHD at the site which because of site topography means that the permanent groundwater table is deeper in the western part of the site (approx. 7 mBGL) and shallower in depth in the eastern part of the site (approx. 3-4 mBGL). Stabilised groundwater levels were later found to be within 1 and 3 mBGL across the site but this is either influenced by pressure in the groundwater system or significant rainfall infiltration that was experienced during the investigation.

- Groundwater levels are subject to seasonal fluctuations and rainfall events. Groundwater is inferred to flow in a southerly general direction towards the Shoalhaven River.
- pH in all wells indicates an acidic condition which may be related to a connection with oxidated acid sulfate soils (ASS), acid sulfate rock (ASR) or elevated carbon dioxide in the groundwater. A check of available ASR mapping indicates that the site is within or immediately bordering an area designated as having a very high probability of acid sulfate rock (Source: Figure 1, Managing The Risks Associated With Acid Sulfate Rock In NSW Road Projects Nicholas Bridgement). The mapping does not have good enough resolution to confirm with 100% accuracy.
- Relatively low dissolved oxygen in BH02 (3.3%) and BH04 (1.7%) as compared to the other wells may indicate localised increased biological activity or reduced conditions due to increased organic content (i.e. such as sewage, highly organic swamp water), ASS conditions, or ASR conditions.
- Sulphur odours were observed in BH02, BH04, and GG3. The odours in BH02 and BH04 correlate somewhat with the low DO measurements.

Table 7-4 Stabilised Physiochemical Field Parameters

Well ID	SWL (mBGL)	pH	EC (µS/cm)	DO (%)	Temp (°C)	Redox Potential (mV)	Observations (e.g. colour, turbidity)
18th January 2024							
BH02	3.27	4.56	411.9	24.4	21.0	-104.5	Clear, no turbidity, very strong sulphur odour.
BH03	0.53	4.25	445.3	26.6	24.3	98.9	Clear to brown, low to medium turbidity, no odour.
BH04	2.18	4.29	410.3	23.2	21.7	140.4	Brown, medium to high turbidity, no odour.
27th February 2024							
BH02	4.48	4.33	306.6	3.3	19.5	-113.0	Clear to cloudy grey, low turbidity, strong sulphur odour, reducing conditions.
BH03	1.45	4.55	576	40.5	20.3	94.3	Clear, no turbidity, no odour, oxidising conditions.
BH04	2.37	4.14	433.3	1.7	21.7	-152.5	Clear to brown, low to medium turbidity, slight sulphur odour reducing conditions.
GG3	0.98	5.68	283.0	17.8	21.9	-94.9	Cloudy yellow, low turbidity, slight sulphur odour. reducing conditions.

* – observation recorded during well development
SWL – standing/static water level
EC – electrical conductivity
DO – dissolved oxygen

7.4.2 Groundwater Observations

During completion of the DGI, the following observations were noted during groundwater monitoring:

- Boreholes BH02 and BH03 were drilled to 11.93 mBGL and 11.52 mBGL, respectively, with a groundwater monitoring well constructed in each that contained a 3 metre screen from the base of the well. At approx. 24 hours after installation and well development, groundwater levels in BH02 and BH03 were measured at depths of approx. 2.7 mBGL (4.2 mAHD) and 7 mBGL (3.616 mAHD), respectively. On 18 January and 27 February as shown in **Table 7-4** above, groundwater level in BH03 was significantly shallower (0.53 and 1.45 mBGL) indicating either potential pressure in the groundwater formation or recharge from rainfall events.
- Borehole BH04 was drilled to 5.0 mBGL with a groundwater monitoring well constructed within that contained a 2.8 metre screen from the base of the well. The stabilised groundwater level was measured at depths of 2.18 mBGL and 2.37 mBGL corresponding to an approximate elevation of 3.6-3.8 mAHD.
- During sampling of groundwater, a moderate hydrogen sulphide odour was noted in water purged from BH02 and a slight hydrogen sulphide odour was noted in water from BH04. Groundwater from BU04 was brownish.
- On the day of groundwater sampling and following groundwater sampling, the well cap was replaced, and a time was allowed for ground gas or trace gas to re-equilibrate in the well-head. Following this time interval, the well cap was removed at each groundwater well and an assessment for VOC vapour in the headspace of the well was undertaken utilising a calibrated photo-ionisation detector (PID). The assessment of VOC did not indicate the presence of volatile contaminants in air at the well head. At the time of monitoring, a landfill gas analyser was not present to check for these gases.

7.4.3 Groundwater Laboratory Analysis

The groundwater laboratory analytical results obtained during the DGI are presented in the laboratory summary tables provided in **Appendix C**, along with the adopted assessment criteria. These results have been further summarised below. Copies of the laboratory certificates are provided in **Appendix E** and the location of each exceedance is illustrated in **Appendix A**.

The groundwater analytical results for the monitoring event undertaken on 18 January 2024 indicated the following:

- Groundwater samples were collected from groundwater wells BH02, BH03 and BH04.
- TRH, BTEXN, pesticides, PAH, and PCB were detected below the laboratory LOR and were therefore considered to be below the adopted human health and ecological assessment criteria.
- Total and dissolved concentrations of metals were assessed during the investigation. For interpretation, the dissolved concentrations have been considered. Dissolved phase concentrations that exceeded the ANZG (2018) Freshwater 95% toxicant DGVs criteria were limited to:
  - Cadmium in sample BH04.
  - Copper in samples BH02, BH03 and BH04.
  - Nickel in samples BH02, BH03 and BH04.
  - Zinc in samples BH02, BH03 and BH04.
- Dissolved phase concentrations that exceed the ANZG (2018) Freshwater 99% toxicant DGVs criteria were limited to:
  - Lead in sample BH04.

- The elevated metals may be associated with background geologic conditions influenced by ASR or ASS conditions. The oxidation of ASS or ASR would result in acidic conditions (as detected in groundwater) resulting in higher concentrations of metals.
- Perfluorooctane sulfonic acid (PFOS) was detected in all samples, BH02, BH03 and BH04, with a maximum concentration of 0.002 µg/L in BH04. The concentrations were below the PFAS NEMP (2020) ecological Freshwater 95% toxicant DGV for PFOS but exceeded the Freshwater 99% toxicant DGV. Sample BH04 also contained concentrations of other PFAS constituents including PFHxS and PFOA. Concentrations in groundwater were generally below the laboratory LOR with exception of PFOS and 6:2 Fluorotelomer Sulfonate in analysed samples.
- The concentrations for all PFAS constituents were below the applicable human health criteria.

A summary of the minimum, maximum, and exceedance of either human health or ecological criteria is provided in **Table 7-5** below.

Table 7-5 Summary of Groundwater Analytical Results 18/01/2024

Number of Samples	Analytes		Concentrations (µg/L)		Human Health Exceedances	Ecological Exceedances
			Minimum	Maximum		
3	Solvents		<5	<5	All samples were below LOR.	All samples were below LOR.
3	TPH		<100	<100		
3	CRC Care TRH Fractions		<100	<100		
3	BTEX		<10	<10		
3	MAH		<1	<1		
3	Metals	Arsenic (total)	<1	13	None	None
3		Arsenic (dissolved)	<1	4	None	None
3		Cadmium (total)	<0.2	<0.2	All samples were below LOR.	All samples were below LOR.
3		Cadmium (dissolved)	<0.2	0.3	None	BH04 (0.3 µg/L) exceeded the ANZG (2018) Freshwater 95% level of protection criteria (for bioaccumulative contaminants) toxicant DGV of 0.2 µg/L.
3		Chromium (III+VI) (total)	2	10	None	None
3		Chromium (III+VI) (dissolved)	<1	2	None	None
3		Copper (total)	<1	28	None	BH03 (28 µg/L) and BH04 (7 µg/L) exceeded the ANZG 2018 Freshwater 95% level of protection toxicant DGV of 1.4 µg/L.
3		Copper (dissolved)	2	41	None	BH02 (QC200) (3 µg/L), BH03 (41 µg/L) and BH04 (7 µg/L) exceeded the ANZG 2018 Freshwater 95% level

Number of Samples	Analytes		Concentrations (µg/L) Minimum	Concentrations (µg/L) Maximum	Human Health Exceedances	Ecological Exceedances
						of protection toxicant DGV of 1.4 µg/L.
3		Lead (total)	<1	7	None	BH02 (QC200) (2 µg/L) exceeded the ANZG 2018 Freshwater 99% level of protection toxicant DGV of 1 µg/L. BH03 (5 µg/L) and BH04 (7 µg/L) exceeded the ANZG 2018 Freshwater 95% level of protection toxicant DGV of 3.4 µg/L.
3		Lead (dissolved)	<1	2	None	BH04 (2 µg/L) exceeded the ANZG 2018 Freshwater 99% level of protection toxicant DGV of 1 µg/L.
3		Mercury (total)	<0.1	<0.1	All samples were below LOR.	All samples were below LOR.
3		Mercury (dissolved)	<0.1	<0.1	All samples were below LOR.	All samples were below LOR.
3		Nickel (total)	16	43	None	BH02 (QC200) (18 µg/L), BH03 (31 µg/L) and BH04 (43 µg/L) exceeded the ANZG 2018 Freshwater 95% level of protection toxicant DGV of 11 µg/L.
3		Nickel (dissolved)	16	53	None	BH02 (QC200) (17 µg/L), BH03 (45 µg/L) and BH04 (53 µg/L) exceeded the ANZG 2018 Freshwater 95% level of protection toxicant DGV of 11 µg/L.
3		Zinc (total)	21	130	None	BH02 (QC200) (25 µg/L), BH03 (130 µg/L) and BH04 (83 µg/L) exceeded the ANZG 2018 Freshwater 95% level of protection toxicant DGV of 8 µg/L.
3		Zinc (dissolved)	23	170	None	BH02 (QA200) (28 µg/L), BH03 (170 µg/L) and BH04 (74 µg/L) exceeded the ANZG 2018 Freshwater 95% level of protection toxicant DGV of 8 µg/L.
3	Organics		<0.001	0.025	None	None
3	PAH		<0.01	<0.01	All samples were below	All samples were below LOR.
3	OCP		<0.01	<0.01		

Results

Number of Samples	Analytes		Concentrations (µg/L) Minimum	Maximum	Human Health Exceedances	Ecological Exceedances
3	OPP		<1	<1	LOR.	
3	Insecticides		<1	<1		
3	Pesticides		<0.01	<0.01		
3	PCB		<1	<1		
3	SVOC		<1	<1		
3	Chlorinated Hydrocarbons		<1	<1		
3	Halogenated Hydrocarbons		<1	<1		
3	PFAS	Perfluorobutane sulfonic acid (PFBS)	<0.001	0.008	None	None
3		Perfluoroheptanoic acid (PFHpA)	<0.001	0.002	None	None
3		Perfluorohexanoic acid (PFHxA)	<0.001	0.006	None	None
		Perfluorobutanoic acid (PFBA)	<0.005	0.007	None	None
3		Perfluorohexane sulfonic acid (PFHxS)	<0.001	0.021	None	None
3		Perfluorooctane sulfonic acid (PFOS)	0.001	0.002	None	BH02 (QA200) (0.002 µg/L), BH03 (0.001 µg/L) and BH04 (0.002 µg/L) exceeded the NEMP 1018 Freshwater 99% level of species protection.
3		Perfluoropentane sulfonic acid (PFPeS)	<0.001	0.003	None	None
3		Perfluoropentanoic acid (PFPeA)	<0.001	0.004	None	None
3		Sum of PFAS	0.021	0.083	None	None
3		Sum of PFHxS and PFOS	0.001	0.023	None	None
3		6:2 Fluorotelomer Sulfonate (6:2 FtS)	0.020	0.033	None	None
3		Perfluorooctanoate (PFOA)	<0.001	0.002	None	None

An additional round of groundwater monitoring was recommended to investigate potential ground gases and indicators of pollution in groundwater. The results of this monitoring are summarised below:

- One groundwater sample was collected from each of groundwater wells BH02, BH03 and BH04, and ground gas bore GG3, for a total of four primary samples.

- Elevated COD values (i.e. mass of oxygen consumed over a volume of solution) that typify the potential presence of wastewater effluent (characterised by waters with a low range COD varying from 100-200 mg/L) and/or anaerobic conditions were detected in BH04 (190 mg/L) and GG3 (340 mg/L).
- BOD values (i.e. amount of dissolved oxygen (DO) consumed by aerobic bacteria growing on the organic material present in a water sample at a specific temperature over a specific time period) were generally less than 2 mg/L with the exception of 10 mg/L in BH02.
- Hydrogen sulfide levels were all below the LOR (<50 µg/L) however, the LOR was not low enough for comparison with guidelines (<1 µg/L).
- Very low acidic level pH was measured in BH02 (4.3), BH03 (4.6) and BH04 (3.7), while pH in GG3 was less acidic and nearly neutral (6.7). The near neutral pH in GG3 may be a result of ingress of rainfall as it is the shallowest well. The acidic pH groundwaters may a result of the generation of acids from oxidation of ASS or ASR.
- Sulphate concentrations (13-320 ppm) were in a non-aggressive range for concrete exposure (i.e. < 1,000 ppm), however, the sample in BH03 (320 ppm) exceeded the recreational criteria (250 ppm). As the criteria applies in a recreational water body, this exceedance in groundwater is of less concern. A chemical mechanism for elevated sulphate in a freshwater environment can be the oxidation of pyrite in ASR to sulphate.
- Trace concentrations of dissolved methane were detected ranging from 0.29 mg/L (BH03) to 1.1 mg/L (BH02) in all wells. As methane does not easily become soluble in groundwater, these concentrations are indicative of a relatively strong methane source, however, immediate action level would only be considered at 10 mg/L.

Overall, the groundwater concentrations indicate potential presence of reactions associated with ASR and/or ASS in the natural geology. Lines of evidence of this include the presence of methane, hydrogen sulfide and carbon dioxide in ground gas, dissolved methane in groundwater, acidic pH in groundwater, elevated metals in groundwater, iron oxide staining in the shallow sandstone geology, and localised elevated BOD and COD indicating biogenic processes. The presence of volatile petroleum hydrocarbons, such as from a petrol station, were not detected in groundwater indicating that the petrol station located cross- to down-gradient of the site is an unlikely source.

A summary of the minimum, maximum, and exceedance of either human health or ecological criteria is provided in Table 7-6 below.

Table 7-6 Summary of Groundwater Analytical Results 27/02/2024

Number of Samples	Analytes		Concentrations (µg/L)		Human Health Exceedances	Ecological Exceedances
			Minimum	Maximum		
4	Inorganics	BOD	<2,000	10,000	None	None
4		COD	31,000	340,000	None	None
4		Electrical conductivity	310	550	None	None
		Hydrogen sulfide	<50	<50	All samples were below LOR.	All samples were below LOR.

Number of Samples	Analytes		Concentrations (μg/L)		Human Health Exceedances	Ecological Exceedances
			Minimum	Maximum		
4		Nitrate (as N)	<20	30	None	None
4		pH	4.3	6.1	None	None
4		Sulphate	13,000	320,000	BH03 contained a sulphate concentration of 320,000 μg/L, exceeding the Managing Risks in Recreational Water 2008 (Aesthetic) of 250,000 μg/L.	None
4	Organics	Methane	230	1,100	None	None

7.5 GROUND GAS RESULTS

7.5.1 Subsurface Gas Monitoring – Discrete Monitoring

Subsurface gas monitoring was undertaken on four occasions, listed below, utilising the monitoring wells installed within the site.

- 23rd January 2024
  - Monitoring of BH04.
  - Monitoring was undertaken utilising a calibrated GA5000 gas analyser.
- 27th February 2024
  - Monitoring of BH04, GG1, GG2 and GG3.
  - Monitoring was undertaken utilising a calibrated GA5000 gas analyser.
- 5th March 2024
  - Monitoring of BH04, GG1, GG2 and GG3.
  - Monitoring of waste water drains inside the 2 residential buildings within the site.
  - Monitoring of sub-floor space below 1 residential building within the site.
  - Monitoring of any external drains and service pits within and surrounding the site.
  - Monitoring was undertaken utilising a calibrated GA5000 gas analyser.
- 12th March 2024
  - Monitoring of BH04, GG1, GG2 and GG3.
  - Monitoring of the drain located along the western edge of the residential building in the southeast.
  - Monitoring was undertaken utilising a calibrated GA5000 gas analyser.
- 19th March 2024
  - Monitoring of BH04, GG1, GG2 and GG3.
  - Monitoring of the drain located along the western edge of the residential building in the southeast.
  - Advancement of 3 hand auger holes to 0.4m (bedrock) between GG3 and the residential building in the southeast to assess for odour and/or unusual visual traits.
  - Monitoring was undertaken utilising a calibrated GA5000 gas analyser.

A summary of stabilised gas readings measured on site at discrete points in time is provided below in **Table 7-6** along with the Preliminary ground Gas Assessment Criteria specified in **Section 5.1.2.1**. Readings exceeding the Preliminary Assessment Criteria are shaded orange. Copies of the completed field forms are provided in **Appendix F** and the location of each monitoring point is provided in **Appendix A**.

Table 7-7 Discrete Subsurface Ground Gas Readings

Well ID	Peak Methane	Peak Carbon Dioxide	Peak Carbon Monoxide	Peak Hydrogen Sulphide	Comments
Preliminary Assessment Criteria	**1% v/v**	**1.5% v/v**	**25 ppm**	**5 ppm**	
23rd January 2024, sunny, approximately 25°C, atmospheric pressure 1021 hPA (BOM)					
BH04	1.9	5.8	5	1	Peak flow rate of 0 L/hr Standing water level: 2.34mBGL
27th February 2024, overcast, approximately 23°C, atmospheric pressure 1021 hPA (BOM)					
GG1	0.1	1.2	<0.1	<0.1	Peak flow rate of 1.8 L/hr Standing water level: 1.68mBGL
GG2	<0.1	1.1	<0.1	<0.1	Peak flow rate of 3.9 L/hr Standing water level: 1.52mBGL
GG3	<0.1	5.4	<0.1	49	Peak flow rate of 6.7 L/hr Standing water level: 0.78mBGL
BH04	0.4	4.9	<0.1	<0.1	Peak flow rate of 5.2 L/hr Standing water level: 3.43mBGL
5th March 2024, overcast, approximately 24°C, atmospheric pressure 1025 hPA (BOM)					
GG1	<0.1	3.9	<0.1	<0.1	Peak flow rate of 11.2 L/hr Standing water level: 1.49mBGL
GG2	<0.1	4.3	<0.1	<0.1	Peak flow rate of 9.7 L/hr Standing water level: 1.32mBGL
GG3	<0.1	6.8	<0.1	30	Peak flow rate of 0.8 L/hr Standing water level: 1.06mBGL
BH04	0.8	11.4	1	<0.1	Peak flow rate of -1.8 L/hr Standing water level: 4.83mBGL
12th March 2024, sunny, approximately 29°C, atmospheric pressure 1017 hPA (BOM)					
GG1	<0.1	3.9	<0.1	<0.1	Peak flow rate of 5.7 L/hr Standing water level: 1.58mBGL
GG2	<0.1	4.1	<0.1	<0.1	Peak flow rate of 8.7 L/hr Standing water level: 1.52mBGL
GG3	<0.1	5.8	<0.1	<0.1	Peak flow rate of 0.1 L/hr

Results

Well ID	Peak Methane	Peak Carbon Dioxide	Peak Carbon Monoxide	Peak Hydrogen Sulphide	Comments
Preliminary Assessment Criteria	**1% v/v**	**1.5% v/v**	**25 ppm**	**5 ppm**	
					Standing water level: 1.53mBGL
BH04	<0.1	10	<0.1	<0.1	Peak flow rate of -6.2 L/hr Standing water level: 4.83mBGL
19th March 2024, sunny, approximately 26°C, atmospheric pressure 1017 hPA (BOM)					
GG1	<0.1	0.5	<0.1	<0.1	Peak flow rate of 4.3 L/hr Standing water level: 1.54mBGL
GG2	<0.1	5.3	<0.1	<0.1	Peak flow rate of 16.3 L/hr Standing water level: 1.31mBGL
GG3	<0.1	7.1	<0.1	<0.1	Peak flow rate of 14.5 L/hr Standing water level: 0.15mBGL
BH04	<0.1	8.1	<0.1	<0.1	Peak flow rate of -12.3 L/hr Standing water level: 4.83mBGL

- Subsurface ground gas monitoring at GG1 occurred on four occasions with the following observed:
  - Methane concentrations ranged from 0 to 0.1 % v/v; carbon dioxide ranged from 0.5 to 3.9 % v/v and flow rate ranged from 1.8 to 11.2 L/hr. The elevated flow rate may be a result of groundwater fluctuations in the well volume.
  - The concentrations of carbon dioxide were above the adopted assessment criteria on two out of the four occasions, however, a portion or all of this carbon dioxide may be related to the natural background conditions at the site.
- Subsurface ground gas monitoring at GG2 occurred on four occasions with the following observed:
  - Carbon dioxide ranged from 1.1 to 5.3 % v/v and flow rate ranged from 3.9 to 16.3 L/hr.
  - The concentrations of carbon dioxide were above the adopted assessment criteria on three out of the four occasions, however, a portion or all of this carbon dioxide may be related to the natural background conditions at the site.
  - The elevated flow rate may be a result of groundwater fluctuations in the well volume.
- Subsurface ground gas monitoring at GG3 occurred on four occasions with the following observed:
  - Carbon dioxide ranged from 5.4 to 7.1 % v/v;
  - Hydrogen sulphide ranged from 0 to 49 ppm. The hydrogen sulphide is evidence of sulfur compounds subjected to reducing conditions. Hydrogen sulphide can be generated in marine and estuarine deposits, sewers, stormwater drains and pits, landfilled plasterboard, and Acid Sufate Rock (ASR) and Acid Sulfate Soils (ASS).
  - Fow rate ranged from 0.1 to 14.5 L/hr. The elevated flow rate may be a result of groundwater fluctuations in the well volume.

- The concentrations of carbon dioxide were above the adopted assessment criteria on all occasions and the concentrations of hydrogen sulphide were above the adopted assessment criteria on two out of the four occasions, however, a portion or all of this carbon dioxide may be related to the natural background conditions at the site.

- Subsurface ground gas monitoring at BH04 occurred on five occasions with the following observed:
  - Methane ranged from 0.1 to 1.9 % v/v, carbon dioxide ranged from 4.9 to 11.4 % v/v; carbon monoxide ranged from 0 to 1 ppm and flow rate ranged from -1.8 to -12.3 L/hr.
  - Methane was above the adopted assessment criteria on one occasion.
  - The elevated and negative flow rate may be a result of groundwater fluctuations in the well volume.
  - The concentrations of carbon dioxide were above the adopted assessment criteria on all occasions, however, a portion or all of this carbon dioxide may be related to the natural background conditions at the site.
- Monitoring within the two residential buildings occurred on one occasion with the following observed:
  - There were no detections of methane, carbon dioxide, carbon monoxide or hydrogen sulphide.
- Monitoring of service pits within and surrounding the site occurred on two occasions with the following observed:
  - There were no detections of methane, carbon dioxide, carbon monoxide or hydrogen sulphide at any locations, except at one drain located along the western edge of the residential building in the southeast, where there was a detection of hydrogen sulphide recorded at 2 ppm on one occasion.

7.5.2 Subsurface Gas Monitoring – Continuous monitoring

Continuous subsurface gas monitoring utilising calibrated GasClam equipment took place from the 27th of February to 14th of March 2024. Data alternated between two locations due to fluctuations in standing water level in the wells caused by heavy rainfall. A brief rationale and justification regarding the monitoring well location selected for semi-continuous gas monitoring is provided below:

- GG1 (27th to 29th of February 2024):
  - Elevated methane was detected on the 27th of February during the first round of subsurface gas monitoring.
  - The standing water level was low enough to deploy the GasClam without submerging the instrument.
- GG3 (29th of February to 14th March 2024):
  - Elevated carbon dioxide and hydrogen sulphide was detected on the 27th of February during the first round of subsurface gas monitoring.
  - This well is located within close proximity to building footprints and sewer utility lines.

Bulk ground gas concentrations (CH_4, CO_2, CO, H_2S, O_2) at the monitored locations were below the applicable assessment criteria with the exceptions summarised below in **Table 7-7**. The full monitoring results are shown in **Appendix C**.

Table 7-8 Summary of Semi-continuous Subsurface Gas Monitoring

Well ID	Monitoring Period	CH_4 (% v/v)		CO_2 (% v/v)		CO (ppm)		H_2S (ppm)	
		Max.	Ave.	Max.	Ave.	Max.	Ave.	Max.	Ave.
Assessment Criteria		**1% v/v**		**1.5% v/v**		**25 ppm**		**5 ppm**	
GG1	27/02/24 – 29/02/24	0.1	0.1	4.2	2.9	37	22.8	3	2.0

Results

GG3	29/02/24 – 14/03/24	2.8	1.5	10	6.6	344	52.4	4	2.1

Results from the semi-continuous subsurface gas monitoring show the following Preliminary Assessment Criteria exceedances:

- GG1:
  - Elevated concentrations above criteria for both peak and average carbon dioxide and peak carbon monoxide.
- GG3
  - Elevated concentrations above criteria for both peak and average methane and carbon dioxide, and peak carbon monoxide.

As defined in the NSW EPA 2020a, the worst-case meteorological scenario can be estimated from the 5th-percentile 3-hour pressure decrease rate for the site based on a two-year dataset for the nearest BOM site with continuous barometric pressure recordings. This calculation has not been computed for the site but Stantec's experience in various regions of NSW is that this value generally falls between 2 mb and 3 mb. As the actual value has not been calculated for the nearest weather station, a conservative value of 3 mb drop over a 3-hr period has been used as representative wort-meteorological condition. A check of the gas clam barometric data recorded at the site indicated that this occurred during the deployment of the gas clam in GG1 and GG3 at the times shown in **Table 7-8** below.

Table 7-9 Summary of Worst-meteorological Conditions

Well ID	Monitoring Period	Date	Start Time	End Time	Pressure drop over 3-hr (mb)
GG1	27/02/24 – 29/02/24	28/02/2024	10:20	13:20	3
		28/02/2024	11:20	14:20	3
GG3	29/02/24 – 14/03/24	1/03/2024	13:20	16:20	3
		2/03/2024	23:20	2:20	3
		5/03/2024	12:20	`15:20	4
		6/03/2024	11:20	14:20	3
			12:20	15:20	3
		11/03/2024	10:20	13:20	3
			14:20	17:20	3
		14/03/2024	0:20	3:20	3

During the worst-meteorological conditions experienced at the site, the maximum gas concentrations were as follows:

Table 7-10 Summary of Gas Concentrations at Worst-meteorological Conditions

Well ID	Monitoring Period	CH_4 (% v/v)		CO_2 (% v/v)		CO (ppm)		H_2S (ppm)	
		Max.	Ave.	Max.	Ave.	Max.	Ave.	Max.	Ave.
Assessment Criteria		**1% v/v**		**1.5% v/v**		**25 ppm**		**5 ppm**	
GG1	27/02/24 – 29/02/24	0.1	0.1	3.1	3.1	26	25	2	2
GG3	29/02/24 – 14/03/24	2.3	1.0	9.9	5.0	329	110	4	2

Based on the discrete and semi-continuous ground gas measurements, the following comments are made:

- Maximum methane of 2.8% v/v was measured in GG3 while a lesser concentration of 1.9% v/v was measured in BH04. Both of these are located on the eastern side of the site. Methane in all other monitored wells was generally below 0.1% v/v.
- Maximum carbon dioxide of 11.4% v/v was measured in BH04 while a lesser concentration of 10% v/v was measured in GG3. It is considered that a natural background carbon dioxide of at least 4% v/v is present at the site and this would result in a criteria in the order of 5.5% v/v in the subsurface. The additional carbon dioxide in BH04 and GG3 may be a result of natural attenuation of methane to carbon dioxide in the presence of oxygen in the shallower environment.
- Maximum carbon monoxide of 344 ppm was measured in GG3 while a lesser concentration of 37 ppm was measured in GG1. The carbon monoxide in GG3 reached its peak within 9 days of well installation and then diminished to generally less than 25 ppm within an additional 5 days. This data indicates an introduced carbon monoxide as part of the well drilling process with stable carbon monoxide within a normal range of less than 10 ppm.
- Maximum hydrogen sulfide of 49 ppm was measured in GG3 while no other monitoring well recorded hydrogen sulfide greater than the detection limit of the equipment (1 ppm). The semi-continuous monitoring data in GG3 indicated a maximum hydrogen sulfide concentration of 4 ppm. During groundwater sampling, hydrogen sulfide odours were noted in BH02 (very strong to strong), BH04 (slight), and GG3 (slight).
- The elevated flow rates measured in the wells may be attributable to groundwater fluctuations observed during monitoring following significant storm events, and as such are not considered representative.

7.5.3 Reliability of Screening Model Information

1. **Is the screening model based on sufficient, reliable site information to allow its use for screening purposes?**

The preliminary screening model is the Preliminary CSM outlined in **Section 4.1** and the information gathered during the DSI and DGI which are considered sufficient and reliable. The preliminary CSM is considered to be reliable as it has been constructed by Stantec on the basis of historical documentation and site observations during drilling of the DSI. The preliminary screening model has also been informed by preliminary ground gas measurements (4 rounds at GG1, GG2. GG3 and BH04), semi-continuous ground gas monitoring, and two rounds of groundwater sampling and analyses.

7.5.4 Potential Source of Bulk Ground Gas

2. Is there a potential source of bulk ground gas?

Based on the observations during drilling, monitoring of ground gas, and sampling and analyses of groundwater across the site, potential sources of bulk ground gas exist both on-site and off-site. The preliminary findings of subsurface ground gas monitoring and groundwater sampling and analyses within the site indicate potential presence of subsurface chemical reactions associated with acid sulfate rock and/or acid sulfate soils.

Overall, the groundwater concentrations indicate potential presence of reactions associated with ASR and/or ASS in the natural geology. Lines of evidence of this include the presence of methane, hydrogen sulfide and carbon dioxide in ground gas, dissolved methane in groundwater, acidic pH in groundwater, elevated metals in groundwater, iron oxide staining in the shallow sandstone geology, and localised elevated BOD and COD indicating biogenic processes.

Other potential sources of groundwater and ground gas impact could be associated with the property sewage line, trunk sewers, and/or other infrastructure associated with the historic abandoned houses on the property, however, Council representatives were not aware of sewage leaks. If there is a localised sewage leak source, this can be removed as part of the development and thus removing this risk. In regard to a geologic source such as the natural sandstone and alluvial deposits underlying and surrounding the property, a site mitigation system and correct building materials may be required as the source cannot be removed.

Of note are the measured concentrations of methane and hydrogen sulfide, and to a lesser extent carbon dioxide, at parts or all of the site. The maximum noted concentrations of methane (2.8% v/v) and hydrogen sulfide (49 ppm) both warrant further source investigation and/or mitigation for a proposed residential development, while the carbon dioxide is likely a residual constituent of methane attenuation and background concentration and would be mitigated by treatment of the others. The potential presence of ASR, that requires confirmation, also requires that protection against corrosion is needed for concrete structures in contact with ASR and groundwater.

As flow rates measured during this investigation are considered to be highly influenced by groundwater influxes and/or groundwater table pressures, a Characteristic Gas Situation is difficult to establish at this stage.

Further rationale for the above is summarised below:

- The organic rich environments surrounding the site where organic materials may be naturally degrading. These environments exist locally to the west, north and east of the site, with areas of low-lying wetland and acid sulfate soil environments known to exist.
- Typical sources of hydrogen sulphide in the natural environment can include organic rich settings, such as acid sulfate soil environments and peaty organic deposits. The site geology comprises of relatively shallow bedrock but is situated between two areas mapped as Class 2 Acid Sulfate Soils.

These areas include a wetland to the west and low-lying alluvial deposits to the north and east in the vicinity of Bomaderry Creek, both with an approximate elevation of 4m Australian Height Datum (AHD).

- The site is located within or at the boundary of a mapped area of very high risk for Acid Sulfate Rock.
- A potential supplied natural gas leak from an asset running through or within the vicinity of the site. However, less likely as there would be much higher methane concentrations. As an extra line of evidence to consider this potential source, Stantec contacted Jemena who have a natural gas asset that passes the immediate east of the site within Bolong Road. The Jemena asset is a 75mm diameter nylon main. A local representative of Jemena attended the site on the 29 February 2024 to assess whether their asset may be leaking. Stantec were advised that there were no known or recent leaks of gas from their assets within the vicinity of the site. The representative also advised that vegetation within approximately 5m of their asset would likely be dead in the event of a leak.
- A potential influence from local municipal wastewater assets within the vicinity of the site. As an extra line of evidence to consider this potential source, Stantec contacted Shoalhaven Water who have wastewater assets to the immediate east of the site within Bolong Road, including a gravity main. A local representative of Shoalhaven Water attended the site on the 28 February 2024 to assess whether their asset may be leaking or damaged. Stantec were advised of the following:
  - The sewer main passes the two dwellings along Bolong Road, and each dwelling has a connection to the main. He said the main would be located approximately 1m from the eastern site boundary. The junction where the dwellings connect with the sewer are around 1.1m deep (bottom of pipe), and the sewer is likely situated at a similar depth (possibly slightly deeper).
  - The Shoalhaven Water representative attributed the probably source of the odour to be associated with acid sulfate soils.
  - The Shoalhaven Water representative sighted the location of borehole GG3 and advised that we are unlikely to have encountered the internal wastewater pipe that is connected to the sewer main.
  - The Shoalhaven Water representative advised that sometimes when a property has the water supply cut, the pipes, cisterns, pans can dry out and there is potential for gas / odour from the main to come through the pipework into the building.
  - The Shoalhaven Water representative was not aware of any leaks or compromised sewer infrastructure in the area.
- A potential sewage leak from an asset running through or within the vicinity of the site (i.e. such as a septic tank or sewer service). Several vent pipes and venting infrastructure have been observed at the two existing houses at the site. The actual function of this infrastructure is not yet known.
- Decomposing material within the vicinity of the site:

- Historical imagery shows earthworks and ground disturbance within the open space at Thurgate Oval located approximately 100m north of the site, but the imagery does not appear to show waste disposal. Further, historic topographic maps provided in Lotsearch report LS045079 show that in 1929 the area is shown as vegetated open space with a creek, in 1998 as vegetated open space and in 2015 as Thurgate Oval.
- The current surface levels at that Thurgate Oval are relatively flat with an approximate elevation of between 2 and 4 metres Australian Height Datum. The ground surface of Thurgate Oval sits approximately 1 to 2 metres above the surface water body to the immediate north, which is a tributary to Bomaderry.
- The above topographic features do not indicate a deep deposit of fill or waste conducive to generating elevated hazardous ground gases that could impact the site, however, this remains a possible source.
- During the investigation period, an inspection was conducted at Thurgate Oval and the surrounding areas, including nearby buildings and structures. Signage indicating the potential presence of buried waste or hazardous conditions were not identified and buildings and structures did not appear to contain ventilation infrastructure beyond that required for standard construction. Further, a BYD Australia enquiry was lodged for Thurgate Oval and the surrounding area, sequence number 236020108, to identify whether any portions of land or utility / asset owners had notations on their BYD responses regarding hazardous ground gas or requirements for health and safety controls. A review of the BYD responses did not identify such notations.

7.5.5 Credible Pathway Linkage

3. Is there a credible pathway between the source and the receptors?

The extent of pathways from the gas producing areas within the site to potential receptors is associated with the built environment including foundations below grade and service penetrations into buildings. Where a source is located within a site, services may also allow for the migration of gas across property boundaries.

Given the relatively shallow detection of ground gases (within approx. 1.5 m BGL), and the depth of typical services (typ. 0.5 to 1.5 mBGL), there is sufficient potential for the site ground gases to migrate towards the underside of building spaces via convection and via groundwater and then to migrate into building spaces via advection, unless sufficient pathway intervention is supplied.

7.6 QAQC ASSESSMENT

A QA/QC assessment of the field and laboratory data is enclosed in **Appendix H**. It is concluded that overall, the quality of the analytical data produced is acceptable and reliable for the intended purpose.

8.0 SITE CHARACTERISATION

The subsections below provide site characterisation for the site in consideration of the data and information available for soil, groundwater, ground gas, and provides a summary of applicable data gaps.

8.1 SOIL

8.1.1 Human Health

The soils assessed from within the site, at the points of sample collection, did not contain concentrations of chemical contaminants that would preclude a future medium-density residential land use, as per the current concept design. During the investigation at the site, a shallow rock profile was evident, with the greatest thickness of soil present in the central eastern portion along the southern boundary, with a maximum thickness of 0.65m. The shallow veneer of soils across the site were observed to contain relatively high levels of organic content.

8.1.1.1 Asbestos

A single fragment of asbestos cement sheeting was observed during test pitting at the site and was noted as being bonded, with no evidence of weathering or malleability when assessed on site. The fragment was identified at ground surface, noting that rock was evident from approximately 0.05 mBGL, within a pile of remnant waste from the former landowner who operated a commercial sawmill within that portion of the site. The pile of waste comprised mostly of vegetative matter, however, some small quantities of brick, concrete and wire were also observed. Upon discovery of the fragment, several further surface scrapes were conducted within the immediate surrounds, however, no further evidence of asbestos containing materials.

The pile of waste is unsuitable for retention on site due to its poor aesthetic properties (i.e. waste contents) and will require off-site disposal at a NSW EPA licensed premises. Based on current information, the ACM impact is considered localised to the location of the pile of waste, and any further asbestos, if present, could be appropriately and adequately managed during construction in consultation with an occupational hygienist.

8.1.1.2 Aesthetic

With exception to the above pile of waste, no other solid materials possessed aesthetically unsuitable properties that would require off-site disposal. Following demolition of buildings and structures, ground surfaces must be free of any non-hazardous inert foreign materials that are considered, as per Schedule B1 Section 3.6 of the (NEPC, 1999).

8.1.2 Ecological

Nickel and zinc were identified at concentrations that exceeded the generic ecological criteria for an urban residential setting at several sampling points. Current data indicates that these materials can be retained on site but are not suitable for use as a growing medium, and as such must not be utilised within the top two meters of the soil profile within any area of vegetation or landscaping.

No other exceedances of the ecological criteria were identified in soil.

8.2 GROUNDWATER

8.2.1 Hydrogeological Setting

The Hydrogeology Map of Australia, as referenced in Lotsearch Report LS045079 EP (June 2023), identifies that the hydrogeological setting beneath the site comprises of *fractured or fissured, extensive aquifers of low to moderate productivity*.

Groundwater levels observed immediately following the geotechnical investigation indicated a groundwater level at approximately 4 m AHD at the site which because of site topography means that the permanent groundwater table is inferred to be deeper in the western part of the site (approx. 7 mBGL) and shallower in depth in the eastern part of the site (approx. 3-4 mBGL). Stabilised groundwater levels were found to be within 1 and 3 mBGL across the site but this is either influenced by pressure in the groundwater system or significant rainfall infiltration that was experienced during the investigation.

Groundwater levels are subject to seasonal fluctuations and rainfall events. Groundwater is inferred to flow in a southerly to southeasterly general direction towards the Shoalhaven River.

8.2.2 Human Health

Groundwater sampling from within the site did not identify contaminant concentrations that exceeded the adopted criteria for a medium density residential development.

The site, under the proposed development, will be connected to the municipal potable water supply, and as such there is no anticipated scenario where residents will interact with groundwater. Further, due to the shallow rock profile and the medium-density land use setting (limited green-space), it is not envisaged that future residents will undertake activities, such as gardening, that could potentially interact with groundwater.

Overall, the groundwater concentrations indicate potential presence of reactions associated with ASR and/or ASS in the natural geology. Lines of evidence of this include the presence of methane, hydrogen sulfide and carbon dioxide in ground gas, dissolved methane in groundwater, acidic pH in groundwater, elevated metals in groundwater, iron oxide staining in the shallow sandstone geology, and localised elevated BOD and COD indicating biogenic processes.

Other potential sources of groundwater and ground gas impact could be associated with the property sewage line, trunk sewers, and/or other infrastructure associated with the historic abandoned houses on the property, however, Council representatives were not aware of sewage leaks. If there is a localised sewage leak source, this can be removed as part of the development and thus removing this risk. In regard to a geologic source such as the natural sandstone and alluvial deposits underlying and surrounding the property, a site mitigation system and correct building materials may be required as the source cannot be removed.

Of note are the measured concentrations of methane and hydrogen sulfide, and to a lesser extent carbon dioxide, at parts or all of the site. The maximum noted concentrations of methane (2.8% v/v) and hydrogen sulfide (49 ppm) both warrant further source investigation and/or mitigation for a proposed residential development, while the carbon dioxide is likely a residual constituent of methane attenuation and background concentration and would be mitigated by treatment of the others. The potential presence of

ASR, that requires confirmation, also requires that protection against corrosion is needed for concrete structures in contact with ASR and groundwater.

As flow rates measured during this investigation are considered to be highly influenced by groundwater influxes and/or groundwater table pressures, a Characteristic Gas Situation is difficult to establish at this stage.

8.2.3 Ecological

The contaminants present in groundwater above the adopted ecological criteria, specifically cadmium, copper, nickel and zinc for freshwater 95%, lead for fresh water 99% ANZG (2018) toxicant DVGs and Perfluorooctane sulfonic acid (PFOS), may be representative of background concentrations or from off-site sources, noting that the regional setting includes commercial and industrial operations.

Due to the absence of elevated contaminants in soil, the contaminant concentrations detected in groundwater are unlikely to be attributable to an on-site source. It is noted that the Shoalhaven River is known to contain PFAS, with the NSW EPA undertaking ongoing investigations in relation to the matter.

8.3 GROUND GAS

The ground gas conditions at the site are characterised below, based on current information:

- Maximum methane of 2.8% v/v was measured in GG3 while a lesser concentration of 1.9% v/v was measured in BH04. Both of these are located on the eastern side of the site. Methane in all other monitored wells was generally below 0.1% v/v, however, there has been limited ground gas investigation in the western part of the site.

- Maximum carbon dioxide of 11.4% v/v was measured in BH04 while a lesser concentration of 10% v/v was measured in GG3. It is considered that a natural background carbon dioxide of at least 4% v/v is present at the site and this would result in a criteria in the order of 5.5% v/v in the subsurface. The additional carbon dioxide in BH04 and GG3 may be a result of natural attenuation of methane to carbon dioxide in the presence of oxygen in the shallower environment.

- Maximum carbon monoxide of 344 ppm was measured in GG3 while a lesser concentration of 37 ppm was measured in GG1. The carbon monoxide in GG3 reached its peak within 9 days of well installation and then diminished to generally less than 25 ppm within an additional 5 days. This data indicates an introduced carbon monoxide as part of the well drilling process with stable carbon monoxide within a normal range of less than 10 ppm.

- Maximum hydrogen sulfide of 49 ppm was measured in GG3 while no other monitoring well recorded hydrogen sulfide greater than the detection limit of the equipment (1 ppm). The semi-continuous monitoring data in GG3 indicated a maximum hydrogen sulfide concentration of 4 ppm. During groundwater sampling, hydrogen sulfide odours were noted in BH02 (very strong to strong), BH04 (slight), and GG3 (slight).

- The elevated flow rates measured in the wells may be attributable to groundwater fluctuations observed during monitoring following significant storm events, and as such are not considered representative.

- The methane, hydrogen sulfide, and carbon dioxide gas concentrations generally correlate with the measured groundwater concentrations and the potential influence of ASR and/or ASS within the natural geologic environment. The presence of ASR has not been confirmed, however, the lines of evidence point to this possibility.
- Both methane and hydrogen sulfide concentrations detected in the eastern part of the site to date warrant further investigation across the site so that sources can be resolved and/or mitigation for the proposed development is designed. Elevated carbon dioxide would similarly be mitigated by treatment of the other gases. Where not mitigated or resolved, both gases at the current maximum measured concentrations would require notification to the NSW EPA should they be detected within infrastructure. A mitigation system would resolve the gas risk such that notification to the NSW EPA would not be required.
- Based on current information, the most likely gas mitigation system would include a sub-slab ventilation layer and potential vapour barrier where potential gas accumulation is vented to the atmosphere via pipework and a barrier is placed to mitigate odour. An independent assessment of site conditions and management advice was sought from BGL Nominees Pty Ltd, a specialist consultancy responsible for design and installation of hazardous ground gas protection systems. A copy of the Ground Gas Protection System – Conceptual Advice memo prepared by BGL is available in **Appendix I** and states the following in relation to the site:
    - *Consideration for sub-slab ventilation and/or an independently tested gas membrane are commonplace to the presented risk profile at the site and BGL provide an example cross section for illustrative purposes (*see **Appendix I***).*
    - *These types of mitigation approaches have been performed within the Australian market over the last 20 years and can be integrated into the built form without significant changes to the building design.*
    - *On the available information, BGL consider the scenario presented as typical of those we commonly encounter and by adoption of similar protection measures to those outlined above, a solution can be integrated into the built form without significant change.*
- In a workplace environment the noted gases would be considered to represent hazardous or unsafe environments for workers at concentrations that exceed 0.25% v/v (methane), 5 ppm (hydrogen sulfide), 0.1% v/v (carbon dioxide in an accessible space for workers), 25 ppm (carbon monoxide) and less than 19.5% v/v (oxygen). As such control measures for construction workers and works would require consideration during future construction activities.
- The gas assessment completed at the site was undertaken to support the development approval for the proposed medium density residential development at the site. Section 4.6 of the State Environmental Planning Policy (Resilience and Hazards) 2021 specifies the considerations for determining a development application. Based on the works completed, Stantec consider that the SEPP requirements have been met through demonstration that the ground gas identified at the site can be appropriately managed through incorporation of a ground gas protection system into the detailed design (see **Appendix I**), such that the site would be suitable for the proposed medium density residential land use, as per the current design.

8.4 REVISED CONCEPTUAL SITE MODEL

Based on the findings of the DGI and in consideration of data and information gathered during previous investigation, an updated CSM for the site is provided below.

Contaminant Source	Impacted Media	Contaminants of Potential Concern	Exposure Pathways	Receptors	Likelihood of complete exposure pathway
Potential contamination resultant from historical waste storage and commercial activities, including the western and central portions of the site historically being utilised by a commercial sawmill.	Shallow soil	Asbestos	Incidental ingestion and inhalation of dust and/or fibres	**Human:** • Current site users • Future Site workers (including maintenance workers • Future site occupants	Moderate: a single fragment of asbestos cement sheeting (ACM) was observed within a pile of waste material within the western portion of the site. The fragment was assessed to be in sound condition and is therefore considered non-friable. Given that the fragment was identified within the top 100mm of the soil profile (ie surface soils), the exposure pathway is considered complete, however, due to the impact being limited to a single fragment and the material being in sound condition, the potential risk to human receptors is currently considered low. The material would need to be appropriately removed during demolition and earthworks to render the exposure pathway incomplete.
Weathered and structurally compromised hazardous building materials within current site structures, including sheds and dwellings.	Soil	Asbestos Metals PCB Synthetic mineral fibres	Direct contact Incidental ingestion of soil Incidental ingestion and inhalation dust and/or fibres	**Human:** • Current site users • Future Site workers (including maintenance workers • Future site occupants **Ecological:**	Moderate: damage to existing structures was evident within the north eastern portion of the site where the asbestos cement sheeting external cladding had been broken. Fragments of ACM were visible on ground surfaces within the vicinity, however, the ACM appeared to be in sound condition. Given that the fragments were identified within the top 100mm of the soil profile (ie surface soils), the exposure pathway is considered complete. The potential risk to human receptors is considered low based on the current land use, however, the material would need to be

Contaminant Source	**Impacted Media**	**Contaminants of Potential Concern**	**Exposure Pathways**	**Receptors**	**Likelihood of complete exposure pathway**
				• Existing and future plant-based biota within the site	appropriately removed during demolition to render the exposure pathway incomplete.
Materials with potential to impact groundwater and ground gas beneath the site including oxidation of potential ASR and ASS both underlying and surrounding the site, and to a lesser probability, subsurface infrastructure within and adjoining the site including wastewater assets and utilities.	Groundwater Ground gas	Methane; Carbon dioxide; Hydrogen sulphide; Carbon monoxide; trace gases	Asphyxiation Explosive potential	**Human:** ▪ Future Site workers (including maintenance workers ▪ Future site occupants **Ecological:** ▪ Existing and future plant-based biota within the site ▪ Offsite receptors including vegetation and waterways	Moderate to high: current findings from the ground gas and groundwater assessment at the site has identified ground gas concentrations that could present a risk to future occupants through potential accumulation of gases within subsurface assets (e.g. utilities) and ground floor rooms and dwellings. The impacts appear to be greatest within the rock profile in the lower-lying eastern portion of the site. Without appropriate mitigation, the presence of ground gas could present a complete exposure pathway and risk to on-site receptors and built infrastructure.

8.5 DATA GAPS AND UNCERTAINTIES

Based on the findings of investigations completed at the site, the following data gaps were identified:

- The entire site is covered with dense vegetation or existing structures. Observations of ground surfaces and shallow soils and rock were limited to that noted during excavation of boreholes and test pits during the investigation. As such, there may be unexpected finds on the ground surface associated with the site.
- It is unknown if the residential dwellings along Bolong Road were historically connected to on-site septic systems prior to being connected to the current municipal wastewater system, and if any septic or sewerage systems have leaked contributing to the concentrations found in groundwater and ground gas.
- Whilst hazardous ground gas appears to be impacting the site, particularly in the eastern portion, the source and extent of the gas remains unconfirmed and may include multiple sources such as the natural alluvial and sandstone geology underlying and surrounding the site which includes acid sulphate soils and which may contain acid sulfate rock and as a localised sewage leak. The lines of evidence is that ASR may be present however if present, its extent and mechanism for creating acidic conditions is not confirmed.
- The extent of ground gas across the site is not confirmed partly because of high groundwater influxes during the investigation period. Notwithstanding, strong hydrogen sulfide odours were also observed in BH02 located in the western part of the proposed development, and these should not be discounted. A potential mechanism is the ASR is present across the site and thus causing the production of ground gases during oxidation as groundwater levels fluctuate.

9.0 CONCLUSIONS AND RECOMMENDATIONS

Stantec Australia Pty Ltd (Stantec) was engaged by Landcom (the client) to complete a Contamination Data Gap Investigation (DGI) for a property located at 53-57 Bolong Road & 4 Beinda Street, Bomaderry, NSW 2541 (the site).

The purpose of the DGI report is to support a Development Application (DA) for the proposed medium-density residential development at the site, and the objective of the DGI is to provide a more complete and definitive assessment of contamination at the site to assess the suitability for the proposed future land use.

Following completion of the DGI, the following conclusions have been drawn:

- Naturally occurring methane and carbon dioxide gases, and probable naturally occurring hydrogen sulfide gas are currently detected at the site underlying the proposed development area at concentrations that could pose risk to workers and occupiers of a proposed development unless managed and mitigated appropriately.
- In regard to this potential gas risk, Stantec consider that sufficient monitoring data has been gathered to determine that the site can be made suitable for the proposed development through implementation of a standard gas mitigation approach that does not significantly alter the current concept design prepared for Development Application (DA) and that would render the source-pathway-receptor linkage incomplete for future occupants.
- Based on current information, the most likely gas mitigation system would include a sub-slab ventilation layer and potential vapour barrier where potential gas accumulation is vented to the atmosphere via pipework and a barrier is placed to mitigate odour. An independent assessment of site conditions and management advice was sought from BGL Nominees Pty Ltd, a specialist consultancy responsible for design and installation of hazardous ground gas protection systems. A copy of the Ground Gas Protection System – Conceptual Advice memo prepared by BGL is available in **Appendix I** and states the following in relation to the site:
  - *Consideration for sub-slab ventilation and/or an independently tested gas membrane are commonplace to the presented risk profile at the site and BGL provide an example cross section for illustrative purposes (*see **Appendix I***).*
  - *These types of mitigation approaches have been performed within the Australian market over the last 20 years and can be integrated into the built form without significant changes to the building design.*
  - *On the available information, BGL consider the scenario presented as typical of those we commonly encounter and by adoption of similar protection measures to those outlined above, a solution can be integrated into the built form without significant change.*
- Where the source of hydrogen sulfide gas is identified as a leaking sewer, rather than naturally occurring, the leaking sewer can be fixed to mitigate the problem. This would remove the need for a vapour barrier while the ventilation layer in response to methane and carbon dioxide would remain.
- The preferred and most suitable mitigation strategy will be incorporated into the project design, post-DA, and be considerate of the planned further gas monitoring targeted at the ground floor receptors and design features that could be affected by hazardous ground gas. The ground gas protection system would be designed in conjunction with the detailed design with specialist inputs provided by a suitably qualified and experienced ground gas specialist, such as BGL Nominees Pty Ltd. As shown within the

cross-sectional illustration of a typical ground gas protection system typically applied under a scenario comparable with the site (see **Appendix I**), the sub-slab design is relatively basic and would not significantly alter the current design.

- Further gas monitoring will continue during the DA assessment period and during early stages of the detailed design phase of the development. The findings of continued gas monitoring will inform the mitigation system design and ultimately be incorporated into the detailed design.
- No contaminant concentrations in soil were detected above the adopted human health criteria.
- Bonded fragments of asbestos cement sheeting were observed at the following locations:
  - A single fragment was observed within a pile of waste with the centre of the site, a location historically utilised by the former sawmill. Based on observations and laboratory testing, the asbestos appeared to be localised to this area.
  - Fragments of asbestos cement sheeting were observed near the exterior of the existing residential dwelling at the corner of Beinda Street and Bolong Road. The fragments appeared to be resultant from recent damage to the cement sheeting façade of the dwelling.
- Groundwater conditions on site, from a chemical contaminant perspective, are not expected to preclude the proposed medium-density residential land use as per the current concept design. Based on the current design (refer to Appendix A), deep earthworks that would encounter permanent groundwater are not likely and extraction of groundwater for the protection of future residential building assets (i.e. flooding buildings or hydrostatic pressures) may not be required.
- Groundwater and ground gas impacts generally corelate with each other and indicate the potential presence of Acid Sulfate Rock (ASR) and/or acid sulfate soil (ASS) that are generating acidic and reducing groundwater conditions and gas production of methane, hydrogen sulfide and carbon dioxide. The presence of ASR has not been confirmed, however, the lines of evidence point to this possibility. Investigation of the potential for ASR should be conducted.
- Alternative sources may include leaking sewage infrastructure, but this is less likely based on Council review and comment.
- Further investigation across the site is warranted so that sources can be resolved and/or mitigation for the proposed development designed. Elevated carbon dioxide would similarly be mitigated by treatment of the other gases. Where not mitigated or resolved, both gases at the current maximum measured concentrations would require notification to the NSW Environment Protection Authority (EPA) should they be detected within infrastructure. The proposed mitigation system would resolve the gas risk such that notification to the NSW EPA would not be required.
- In a workplace environment the noted gases would be considered to represent hazardous or unsafe environments for workers at concentrations that exceed 0.25% v/v (methane), 5 ppm (hydrogen sulfide), 0.1% v/v (carbon dioxide in an accessible space for workers), 25 ppm (carbon monoxide) and less than 19.5% v/v (oxygen). As such control measures for construction workers and works would require consideration during future construction activities.
- The investigations completed at the site have been undertaken to support the development approval for the proposed medium density residential development at the site. Section 4.6 of the State Environmental Planning Policy (Resilience and Hazards) 2021 specifies the considerations for determining a development application. Based on the works completed, Stantec consider that the SEPP requirements have been met through demonstration that the ground gas identified at the site can be appropriately managed through incorporation of a ground gas protection system into the detailed design (see **Appendix I**), such that the site would be suitable for the proposed medium density residential land use, as per the current design.

10.0 LIMITATIONS

This assessment has been undertaken in general accordance with the current "industry standards" for a DGI for the purpose and objectives and scope identified in this report. These standards are set out in:

- National Environment Protection (Assessment of Site Contamination) Measure (NEPM) *1999* (NEPC, 1999) as varied May 2013 (the 'NEPM 2013').
- AS4482.1- 2005: Guide to the sampling and investigation of potentially contaminated soil Part 1: Non-volatile and semi-volatile compounds. Standards Australia (2005).

The agreed scope of this assessment has been limited for the current purposes of the Client. The assessment may not identify contamination occurring in all areas of the site, or occurring after sampling was conducted. Subsurface conditions may vary considerably away from the sample locations where information has been obtained.

This Document has been provided by Stantec subject to the following limitations:

- This Document has been prepared for the particular purpose outlined in Stantec's proposal and no responsibility is accepted for the use of this Document, in whole or in part, in other contexts or for any other purpose.
- The scope and the period of Stantec's services are as described in Stantec's proposal, and are subject to restrictions and limitations. Stantec did not perform a complete assessment of all possible conditions or circumstances that may exist at the site referenced in the Document. If a service is not expressly indicated, do not assume it has been provided. If a matter is not addressed, do not assume that any determination has been made by Stantec in regards to it.
- Conditions may exist which were undetectable given the limited nature of the enquiry Stantec was retained to undertake with respect to the site. Variations in conditions may occur between investigatory locations, and there may be special conditions pertaining to the site which have not been revealed by the investigation and which have not therefore been taken into account in the Document. Accordingly, additional studies and actions may be required.
- In addition, it is recognised that the passage of time affects the information and assessment provided in this Document. Stantec's opinions are based upon information that existed at the time of the production of the Document. It is understood that the services provided allowed Stantec to form no more than an opinion of the actual conditions of the site at the time this Document was prepared and cannot be used to assess the effect of any subsequent changes in the quality of the site, or its surroundings, or any laws or regulations.
- Any assessments made in this Document are based on the conditions indicated from published sources and the investigation described. No warranty is included, either express or implied, that the actual conditions will conform exactly to the assessments contained in this Document.
- Where data supplied by the client or other external sources, including previous site investigation data, have been used, it has been assumed that the information is correct unless otherwise stated. No responsibility is accepted by Stantec for incomplete or inaccurate data supplied by others.
- Stantec may have retained sub consultants affiliated with Stantec to provide services for the benefit of Stantec. To the maximum extent allowed by law, the Client acknowledges and agrees it will not have any

direct legal recourse to, and waives any claim, demand, or cause of action against, Stantec's affiliated companies, and their employees, officers and directors.

This assessment report is not any of the following:

- A Site Audit Report or Site Audit Statement as defined under the *Contaminated Land Management Act, 1997*.
- A site investigation sufficient for an Site Auditor to be able to conclude a Site Audit Report and Site Audit Statement.
- A geotechnical report and the bore logs or test pit logs may not be sufficient as the basis for geotechnical advice.
- A detailed hydrogeological assessment in conformance with NSW DEC (2007) Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination.
- A hazardous building material survey that will identify any specific building materials on site, which may pose a risk to human health or the environment.
- A waste classification certificate in conformance with NSW EPA Waste Classification Guidelines (NSW EPA, 2014).

11.0 REFERENCES

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GS NSW (2018). *NSW Statewide Seamless Geology.* Retrieved from Minview: minview.geoscience.nsw.gov.au

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NSW EPA (2020) *Consultants Reporting on Contaminated Land*, Contaminated Land Guidelines, NSW Environment Protection Authority, Sydney, April 2020.

NSW Government (2021) *MinView*, Mining, Exploration and Geoscience, NSW Government, Regional NSW, Retrieved from: https://minview.geoscience.nsw.gov.au/#/?lon=148.9143&lat=-32.65607&z=6&bm=bm1&l=.

APPENDIX A

Figures

Site and Sampling Plan

Build to Rent (BtR), South Coast
Bomaderry, NSW

Project Code: 304001019-GS-001
Drawn By: CL, Checked By: MM
Rev: 06
Date: 2024-04-11

Legend

- Site Boundary
- Borehole/ Monitoring Well
- Test Pit
- Gas Monitoring Location
- Watercourse
- 2m Contours

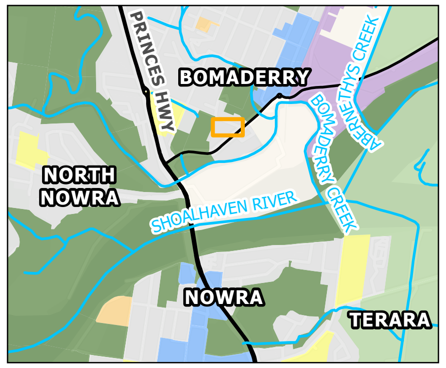
Land Use

- Commercial
- Education
- Hospital/Medical
- Industrial
- Parkland
- Primary Production
- Residential
- Water
- Other

Notes:
1. Map displayed in GDA2020 MGA Zone 56

References:
1. Aerial imagery (MetroMap, May 2023)
2. Watercourse and Cadastre (NSW SS, 2023)
3. 2m Contours (LPI LiDAR, 2010)
4. Land Use (ABS, 2023)

0 5 10 15 20 25 Metres
Scale at A3: 1:500



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St. Clair Architecture

Bomaderry BTR

53 & 57 Bolong Road, and 4 Beinda Street
Bomaderry NSW 2541
Development Application Stage Design Report

Prepared for	Landcom
Reference	202312
Issue date	12/04/24
Version	DA01

We would like to acknowledge Wodi Wodi Country and the people of the Yuin Nation as the traditional custodians of the land on which the project is located and pay our respects to elders, past, present and emerging.

Front cover: Tharawal and Yuin country
Shoalhaven River from Nowra Showground Hanging Rock

At St Clair Architecture we believe in design excellence as a way to deliver sustainable and affordable living environments and neighbourhoods for diverse communities.

This project has a number of key objectives:

+ to benefit the NSW public through the application of the NSW Housing SEPP 2021 and related build-to -rent and affordable housing provisions that aim to increase the supply of secure tenure rental housing.

+ to promote good design, sustainability and amenity of the built environment, consistent with NSW Government Policy and the NSW Environmental Planning and Assessment Act.

+ to apply Landcom Housing Policy for increased rental housing supply and diversity and deliver a design that is replicable and scalable for possible application to other sites.

As a pilot project this aims to be a model for the wider industry for build- to-rent developments in regional NSW and to demonstrate that they can be delivered at smaller scales.

Document control

Version	Description	Prepared by	Checked by
01	Issued for DA	PSC	VT

Table of Contents

Previous page -

1.0 Introduction

1.1 Purpose of this document

This document has been prepared as a design report to accompany the development application submission. It provides a summary of the design process that has been undertaken, including site investigations and key design objectives and strategies, illustrated in diagram form.

1.2 Key milestones completed

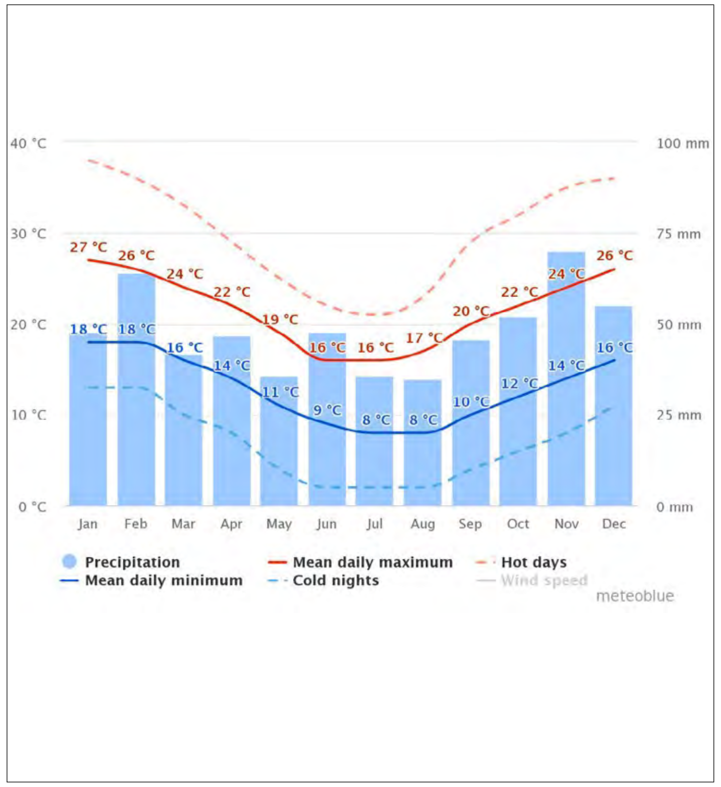
A number of Milestones have been completed, that contributed to the preparation of this design and development application. There's included:

1. Pre-development application meeting with Shoalhaven Council: 25th January 2023
2. Walk on Country with Uncle Sunny: 25th January 2024
3. Landcom Design Review Panel meeting: February 2024
4. Community meetings: various meetings betwen January and April 2024


Beinda St
Site

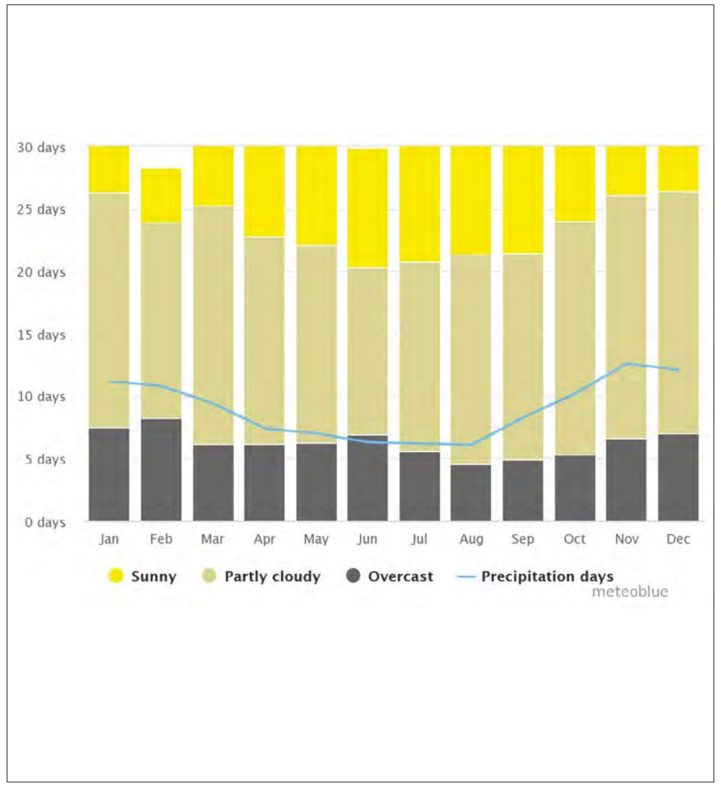
2.0 Context and site studies

Simulated historical climate & weather data for Nowra (closest weather station)



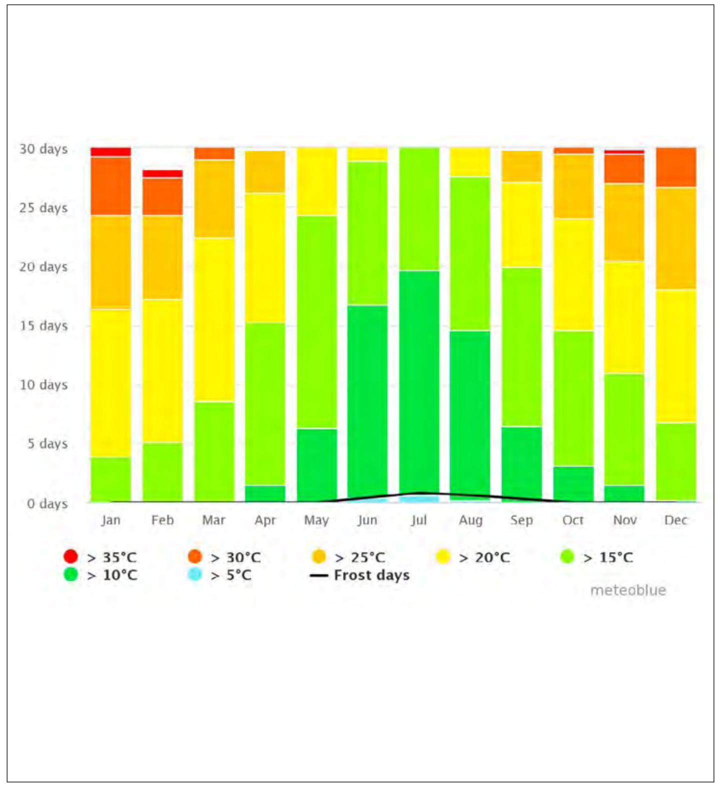
1

Average temperatures and precipitation



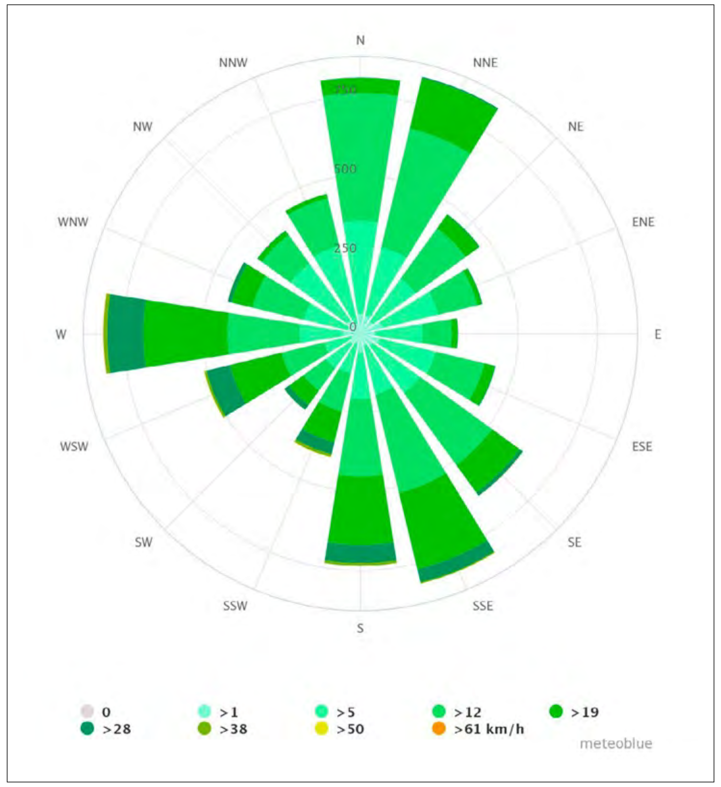
2

Cloudy, sunny, and precipitation days



3

Maximum temperatures

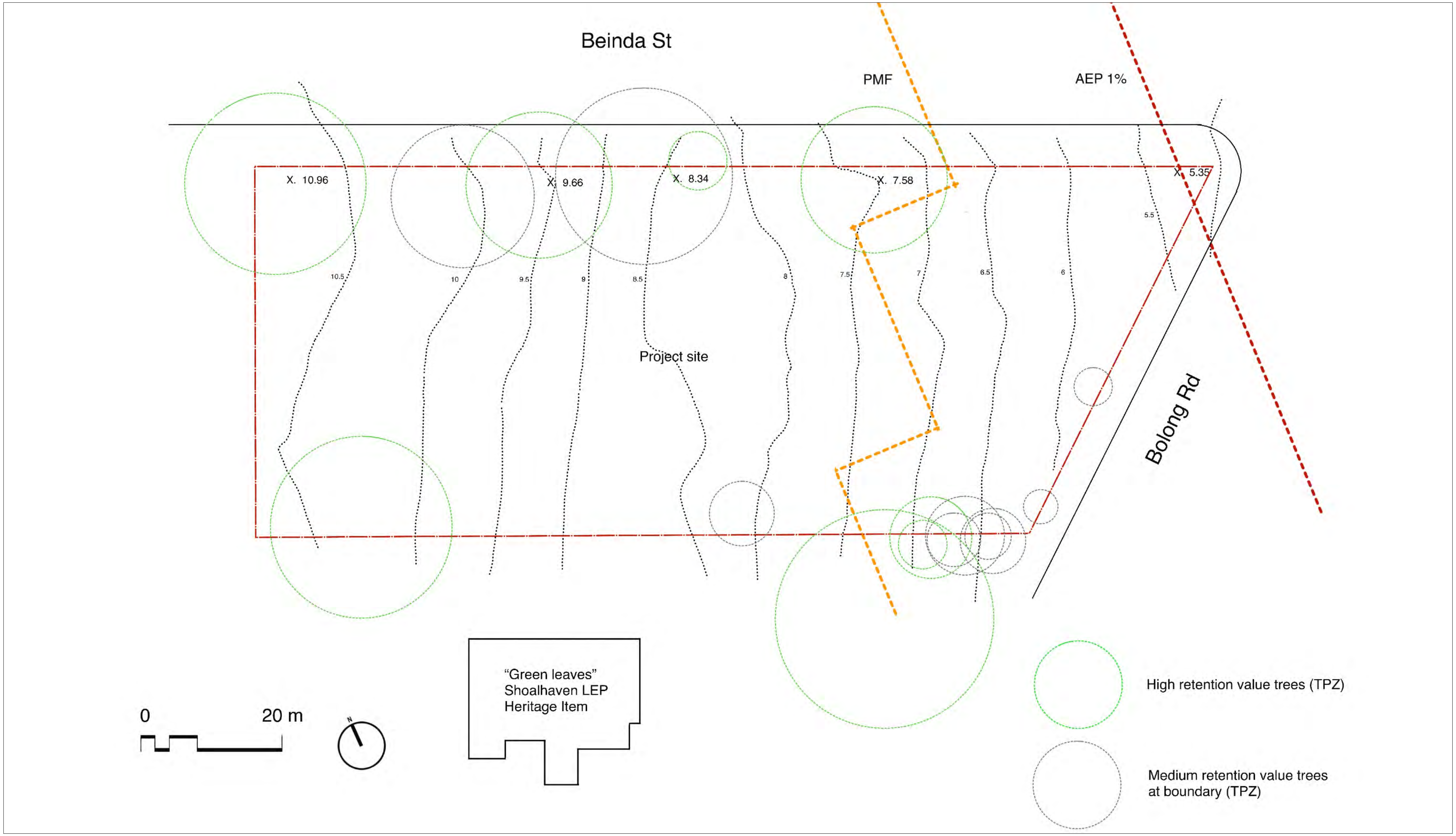


4

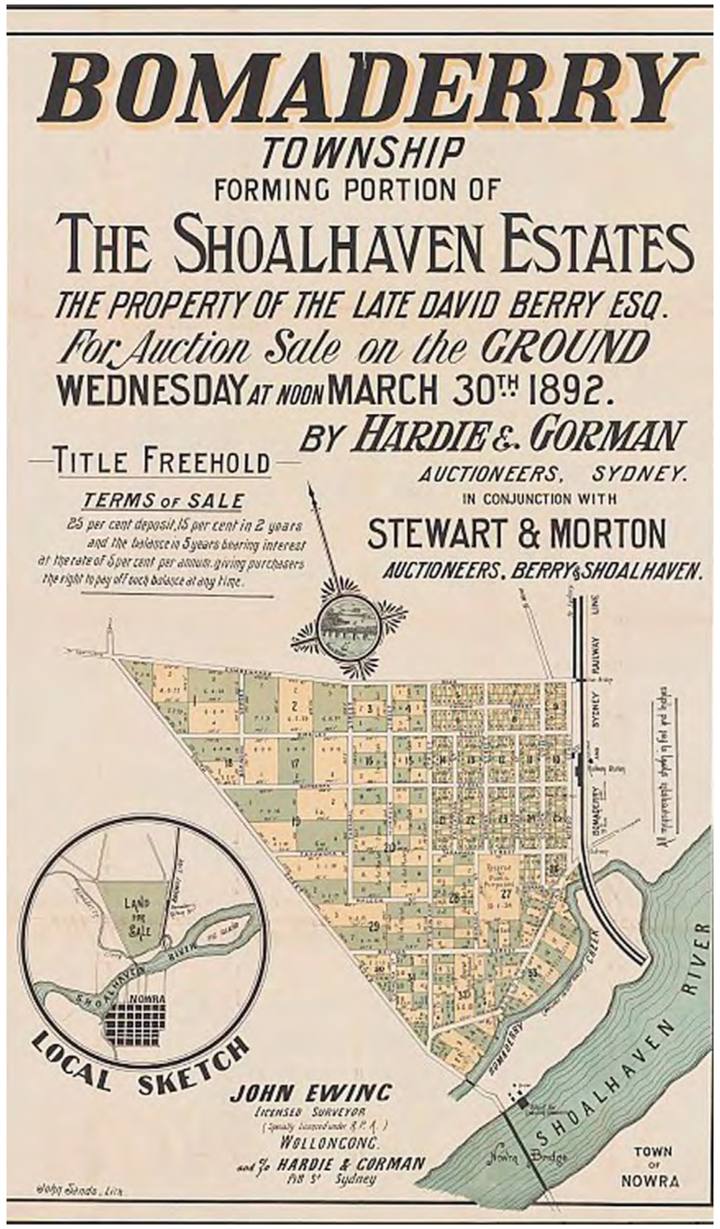
Wind rose

Location: Nowra AP, AUS
Longitude: 150.54
Latitude: -34.95
Elevation above sea level: 105.0 m
Köppen–Geiger climate zone: Cfb. Marine west coast, warm summer.
Average yearly temperature: 16.0 °C
Hottest yearly temperature (99%): 30.7 °C
Coldest yearly temperature (1%): 5.7 °C
Annual cumulative horizontal solar radiation: 1634.07 Wh/m2
Percentage of diffuse horizontal solar radiation: 39.0 %

Site constraints diagram - topography, tree APZ's, flood planing levels, heritage



History + architectural character - Bomaderry



Bomaderry Auction Plan 1892
Hardie & Gorman Pty. Ltd - out of copyright

Private home, Tarawara St
Photo by author

Natural and recycled materials
Sun shading
Lightweight cladding - CFC

Private home, Coomea St
Photo by author

Elevated above ground
Verandahs
Lightweight cladding - timber
Brickwork

Illawarra Institute of Technology - TAFE, Beinda St
Photo by author

Sun shading
Brickwork
Lightweight cladding - CFC

Dog park, Bolong Rd
Photo by author

Public amenity
Green space and cooling
Natural habitat

Reserve, Tarawara St
Photo by author

Public amenity
Green space and cooling
Natural habitat

Former Bomaderry Aboriginal Children's Home, Bienda St

Historical significance
Heritage listed buildings
Light weight cladding and roofs

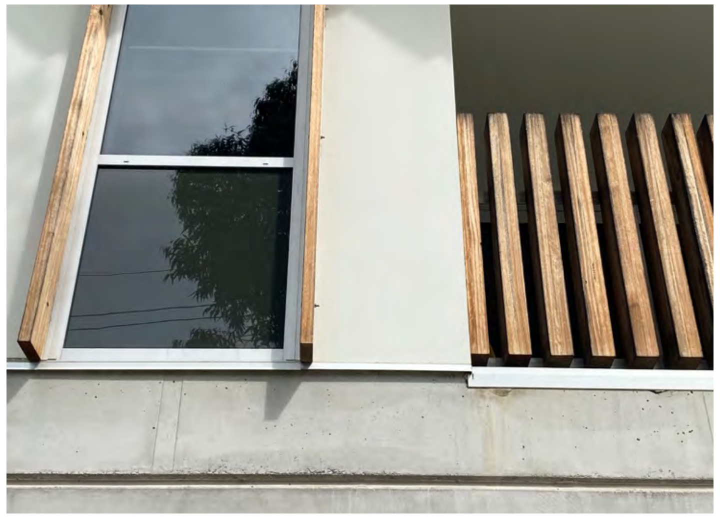
History + architectural character - Nowra

Nowra Showgrotund Woodchop Stands
Photo by author

Privacy screening
Sun shading
Lightweight materials

Anglicare Fairview Independent Living
Photo by author

Landscape buffer
Privacy screening
Private outdoor space



Shoalhaven Cancer Centre
Photo by author

Natural and recycled materials
Sun shading
Lightweight cladding - CFC

Shoalhaven Hospital
Photo by author

Sustainability
Sun shading
Lightweight cladding - precoarted metal

Private home, Plunkett St
Photo by author

Street corner entrance and gardens
Sandstone walls
High quality landscaping

Meroogal
Photo by author

Detailed metalwork
Verandahs
Lightweight cladding - timber

Private home, Plunkett St
Photo by author

Elevated above ground
Verandahs
Lightweight cladding - timber

Private home, Plunkett St
Photo by author

Detailed concrete block
Natural ventilation
Privacy screening

Site photos

View from Beinda St looking east

View from Beinda St looking west

View from from corner of Beinda St and Bolong Rd looking east

View from Bolong Rd

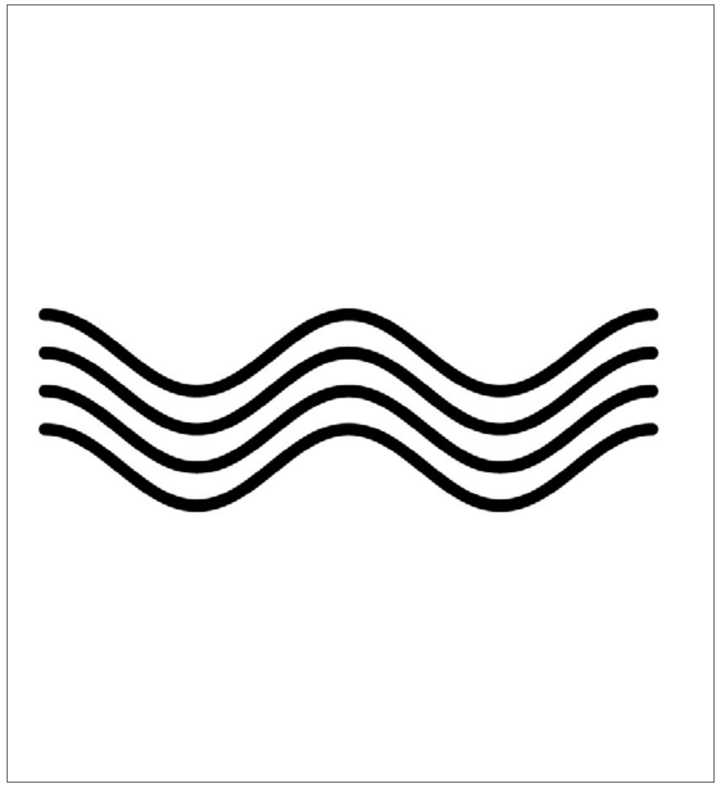
View from Beinda St of service station

View from Beinda St looking east (site on right)

View of corner of Beinda St and Bolong Rd

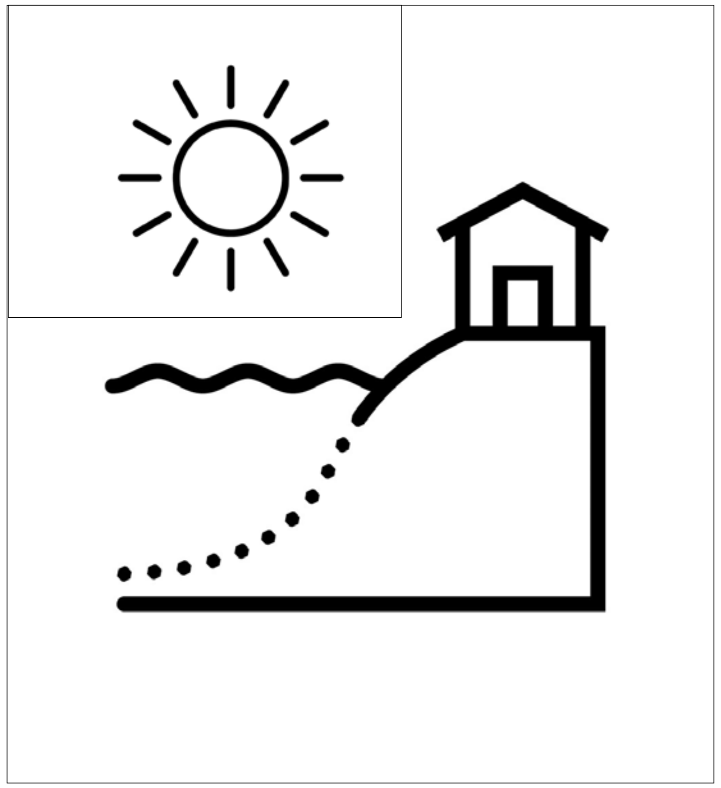
View from Bolong Rd looking north

3.0 Design Principles



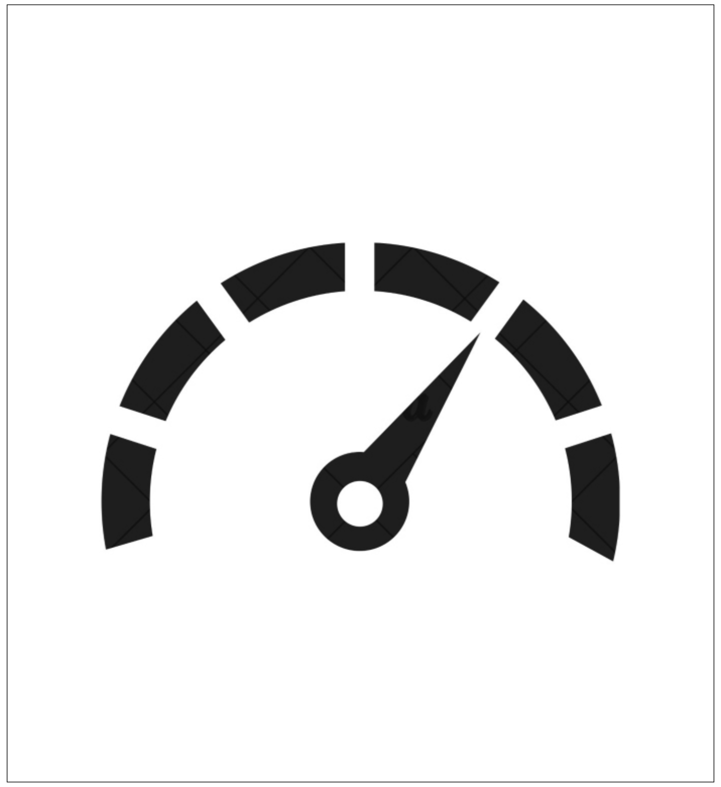
Principle 1 - Rivers and layering

- Recognise, respect and express Shoalhaven River system, wetlands and tributaries including Bomaderry Creek and on site water movement.
- Promote ongoing ecological health and bio-diversity by preserving key landscape elements such as high value trees on site.
- Recognise low density character of Bomaderry and visually permeable streetscapes with framed distant views
- Recognise ground conditions and layering of sandstone and wetlands with visible outcrops on site
- Preserve existing layering of bushland in landscape design.
- Provide a layered sequence of public to communal to private spaces, to encourage use of outdoor space and provide the highest level of amenity for both residents and neighbours.



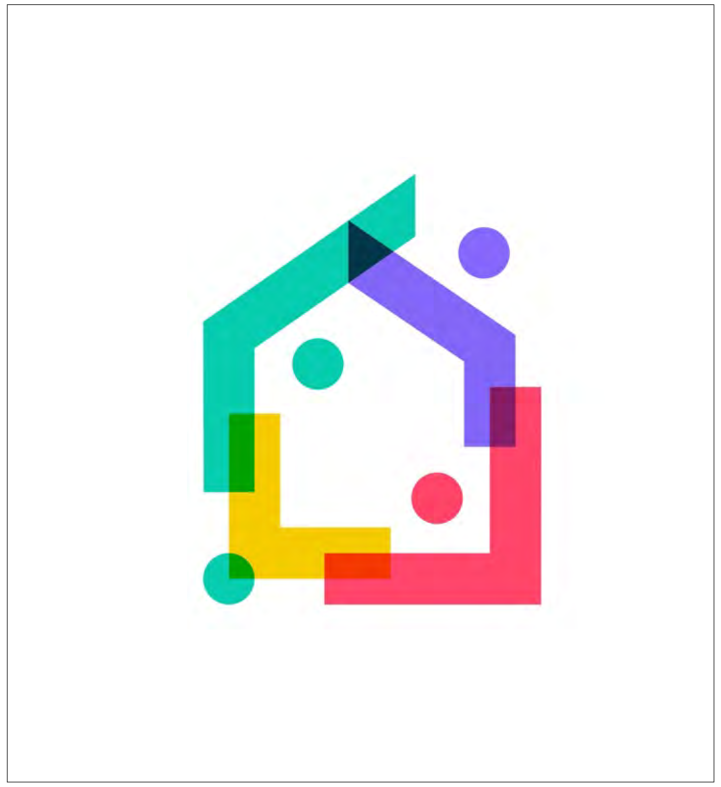
Principle 2 - South Coast local character and lifestyle

- Recognise and build upon distinct South Coast architectural style of elevated buildings, ventilated walls, lightweght cladding and roofs
- Respond to flood levels and climate resilience with elevated buildings.
- Explore different lifestyle opportunities and dwelling typologies suited to Bomaderry and different to typical metropolitan responses.
- Promote outdoor circulation, solar access and cross ventilation as part of healthy lifestyle and South Coast character.
- Provide a welcoming environment with a light and spacious design that allows living with a sense of dignity and reflects a commitment to design quality.



Principle 3 - High performance buildings and landscapes

- Design homes for durability and high performance, thermal comfort, and significantly reduce the cost of living/utility bills through high efficiency performance.
- Incorporate low-maintenance and durable materials
- Incorporate cost-effective and affordable materials, that consider not only the initial capital cost, but material costs over the life of the building
- Ensure sustainability outcomes consistent with Landcom industry benchmarks and project specific goals.
- Incorporate simple and cost effective passive design strategies.
- Embrace low Volatile Organic Compound (VOC), low carbon and renewable materials.



Principle 4 - Diversity and Affordability

- Provide a variety of dwelling types for varied demographics and lifestyle opportunities
- Address the needs of local households including single occupant homes and town-housing
- Provide equal amenity, finishes and fixtures to all dwellings, providing maximum flexibility for tenant allocations and without differentiation between affordable and other rental homes
- Design flexible housing permitting tenants to move within the site to suit future needs
- Provide a high proportion of universal housing to allow use irrespective of age, level of mobility or health.

4.0 Connecting with Country

Project Brief

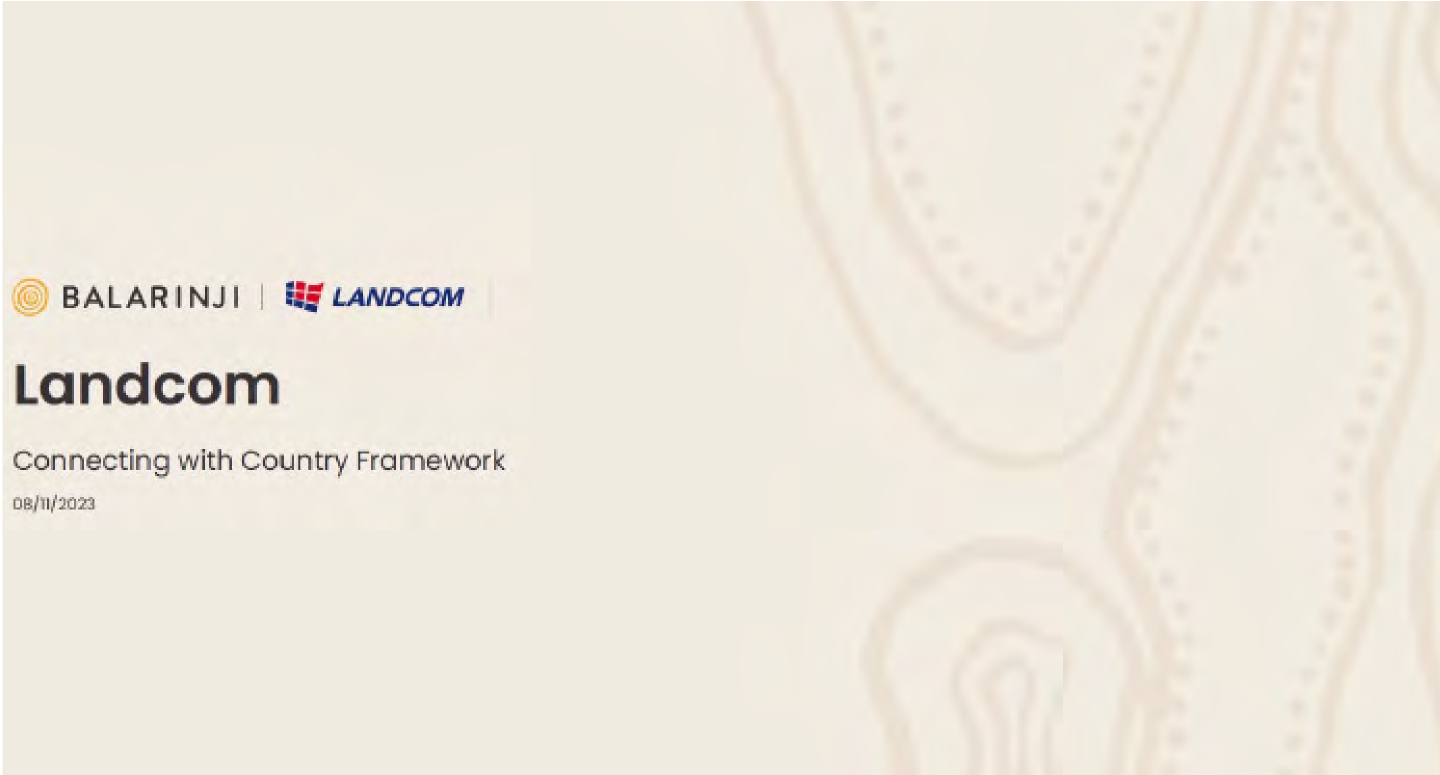
4.1 Approach

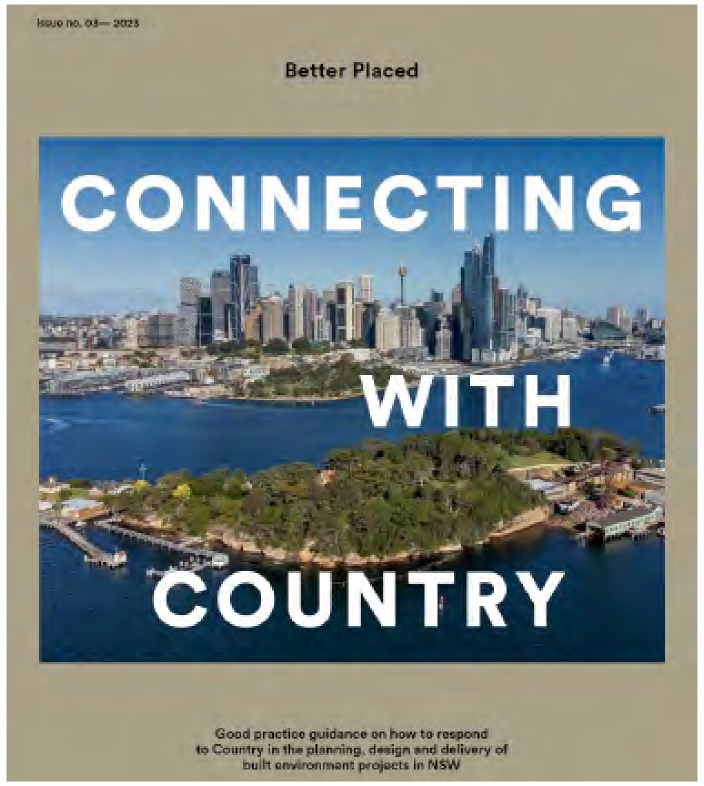
The proposal will address Landcom's Connecting with Country Framework 2023 and the Government Architect's Connecting with Country guide 2023.

An initial walk on country was completed in late January 2024 with Henry Simms (Uncle Sonny), identifying some of the key considerations for the project and significant elements of the site.

Some initial strategies are described in the following diagrams. As the architecture and landscape designs progress towards DA, these will be further developed.

Further input will also be sought from Landcom's Design Review Panel.



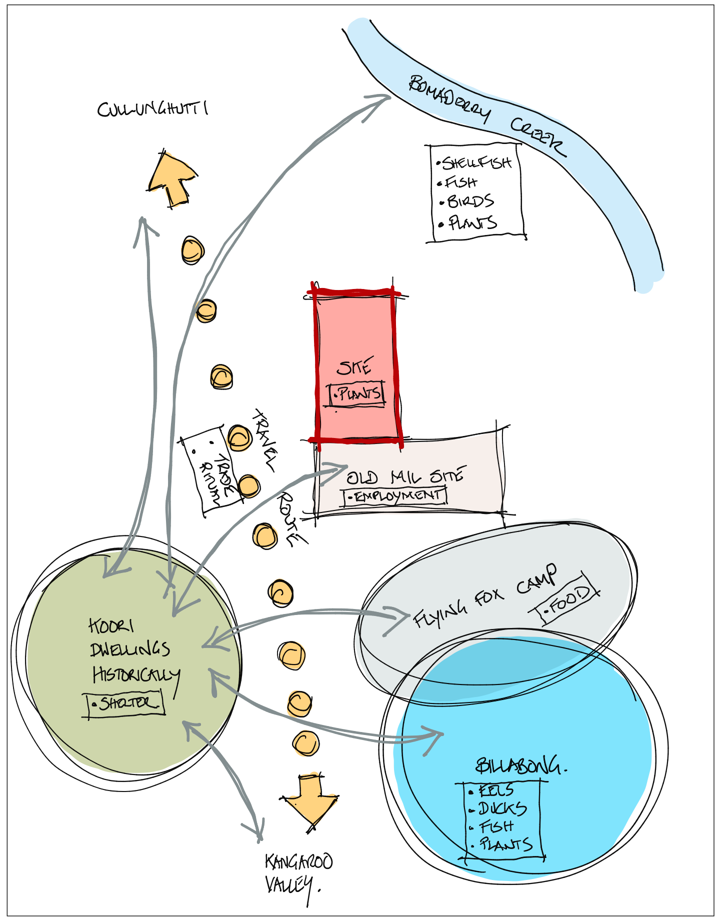


Walk on Country - 25th January 2024

Spotted gum trees to Beinda St - looking north east from site
Photo by author

Spotted gum trees to Beinda St - looking east (downhill) from site
Photo by author

Exposed rock outcrops within site
Photo by author



Connection to Country Recording and Impressions
Edmiston Jones

Exposed rock outcrops within site - north west corner
Photo by author

Wetland 100m west of site - traditional place for water collection
Copyright Daryl Jones (Oz Aerial) used with kind permission of Daryl Jones

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Walk on Country with Uncle Sonny (Henry Simms)
Photo by Stuart Scobie

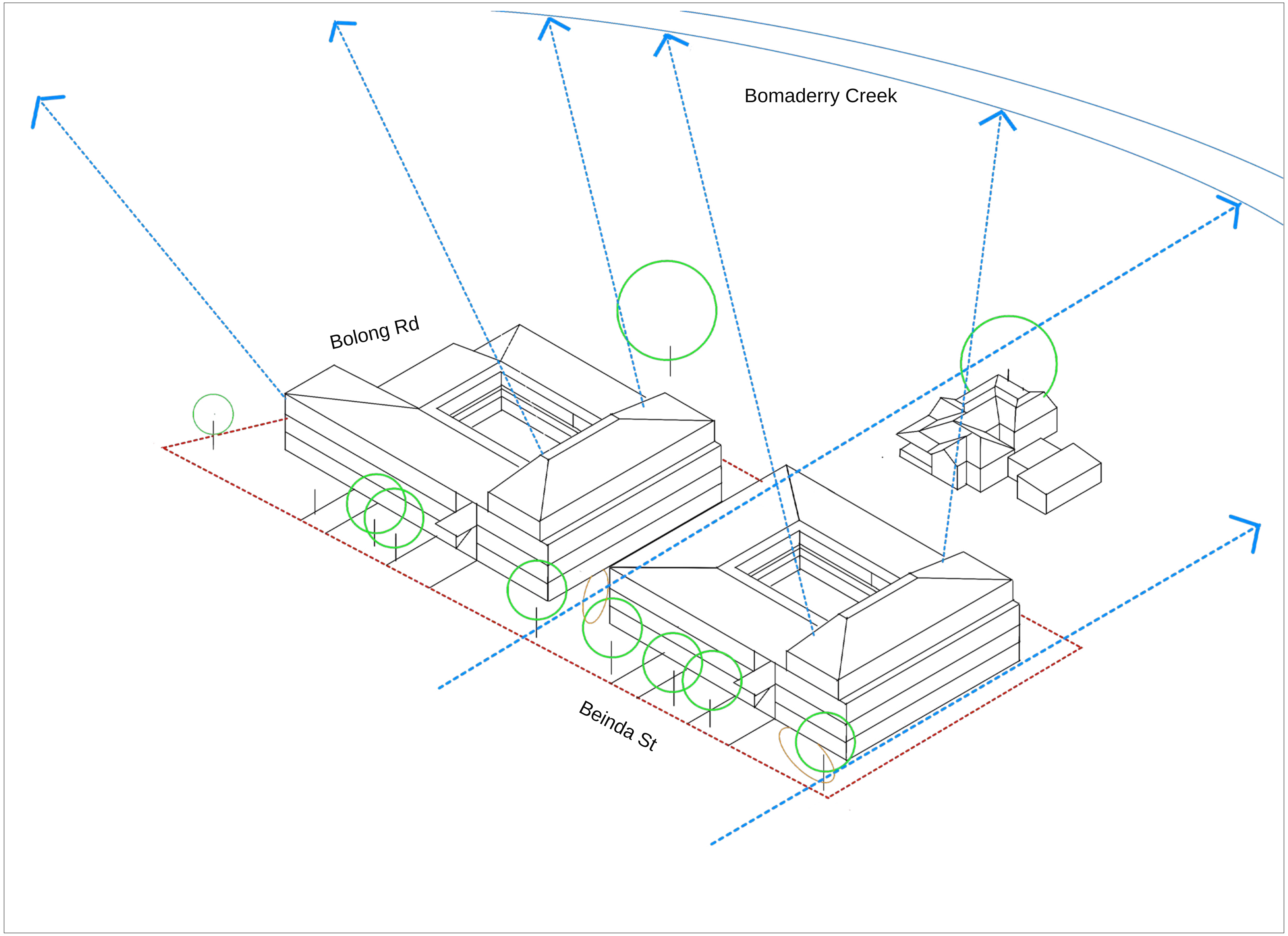
Connecting the site to Country - design strategies

Key design moves:

+ Maximise Beinda St building setback to preserve mature boundary trees
+ Carefully locate and plan pedestrian and vehicle entrances and car-parking
+ Minimise excavation by placing car parking above ground
+ Reuse and repurpose existing sandstone from the site
+ Preserve existing surface level rock outcrops where possible and feature within landscape design.
+ Apply textured and natural materials to the ground level carpark at and transition into lighter weight materials above.
+ Take inspiration from the Shoalhaven River, Bomaderry Creek, adjacent wetland and indigenous places of gathering. Create a unique sense of place based upon sheltered courtyards whilst also complimenting neighbouring landscapes and streets.
+ Maintain through site views from ground level
+ Maximise views towards Bomaderry Creek and Shoalhaven River
+ Maximise passive design strategies that seek to minimise energy usage

Benefits and opportunities:

+ Maintains and expresses existing site character and opportunities to connect with Country
+ Provides a resource efficient design that is respectful ofa Country
+ Preserves existing high-value mature trees to Beinda St and allows for future tree planting benefiting overall ecology, streetscape and community
+ Avoids unattractive vehicle down ramps



5.0 Sustainability

Project Brief Summary

5.1 Key Sustainability Considerations

Landcom's key sustainability objectives for new projects are summarised in the table below:

Healthy and inclusive places

Objective: To deliver healthy and inclusive places, founded on equity for people of all ages and abilities

Target: To deliver high quality liveatttble places, founded on equity, affordability, and inclusion

Climate resilient places

Objective: To deliver low carbon resource efficiency, and environmentally, sensitive places.

Target: To lead environmental performance across Landcom developments by committing to be in carbon, neutral and water positive, with zero waste and net positive ecological outcomes by 2028. Undertake a climate resilience assessment and prepare and implement a climate adaptation and community resilience plan.
All new projects should enhance the local habitat and biodiversity compared with the site conditions pre-acquisition. Reduce the impact of urban heat island effect on between 20 and 50% of project site area.

Energy and emissions performance

Objective: To conserve energy and drive, energy-efficient, low carbon and low emissions precincts for the future.

Targets: All new projects to be modelled to reduce greenhouse gas emissions at a precinct scale by 50% against 2016 reference case. Minimum of 5% of predicted precinct energy demand to be supplied by on-site renewable energy where site constraints permit.

Environmental management

Objective: To maintain and enhance the culture of high environmental performance

Target: All projects to adopt the use of industry recognise rating tools, , master plan and build form scale, achieving not less than 'Australian best practice equivalent'.

Basix: Target energy rating of 55 for low rise, 45 for medium rise and 40 for high-rise construction. Target water rating of 60 for all dwellings.

Waste and Materials

Objective: To drive innovation in waste reduction, and further enable the use of responsible resources

Target: All new projects divert minimum 95% of construction waste from landfill and 100% of timber sourced for construction to be Forest Stewardship Council certified.

Water

Objective: To design precincts based on best practice water sensitive urban design (WSUD) principles, and actively conserve potable water.

Target: WSUD strategies for all projects and apply pollutant discharge maximums. All new projects to be modelled to reduce mains potable water demand by 50% at the precinct scale, against the 2016 reference case.

Health equity and inclusion, community, connection and safety

Objective: To deliver, healthy and inclusive places, founded on equity for people of all ages and abilities

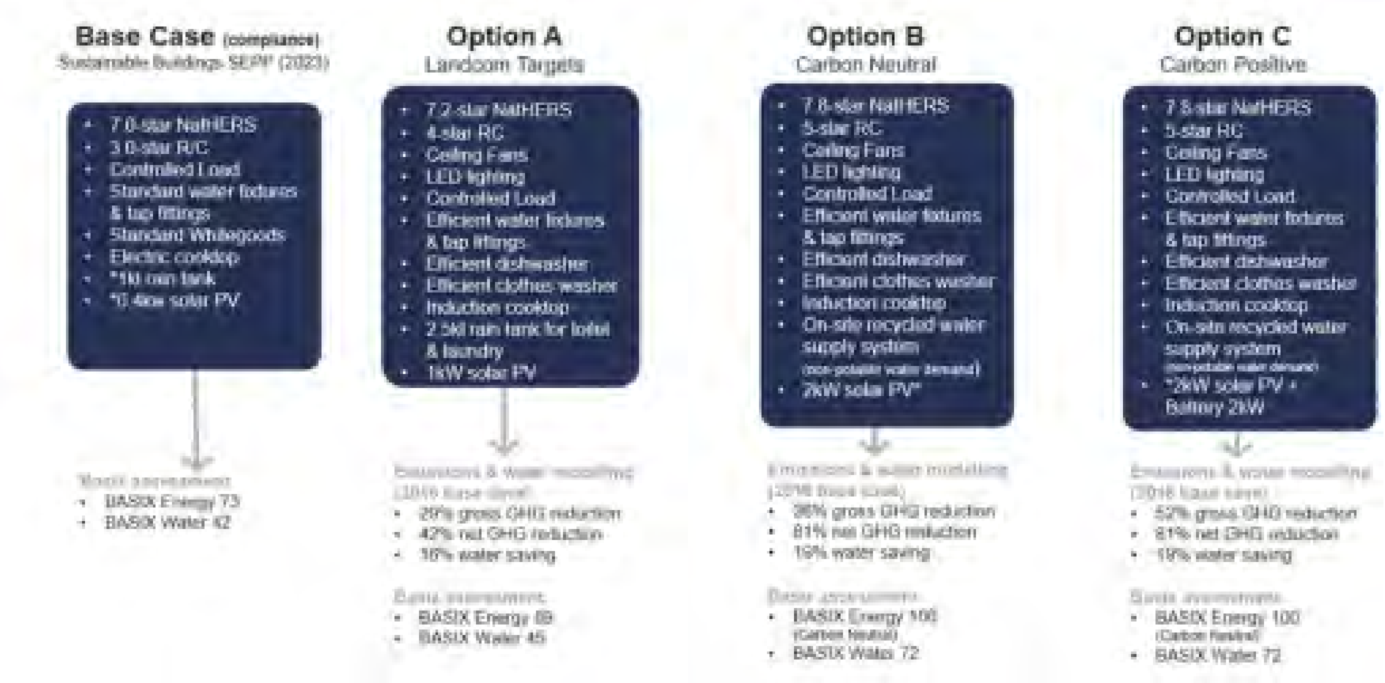
Target: 90% of residents to report satisfaction with quality of life, physical and mental health, reflecting project design, programs or events that encourage active, social and healthy lifestyles.
90% of residence to report satisfaction with integration of culture and heritage, community cohesion by fostering the integration of community networks and facilities in projects. 90% of residence to report feeling safe.

Affordability and diversity

Target: A minimum of 15% of new housing should meet the definition of diverse housing. Medium and high density housing to include at least 30% that is universally designed to meet or exceed Liveable Housing Australia Silver level certification.

Landcom aims to include sustainability initiatives in this BTR project in line with these objectives.

Different levels of inclusion have been scenario tested for this project and are shown in the following graph. The design must aim to include the highest possible level that the given budget allows for whilst maintaining the project objectives.



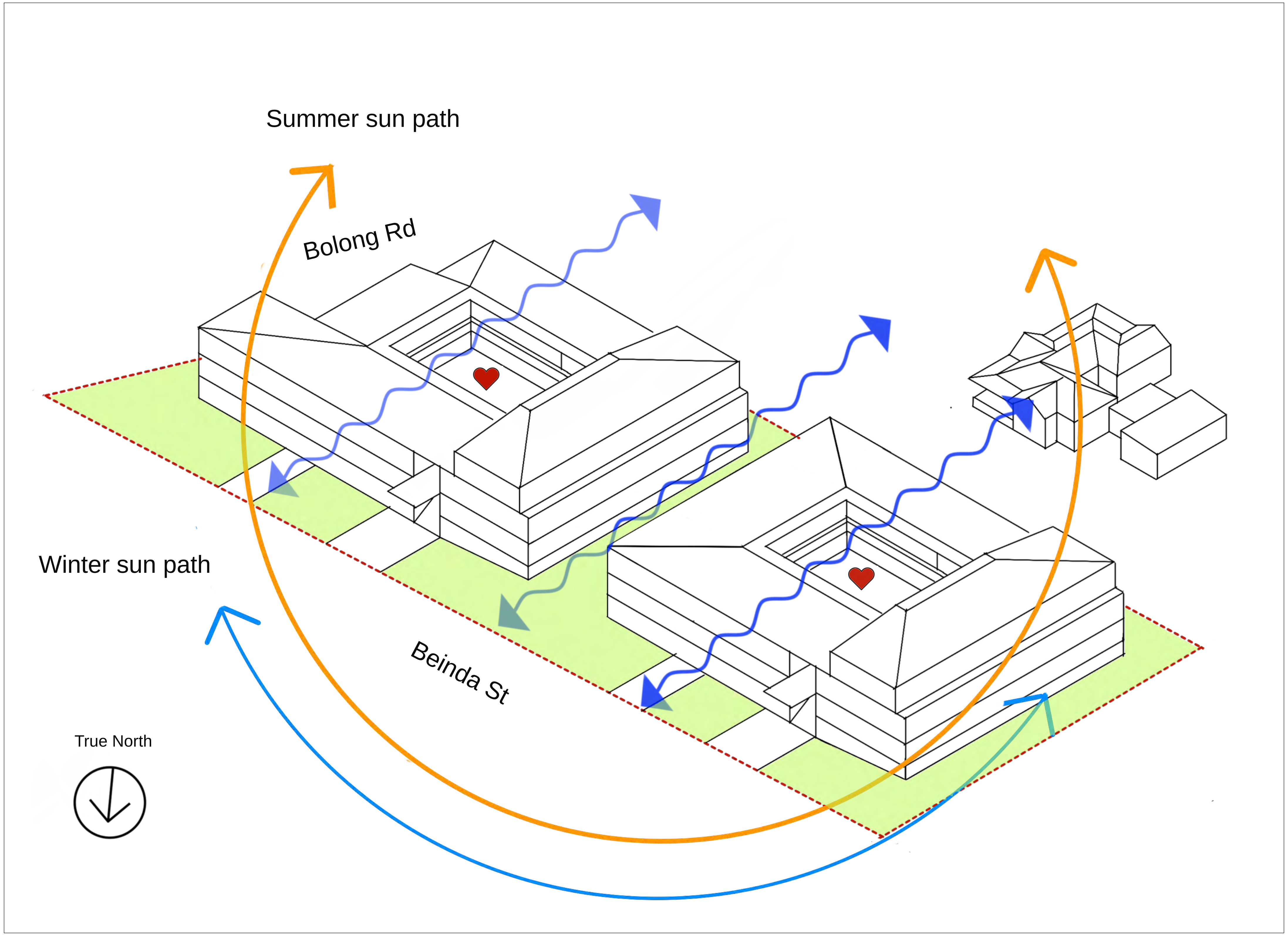
Sustainable design + resident amenity/well-being

Key design moves:

+ Provide high performing buildings based on simple, passive design strategies
+ Provide private central courtyards for planned and casual social interaction
+ Implement sustainability rating and certification schemes
+ Co-ordinate sustainable design with connecting with Country strategies
+ Provide dual aspect apartments with high levels of cross ventilation, solar access and daylighting to meet and exceed the ADG
+ Create naturally ventilated common circulation areas in the form of galleries and naturally ventilated stairs

Benefits and opportunities:

+ Satisfies and exceeds ADG objectives
+ Satisfies Sustainable Buildings SEPP requirements and Landcom sustainability requirements
+ Recognises relationship between sustainable design, passive design and designing for Country
+ Reduces energy consumption and carbon emissions by reducing reliance on air conditioning
+ Reduces utility bill costs for residents
+ Passive design provides respectful approach to designing with Country
+ Provides opportunities for social interaction and associated resident well-being



6.0 Key design moves

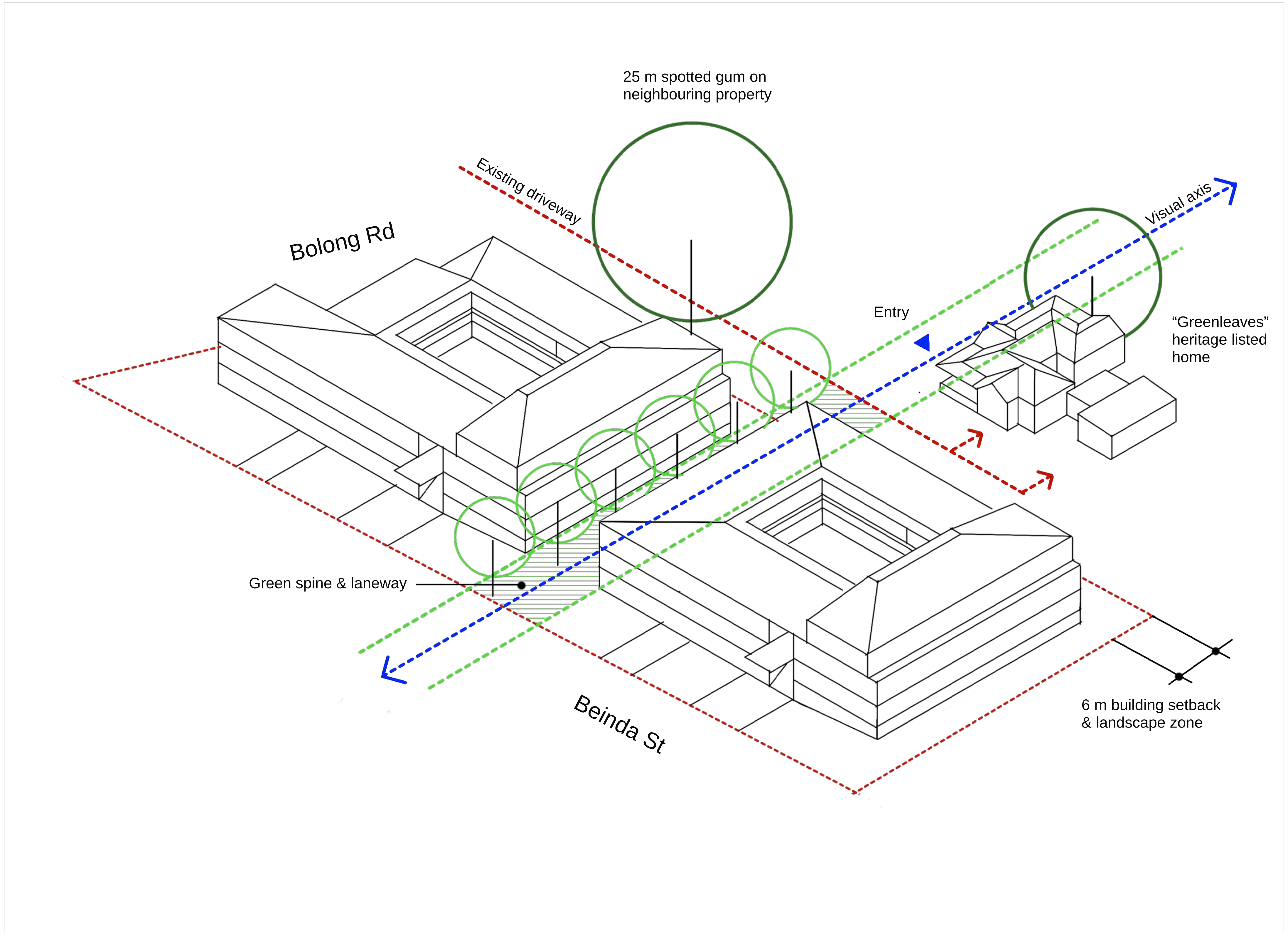
Heritage

Key design moves:

+ Provide green spine between proposed buildings as resident laneway and communal open space
+ Set back proposed buildings 6 m from southern boundary
+ Incorporates advice from heritage consultant including face brickwork to landscape elements

Benefits and opportunities:

+ Preserves existing through site vistas to "Greenleaves" lot
+ Preserves curtlage around "Greenleaves"
+ Increases percentage of site dedicated to landscape area, deep soil and communal open space
+ Provides service access to rear of site



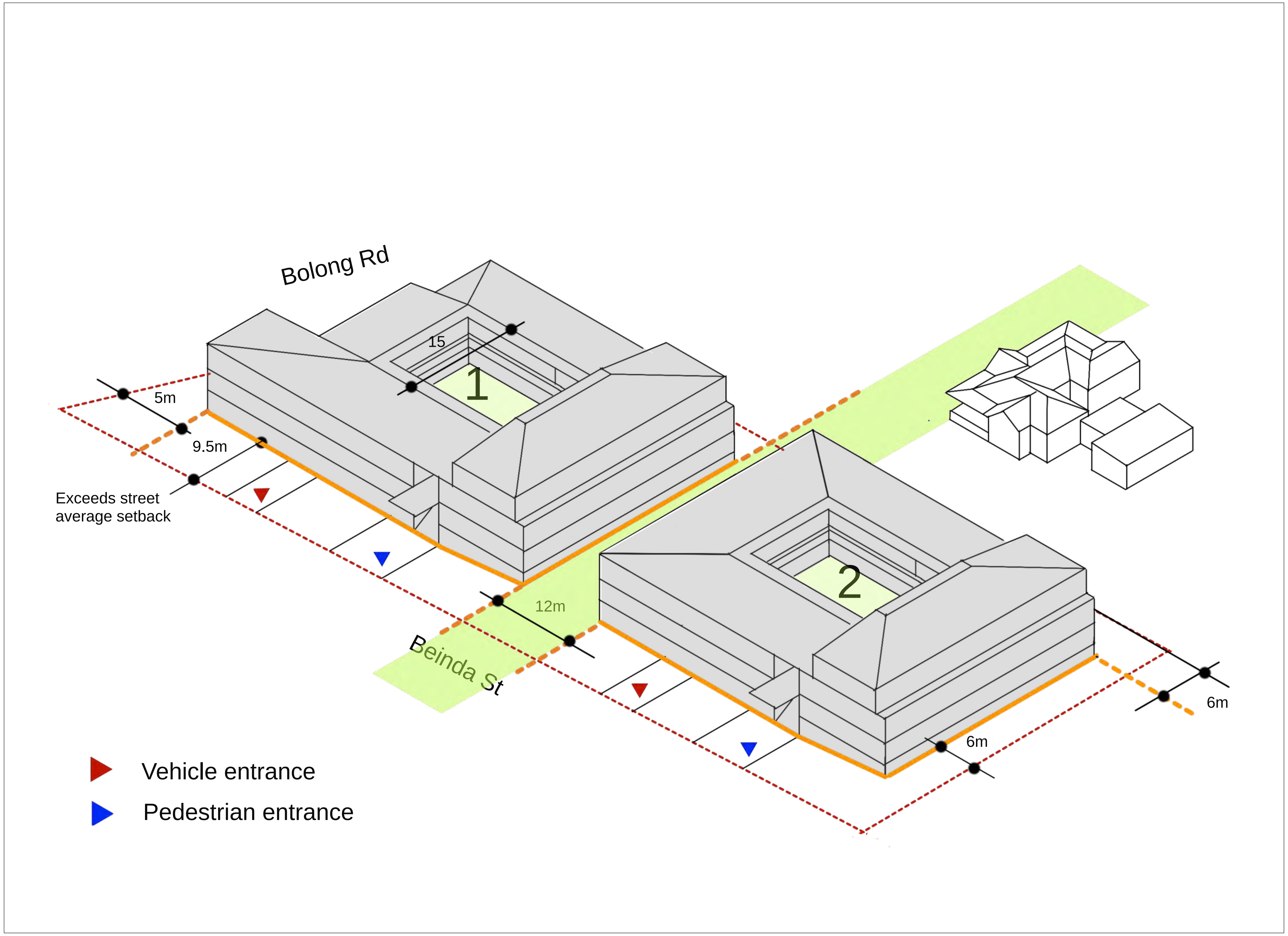
Built Form 1

Key design moves:

+ Form 2 individual buildings separated by a resident pedestrian laneway and communal green spine
+ Set back buildings 9.5m from Beinda St to preserve existing mature trees and maximise landscape amenity and streetscape for community
+ Set back buildings 6 m from neighbouring properties and provide recessed apartment balconies and screening

Benefits and opportunities:

+ Minimises building footprint and preserves through site views and access
+ Reduces building height by terracing the buildings down towards Bolong Rd to follow the topography
+ Provides appropriate scale and articulation to Beinda St and to southern boundary and heritage building "Green leaves"
+ Reduces effect of traffic and waste handling by seperating into 2 sites
+ Satisfies ADG building separation objectives
+ Promote visual privacy at boundaries
+ Maximises landscape area and deep soil
+ Reduces scale of development and promotes consistency with smaller building lots to north



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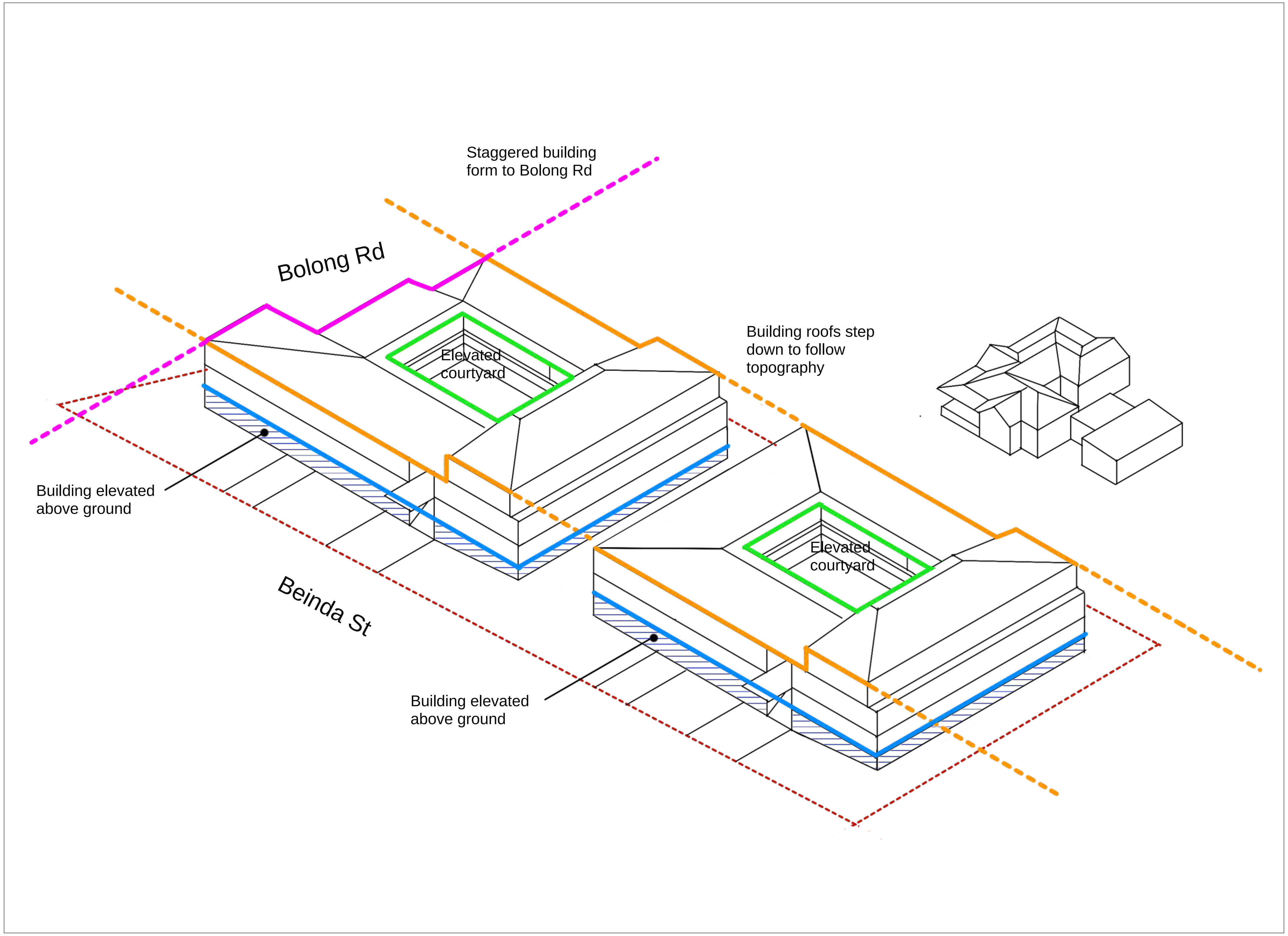
Built Form 2

Key design moves:

+ Elevate buildings above ground to achieve ground level undercroft parking
+ Step buildings down to follow topography
+ Stagger building form to Bolong Rd
+ Provide central elevated courtyards

Benefits and opportunities:

+ Minimises building height
+ Provides varied articulated building form
+ Promotes South Coast character of elevated buildings
+ Mitigates flood management
+ Minimises rock excavation and related site impacts and costs
+ Avoids unattractive vehicle down ramps
+ Achieves naturally ventilated car parking
+ Enables cross ventilation of adjacent apartments



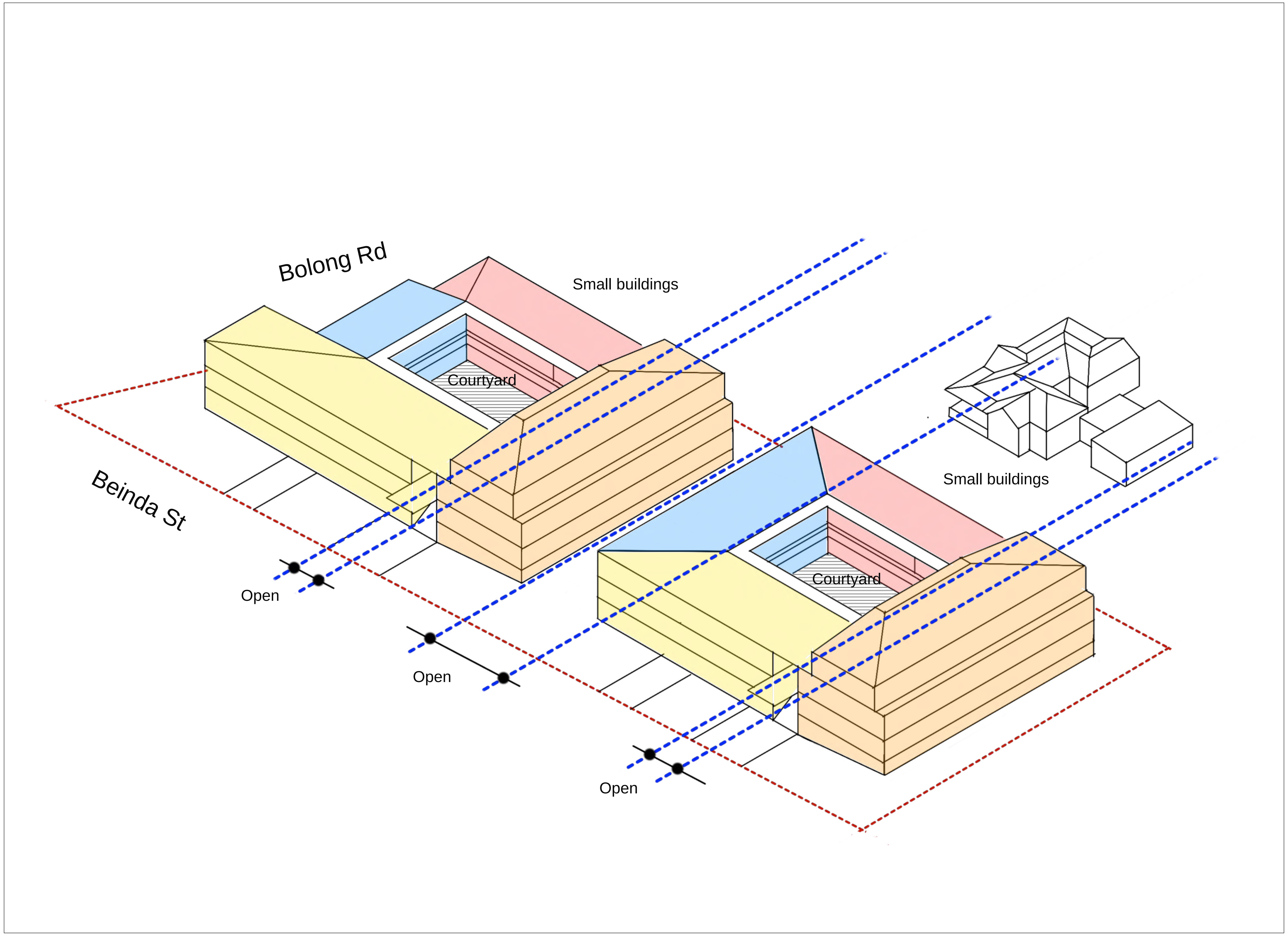
Built Form 3

Key design moves:

- Provide a variety of small built forms collected around courtyards
- Maintain some existing views through site

Benefits and opportunities:

- Minimises building floor plate areas
- Provides a variety of low and medium density building types and characters consistent with South Coast built form and scale
- Maintains level of site permeability from street
- Allows private communal open space
- Promotes apartment natural ventilation
- Provides secure outdoor space with high levels of visual surveillance



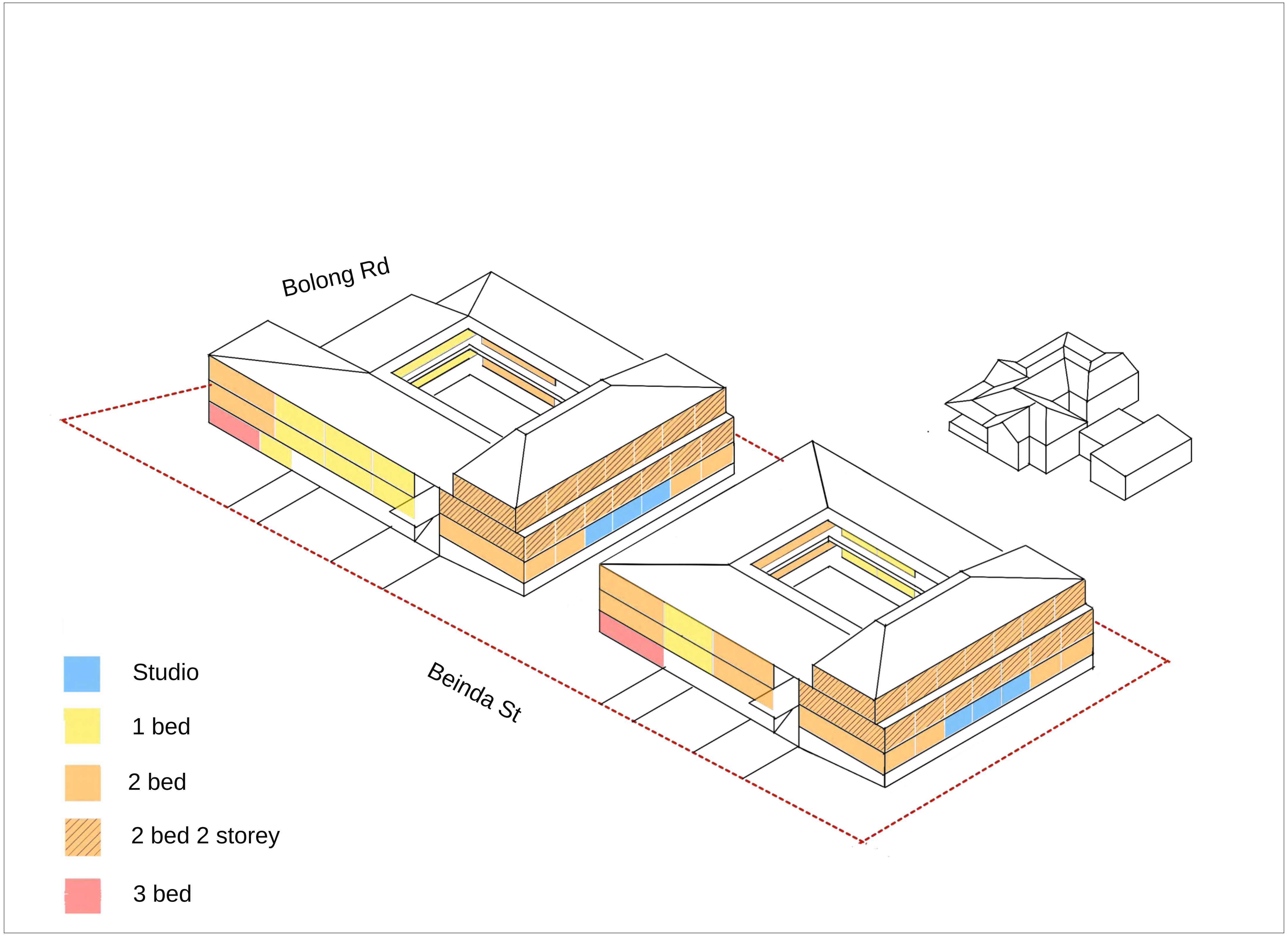
Dwelling Types

Key design moves:

+ Provide a mix of studio, 1 bed, 2 bed single-storey, 2 bed double-storey, and 3 bed apartments
+ Include ground level garden, courtyard level and upper level apartments

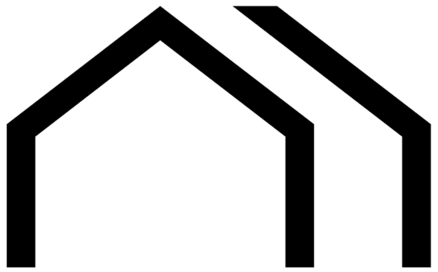
Benefits and opportunities:

+ Achieves rental accommodation for a variety of resident types
+ Addresses high level of single occupant households and popularity of 2 storey town-housing in local area
+ Satisfies Landcom's housing policy, including affordable housing and diversity targets
+ Caters to variety of residents, including families
+ Promotes use of outdoor landscape area
+ "Sleeves" ground level car parking benefiting streetscape design and street activation
+ Capitalises on views from site



7.0 Project Targets and Compliance

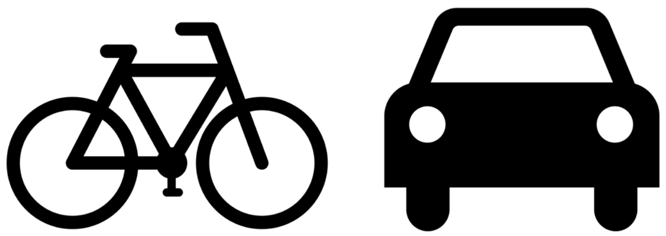
Project Targets and Compliance



60

Dwelling Mix

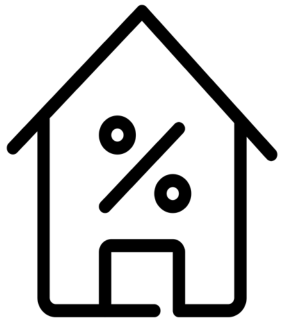
Dwelling Mix	Total	% Mix
Studio	8	13.3
1 Bed	17	28.3
2 Bed	19	31.7
2 Bed (2 storey)	14	23.4
3 Bed	2	3.3



70

Parking

Residential conventional	69
Residential tandem	1
Residential adaptable	3
Total car parking	70
Bicycle	46



20%

Regional Affordable Housing

Provide 20% affordable housing for key workers managed by on site provider
[Housing SEPP AH provisions]
[Project Brief +Landcom Housing Policy]

75%

Universal Housing

Provide min 30% universally designed accessible/adaptable housing to meet or exceed LHA Silver Certification
[Project Brief + Landcom Housing Policy]

15%

Diverse Housing

Provide 15% diverse housing types and sizes and flexible tenure within development
[Project Brief + Landcom Housing Policy]

100 %

Rental Housing

Provide secure tenure rental housing managed by on site provider
Hold in single ownership as long-term revenue generating asset
[Project Brief +
Housing SEPP BTR provisions]

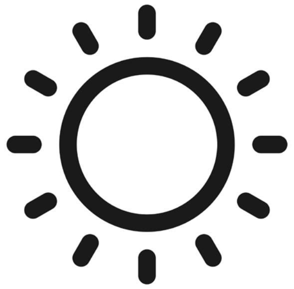
55 m2

(subject to parking level layout)

Amenity/Unit

Target minimum 3m2 of shared resident amenities per unit including possible co-work, lounge and games room
[private BTR sector standard 3-9m2 per metropolitan unit in 2023]

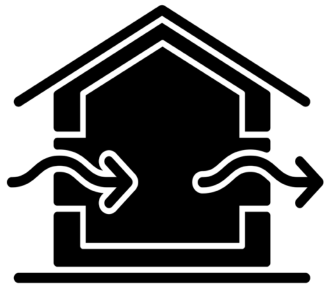
Project Targets and Compliance



73%

Solar access

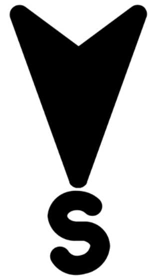
Provide 70% of dwellings with 3 hours of solar access to living spaces/private open space in winter 9.00am - 3.00pm
[ADG Objective 4A.1minimum 70%]



95%

Cross Ventilation

Provide 60% of dwellings with cross ventilation (corner or dual frontage) [ADG Objective 4B.3 minimum 60%]
Target natural ventilation to remaining 40% of dwelings to offset no a/c tbc including use of breezeways and skylights
[ADG Objective 4B.2 + Part 4F]



7% Approx

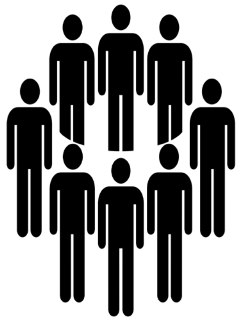
South Facing

Provide less than15% of dwellings with no direct sunlight in winter
[ADG Objective 4A.1maximum 15%]

6 Star Nathers

Sustainability Compliance and Targets

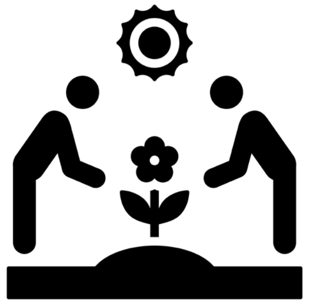
Target Landcom sustainability measures including energy reductions, on-site renewables, water savings and bio-diversity
[6 Star NABERS 4 Star Greenstar
Sustainable Buildings SEPP]



62%

Public Domain Interface and Street Activation

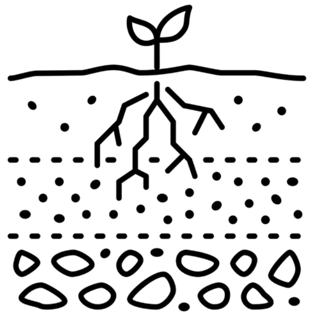
Maximise street activation to site perimeter including pedestrian entrances and stairs, laneways, communal open space, ground level apartments and balconies.
[ADG Objective 3C.1, 3C.2, 3G.1, 3G.2 and 3G.3]



85%

High retention value trees retained

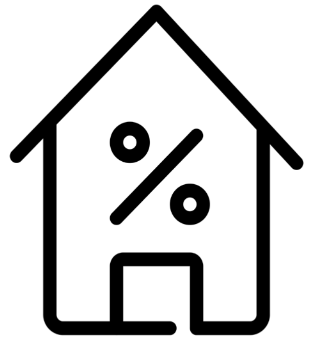
Retain high value trees and provide street setback zone for establishment of new trees and plant communities
[Project Brief/Arborist Plan]



30% +

Deep Soil

Maximsie % of site area as deep soil zone with min 6m width to allow for healthy plant, tree growth, improve residential amenity and promote water and air quality
[ADG Objective 3E-1 minimum 7% of site area]



25%

Communal open space

Provide resident access to 25% of site as gardens, courtyards and open covered areas with min 50% direct sunlight in winter. Maximise quality and useability through providing varied landscape programme, privacy and safety.
[ADG Objective 3D.1 minimum 25% of site area]

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DEVELOPMENT APPLICATION FOR BOMADERRY BTR AT:

53 & 57 BOLONG ROAD AND 4 BEINDA STREET

BOMADERRY NSW 2541

VIEW FROM BEINDA STREET (NORTH WEST)

DEVELOPMENT APPLICATION:

Architectural Drawing List

NOTES

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REVISION SCHEDULE

Rev.	Date	Revision Notes
A	12/04/24	DEVELOPMENT APPLICATION

Project:
BOMADERRY BTR, 53 & 57 Bolong rd and 4 Beinda St, Bomaderry, NSW 2541

Client:
LANDCOM

Drawing Name:
COVER SHEET

Job Number:
202312

Scale:
NTS

Plot Date:
12/04/2024

Drawing Status:
DEVELOPMENT APPLICATION

Drawing No: **DA - 00**
Revision : **A**

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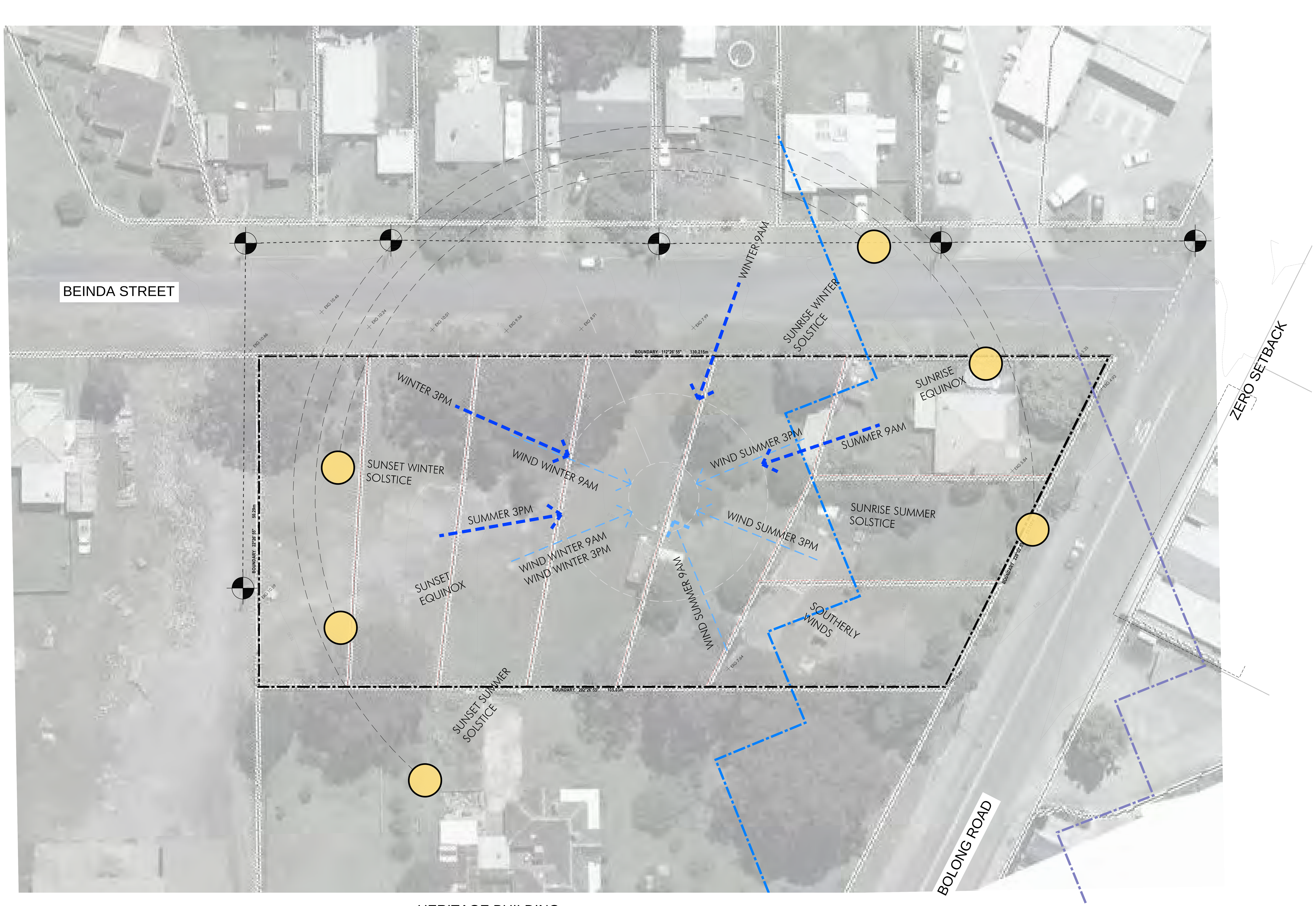

HERITAGE BUILDING

SITE ANALYSIS PLAN
Scale TBC

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REVISION SCHEDULE

Rev.	Date	Revision Notes
A	12/04/24	DEVELOPMENT APPLICATION

ELECTRICAL POWER POLE
OVERHEAD ELECTRICAL POWER LINE
FLOOD PMF LEVEL
FLOOD 1% AEP

Project:
BOMADERRY BTR, 53 & 57 Bolong rd and 4 Beinda St, Bomaderry, NSW 2541

Client:
LANDCOM

Drawing Name:
SITE ANALYSIS PLAN

Job Number:
202312

Scale:
NTS

Plot Date:
12/04/2024

TN

Drawing Status:
DEVELOPMENT APPLICATION

Drawing No: **DA - 01**
Revision : **A**

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SITE & ROOF PLAN
Scale 1:200 (A1) / 1:400 (A3)

0 2 4 6 8 10m
SCALE

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REVISION SCHEDULE

Rev.	Date	Revision Notes
A	12/04/24	DEVELOPMENT APPLICATION

PROPOSED NEW TREE

TREES PROPOSED FOR RETENTION

TREES PROPOSED FOR REMOVAL

Project:
BOMADERRY BTR, 53 & 57 Bolong rd and 4 Beinda St, Bomaderry, NSW 2541

Client:
LANDCOM

Drawing Name:
SITE & ROOF PLAN

Job Number:
202312

Scale:
1:200 @A1 / 1:400 @A3

Plot Date:
12/04/2024

TN

Drawing Status:
DEVELOPMENT APPLICATION

Drawing No: **DA - 02**
Revision : **A**

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GROUND FLOOR PLAN
Scale 1:200 (A1) / 1:400 (A3)

0 2 4 6 8 10m
SCALE

NOTES

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REVISION SCHEDULE

Rev.	Date	Revision Notes
A	12/04/24	DEVELOPMENT APPLICATION

PROPOSED NEW TREE
TREES PROPOSED FOR RETENTION
TREES PROPOSED FOR REMOVAL

AFW	ALUMINIUM FRAMED WINDOW
BG	BOX GUTTER
BS	BENCH SEAT
BOL	BOLLARD
DP	DOWNPIPE
FW	FLOOR WASTE
GD	GRATED DRAIN TO ENGINEERS DETAILS
MB	MAILBOXES
O/F	OVERFLOW (ROOF)
PB	PLANTER BOX
PLD	PANEL LIFT GARAGE DOOR
RL	REDUCED LEVELS RELATIVE TO AHD
RWH	RAINWATER HEAD
RWO	RAIN WATER OUTLET
RWT	RAIN WATER TANK
SC	STORAGE CAGE
SK	SKYLIGHT
SWP	STORM WATER PIT

NOTE:

REFER TO EXTERNAL FINISHES SCHEDULE FOR SPECIFICATION DETAIL TO ALL FINISHES CODES INDICATED ON DRAWINGS

P1, P2, P3...	PAVER TYPE
R1, R2...	ROOF TYPE
S1, S2, S3...	SCREEN TYPE
W1, W2, W3...	WALL TYPE

Project:
BOMADERRY BTR, 53 & 57 Bolong rd and 4 Beinda St, Bomaderry, NSW 2541

Client:
LANDCOM

Drawing Name:
GROUND FLOOR PLAN

Job Number:
202312
Scale:
1:200 @A1 / 1:400 @A3
Plot Date:
12/04/2024
Drawing Status:
DEVELOPMENT APPLICATION
Drawing No: **DA - 11**
Revision : **A**

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LEVEL 1 FLOOR PLAN
Scale 1:200 (A1) / 1:400 (A3)

0 2 4 6 8 10m
SCALE

NOTES

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REVISION SCHEDULE

Rev.	Date	Revision Notes
A	12/04/24	DEVELOPMENT APPLICATION

PROPOSED NEW TREE
TREES PROPOSED FOR RETENTION
TREES PROPOSED FOR REMOVAL

AFW	ALUMINIUM FRAMED WINDOW
BG	BOX GUTTER
BS	BENCH SEAT
BOL	BOLLARD
DP	DOWNPIPE
FW	FLOOR WASTE
GD	GRATED DRAIN TO ENGINEERS DETAILS
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O/F	OVERFLOW (ROOF)
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PLD	PANEL LIFT GARAGE DOOR
RL	REDUCED LEVELS RELATIVE TO AHD
RWH	RAINWATER HEAD
RWO	RAIN WATER OUTLET
RWT	RAIN WATER TANK
SC	STORAGE CAGE
SK	SKYLIGHT
SWP	STORM WATER PIT

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P1, P2, P3...	PAVER TYPE
R1, R2...	ROOF TYPE
S1, S2, S3...	SCREEN TYPE
W1, W2, W3...	WALL TYPE

Project:
BOMADERRY BTR, 53 & 57 Bolong rd and 4 Beinda St, Bomaderry, NSW 2541

Client:
LANDCOM

Drawing Name:
LEVEL 1 FLOOR PLAN

Job Number:
202312
Scale:
1:200 @A1 / 1:400 @A3
Plot Date:
12/04/2024
Drawing Status:
DEVELOPMENT APPLICATION
Drawing No: **DA - 12**
Revision : **A**

TN

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Peter St.Clair NSW ARB 7325

LEVEL 2 FLOOR PLAN
Scale 1:200 (A1) / 1:400 (A3)

0 2 4 6 8 10m
SCALE

NOTES

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REVISION SCHEDULE

Rev.	Date	Revision Notes
A	12/04/24	DEVELOPMENT APPLICATION

AFW	ALUMINIUM FRAMED WINDOW
BG	BOX GUTTER
BS	BENCH SEAT
BOL	BOLLARD
DP	DOWNPIPE
FW	FLOOR WASTE
GD	GRATED DRAIN TO ENGINEERS DETAILS
MB	MAILBOXES
O/F	OVERFLOW (ROOF)
PB	PLANTER BOX
PLD	PANEL LIFT GARAGE DOOR
RL	REDUCED LEVELS RELATIVE TO AHD
RWH	RAINWATER HEAD
RWO	RAIN WATER OUTLET
RWT	RAIN WATER TANK
SC	STORAGE CAGE
SK	SKYLIGHT
SWP	STORM WATER PIT

NOTE:

REFER TO EXTERNAL FINISHES SCHEDULE FOR SPECIFICATION DETAIL TO ALL FINISHES CODES INDICATED ON DRAWINGS

P1, P2, P3...	PAVER TYPE
R1, R2...	ROOF TYPE
S1, S2, S3...	SCREEN TYPE
W1, W2, W3...	WALL TYPE

Project:
BOMADERRY BTR, 53 & 57 Bolong rd and 4 Beinda St, Bomaderry, NSW 2541

Client:
LANDCOM

Drawing Name:
LEVEL 2 FLOOR PLAN

Job Number:
202312

Scale:
1:200 @A1 / 1:400 @A3

TN

Plot Date:
12/04/2024

Drawing Status:
DEVELOPMENT APPLICATION

Drawing No: **DA - 13**
Revision : **A**

St.Clair Architecture
136 Milson Rd, Cremorne Point, NSW 2090
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Peter St.Clair NSW ARB 7325

LEVEL 3 FLOOR PLAN
Scale 1:200 (A1) / 1:400 (A3)

0 2 4 6 8 10m
SCALE

NOTES

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REVISION SCHEDULE

Rev.	Date	Revision Notes
A	12/04/24	DEVELOPMENT APPLICATION

AFW	ALUMINIUM FRAMED WINDOW
BG	BOX GUTTER
BS	BENCH SEAT
BOL	BOLLARD
DP	DOWNPIPE
FW	FLOOR WASTE
GD	GRATED DRAIN TO ENGINEERS DETAILS
MB	MAILBOXES
O/F	OVERFLOW (ROOF)
PB	PLANTER BOX
PLD	PANEL LIFT GARAGE DOOR
RL	REDUCED LEVELS RELATIVE TO AHD
RWH	RAINWATER HEAD
RWO	RAIN WATER OUTLET
RWT	RAIN WATER TANK
SC	STORAGE CAGE
SK	SKYLIGHT
SWP	STORM WATER PIT

NOTE:

REFER TO EXTERNAL FINISHES SCHEDULE FOR SPECIFICATION DETAIL TO ALL FINISHES CODES INDICATED ON DRAWINGS

P1, P2, P3...	PAVER TYPE
R1, R2...	ROOF TYPE
S1, S2, S3...	SCREEN TYPE
W1, W2, W3...	WALL TYPE

Project:
BOMADERRY BTR, 53 & 57 Bolong rd and 4 Beinda St, Bomaderry, NSW 2541

Client:
LANDCOM

Drawing Name:
LEVEL 3 FLOOR PLAN

Job Number: 202312
Scale: 1:200 @A1 / 1:400 @A3
Plot Date: 12/04/2024
Drawing Status: **DEVELOPMENT APPLICATION**
Drawing No: **DA - 14**
Revision : **A**

TN

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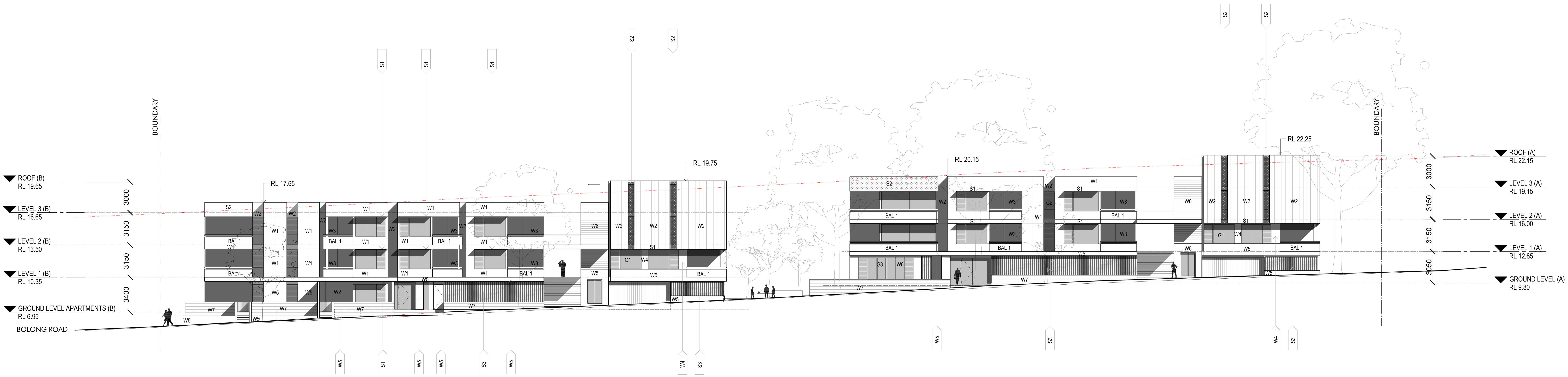
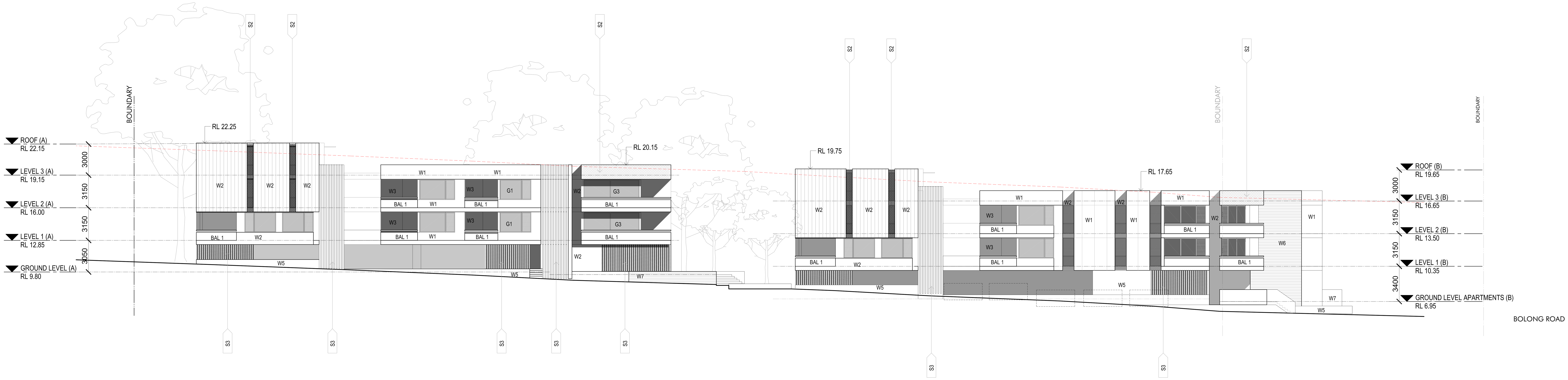
Peter St.Clair NSW ARB 7325



NORTH ELEVATION
Scale 1:200 (A1) / 1:400 (A3)



SOUTH ELEVATION
Scale 1:200 (A1) / 1:400 (A3)

0 2 4 6 8 10m
SCALE

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REVISION SCHEDULE

Rev.	Date	Revision Notes
A	12/04/24	DEVELOPMENT APPLICATION

Code	Item
	Walls and screens
W1	Compressed fibre-cement cladding
W2	Compressed fibre-cement cladding
W3	Compressed fibre-cement cladding
W4	Metal cladding
W5	Concrete
W6	Fair faced concrete blockwork
W7	Fair faced concrete blockwork
	Balustrades
BAL1	Perforated aluminium
	Sun shading and privacy screens
S1	Aluminium hoods
S2	Perforated aluminium
S3	Coloured aluminium **or** hardwood battens

NOTE:

REFER TO EXTERNAL FINISHES SCHEDULE FOR FULL SPECIFICATION DETAIL TO ALL FINISHES CODES INDICATED ON DRAWINGS

RL = REDUCED LEVEL RELATIVE TO AHD

Project:
BOMADERRY BTR, 53 & 57 Bolong rd and 4 Beinda St, Bomaderry, NSW 2541

Client:
LANDCOM

Drawing Name:
ELEVATIONS SHEET 1

Job Number:
202312

Scale:
1:200 @A1 / 1:400 @A3

Plot Date:
12/04/2024

Drawing Status:
DEVELOPMENT APPLICATION

Drawing No: **DA - 21**
Revision : **A**

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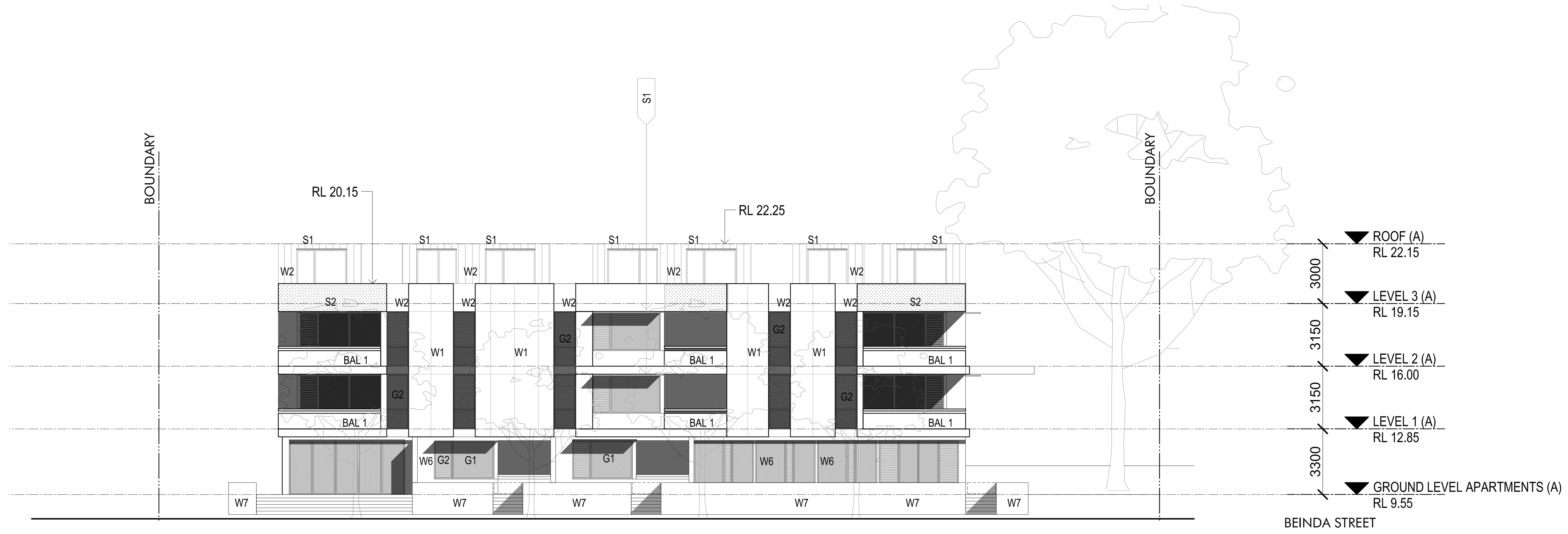
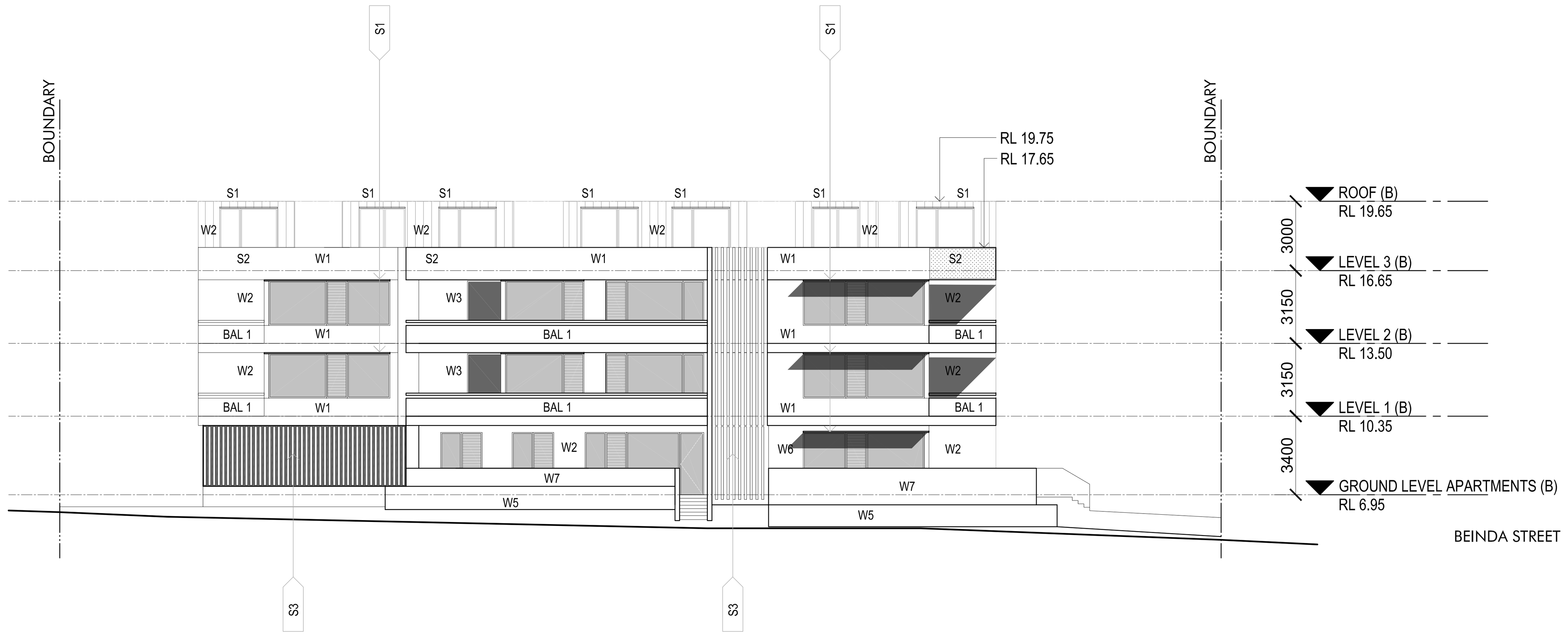
Peter St.Clair NSW ARB 7325

WEST ELEVATION (BUILDING 2)
Scale 1:200 (A1) / 1:400 (A3)



EAST ELEVATION (BUILDING A)
Scale 1:200 (A1) / 1:400 (A3)



EAST ELEVATION (BUILDING B) BOLONG RD.
Scale 1:200 (A1) / 1:400 (A3)

WEST ELEVATION (BUILDING B)
Scale 1:200 (A1) / 1:400 (A3)

0 2 4 6 8 10m
SCALE

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REVISION SCHEDULE

Rev.	Date	Revision Notes
A	12/04/24	DEVELOPMENT APPLICATION

Code	Item
	Walls and screens
W1	Compressed fibre-cement cladding
W2	Compressed fibre-cement cladding
W3	Compressed fibre-cement cladding
W4	Metal cladding
W5	Concrete
W6	Fair faced concrete blockwork
W7	Fair faced concrete blockwork
	Balustrades
BAL1	Perforated aluminium
	Sun shading and privacy screens
S1	Aluminium hoods
S2	Perforated aluminium
S3	Coloured aluminium or hardwood battens

NOTE:

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RL = REDUCED LEVEL RELATIVE TO AHD

NOTE:
RL = REDUCED LEVEL RELATIVE TO AHD

Project:
BOMADERRY BTR, 53 & 57 Bolong rd and 4 Beinda St, Bomaderry, NSW 2541

Client:
LANDCOM

Drawing Name:
ELEVATIONS SHEET 2

Job Number:
202312

Scale:
1:200 @A1 / 1:400 @A3

Plot Date:
12/04/2024

Drawing Status:
DEVELOPMENT APPLICATION

Drawing No: **DA - 22**
Revision : **A**

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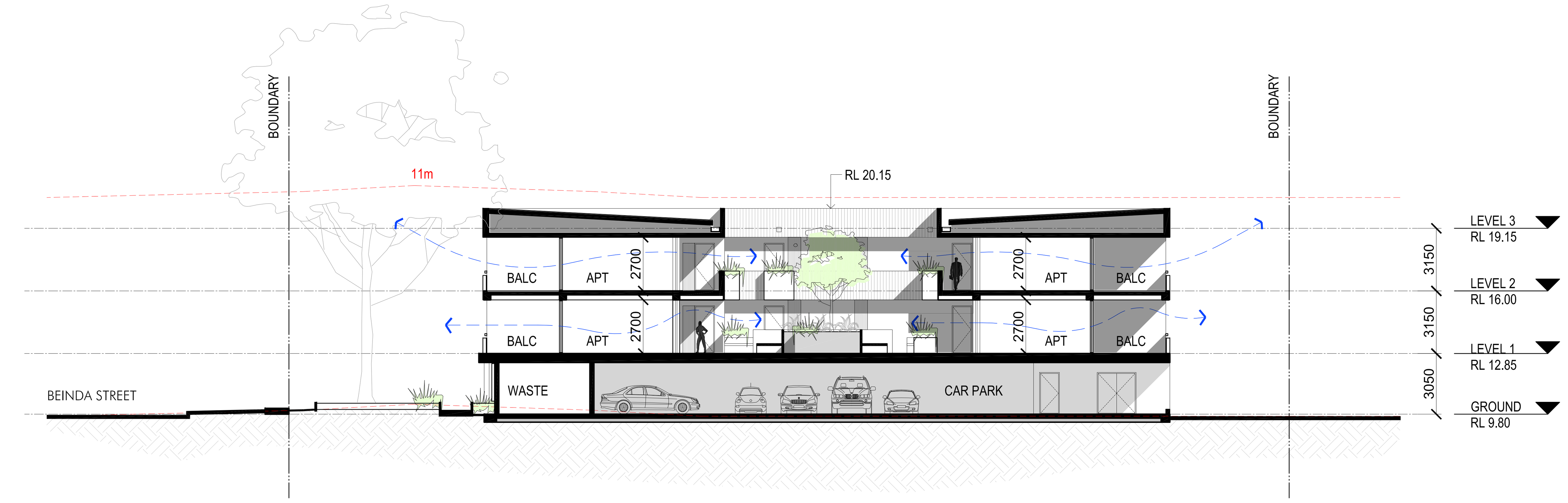
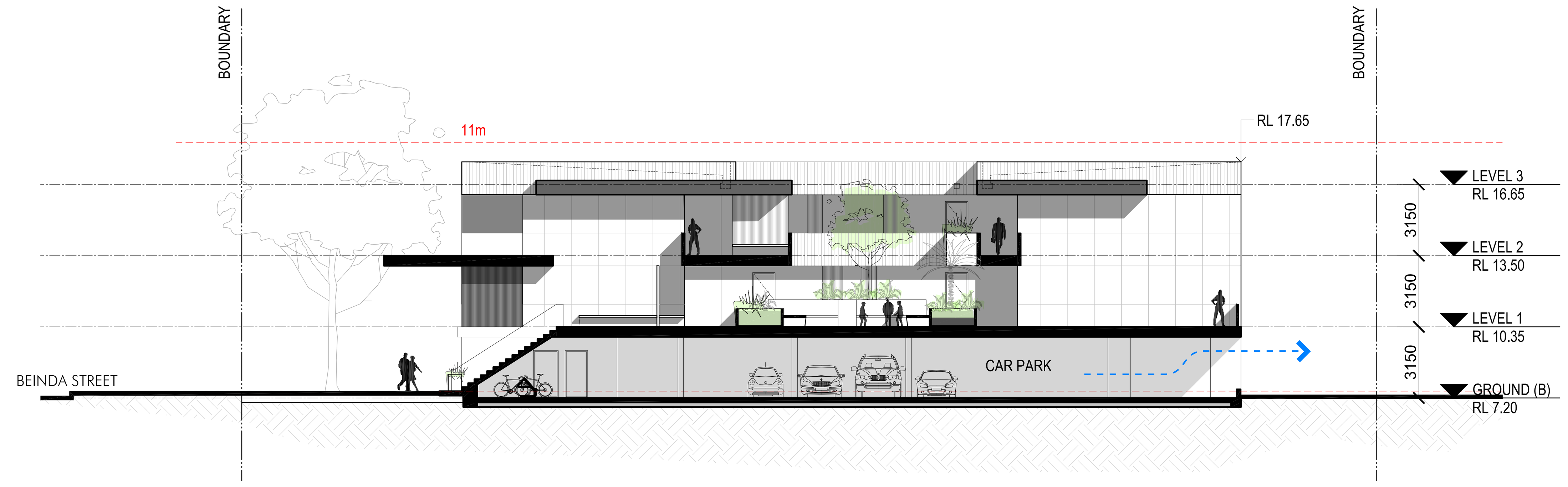
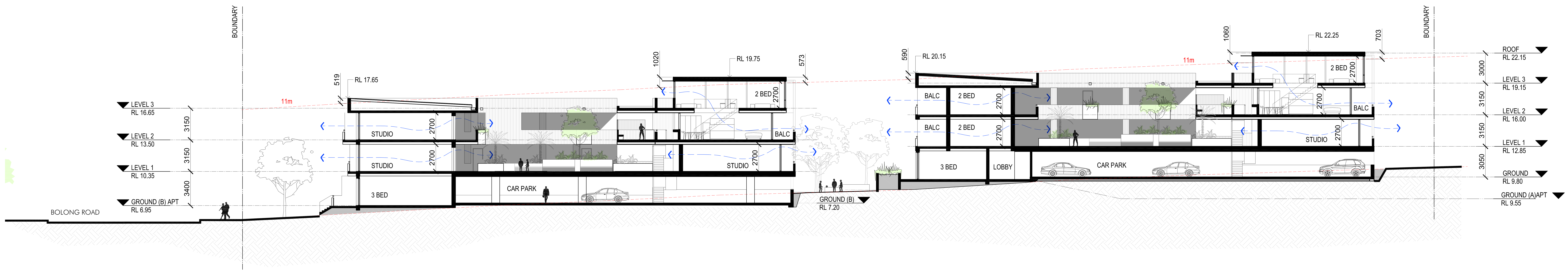
ph. 0435 069 899 peter@stclairarchitecture.com
Peter St.Clair NSW ARB 7325



1 SECTION 1
Scale 1:200 (A1) / 1:400 (A3)



3 SECTION 3
Scale 1:200 (A1) / 1:400 (A3)



2 SECTION 2
Scale 1:200 (A1) / 1:400 (A3)

0 2 4 6 8 10m
SCALE

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REVISION SCHEDULE

Rev.	Date	Revision Notes
A	12/04/24	DEVELOPMENT APPLICATION

NOTE:

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RL = REDUCED LEVEL RELATIVE TO AHD

Project:
BOMADERRY BTR, 53 & 57 Bolong rd and 4 Beinda St, Bomaderry, NSW 2541

Client:
LANDCOM

Drawing Name:
SECTIONS

Job Number:
202312

Scale:
1:200 @A1 / 1:400 @A3

Plot Date:
12/04/2024

Drawing Status:
DEVELOPMENT APPLICATION

Drawing No: **DA - 31**
Revision : **A**

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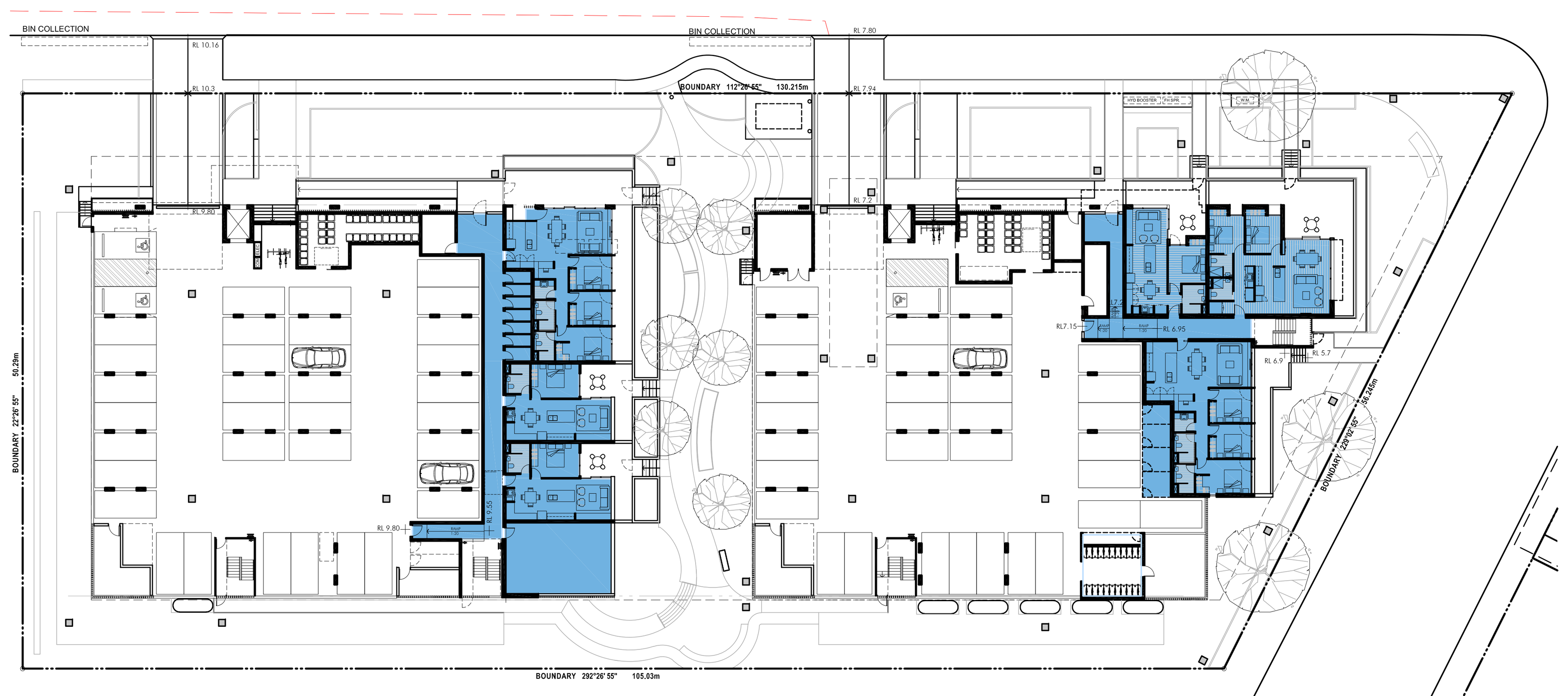
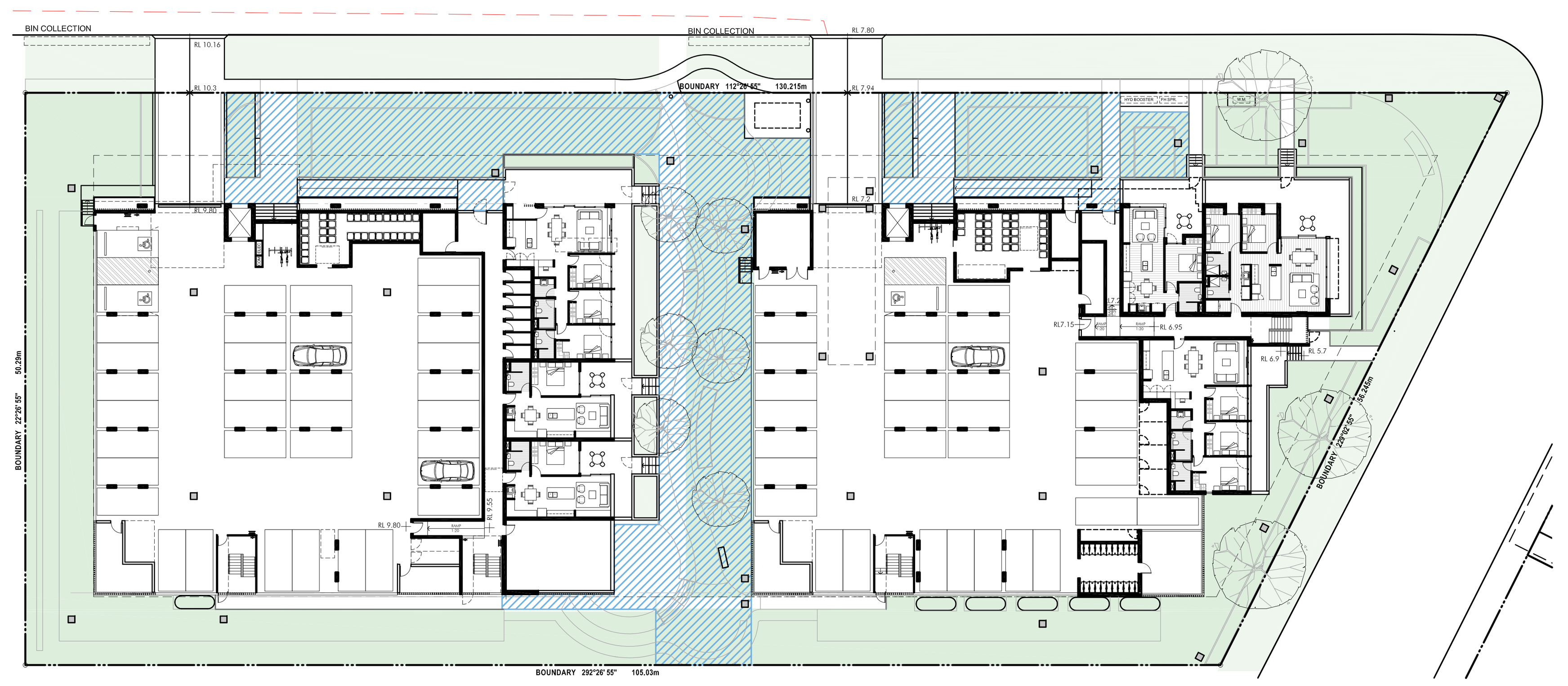


1 GFA GROUND FLOOR PLAN = 351 m2, 318 m2
Scale 1:500 (A1) / 1:1000 (A3)

2 GFA LEVEL 1 PLAN = 831 m2, 859 m2
Scale 1:500 (A1) / 1:1000 (A3)

3 GFA LEVEL 2 PLAN = 819m2, 839m2
Scale 1:500 (A1) / 1:1000 (A3)

4 GFA LEVEL 3 PLAN = 312m2, 312m2
Scale 1:500 (A1) / 1:1000 (A3)



5 GROUND FLOOR PLAN COMMUNAL OPEN SPACE (COS) = 1016 m2
Scale 1:500 (A1) / 1:1000 (A3)

6 LEVEL 1 PLAN = 470 m2 (COS)
Scale 1:500 (A1) / 1:1000 (A3)

LEGEND:

GROSS FLOOR AREA (GFA)

COMMUNAL OPEN SPACE

GFA CALCULATIONS:

SITE AREA: 5915 m2
PROPOSED GROSS FLOOR AREA (GFA) 4641 m2 (FSR 0.78 : 1)

GFA:	BLDG. A	BLDG. B	TOTAL
GROUND	351	318	669
LEVEL 1	831	859	1690
LEVEL 2	819	839	1658
LEVEL 3	312	312	624
TOTAL:	2313	2328	4641

SITE AREA: 5915 m2
PROPOSED COMMUNAL OPEN SPACE* 1486 m2 (25%)

NOTE:
REFER TO LANDSCAPE ARCHITECT'S DOCUMENTATION FOR DEEP SOIL AREAS AND LANDSCAPING AND PLANTING SCHEDULES

0 5 10 15 20 25m
SCALE

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REVISION SCHEDULE

Rev.	Date	Revision Notes
A	12/04/24	DEVELOPMENT APPLICATION

Project:
BOMADERRY BTR, 53 & 57 Bolong rd and 4 Beinda St, Bomaderry, NSW 2541

Client:
LANDCOM

Drawing Name:
CALCULATIONS SUMMARY

Job Number:
202312

Scale:
1:100 @A1 / 1:200 @A3

TN

Plot Date:
12/04/2024

Drawing Status:
DEVELOPMENT APPLICATION

Drawing No: **DA - 41**
Revision : **A**

St.Clair Architecture
136 Milson Rd, Cremorne Point, NSW 2090
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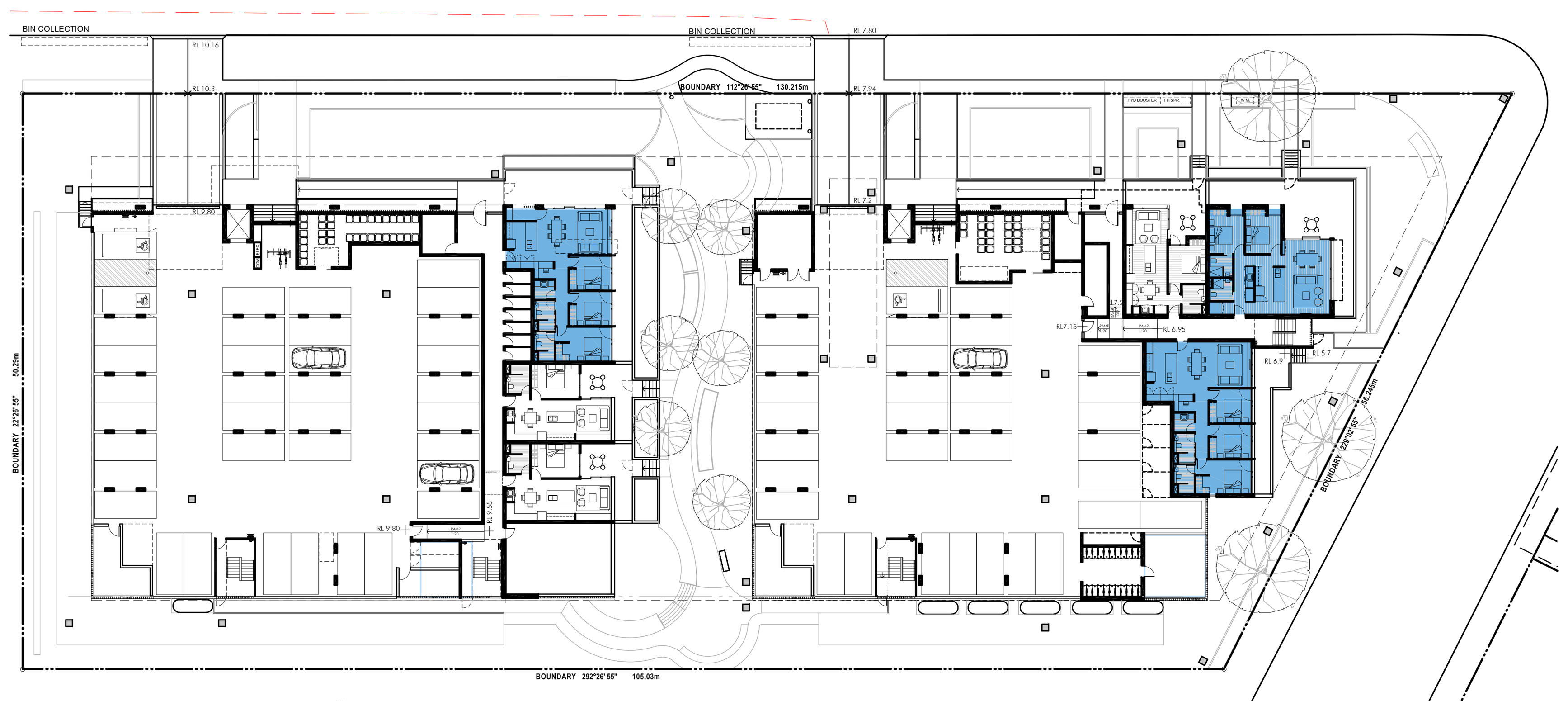
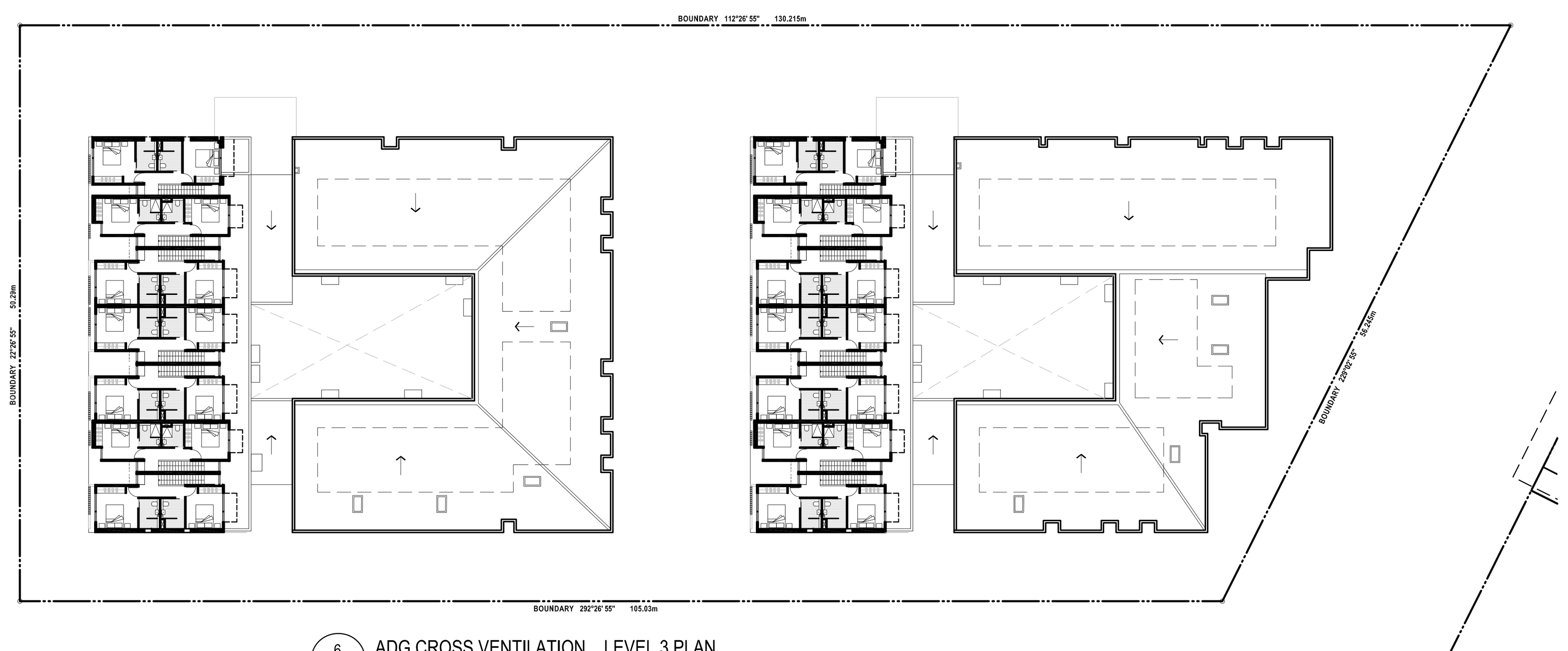
Peter St.Clair NSW ARB 7325



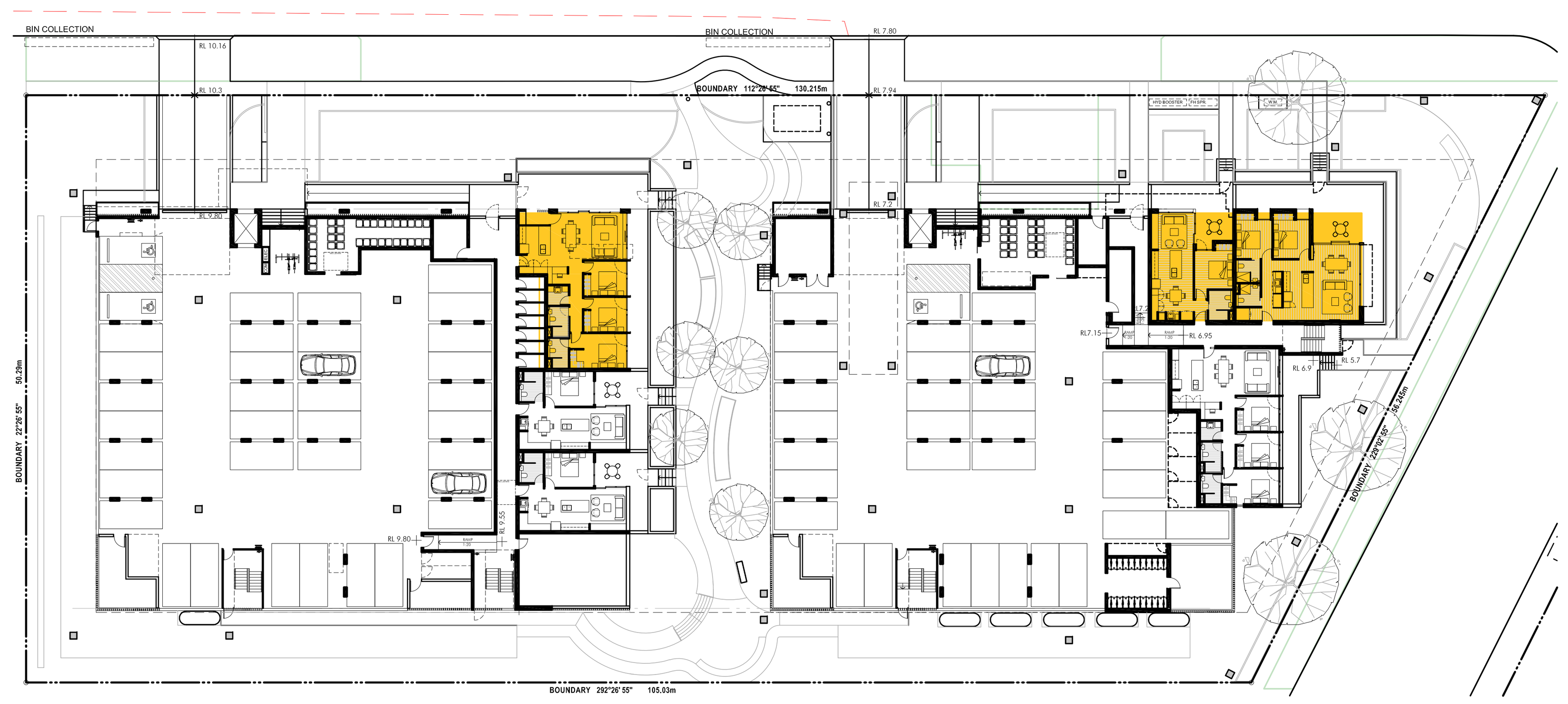
5 ADG CROSS VENTILATION _ GROUND FLOOR PLAN
Scale 1:500 (A1) / 1:1000 (A3)

6 ADG CROSS VENTILATION _ LEVEL 1 PLAN
Scale 1:500 (A1) / 1:1000 (A3)

6 ADG CROSS VENTILATION _ LEVEL 2 PLAN
Scale 1:500 (A1) / 1:1000 (A3)



6 ADG CROSS VENTILATION _ LEVEL 3 PLAN
Scale 1:500 (A1) / 1:1000 (A3)



1 ADG SOLAR (3 HOURS) _ GROUND FLOOR PLAN
Scale 1:500 (A1) / 1:1000 (A3)

2 ADG SOLAR (3 HOURS) _ LEVEL 1 PLAN
Scale 1:500 (A1) / 1:1000 (A3)

3 ADG SOLAR (3 HOURS) _ LEVEL 2 PLAN
Scale 1:500 (A1) / 1:1000 (A3)

4 ADG SOLAR (3 HOURS) _ LEVEL 3 PLAN
Scale 1:500 (A1) / 1:1000 (A3)

0 5 10 15 20 25m
SCALE

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REVISION SCHEDULE

Rev.	Date	Revision Notes
A	12/04/24	DEVELOPMENT APPLICATION

LEGEND:

- ADG CROSS VENTILATED UNITS
- ADG SOLAR COMPLIANT UNITS (3 HOURS)

ADG CALCULATIONS:

ADG CROSS VENTILATED TOTAL	57 / 60 = 95%
ADG SOLAR COMPLIANT (3 HOURS) TOTAL	44 / 60 = 73%

Project:
BOMADERRY BTR, 53 & 57 Bolong rd and 4 Beinda St, Bomaderry, NSW 2541

Client:
LANDCOM

Drawing Name:
ADG COMPLIANCE SUMMARY

Job Number:
202312

Scale:
1:100 @A1 / 1:200 @A3

TN

Plot Date:
12/04/2024

Drawing Status:
DEVELOPMENT APPLICATION

Drawing No: **DA - 51**
Revision : **A**

St.Clair Architecture
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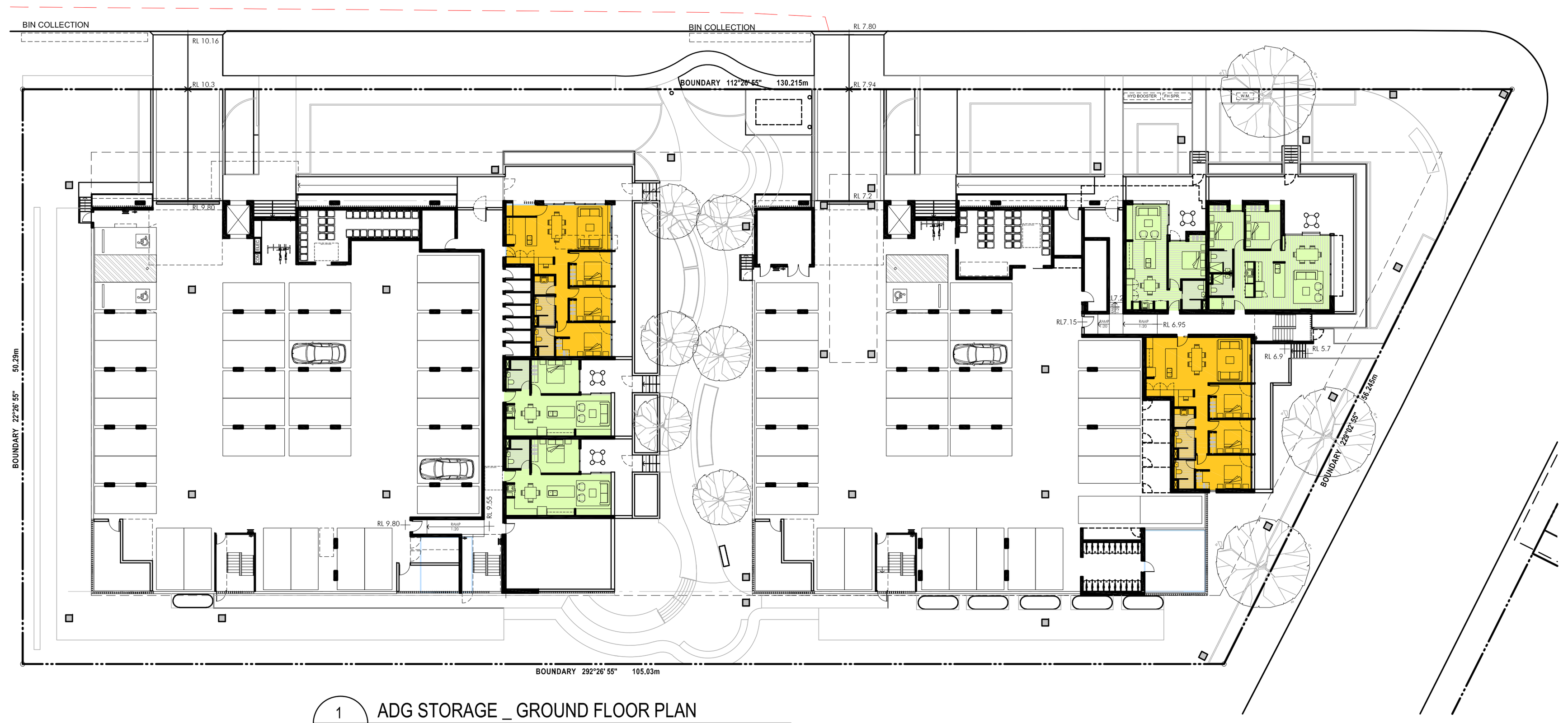
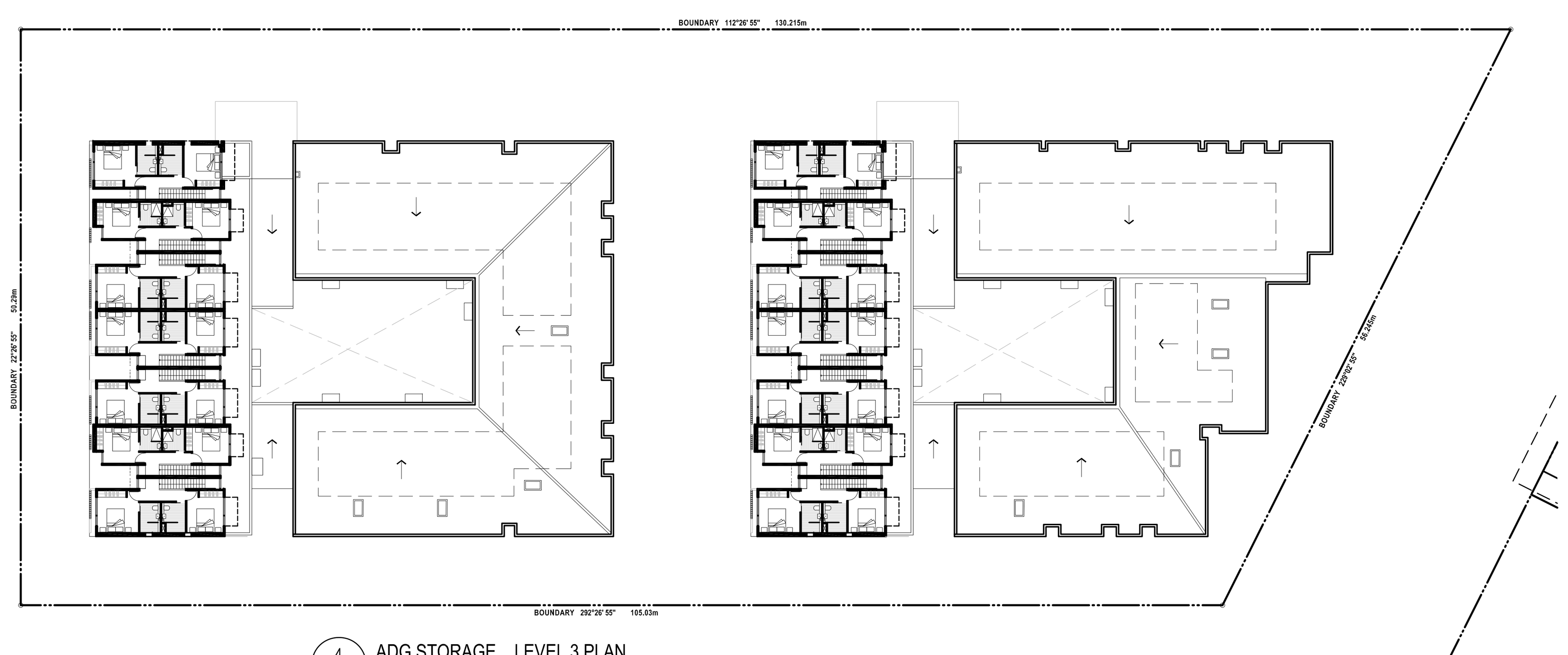
Peter St.Clair NSW ARB 7325



1 ADG STORAGE _ GROUND FLOOR PLAN
Scale 1:500 (A1) / 1:1000 (A3)

2 ADG STORAGE _ LEVEL 1 PLAN
Scale 1:500 (A1) / 1:1000 (A3)

3 ADG STORAGE_ LEVEL 2 PLAN
Scale 1:500 (A1) / 1:1000 (A3)



4 ADG STORAGE _ LEVEL 3 PLAN
Scale 1:500 (A1) / 1:1000 (A3)

St. Clair Architecture

Bomaderry BTR ADG Storage Summary

RESIDENTIAL SUMMARY OF UNIT TYPES AND ADG STORAGE							
				ADG Storage			
Building	Level	Dwelling No.	Type	Required volume (m3)	Actual volume within apartment (m3)	Actual volume within carpark (m3)	Complies
1 (East)	Ground	**1.G01**	1 Bed (1B 01)	6	6.5	-	✓
		1.G02	2 Bed (2B 02)	8	8	-	✓
		1.G03	3 Bed (3B 01)	10	5.6	4.4	✓
	Level 1	**1.101**	1 Bed (1B 01)	6	6.5	-	✓
		1.102	1 Bed (1B 01)	6	6.5	-	✓
		1.103	1 Bed (1B 01)	6	6.5	-	✓
		1.104	2 Bed (2B 02)	8	8	-	✓
		1.105	Studio (Studio 01)	4	4	-	✓
		1.106	1 Bed (1B 01)	6	6.5	-	✓
		1.107	2 Bed (2B 02)	8	8	-	✓
		1.108	2 Bed (2B 01)	8	4.3	3.7	✓
		1.109	2 Bed (2B 03)	8	8	-	✓
		1.110	Studio (Studio 01)	4	4	-	✓
		1.111	Studio (Studio 01)	4	4	-	✓
		1.112	Studio (Studio 01)	4	4	-	✓
		1.113	2 Bed (2B 03)	8	8	-	✓
	Level 2 (including both levels of 2 storey units entered at Level 2)	**1.201**	1 Bed (1B 01)	6	6.5	-	✓
		1.202	1 Bed (1B 01)	6	6.5	-	✓
		1.203	1 Bed (1B 01)	6	6.5	-	✓
		1.204	2 Bed (2B 02)	8	8	-	✓
		1.205	Studio (Studio 01)	4	4	-	✓
		1.206	1 Bed (1B 01)	6	6.5	-	✓
		1.207	2 Bed (2B 02)	8	8	-	✓
		1.208	2 Bed (2B 01)	8	4.3	3.7	✓
		1.209	2 Bed/2 Storey (2B 04)	8	8	-	✓
		1.210	2 Bed/2 Storey (2B 05)	8	5.9	2.1	✓
		1.211	2 Bed/2 Storey (2B 04)	8	8	-	✓
		1.212	2 Bed/2 Storey (2B 04)	8	8	-	✓
		1.213	2 Bed/2 Storey (2B 04)	8	8	-	✓
		1.214	2 Bed/2 Storey (2B 05)	8	5.9	2.1	✓
		1.215	2 Bed/2 Storey (2B 04)	8	8	-	✓
2 (West)	Ground	**2.G01**	3 Bed (3B 01)	10	5.6	4.4	✓
		2.G02	1 Bed (1B 01)	6	6.3	-	✓
		2.G03	1 Bed (1B 01)	6	6.3	-	✓
	Level 1	**2.101**	2 Bed (2B 02)	8	8	-	✓
		2.102	1 Bed (1B 01)	6	6.5	-	✓
		2.103	2 Bed (2B 02)	8	4.4	3.6	✓
		2.104	2 Bed (2B 01)	8	4.3	3.7	✓
		2.105	2 Bed (2B 02)	8	4.4	3.6	✓
		2.106	1 Bed (1B 01)	6	6.5	-	✓
		2.107	1 Bed (1B 01)	6	6.5	-	✓
		2.108	2 Bed (2B 03)	8	8	-	✓
		2.109	Studio (Studio 01)	4	4	-	✓
		2.110	Studio (Studio 01)	4	4	-	✓
		2.111	Studio (Studio 01)	4	4	-	✓
		2.112	2 Bed (2B 03)	8	8	-	✓
	Level 2 (including both levels of 2 storey units entered at Level 2)	**2.201**	2 Bed (2B 02)	8	8	-	✓
		2.202	1 Bed (1B 01)	6	6.5	-	✓
		2.203	2 Bed (2B 02)	8	4.4	3.6	✓
		2.204	2 Bed (2B 01)	8	8		✓
		2.205	2 Bed (2B 02)	8	4.4	3.6	✓
		2.206	1 Bed (1B 01)	6	6.5	-	✓
		1.207	1 Bed (1B 01)	6	6.5	-	✓
		2.208	2 Bed/2 Storey (2B 04)	8	8	-	✓
		2.209	2 Bed/2 Storey (2B 05)	8	5.9	2.1	✓
		2.21	2 Bed/2 Storey (2B 04)	8	8	-	✓
		2.211	2 Bed/2 Storey (2B 04)	8	8	-	✓
		2.212	2 Bed/2 Storey (2B 04)	8	8	-	✓
		2.213	2 Bed/2 Storey (2B 05)	8	5.9	2.1	✓
		2.214	2 Bed/2 Storey (2B 04)	8	8	-	✓

0 5 10 15 20 25m
SCALE

NOTES

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REVISION SCHEDULE

Rev.	Date	Revision Notes
A	12/04/24	DEVELOPMENT APPLICATION

LEGEND:

ADG 50% STORAGE WITHIN UNIT
ADG 100% STORAGE WITHIN UNIT

Project:
BOMADERRY BTR, 53 & 57 Bolong rd and 4 Beinda St, Bomaderry, NSW 2541

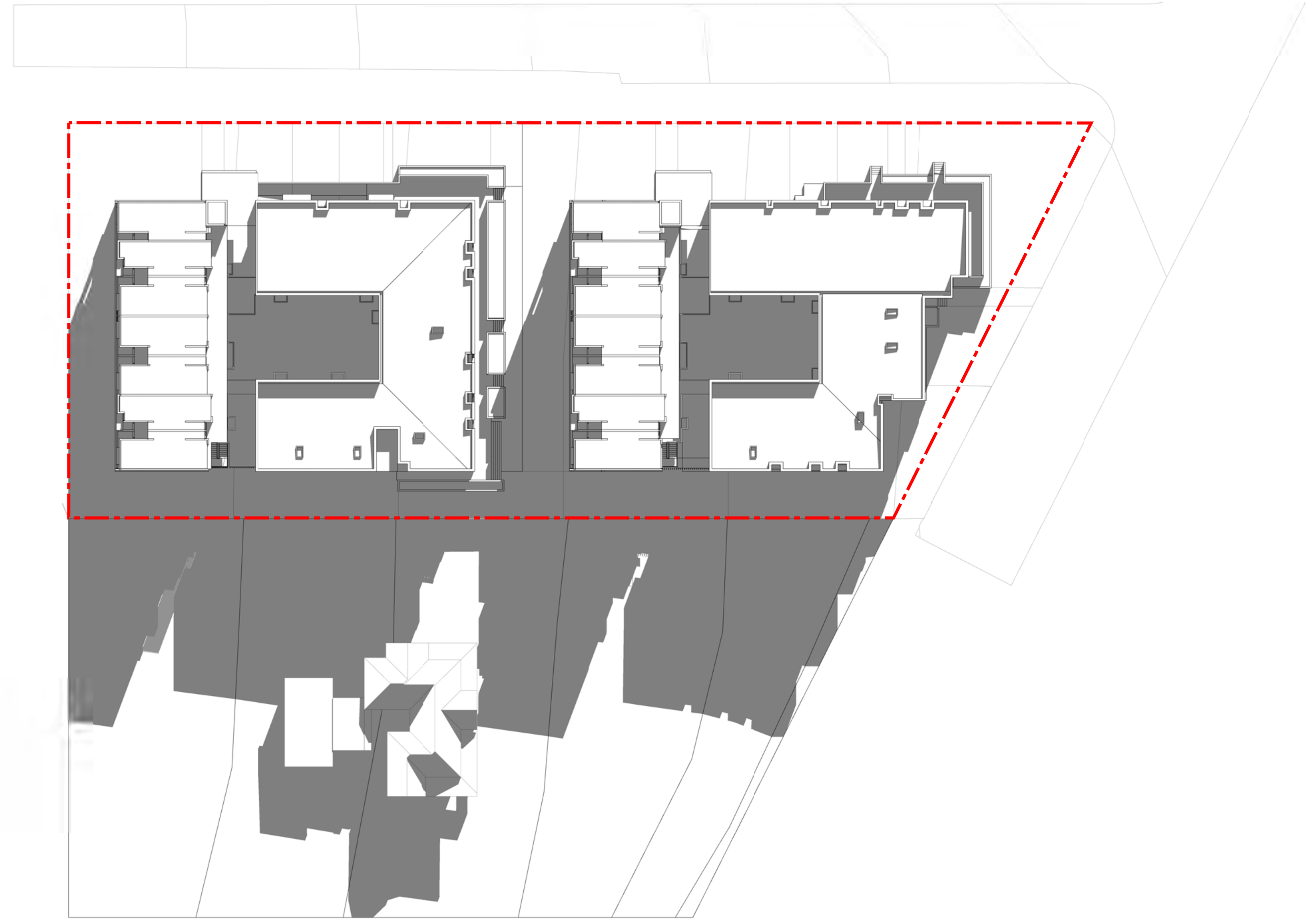
Client:
LANDCOM

Drawing Name:
ADG COMPLIANCE SUMMARY STORAGE

Job Number: **202312**
Scale: 1:100 @A1 / 1:200 @A3
Plot Date: 12/04/2024
Drawing Status: **DEVELOPMENT APPLICATION**
Drawing No: **DA - 52** Revision : **A**

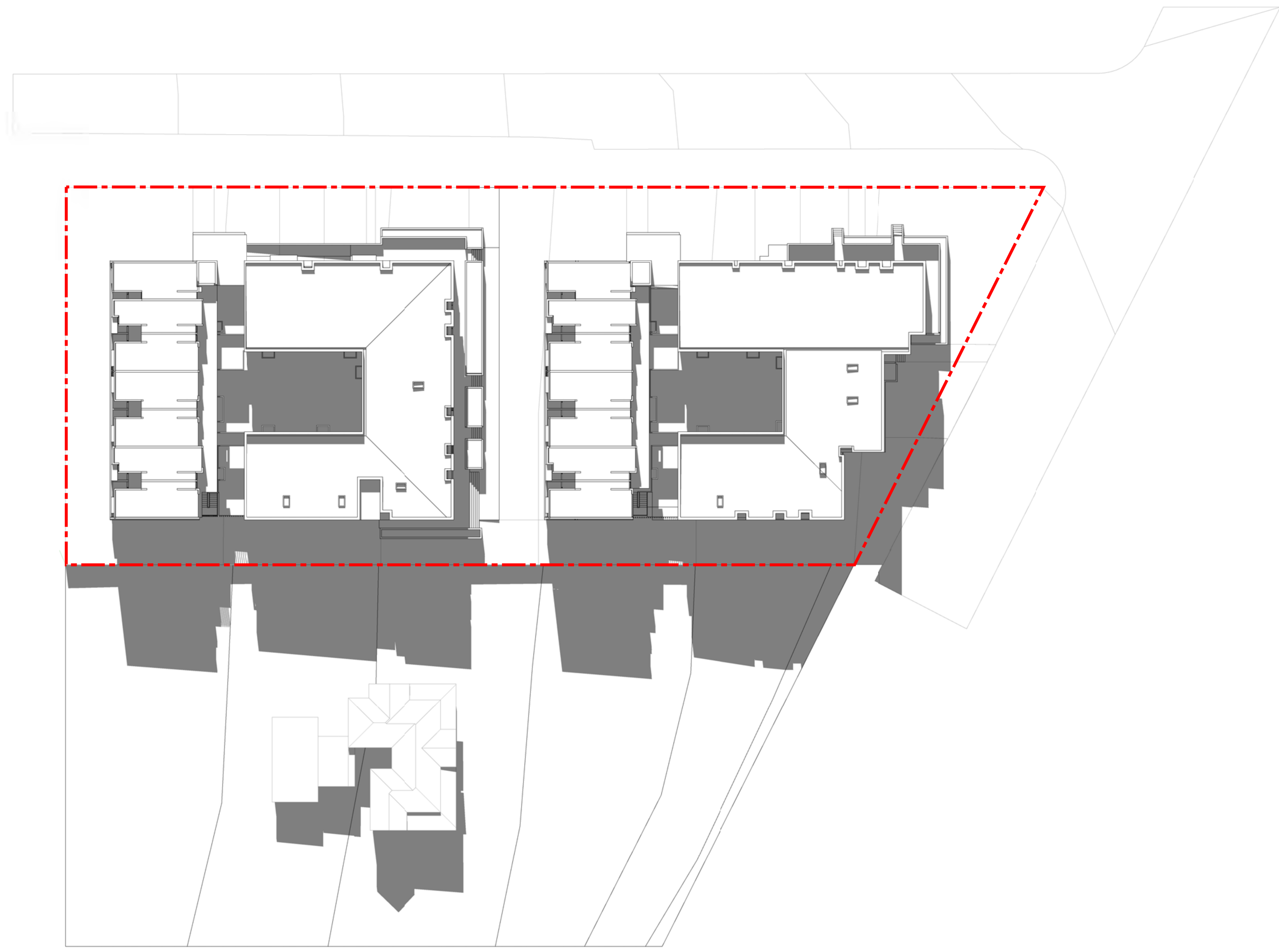
TN

St.Clair Architecture
136 Milson Rd, Cremorne Point, NSW 2090
ph. 0435 069 899 peter@stclairarchitecture.com
Peter St.Clair NSW ARB 7325

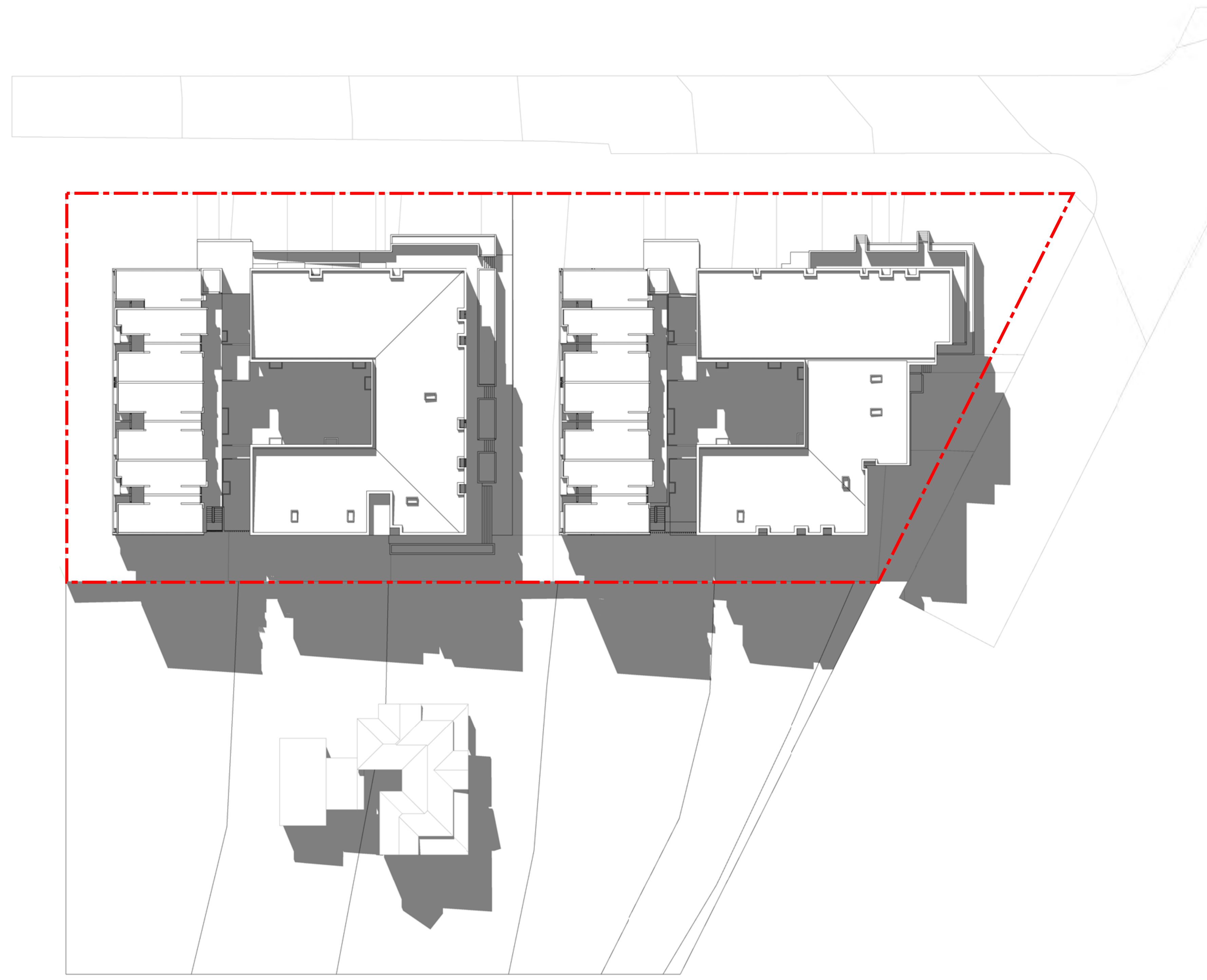


1 21 June - 900
1 : 500

2 21 June - 1000
1 : 500



3 21 June - 1100
1 : 500



4 21 June - 1200
1 : 500

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REVISION SCHEDULE

Rev.	Date	Revision Notes
A	12/04/24	DEVELOPMENT APPLICATION

Project:
BOMADERRY BTR, 53 & 57 Bolong rd and 4 Beinda St, Bomaderry, NSW 2541

Client:
LANDCOM

Drawing Name:
SHADOW DIAGRAMS SHEET 1

Job Number:
202312

Scale:
1:250 @A1 / 1:500 @A3

Plot Date:
12/04/2024

Drawing Status:
DEVELOPMENT APPLICATION

Drawing No: **DA - 71**
Revision : **A**

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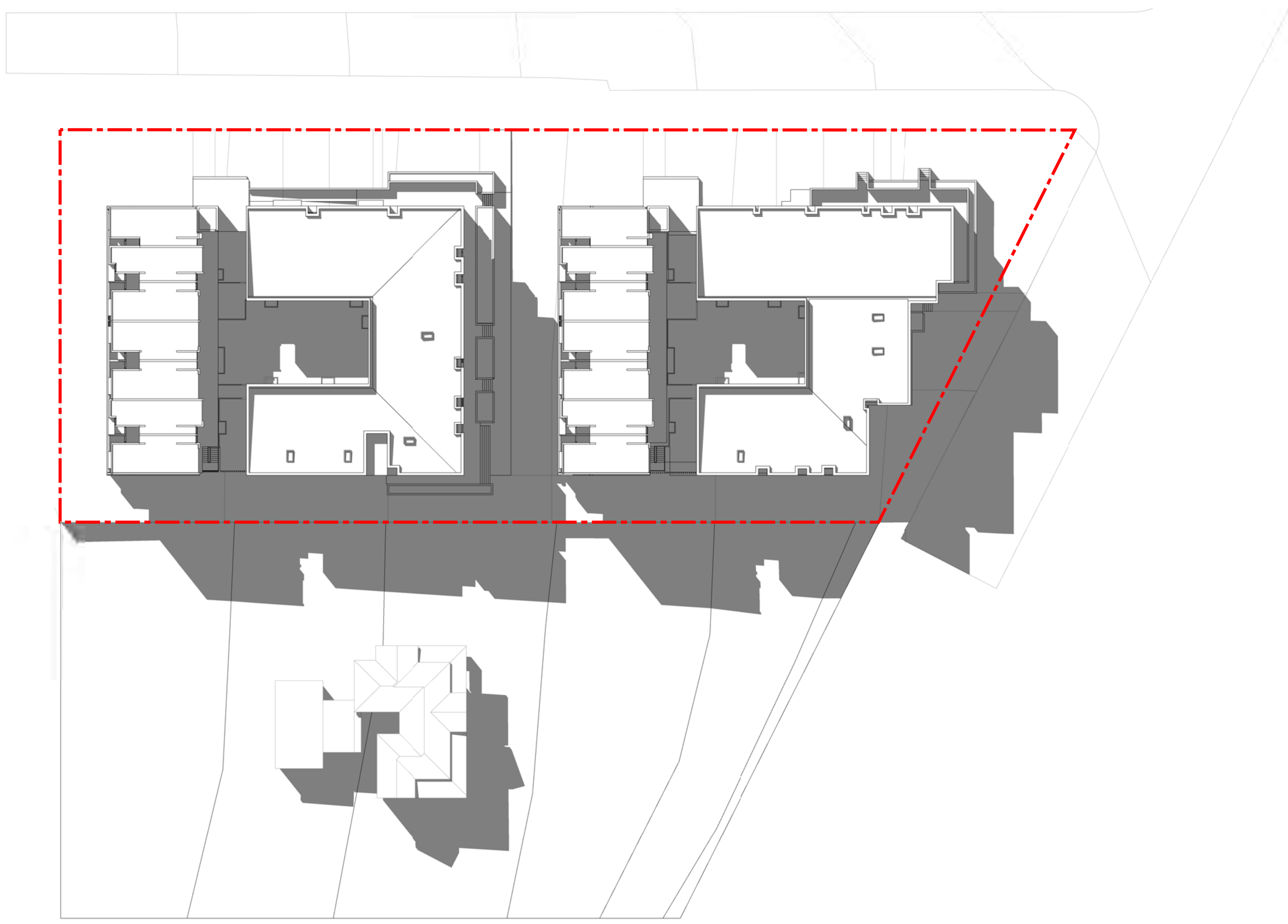
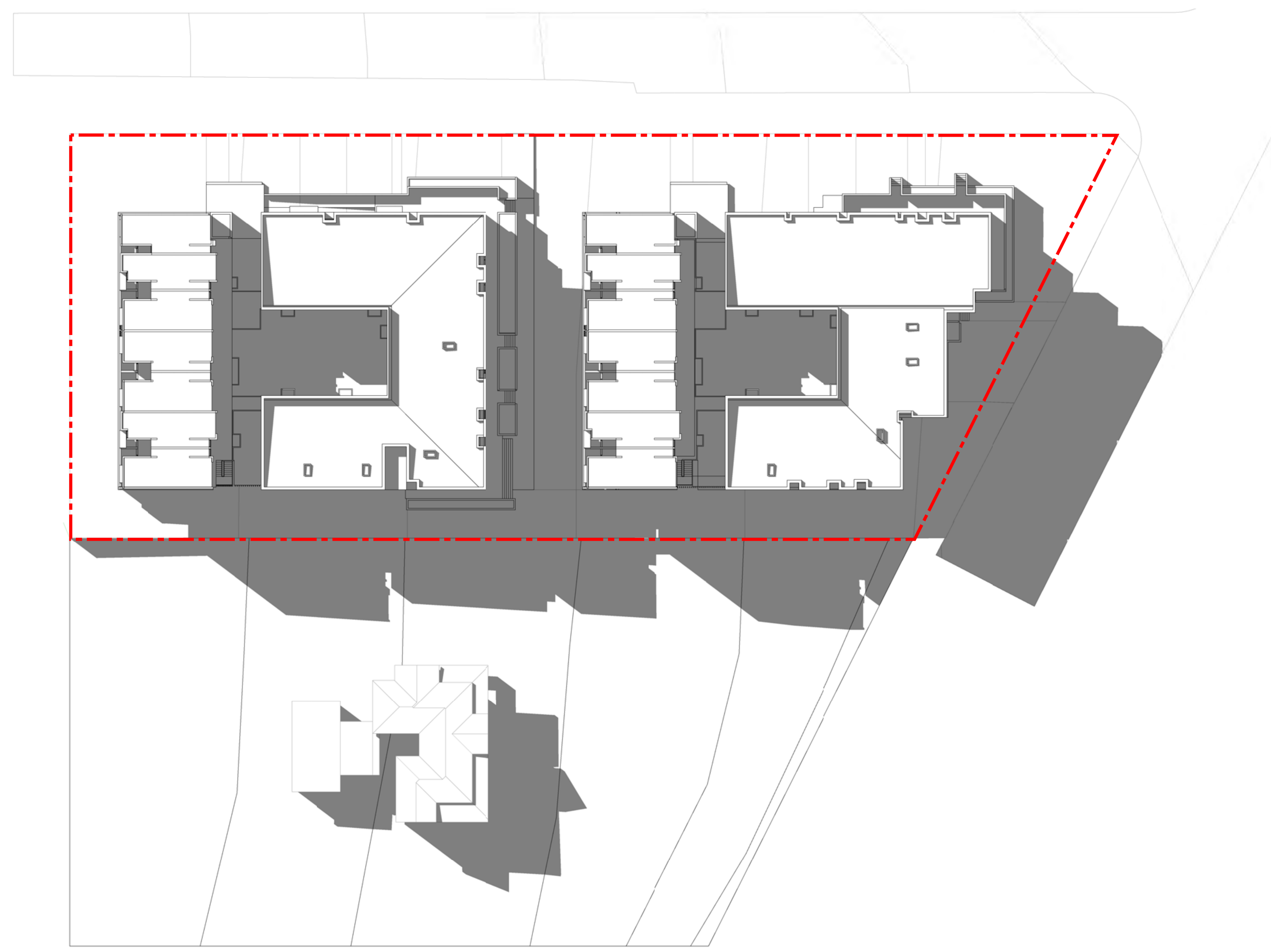
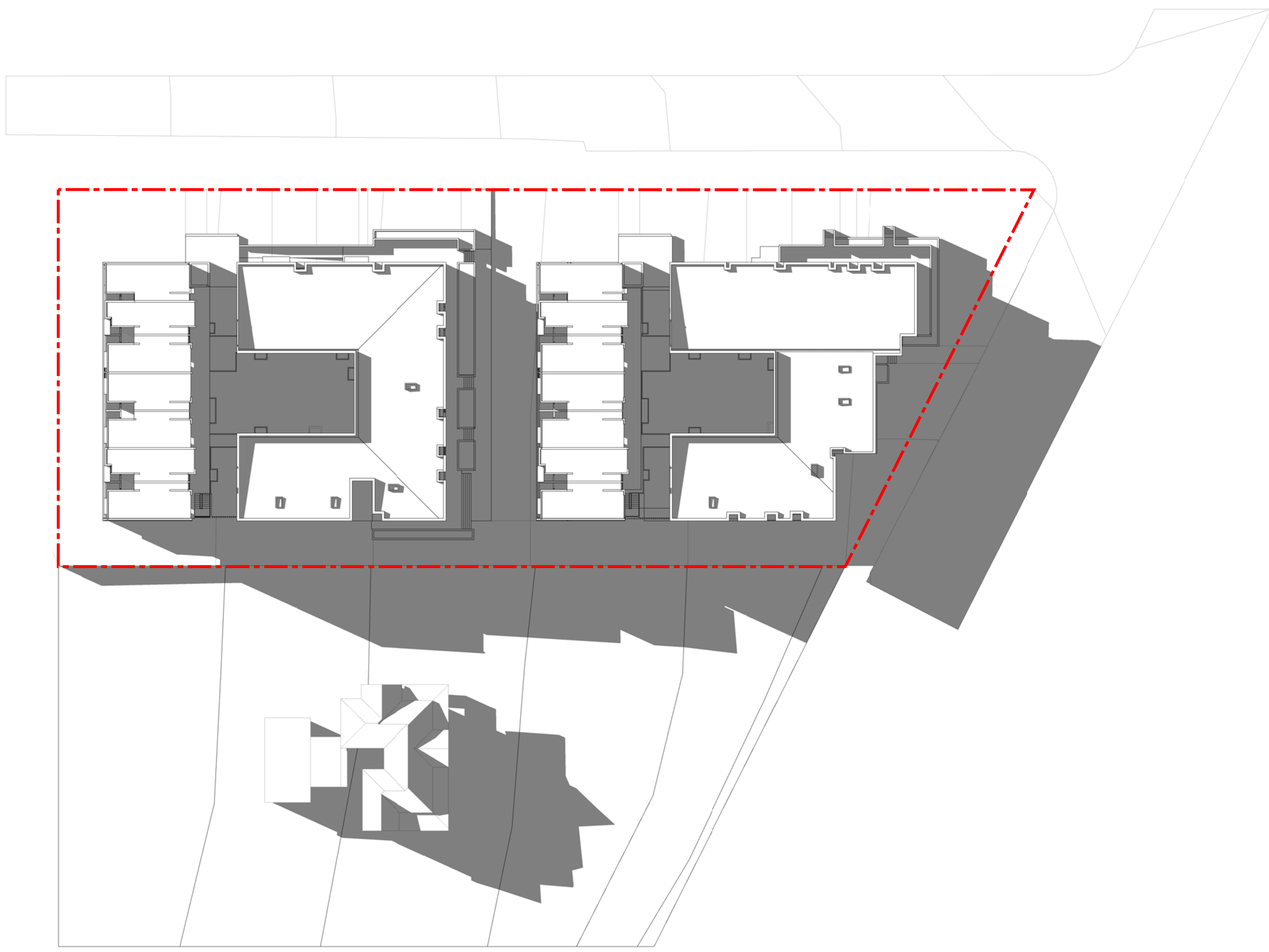


1 21 June - 1300
1 : 500



2 21 June - 1400
1 : 500



3 21 June - 1500
1 : 500

REVISION SCHEDULE

Rev.	Date	Revision Notes
A	12/04/24	DEVELOPMENT APPLICATION

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Project:
BOMADERRY BTR, 53 & 57 Bolong rd and 4 Beinda St, Bomaderry, NSW 2541

Client:
LANDCOM

Drawing Name:
SHADOW DIAGRAMS SHEET 2

Job Number:
202312

Scale:
1:250 @A1 / 1:500 @A3

Plot Date:
12/04/2024

Drawing Status:
DEVELOPMENT APPLICATION

Drawing No: **DA - 72**
Revision : **A**

St.Clair Architecture
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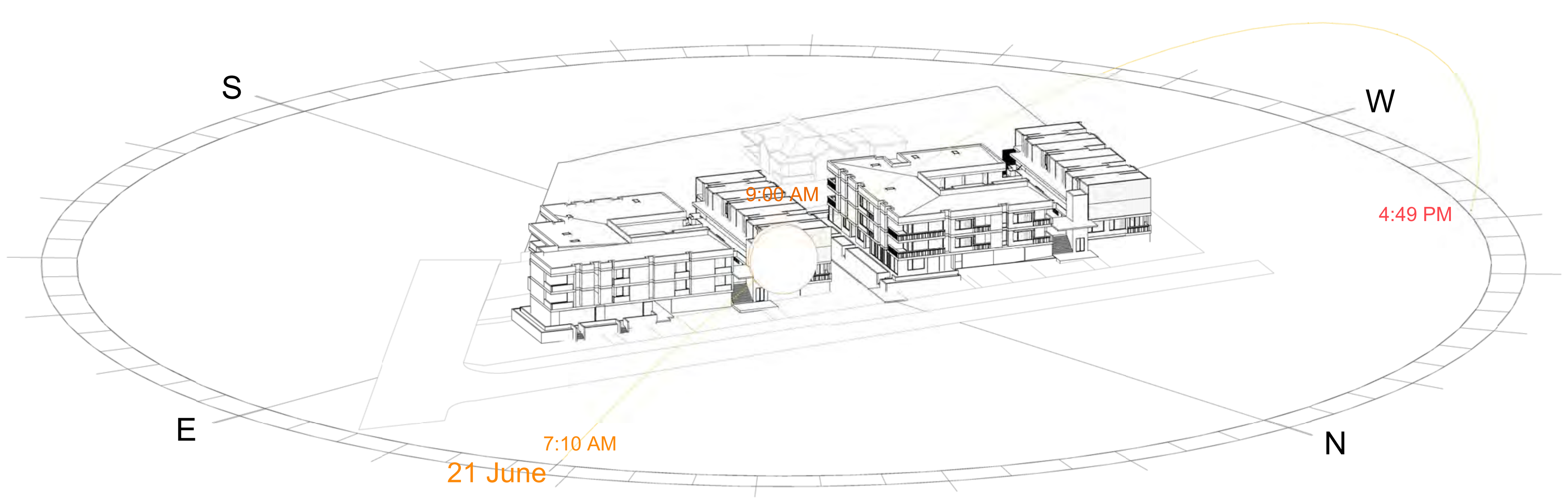
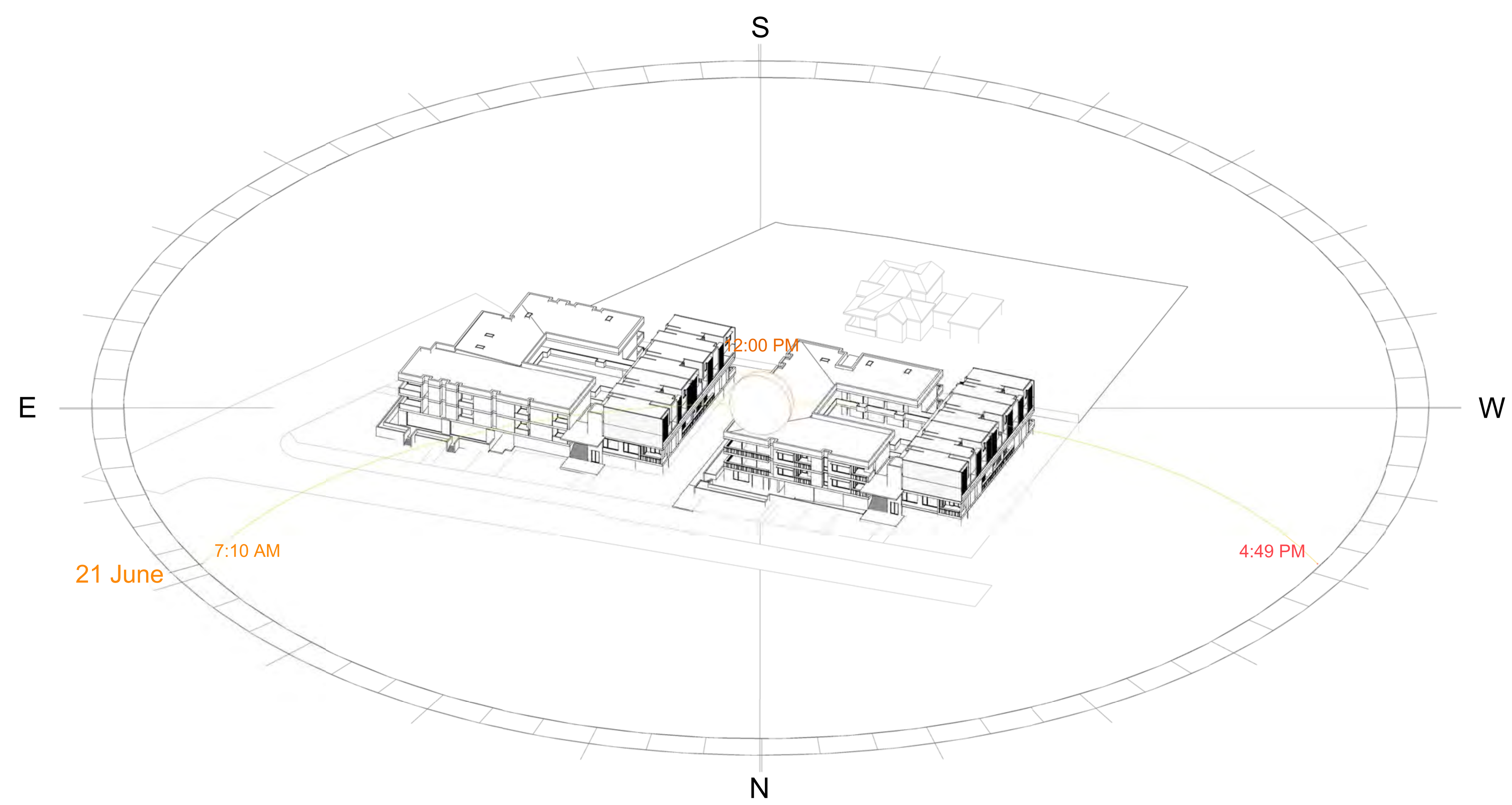
Peter St.Clair NSW ARB 7325



1 3D Shadow 0900

2 3D Shadow 1000

3 3D Shadow 1100



4 3D Shadow 1200

NOTES

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REVISION SCHEDULE

Rev.	Date	Revision Notes
A	12/04/24	DEVELOPMENT APPLICATION

Project:
BOMADERRY BTR, 53 & 57 Bolong rd and 4 Beinda St, Bomaderry, NSW 2541

Client:
LANDCOM

Drawing Name:
VIEWS FROM SUN SHEET 1

Job Number:
202312

Scale:
NTS

Plot Date:
12/04/2024

Drawing Status:
DEVELOPMENT APPLICATION

Drawing No: **DA - 73**

Revision : **A**

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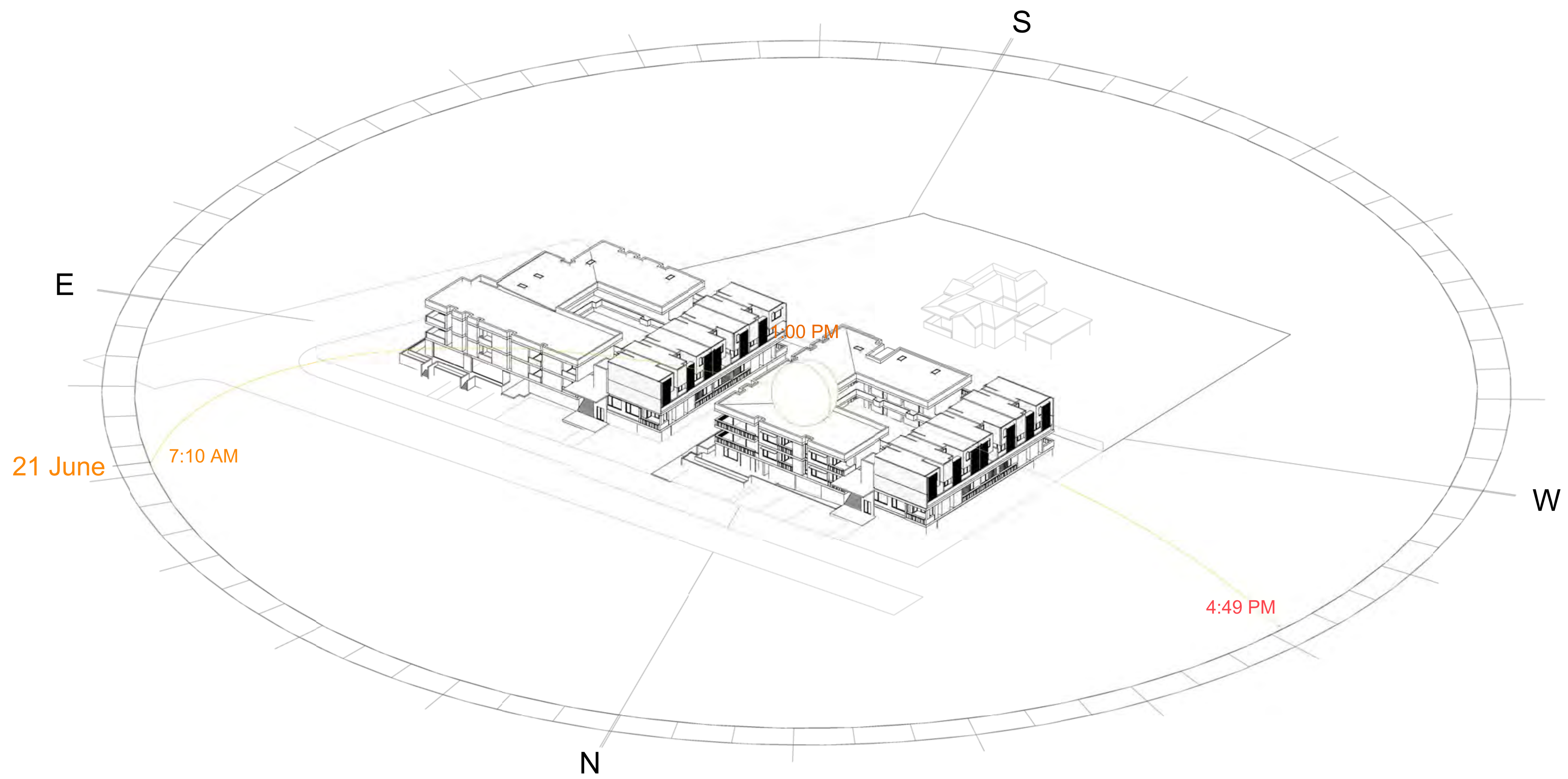
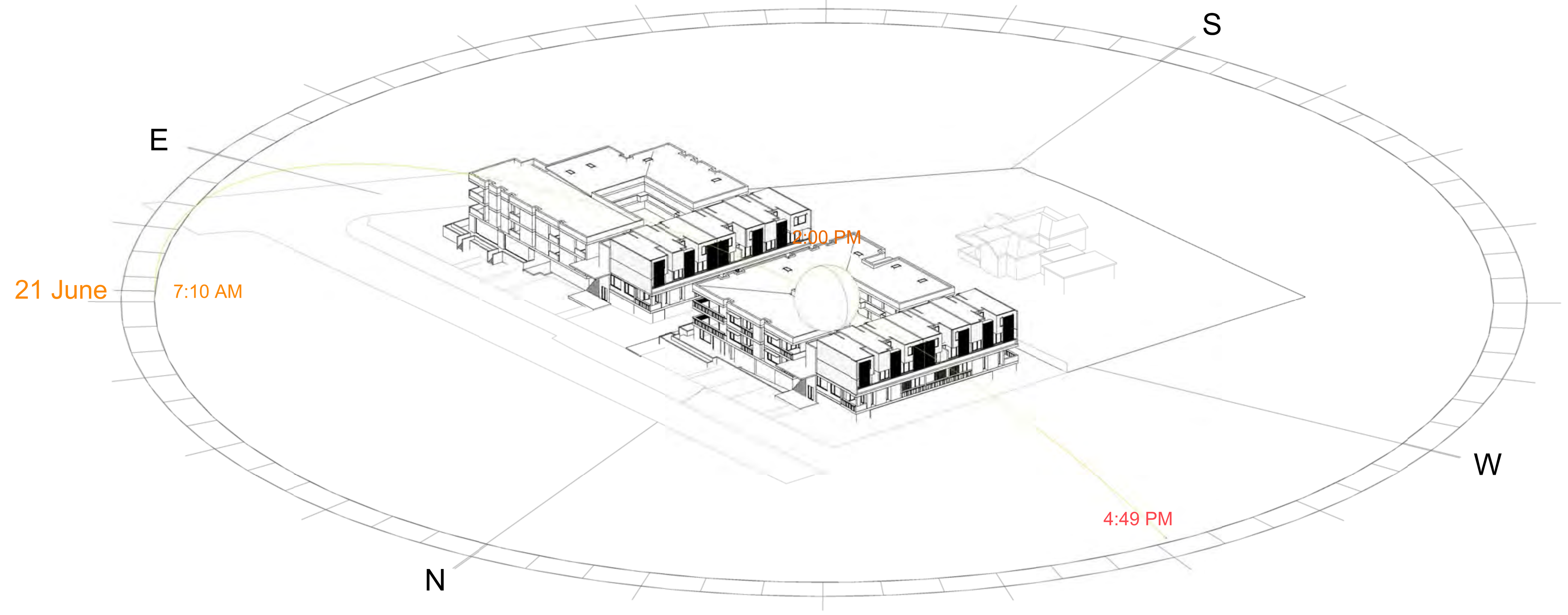
ph. 0435 069 899 peter@stclairarchitecture.com
Peter St.Clair NSW ARB 7325



1 3D Shadow 1300



2 3D Shadow 1400

3 3D Shadow 1500

NOTES

REVISION SCHEDULE

Rev.	Date	Revision Notes
A	12/04/24	DEVELOPMENT APPLICATION

Project:
BOMADERRY BTR, 53 & 57 Bolong rd and 4 Beinda St, Bomaderry, NSW 2541

Client:
LANDCOM

Drawing Name:
VIEWS FROM SUN SHEET 2

Job Number:
202312

Scale:
NTS

Plot Date:
12/04/2024

Drawing Status:
DEVELOPMENT APPLICATION

Drawing No: **DA - 74**
Revision : **A**

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Peter St.Clair NSW ARB 7325

SITE DEMOLITION PLAN
Scale TBC

NOTES

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REVISION SCHEDULE

Rev.	Date	Revision Notes
A	12/04/24	DEVELOPMENT APPLICATION

TREES PROPOSED FOR RETENTION

TREES PROPOSED FOR REMOVAL

ELECTRICAL POWER POLE

OVERHEAD ELECTRICAL POWER LINE

EXISTING STRUCTURES TO BE DEMOLISHED

NOTE:

ONLY SIGNIFICANT TREES AS IDENTIFIED BY ARBORIST HAVE BEEN NUMBERED ON THIS PLAN

PLEASE REFER TO ARBORIST REPORT FOR DETAILS OF ALL TREES TO BE REMOVED, RETAINED AND ASSOCIATED TREE PROTECTION ZONES FOR ALL RETAINED TREES.

Project:
BOMADERRY BTR, 53 & 57 Bolong rd and 4 Beinda St, Bomaderry, NSW 2541

Client:
LANDCOM

Drawing Name:
DEMOLITION PLAN

Job Number:
202312

Scale:
1:200 @A1 / 1:400 @A3

Plot Date:
12/04/2024

TN

Drawing Status:
DEVELOPMENT APPLICATION

Drawing No: **DA - 81**
Revision : **A**

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Peter St.Clair NSW ARB 7325

APPENDIX B
Photographic Log

Appendix B - Photographic Log

 Figure 1. Drilling of BH04, evidence of moisture on rod visible.	 Figure 2. Installation of BH04, gatic cover fixed I place.
 Figure 3. Typical soil profile to bedrock in the northern portion of the site, photographed at TP108.	 Figure 4. Typical soil profile in the central portion of the site, photographed at TP111.

Reference: Enter Reference

 Figure 5. ACM fragment observed in SP01.	 Figure 6. Typical soil profile in the southern portion of the site, photographed at TP115.
 Figure 7. Monitored utility pipe associated with residential building 1.	 Figure 8. Monitored utility pipe associated with residential building 2.

Reference: Enter Reference

 Figure 9. Façade of residential building 1, located in the southwestern end of the site.	 Figure 10. Façade of residential building 2, located in the southeastern corner of the site.
 Figure 5. Typical soil profile between GG3 and utility pipe associated with residential building 2.	 Figure 6. Area between GG3 and utility pipe associated with residential building 2.

Reference: Enter Reference

	
Figure 7. Distance between GG3 and utility pipe associated with residential building 2.	Figure 8. Discrete ground gas monitoring using a GA5000 at GG3.

APPENDIX C

Data Summary Tables

			ES_EPA8100	EW_EPA418	NA					TPH					CRC Care TPH Fractions							BTEX		
			Total PAH (NEPM/WHO 16)	TRH C37-C40	Total Other OC VIC EPA	% Moisture	1H,1H,2H,2H-Perfluorooctane sulfonate (6:2) (6:2 F	Perfluorobutane sulfonate (PFBS)	Perfluorononane sulfonate (PFNS)	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)	C6-C10	C10-C16	C16-C34	C34-C40	C10 - C40 (Sum of total)	F1: C6-C10 less BTEX	F2: >C10-C16 less NAPHTHALENE	Naphthalene (VOC)	Benzene	Toluene
			mg/kg	mg/kg	µg/L	%w/w	µg/L	µg/L	µg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL			0.8	100	100	1	1.6	1.6	1.6	20	20	45	45	50	20	25	90	100	100	20	25	0.1	0.1	0.1
PFAS NEMP 2020 Ecological indirect exposure																								
PFAS NEMP 2020 Residential with minimal opportunities for soil access (HIL B)																								
NEPM 2013 ESL UR/POS, Coarse Soil											120					120	300	2,800		180			50	85
NEPM 2013 HIL, Residential B																								
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand																				45 | 70 | 110 | 200	110 | 240 | 440		0.5 | 0.5 | 0.5 | 0.5	160 | 220 | 310 | 540
Field ID	**Sample Type**	**Date**																						
BH04_0.1	Normal	12 Jan 2024			<100					<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.5	<0.1	<0.1
QA111	Field_D	15 Jan 2024			<100					<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.5	<0.1	<0.1
QC111	Interlab_D	15 Jan 2024	<0.8	<100		22.6	<1.6	<1.6	<1.6	<20	<20	<45	<45	<110	<25	<25	<90	<120	<210	<25	<25	<0.1	<0.1	<0.1
SP01_ACM1	Normal	15 Jan 2024																						
TP107_0.1	Normal	15 Jan 2024								<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.5	<0.1	<0.1
TP108_0.1	Normal	15 Jan 2024			<100					<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.5	<0.1	<0.1
TP108_0.3	Normal	15 Jan 2024								<20	<20	<50	52	52	<20	<50	<100	<100	<100	<20	<50	<0.5	<0.1	<0.1
TP109_0.1	Normal	15 Jan 2024								<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.5	<0.1	<0.1
TP110_0.1	Normal	15 Jan 2024			<100					<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.5	<0.1	<0.1
TP110_0.5	Normal	15 Jan 2024								<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.5	<0.1	<0.1
TP111_0.1	Normal	15 Jan 2024			<100					<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.5	<0.1	<0.1
TP111_0.3	Normal	15 Jan 2024								<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.5	<0.1	<0.1
TP112_0.1	Normal	15 Jan 2024			<100					<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.5	<0.1	<0.1
TP112_0.5	Normal	15 Jan 2024								<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.5	<0.1	<0.1
TP113_0.1	Normal	15 Jan 2024			<100					<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.5	<0.1	<0.1
TP113_0.5	Normal	15 Jan 2024								<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.5	<0.1	<0.1
TP114_0.1	Normal	15 Jan 2024			<100					<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.5	<0.1	<0.1
TP115_0.1	Normal	15 Jan 2024			<100					<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.5	<0.1	<0.1

Statistics

Number of Results	1	1	9	1	1	1	1	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
Number of Detects	0	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.8	<100	<100	22.6	<1.6	<1.6	<1.6	<20	<20	<45	<45	<50	<20	<25	<90	<100	<100	<20	<25	<0.1	<0.1	<0.1
Minimum Detect	ND	ND	ND	22.6	ND	ND	ND	ND	ND	ND	52	52	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	<0.8	<100	<100	22.6	<1.6	<1.6	<1.6	<20	<20	<50	52	<110	<25	<50	<100	<120	<210	<25	<50	<0.5	<0.1	<0.1
Maximum Detect	ND	ND	ND	22.6	ND	ND	ND	ND	ND	ND	52	52	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration *			50					10	10	25	26	28	10	24	50	51	53	10	24	0.24	0.05	0.05
Geometric Average *	0.4	50	50	23	0.8	0.8	0.8	10	10	25	26	27	10	24	50	51	52	10	24	0.23	0.05	0.05
Median Concentration *	0.4	50	50	22.6	0.8	0.8	0.8	10	10	25	25	25	10	25	50	50	50	10	25	0.25	0.05	0.05
Standard Deviation *			0					0	0	0.61	6.6	9.5	0.61	3	1.2	2.4	13	0.61	3	0.049	0	0
Geometric Standard Deviation *			1	∞				1	1	1	1.2	1.3	1.1	1.2	1	1	1.2	1.1	1.2	1.5	1	1
95% UCL (Student's-t) *			50					10	10	25.11	29.24	32.37	10.4	25.55	50.22	51.62	58.88	10.4	25.55	0.259	0.05	0.05
% of Detects	0	0	0	100	0	0	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0
% of Non-Detects	100	100	100	0	100	100	100	100	100	100	94	94	100	100	100	100	100	100	100	100	100	100

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Ecological indirect exposure

HEPA, January 2020, PFAS NEMP 2020 Residential with minimal opportunities for soil access (HIL B)

			BTEX continued					Metals								Asbestos	Organic		PAH			
			Ethylbenzene	Xylene (m & p)	Xylene (o)	Total BTEX	Xylene Total	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	Asbestos in Soil	Sum of US EPA PFAS (PFOS + PFOA)*	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	Naphthalene	2-methylnaphthalene	1-Methylnaphthalene	Acenaphthylene
			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	Comment	UG/KG	UG/KG	mg/kg	mg/kg	mg/kg	mg/kg
EQL			0.1	0.2	0.1	0.6	0.3	1	0.3	0.5	0.5	1	0.05	0.5	2		5	5	0.1	0.1	0.1	0.1
PFAS NEMP 2020 Ecological indirect exposure																						
PFAS NEMP 2020 Residential with minimal opportunities for soil access (HIL B)																						
NEPM 2013 ESL UR/POS, Coarse Soil			70				105															
NEPM 2013 HIL, Residential B								500	150		30,000	1,200	120	1,200	60,000							
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand			55				40 | 60 | 95 | 170												3			
Field ID	**Sample Type**	**Date**																				
BH04_0.1	**Normal**	**12 Jan 2024**	<0.1	<0.2	<0.1		<0.3	<2	<0.4	<5	<5	5.9	<0.1	<5	6.8	No asbestos detected	<5	<5	<0.5			<0.5
QA111	**Field_D**	**15 Jan 2024**	<0.1	<0.2	<0.1		<0.3	8.9	<0.4	17	19	27	<0.1	14	62		<5	<5	<0.5			<0.5
QC111	**Interlab_D**	**15 Jan 2024**	<0.1	<0.2	<0.1	<0.6	<0.3	4	<0.3	7.8	8.4	15	<0.05	5.5	29				<0.1	<0.1	<0.1	<0.1
SP01_ACM1	**Normal**	**15 Jan 2024**														Chrysotile and amosite asbestos detected						
TP107_0.1	**Normal**	**15 Jan 2024**	<0.1	<0.2	<0.1		<0.3	3.7	<0.4	5.5	11	16	<0.1	<5	39	No asbestos detected			<0.5			<0.5
TP108_0.1	**Normal**	**15 Jan 2024**	<0.1	<0.2	<0.1		<0.3	9.1	<0.4	23	17	19	<0.1	6.0	130	No asbestos detected	<5	<5	<0.5			<0.5
TP108_0.3	**Normal**	**15 Jan 2024**	<0.1	<0.2	<0.1		<0.3	8.5	<0.4	21	23	58	<0.1	31	1,300				<0.5			<0.5
TP109_0.1	**Normal**	**15 Jan 2024**	<0.1	<0.2	<0.1		<0.3	10	<0.4	31	20	22	<0.1	8.3	160	No asbestos detected			<0.5			<0.5
TP110_0.1	**Normal**	**15 Jan 2024**	<0.1	<0.2	<0.1		<0.3	3.7	<0.4	11	28	11	<0.1	<5	35	No asbestos detected	<5	<5	<0.5			<0.5
TP110_0.5	**Normal**	**15 Jan 2024**	<0.1	<0.2	<0.1		<0.3	2.7	<0.4	7.3	12	9.6	<0.1	<5	26				<0.5			<0.5
TP111_0.1	**Normal**	**15 Jan 2024**	<0.1	<0.2	<0.1		<0.3	3.2	<0.4	10	11	37	<0.1	<5	64	No asbestos detected			<0.5			<0.5
TP111_0.3	**Normal**	**15 Jan 2024**	<0.1	<0.2	<0.1		<0.3	5.4	<0.4	15	<5	5.8	<0.1	<5	<5				<0.5			<0.5
TP112_0.1	**Normal**	**15 Jan 2024**	<0.1	<0.2	<0.1		<0.3	10	<0.4	17	14	30	<0.1	16	100	No asbestos detected	<5	<5	<0.5			<0.5
TP112_0.5	**Normal**	**15 Jan 2024**	<0.1	<0.2	<0.1		<0.3	2.2	<0.4	<5	<5	7.0	<0.1	<5	8.8	No asbestos detected			<0.5			<0.5
TP113_0.1	**Normal**	**15 Jan 2024**	<0.1	<0.2	<0.1		<0.3	10	<0.4	15	14	29	<0.1	14	120	No asbestos detected			<0.5			<0.5
TP113_0.5	**Normal**	**15 Jan 2024**	<0.1	<0.2	<0.1		<0.3	8.9	<0.4	14	<5	16	<0.1	<5	27				<0.5			<0.5
TP114_0.1	**Normal**	**15 Jan 2024**	<0.1	<0.2	<0.1		<0.3	3.5	<0.4	10	19	30	<0.1	13	56	No asbestos detected	<5	<5	<0.5			<0.5
TP115_0.1	**Normal**	**15 Jan 2024**	<0.1	<0.2	<0.1		<0.3	11	<0.4	19	15	24	<0.1	16	66	No asbestos detected			<0.5			<0.5
Statistics																						
Number of Results			**17**	**17**	**17**	**1**	**17**	**17**	**17**	**17**	**17**	**17**	**17**	**17**	**17**	**12**	**6**	**6**	**17**	**1**	**1**	**17**
Number of Detects			**0**	**0**	**0**	**0**	**0**	**16**	**0**	**15**	**13**	**17**	**0**	**9**	**16**	**12**	**0**	**0**	**0**	**0**	**0**	**0**
Minimum Concentration			**<0.1**	**<0.2**	**<0.1**	**<0.6**	**<0.3**	**<2**	**<0.3**	**<5**	**<5**	**5.8**	**<0.05**	**<5**	**<5**	**0**	**<5**	**<5**	**<0.1**	**<0.1**	**<0.1**	**<0.1**
Minimum Detect			**ND**	**ND**	**ND**	**ND**	**ND**	**2.2**	**ND**	**5.5**	**8.4**	**5.8**	**ND**	**5.5**	**6.8**	**0**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Maximum Concentration			**<0.1**	**<0.2**	**<0.1**	**<0.6**	**<0.3**	**11**	**<0.4**	**31**	**28**	**58**	**<0.1**	**31**	**1,300**	**0**	**<5**	**<5**	**<0.5**	**<0.1**	**<0.1**	**<0.5**
Maximum Detect			**ND**	**ND**	**ND**	**ND**	**ND**	**11**	**ND**	**31**	**28**	**58**	**ND**	**31**	**1,300**	**0**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Average Concentration *			**0.05**	**0.1**	**0.05**		**0.15**	**6.2**	**0.2**	**13**	**13**	**21**	**0.049**	**8.5**	**131**	**0**	**2.5**	**2.5**	**0.24**			**0.24**
Geometric Average *			**0.05**	**0.1**	**0.05**	**0.3**	**0.15**	**5.2**	**0.2**	**11**	**10**	**18**	**0.048**	**5.8**	**46**	**0**	**2.5**	**2.5**	**0.23**	**0.05**	**0.05**	**0.23**
Median Concentration *			**0.05**	**0.1**	**0.05**	**0.3**	**0.15**	**5.4**	**0.2**	**14**	**14**	**19**	**0.05**	**5.5**	**56**	**0**	**2.5**	**2.5**	**0.25**	**0.05**	**0.05**	**0.25**
Standard Deviation *			**0**	**0**	**0**		**0**	**3.4**	**0.012**	**7.6**	**7.7**	**13**	**0.0061**	**7.9**	**305**	**0**	**0**	**0**	**0.049**			**0.049**
Geometric Standard Deviation *			**1**	**1**	**1**		**1**	**2**	**1.1**	**2**	**2.3**	**1.9**	**1.2**	**2.5**	**4.1**		**1**	**1**	**1.5**			**1.5**
95% UCL (Student's-t) *			**0.05**	**0.1**	**0.05**		**0.15**	**7.66**	**0.202**	**16.66**	**16.27**	**26.98**	**0.0511**	**11.81**	**260.3**	**0**	**2.5**	**2.5**	**0.259**			**0.259**
% of Detects			**0**	**0**	**0**	**0**	**0**	**94**	**0**	**88**	**76**	**100**	**0**	**53**	**94**	**100**	**0**	**0**	**0**	**0**	**0**	**0**
% of Non-Detects			**100**	**100**	**100**	**100**	**100**	**6**	**100**	**12**	**24**	**0**	**100**	**47**	**6**	**0**	**100**	**100**	**100**	**100**	**100**	**100**

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Ecological indirect exposure

HEPA, January 2020, PFAS NEMP 2020 Residential with minimal opportunities for soil

			PAH continued																		Organochlorine Pesticides					
			Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(k)fluoranthene	Benzo(b+j)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-c,d)pyrene	Dibenzo(a,h)anthracene	Benzo(g,h,i)perylene	Benzo(a)pyrene TEQ (Zero LOR)	Benzo(a)pyrene TEQ (Half LOR)_1	Benzo(a)pyrene TEQ (Full LOR)	PAHs (Sum of total)	Organochlorine pesticides IWRG621	2,4-DDT	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin
			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
EQL			0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.5	0.5	0.5	0.1	0.1	0.05	0.05	0.05	0.05
PFAS NEMP 2020 Ecological indirect exposure																										
PFAS NEMP 2020 Residential with minimal opportunities for soil access (HIL B)																										
NEPM 2013 ESL UR/POS, Coarse Soil											0.7															
NEPM 2013 HIL, Residential B															4	4	4	400						10
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand																										
Field ID	**Sample Type**	**Date**																								
BH04_0.1	Normal	12 Jan 2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.1		<0.05	<0.05	<0.05	<0.05
QA111	Field_D	15 Jan 2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.1		<0.05	<0.05	<0.05	<0.05
QC111	Interlab_D	15 Jan 2024	<0.1	<0.1	<0.1	<0.1	0.1	0.1	<0.1	<0.1	<0.1	0.1	0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.3	<0.8	<1	<0.1	<0.1	<0.1	<0.1	
SP01_ACM1	Normal	15 Jan 2024																								
TP107_0.1	Normal	15 Jan 2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5						
TP108_0.1	Normal	15 Jan 2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.1		<0.05	<0.05	<0.05	<0.05
TP108_0.3	Normal	15 Jan 2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5						
TP109_0.1	Normal	15 Jan 2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5						
TP110_0.1	Normal	15 Jan 2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.1		<0.05	<0.05	<0.05	<0.05
TP110_0.5	Normal	15 Jan 2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5						
TP111_0.1	Normal	15 Jan 2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.1		<0.05	<0.05	<0.05	<0.05
TP111_0.3	Normal	15 Jan 2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5						
TP112_0.1	Normal	15 Jan 2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.1		<0.05	<0.05	<0.05	<0.05
TP112_0.5	Normal	15 Jan 2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5						
TP113_0.1	Normal	15 Jan 2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.1		<0.05	<0.05	<0.05	<0.05
TP113_0.5	Normal	15 Jan 2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5						
TP114_0.1	Normal	15 Jan 2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.1		<0.05	<0.05	<0.05	<0.05
TP115_0.1	Normal	15 Jan 2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.1		<0.05	<0.05	<0.05	<0.05
Statistics																										
Number of Results			17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	10	1	10	10	10	9
Number of Detects			0	0	0	0	1	1	0	0	0	1	1	0	0	0	0	16	16	0	0	0	0	0	0	0
Minimum Concentration			<0.1	<0.1	<0.1	<0.1	0.1	0.1	<0.1	<0.1	<0.1	0.1	0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.3	<0.5	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05
Minimum Detect			ND	ND	ND	ND	0.1	0.1	ND	ND	ND	0.1	0.1	ND	ND	ND	ND	0.6	1.2	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.8	<1	<0.1	<0.1	<0.1	<0.1	<0.05
Maximum Detect			ND	ND	ND	ND	0.1	0.1	ND	ND	ND	0.1	0.1	ND	ND	ND	ND	0.6	1.2	ND	ND	ND	ND	ND	ND	ND
Average Concentration *			0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.57	1.1	0.26	0.095		0.027	0.027	0.027	0.025
Geometric Average *			0.23	0.23	0.23	0.23	0.24	0.24	0.23	0.23	0.23	0.24	0.24	0.23	0.23	0.23	0.24	0.54	1.1	0.26	0.063	0.05	0.027	0.027	0.027	0.025
Median Concentration *			0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.6	1.2	0.25	0.05	0.05	0.025	0.025	0.025	0.025
Standard Deviation *			0.049	0.049	0.049	0.049	0.036	0.036	0.049	0.049	0.049	0.036	0.036	0.049	0.049	0.049	0.036	0.12	0.25	0.036	0.14		0.0079	0.0079	0.0079	0
Geometric Standard Deviation *			1.5	1.5	1.5	1.5	1.2	1.2	1.5	1.5	1.5	1.2	1.2	1.5	1.5	1.5	1.2	1.5	1.7	1.1	2.1		1.2	1.2	1.2	1
95% UCL (Student's-t) *			0.259	0.259	0.259	0.259	0.257	0.257	0.259	0.259	0.259	0.257	0.257	0.259	0.259	0.259	0.257	0.622	1.246	0.274	0.177		0.0321	0.0321	0.0321	0.025
% of Detects			0	0	0	0	6	6	0	0	0	6	6	0	0	0	0	94	94	0	0	0	0	0	0	0
% of Non-Detects			100	100	100	100	94	94	100	100	100	94	94	100	100	100	100	6	6	100	100	100	100	100	100	100

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Ecological indirect exposure

HEPA, January 2020, PFAS NEMP 2020 Residential with minimal opportunities for soil

			Organochlorine Pesticides continued																							
			b-BHC	Chlordane	Chlordane (cis)	gamma-Chlordane	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	o,p-DDD	o,p'-DDE	Toxaphene	trans-Nonachlor
			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
EQL			0.05	0.1	0.1	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1	0.1	0.5	0.1
PFAS NEMP 2020 Ecological indirect exposure																										
PFAS NEMP 2020 Residential with minimal opportunities for soil access (HIL B)																										
NEPM 2013 ESL UR/POS, Coarse Soil																										
NEPM 2013 HIL, Residential B				90						600					20				10		15	500			30	
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand																										
Field ID	Sample Type	Date																								
BH04_0.1	Normal	12 Jan 2024	<0.05	<0.1			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05			<0.5	
QA111	Field_D	15 Jan 2024	<0.05	<0.1			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05			<0.5	
QC111	Interlab_D	15 Jan 2024	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1		<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1
SP01_ACM1	Normal	15 Jan 2024																								
TP107_0.1	Normal	15 Jan 2024																								
TP108_0.1	Normal	15 Jan 2024	<0.05	<0.1			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05			<0.5	
TP108_0.3	Normal	15 Jan 2024																								
TP109_0.1	Normal	15 Jan 2024																								
TP110_0.1	Normal	15 Jan 2024	<0.05	<0.1			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05			<0.5	
TP110_0.5	Normal	15 Jan 2024																								
TP111_0.1	Normal	15 Jan 2024	<0.05	<0.1			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05			<0.5	
TP111_0.3	Normal	15 Jan 2024																								
TP112_0.1	Normal	15 Jan 2024	<0.05	<0.1			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05			<0.5	
TP112_0.5	Normal	15 Jan 2024																								
TP113_0.1	Normal	15 Jan 2024	<0.05	<0.1			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05			<0.5	
TP113_0.5	Normal	15 Jan 2024																								
TP114_0.1	Normal	15 Jan 2024	<0.05	<0.1			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05			<0.5	
TP115_0.1	Normal	15 Jan 2024	<0.05	<0.1			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05			<0.5	
Statistics																										
Number of Results			10	9	1	1	10	10	10	9	10	10	10	10	10	10	10	10	10	10	10	10	1	1	9	1
Number of Detects			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration			<0.05	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.1	<0.5	<0.1
Minimum Detect			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1
Maximum Detect			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration *			0.027	0.05			0.027	0.027	0.027	0.025	0.032	0.032	0.032	0.027	0.032	0.027	0.027	0.027	0.027	0.027	0.027	0.027			0.25	
Geometric Average *			0.027	0.05	0.05	0.05	0.027	0.027	0.027	0.025	0.029	0.029	0.029	0.027	0.029	0.027	0.027	0.027	0.027	0.027	0.027	0.027	0.05	0.05	0.25	0.05
Median Concentration *			0.025	0.05	0.05	0.05	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.05	0.05	0.25	0.05
Standard Deviation *			0.0079	0			0.0079	0.0079	0.0079	0	0.024	0.024	0.024	0.0079	0.024	0.0079	0.0079	0.0079	0.0079	0.0079	0.0079	0.0079			0	
Geometric Standard Deviation *			1.2	1			1.2	1.2	1.2	1	1.6	1.6	1.6	1.2	1.6	1.2	1.2	1.2	1.2	1.2	1.2	1.2			1	
95% UCL (Student's-t) *			0.0321	0.05			0.0321	0.0321	0.0321	0.025	0.0462	0.0462	0.0462	0.0321	0.0462	0.0321	0.0321	0.0321	0.0321	0.0321	0.0321	0.0321			0.25	
% of Detects			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% of Non-Detects			100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Ecological indirect exposure

HEPA, January 2020, PFAS NEMP 2020 Residential with minimal opportunities for soil

			Organophosphorous Pesticides																			
			Azinophos methyl	Bolstar (Sulprofos)	Bromophos-ethyl	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Coumaphos	Demeton-O	Demeton-S	Diazinon	Dichlorvos	Dimethoate	Disulfoton	Ethion	Ethoprop	Fenitrothion	Fensulfothion	Fenthion	Malathion	Merphos
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL			0.2	0.2	0.2	0.2	0.2	0.2	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
PFAS NEMP 2020 Ecological indirect exposure																						
PFAS NEMP 2020 Residential with minimal opportunities for soil access (HIL B)																						
NEPM 2013 ESL UR/POS, Coarse Soil																						
NEPM 2013 HIL, Residential B							340															
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand																						
Field ID	**Sample Type**	**Date**																				
BH04_0.1	Normal	12 Jan 2024	<0.2	<0.2		<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
QA111	Field_D	15 Jan 2024	<0.2	<0.2		<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
QC111	Interlab_D	15 Jan 2024	<0.2		<0.2		<0.2					<0.5	<0.5	<0.5		<0.2		<0.2			<0.2	
SP01_ACM1	Normal	15 Jan 2024																				
TP107_0.1	Normal	15 Jan 2024																				
TP108_0.1	Normal	15 Jan 2024	<0.2	<0.2		<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
TP108_0.3	Normal	15 Jan 2024																				
TP109_0.1	Normal	15 Jan 2024																				
TP110_0.1	Normal	15 Jan 2024	<0.2	<0.2		<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
TP110_0.5	Normal	15 Jan 2024																				
TP111_0.1	Normal	15 Jan 2024	<0.2	<0.2		<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
TP111_0.3	Normal	15 Jan 2024																				
TP112_0.1	Normal	15 Jan 2024	<0.2	<0.2		<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
TP112_0.5	Normal	15 Jan 2024																				
TP113_0.1	Normal	15 Jan 2024	<0.2	<0.2		<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
TP113_0.5	Normal	15 Jan 2024																				
TP114_0.1	Normal	15 Jan 2024	<0.2	<0.2		<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
TP115_0.1	Normal	15 Jan 2024	<0.2	<0.2		<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Statistics																						
Number of Results			10	9	1	9	10	9	9	9	9	10	10	10	9	10	9	10	9	9	10	9
Number of Detects			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Minimum Detect			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Maximum Detect			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration *			0.1	0.1		0.1	0.1	0.1	1	0.1	0.1	0.12	0.12	0.12	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Geometric Average *			0.1	0.1	0.1	0.1	0.1	0.1	1	0.1	0.1	0.11	0.11	0.11	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Median Concentration *			0.1	0.1	0.1	0.1	0.1	0.1	1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Standard Deviation *			0	0		0	0	0	0	0	0	0.047	0.047	0.047	0	0	0	0	0	0	0	0
Geometric Standard Deviation *			1	1		1	1	1	1	1	1	1.3	1.3	1.3	1	1	1	1	1	1	1	1
95% UCL (Student's-t) *			0.1	0.1		0.1	0.1	0.1	1	0.1	0.1	0.142	0.142	0.142	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
% of Detects			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% of Non-Detects			100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Ecological indirect exposure

HEPA, January 2020, PFAS NEMP 2020 Residential with minimal opportunities for soil

			Organophosphorous Pesticides continued												Insecticides	Pesticides				Polychlorinated Biphenyls		
			Methidathion	Methyl parathion	Mevinphos (Phosdrin)	Monocrotophos	Naled (Dibrom)	Omethoate	Phorate	Pyrazophos	Ronnel	Terbufos	Trichloronate	Tetrachlorvinphos	Tokuthion	Isodrin	Mirex	Parathion	Pirimiphos-methyl	Arochlor 1016	Arochlor 1221	Arochlor 1232
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL			0.5	0.2	0.2	2	0.2	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.1
PFAS NEMP 2020 Ecological indirect exposure																						
PFAS NEMP 2020 Residential with minimal opportunities for soil access (HIL B)																						
NEPM 2013 ESL UR/POS, Coarse Soil																						
NEPM 2013 HIL, Residential B																	20					
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand																						
Field ID	**Sample Type**	**Date**																				
BH04_0.1	Normal	12 Jan 2024		<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2			<0.2	<0.2	<0.1	<0.1	<0.1
QA111	Field_D	15 Jan 2024		<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2			<0.2	<0.2	<0.1	<0.1	<0.1
QC111	Interlab_D	15 Jan 2024	<0.5													<0.1	<0.1	<0.2		<0.2	<0.2	<0.2
SP01_ACM1	Normal	15 Jan 2024																				
TP107_0.1	Normal	15 Jan 2024																				
TP108_0.1	Normal	15 Jan 2024		<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2			<0.2	<0.2	<0.1	<0.1	<0.1
TP108_0.3	Normal	15 Jan 2024																				
TP109_0.1	Normal	15 Jan 2024																				
TP110_0.1	Normal	15 Jan 2024		<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2			<0.2	<0.2	<0.1	<0.1	<0.1
TP110_0.5	Normal	15 Jan 2024																				
TP111_0.1	Normal	15 Jan 2024		<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2			<0.2	<0.2	<0.1	<0.1	<0.1
TP111_0.3	Normal	15 Jan 2024																				
TP112_0.1	Normal	15 Jan 2024		<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2			<0.2	<0.2	<0.1	<0.1	<0.1
TP112_0.5	Normal	15 Jan 2024																				
TP113_0.1	Normal	15 Jan 2024		<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2			<0.2	<0.2	<0.1	<0.1	<0.1
TP113_0.5	Normal	15 Jan 2024																				
TP114_0.1	Normal	15 Jan 2024		<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2			<0.2	<0.2	<0.1	<0.1	<0.1
TP115_0.1	Normal	15 Jan 2024		<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2			<0.2	<0.2	<0.1	<0.1	<0.1

Statistics

	Methidathion	Methyl parathion	Mevinphos (Phosdrin)	Monocrotophos	Naled (Dibrom)	Omethoate	Phorate	Pyrazophos	Ronnel	Terbufos	Trichloronate	Tetrachlorvinphos	Tokuthion	Isodrin	Mirex	Parathion	Pirimiphos-methyl	Arochlor 1016	Arochlor 1221	Arochlor 1232
Number of Results	1	9	9	9	9	9	9	9	9	9	9	9	9	1	1	10	9	10	10	10
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.5	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.2	<0.2	<0.1	<0.1	<0.1
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	<0.5	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration *		0.1	0.1	1	0.1	1	0.1	0.1	0.1	0.1	0.1	0.1	0.1			0.1	0.1	0.055	0.055	0.055
Geometric Average *	0.25	0.1	0.1	1	0.1	1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.05	0.05	0.1	0.1	0.054	0.054	0.054
Median Concentration *	0.25	0.1	0.1	1	0.1	1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.05	0.05	0.1	0.1	0.05	0.05	0.05
Standard Deviation *		0	0	0	0	0	0	0	0	0	0	0	0			0	0	0.016	0.016	0.016
Geometric Standard Deviation *		1	1	1	1	1	1	1	1	1	1	1	1			1	1	1.2	1.2	1.2
95% UCL (Student's-t) *		0.1	0.1	1	0.1	1	0.1	0.1	0.1	0.1	0.1	0.1	0.1			0.1	0.1	0.0642	0.0642	0.0642
% of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% of Non-Detects	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Ecological indirect exposure

HEPA, January 2020, PFAS NEMP 2020 Residential with minimal opportunities for soil

			Polychlorinated Biphenyls continued							SVOCs	Perfluorocarbons												
			Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Arochlor 1268	Aroclor 1262	PCBs (Sum of total)	EPN	8:2 Fluorotelomer sulfonate	Perfluoroheptanoic acid (PFHpA)	Perfluorohexanoic acid (PFHxA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	Perfluorobutanoic acid (PFBA)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluorooctane sulfonic acid (PFOS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluoropentanoic acid (PFPeA)	Sum of PFHxS and PFOS	6:2 Fluorotelomer Sulfonate (6:2 FtS)	Perfluorooctanoate (PFOA)
			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
EQL			0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.01	0.0008
PFAS NEMP 2020 Ecological indirect exposure																		0.01					
PFAS NEMP 2020 Residential with minimal opportunities for soil access (HIL B)																					2		20
NEPM 2013 ESL UR/POS, Coarse Soil																							
NEPM 2013 HIL, Residential B									1														
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand																							
Field ID	**Sample Type**	**Date**																					
BH04_0.1	Normal	12 Jan 2024	<0.1	<0.1	<0.1	<0.1			<0.1	<0.2							<0.005	<0.005			<0.005	<0.01	<0.005
QA111	Field_D	15 Jan 2024	<0.1	<0.1	<0.1	<0.1			<0.1	<0.2							<0.005	<0.005			<0.005	<0.01	<0.005
QC111	Interlab_D	15 Jan 2024	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1		<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016		<0.0008
SP01_ACM1	Normal	15 Jan 2024																					
TP107_0.1	Normal	15 Jan 2024																					
TP108_0.1	Normal	15 Jan 2024	<0.1	<0.1	<0.1	<0.1			<0.1	<0.2							<0.005	<0.005			<0.005	<0.01	<0.005
TP108_0.3	Normal	15 Jan 2024																					
TP109_0.1	Normal	15 Jan 2024																					
TP110_0.1	Normal	15 Jan 2024	<0.1	<0.1	<0.1	<0.1			<0.1	<0.2							<0.005	<0.005			<0.005	<0.01	<0.005
TP110_0.5	Normal	15 Jan 2024																					
TP111_0.1	Normal	15 Jan 2024	<0.1	<0.1	<0.1	<0.1			<0.1	<0.2													
TP111_0.3	Normal	15 Jan 2024																					
TP112_0.1	Normal	15 Jan 2024	<0.1	<0.1	<0.1	<0.1			<0.1	<0.2							<0.005	<0.005			<0.005	<0.01	<0.005
TP112_0.5	Normal	15 Jan 2024																					
TP113_0.1	Normal	15 Jan 2024	<0.1	<0.1	<0.1	<0.1			<0.1	<0.2													
TP113_0.5	Normal	15 Jan 2024																					
TP114_0.1	Normal	15 Jan 2024	<0.1	<0.1	<0.1	<0.1			<0.1	<0.2							<0.005	<0.005			<0.005	<0.01	<0.005
TP115_0.1	Normal	15 Jan 2024	<0.1	<0.1	<0.1	<0.1			<0.1	<0.2													
Statistics																							
Number of Results			10	10	10	10	1	1	10	9	1	1	1	1	1	1	7	7	1	1	7	6	7
Number of Detects			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration			<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.1	<0.2	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.01	<0.0008
Minimum Detect			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	<0.2	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.005	<0.005	<0.0016	<0.0016	<0.005	<0.01	<0.005
Maximum Detect			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration *			0.055	0.055	0.055	0.055			0.095	0.1							0.0023	0.0023			0.0023	0.005	0.0022
Geometric Average *			0.054	0.054	0.054	0.054	0.1	0.1	0.063	0.1	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0021	0.0021	0.0008	0.0008	0.0021	0.005	0.0019
Median Concentration *			0.05	0.05	0.05	0.05	0.1	0.1	0.05	0.1	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0025	0.0025	0.0008	0.0008	0.0025	0.005	0.0025
Standard Deviation *			0.016	0.016	0.016	0.016			0.14	0							0.00064	0.00064			0.00064	0	0.00079
Geometric Standard Deviation *			1.2	1.2	1.2	1.2			2.1	1							1.5	1.5			1.5	1	2
95% UCL (Student's-t) *			0.0642	0.0642	0.0642	0.0642			0.177	0.1							0.00273	0.00273			0.00273	0.005	0.00278
% of Detects			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% of Non-Detects			100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Ecological indirect exposure

HEPA, January 2020, PFAS NEMP 2020 Residential with minimal opportunities for soil

	EW_EPA418	EW_LEED_MA_1523	NA									Solvents					TPH				
	TRH C37-C40	Perfluoro-n-hexadecanoic acid	Perfluorododecane sulfonate (PFDoS)	Sum of WA DWER PFAS (n=10)*	Total MAH*	Total Other Chlorinated Hydrocarbons VIC EPA	Total Other OC VIC EPA	Total PAH VIC EPA Guidelines (16)	1H,1H,2H,2H-Perfluorooctane sulfonate (6:2) (6:2 F	Perfluorobutane sulfonate (PFBS)	Perfluorononane sulfonate (PFNS)	Methyl Ethyl Ketone	4-Methyl-2-pentanone	Acetone	Allyl chloride	Carbon disulfide	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)
	µg/L	µg/L	µg/L	UG/L	MG/KG	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
EQL	100	0.002	0.0005	0.005	0.003	5	0.01	0.1	0.0005	0.001	0.0005	5	5	5	1	1	10	50	100	50	100
ANZG (2018) Freshwater 95% toxicant DGVs																					
ANZG (2018) Freshwater 99% toxicant DGVs																					
PFAS NEMP 2018 Table 1 Health Recreational Water																					
PFAS NEMP 2018 Table 5 Freshwater 95%																					
PFAS NEMP 2018 Table 5 Freshwater 99%																					
Managing Risks in Recreational Water 2008 (Aesthetic)																					
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand																					

Location Code	Field ID	Sample Type	Date	TRH C37-C40	Perfluoro-n-hexadecanoic acid	Perfluorododecane sulfonate (PFDoS)	Sum of WA DWER PFAS (n=10)*	Total MAH*	Total Other Chlorinated Hydrocarbons VIC EPA	Total Other OC VIC EPA	Total PAH VIC EPA Guidelines (16)	1H,1H,2H,2H-Perfluorooctane sulfonate (6:2) (6:2 F	Perfluorobutane sulfonate (PFBS)	Perfluorononane sulfonate (PFNS)	Methyl Ethyl Ketone	4-Methyl-2-pentanone	Acetone	Allyl chloride	Carbon disulfide	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)
BH02	BH02	Normal	18 Jan 2024				0.021	<0.003	<5	<0.01				<0.001	<5	<5	<5	<1	<1	<20	<50	<100	<100	<100
			27 Feb 2024																					
	QA200	Field_D	18 Jan 2024				0.037	<0.003	<5	<0.01				<0.001	<5	<5	<5	<1	<1	<20	<50	<100	<100	<100
	QA300	Field_D	27 Feb 2024																					
	QC200	Interlab_D	18 Jan 2024	<100	<0.002	<0.0005					<0.1	<0.0005	<0.001	<0.0005						<10	<50	<100	<50	<100
	QC300	Interlab_D	27 Feb 2024																					
BH03	BH03	Normal	18 Jan 2024				0.021	<0.003	<5	<0.01				<0.001	<5	<5	<5	<1	<1	<20	<50	<100	<100	<100
			27 Feb 2024																					
BH04	BH04	Normal	18 Jan 2024				0.078	<0.003	<5	<0.01				<0.001	<5	<5	<5	<1	1	<20	<50	<100	<100	<100
			27 Feb 2024																					
GG3	GG3	Normal	27 Feb 2024																					

Statistics	TRH C37-C40	Perfluoro-n-hexadecanoic acid	Perfluorododecane sulfonate (PFDoS)	Sum of WA DWER PFAS (n=10)*	Total MAH*	Total Other Chlorinated Hydrocarbons VIC EPA	Total Other OC VIC EPA	Total PAH VIC EPA Guidelines (16)	1H,1H,2H,2H-Perfluorooctane sulfonate (6:2) (6:2 F	Perfluorobutane sulfonate (PFBS)	Perfluorononane sulfonate (PFNS)	Methyl Ethyl Ketone	4-Methyl-2-pentanone	Acetone	Allyl chloride	Carbon disulfide	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)
Number of Results	1	1	1	4	4	4	4	1	1	1	5	4	4	4	4	4	5	5	5	5	5
Number of Detects	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Minimum Concentration	<100	<0.002	<0.0005	0.021	<0.003	<5	<0.01	<0.1	<0.0005	<0.001	<0.0005	<5	<5	<5	<1	1	<10	<50	<100	<50	<100
Minimum Detect	ND	ND	ND	0.021	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ND	ND	ND	ND	ND
Maximum Concentration	<100	<0.002	<0.0005	0.078	<0.003	<5	<0.01	<0.1	<0.0005	<0.001	<0.001	<5	<5	<5	<1	1	<20	<50	<100	<100	<100
Maximum Detect	ND	ND	ND	0.078	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ND	ND	ND	ND	ND
Average Concentration *				0.039	0.0015	2.5	0.005				0.00045	2.5	2.5	2.5	0.5	0.62	9	25	50	45	50
Geometric Average *	50	0.001	0.00025	0.034	0.0015	2.5	0.005	0.05	0.00025	0.0005	0.00044	2.5	2.5	2.5	0.5	0.59	8.7	25	50	44	50
Median Concentration *	50	0.001	0.00025	0.029	0.0015	2.5	0.005	0.05	0.00025	0.0005	0.0005	2.5	2.5	2.5	0.5	0.5	10	25	50	50	50
Standard Deviation *				0.027	0	0	0				0.00011	0	0	0	0	0.25	2.2	0	0	11	0
Geometric Standard Deviation *				1.9	1	1	1				1.4	1	1	1	1	1.4	1.4	1	1	1.4	1
95% UCL (Student's-t) *				0.0709	0.0015	2.5	0.005				0.00055659	2.5	2.5	2.5	0.5	0.919	11.13	25	50	55.66	50
% of Detects	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0
% of Non-Detects	100	100	100	0	100	100	100	100	100	100	100	100	100	100	100	75	100	100	100	100	100

* A Non Detect Multiplier of 0.5 has been applied.

	CRC Care TPH Fractions							BTEX							
	C6-C10	C10-C16	C16-C34	C34-C40	C10 - C40 (Sum of total)	F1: C6-C10 less BTEX	F2: >C10-C16 less NAPHTHALENE	Naphthalene (VOC)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Total BTEX	Xylene Total
	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	ug/L
EQL	10	50	100	100	100	10	50	0.1	0.1	0.1	0.1	0.2	0.1	0.6	1.5
ANZG (2018) Freshwater 95% toxicant DGVs									950				350		
ANZG (2018) Freshwater 99% toxicant DGVs									600				200		
PFAS NEMP 2018 Table 1 Health Recreational Water															
PFAS NEMP 2018 Table 5 Freshwater 95%															
PFAS NEMP 2018 Table 5 Freshwater 99%															
Managing Risks in Recreational Water 2008 (Aesthetic)										25	3				20
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand						1,000	1,000		800						

Location Code	Field ID	Sample Type	Date	C6-C10	C10-C16	C16-C34	C34-C40	C10 - C40 (Sum of total)	F1: C6-C10 less BTEX	F2: >C10-C16 less NAPHTHALENE	Naphthalene (VOC)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Total BTEX	Xylene Total
BH02	BH02	Normal	18 Jan 2024	<20	<50	<100	<100	<100	<20	<50	<10	<1	<1	<1	<2	<1		<3
			27 Feb 2024															
	QA200	Field_D	18 Jan 2024	<20	<50	<100	<100	<100	<20	<50	<10	<1	<1	<1	<2	<1		<3
	QA300	Field_D	27 Feb 2024															
	QC200	Interlab_D	18 Jan 2024	<10	<50	<100	<100		<10		<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.6	<1.5
	QC300	Interlab_D	27 Feb 2024															
BH03	BH03	Normal	18 Jan 2024	<20	<50	<100	<100	<100	<20	<50	<10	<1	<1	<1	<2	<1		<3
			27 Feb 2024															
BH04	BH04	Normal	18 Jan 2024	<20	<50	<100	<100	<100	<20	<50	<10	<1	<1	<1	<2	<1		<3
			27 Feb 2024															
GG3	GG3	Normal	27 Feb 2024															

Statistics

Statistics	C6-C10	C10-C16	C16-C34	C34-C40	C10 - C40 (Sum of total)	F1: C6-C10 less BTEX	F2: >C10-C16 less NAPHTHALENE	Naphthalene (VOC)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Total BTEX	Xylene Total
Number of Results	5	5	5	5	4	5	4	5	9	9	9	9	9	1	9
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<10	<50	<100	<100	<100	<10	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.6	<1.5
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	<20	<50	<100	<100	<100	<20	<50	<10	<1	<1	<1	<2	<1	<0.6	<3
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration *	9	25	50	50	50	9	25	4	0.45	0.45	0.45	0.9	0.45		1.4
Geometric Average *	8.7	25	50	50	50	8.7	25	2	0.39	0.39	0.39	0.77	0.39	0.3	1.4
Median Concentration *	10	25	50	50	50	10	25	5	0.5	0.5	0.5	1	0.5	0.3	1.5
Standard Deviation *	2.2	0	0	0	0	2.2	0	2.2	0.15	0.15	0.15	0.3	0.15		0.25
Geometric Standard Deviation *	1.4	1	1	1	1	1.4	1	7.8	2.2	2.2	2.2	2.2	2.2		1.3
95% UCL (Student's-t) *	11.13	25	50	50	50	11.13	25	6.121	0.543	0.543	0.543	1.086	0.543		1.572
% of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% of Non-Detects	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

* A Non Detect Multiplier of 0.5 has been applied.

	MAH				Metals															
	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	Isopropylbenzene	Styrene	Arsenic	Arsenic (filtered)	Cadmium	Cadmium (filtered)	Chromium (III+VI)	Chromium (III+VI) (filtered)	Copper	Copper (filtered)	Lead	Lead (filtered)	Mercury	Mercury (filtered)	Nickel	Nickel (filtered)	Zinc	Zinc (filtered)
	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
EQL	1	1	1	1	1	1	0.1	0.1	1	1	1	1	1	1	0.1	0.1	1	1	5	5
ANZG (2018) Freshwater 95% toxicant DGVs							0.2	0.2			1.4	1.4	3.4	3.4	0.6	0.6	11	11	8	8
ANZG (2018) Freshwater 99% toxicant DGVs							0.06	0.06			1	1	1	1	0.06	0.06	8	8	2.4	2.4
PFAS NEMP 2018 Table 1 Health Recreational Water																				
PFAS NEMP 2018 Table 5 Freshwater 95%																				
PFAS NEMP 2018 Table 5 Freshwater 99%																				
Managing Risks in Recreational Water 2008 (Aesthetic)				4							1,000	1,000							3,000	3,000
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand																				

Location Code	Field ID	Sample Type	Date	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	Isopropylbenzene	Styrene	Arsenic	Arsenic (filtered)	Cadmium	Cadmium (filtered)	Chromium (III+VI)	Chromium (III+VI) (filtered)	Copper	Copper (filtered)	Lead	Lead (filtered)	Mercury	Mercury (filtered)	Nickel	Nickel (filtered)	Zinc	Zinc (filtered)
BH02	BH02	Normal	18 Jan 2024	<1	<1	<1	<1	<1	<1	<0.2	<0.2	3	<1	<1	2	1	1	<0.1	<0.1	17	16	21	23
			27 Feb 2024																				
	QA200	Field_D	18 Jan 2024	<1	<1	<1	<1	<1	<1	<0.2	<0.2	3	1	<1	2	<1	1	<0.1	<0.1	16	16	22	28
	QA300	Field_D	27 Feb 2024																				
	QC200	Interlab_D	18 Jan 2024					<1	<1	<0.1	<0.1	2	2	<1	3	2	<1	<0.1	<0.1	18	17	25	27
	QC300	Interlab_D	27 Feb 2024																				
BH03	BH03	Normal	18 Jan 2024	<1	<1	<1	<1	4	<1	<0.2	<0.2	10	2	28	41	5	1	<0.1	<0.1	31	45	130	170
			27 Feb 2024																				
BH04	BH04	Normal	18 Jan 2024	<1	<1	<1	<1	13	4	<0.2	0.3	7	2	7	6	7	2	<0.1	<0.1	43	53	83	74
			27 Feb 2024																				
GG3	GG3	Normal	27 Feb 2024																				

Statistics

Statistics	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	Isopropylbenzene	Styrene	Arsenic	Arsenic (filtered)	Cadmium	Cadmium (filtered)	Chromium (III+VI)	Chromium (III+VI) (filtered)	Copper	Copper (filtered)	Lead	Lead (filtered)	Mercury	Mercury (filtered)	Nickel	Nickel (filtered)	Zinc	Zinc (filtered)
Number of Results	4	4	4	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Number of Detects	0	0	0	0	2	1	0	1	5	4	2	5	4	4	0	0	5	5	5	5
Minimum Concentration	<1	<1	<1	<1	<1	<1	<0.1	<0.1	2	1	<1	2	1	1	<0.1	<0.1	16	16	21	23
Minimum Detect	ND	ND	ND	ND	4	4	ND	0.3	2	1	7	2	1	1	ND	ND	16	16	21	23
Maximum Concentration	<1	<1	<1	<1	13	4	<0.2	0.3	10	2	28	41	7	2	<0.1	<0.1	43	53	130	170
Maximum Detect	ND	ND	ND	ND	13	4	ND	0.3	10	2	28	41	7	2	ND	ND	43	53	130	170
Average Concentration *	0.5	0.5	0.5	0.5	3.7	1.2	0.09	0.13	5	1.5	7.3	11	3.1	1.1	0.05	0.05	25	29	56	64
Geometric Average *	0.5	0.5	0.5	0.5	1.5	0.76	0.087	0.11	4.2	1.3	1.9	4.9	2	1	0.05	0.05	23	25	42	47
Median Concentration *	0.5	0.5	0.5	0.5	0.5	0.5	0.1	0.1	3	2	0.5	3	2	1	0.05	0.05	18	17	25	28
Standard Deviation *	0	0	0	0	5.4	1.6	0.022	0.097	3.4	0.71	12	17	2.8	0.55	0	0	12	18	49	63
Geometric Standard Deviation *	1	1	1	1	4.6	2.5	1.4	1.9	2	1.9	6.6	3.5	3	1.6	1	1	1.5	1.8	2.3	2.4
95% UCL (Student's-t) *	0.5	0.5	0.5	0.5	8.863	2.692	0.111	0.223	8.233	2.174	18.65	26.97	5.763	1.622	0.05	0.05	36.22	46.67	102.8	124.1
% of Detects	0	0	0	0	40	20	0	20	100	80	40	100	80	80	0	0	100	100	100	100
% of Non-Detects	100	100	100	100	60	80	100	80	0	20	60	0	20	20	100	100	0	0	0	0

* A Non Detect Multiplier of 0.5 has been applied.

Location Code	Field ID	Sample Type	Date	Inorganics													Organic				PAH				
				BOD	COD	Electrical conductivity *(lab)	Hydrogen sulfide	Hydrogen sulfide (filtered)	Nitrate (as N)	Nitrate (as N) (filtered)	pH (Lab)		Sulfate	Sulfate (filtered)	Sulphide (filtered)	TDS	Perfluoropropanesulfonic acid (PFPrS)	Sum of US EPA PFAS (PFOS + PFOA)*	Methane	OCP	Naphthalene	2-methylnaphthalene	1-Methylnaphthalene	Acenaphthylene	Acenaphthene
				µg/L	µg/L	µS/cm	µg/L	µg/L	µg/L	µg/L	pH_Units	No unit	µg/L	µg/L	µg/L	µg/L	UG/KG	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL				2,000	10,000	2	50	50	5	5	0.1	0	1,000	1,000	500	2,000	0.001	0.001	5	0.001	0.01	0.01	0.01	0.01	0.01
ANZG (2018) Freshwater 95% toxicant DGVs							1	1													16				
ANZG (2018) Freshwater 99% toxicant DGVs							0.5	0.5													2.5				
PFAS NEMP 2018 Table 1 Health Recreational Water																									
PFAS NEMP 2018 Table 5 Freshwater 95%																									
PFAS NEMP 2018 Table 5 Freshwater 99%																									
Managing Risks in Recreational Water 2008 (Aesthetic)							50	50					250,000	250,000											
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand																									
BH02	BH02	Normal	18 Jan 2024														<0.001	0.001		0.001	<0.01			<0.01	<0.01
			27 Feb 2024	<2,000	57,000	310	<50		<20		4.3		22,000						950						
	QA200	Field_D	18 Jan 2024														<0.001	0.002		0.002	<0.01			<0.01	<0.01
	QA300	Field_D	27 Feb 2024	<2,000	47,000	330	<50		<20		4.3		24,000						1,100						
	QC200	Interlab_D	18 Jan 2024																		<0.02	<0.01	<0.01	<0.01	<0.01
	QC300	Interlab_D	27 Feb 2024	10,000	31,000	380		<250		<5		3.9		20,000	<500	230,000			230						
BH03	BH03	Normal	18 Jan 2024														<0.001	0.001		0.003	<0.01			<0.01	<0.01
			27 Feb 2024	<2,000	57,000	550	<50		30		4.6		320,000						290						
BH04	BH04	Normal	18 Jan 2024														0.002	0.004		0.025	<0.01			<0.01	<0.01
			27 Feb 2024	<2,000	190,000	430	<50		<20		3.7		210,000						370						
GG3	GG3	Normal	27 Feb 2024	<2,000	340,000	260	<50		<20		6.1		13,000						790						

Statistics

Statistics	BOD	COD	Electrical conductivity *(lab)	Hydrogen sulfide	Hydrogen sulfide (filtered)	Nitrate (as N)	Nitrate (as N) (filtered)	pH (Lab) pH_Units	pH (Lab) No unit	Sulfate	Sulfate (filtered)	Sulphide (filtered)	TDS	PFPrS	Sum of US EPA PFAS (PFOS + PFOA)*	Methane	OCP	Naphthalene	2-methylnaphthalene	1-Methylnaphthalene	Acenaphthylene	Acenaphthene
Number of Results	6	6	6	5	1	5	1	5	1	5	1	1	1	4	4	6	4	5	1	1	5	5
Number of Detects	1	6	6	0	0	1	0	5	1	5	1	0	1	1	4	6	4	0	0	0	0	0
Minimum Concentration	<2,000	31,000	260	<50	<250	<20	<5	3.7	3.9	13,000	20,000	<500	230,000	<0.001	0.001	230	0.001	<0.01	<0.01	<0.01	<0.01	<0.01
Minimum Detect	10,000	31,000	260	ND	ND	30	ND	3.7	3.9	13,000	20,000	ND	230,000	0.002	0.001	230	0.001	ND	ND	ND	ND	ND
Maximum Concentration	10,000	340,000	550	<50	<250	30	<5	6.1	3.9	320,000	20,000	<500	230,000	0.002	0.004	1,100	0.025	<0.02	<0.01	<0.01	<0.01	<0.01
Maximum Detect	10,000	340,000	550	ND	ND	30	ND	6.1	3.9	320,000	20,000	ND	230,000	0.002	0.004	1,100	0.025	ND	ND	ND	ND	ND
Average Concentration *	2,500	120,333	377	25		14		4.6		117,800				0.00088	0.002	622	0.0078	0.006			0.005	0.005
Geometric Average *	1,468	82,081	366	25	125	12	2.5	4.5	3.9	54,049	20,000	250	230,000	0.00071	0.0017	523	0.0035	0.0057	0.005	0.005	0.005	0.005
Median Concentration *	1,000	57,000	355	25	125	10	2.5	4.3	3.9	24,000	20,000	250	230,000	0.0005	0.0015	580	0.0025	0.005	0.005	0.005	0.005	0.005
Standard Deviation *	3,674	122,055	103	0		8.9		0.9		139,951				0.00075	0.0014	372	0.012	0.0022			0	0
Geometric Standard Deviation *	2.6	2.5	1.3	1		1.6		1.2		4.3				2	1.9	1.9	4	1.4			1	1
95% UCL (Student's-t) *	5,523	220,741	461.5	25		22.53		5.458		251,228				0.00176	0.00366	927.6	0.0213	0.00813			0.005	0.005
% of Detects	17	100	100	0	0	20	0	100	100	100	100	0	100	25	100	100	100	0	0	0	0	0
% of Non-Detects	83	0	0	100	100	80	100	0	0	0	0	100	0	75	0	0	0	100	100	100	100	100

* A Non Detect Multiplier of 0.5 has been applied.

				PAH continued															
				Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(k)fluoranthene	Benzo(b)&(k)fluoranthene	Benzo(b+j)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-c,d)pyrene	Dibenzo(a,h)anthracene	Benzo(g,h,i)perylene	Benzo(a)pyrene TEQ (Zero LOR)	PAHs (Sum of total)
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	TEQ (µg/L)	µg/L
EQL				0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.00001	0.01	0.01	0.01	0.012	0.01
ANZG (2018) Freshwater 95% toxicant DGVs																			
ANZG (2018) Freshwater 99% toxicant DGVs																			
PFAS NEMP 2018 Table 1 Health Recreational Water																			
PFAS NEMP 2018 Table 5 Freshwater 95%																			
PFAS NEMP 2018 Table 5 Freshwater 99%																			
Managing Risks in Recreational Water 2008 (Aesthetic)																			
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand																			
Location Code	**Field ID**	**Sample Type**	**Date**																
BH02	**BH02**	**Normal**	**18 Jan 2024**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01	<0.00001	<0.01	<0.01	<0.01		<0.01
			27 Feb 2024																
	QA200	**Field_D**	**18 Jan 2024**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01	<0.00001	<0.01	<0.01	<0.01		<0.01
	QA300	**Field_D**	**27 Feb 2024**																
	QC200	**Interlab_D**	**18 Jan 2024**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.02		<0.00001	<0.01	<0.01	<0.01	<0.012	<0.1
	QC300	**Interlab_D**	**27 Feb 2024**																
BH03	**BH03**	**Normal**	**18 Jan 2024**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01	<0.00001	<0.01	<0.01	<0.01		<0.01
			27 Feb 2024																
BH04	**BH04**	**Normal**	**18 Jan 2024**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01	<0.00001	<0.01	<0.01	<0.01		<0.01
			27 Feb 2024																
GG3	**GG3**	**Normal**	**27 Feb 2024**																

Statistics

Number of Results	5	5	5	5	5	5	5	4	1	4	5	5	5	5	1	5
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.00001	<0.01	<0.01	<0.01	<0.012	<0.01
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.00001	<0.01	<0.01	<0.01	<0.012	<0.1
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration *	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005		0.005	0.000005	0.005	0.005	0.005		0.014
Geometric Average *	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.005	0.000005	0.005	0.005	0.005	0.006	0.0079
Median Concentration *	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.005	0.000005	0.005	0.005	0.005	0.006	0.005
Standard Deviation *	0	0	0	0	0	0	0	0		0	0	0	0	0		0.02
Geometric Standard Deviation *	1	1	1	1	1	1	1	1		1	1	1	1	1		2.8
95% UCL (Student's-t) *	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005		0.005	0.000005	0.005	0.005	0.005		0.0332
% of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% of Non-Detects	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

* A Non Detect Multiplier of 0.5 has been applied.

	Organochlorine Pesticides																					
	Organochlorine pesticides IWRG621	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	Chlordane (cis)	gamma-Chlordane	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor
	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
EQL	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
ANZG (2018) Freshwater 95% toxicant DGVs							0.08					0.01						0.02			0.2	0.09
ANZG (2018) Freshwater 99% toxicant DGVs							0.03					0.006						0.01			0.07	0.01
PFAS NEMP 2018 Table 1 Health Recreational Water																						
PFAS NEMP 2018 Table 5 Freshwater 95%																						
PFAS NEMP 2018 Table 5 Freshwater 99%																						
Managing Risks in Recreational Water 2008 (Aesthetic)																						
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand																						

Location Code	Field ID	Sample Type	Date	Organochlorine pesticides IWRG621	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	Chlordane (cis)	gamma-Chlordane	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor
BH02	BH02	Normal	18 Jan 2024	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
			27 Feb 2024																						
	QA200	Field_D	18 Jan 2024	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	QA300	Field_D	27 Feb 2024																						
	QC200	Interlab_D	18 Jan 2024		<0.01	<0.05	<0.01		<0.05		<0.01	<0.01	<0.05	<0.01	<0.01		<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.02
	QC300	Interlab_D	27 Feb 2024																						
BH03	BH03	Normal	18 Jan 2024	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
			27 Feb 2024																						
BH04	BH04	Normal	18 Jan 2024	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
			27 Feb 2024																						
GG3	GG3	Normal	27 Feb 2024																						

Statistics	Organochlorine pesticides IWRG621	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	Chlordane (cis)	gamma-Chlordane	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor
Number of Results	4	5	5	5	4	5	4	1	1	5	5	5	4	5	5	5	5	5	5	5	5	5
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.02
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration *	0.005	0.005	0.009	0.005	0.005	0.009	0.005			0.009	0.005	0.005	0.005	0.005	0.006	0.006	0.006	0.006	0.006	0.009	0.009	0.006
Geometric Average *	0.005	0.005	0.0069	0.005	0.005	0.0069	0.005	0.005	0.005	0.0069	0.005	0.005	0.005	0.005	0.0057	0.0057	0.0057	0.0057	0.0057	0.0069	0.0069	0.0057
Median Concentration *	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
Standard Deviation *	0	0	0.0089	0	0	0.0089	0			0.0089	0	0	0	0	0.0022	0.0022	0.0022	0.0022	0.0022	0.0089	0.0089	0.0022
Geometric Standard Deviation *	1	1	2.1	1	1	2.1	1			2.1	1	1	1	1	1.4	1.4	1.4	1.4	1.4	2.1	2.1	1.4
95% UCL (Student's-t) *	0.005	0.005	0.0175	0.005	0.005	0.0175	0.005			0.0175	0.005	0.005	0.005	0.005	0.00813	0.00813	0.00813	0.00813	0.00813	0.0175	0.0175	0.00813
% of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% of Non-Detects	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

* A Non Detect Multiplier of 0.5 has been applied.

				Organochlorine Pesticides continued					Organophosphorous Pesticides																
				Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Oxychlordane	Toxaphene	Azinophos methyl	Bolstar (Sulprofos)	Bromophos-ethyl	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Coumaphos	Demeton-O	Demeton-S	Diazinon	Dichlorvos	Dimethoate	Disulfoton	Ethion	Ethoprop	Fenitrothion	Fensulfothion
				µg/L	µg/L	µg/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
EQL				0.01	0.01	0.01	0.00001	0.002	0.05	1	0.05	1	0.01	1	10	1	10	0.01	0.5	0.15	1	0.05	1	0.2	1
ANZG (2018) Freshwater 95% toxicant DGVs								0.0002	0.02				0.01					0.01		0.15				0.2	
ANZG (2018) Freshwater 99% toxicant DGVs								0.0001	0.01				0.00004					0.00003		0.1				0.1	
PFAS NEMP 2018 Table 1 Health Recreational Water																									
PFAS NEMP 2018 Table 5 Freshwater 95%																									
PFAS NEMP 2018 Table 5 Freshwater 99%																									
Managing Risks in Recreational Water 2008 (Aesthetic)																									
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand																									
Location Code	**Field ID**	**Sample Type**	**Date**																						
BH02	**BH02**	**Normal**	**18 Jan 2024**	<0.01	<0.01	<0.01		<0.002	<1	<1		<1	<10	<1	<10	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1
			27 Feb 2024																						
	QA200	**Field_D**	**18 Jan 2024**	<0.01	<0.01	<0.01		<0.002	<1	<1		<1	<10	<1	<10	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1
	QA300	**Field_D**	**27 Feb 2024**																						
	QC200	**Interlab_D**	**18 Jan 2024**	<0.02	<0.01	<0.1	<0.00001		<0.05		<0.05		<0.01					<0.01	<0.5	<0.15		<0.05		<0.2	
	QC300	**Interlab_D**	**27 Feb 2024**																						
BH03	**BH03**	**Normal**	**18 Jan 2024**	<0.01	<0.01	<0.01		<0.002	<1	<1		<1	<10	<1	<10	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1
			27 Feb 2024																						
BH04	**BH04**	**Normal**	**18 Jan 2024**	<0.01	<0.01	<0.01		<0.002	<1	<1		<1	<10	<1	<10	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1
			27 Feb 2024																						
GG3	**GG3**	**Normal**	**27 Feb 2024**																						
Statistics																									
Number of Results				5	5	5	1	4	5	4	1	4	5	4	4	4	4	5	5	5	4	5	4	5	4
Number of Detects				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration				<0.01	<0.01	<0.01	<0.00001	<0.002	<0.05	<1	<0.05	<1	<0.01	<1	<10	<1	<10	<0.01	<0.5	<0.15	<1	<0.05	<1	<0.2	<1
Minimum Detect				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration				<0.02	<0.01	<0.1	<0.00001	<0.002	<1	<1	<0.05	<1	<10	<1	<10	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1
Maximum Detect				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration *				0.006	0.005	0.014		0.001	0.4	0.5		0.5	4	0.5	5	0.5	5	0.4	0.45	0.42	0.5	0.4	0.5	0.42	0.5
Geometric Average *				0.0057	0.005	0.0079	0.000005	0.001	0.27	0.5	0.025	0.5	1.3	0.5	5	0.5	5	0.2	0.44	0.34	0.5	0.27	0.5	0.36	0.5
Median Concentration *				0.005	0.005	0.005	0.000005	0.001	0.5	0.5	0.025	0.5	5	0.5	5	0.5	5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Standard Deviation *				0.0022	0	0.02		0	0.21	0		0	2.2	0	0	0	0	0.22	0.11	0.19	0	0.21	0	0.18	0
Geometric Standard Deviation *				1.4	1	2.8		1	3.8	1		1	22	1	1	1	1	7.8	1.4	2.3	1	3.8	1	2.1	1
95% UCL (Student's-t) *				0.00813	0.005	0.0332		0.001	0.608	0.5		0.5	6.131	0.5	5	0.5	5	0.612	0.557	0.596	0.5	0.608	0.5	0.591	0.5
% of Detects				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% of Non-Detects				100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

* A Non Detect Multiplier of 0.5 has been applied.

				Organophosphorous Pesticides continued															Insecticides	Pesticides			
				Fenthion	Malathion	Merphos	Methidathion	Methyl parathion	Mevinphos (Phosdrin)	Monocrotophos	Naled (Dibrom)	Omethoate	Phorate	Pyrazophos	Ronnel	Terbufos	Trichloronate	Tetrachlorvinphos	Tokuthion	Isodrin	Mirex	Parathion	Pirimiphos-methyl
				µg/L	µg/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	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL				1	0.05	0.001	0.05	1	1	1	1	1	1	1	1	1	1	0.001	1	0.02	0.01	0.01	10
ANZG (2018) Freshwater 95% toxicant DGVs					0.05																	0.004	
ANZG (2018) Freshwater 99% toxicant DGVs					0.002																	0.0007	
PFAS NEMP 2018 Table 1 Health Recreational Water																							
PFAS NEMP 2018 Table 5 Freshwater 95%																							
PFAS NEMP 2018 Table 5 Freshwater 99%																							
Managing Risks in Recreational Water 2008 (Aesthetic)																							
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand																							
Location Code	Field ID	Sample Type	Date																				
BH02	BH02	Normal	18 Jan 2024	<1	<1	<0.001		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.001	<1			<1	<10
			27 Feb 2024																				
	QA200	Field_D	18 Jan 2024	<1	<1	<0.001		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.001	<1			<1	<10
	QA300	Field_D	27 Feb 2024																				
	QC200	Interlab_D	18 Jan 2024		<0.05		<0.05													<0.02	<0.01	<0.01	
	QC300	Interlab_D	27 Feb 2024																				
BH03	BH03	Normal	18 Jan 2024	<1	<1	<0.001		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.001	<1			<1	<10
			27 Feb 2024																				
BH04	BH04	Normal	18 Jan 2024	<1	<1	<0.001		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.001	<1			<1	<10
			27 Feb 2024																				
GG3	GG3	Normal	27 Feb 2024																				

Statistics

	Fenthion	Malathion	Merphos	Methidathion	Methyl parathion	Mevinphos (Phosdrin)	Monocrotophos	Naled (Dibrom)	Omethoate	Phorate	Pyrazophos	Ronnel	Terbufos	Trichloronate	Tetrachlorvinphos	Tokuthion	Isodrin	Mirex	Parathion	Pirimiphos-methyl
Number of Results	4	5	4	1	4	4	4	4	4	4	4	4	4	4	4	4	1	1	5	4
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<1	<0.05	<0.001	<0.05	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.001	<1	<0.02	<0.01	<0.01	<10
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	<1	<1	<0.001	<0.05	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.001	<1	<0.02	<0.01	<1	<10
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration *	0.5	0.4	0.0005		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0005	0.5			0.4	5
Geometric Average *	0.5	0.27	0.0005	0.025	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0005	0.5	0.01	0.005	0.2	5
Median Concentration *	0.5	0.5	0.0005	0.025	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0005	0.5	0.01	0.005	0.5	5
Standard Deviation *	0	0.21	0		0	0	0	0	0	0	0	0	0	0	0	0			0.22	0
Geometric Standard Deviation *	1	3.8	1		1	1	1	1	1	1	1	1	1	1	1	1			7.8	1
95% UCL (Student's-t) *	0.5	0.608	0.0005		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0005	0.5			0.612	5
% of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% of Non-Detects	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

* A Non Detect Multiplier of 0.5 has been applied.

				Polychlorinated Biphenyls										SVOCs	Chlorinated Hydrocarbons				
				Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Arochlor 1268	Aroclor 1262	PCBs (Sum of total)	EPN	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL				1	1	1	1	1	1	1	0.001	1	5	1	1	1	1	1	1
ANZG (2018) Freshwater 95% toxicant DGVs							0.6		0.03									6,500	
ANZG (2018) Freshwater 99% toxicant DGVs							0.3		0.01									5,400	
PFAS NEMP 2018 Table 1 Health Recreational Water																			
PFAS NEMP 2018 Table 5 Freshwater 95%																			
PFAS NEMP 2018 Table 5 Freshwater 99%																			
Managing Risks in Recreational Water 2008 (Aesthetic)																			
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand																			
Location Code	**Field ID**	**Sample Type**	**Date**																
BH02	BH02	Normal	18 Jan 2024	<5	<5	<5	<5	<5	<5	<5			<5	<1	<1	<1	<1	<1	<1
			27 Feb 2024																
	QA200	Field_D	18 Jan 2024	<5	<5	<5	<5	<5	<5	<5			<5	<1	<1	<1	<1	<1	<1
	QA300	Field_D	27 Feb 2024																
	QC200	Interlab_D	18 Jan 2024	<1	<1	<1	<1	<1	<1	<1	<0.001	<1	<5						
	QC300	Interlab_D	27 Feb 2024																
BH03	BH03	Normal	18 Jan 2024	<5	<5	<5	<5	<5	<5	<5			<5	<1	<1	<1	<1	<1	<1
			27 Feb 2024																
BH04	BH04	Normal	18 Jan 2024	<5	<5	<5	<5	<5	<5	<5			<5	<1	<1	<1	<1	<1	<1
			27 Feb 2024																
GG3	GG3	Normal	27 Feb 2024																

Statistics

	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Arochlor 1268	Aroclor 1262	PCBs (Sum of total)	EPN	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane
Number of Results	5	5	5	5	5	5	5	1	1	5	4	4	4	4	4	4
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<1	<1	<1	<1	<1	<1	<1	<0.001	<1	<5	<1	<1	<1	<1	<1	<1
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	<5	<5	<5	<5	<5	<5	<5	<0.001	<1	<5	<1	<1	<1	<1	<1	<1
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration *	2.1	2.1	2.1	2.1	2.1	2.1	2.1			2.5	0.5	0.5	0.5	0.5	0.5	0.5
Geometric Average *	1.8	1.8	1.8	1.8	1.8	1.8	1.8	0.0005	0.5	2.5	0.5	0.5	0.5	0.5	0.5	0.5
Median Concentration *	2.5	2.5	2.5	2.5	2.5	2.5	2.5	0.0005	0.5	2.5	0.5	0.5	0.5	0.5	0.5	0.5
Standard Deviation *	0.89	0.89	0.89	0.89	0.89	0.89	0.89			0	0	0	0	0	0	0
Geometric Standard Deviation *	2.1	2.1	2.1	2.1	2.1	2.1	2.1			1	1	1	1	1	1	1
95% UCL (Student's-t) *	2.953	2.953	2.953	2.953	2.953	2.953	2.953			2.5	0.5	0.5	0.5	0.5	0.5	0.5
% of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% of Non-Detects	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

* A Non Detect Multiplier of 0.5 has been applied.

				1,1-dichloroethene	1,2,3-trichloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	Bromochloromethane	Bromodichloromethane	Bromoform	Carbon tetrachloride	Chlorodibromomethane	Chloroethane	Chloroform	Chloromethane	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Dibromomethane	Dichloromethane	Trichloroethene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Vinyl chloride
				Chlorinated Hydrocarbons continued																					
				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
EQL				1	1	1	1	1	1	1	1	1	1	5	5	5	1	1	1	5	1	1	1	1	5
ANZG (2018) Freshwater 95% toxicant DGVs																									
ANZG (2018) Freshwater 99% toxicant DGVs																									
PFAS NEMP 2018 Table 1 Health Recreational Water																									
PFAS NEMP 2018 Table 5 Freshwater 95%																									
PFAS NEMP 2018 Table 5 Freshwater 99%																									
Managing Risks in Recreational Water 2008 (Aesthetic)																									
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand																									
Location Code	**Field ID**	**Sample Type**	**Date**																						
BH02	**BH02**	**Normal**	**18 Jan 2024**	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<5	<5	<1	<1	<1	<5	<1	<1	<1	<1	<5
			27 Feb 2024																						
	QA200	**Field_D**	**18 Jan 2024**	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<5	<5	<1	<1	<1	<5	<1	<1	<1	<1	<5
	QA300	**Field_D**	**27 Feb 2024**																						
	QC200	**Interlab_D**	**18 Jan 2024**																						
	QC300	**Interlab_D**	**27 Feb 2024**																						
BH03	**BH03**	**Normal**	**18 Jan 2024**	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<5	<5	<1	<1	<1	<5	<1	<1	<1	<1	<5
			27 Feb 2024																						
BH04	**BH04**	**Normal**	**18 Jan 2024**	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<5	<5	<1	<1	<1	<5	<1	<1	<1	<1	<5
			27 Feb 2024																						
GG3	**GG3**	**Normal**	**27 Feb 2024**																						

Statistics

Statistic	1,1-dichloroethene	1,2,3-trichloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	Bromochloromethane	Bromodichloromethane	Bromoform	Carbon tetrachloride	Chlorodibromomethane	Chloroethane	Chloroform	Chloromethane	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Dibromomethane	Dichloromethane	Trichloroethene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Vinyl chloride
Number of Results	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<5	<5	<1	<1	<1	<5	<1	<1	<1	<1	<5
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<5	<5	<1	<1	<1	<5	<1	<1	<1	<1	<5
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration *	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2.5	2.5	2.5	0.5	0.5	0.5	2.5	0.5	0.5	0.5	0.5	2.5
Geometric Average *	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2.5	2.5	2.5	0.5	0.5	0.5	2.5	0.5	0.5	0.5	0.5	2.5
Median Concentration *	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2.5	2.5	2.5	0.5	0.5	0.5	2.5	0.5	0.5	0.5	0.5	2.5
Standard Deviation *	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geometric Standard Deviation *	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
95% UCL (Student's-t) *	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2.5	2.5	2.5	0.5	0.5	0.5	2.5	0.5	0.5	0.5	0.5	2.5
% of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% of Non-Detects	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

* A Non Detect Multiplier of 0.5 has been applied.

Halogenated Hydrocarbons

				Chlorinated hydrocarbons IWRG621	1,2-dibromoethane	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	4-chlorotoluene	Bromobenzene	Bromomethane	Chlorobenzene	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL				5	1	1	1	1	1	1	5	1	5	1	5
ANZG (2018) Freshwater 95% toxicant DGVs						160	260	60							
ANZG (2018) Freshwater 99% toxicant DGVs						120	160	40							
PFAS NEMP 2018 Table 1 Health Recreational Water															
PFAS NEMP 2018 Table 5 Freshwater 95%															
PFAS NEMP 2018 Table 5 Freshwater 99%															
Managing Risks in Recreational Water 2008 (Aesthetic)						1	20	0.3				10			
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand															
Location Code	**Field ID**	**Sample Type**	**Date**												
BH02	**BH02**	**Normal**	**18 Jan 2024**	<5	<1	<1	<1	<1	<1	<1	<5	<1	<5	<1	<5
			27 Feb 2024												
	QA200	**Field_D**	**18 Jan 2024**	<5	<1	<1	<1	<1	<1	<1	<5	<1	<5	<1	<5
	QA300	**Field_D**	**27 Feb 2024**												
	QC200	**Interlab_D**	**18 Jan 2024**												
	QC300	**Interlab_D**	**27 Feb 2024**												
BH03	**BH03**	**Normal**	**18 Jan 2024**	<5	<1	<1	<1	<1	<1	<1	<5	<1	<5	<1	<5
			27 Feb 2024												
BH04	**BH04**	**Normal**	**18 Jan 2024**	<5	<1	<1	<1	<1	<1	<1	<5	<1	<5	<1	<5
			27 Feb 2024												
GG3	**GG3**	**Normal**	**27 Feb 2024**												

Perfluorocarbons

				2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	Perfluorobutane sulfonic acid (PFBS)	Perfluorodecanoic acid (PFDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorononanoic acid (PFNA)	Perfluorooctane sulfonamide (FOSA)	Perfluorotetradecanoic acid (PFTeDA)
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL				0.0025	0.0025	0.0025	0.0025	0.001	0.001	0.001	0.001	0.002	0.001
ANZG (2018) Freshwater 95% toxicant DGVs													
ANZG (2018) Freshwater 99% toxicant DGVs													
PFAS NEMP 2018 Table 1 Health Recreational Water													
PFAS NEMP 2018 Table 5 Freshwater 95%													
PFAS NEMP 2018 Table 5 Freshwater 99%													
Managing Risks in Recreational Water 2008 (Aesthetic)													
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand													
Location Code	**Field ID**	**Sample Type**	**Date**										
BH02	**BH02**	**Normal**	**18 Jan 2024**	<0.005	<0.005	<0.005	<0.005	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001
			27 Feb 2024										
	QA200	**Field_D**	**18 Jan 2024**	<0.005	<0.005	<0.005	<0.005	0.002	<0.001	<0.001	<0.001	<0.005	<0.001
	QA300	**Field_D**	**27 Feb 2024**										
	QC200	**Interlab_D**	**18 Jan 2024**	<0.0025	<0.0025	<0.0025	<0.0025		<0.001	<0.001	<0.001	<0.002	<0.001
	QC300	**Interlab_D**	**27 Feb 2024**										
BH03	**BH03**	**Normal**	**18 Jan 2024**	<0.005	<0.005	<0.005	<0.005	0.004	<0.001	<0.001	<0.001	<0.005	<0.001
			27 Feb 2024										
BH04	**BH04**	**Normal**	**18 Jan 2024**	<0.005	<0.005	<0.005	<0.005	0.008	<0.001	<0.001	<0.001	<0.005	<0.001
			27 Feb 2024										
GG3	**GG3**	**Normal**	**27 Feb 2024**										

Statistics

Statistics	Chlorinated hydrocarbons IWRG621	1,2-dibromoethane	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	4-chlorotoluene	Bromobenzene	Bromomethane	Chlorobenzene	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane
Number of Results	4	4	4	4	4	4	4	4	4	4	4	4
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<5	<1	<1	<1	<1	<1	<1	<5	<1	<5	<1	<5
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	<5	<1	<1	<1	<1	<1	<1	<5	<1	<5	<1	<5
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration *	2.5	0.5	0.5	0.5	0.5	0.5	0.5	2.5	0.5	2.5	0.5	2.5
Geometric Average *	2.5	0.5	0.5	0.5	0.5	0.5	0.5	2.5	0.5	2.5	0.5	2.5
Median Concentration *	2.5	0.5	0.5	0.5	0.5	0.5	0.5	2.5	0.5	2.5	0.5	2.5
Standard Deviation *	0	0	0	0	0	0	0	0	0	0	0	0
Geometric Standard Deviation *	1	1	1	1	1	1	1	1	1	1	1	1
95% UCL (Student's-t) *	2.5	0.5	0.5	0.5	0.5	0.5	0.5	2.5	0.5	2.5	0.5	2.5
% of Detects	0	0	0	0	0	0	0	0	0	0	0	0
% of Non-Detects	100	100	100	100	100	100	100	100	100	100	100	100

Statistics	N-MeFOSE	EtFOSA	EtFOSE	MeFOSA	PFBS	PFDA	PFDoDA	PFNA	FOSA	PFTeDA
Number of Results	5	5	5	5	4	5	5	5	5	5
Number of Detects	0	0	0	0	3	0	0	0	0	0
Minimum Concentration	<0.0025	<0.0025	<0.0025	<0.0025	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001
Minimum Detect	ND	ND	ND	ND	0.002	ND	ND	ND	ND	ND
Maximum Concentration	<0.005	<0.005	<0.005	<0.005	0.008	<0.001	<0.001	<0.001	<0.005	<0.001
Maximum Detect	ND	ND	ND	ND	0.008	ND	ND	ND	ND	ND
Average Concentration *	0.0022	0.0022	0.0022	0.0022	0.0036	0.0005	0.0005	0.0005	0.0022	0.0005
Geometric Average *	0.0022	0.0022	0.0022	0.0022	0.0024	0.0005	0.0005	0.0005	0.0021	0.0005
Median Concentration *	0.0025	0.0025	0.0025	0.0025	0.003	0.0005	0.0005	0.0005	0.0025	0.0005
Standard Deviation *	0.00056	0.00056	0.00056	0.00056	0.0032	0	0	0	0.00067	0
Geometric Standard Deviation *	1.4	1.4	1.4	1.4	3.3	1	1	1	1.5	1
95% UCL (Student's-t) *	0.00278	0.00278	0.00278	0.00278	0.00745	0.0005	0.0005	0.0005	0.00284	0.0005
% of Detects	0	0	0	0	75	0	0	0	0	0
% of Non-Detects	100	100	100	100	25	100	100	100	100	100

* A Non Detect Multiplier of 0.5 has been applied.

				Perfluorocarbons continued																			
				Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	8:2 Fluorotelomer sulfonate	Perfluoroheptanoic acid (PFHpA)	Perfluorohexanoic acid (PFHxA)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	Perfluorobutanoic acid (PFBA)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluorooctane sulfonic acid (PFOS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluoropentanoic acid (PFPeA)	Sum of PFAS	Perfluorodecanesulfonic acid (PFDS)	Sum of PFHxS and PFOS	6:2 Fluorotelomer Sulfonate (6:2 FtS)	Perfluorooctanoate (PFOA)
				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	ug/L	µg/L	µg/L	µg/L	µg/L
EQL				0.001	0.001	0.0005	0.0005	0.0005	0.001	0.0005	0.0025	0.0025	0.0005	0.0002	0.0002	0.0002	0.001	0.0005	0.005	0.0005	0.0002	0.005	0.0005
ANZG (2018) Freshwater 95% toxicant DGVs																							
ANZG (2018) Freshwater 99% toxicant DGVs																							
PFAS NEMP 2018 Table 1 Health Recreational Water																					0.7		5.6
PFAS NEMP 2018 Table 5 Freshwater 95%																0.13							220
PFAS NEMP 2018 Table 5 Freshwater 99%																0.00023							19
Managing Risks in Recreational Water 2008 (Aesthetic)																							
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand																							
Location Code	**Field ID**	**Sample Type**	**Date**																				
BH02	**BH02**	**Normal**	**18 Jan 2024**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.001	<0.001	0.001	<0.001	<0.001	0.021	<0.001	0.001	0.020	<0.001
			27 Feb 2024																				
	QA200	**Field_D**	**18 Jan 2024**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.001	<0.001	0.002	<0.001	<0.001	0.037	<0.001	0.002	0.033	<0.001
	QA300	**Field_D**	**27 Feb 2024**																				
	QC200	**Interlab_D**	**18 Jan 2024**	<0.001	<0.001	<0.0005	<0.0005	<0.0005		<0.0005	<0.0025	<0.0025	<0.0005	<0.0002	0.0003	<0.0002	<0.001	<0.0005	<0.006	<0.0005	0.0003		<0.0005
	QC300	**Interlab_D**	**27 Feb 2024**																				
BH03	**BH03**	**Normal**	**18 Jan 2024**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.001	0.002	0.001	0.001	<0.001	0.022	<0.001	0.003	0.014	<0.001
			27 Feb 2024																				
BH04	**BH04**	**Normal**	**18 Jan 2024**	<0.001	<0.001	<0.001	0.002	0.006	<0.001	<0.001	<0.005	<0.005	0.007	<0.001	0.021	0.002	0.003	0.004	0.083	<0.001	0.023	0.026	0.002
			27 Feb 2024																				
GG3	**GG3**	**Normal**	**27 Feb 2024**																				

Statistics

	PFTrDA	PFUnDA	8:2 Fluorotelomer sulfonate	PFHpA	PFHxA	10:2 FTS	4:2 FTS	EtFOSAA	MeFOSAA	PFBA	PFHpS	PFHxS	PFOS	PFPeS	PFPeA	Sum of PFAS	PFDS	Sum of PFHxS and PFOS	6:2 FtS	PFOA
Number of Results	**5**	**5**	**5**	**5**	**5**	**4**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**4**	**5**
Number of Detects	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**3**	**4**	**2**	**1**	**4**	**0**	**5**	**4**	**1**
Minimum Concentration	**<0.001**	**<0.001**	**<0.0005**	**<0.0005**	**<0.0005**	**<0.001**	**<0.0005**	**<0.0025**	**<0.0025**	**<0.0005**	**<0.0002**	**0.0003**	**<0.0002**	**0.001**	**<0.0005**	**<0.006**	**<0.0005**	**0.0003**	**0.014**	**<0.0005**
Minimum Detect	**ND**	**ND**	**ND**	**0.002**	**0.006**	**ND**	**ND**	**ND**	**ND**	**0.007**	**ND**	**0.0003**	**0.001**	**0.001**	**0.004**	**0.021**	**ND**	**0.0003**	**0.014**	**0.002**
Maximum Concentration	**<0.001**	**<0.001**	**<0.001**	**0.002**	**0.006**	**<0.001**	**<0.001**	**<0.005**	**<0.005**	**0.007**	**<0.001**	**0.021**	**0.002**	**0.003**	**0.004**	**0.083**	**<0.001**	**0.023**	**0.033**	**0.002**
Maximum Detect	**ND**	**ND**	**ND**	**0.002**	**0.006**	**ND**	**ND**	**ND**	**ND**	**0.007**	**ND**	**0.021**	**0.002**	**0.003**	**0.004**	**0.083**	**ND**	**0.023**	**0.033**	**0.002**
Average Concentration *	**0.0005**	**0.0005**	**0.00045**	**0.00075**	**0.0016**	**0.0005**	**0.00045**	**0.0022**	**0.0022**	**0.003**	**0.00042**	**0.0049**	**0.0012**	**0.0011**	**0.0012**	**0.033**	**0.00045**	**0.0059**	**0.023**	**0.00075**
Geometric Average *	**0.0005**	**0.0005**	**0.00044**	**0.00057**	**0.00072**	**0.0005**	**0.00044**	**0.0022**	**0.0022**	**0.0019**	**0.00036**	**0.0013**	**0.00083**	**0.00082**	**0.00066**	**0.021**	**0.00044**	**0.0021**	**0.022**	**0.00057**
Median Concentration *	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0025**	**0.0025**	**0.0025**	**0.0005**	**0.0005**	**0.001**	**0.0005**	**0.0005**	**0.022**	**0.0005**	**0.002**	**0.023**	**0.0005**
Standard Deviation *	**0**	**0**	**0.00011**	**0.00071**	**0.0025**	**0**	**0.00011**	**0.00056**	**0.00056**	**0.0025**	**0.00018**	**0.009**	**0.0008**	**0.0011**	**0.0016**	**0.03**	**0.00011**	**0.0096**	**0.0081**	**0.00071**
Geometric Standard Deviation *	**1**	**1**	**1.4**	**2.1**	**3.4**	**1**	**1.4**	**1.4**	**1.4**	**3.4**	**2.1**	**5.6**	**3.4**	**2.2**	**2.9**	**3.4**	**1.4**	**4.9**	**1.4**	**2.1**
95% UCL (Student's-t) *	**0.0005**	**0.0005**	**0.00055659**	**0.00142**	**0.00392**	**0.0005**	**0.00055659**	**0.00278**	**0.00278**	**0.0053**	**0.00059055**	**0.0135**	**0.00198**	**0.00213**	**0.00267**	**0.0621**	**0.00055659**	**0.015**	**0.0328**	**0.00142**
% of Detects	**0**	**0**	**0**	**20**	**20**	**0**	**0**	**0**	**0**	**20**	**0**	**60**	**80**	**40**	**20**	**80**	**0**	**100**	**100**	**20**
% of Non-Detects	**100**	**100**	**100**	**80**	**80**	**100**	**100**	**100**	**100**	**80**	**100**	**40**	**20**	**60**	**80**	**20**	**100**	**0**	**0**	**80**

* A Non Detect Multiplier of 0.5 has been applied.

Date and Time	CH4	CO2	O2	H2S	CO	Bore press	Atm press	Diff press	°C	Water level	Battery (V)	Filter press
27/02/2024 15:20	0.1	1.1	20.3	2	2	1019	1019	0	22.7	22	2.91	38
27/02/2024 16:20	0	1.3	20	2	3	1024	1018	6	22.6	22	2.93	40
27/02/2024 17:20	0.1	1.5	20.1	2	5	1027	1018	9	22.4	22	2.92	39
27/02/2024 18:20	0.1	1.6	20.1	2	6	1030	1018	12	22.4	22	2.93	40
27/02/2024 19:20	0	1.7	20.1	2	8	1033	1018	15	22.4	22	2.91	41
27/02/2024 20:20	0	1.9	20.2	2	6	1035	1019	16	22.4	22	2.89	41
27/02/2024 21:20	0.1	1.9	20.2	2	9	1038	1020	18	22.4	22	2.9	42
27/02/2024 22:20	0.1	2.1	20.2	2	11	1039	1020	19	22.4	22	2.9	41
27/02/2024 23:20	0.1	2.2	20.2	2	12	1041	1019	22	22.5	22	2.88	43
28/02/2024 0:20	0.1	2.2	20.2	2	11	1043	1019	24	22.5	22	2.89	44
28/02/2024 1:20	0.1	2.2	20.2	2	14	1044	1019	25	22.5	22	2.89	44
28/02/2024 2:20	0	2.3	20.2	2	14	1045	1018	27	22.4	22	2.88	44
28/02/2024 3:20	0	2.3	20.2	2	16	1047	1018	29	22.4	22	2.87	45
28/02/2024 4:20	0	2.5	20.2	2	17	1048	1017	31	22.4	22	2.88	46
28/02/2024 5:20	0	2.5	20.1	2	18	1046	1017	29	22.4	22	2.87	44
28/02/2024 6:20	0.1	2.5	19.7	2	19	1026	1018	8	22.3	22	2.88	46
28/02/2024 7:20	0	2.5	19.6	2	19	1019	1018	1	22.3	22	2.88	44
28/02/2024 8:20	0.1	2.7	19.6	2	20	1020	1019	1	22.2	22	2.88	45
28/02/2024 9:20	0.1	2.7	19.6	2	20	1020	1019	1	22.2	22	2.87	47
28/02/2024 10:20	0.1	2.7	19.5	2	21	1019	1019	0	22.1	22	2.84	46
28/02/2024 11:20	0	2.8	19.5	2	23	1019	1018	1	22.1	22	2.86	48
28/02/2024 12:20	0.1	3	19.4	2	23	1018	1017	1	22.1	22	2.87	46
28/02/2024 13:20	0.1	3	19.4	2	24	1017	1016	1	22.1	22	2.86	48
28/02/2024 14:20	0	3.1	19.3	2	26	1016	1015	1	22.1	22	2.87	47
28/02/2024 15:20	0	3.1	19.3	3	26	1015	1015	0	22.2	22	2.86	48
28/02/2024 16:20	0.1	3.2	19.3	2	27	1015	1014	1	22.3	22	2.87	47
28/02/2024 17:20	0.1	3.2	19.3	2	27	1014	1014	0	22.4	22	2.87	46
28/02/2024 18:20	0	3.2	19.3	2	28	1015	1014	1	22.5	22	2.87	48
28/02/2024 19:20	0.1	3.4	19.2	2	30	1015	1015	0	22.6	22	2.87	47
28/02/2024 20:20	0.1	3.5	19.3	2	30	1015	1015	0	22.8	22	2.86	47
28/02/2024 21:20	0	3.5	19.3	2	30	1016	1015	1	22.9	22	2.86	47
28/02/2024 22:20	0.1	3.5	19.4	2	31	1016	1015	1	23.1	22	2.84	48
28/02/2024 23:20	0.1	3.7	19.4	2	34	1016	1015	1	23.1	22	2.85	47
29/02/2024 0:20	0	3.7	19.3	2	33	1014	1013	1	23.1	22	2.85	46
29/02/2024 1:20	0	3.7	19.3	2	34	1013	1013	0	23.1	22	2.85	47
29/02/2024 2:20	0	3.8	19.3	2	35	1013	1013	0	23.1	22	2.85	48
29/02/2024 3:20	0.1	3.8	19.3	2	36	1013	1012	1	23.1	22	2.83	47
29/02/2024 4:20	0	4	19.3	2	35	1012	1012	0	23.1	22	2.83	46
29/02/2024 5:20	0.1	4	19.3	2	35	1012	1011	1	23.1	22	2.83	47
29/02/2024 6:20	0.1	4.1	19.3	2	37	1012	1011	1	23.1	22	2.83	46
29/02/2024 7:20	0.1	4.1	19.3	2	36	1012	1012	0	23	22	2.82	47
29/02/2024 8:20	0.1	4.1	19.3	2	37	1012	1012	0	22.9	22	2.83	47
29/02/2024 9:20	0.1	4.2	19.3	2	37	1012	1012	0	22.9	22	2.82	46
29/02/2024 10:20	0.1	4.2	19.3	2	37	1012	1012	0	22.9	22	2.81	45
29/02/2024 11:20	0.1	4.4	19.2	2	37	1012	1011	1	22.9	22	2.82	47
Average	0.1	2.9	19.6	2.0	23.1							

Date and Time	CH4	CO2	O2	H2S	CO	Bore press	Atm press	Diff press	°C	Water level	Battery (V)	Filter press
29/02/2024 12:20	GasCLam installed into GG3											
29/02/2024 13:20	0	2.8	19.9	2	17	1011	1010	1	21.6	22	2.79	45
29/02/2024 14:20	0.1	2.8	19.9	2	33	1011	1010	1	21.4	22	2.79	47
29/02/2024 15:20	0.1	2.8	19.9	2	47	1010	1010	0	21.3	22	2.82	46
29/02/2024 16:20	0.1	2.8	19.8	3	61	1010	1010	0	21.3	22	2.81	44
29/02/2024 17:20	0.1	2.8	19.8	2	73	1010	1010	0	21.3	22	2.8	45
29/02/2024 18:20	0.1	2.8	19.8	2	83	1013	1012	1	21.3	22	2.8	47
29/02/2024 19:20	0.1	2.8	19.8	3	96	1014	1014	0	21.3	22	2.8	47
29/02/2024 20:20	0	2.6	19.8	3	105	1016	1016	0	21.4	22	2.8	47
29/02/2024 21:20	0	2.6	19.7	3	116	1017	1017	0	21.4	22	2.8	46
29/02/2024 22:20	0.1	2.6	19.7	3	126	1018	1018	0	21.4	22	2.8	46
29/02/2024 23:20	0	2.6	19.7	3	135	1018	1018	0	21.5	22	2.79	46
1/03/2024 0:20	0	2.5	19.6	3	146	1018	1017	1	21.5	22	2.79	47
1/03/2024 1:20	0.1	2.5	19.6	3	157	1017	1017	0	21.6	22	2.78	46
1/03/2024 2:20	0	2.5	19.5	3	168	1017	1017	0	21.6	22	2.78	47
1/03/2024 3:20	0	2.5	19.5	3	182	1017	1016	1	21.6	22	2.76	48
1/03/2024 4:20	0.1	2.5	19.5	3	192	1016	1016	0	21.6	22	2.77	46
1/03/2024 5:20	0.1	2.5	19.4	3	204	1015	1015	0	21.6	22	2.78	46
1/03/2024 6:20	0.1	2.5	19.4	3	216	1016	1015	1	21.6	22	2.77	48
1/03/2024 7:20	0.1	2.5	19.4	3	228	1016	1016	0	21.6	22	2.77	47
1/03/2024 8:20	0.1	2.5	19.3	4	232	1016	1016	0	21.6	22	2.78	47
1/03/2024 9:20	0.1	2.5	19.3	3	245	1017	1016	1	21.6	22	2.78	48
1/03/2024 10:20	0	2.5	19.3	3	254	1016	1016	0	21.6	22	2.77	48
1/03/2024 11:20	0	2.3	19.2	3	264	1016	1016	0	21.6	22	2.76	50
1/03/2024 12:20	0	2.5	19.2	3	274	1015	1014	1	21.6	22	2.78	49
1/03/2024 13:20	0	2.5	19.1	3	284	1014	1014	0	21.6	22	2.77	48
1/03/2024 14:20	0	2.3	19.1	4	293	1013	1013	0	21.6	22	2.76	47
1/03/2024 15:20	0	2.3	19	4	300	1013	1012	1	21.6	22	2.74	49
1/03/2024 16:20	0.1	2.3	19	4	307	1012	1011	1	21.6	22	2.77	50
1/03/2024 17:20	0	2.3	18.9	4	311	1011	1011	0	21.6	22	2.77	49
1/03/2024 18:20	0.1	2.3	18.9	4	315	1011	1011	0	21.6	22	2.77	50
1/03/2024 19:20	0.1	2.3	18.9	4	319	1012	1012	0	21.6	22	2.78	50
1/03/2024 20:20	0.1	2.3	18.9	4	320	1012	1012	0	21.6	22	2.76	50
1/03/2024 21:20	0.1	2.3	18.9	4	322	1012	1012	0	21.6	22	2.75	49
1/03/2024 22:20	0.1	2.3	18.9	4	319	1012	1012	0	21.7	22	2.76	49
1/03/2024 23:20	0	2.3	18.8	4	324	1012	1012	0	21.7	22	2.75	51
2/03/2024 0:20	0	2.3	18.8	4	327	1011	1011	0	21.8	22	2.75	51
2/03/2024 1:20	0.1	2.3	18.8	4	329	1010	1010	0	21.8	22	2.75	50
2/03/2024 2:20	0	2.3	18.8	4	329	1010	1009	1	21.8	22	2.75	51
2/03/2024 3:20	0.1	2.2	18.7	4	329	1010	1010	0	21.8	22	2.74	51
2/03/2024 4:20	0.1	2.2	18.7	4	329	1010	1010	0	21.8	22	2.75	50
2/03/2024 5:20	0	2.2	18.7	4	335	1009	1009	0	21.8	22	2.74	51
2/03/2024 6:20	0	2.3	18.7	4	339	1011	1011	0	21.8	22	2.75	50
2/03/2024 7:20	0.1	2.2	18.7	4	344	1013	1013	0	21.8	22	2.73	50
2/03/2024 8:20	GasClam removed from GG3 due to predicted wet weather											
4/03/2024 8:20	Gas clam re-installed into GG3											
4/03/2024 9:20	0.5	0	21.3	0	0	1021	1021	0	21.9	22	2.66	36
4/03/2024 10:20	0.5	2.8	20.3	1	-6	1025	1024	1	21.8	22	2.65	38
4/03/2024 11:20	0.5	4	19.6	1	5	1025	1024	1	21.4	22	2.65	39
4/03/2024 12:20	0.5	4	19.5	1	8	1025	1024	1	21.3	22	2.65	39
4/03/2024 13:20	0.5	3.8	19.5	0	7	1024	1024	0	21.2	22	2.65	39
4/03/2024 14:20	0.5	3.8	19.4	1	18	1024	1024	0	21.2	22	2.63	40
4/03/2024 15:20	0.5	3.7	19.3	1	20	1024	1024	0	21.1	22	2.65	39
4/03/2024 16:20	0.5	3.5	19.2	2	24	1024	1023	1	21.1	22	2.65	40
4/03/2024 17:20	0.5	3.4	19.2	2	28	1024	1024	0	21.1	22	2.65	40
4/03/2024 18:20	0.5	3.4	19.2	1	30	1024	1024	0	21.1	22	2.65	40
4/03/2024 19:20	0.5	3.2	19.2	1	30	1025	1024	1	21.1	22	2.65	41
4/03/2024 20:20	0.5	3.1	19.1	1	30	1025	1025	0	21.1	22	2.65	42
4/03/2024 21:20	0.5	3.1	19.1	2	32	1026	1025	1	21.1	22	2.65	44
4/03/2024 22:20	0.5	3	19.1	2	33	1026	1025	1	21.1	22	2.65	43
4/03/2024 23:20	0.5	2.8	19.1	2	32	1026	1025	1	21.1	22	2.64	44
5/03/2024 0:20	0.5	2.8	19	2	34	1026	1025	1	21.1	22	2.63	46
5/03/2024 1:20	0.5	2.8	18.9	2	33	1025	1025	0	21.1	22	2.62	45
5/03/2024 2:20	0.5	2.7	18.9	2	32	1024	1024	0	21.1	22	2.62	45
5/03/2024 3:20	0.5	2.7	18.8	1	32	1024	1024	0	21.1	22	2.63	45
5/03/2024 4:20	0.5	2.6	18.8	2	32	1024	1024	0	21	22	2.62	46
5/03/2024 5:20	0.5	2.5	18.7	2	33	1024	1024	0	21	22	2.62	46

Date and Time	CH4	CO2	O2	H2S	CO	Bore press	Atm press	Diff press	°C	Water level	Battery (V)	Filter press
5/03/2024 6:20	0.5	2.5	18.7	2	33	1024	1024	0	20.9	22	2.62	47
5/03/2024 7:20	0.5	2.5	18.7	2	34	1024	1024	0	20.9	22	2.62	47
5/03/2024 8:20	0.5	2.5	18.7	2	34	1025	1025	0	20.9	22	2.6	48
5/03/2024 9:20	0.5	2.3	18.6	2	34	1025	1025	0	20.8	22	2.61	48
5/03/2024 10:20	GasClam temporarily removed to allow for bulk ground gas monitoring											
5/03/2024 12:20	0.5	1.5	20	1	0	1024	1024	0	23.1	22	2.63	38
5/03/2024 13:20	0.5	1.9	19.9	2	4	1026	1022	4	21.4	22	2.64	40
5/03/2024 14:20	0.5	1.9	19.9	2	11	1025	1021	4	21	22	2.63	39
5/03/2024 15:20	0.5	1.9	19.7	1	16	1021	1020	1	20.8	22	2.64	40
5/03/2024 16:20	0.5	1.9	19.6	1	22	1020	1020	0	20.8	22	2.63	41
5/03/2024 17:20	0.5	1.9	19.6	2	28	1020	1020	0	20.7	22	2.63	43
5/03/2024 18:20	0.5	1.8	19.6	2	35	1019	1019	0	20.6	22	2.62	41
5/03/2024 19:20	0.5	1.9	19.6	2	39	1020	1019	1	20.6	22	2.63	43
5/03/2024 20:20	0.5	1.8	19.6	2	45	1020	1020	0	20.6	22	2.62	43
5/03/2024 21:20	0.5	1.8	19.6	2	49	1020	1020	0	20.6	22	2.63	43
5/03/2024 22:20	0.5	1.8	19.5	2	54	1021	1020	1	20.6	22	2.61	45
5/03/2024 23:20	0.5	1.7	19.5	2	59	1020	1020	0	20.6	22	2.61	46
6/03/2024 0:20	0.5	1.8	19.5	2	63	1020	1020	0	20.6	22	2.62	47
6/03/2024 1:20	0.5	1.8	19.4	2	68	1020	1020	0	20.6	22	2.62	47
6/03/2024 2:20	0.9	1.8	19.4	2	74	1019	1019	0	20.6	22	2.61	46
6/03/2024 3:20	0.9	1.8	19.5	2	76	1019	1019	0	20.6	22	2.61	47
6/03/2024 4:20	0.9	1.7	19.3	2	82	1019	1019	0	20.6	22	2.61	48
6/03/2024 5:20	0.9	1.7	19.3	2	85	1019	1019	0	20.5	22	2.61	48
6/03/2024 6:20	0.9	1.8	19.3	3	90	1019	1019	0	20.5	22	2.61	49
6/03/2024 7:20	0.9	1.7	19.3	2	93	1020	1020	0	20.5	22	2.59	48
6/03/2024 8:20	0.9	1.8	19.3	2	95	1020	1020	0	20.4	22	2.6	48
6/03/2024 9:20	0.9	1.7	19.3	2	99	1020	1020	0	20.4	22	2.6	48
6/03/2024 10:20	1.4	1.9	19.3	2	104	1020	1020	0	20.4	22	2.6	48
6/03/2024 11:20	1.4	1.8	19.2	3	104	1020	1020	0	20.4	22	2.6	49
6/03/2024 12:20	1.4	1.7	19.1	2	108	1019	1019	0	20.3	22	2.59	50
6/03/2024 13:20	1.4	1.8	19.1	2	109	1018	1018	0	20.3	22	2.6	50
6/03/2024 14:20	1.4	1.7	19.1	2	112	1017	1017	0	20.3	22	2.61	50
6/03/2024 15:20	1.4	1.7	19.1	3	112	1016	1016	0	20.3	22	2.62	51
6/03/2024 16:20	1.4	1.7	19	2	115	1016	1016	0	20.3	22	2.6	52
6/03/2024 17:20	1.4	1.8	19	2	117	1016	1016	0	20.3	22	2.61	50
6/03/2024 18:20	1.4	1.9	19	3	117	1016	1016	0	20.3	22	2.61	52
6/03/2024 19:20	1.4	1.9	19	2	115	1017	1016	1	20.3	22	2.61	51
6/03/2024 20:20	1.4	2.6	18.2	2	68	1017	1017	0	20.3	22	2.59	51
6/03/2024 21:20	1.4	3.7	17.3	2	44	1018	1018	0	20.4	22	2.61	52
6/03/2024 22:20	1.4	4.6	16.6	2	35	1018	1018	0	20.4	22	2.62	53
6/03/2024 23:20	1.4	5	16.1	2	31	1018	1018	0	20.4	22	2.61	53
7/03/2024 0:20	1.4	5.6	15.8	2	27	1018	1018	0	20.5	22	2.59	53
7/03/2024 1:20	1.4	5.9	15.6	2	22	1018	1018	0	20.5	22	2.6	53
7/03/2024 2:20	1.4	6.2	15.4	2	20	1018	1017	1	20.6	22	2.61	54
7/03/2024 3:20	1.4	6.5	15.3	2	19	1018	1017	1	20.6	22	2.6	53
7/03/2024 4:20	1.4	6.6	15.1	2	20	1018	1018	0	20.6	22	2.6	54
7/03/2024 5:20	1.4	6.9	15	2	16	1020	1019	1	20.6	22	2.59	54
7/03/2024 6:20	1.4	7.1	14.9	2	16	1020	1020	0	20.7	22	2.61	52
7/03/2024 7:20	1.4	7.2	14.8	2	16	1021	1021	0	20.7	22	2.59	53
7/03/2024 8:20	1.4	7.4	14.8	2	14	1023	1022	1	20.7	22	2.6	54
7/03/2024 9:20	1.4	7.5	14.7	2	15	1024	1023	1	20.7	22	2.59	53
7/03/2024 10:20	1.4	7.6	14.6	2	15	1025	1024	1	20.7	22	2.59	54
7/03/2024 11:20	1.4	7.8	14.5	2	15	1025	1025	0	20.7	22	2.6	54
7/03/2024 12:20	1.4	8	14.4	2	16	1025	1024	1	20.7	22	2.6	55
7/03/2024 13:20	1.4	8.1	14.4	2	15	1025	1024	1	20.7	22	2.6	56
7/03/2024 14:20	1.4	8.3	14.3	2	14	1025	1024	1	20.7	22	2.6	54
7/03/2024 15:20	1.4	8.3	14.2	2	15	1024	1024	0	20.7	22	2.59	54
7/03/2024 16:20	1.4	8.3	14.2	2	15	1024	1024	0	20.7	22	2.59	54
7/03/2024 17:20	1.4	8.4	14.2	2	14	1025	1024	1	20.7	22	2.59	56
7/03/2024 18:20	1.4	8.4	14.1	2	14	1025	1025	0	20.7	22	2.59	54
7/03/2024 19:20	1.4	8.5	14.1	2	16	1026	1025	1	20.8	22	2.59	54
7/03/2024 20:20	1.4	8.4	14.1	2	15	1026	1026	0	20.8	22	2.59	55
7/03/2024 21:20	1.4	8.7	14.1	2	13	1027	1027	0	20.8	22	2.59	56
7/03/2024 22:20	1.4	8.7	14	2	14	1027	1027	0	20.8	22	2.58	56
7/03/2024 23:20	1.4	8.7	14	2	14	1027	1027	0	20.8	22	2.59	54
8/03/2024 0:20	1.4	8.9	13.9	2	16	1027	1027	0	20.8	22	2.58	56
8/03/2024 1:20	1.4	8.8	13.9	2	12	1027	1027	0	20.8	22	2.58	55

Date and Time	CH4	CO2	O2	H2S	CO	Bore press	Atm press	Diff press	°C	Water level	Battery (V)	Filter press
8/03/2024 2:20	1.4	8.9	13.9	2	15	1027	1026	1	20.8	22	2.58	57
8/03/2024 3:20	1.4	9	13.8	1	13	1026	1025	1	20.8	22	2.57	55
8/03/2024 4:20	1.4	9.1	13.8	2	15	1025	1025	0	20.8	22	2.57	56
8/03/2024 5:20	1.4	9.1	13.8	2	15	1025	1025	0	20.8	22	2.58	55
8/03/2024 6:20	1.4	9	13.8	2	13	1026	1025	1	20.8	22	2.57	57
8/03/2024 7:20	1.4	9.3	13.8	2	13	1026	1026	0	20.8	22	2.56	55
8/03/2024 8:20	1.4	9.3	13.7	2	13	1026	1026	0	20.8	22	2.57	55
8/03/2024 9:20	1.4	9.1	13.7	2	14	1027	1026	1	20.8	22	2.57	56
8/03/2024 10:20	1.4	9.3	13.7	2	15	1027	1026	1	20.8	22	2.58	56
8/03/2024 11:20	1.4	9.3	13.7	2	15	1027	1026	1	20.8	22	2.58	57
8/03/2024 12:20	1.4	9.3	13.6	2	11	1026	1025	1	20.8	22	2.57	56
8/03/2024 13:20	1.4	9.4	13.6	2	13	1025	1025	0	20.8	22	2.58	55
8/03/2024 14:20	1.4	9.3	13.6	2	13	1024	1024	0	20.8	22	2.57	57
8/03/2024 15:20	1.4	9.3	13.6	2	13	1024	1024	0	20.8	22	2.58	56
8/03/2024 16:20	1.4	9.6	13.6	2	14	1024	1023	1	20.8	22	2.58	57
8/03/2024 17:20	1.4	9.4	13.6	2	13	1023	1023	0	20.8	22	2.58	57
8/03/2024 18:20	1.4	9.6	13.6	2	13	1023	1023	0	20.8	22	2.57	56
8/03/2024 19:20	1.4	9.4	13.6	2	14	1024	1023	1	20.9	22	2.58	57
8/03/2024 20:20	1.4	9.6	13.6	2	15	1024	1024	0	20.9	22	2.59	56
8/03/2024 21:20	1.4	9.6	13.6	2	13	1025	1024	1	20.9	22	2.58	56
8/03/2024 22:20	1.4	9.6	13.6	2	14	1025	1025	0	20.9	22	2.58	57
8/03/2024 23:20	1.4	9.6	13.6	2	15	1025	1025	0	20.9	22	2.58	57
9/03/2024 0:20	1.4	9.6	13.6	2	13	1025	1025	0	20.9	22	2.58	56
9/03/2024 1:20	1.4	9.7	13.6	2	13	1025	1025	0	21	22	2.58	58
9/03/2024 2:20	1.4	9.7	13.6	2	14	1025	1024	1	21	22	2.58	57
9/03/2024 3:20	1.4	9.6	13.6	2	15	1025	1025	0	21	22	2.57	56
9/03/2024 4:20	1.4	9.6	13.6	2	15	1025	1025	0	21	22	2.56	56
9/03/2024 5:20	1.4	9.7	13.6	2	13	1025	1025	0	21	22	2.57	57
9/03/2024 6:20	1.4	9.7	13.6	2	15	1026	1025	1	21	22	2.57	57
9/03/2024 7:20	1.4	9.7	13.6	2	14	1026	1026	0	21	22	2.57	56
9/03/2024 8:20	1.4	9.8	13.6	2	15	1027	1027	0	21	22	2.56	57
9/03/2024 9:20	1.4	9.7	13.6	2	13	1027	1027	0	21	22	2.56	58
9/03/2024 10:20	1.4	9.9	13.6	2	13	1027	1027	0	20.9	22	2.56	57
9/03/2024 11:20	1.4	9.7	13.6	2	14	1027	1027	0	20.9	22	2.56	57
9/03/2024 12:20	1.8	9.7	13.6	2	15	1026	1026	0	20.9	22	2.57	57
9/03/2024 13:20	1.9	9.9	13.6	2	13	1026	1025	1	20.9	22	2.57	57
9/03/2024 14:20	1.9	9.9	13.6	2	12	1025	1025	0	20.9	22	2.57	57
9/03/2024 15:20	1.9	9.9	13.6	2	14	1024	1024	0	20.9	22	2.56	58
9/03/2024 16:20	1.9	9.9	13.6	2	13	1024	1024	0	20.8	22	2.56	58
9/03/2024 17:20	1.9	9.9	13.6	2	14	1024	1024	0	20.8	22	2.58	57
9/03/2024 18:20	1.9	9.7	13.6	2	13	1025	1024	1	20.8	22	2.57	59
9/03/2024 19:20	1.8	9.8	13.6	1	13	1025	1025	0	20.8	22	2.57	59
9/03/2024 20:20	1.9	9.9	13.6	2	13	1025	1025	0	20.8	22	2.56	57
9/03/2024 21:20	1.9	9.9	13.6	1	12	1027	1026	1	20.8	22	2.56	58
9/03/2024 22:20	1.8	9.9	13.6	2	13	1027	1027	0	20.9	22	2.56	58
9/03/2024 23:20	1.8	10	13.6	2	11	1027	1027	0	20.9	22	2.56	58
10/03/2024 0:20	1.9	10	13.6	2	13	1027	1027	0	20.9	22	2.56	58
10/03/2024 1:20	1.8	10	13.6	2	14	1027	1027	0	20.9	22	2.54	58
10/03/2024 2:20	1.8	10	13.6	2	11	1027	1027	0	20.9	22	2.56	59
10/03/2024 3:20	1.9	10	13.7	2	12	1027	1026	1	20.9	22	2.57	58
10/03/2024 4:20	1.8	10	13.7	2	13	1027	1026	1	20.9	22	2.54	58
10/03/2024 5:20	1.8	9.9	13.7	2	13	1027	1026	1	20.9	22	2.56	58
10/03/2024 6:20	1.8	9.8	13.7	2	14	1027	1027	0	20.9	22	2.54	58
10/03/2024 7:20	1.8	9.7	13.7	2	13	1028	1027	1	20.8	22	2.54	59
10/03/2024 8:20	1.9	10	13.7	1	13	1028	1027	1	20.8	22	2.54	58
10/03/2024 9:20	1.9	9.9	13.7	2	12	1028	1028	0	20.8	22	2.55	59
10/03/2024 10:20	1.9	9.9	13.7	2	11	1028	1028	0	20.8	22	2.52	57
10/03/2024 11:20	1.8	9.9	13.7	2	13	1028	1028	0	20.8	22	2.54	59
10/03/2024 12:20	1.8	10	13.8	1	13	1027	1027	0	20.8	22	2.54	58
10/03/2024 13:20	1.9	9.9	13.8	2	11	1027	1027	0	20.7	22	2.54	58
10/03/2024 14:20	1.8	9.7	13.7	2	13	1027	1026	1	20.7	22	2.56	60
10/03/2024 15:20	2.3	9.9	13.7	2	14	1026	1026	0	20.7	22	2.54	59
10/03/2024 16:20	1.9	10	13.8	2	13	1026	1025	1	20.6	22	2.54	60
10/03/2024 17:20	1.9	9.9	13.8	2	13	1026	1026	0	20.6	22	2.54	58
10/03/2024 18:20	2.3	10	13.8	2	14	1026	1026	0	20.6	22	2.54	58
10/03/2024 19:20	2.3	10	13.8	2	13	1027	1026	1	20.6	22	2.56	60
10/03/2024 20:20	1.8	10	13.8	2	15	1027	1027	0	20.6	22	2.55	60

Date and Time	CH4	CO2	O2	H2S	CO	Bore press	Atm press	Diff press	°C	Water level	Battery (V)	Filter press
10/03/2024 21:20	2.3	9.9	13.8	2	13	1027	1027	0	20.6	22	2.54	60
10/03/2024 22:20	2.3	10	13.8	2	12	1028	1027	1	20.7	22	2.54	59
10/03/2024 23:20	2.3	10	13.9	2	13	1028	1028	0	20.7	22	2.55	58
11/03/2024 0:20	2.3	9.9	13.9	2	12	1028	1027	1	20.7	22	2.54	61
11/03/2024 1:20	1.9	9.9	13.9	1	13	1027	1027	0	20.7	22	2.54	60
11/03/2024 2:20	2.3	10	13.9	2	13	1027	1027	0	20.7	22	2.53	58
11/03/2024 3:20	2.3	9.9	13.9	2	13	1027	1027	0	20.7	22	2.54	60
11/03/2024 4:20	2.3	10	13.9	2	13	1027	1027	0	20.7	22	2.53	59
11/03/2024 5:20	2.3	9.8	14	1	12	1027	1027	0	20.7	22	2.54	59
11/03/2024 6:20	2.3	10	14	2	12	1027	1027	0	20.7	22	2.52	60
11/03/2024 7:20	2.3	10	14	2	12	1027	1027	0	20.7	22	2.52	58
11/03/2024 8:20	2.3	9.9	14	2	13	1027	1027	0	20.7	22	2.53	59
11/03/2024 9:20	2.3	10	14	2	12	1027	1027	0	20.7	22	2.53	58
11/03/2024 10:20	2.3	9.9	14	2	14	1027	1027	0	20.6	22	2.51	59
11/03/2024 11:20	2.3	9.9	14	1	13	1027	1026	1	20.6	22	2.51	61
11/03/2024 12:20	2.3	9.9	14	2	13	1026	1025	1	20.6	22	2.52	60
11/03/2024 13:20	2.3	9.9	14	2	12	1025	1024	1	20.6	22	2.53	60
11/03/2024 14:20	2.3	9.7	14	2	11	1024	1024	0	20.6	22	2.51	61
11/03/2024 15:20	2.3	9.7	14	2	12	1023	1023	0	20.6	22	2.52	60
11/03/2024 16:20	2.3	9.7	14	1	12	1022	1022	0	20.6	22	2.53	60
11/03/2024 17:20	2.3	9.7	14.1	2	13	1022	1021	1	20.6	22	2.53	59
11/03/2024 18:20	2.3	9.8	14.1	2	13	1022	1021	1	20.6	22	2.53	60
11/03/2024 19:20	GasClam temporarily removed to purge the well dry											
11/03/2024 20:20	2.3	4.4	17.8	1	9	1021	1021	0	20.7	22	2.54	60
11/03/2024 21:20	2.3	4.9	17.6	1	13	1022	1022	0	20.6	22	2.53	60
11/03/2024 22:20	2.3	5.3	17.3	1	15	1022	1022	0	20.6	22	2.53	60
11/03/2024 23:20	2.3	5.6	17.1	2	16	1022	1021	1	20.7	22	2.53	59
12/03/2024 0:20	2.3	5.7	16.9	2	15	1021	1020	1	20.7	22	2.53	59
12/03/2024 1:20	2.3	5.9	16.7	2	15	1020	1020	0	20.7	22	2.51	58
12/03/2024 2:20	2.3	6.1	16.5	1	17	1020	1019	1	20.7	22	2.51	60
12/03/2024 3:20	2.3	6.4	16.4	2	16	1019	1018	1	20.7	22	2.52	60
12/03/2024 4:20	2.3	6.6	16.2	2	16	1018	1018	0	20.7	22	2.52	59
12/03/2024 5:20	2.3	6.7	16.1	2	16	1018	1018	0	20.7	22	2.51	59
12/03/2024 6:20	2.3	6.9	15.9	1	15	1018	1018	0	20.7	22	2.49	60
12/03/2024 7:20	2.3	7.1	15.8	2	15	1019	1018	1	20.7	22	2.51	61
12/03/2024 8:20	2.3	7.1	15.8	1	15	1018	1018	0	20.7	22	2.51	60
12/03/2024 9:20	2.8	7.4	15.7	1	16	1019	1018	1	20.6	22	2.54	59
12/03/2024 10:20	GasClam temporarily removed to allow for bulk ground gas monitoring											
12/03/2024 11:20	2.3	7.6	14.4	2	4	1017	1017	0	22.3	22	2.51	59
12/03/2024 12:20	2.3	8.5	13.4	2	9	1016	1016	0	21.2	22	2.51	57
12/03/2024 13:20	2.8	8.9	13.2	1	11	1016	1016	0	20.8	22	2.51	58
12/03/2024 14:20	2.7	9.1	13.2	2	11	1016	1016	0	20.7	22	2.5	59
12/03/2024 15:20	2.8	9.1	13.3	1	13	1016	1016	0	20.6	22	2.53	59
12/03/2024 16:20	2.7	9.3	13.3	1	14	1016	1016	0	20.6	22	2.51	59
12/03/2024 17:20	2.7	9.1	13.4	1	13	1016	1016	0	20.6	22	2.51	60
12/03/2024 18:20	2.7	9.1	13.5	2	12	1016	1016	0	20.5	22	2.52	58
12/03/2024 19:20	2.8	9.3	13.5	1	13	1017	1017	0	20.5	22	2.52	59
12/03/2024 20:20	2.7	9	13.6	2	11	1017	1017	0	20.5	22	2.51	59
12/03/2024 21:20	2.8	9.1	13.7	2	11	1018	1018	0	20.6	22	2.51	59
12/03/2024 22:20	2.8	9.1	13.7	2	12	1019	1018	1	20.6	22	2.52	61
12/03/2024 23:20	2.7	9.1	13.7	2	13	1019	1019	0	20.6	22	2.48	60
13/03/2024 0:20	2.8	9.3	13.8	2	11	1019	1018	1	20.6	22	2.51	60
13/03/2024 1:20	2.8	9.1	13.8	2	11	1019	1018	1	20.6	22	2.5	61
13/03/2024 2:20	2.8	9.3	13.8	2	10	1018	1018	0	20.6	22	2.5	59
13/03/2024 3:20	2.8	9.1	13.9	2	10	1018	1018	0	20.6	22	2.49	59
13/03/2024 4:20	2.8	9.1	13.9	2	11	1018	1017	1	20.6	22	2.5	59
13/03/2024 5:20	2.8	9.1	13.9	2	8	1018	1017	1	20.6	22	2.5	60
13/03/2024 6:20	2.8	9.1	13.9	2	11	1018	1017	1	20.6	22	2.53	60
13/03/2024 7:20	2.7	9	13.9	2	11	1018	1018	0	20.6	22	2.5	59
13/03/2024 8:20	2.8	9.1	14	2	10	1019	1018	1	20.6	22	2.48	60
13/03/2024 9:20	2.8	9	14	2	11	1019	1018	1	20.6	22	2.48	60
13/03/2024 10:20	2.8	9.3	14	1	10	1019	1018	1	20.6	22	2.49	59
13/03/2024 11:20	2.8	9.1	14	2	9	1018	1018	0	20.6	22	2.5	60
13/03/2024 12:20	2.8	9.1	14	2	12	1017	1017	0	20.6	22	2.5	60
13/03/2024 13:20	2.8	9.1	14	2	12	1017	1017	0	20.6	22	2.5	59
13/03/2024 14:20	2.8	9	14	2	10	1016	1016	0	20.6	22	2.51	60
13/03/2024 15:20	2.7	9.1	14	2	10	1015	1015	0	20.6	22	2.53	59

Date and Time	CH4	CO2	O2	H2S	CO	Bore press	Atm press	Diff press	°C	Water level	Battery (V)	Filter press
13/03/2024 16:20	2.8	8.8	14.1	2	10	1015	1015	0	20.7	22	2.52	60
13/03/2024 17:20	2.8	9	14.1	1	11	1014	1014	0	20.7	22	2.51	59
13/03/2024 18:20	2.8	9	14	2	10	1014	1014	0	20.8	22	2.51	59
13/03/2024 19:20	2.8	9.1	14.1	2	10	1014	1014	0	20.8	22	2.52	60
13/03/2024 20:20	2.8	9.1	14.1	2	10	1014	1014	0	20.8	22	2.51	58
13/03/2024 21:20	2.3	9	14.1	2	10	1014	1014	0	20.8	22	2.52	59
13/03/2024 22:20	2.3	9	14.2	1	11	1014	1014	0	20.9	22	2.5	59
13/03/2024 23:20	2.3	9	14.2	2	8	1013	1013	0	20.9	22	2.5	59
14/03/2024 0:20	2.3	9	14.2	2	10	1013	1013	0	20.9	22	2.5	58
14/03/2024 1:20	2.3	9	14.2	2	11	1012	1012	0	20.9	22	2.48	59
14/03/2024 2:20	2.3	9	14.2	2	11	1012	1011	1	21	22	2.53	59
14/03/2024 3:20	2.3	9	14.2	2	10	1011	1010	1	21	22	2.53	58
14/03/2024 4:20	2.3	9	14.2	2	10	1010	1010	0	21	22	2.49	58
14/03/2024 5:20	2.3	8.8	14.1	2	11	1010	1009	1	21.1	22	2.5	60
14/03/2024 6:20	2.3	9	14.2	2	11	1010	1010	0	21.1	22	2.48	58
14/03/2024 7:20	2.3	9	14.2	2	10	1011	1010	1	21.1	22	2.47	60
14/03/2024 8:20	2.3	9	14.2	1	10	1011	1011	0	21.1	22	2.47	59
14/03/2024 9:20	2.3	9.1	14.3	2	11	1012	1011	1	21	22	2.48	60
14/03/2024 10:20	2.8	9	14.3	2	10	1012	1012	0	21	22	2.49	60
14/03/2024 11:20	2.7	8.9	14.3	2	9	1011	1011	0	21	22	2.49	58
14/03/2024 12:20	2.7	9	14.3	2	8	1011	1010	1	21	22	2.49	60
14/03/2024 13:20	2.3	9	14.3	2	11	1011	1010	1	21	22	2.49	59
14/03/2024 14:20	2.8	8.7	14.4	1	10	1011	1011	0	21	22	2.53	58
14/03/2024 15:20	2.8	8.8	14.4	1	10	1011	1011	0	21	22	2.49	58
14/03/2024 16:20	2.8	8.6	14.5	1	10	1012	1012	0	21	22	2.52	60
14/03/2024 17:20	2.8	8.6	14.6	1	11	1012	1012	0	21	22	2.5	59
14/03/2024 18:20	2.8	8.7	14.6	2	11	1013	1013	0	21	22	2.49	60
14/03/2024 19:20	2.7	8.6	14.7	2	10	1014	1014	0	21	22	2.52	59
14/03/2024 20:20	2.8	8.7	14.7	2	10	1016	1016	0	21.1	22	2.49	59
14/03/2024 21:20	GasClam removed from GG3 due to predicted wet weather											
Average	1.5	6.6	16.0	2.1	52.4							

			NA			TPH					CRC Care TPH Fractions							BTEX					
			Sum of WA DWER PFAS (n=10)* UG/L	Total Other OC VIC EPA µg/L	Perfluorononane sulfonate (PFNS) µg/L	C6 - C9 µg/L	C10 - C14 µg/L	C15 - C28 µg/L	C29-C36 µg/L	+C10 - C36 (Sum of total) µg/L	C6-C10 µg/L	C10-C16 µg/L	C16-C34 µg/L	C34-C40 µg/L	C10 - C40 (Sum of total) µg/L	F1: C6-C10 less BTEX µg/L	F2: >C10-C16 less NAPHTHALENE µg/L	Naphthalene (VOC) µg/L	Benzene µg/L	Toluene µg/L	Ethylbenzene µg/L	Xylene (m & p) µg/L	Xylene (o) µg/L
Field ID	**Sample Type**	**Date**																					
RIN_240115	Rinsate	15 Jan 2024		<2		<20	<50	<100	<100	<100	<20	<50	<100	<100	<100	<20	<50	<10	<1	<1	<1	<2	<1
RIN_240118	Rinsate	18 Jan 2024	<0.005	<0.01	<0.001	<20	<50	<100	<100	<100	<20	<50	<100	<100	<100	<20	<50	<10	<1	<1	<1	<2	<1

Statistics

Statistics	Sum of WA DWER PFAS (n=10)*	Total Other OC VIC EPA	Perfluorononane sulfonate (PFNS)	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)	C6-C10	C10-C16	C16-C34	C34-C40	C10 - C40 (Sum of total)	F1: C6-C10 less BTEX	F2: >C10-C16 less NAPHTHALENE	Naphthalene (VOC)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)
Number of Results	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.005	<0.01	<0.001	<20	<50	<100	<100	<100	<20	<50	<100	<100	<100	<20	<50	<10	<1	<1	<1	<2	<1
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	<0.005	<2	<0.001	<20	<50	<100	<100	<100	<20	<50	<100	<100	<100	<20	<50	<10	<1	<1	<1	<2	<1
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration *		0.5		10	25	50	50	50	10	25	50	50	50	10	25	5	0.5	0.5	0.5	1	0.5
Geometric Average *	0.0025	0.071	0.0005	10	25	50	50	50	10	25	50	50	50	10	25	5	0.5	0.5	0.5	1	0.5
Median Concentration *	0.0025	0.5025	0.0005	10	25	50	50	50	10	25	50	50	50	10	25	5	0.5	0.5	0.5	1	0.5
Standard Deviation *		0.7		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geometric Standard Deviation *		42		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
95% UCL (Student's-t) *		3.644		10	25	50	50	50	10	25	50	50	50	10	25	5	0.5	0.5	0.5	1	0.5
% of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% of Non-Detects	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

* A Non Detect Multiplier of 0.5 has been applied.

				Metals																
			Xylene Total	Arsenic	Arsenic (filtered)	Cadmium	Cadmium (filtered)	Chromium (III+VI)	Chromium (III+VI) (filtered)	Copper	Copper (filtered)	Lead	Lead (filtered)	Mercury	Mercury (filtered)	Nickel	Nickel (filtered)	Zinc	Zinc (filtered)
			ug/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
Field ID	**Sample Type**	**Date**																	
RIN_240115	**Rinsate**	**15 Jan 2024**	<3	<1		<0.2		<1		<1		<1		<0.1		<1		<5	
RIN_240118	**Rinsate**	**18 Jan 2024**	<3	<1	<1	<0.2	<0.2	<1	<1	<1	<1	<1	<1	<0.1	<0.1	<1	<1	<5	<5

Statistics

Number of Results	**2**	**2**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**	**1**
Number of Detects	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Minimum Concentration	**<3**	**<1**	**<1**	**<0.2**	**<0.2**	**<1**	**<1**	**<1**	**<1**	**<1**	**<1**	**<0.1**	**<0.1**	**<1**	**<1**	**<5**	**<5**
Minimum Detect	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Maximum Concentration	**<3**	**<1**	**<1**	**<0.2**	**<0.2**	**<1**	**<1**	**<1**	**<1**	**<1**	**<1**	**<0.1**	**<0.1**	**<1**	**<1**	**<5**	**<5**
Maximum Detect	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Average Concentration *	**1.5**	**0.5**		**0.1**		**0.5**		**0.5**		**0.5**		**0.05**		**0.5**		**2.5**	
Geometric Average *	**1.5**	**0.5**	**0.5**	**0.1**	**0.1**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.05**	**0.05**	**0.5**	**0.5**	**2.5**	**2.5**
Median Concentration *	**1.5**	**0.5**	**0.5**	**0.1**	**0.1**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.05**	**0.05**	**0.5**	**0.5**	**2.5**	**2.5**
Standard Deviation *	**0**	**0**		**0**		**0**		**0**		**0**		**0**		**0**		**0**	
Geometric Standard Deviation *	**1**	**1**		**1**		**1**		**1**		**1**		**1**		**1**		**1**	
95% UCL (Student's-t) *	**1.5**	**0.5**		**0.1**		**0.5**		**0.5**		**0.5**		**0.05**		**0.5**		**2.5**	
% of Detects	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
% of Non-Detects	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

* A Non Detect Multiplier of 0.5 has been applied.

			Organic			PAH																
			Perfluoropropanesulfonic acid (PFPrS)	Sum of US EPA PFAS (PFOS + PFOA)*	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(k)fluoranthene	Benzo(b+j)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-c,d)pyrene	Dibenzo(a,h)anthracene	Benzo(g,h,i)perylene	PAHs (Sum of total)
			UG/KG	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	mg/L	µg/L	µg/L	µg/L	µg/L
Field ID	**Sample Type**	**Date**																				
RIN_240115	**Rinsate**	**15 Jan 2024**				<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.001	<1	<1	<1	<1
RIN_240118	**Rinsate**	**18 Jan 2024**	<0.001	<0.001	<0.001	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.00001	<0.01	<0.01	<0.01	<0.01
Statistics																						
Number of Results			1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Number of Detects			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration			<0.001	<0.001	<0.001	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.00001	<0.01	<0.01	<0.01	<0.01
Minimum Detect			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration			<0.001	<0.001	<0.001	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.001	<1	<1	<1	<1
Maximum Detect			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration *						0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.00025	0.25	0.25	0.25	0.25
Geometric Average *			0.0005	0.0005	0.0005	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.00005	0.05	0.05	0.05	0.05
Median Concentration *			0.0005	0.0005	0.0005	0.2525	0.2525	0.2525	0.2525	0.2525	0.2525	0.2525	0.2525	0.2525	0.2525	0.2525	0.2525	0.0002525	0.2525	0.2525	0.2525	0.2525
Standard Deviation *						0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.00035	0.35	0.35	0.35	0.35
Geometric Standard Deviation *						26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
95% UCL (Student's-t) *						1.815	1.815	1.815	1.815	1.815	1.815	1.815	1.815	1.815	1.815	1.815	1.815	0.00182	1.815	1.815	1.815	1.815
% of Detects			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% of Non-Detects			100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

* A Non Detect Multiplier of 0.5 has been applied.

			Organochlorine Pesticides																				
			Organochlorine pesticides IWRG621	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide
			ug/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
Field ID	**Sample Type**	**Date**																					
RIN_240115	Rinsate	15 Jan 2024	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
RIN_240118	Rinsate	18 Jan 2024	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Statistics

Statistics	Organochlorine pesticides IWRG621	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide
Number of Results	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration *	0.5	0.053	0.053	0.053	0.053	0.053	0.5	0.053	0.053	0.053	0.053	0.053	0.053	0.053	0.053	0.053	0.053	0.053	0.053	0.053	0.053
Geometric Average *	0.071	0.022	0.022	0.022	0.022	0.022	0.071	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022
Median Concentration *	0.5025	0.0525	0.0525	0.0525	0.0525	0.0525	0.5025	0.0525	0.0525	0.0525	0.0525	0.0525	0.0525	0.0525	0.0525	0.0525	0.0525	0.0525	0.0525	0.0525	0.0525
Standard Deviation *	0.7	0.067	0.067	0.067	0.067	0.067	0.7	0.067	0.067	0.067	0.067	0.067	0.067	0.067	0.067	0.067	0.067	0.067	0.067	0.067	0.067
Geometric Standard Deviation *	42	8.3	8.3	8.3	8.3	8.3	42	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3
95% UCL (Student's-t) *	3.644	0.352	0.352	0.352	0.352	0.352	3.644	0.352	0.352	0.352	0.352	0.352	0.352	0.352	0.352	0.352	0.352	0.352	0.352	0.352	0.352
% of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% of Non-Detects	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

* A Non Detect Multiplier of 0.5 has been applied.

						Organophosphorous Pesticides																	
			Hexachlorobenzene	Methoxychlor	Toxaphene	Azinophos methyl	Bolstar (Sulprofos)	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Coumaphos	Demeton-O	Demeton-S	Diazinon	Dichlorvos	Dimethoate	Disulfoton	Ethion	Ethoprop	Fenitrothion	Fensulfothion	Fenthion	Malathion
			µg/L	µg/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
Field ID	**Sample Type**	**Date**																					
RIN_240115	Rinsate	15 Jan 2024	<0.2	<0.2	<0.005	<2	<2	<20	<2	<2	<20	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
RIN_240118	Rinsate	18 Jan 2024	<0.01	<0.01	<0.002	<1	<1	<1	<10	<1	<10	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Statistics																							
Number of Results			2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Number of Detects			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration			<0.01	<0.01	<0.002	<1	<1	<1	<2	<1	<10	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Minimum Detect			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration			<0.2	<0.2	<0.005	<2	<2	<20	<10	<2	<20	<2	<10	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Maximum Detect			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration *			0.053	0.053	0.0018	0.75	0.75	5.2	3	0.75	7.5	0.75	3	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Geometric Average *			0.022	0.022	0.0016	0.71	0.71	2.2	2.2	0.71	7.1	0.71	2.2	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Median Concentration *			0.0525	0.0525	0.00175	0.75	0.75	5.25	3	0.75	7.5	0.75	3	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Standard Deviation *			0.067	0.067	0.0011	0.35	0.35	6.7	2.8	0.35	3.5	0.35	2.8	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
Geometric Standard Deviation *			8.3	8.3	1.9	1.6	1.6	8.3	3.1	1.6	1.6	1.6	3.1	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
95% UCL (Student's-t) *			0.352	0.352	0.00649	2.328	2.328	35.24	15.63	2.328	23.28	2.328	15.63	2.328	2.328	2.328	2.328	2.328	2.328	2.328	2.328	2.328	2.328
% of Detects			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% of Non-Detects			100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

* A Non Detect Multiplier of 0.5 has been applied.

Field ID	Sample Type	Date	Merphos	Methyl parathion	Mevinphos (Phosdrin)	Monocrotophos	Naled (Dibrom)	Omethoate	Phorate	Pyrazophos	Ronnel	Terbufos	Trichloronate	Tetrachlorvinphos	Insecticides Tokuthion
			mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L
RIN_240115	Rinsate	15 Jan 2024	<0.002	<2	<2	<2	<2	<20	<2	<2	<2	<2	<2	<0.002	<2
RIN_240118	Rinsate	18 Jan 2024	<0.001	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.001	<1

Statistics

Statistics	Merphos	Methyl parathion	Mevinphos (Phosdrin)	Monocrotophos	Naled (Dibrom)	Omethoate	Phorate	Pyrazophos	Ronnel	Terbufos	Trichloronate	Tetrachlorvinphos	Tokuthion
Number of Results	2	2	2	2	2	2	2	2	2	2	2	2	2
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.001	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.001	<1
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	<0.002	<2	<2	<2	<2	<20	<2	<2	<2	<2	<2	<0.002	<2
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration *	0.00075	0.75	0.75	0.75	0.75	5.2	0.75	0.75	0.75	0.75	0.75	0.00075	0.75
Geometric Average *	0.00071	0.71	0.71	0.71	0.71	2.2	0.71	0.71	0.71	0.71	0.71	0.00071	0.71
Median Concentration *	0.00075	0.75	0.75	0.75	0.75	5.25	0.75	0.75	0.75	0.75	0.75	0.00075	0.75
Standard Deviation *	0.00035	0.35	0.35	0.35	0.35	6.7	0.35	0.35	0.35	0.35	0.35	0.00035	0.35
Geometric Standard Deviation *	1.6	1.6	1.6	1.6	1.6	8.3	1.6	1.6	1.6	1.6	1.6	1.6	1.6
95% UCL (Student's-t) *	0.00233	2.328	2.328	2.328	2.328	35.24	2.328	2.328	2.328	2.328	2.328	0.00233	2.328
% of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0
% of Non-Detects	100	100	100	100	100	100	100	100	100	100	100	100	100

* A Non Detect Multiplier of 0.5 has been applied.

			Pesticides		Polychlorinated Biphenyls								SVOCs									
			Parathion	Pirimiphos-methyl	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	PCBs (Sum of total)	EPN	2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	Perfluorobutane sulfonic acid (PFBS)	Perfluorodecanoic acid (PFDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorononanoic acid (PFNA)	Perfluorooctane sulfonamide (FOSA)
			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
Field ID	**Sample Type**	**Date**																				
RIN_240115	Rinsate	15 Jan 2024	<2	<20	<5	<5	<5	<5	<5	<5	<5	<5	<2									
RIN_240118	Rinsate	18 Jan 2024	<1	<10	<5	<5	<5	<5	<5	<5	<5	<5	<1	<0.005	<0.005	<0.005	<0.005	<0.001	<0.001	<0.001	<0.001	<0.005
Statistics																						
Number of Results			2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1
Number of Detects			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration			<1	<10	<5	<5	<5	<5	<5	<5	<5	<5	<1	<0.005	<0.005	<0.005	<0.005	<0.001	<0.001	<0.001	<0.001	<0.005
Minimum Detect			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration			<2	<20	<5	<5	<5	<5	<5	<5	<5	<5	<2	<0.005	<0.005	<0.005	<0.005	<0.001	<0.001	<0.001	<0.001	<0.005
Maximum Detect			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration *			0.75	7.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	0.75									
Geometric Average *			0.71	7.1	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	0.71	0.0025	0.0025	0.0025	0.0025	0.0005	0.0005	0.0005	0.0005	0.0025
Median Concentration *			0.75	7.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	0.75	0.0025	0.0025	0.0025	0.0025	0.0005	0.0005	0.0005	0.0005	0.0025
Standard Deviation *			0.35	3.5	0	0	0	0	0	0	0	0	0.35									
Geometric Standard Deviation *			1.6	1.6	1	1	1	1	1	1	1	1	1.6									
95% UCL (Student's-t) *			2.328	23.28	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.328									
% of Detects			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% of Non-Detects			100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

* A Non Detect Multiplier of 0.5 has been applied.

			Perfluorocarbons																				
			Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	8:2 Fluorotelomer sulfonate	Perfluoroheptanoic acid (PFHpA)	Perfluorohexanoic acid (PFHxA)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	Perfluorobutanoic acid (PFBA)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluorooctane sulfonic acid (PFOS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluoropentanoic acid (PFPeA)	Sum of PFAS	Perfluorodecanesulfonic acid (PFDS)	Sum of PFHxS and PFOS	6:2 Fluorotelomer Sulfonate (6:2 FtS)	Perfluorooctanoate (PFOA)
			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	ug/L	µg/L	µg/L	µg/L	µg/L
Field ID	**Sample Type**	**Date**																					
RIN_240115	Rinsate	15 Jan 2024																					
RIN_240118	Rinsate	18 Jan 2024	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.005	<0.001
Statistics																							
Number of Results			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Number of Detects			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.005	<0.001
Minimum Detect			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.005	<0.001
Maximum Detect			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration *																							
Geometric Average *			0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0025	0.0025	0.0025	0.0005	0.0005	0.0005	0.0005	0.0005	0.0025	0.0005	0.0005	0.0025	0.0005
Median Concentration *			0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0025	0.0025	0.0025	0.0005	0.0005	0.0005	0.0005	0.0005	0.0025	0.0005	0.0005	0.0025	0.0005
Standard Deviation *																							
Geometric Standard Deviation *																							
95% UCL (Student's-t) *																							
% of Detects			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% of Non-Detects			100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

* A Non Detect Multiplier of 0.5 has been applied.

Field ID			BH02	QA200		BH02	QA200		BH02	QC200	
Matrix Type			Water	Water		Water	Water		Water	Water	
Sample Type			Normal	Field_D		Normal	Field_D		Normal	Interlab_D	
Date			18 Jan 2024	18 Jan 2024		18 Jan 2024	18 Jan 2024		18 Jan 2024	18 Jan 2024	
Lab Report Number			1061412	1061412	RPD	1060537	1060537	RPD	1060537	SE259463	RPD
	Unit	EQL									
EW_EPA418											
TRH C37-C40	µg/L	100								<100	
EW_LEED_MA_1523											
Perfluoro-n-hexadecanoic acid	µg/L	0.002								<0.002	
NA											
Perfluorododecane sulfonate (PFDoS)	µg/L	0.0005								<0.0005	
Sum of WA DWER PFAS (n=10)*	UG/L	0.005				0.021	0.037	55	0.021		
Total MAH*	MG/KG	0.003	<0.003	<0.003	0						
Total Other Chlorinated Hydrocarbons VIC EPA	µg/L	5	<5	<5	0						
Total Other OC VIC EPA	µg/L	0.01				<0.01	<0.01	0	<0.01		
Total PAH VIC EPA Guidelines (16)	µg/L	0.1								<0.1	
1H,1H,2H,2H-Perfluorooctane sulfonate (6:2) (6:2 F	µg/L	0.0005								<0.0005	
Perfluorobutane sulfonate (PFBS)	µg/L	0.001								<0.001	
Perfluorononane sulfonate (PFNS)	µg/L	0.0005				<0.001	<0.001	0	<0.001	<0.0005	0
Solvents											
Methyl Ethyl Ketone	µg/L	5	<5	<5	0						
4-Methyl-2-pentanone	µg/L	5	<5	<5	0						
Acetone	µg/L	5	<5	<5	0						
Allyl chloride	µg/L	1	<1	<1	0						
Carbon disulfide	µg/L	1	<1	<1	0						
TPH											
C6 - C9	µg/L	10								<10	
C10 - C14	µg/L	50								<50	
C15 - C28	µg/L	100								<100	
C29-C36	µg/L	50								<50	
+C10 - C36 (Sum of total)	µg/L	100								<100	
CRC Care TPH Fractions											
C6-C10	µg/L	10								<10	
C10-C16	µg/L	50								<50	
C16-C34	µg/L	100								<100	
C34-C40	µg/L	100								<100	
C10 - C40 (Sum of total)	µg/L	100									
F1: C6-C10 less BTEX	µg/L	10								<10	
F2: >C10-C16 less NAPHTHALENE	µg/L	50									
BTEX											
Naphthalene (VOC)	µg/L	0.1								<0.1	
Benzene	µg/L	0.1	<1	<1	0					<0.1	
Toluene	µg/L	0.1	<1	<1	0					<0.1	
Ethylbenzene	µg/L	0.1	<1	<1	0					<0.1	
Xylene (m & p)	µg/L	0.2	<2	<2	0					<0.2	
Xylene (o)	µg/L	0.1	<1	<1	0					<0.1	
Total BTEX	µg/L	0.6								<0.6	
Xylene Total	ug/L	1.5	<3	<3	0					<1.5	
MAH											
1,2,4-trimethylbenzene	µg/L	1	<1	<1	0						
1,3,5-trimethylbenzene	µg/L	1	<1	<1	0						
Isopropylbenzene	µg/L	1	<1	<1	0						
Styrene	µg/L	1	<1	<1	0						
Metals											
Arsenic	µg/L	1				<1	<1	0	<1	<1	0
Arsenic (filtered)	µg/L	1				<1	<1	0	<1	<1	0
Cadmium	µg/L	0.1				<0.2	<0.2	0	<0.2	<0.1	0
Cadmium (filtered)	µg/L	0.1				<0.2	<0.2	0	<0.2	<0.1	0
Chromium (III+VI)	µg/L	1				3	3	0	3	2	40
Chromium (III+VI) (filtered)	µg/L	1				<1	1	0	<1	2	67
Copper	µg/L	1				<1	<1	0	<1	<1	0
Copper (filtered)	µg/L	1				2	2	0	2	3	40
Lead	µg/L	1				1	<1	0	1	2	67
Lead (filtered)	µg/L	1				1	1	0	1	<1	0
Mercury	µg/L	0.1				<0.1	<0.1	0	<0.1	<0.1	0
Mercury (filtered)	µg/L	0.1				<0.1	<0.1	0	<0.1	<0.1	0
Nickel	µg/L	1				17	16	6	17	18	6
Nickel (filtered)	µg/L	1				16	16	0	16	17	6
Zinc	µg/L	5				21	22	5	21	25	17
Zinc (filtered)	µg/L	5				23	28	20	23	27	16
Organic											
Perfluoropropanesulfonic acid (PFPrS)	UG/KG	0.001				<0.001	<0.001	0	<0.001		
Sum of US EPA PFAS (PFOS + PFOA)*	µg/L	0.001				0.001	0.002	67	0.001		
Methane	µg/L	5									
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	µg/L	0.001				0.001	0.002	67	0.001		
PAH											
Naphthalene	µg/L	0.01				<0.01	<0.01	0	<0.01	<0.02	0
2-methylnaphthalene	µg/L	0.01								<0.01	
1-Methylnaphthalene	µg/L	0.01								<0.01	
Acenaphthylene	µg/L	0.01				<0.01	<0.01	0	<0.01	<0.01	0
Acenaphthene	µg/L	0.01				<0.01	<0.01	0	<0.01	<0.01	0
Fluorene	µg/L	0.01				<0.01	<0.01	0	<0.01	<0.01	0
Phenanthrene	µg/L	0.01				<0.01	<0.01	0	<0.01	<0.01	0
Anthracene	µg/L	0.01				<0.01	<0.01	0	<0.01	<0.01	0
Fluoranthene	µg/L	0.01				<0.01	<0.01	0	<0.01	<0.01	0
Pyrene	µg/L	0.01				<0.01	<0.01	0	<0.01	<0.01	0
Benz(a)anthracene	µg/L	0.01				<0.01	<0.01	0	<0.01	<0.01	0
Chrysene	µg/L	0.01				<0.01	<0.01	0	<0.01	<0.01	0
Benzo(k)fluoranthene	µg/L	0.01				<0.01	<0.01	0	<0.01		
Benzo(b)&(k)fluoranthene	µg/L	0.02								<0.02	
Benzo(b+j)fluoranthene	µg/L	0.01				<0.01	<0.01	0	<0.01		
Benzo(a)pyrene	mg/L	0.00001				<0.00001	<0.00001	0	<0.00001	<0.00001	0
Indeno(1,2,3-c,d)pyrene	µg/L	0.01				<0.01	<0.01	0	<0.01	<0.01	0
Dibenzo(a,h)anthracene	µg/L	0.01				<0.01	<0.01	0	<0.01	<0.01	0
Benzo(g,h,i)perylene	µg/L	0.01				<0.01	<0.01	0	<0.01	<0.01	0
Benzo(a)pyrene TEQ (Zero LOR)	TEQ (µg/L)	0.012								<0.012	
PAHs (Sum of total)	µg/L	0.01				<0.01	<0.01	0	<0.01	<0.1	0

	Unit	EQL									
Field ID			**BH02**	**QA200**		**BH02**	**QA200**		**BH02**	**QC200**	
Matrix Type			**Water**	**Water**		**Water**	**Water**		**Water**	**Water**	
Sample Type			**Normal**	**Field_D**		**Normal**	**Field_D**		**Normal**	**Interlab_D**	
Date			**18 Jan 2024**	**18 Jan 2024**		**18 Jan 2024**	**18 Jan 2024**		**18 Jan 2024**	**18 Jan 2024**	
Lab Report Number			**1061412**	**1061412**	**RPD**	**1060537**	**1060537**	**RPD**	**1060537**	**SE259463**	**RPD**
Organochlorine Pesticides											
Organochlorine pesticides IWRG621	**ug/L**	0.01				<0.01	<0.01	0	<0.01		
4,4-DDE	**µg/L**	0.01				<0.01	<0.01	0	<0.01	<0.01	0
a-BHC	**µg/L**	0.01				<0.01	<0.01	0	<0.01	<0.05	0
Aldrin	**µg/L**	0.01				<0.01	<0.01	0	<0.01	<0.01	0
Aldrin + Dieldrin	**µg/L**	0.01				<0.01	<0.01	0	<0.01		
b-BHC	**µg/L**	0.01				<0.01	<0.01	0	<0.01	<0.05	0
Chlordane	**µg/L**	0.01				<0.01	<0.01	0	<0.01		
Chlordane (cis)	**µg/L**	0.01								<0.01	
gamma-Chlordane	**µg/L**	0.01								<0.01	
d-BHC	**µg/L**	0.01				<0.01	<0.01	0	<0.01	<0.05	0
DDD	**µg/L**	0.01				<0.01	<0.01	0	<0.01	<0.01	0
DDT	**µg/L**	0.01				<0.01	<0.01	0	<0.01	<0.01	0
DDT+DDE+DDD	**µg/L**	0.01				<0.01	<0.01	0	<0.01		
Dieldrin	**µg/L**	0.01				<0.01	<0.01	0	<0.01	<0.01	0
Endosulfan I	**µg/L**	0.01				<0.01	<0.01	0	<0.01	<0.02	0
Endosulfan II	**µg/L**	0.01				<0.01	<0.01	0	<0.01	<0.02	0
Endosulfan sulphate	**µg/L**	0.01				<0.01	<0.01	0	<0.01	<0.02	0
Endrin	**µg/L**	0.01				<0.01	<0.01	0	<0.01	<0.02	0
Endrin aldehyde	**µg/L**	0.01				<0.01	<0.01	0	<0.01	<0.02	0
Endrin ketone	**µg/L**	0.01				<0.01	<0.01	0	<0.01	<0.05	0
g-BHC (Lindane)	**µg/L**	0.01				<0.01	<0.01	0	<0.01	<0.05	0
Heptachlor	**µg/L**	0.01				<0.01	<0.01	0	<0.01	<0.02	0
Heptachlor epoxide	**µg/L**	0.01				<0.01	<0.01	0	<0.01	<0.02	0
Hexachlorobenzene	**µg/L**	0.01				<0.01	<0.01	0	<0.01	<0.01	0
Methoxychlor	**µg/L**	0.01				<0.01	<0.01	0	<0.01	<0.1	0
Oxychlordane	**mg/L**	0.00001								<0.00001	
Toxaphene	**mg/L**	0.002				<0.002	<0.002	0	<0.002		
Organophosphorous Pesticides											
Azinophos methyl	**µg/L**	0.05				<1	<1	0	<1	<0.05	0
Bolstar (Sulprofos)	**µg/L**	1				<1	<1	0	<1		
Bromophos-ethyl	**µg/L**	0.05								<0.05	
Chlorfenvinphos	**µg/L**	1				<1	<1	0	<1		
Chlorpyrifos	**µg/L**	0.01				<10	<10	0	<10	<0.01	0
Chlorpyrifos-methyl	**µg/L**	1				<1	<1	0	<1		
Coumaphos	**µg/L**	10				<10	<10	0	<10		
Demeton-O	**µg/L**	1				<1	<1	0	<1		
Demeton-S	**µg/L**	10				<10	<10	0	<10		
Diazinon	**µg/L**	0.01				<1	<1	0	<1	<0.01	0
Dichlorvos	**µg/L**	0.5				<1	<1	0	<1	<0.5	0
Dimethoate	**µg/L**	0.15				<1	<1	0	<1	<0.15	0
Disulfoton	**µg/L**	1				<1	<1	0	<1		
Ethion	**µg/L**	0.05				<1	<1	0	<1	<0.05	0
Ethoprop	**µg/L**	1				<1	<1	0	<1		
Fenitrothion	**µg/L**	0.2				<1	<1	0	<1	<0.2	0
Fensulfothion	**µg/L**	1				<1	<1	0	<1		
Fenthion	**µg/L**	1				<1	<1	0	<1		
Malathion	**µg/L**	0.05				<1	<1	0	<1	<0.05	0
Merphos	**mg/L**	0.001				<0.001	<0.001	0	<0.001		
Methidathion	**µg/L**	0.05								<0.05	
Methyl parathion	**µg/L**	1				<1	<1	0	<1		
Mevinphos (Phosdrin)	**µg/L**	1				<1	<1	0	<1		
Monocrotophos	**µg/L**	1				<1	<1	0	<1		
Naled (Dibrom)	**µg/L**	1				<1	<1	0	<1		
Omethoate	**µg/L**	1				<1	<1	0	<1		
Phorate	**µg/L**	1				<1	<1	0	<1		
Pyrazophos	**µg/L**	1				<1	<1	0	<1		
Ronnel	**µg/L**	1				<1	<1	0	<1		
Terbufos	**µg/L**	1				<1	<1	0	<1		
Trichloronate	**µg/L**	1				<1	<1	0	<1		
Tetrachlorvinphos	**mg/L**	0.001				<0.001	<0.001	0	<0.001		
Insecticides											
Tokuthion	**µg/L**	1				<1	<1	0	<1		
Pesticides											
Isodrin	**µg/L**	0.02								<0.02	
Mirex	**µg/L**	0.01								<0.01	
Parathion	**µg/L**	0.01				<1	<1	0	<1	<0.01	0
Pirimiphos-methyl	**µg/L**	10				<10	<10	0	<10		
Polychlorinated Biphenyls											
Arochlor 1016	**µg/L**	1				<5	<5	0	<5	<1	0
Arochlor 1221	**µg/L**	1				<5	<5	0	<5	<1	0
Arochlor 1232	**µg/L**	1				<5	<5	0	<5	<1	0
Arochlor 1242	**µg/L**	1				<5	<5	0	<5	<1	0
Arochlor 1248	**µg/L**	1				<5	<5	0	<5	<1	0
Arochlor 1254	**µg/L**	1				<5	<5	0	<5	<1	0
Arochlor 1260	**µg/L**	1				<5	<5	0	<5	<1	0
Arochlor 1268	**mg/L**	0.001								<0.001	
Aroclor 1262	**µg/L**	1								<1	
PCBs (Sum of total)	**µg/L**	5				<5	<5	0	<5	<5	0
SVOCs											
EPN	**µg/L**	1				<1	<1	0	<1		
Chlorinated Hydrocarbons											
1,1,1,2-tetrachloroethane	**µg/L**	1	<1	<1	0						
1,1,1-trichloroethane	**µg/L**	1	<1	<1	0						
1,1,2,2-tetrachloroethane	**µg/L**	1	<1	<1	0						
1,1,2-trichloroethane	**µg/L**	1	<1	<1	0						
1,1-dichloroethane	**µg/L**	1	<1	<1	0						
1,1-dichloroethene	**µg/L**	1	<1	<1	0						
1,2,3-trichloropropane	**µg/L**	1	<1	<1	0						
1,2-dichloroethane	**µg/L**	1	<1	<1	0						
1,2-dichloropropane	**µg/L**	1	<1	<1	0						
1,3-dichloropropane	**µg/L**	1	<1	<1	0						
Bromochloromethane	**µg/L**	1	<1	<1	0						
Bromodichloromethane	**µg/L**	1	<1	<1	0						
Bromoform	**µg/L**	1	<1	<1	0						
Carbon tetrachloride	**µg/L**	1	<1	<1	0						
Chlorodibromomethane	**µg/L**	1	<1	<1	0						
Chloroethane	**µg/L**	5	<5	<5	0						
Chloroform	**µg/L**	5	<5	<5	0						
Chloromethane	**µg/L**	5	<5	<5	0						
cis-1,2-dichloroethene	**µg/L**	1	<1	<1	0						
cis-1,3-dichloropropene	**µg/L**	1	<1	<1	0						
Dibromomethane	**µg/L**	1	<1	<1	0						
Dichloromethane	**µg/L**	5	<5	<5	0						
Trichloroethene	**µg/L**	1	<1	<1	0						
Tetrachloroethene	**µg/L**	1	<1	<1	0						
trans-1,2-dichloroethene	**µg/L**	1	<1	<1	0						
trans-1,3-dichloropropene	**µg/L**	1	<1	<1	0						
Vinyl chloride	**µg/L**	5	<5	<5	0						

Field ID			BH02	QA200		BH02	QA200		BH02	QC200	
Matrix Type			Water	Water		Water	Water		Water	Water	
Sample Type			Normal	Field_D		Normal	Field_D		Normal	Interlab_D	
Date			18 Jan 2024	18 Jan 2024		18 Jan 2024	18 Jan 2024		18 Jan 2024	18 Jan 2024	
Lab Report Number			1061412	1061412	RPD	1060537	1060537	RPD	1060537	SE259463	RPD
	Unit	EQL									
Halogenated Hydrocarbons											
Chlorinated hydrocarbons IWRG621	µg/L	5	<5	<5	0						
1,2-dibromoethane	µg/L	1	<1	<1	0						
1,2-dichlorobenzene	µg/L	1	<1	<1	0						
1,3-dichlorobenzene	µg/L	1	<1	<1	0						
1,4-dichlorobenzene	µg/L	1	<1	<1	0						
4-chlorotoluene	µg/L	1	<1	<1	0						
Bromobenzene	µg/L	1	<1	<1	0						
Bromomethane	µg/L	5	<5	<5	0						
Chlorobenzene	µg/L	1	<1	<1	0						
Dichlorodifluoromethane	µg/L	5	<5	<5	0						
Iodomethane	µg/L	1	<1	<1	0						
Trichlorofluoromethane	µg/L	5	<5	<5	0						
Perfluorocarbons											
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	µg/L	0.0025				<0.005	<0.005	0	<0.005	<0.0025	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.0025				<0.005	<0.005	0	<0.005	<0.0025	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.0025				<0.005	<0.005	0	<0.005	<0.0025	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.0025				<0.005	<0.005	0	<0.005	<0.0025	0
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.001				<0.001	0.002	67	<0.001		
Perfluorodecanoic acid (PFDA)	µg/L	0.001				<0.001	<0.001	0	<0.001	<0.001	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.001				<0.001	<0.001	0	<0.001	<0.001	0
Perfluorononanoic acid (PFNA)	µg/L	0.001				<0.001	<0.001	0	<0.001	<0.001	0
Perfluorooctane sulfonamide (FOSA)	µg/L	0.002				<0.005	<0.005	0	<0.005	<0.002	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.001				<0.001	<0.001	0	<0.001	<0.001	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.001				<0.001	<0.001	0	<0.001	<0.001	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.001				<0.001	<0.001	0	<0.001	<0.001	0
8:2 Fluorotelomer sulfonate	µg/L	0.0005				<0.001	<0.001	0	<0.001	<0.0005	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.0005				<0.001	<0.001	0	<0.001	<0.0005	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.0005				<0.001	<0.001	0	<0.001	<0.0005	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.001				<0.001	<0.001	0	<0.001		
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.0005				<0.001	<0.001	0	<0.001	<0.0005	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.0025				<0.005	<0.005	0	<0.005	<0.0025	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.0025				<0.005	<0.005	0	<0.005	<0.0025	0
Perfluorobutanoic acid (PFBA)	µg/L	0.0005				<0.005	<0.005	0	<0.005	<0.0005	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.0002				<0.001	<0.001	0	<0.001	<0.0002	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.0002				<0.001	<0.001	0	<0.001	0.0003	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.0002				0.001	0.002	67	0.001	<0.0002	133
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.001				<0.001	<0.001	0	<0.001	<0.001	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.0005				<0.001	<0.001	0	<0.001	<0.0005	0
Sum of PFAS	ug/L	0.005				0.021	0.037	55	0.021	<0.006	111
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.0005				<0.001	<0.001	0	<0.001	<0.0005	0
Sum of PFHxS and PFOS	µg/L	0.0002				0.001	0.002	67	0.001	0.0003	108
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.005				0.020	0.033	49	0.020		
Perfluorooctanoate (PFOA)	µg/L	0.0005				<0.001	<0.001	0	<0.001	<0.0005	0

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

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

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

		Field ID	BH02	QA200		BH02	QA300		BH02	QC300	
		Matrix Type	Water	Water		Water	Water		Water	Water	
		Sample Type	Normal	Field_D		Normal	Field_D		Normal	Interlab_D	
		Date	18 Jan 2024	18 Jan 2024		27 Feb 2024	27 Feb 2024		27 Feb 2024	27 Feb 2024	
		Lab Report Number	1060806	1060806	RPD	1072931	1072931	RPD	1072931	SE261551	RPD
	Unit	EQL									
EW_EPA418											
TRH C37-C40	µg/L	100									
EW_LEED_MA_1523											
Perfluoro-n-hexadecanoic acid	µg/L	0.002									
NA											
Perfluorododecane sulfonate (PFDoS)	µg/L	0.0005									
Sum of WA DWER PFAS (n=10)*	UG/L	0.005									
Total MAH*	MG/KG	0.003									
Total Other Chlorinated Hydrocarbons VIC EPA	µg/L	5									
Total Other OC VIC EPA	µg/L	0.01									
Total PAH VIC EPA Guidelines (16)	µg/L	0.1									
1H,1H,2H,2H-Perfluorooctane sulfonate (6:2) (6:2 F	µg/L	0.0005									
Perfluorobutane sulfonate (PFBS)	µg/L	0.001									
Perfluorononane sulfonate (PFNS)	µg/L	0.0005									
Solvents											
Methyl Ethyl Ketone	µg/L	5									
4-Methyl-2-pentanone	µg/L	5									
Acetone	µg/L	5									
Allyl chloride	µg/L	1									
Carbon disulfide	µg/L	1									
TPH											
C6 - C9	µg/L	10	<20	<20	0						
C10 - C14	µg/L	50	<50	<50	0						
C15 - C28	µg/L	100	<100	<100	0						
C29-C36	µg/L	50	<100	<100	0						
+C10 - C36 (Sum of total)	µg/L	100	<100	<100	0						
CRC Care TPH Fractions											
C6-C10	µg/L	10	<20	<20	0						
C10-C16	µg/L	50	<50	<50	0						
C16-C34	µg/L	100	<100	<100	0						
C34-C40	µg/L	100	<100	<100	0						
C10 - C40 (Sum of total)	µg/L	100	<100	<100	0						
F1: C6-C10 less BTEX	µg/L	10	<20	<20	0						
F2: >C10-C16 less NAPHTHALENE	µg/L	50	<50	<50	0						
BTEX											
Naphthalene (VOC)	µg/L	0.1	<10	<10	0						
Benzene	µg/L	0.1	<1	<1	0						
Toluene	µg/L	0.1	<1	<1	0						
Ethylbenzene	µg/L	0.1	<1	<1	0						
Xylene (m & p)	µg/L	0.2	<2	<2	0						
Xylene (o)	µg/L	0.1	<1	<1	0						
Total BTEX	µg/L	0.6									
Xylene Total	ug/L	1.5	<3	<3	0						
MAH											
1,2,4-trimethylbenzene	µg/L	1									
1,3,5-trimethylbenzene	µg/L	1									
Isopropylbenzene	µg/L	1									
Styrene	µg/L	1									
Metals											
Arsenic	µg/L	1									
Arsenic (filtered)	µg/L	1									
Cadmium	µg/L	0.1									
Cadmium (filtered)	µg/L	0.1									
Chromium (III+VI)	µg/L	1									
Chromium (III+VI) (filtered)	µg/L	1									
Copper	µg/L	1									
Copper (filtered)	µg/L	1									
Lead	µg/L	1									
Lead (filtered)	µg/L	1									
Mercury	µg/L	0.1									
Mercury (filtered)	µg/L	0.1									
Nickel	µg/L	1									
Nickel (filtered)	µg/L	1									
Zinc	µg/L	5									
Zinc (filtered)	µg/L	5									
Organic											
Perfluoropropanesulfonic acid (PFPrS)	UG/KG	0.001									
Sum of US EPA PFAS (PFOS + PFOA)*	µg/L	0.001									
Methane	µg/L	5				950	1,100	15	950	230	122
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	µg/L	0.001									
PAH											
Naphthalene	µg/L	0.01									
2-methylnaphthalene	µg/L	0.01									
1-Methylnaphthalene	µg/L	0.01									
Acenaphthylene	µg/L	0.01									
Acenaphthene	µg/L	0.01									
Fluorene	µg/L	0.01									
Phenanthrene	µg/L	0.01									
Anthracene	µg/L	0.01									
Fluoranthene	µg/L	0.01									
Pyrene	µg/L	0.01									
Benz(a)anthracene	µg/L	0.01									
Chrysene	µg/L	0.01									
Benzo(k)fluoranthene	µg/L	0.01									
Benzo(b)&(k)fluoranthene	µg/L	0.02									
Benzo(b+j)fluoranthene	µg/L	0.01									
Benzo(a)pyrene	mg/L	0.00001									
Indeno(1,2,3-c,d)pyrene	µg/L	0.01									
Dibenzo(a,h)anthracene	µg/L	0.01									
Benzo(g,h,i)perylene	µg/L	0.01									
Benzo(a)pyrene TEQ (Zero LOR)	TEQ (µg/L)	0.012									
PAHs (Sum of total)	µg/L	0.01									

Stantec

Field ID			BH02	QA200		BH02	QA300		BH02	QC300	
Matrix Type			Water	Water		Water	Water		Water	Water	
Sample Type			Normal	Field_D		Normal	Field_D		Normal	Interlab_D	
Date			18 Jan 2024	18 Jan 2024		27 Feb 2024	27 Feb 2024		27 Feb 2024	27 Feb 2024	
Lab Report Number			1060806	1060806	RPD	1072931	1072931	RPD	1072931	SE261551	RPD
	Unit	EQL									
Organochlorine Pesticides											
Organochlorine pesticides IWRG621	ug/L	0.01									
4,4-DDE	µg/L	0.01									
a-BHC	µg/L	0.01									
Aldrin	µg/L	0.01									
Aldrin + Dieldrin	µg/L	0.01									
b-BHC	µg/L	0.01									
Chlordane	µg/L	0.01									
Chlordane (cis)	µg/L	0.01									
gamma-Chlordane	µg/L	0.01									
d-BHC	µg/L	0.01									
DDD	µg/L	0.01									
DDT	µg/L	0.01									
DDT+DDE+DDD	µg/L	0.01									
Dieldrin	µg/L	0.01									
Endosulfan I	µg/L	0.01									
Endosulfan II	µg/L	0.01									
Endosulfan sulphate	µg/L	0.01									
Endrin	µg/L	0.01									
Endrin aldehyde	µg/L	0.01									
Endrin ketone	µg/L	0.01									
g-BHC (Lindane)	µg/L	0.01									
Heptachlor	µg/L	0.01									
Heptachlor epoxide	µg/L	0.01									
Hexachlorobenzene	µg/L	0.01									
Methoxychlor	µg/L	0.01									
Oxychlordane	mg/L	0.00001									
Toxaphene	mg/L	0.002									
Organophosphorous Pesticides											
Azinophos methyl	µg/L	0.05									
Bolstar (Sulprofos)	µg/L	1									
Bromophos-ethyl	µg/L	0.05									
Chlorfenvinphos	µg/L	1									
Chlorpyrifos	µg/L	0.01									
Chlorpyrifos-methyl	µg/L	1									
Coumaphos	µg/L	10									
Demeton-O	µg/L	1									
Demeton-S	µg/L	10									
Diazinon	µg/L	0.01									
Dichlorvos	µg/L	0.5									
Dimethoate	µg/L	0.15									
Disulfoton	µg/L	1									
Ethion	µg/L	0.05									
Ethoprop	µg/L	1									
Fenitrothion	µg/L	0.2									
Fensulfothion	µg/L	1									
Fenthion	µg/L	1									
Malathion	µg/L	0.05									
Merphos	mg/L	0.001									
Methidathion	µg/L	0.05									
Methyl parathion	µg/L	1									
Mevinphos (Phosdrin)	µg/L	1									
Monocrotophos	µg/L	1									
Naled (Dibrom)	µg/L	1									
Omethoate	µg/L	1									
Phorate	µg/L	1									
Pyrazophos	µg/L	1									
Ronnel	µg/L	1									
Terbufos	µg/L	1									
Trichloronate	µg/L	1									
Tetrachlorvinphos	mg/L	0.001									
Insecticides											
Tokuthion	µg/L	1									
Pesticides											
Isodrin	µg/L	0.02									
Mirex	µg/L	0.01									
Parathion	µg/L	0.01									
Pirimiphos-methyl	µg/L	10									
Polychlorinated Biphenyls											
Arochlor 1016	µg/L	1									
Arochlor 1221	µg/L	1									
Arochlor 1232	µg/L	1									
Arochlor 1242	µg/L	1									
Arochlor 1248	µg/L	1									
Arochlor 1254	µg/L	1									
Arochlor 1260	µg/L	1									
Arochlor 1268	mg/L	0.001									
Aroclor 1262	µg/L	1									
PCBs (Sum of total)	µg/L	5									
SVOCs											
EPN	µg/L	1									
Chlorinated Hydrocarbons											
1,1,1,2-tetrachloroethane	µg/L	1									
1,1,1-trichloroethane	µg/L	1									
1,1,2,2-tetrachloroethane	µg/L	1									
1,1,2-trichloroethane	µg/L	1									
1,1-dichloroethane	µg/L	1									
1,1-dichloroethene	µg/L	1									
1,2,3-trichloropropane	µg/L	1									
1,2-dichloroethane	µg/L	1									
1,2-dichloropropane	µg/L	1									
1,3-dichloropropane	µg/L	1									
Bromochloromethane	µg/L	1									
Bromodichloromethane	µg/L	1									
Bromoform	µg/L	1									
Carbon tetrachloride	µg/L	1									
Chlorodibromomethane	µg/L	1									
Chloroethane	µg/L	5									
Chloroform	µg/L	5									
Chloromethane	µg/L	5									
cis-1,2-dichloroethene	µg/L	1									
cis-1,3-dichloropropene	µg/L	1									
Dibromomethane	µg/L	1									
Dichloromethane	µg/L	5									
Trichloroethene	µg/L	1									
Tetrachloroethene	µg/L	1									
trans-1,2-dichloroethene	µg/L	1									
trans-1,3-dichloropropene	µg/L	1									
Vinyl chloride	µg/L	5									

	Unit	EQL	BH02	QA200	RPD	BH02	QA300	RPD	BH02	QC300	RPD
Field ID			BH02	QA200		BH02	QA300		BH02	QC300	
Matrix Type			Water	Water		Water	Water		Water	Water	
Sample Type			Normal	Field_D		Normal	Field_D		Normal	Interlab_D	
Date			18 Jan 2024	18 Jan 2024		27 Feb 2024	27 Feb 2024		27 Feb 2024	27 Feb 2024	
Lab Report Number			1060806	1060806	RPD	1072931	1072931	RPD	1072931	SE261551	RPD
Halogenated Hydrocarbons											
Chlorinated hydrocarbons IWRG621	µg/L	5									
1,2-dibromoethane	µg/L	1									
1,2-dichlorobenzene	µg/L	1									
1,3-dichlorobenzene	µg/L	1									
1,4-dichlorobenzene	µg/L	1									
4-chlorotoluene	µg/L	1									
Bromobenzene	µg/L	1									
Bromomethane	µg/L	5									
Chlorobenzene	µg/L	1									
Dichlorodifluoromethane	µg/L	5									
Iodomethane	µg/L	1									
Trichlorofluoromethane	µg/L	5									
Perfluorocarbons											
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	µg/L	0.0025									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.0025									
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.0025									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.0025									
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.001									
Perfluorodecanoic acid (PFDA)	µg/L	0.001									
Perfluorododecanoic acid (PFDoDA)	µg/L	0.001									
Perfluorononanoic acid (PFNA)	µg/L	0.001									
Perfluorooctane sulfonamide (FOSA)	µg/L	0.002									
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.001									
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.001									
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.001									
8:2 Fluorotelomer sulfonate	µg/L	0.0005									
Perfluoroheptanoic acid (PFHpA)	µg/L	0.0005									
Perfluorohexanoic acid (PFHxA)	µg/L	0.0005									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.001									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.0005									
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.0025									
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.0025									
Perfluorobutanoic acid (PFBA)	µg/L	0.0005									
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.0002									
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.0002									
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.0002									
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.001									
Perfluoropentanoic acid (PFPeA)	µg/L	0.0005									
Sum of PFAS	ug/L	0.005									
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.0005									
Sum of PFHxS and PFOS	µg/L	0.0002									
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.005									
Perfluorooctanoate (PFOA)	µg/L	0.0005									

*RPDs have only been considered where a concentration is greater than 1 times the EC
**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for eac
***Interlab Duplicates are matched on a per compound basis as methods vary betwee

APPENDIX D

Geological Logs / Construction Details

Stantec

BOREHOLE LOG SHEET

Client: Landcom			Hole No: BH04
Project: Nowra Build to Rent			
Location: Bomaderry		Job No: 304001019	Sheet: 1 of 1
Position:		Angle from Horizontal: 90°	Surface Elevation:
Rig Type: Geoprobe		Mounting: Track	Driller: EPOCA
Casing Diameter: PVC/Screen			Contractor:
Data Started: 12/1/24	Date Completed: 12/1/24	Logged By: KE	Checked By:

Drilling: Method	Drilling: Resistance	Drilling: Casing	Water	Sampling & Testing: Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
HA (0.00–0.25 m)				ES 0.10 m	0.25m			Silty clayey SAND; Loose, fine to medium grained, uniform, dark greyish brown, trace gravels.	M		0.00 m: Rootlets.
AH (0.25–5.00 m)		Screen (approx. 2.2–5.0 m)			0.5						
					1.0			Softer section of rock.			
					1.5						
					2.0			Softer section of rock.			
					2.5			Softer section of rock and decrease in dust.			
					3.0 – 4.5						
					5.00m			TERMINATED AT 5.00 m Target depth			

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
RR Rock roller

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

Stantec Australia PTY LTD

Stantec

TEST PIT LOG SHEET

Client: Landcom
Project: Nowra Build to Rent
Location: Bomaderry

Hole No: TP107

Job No: 304001019
Sheet: 1 of 1

Position:
Angle from Horizontal: 90°
Surface Elevation:

Machine Type: 3.5 tonne Excavator
Excavation Method: Gummy Bucket

Excavation Dimensions:
Contractor:

Date Excavated: 15/1/24
Logged By: KE
Checked By:

Excavation: Method	Excavation: Resistance	Excavation: Stability	Water	Sampling & Testing: Sample or Field Test	Depth (m)	Graphic Log	Classification	Material Description: SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
				ES 0.10 m				Silty SAND; Loose, fine to medium grained, uniform, dark greyish brown, trace gravels.	M		0.00 m: Rootlets.
					0.15m			TERMINATED AT 0.15 m Refusal			

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
RR Rock roller

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
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PBT - Plate Bearing Test
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VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

Stantec Australia PTY LTD

Stantec

TEST PIT LOG SHEET

Client: Landcom
Project: Nowra Build to Rent
Location: Bomaderry

Hole No: TP108

Job No: 304001019
Sheet: 1 of 1

Position:	**Angle from Horizontal:** 90°	**Surface Elevation:**
Machine Type: 3.5 tonne Excavator	**Excavation Method:** Gummy Bucket	
Excavation Dimensions:		**Contractor:**
Date Excavated: 15/1/24	**Logged By:** KE	**Checked By:**

Excavation: Method	Excavation: Resistance	Excavation: Stability	Water	Sampling & Testing: Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
								Sandy CLAY; Soft, low plasticity, well graded, orangey brown, trace gravels.			0.00 m: Rootlets.
				ES 0.10 m							
					0.15m			Silty SAND; Loose, fine to medium grained, uniform, dark greyish brown, trace gravels.	M		
				ES 0.30 m							
					0.35m			TERMINATED AT 0.35 m Refusal			

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
RR Rock roller

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
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DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
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RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

Stantec Australia PTY LTD

Stantec

TEST PIT LOG SHEET

Client: Landcom **Project:** Nowra Build to Rent **Location:** Bomaderry	**Job No:** 304001019	**Hole No: TP109** **Sheet:** 1 of 1
Position:	**Angle from Horizontal:** 90°	**Surface Elevation:**
Machine Type: 3.5 tonne Excavator	**Excavation Method:** Gummy Bucket	
Excavation Dimensions:		**Contractor:**
Date Excavated: 15/1/24	**Logged By:** KE	**Checked By:**

Excavation: Method	Excavation: Resistance	Excavation: Stability	Water	Sampling & Testing: Sample or Field Test	Depth (m)	Graphic Log	Classification	Material Description: SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
				ES 0.10 m				Silty SAND; Loose, fine to medium grained, uniform, dark brown, trace gravels.	M		0.00 m: Rootlets.
							0.15m	TERMINATED AT 0.15 m Refusal			

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
RR Rock roller

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
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MC - Moisture Content
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PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
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LL - Liquid limit
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SOIL CONSISTENCY
VS - Very Soft
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RELATIVE DENSITY
VL - Very Loose
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MD - Medium Dense
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Stantec Australia PTY LTD

Stantec

TEST PIT LOG SHEET

Client: Landcom
Project: Nowra Build to Rent
Location: Bomaderry

Hole No: TP110

Job No: 304001019
Sheet: 1 of 1

Position:
Angle from Horizontal: 90°
Surface Elevation:

Machine Type: 3.5 tonne Excavator
Excavation Method: Gummy Bucket

Excavation Dimensions:
Contractor:

Date Excavated: 15/1/24
Logged By: KE
Checked By:

Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
				ES 0.10 m				Sandy CLAY; Soft, low plasticity, well graded, orangey brown, trace gravels.	M		0.00 m: Rootlets and sandstone pebbles.
				ES 0.50 m	0.5			0.50m TERMINATED AT 0.50 m Refusal			

STANTEC 2.01.6 LIB.GLB Log STANTEC NON-CORED 8202118201_CONTAMLOGS.GPJ <<DrawingFile>> 16/01/2024 14:30 10.03.00.09 Datgel AGS RTA, Photo, Monitoring Tools

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
RR Rock roller

PENETRATION
VE Very Easy (No Resistance)
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VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
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PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
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SOIL CONSISTENCY
VS - Very Soft
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RELATIVE DENSITY
VL - Very Loose
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MD - Medium Dense
D - Dense
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Refer to explanatory notes for details of abbreviations and basis of descriptions

Stantec Australia PTY LTD

Stantec

TEST PIT LOG SHEET

Client: Landcom
Project: Nowra Build to Rent
Location: Bomaderry

Hole No: TP111

Job No: 304001019
Sheet: 1 of 1

Position:	**Angle from Horizontal:** 90°	**Surface Elevation:**
Machine Type: 3.5 tonne Excavator	**Excavation Method:** Gummy Bucket	
Excavation Dimensions:		**Contractor:**
Date Excavated: 15/1/24	**Logged By:** KE	**Checked By:**

Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
								Silty SAND; Loose, fine to medium grained, uniform, dark brown, trace gravels.			0.00 m: Rootlets and sandstone pebbles.
				ES 0.10 m							
					0.20m			Clayey SAND; Loose, fine to coarse grained, uniform, orangey brown, trace gravels.			
				ES 0.30 m					M		
					0.5						
					0.65m			TERMINATED AT 0.65 m Refusal			

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
RR Rock roller

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

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PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
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MOISTURE
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SOIL CONSISTENCY
VS - Very Soft
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RELATIVE DENSITY
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Refer to explanatory notes for details of abbreviations and basis of descriptions

Stantec Australia PTY LTD

Stantec

TEST PIT LOG SHEET

Client: Landcom
Project: Nowra Build to Rent
Location: Bomaderry

Hole No: TP112

Job No: 304001019
Sheet: 1 of 1

Position:	**Angle from Horizontal:** 90°	**Surface Elevation:**
Machine Type: 3.5 tonne Excavator	**Excavation Method:** Gummy Bucket	
Excavation Dimensions:		**Contractor:**
Date Excavated: 15/1/24	**Logged By:** KE	**Checked By:**

Excavation: Method	Excavation: Resistance	Excavation: Stability	Water	Sampling & Testing: Sample or Field Test	Depth (m)	Graphic Log	Classification	Material Description: SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
								Silty sandy CLAY; Firm, medium plasticity, uniform, dark greyish brown, medium grained sand.			0.00 m: Rootlets and sandstone pebbles.
				ES 0.10 m							
									M		
				ES 0.50 m	0.5						
								0.60m			
								TERMINATED AT 0.60 m Refusal			

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
RR Rock roller

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
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St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

Stantec Australia PTY LTD

Stantec

TEST PIT LOG SHEET

Client: Landcom
Project: Nowra Build to Rent
Location: Bomaderry

Hole No: TP113

Job No: 304001019 | **Sheet:** 1 of 1

Position: | **Angle from Horizontal:** 90° | **Surface Elevation:**

Machine Type: 3.5 tonne Excavator | **Excavation Method:** Gummy Bucket

Excavation Dimensions: | **Contractor:**

Date Excavated: 15/1/24 | **Logged By:** KE | **Checked By:**

Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
				ES 0.10 m ES 0.50 m	0.5			Silty sandy CLAY; Firm, medium plasticity, uniform, dark greyish brown, medium grained sand.	M		0.00 m: Rootlets and sandstone cobbles.
								0.60m TERMINATED AT 0.60 m Refusal			

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
RR Rock roller

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
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VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
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U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
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LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
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St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
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Refer to explanatory notes for details of abbreviations and basis of descriptions

Stantec Australia PTY LTD

Stantec

TEST PIT LOG SHEET

Client: Landcom
Project: Nowra Build to Rent
Location: Bomaderry

Hole No: TP114

Job No: 304001019
Sheet: 1 of 1

Position:
Angle from Horizontal: 90°
Surface Elevation:
Machine Type: 3.5 tonne Excavator
Excavation Method: Gummy Bucket
Excavation Dimensions:
Contractor:
Date Excavated: 15/1/24
Logged By: KE
Checked By:

Excavation: Method	Excavation: Resistance	Excavation: Stability	Water	Sampling & Testing: Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
				ES 0.10 m				Silty sandy CLAY; Firm, medium plasticity, uniform, dark greyish brown, medium grained sand.			0.00 m: Rootlets.
							0.25m	TERMINATED AT 0.25 m Refusal	M		

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
RR Rock roller

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

Stantec Australia PTY LTD

Stantec

TEST PIT LOG SHEET

Client: Landcom
Project: Nowra Build to Rent
Location: Bomaderry

Job No: 304001019

Hole No: TP115

Sheet: 1 of 1

Position:	**Angle from Horizontal:** 90°	**Surface Elevation:**
Machine Type: 3.5 tonne Excavator	**Excavation Method:** Gummy Bucket	
Excavation Dimensions:		**Contractor:**
Date Excavated: 15/1/24	**Logged By:** KE	**Checked By:**

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
				ES 0.10 m				Silty sandy CLAY; Firm, medium plasticity, uniform, dark greyish brown, medium grained sand.	M		0.00 m: Rootlets.
					0.30m			TERMINATED AT 0.30 m Refusal			

METHOD	
EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION	
VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER
- Water Level on Date shown
- water inflow
- water outflow

FIELD TESTS	
SPT	Standard Penetration Test
HP	Hand/Pocket Penetrometer
DCP	Dynamic Cone Penetrometer
PSP	Perth Sand Penetrometer
MC	Moisture Content
PBT	Plate Bearing Test
IMP	Borehole Impression Test
PID	Photoionisation Detector
VS	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES	
B	Bulk disturbed sample
D	Disturbed sample
ES	Environmental sample
U	Thin wall tube 'undisturbed'

MOISTURE	
D	Dry
M	Moist
W	Wet
PL	Plastic limit
LL	Liquid limit
w	Moisture content

SOIL CONSISTENCY	
VS	Very Soft
S	Soft
F	Firm
St	Stiff
VSt	Very Stiff
H	Hard

RELATIVE DENSITY	
VL	Very Loose
L	Loose
MD	Medium Dense
D	Dense
VD	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

Stantec Australia PTY LTD

Stantec

BOREHOLE LOG SHEET

Client: Landcom
Project: Nowra Build to Rent
Location: Bomaderry

Job No: 304001019

Hole No: GG1

Sheet: 1 of 1

Position:	**Angle from Horizontal: 90°**	**Surface Elevation:**
Rig Type: Geoprobe	**Mounting: Track**	**Driller: EPOCA**
Casing Diameter: PVC/Screen		**Contractor:**
Data Started: 21/2/24 / **Date Completed: 21/2/24**	**Logged By: AC**	**Checked By:**

Drilling: Method	Drilling: Resistance	Drilling: Casing	Water	Sampling & Testing: Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
AH (0.0–2.0 m)		PVC (0.0–1.2 m)			0.0–0.30			Sandy SILT; Loose, fine to medium grained, uniform, dark greyish brown, trace gravels.	M		0.00 m: Rootlets.
		Screen (1.2–2.0 m)			0.30–2.00			0.30m			
					2.0			2.00m TERMINATED AT 2.00 m Target depth			

Depth scale: 0.5, 1.0, 1.5, 2.0

METHOD
- EX Excavator bucket
- R Ripper
- HA Hand auger
- PT Push tube
- SON Sonic drilling
- AH Air hammer
- PS Percussion sampler
- AS Short spiral auger
- AD/V Solid flight auger: V-Bit
- AD/T Solid flight auger: TC-Bit
- HFA Hollow flight auger
- WB Washbore drilling
- RR Rock roller

PENETRATION
- VE Very Easy (No Resistance)
- E Easy
- F Firm
- H Hard
- VH Very Hard (Refusal)

WATER
- Water Level on Date shown
- water inflow
- water outflow

FIELD TESTS
- SPT - Standard Penetration Test
- HP - Hand/Pocket Penetrometer
- DCP - Dynamic Cone Penetrometer
- PSP - Perth Sand Penetrometer
- MC - Moisture Content
- PBT - Plate Bearing Test
- IMP - Borehole Impression Test
- PID - Photoionisation Detector
- VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
- B - Bulk disturbed sample
- D - Disturbed sample
- ES - Environmental sample
- U - Thin wall tube 'undisturbed'

MOISTURE
- D - Dry
- M - Moist
- W - Wet
- PL - Plastic limit
- LL - Liquid limit
- *w* - Moisture content

SOIL CONSISTENCY
- VS - Very Soft
- S - Soft
- F - Firm
- St - Stiff
- VSt - Very Stiff
- H - Hard

RELATIVE DENSITY
- VL - Very Loose
- L - Loose
- MD - Medium Dense
- D - Dense
- VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

Stantec Australia PTY LTD

Stantec

BOREHOLE LOG SHEET

Client: Landcom
Project: Nowra Build to Rent
Location: Bomaderry

Hole No: GG2

Job No: 304001019 **Sheet:** 1 of 1

Position:	**Angle from Horizontal:** 90°	**Surface Elevation:**
Rig Type: Geoprobe	**Mounting:** Track	**Driller:** EPOCA
Casing Diameter: PVC/Screen		**Contractor:**
Data Started: 21/2/24 **Date Completed:** 21/2/24	**Logged By:** AC	**Checked By:**

Drilling: Method	Drilling: Resistance	Drilling: Casing	Water	Sampling & Testing: Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
AH (0.00–1.80 m)		PVC Screen			0.10m			Sandy SILT; Loose, fine to medium grained, uniform, dark greyish brown, trace gravels.			
		Screen			1.80m						
								TERMINATED AT 1.80 m Target depth			

Depth scale: 0.5, 1.0, 1.5, 2.0

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
RR Rock roller

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

Stantec Australia PTY LTD

Stantec

BOREHOLE LOG SHEET

Client: Landcom			**Hole No: GG3**
Project: Nowra Build to Rent			
Location: Bomaderry		Job No: 304001019	Sheet: 1 of 1
Position:		Angle from Horizontal: 90°	Surface Elevation:
Rig Type: Geoprobe		Mounting: Track	Driller: EPOCA
Casing Diameter: PVC/Screen			Contractor:
Data Started: 21/2/24	Date Completed: 21/2/24	Logged By: AC	Checked By:

Drilling: Method	Drilling: Resistance	Drilling: Casing	Water	Sampling & Testing: Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
AH (0.00–2.00 m)		PVC (0.00–1.20 m)			0.00–0.50			Sandy SILT; Loose, fine to medium grained, uniform, dark greyish brown, trace gravels.			0.00 m: Rootlets.
		Screen (1.20–2.00 m)			0.50–2.00						
					2.00			TERMINATED AT 2.00 m Target depth			

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
RR Rock roller

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
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St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

Stantec Australia PTY LTD

APPENDIX E

Laboratory Certificates

Chain of Custody

Stantec

From: Stantec Wollongong
Address: Shop 1, Level 1
16 Burelli St
Wollongong NSW 2500
Phone: (02) 4231 9600
Attention: katelyn.elliott@stantec.com
Email: katelyn.elliott@stantec.com mitch.blencowe@stantec.com
Mobile: 0.047614411

To: Eurofins Wollongong
Address: Unit 16
7 Investigator Dr
Unanderra NSW 2526
Phone: (02) 9900 8400
Email: EnviroSampleNSW@eurofins.com

Date: 1/15/2024
TAT: Std 5 days
Purchase Order: NA
Laboratory Quote ID: Stantec Rates
Project number: 304001019
Project name: Bomaderry
Data output format: PDF, Esdat

Attempt to chill evident: Y / N   Sample Temperature on Arrival: 13.7°C

Notes:

Laboratory Sample Number	Cardno Sample Number	Sample Date	Matrix	Container (Plastic Tube – PT, Bag – B, Petri Dish – PD, Plastic Bottle – PB, Plastic Jar - PJ, Glass Jar – GJ, Glass Bottle – GB, Glass Vial - GV)	TRH	TRH w/ Silica Gel	BTEXN	PAHS	OCP	OPP	PCB	Lead	M7 - Metals (exc. Hg)	M8 - Metals (inc. Hg)	Cr6)	Phenols - Speciated	VOCs	SVOC	Asbestos in Soil (NEPM)	Asbestos in Building Mat.	PFAS Short Suite - Std LOR	Dup to 2nd Lab	Hold	Select Analyte or Delete to Clear	Select Analyte or Delete to Clear	Select Analyte or Delete to Clear	Applicable Suites	Sample Comments
	BH04_0.1	1/12/2024	Soil	GJ, PJ, B	1		1	1	1	1	1			1					1		1						B7 B15	
	TP107_0.1	1/15/2024	Soil	GJ, PJ, B	1		1	1						1					1								B7	
	TP108_0.1	1/15/2024	Soil	GJ, PJ, B	1		1	1	1	1	1			1					1		1						B7 B15	
	TP108_0.3	1/15/2024	Soil	GJ, PJ, B	1		1	1						1													B7	
	TP109_0.1	1/15/2024	Soil	GJ, PJ, B	1		1	1						1					1								B7	
	TP110_0.1	1/15/2024	Soil	GJ, PJ, B	1		1	1	1	1	1			1					1		1						B7 B15	
	TP110_0.5	1/15/2024	Soil	GJ, PJ, B	1		1	1						1													B7	
	TP111_0.1	1/15/2024	Soil	GJ, PJ, B	1		1	1	1	1	1			1					1								B7 B15	
	TP111_0.3	1/15/2024	Soil	GJ, PJ, B	1		1	1						1													B7	
	TP112_0.1	1/15/2024	Soil	GJ, PJ, B	1		1	1	1	1	1			1					1		1						B7 B15	
	TP112_0.5	1/15/2024	Soil	GJ, PJ, B	1		1	1						1					1								B7	
	TP113_0.1	1/15/2024	Soil	GJ, PJ, B	1		1	1	1	1	1			1					1								B7 B15	
	TP113_0.5	1/15/2024	Soil	GJ, PJ, B	1		1	1						1													B7	
	TP114_0.1	1/15/2024	Soil	GJ, PJ, B	1		1	1	1	1	1			1					1		1						B7 B15	
	TP115_0.1	1/15/2024	Soil	GJ, PJ, B	1		1	1	1	1	1			1					1								B7 B15	
				Total	15		15	15	8	8	8			15					11		5							

Relinquished By: Katelyn Elliott
Company: Stantec
Time: 1:30pm
Date: 15/01/2024

Received By: Greg DB
Company: Eurofins
Time: 9:00AM
Date: 16/1/24

Relinquished By:
Company:
Time:
Date:

Received By:
Company:
Time:
Date:

#1059639

Chain of Custody

Stantec

From: Stantec Wollongong
Address: Shop 1, Level 1
16 Burelli St
Wollongong NSW 2500
Phone: (02) 4231 9600
Attention: **katelyn.elliott@stantec.com**
Email: katelyn.elliott@stantec.com **mitch.blencowe@stantec.com**
Mobile: **0.047614411**

To: Eurofins Wollongong
Address: Unit 16
7 Investigator Dr
Unanderra NSW 2526
Phone: (02) 9900 8400
Email: EnviroSampleNSW@eurofins.com

Date: 1/15/2024
TAT: Std 5 days
Purchase Order: NA
Laboratory Quote ID: Stantec Rates
Project number: 304001019
Project name: Bomaderry
Data output format: PDF, Esdat

Attempt to chill evident: Y / N

Sample Temperature on Arrival: ____________

Notes:

Laboratory Sample Number	Cardno Sample Number	Sample Date	Matrix	Container (Plastic Tube – PT, Bag – B, Petri Dish – PD, Plastic Bottle – PB, Plastic Jar - PJ, Glass Jar – GJ, Glass Bottle – GB, Glass Vial - GV)	TRH	TRH w/ Silica Gel	BTEXN	PAHS	OCP	OPP	PCB	Lead	M7 - Metals (exc. Hg)	M8 - Metals (inc. Hg)	Cr6)	Phenols - Speciated	VOCs	SVOC	Asbestos in Soil (NEPM)	Asbestos in Building Mat.	PFAS Short Suite - Std LOR	Dup to 2nd Lab	Hold	Select Analyte or Delete to Clear	Select Analyte or Delete to Clear	Select Analyte or Delete to Clear	Applicable Suites	Sample Comments
	SP01_ACM1	1/15/2024	Building Mat	B																1								
	QA111	1/15/2024	Soil	GJ, PJ	1		1	1	1	1	1			1							1						B7 B15	
	QC111	1/15/2024	Soil	GJ, PJ	1		1	1	1	1	1			1							1	1					B7 B15	Please send to SGS for testing
	RIN_240112	1/12/2024	Water	5x Bottles																			1					
	RIN_240115	1/15/2024	Water	5x Bottles	1		1	1	1	1	1			1													B7 B15	
	Trip spike	1/12/2024	Soil	2x GV	1		1																				B1	
	Trip blank	1/12/2024	Soil	2x GV	1		1																				B1	
	Trip spike	1/15/2024	Soil	2x GV	1		1																				B1	
	Trip blank	1/15/2024	Soil	2x GV	1		1																				B1	
				Total	7		7	3	3	3	3			3						1	2	1	1					

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne 6 Monterey Road Dandenong South VIC 3175 +61 3 8564 5000 NATA# 1261 Site# 1254
Geelong 19/8 Lewalan Street Grovedale VIC 3216 +61 3 8564 5000 NATA# 1261 Site# 25403
Sydney 179 Magowar Road Girraween NSW 2145 +61 2 9900 8400 NATA# 1261 Site# 18217
Canberra Unit 1,2 Dacre Street Mitchell ACT 2911 +61 2 6113 8091 NATA# 1261 Site# 25466
Brisbane 1/21 Smallwood Place Murarrie QLD 4172 T: +61 7 3902 4600 NATA# 1261 Site# 20794
Newcastle 1/2 Frost Drive Mayfield West NSW 2304 +61 2 4968 8448 NATA# 1261 Site# 25079 & 25289

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

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

Auckland 35 O'Rorke Road Penrose, Auckland 1061 +64 9 526 4551 IANZ# 1327
Auckland (Asb) Unit C1/4 Pacific Rise, Mount Wellington, Auckland 1061 +64 9 525 0568 IANZ# 1308
Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 +64 3 343 5201 IANZ# 1290
Tauranga 1277 Cameron Road, Gate Pa, Tauranga 3112 +64 9 525 0568 IANZ# 1402

Company Name: Stantec Australia Pty Ltd (Wollongong)
Address: Ground Floor, 16 Burelli Street
Wollongong
NSW 2500

Order No.:
Report #: 1059638
Phone: (02) 9493 9700
Fax:

Received: Jan 16, 2024 9:00 AM
Due: Jan 22, 2024
Priority: 5 Day
Contact Name: Katelyn Elliott

Project Name: BOMADERRY
Project ID: 304001019

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	BTEXN and Volatile TRH	Per- and Polyfluoroalkyl Substances (PFASs) - Short	BTEXN and Volatile TRH
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X	X	X	X	X	X
External Laboratory														
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**									
1	BH04_0.1	Jan 12, 2024		Soil	W24-Ja0016061	X			X	X	X		X	
2	TP107_0.1	Jan 15, 2024		Soil	W24-Ja0016126	X				X	X			
3	TP108_0.1	Jan 15, 2024		Soil	W24-Ja0016127	X			X	X	X		X	
4	TP108_0.3	Jan 15, 2024		Soil	W24-Ja0016128					X	X			
5	TP109_0.1	Jan 15, 2024		Soil	W24-Ja0016129	X				X	X			
6	TP110_0.1	Jan 15, 2024		Soil	W24-Ja0016130	X			X	X	X		X	
7	TP110_0.5	Jan 15, 2024		Soil	W24-Ja0016131					X	X			
8	TP111_0.1	Jan 15, 2024		Soil	W24-Ja0016132	X			X	X	X			
9	TP111_0.3	Jan 15, 2024		Soil	W24-Ja0016133					X	X			
10	TP112_0.1	Jan 15, 2024		Soil	W24-Ja0016134	X			X	X	X		X	
11	TP112_0.5	Jan 15, 2024		Soil	W24-Ja0016135	X				X	X			
12	TP113_0.1	Jan 15, 2024		Soil	W24-Ja0016136	X			X	X	X			
13	TP113_0.5	Jan 15, 2024		Soil	W24-Ja0016137					X	X			

Company Name: Stantec Australia Pty Ltd (Wollongong)
Address: Ground Floor, 16 Burelli Street
Wollongong
NSW 2500

Order No.:
Report #: 1059638
Phone: (02) 9493 9700
Fax:

Received: Jan 16, 2024 9:00 AM
Due: Jan 22, 2024
Priority: 5 Day
Contact Name: Katelyn Elliott

Project Name: BOMADERRY
Project ID: 304001019

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	BTEXN and Volatile TRH	Per- and Polyfluoroalkyl Substances (PFASs) - Short	BTEXN and Volatile TRH
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X	X	X	X	X	X
14	TP114_0.1	Jan 15, 2024		Soil	W24-Ja0016138	X			X	X	X		X	
15	TP115_0.1	Jan 15, 2024		Soil	W24-Ja0016139	X			X	X	X			
16	SP01_ACM1	Jan 15, 2024		Building Materials	W24-Ja0016140		X							
17	QA111	Jan 15, 2024		Soil	W24-Ja0016141				X	X	X		X	
18	RIN_240112	Jan 12, 2024		Water	W24-Ja0016142			X						
19	RIN_240115	Jan 15, 2024		Water	W24-Ja0016143				X		X			
20	TRIP SPIKE	Jan 12, 2024		Water	W24-Ja0016144									X
21	TRIP BLANK	Jan 12, 2024		Water	W24-Ja0016145							X		
22	TRIP SPIKE LAB	Jan 12, 2024		Water	W24-Ja0016146									X
23	TRIP SPIKE	Jan 15, 2024		Water	W24-Ja0016147									X
24	TRIP BLANK	Jan 15, 2024		Water	W24-Ja0016148							X		
25	TRIP SPIKE LAB	Jan 15, 2024		Water	W24-Ja0016149									X
Test Counts						11	1	1	10	16	17	2	6	4

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

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.

Stantec Australia Pty Ltd
Ground Floor, 16 Burelli Street
Wollongong
NSW 2500

Attention:	Katelyn Elliott
Report	1059638-AID
Project Name	BOMADERRY
Project ID	304001019
Received Date	Jan 16, 2024
Date Reported	Jan 24, 2024

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples 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.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres 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 4964 - 2004. *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	The performance limitation of the AS 4964 (2004) 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 (LOR), per se. Examination of a 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 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "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 BOMADERRY
Project ID 304001019
Date Sampled Jan 12, 2024 to Jan 15, 2024
Report 1059638-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
BH04_0.1	24-Ja0016061	Jan 12, 2024	Approximate Sample 588g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP107_0.1	24-Ja0016126	Jan 15, 2024	Approximate Sample 395g Sample consisted of: Brown coarse-grained sandy soil, plant residue and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP108_0.1	24-Ja0016127	Jan 15, 2024	Approximate Sample 472g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP109_0.1	24-Ja0016129	Jan 15, 2024	Approximate Sample 539g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP110_0.1	24-Ja0016130	Jan 15, 2024	Approximate Sample 658g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP111_0.1	24-Ja0016132	Jan 15, 2024	Approximate Sample 505g Sample consisted of: Brown coarse-grained sandy soil, plant residue and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP112_0.1	24-Ja0016134	Jan 15, 2024	Approximate Sample 467g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP112_0.5	24-Ja0016135	Jan 15, 2024	Approximate Sample 582g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
TP113_0.1	24-Ja0016136	Jan 15, 2024	Approximate Sample 495g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP114_0.1	24-Ja0016138	Jan 15, 2024	Approximate Sample 495g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP115_0.1	24-Ja0016139	Jan 15, 2024	Approximate Sample 549g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SP01_ACM1	24-Ja0016140	Jan 15, 2024	Approximate Sample 21g / 70x40x5mm Sample consisted of: Grey fibre cement material	Chrysotile and amosite 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	Sydney	Jan 16, 2024	Indefinite
Asbestos - LTM-ASB-8020	Sydney	Jan 16, 2024	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	T: +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	Site# 25079 & 25289

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35 O'Rorke Road	Unit C1/4 Pacific Rise,	43 Detroit Drive	1277 Cameron Road,
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IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: Stantec Australia Pty Ltd (Wollongong)
Address: Ground Floor, 16 Burelli Street
Wollongong
NSW 2500

Project Name: BOMADERRY
Project ID: 304001019

Order No.:
Report #: 1059638
Phone: (02) 9493 9700
Fax:

Received: Jan 16, 2024 9:00 AM
Due: Jan 22, 2024
Priority: 5 Day
Contact Name: Katelyn Elliott

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	BTEXN and Volatile TRH	Per- and Polyfluoroalkyl Substances (PFASs) - Short	BTEXN and Volatile TRH
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X	X	X	X	X	X
External Laboratory														
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**									
1	BH04_0.1	Jan 12, 2024		Soil	W24-Ja0016061	X			X	X	X		X	
2	TP107_0.1	Jan 15, 2024		Soil	W24-Ja0016126	X				X	X			
3	TP108_0.1	Jan 15, 2024		Soil	W24-Ja0016127	X			X	X	X		X	
4	TP108_0.3	Jan 15, 2024		Soil	W24-Ja0016128					X	X			
5	TP109_0.1	Jan 15, 2024		Soil	W24-Ja0016129	X				X	X			
6	TP110_0.1	Jan 15, 2024		Soil	W24-Ja0016130	X			X	X	X		X	
7	TP110_0.5	Jan 15, 2024		Soil	W24-Ja0016131					X	X			
8	TP111_0.1	Jan 15, 2024		Soil	W24-Ja0016132	X			X	X	X			
9	TP111_0.3	Jan 15, 2024		Soil	W24-Ja0016133					X	X			
10	TP112_0.1	Jan 15, 2024		Soil	W24-Ja0016134	X			X	X	X		X	
11	TP112_0.5	Jan 15, 2024		Soil	W24-Ja0016135	X				X	X			
12	TP113_0.1	Jan 15, 2024		Soil	W24-Ja0016136	X			X	X	X			
13	TP113_0.5	Jan 15, 2024		Soil	W24-Ja0016137					X	X			

Company Name: Stantec Australia Pty Ltd (Wollongong)
Address: Ground Floor, 16 Burelli Street
Wollongong
NSW 2500

Order No.:
Report #: 1059638
Phone: (02) 9493 9700
Fax:

Received: Jan 16, 2024 9:00 AM
Due: Jan 22, 2024
Priority: 5 Day
Contact Name: Katelyn Elliott

Project Name: BOMADERRY
Project ID: 304001019

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	BTEXN and Volatile TRH	Per- and Polyfluoroalkyl Substances (PFASs) - Short	BTEXN and Volatile TRH
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X	X	X	X	X	X
14	TP114_0.1	Jan 15, 2024		Soil	W24-Ja0016138	X			X	X	X		X	
15	TP115_0.1	Jan 15, 2024		Soil	W24-Ja0016139	X			X	X	X			
16	SP01_ACM1	Jan 15, 2024		Building Materials	W24-Ja0016140		X							
17	QA111	Jan 15, 2024		Soil	W24-Ja0016141				X	X	X		X	
18	RIN_240112	Jan 12, 2024		Water	W24-Ja0016142			X						
19	RIN_240115	Jan 15, 2024		Water	W24-Ja0016143				X		X			
20	TRIP SPIKE	Jan 12, 2024		Soil	W24-Ja0016144									X
21	TRIP BLANK	Jan 12, 2024		Soil	W24-Ja0016145							X		
22	TRIP SPIKE	Jan 15, 2024		Soil	W24-Ja0016147									X
23	TRIP BLANK	Jan 15, 2024		Soil	W24-Ja0016148							X		
Test Counts						11	1	1	10	16	17	2	6	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 with the colour **blue** indicates data provided by customer that may have an impact on 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).
If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported. Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

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 contained within a non-asbestos matrix, typically presented in bonded (non-friable) condition. For the purposes of 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 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 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 4964-2004.
Dry	Sample is dried by heating prior to analysis.
DS	Dispersion Staining. 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 that was previously non-friable and in a severely degraded condition. For the purposes of the NEPM and WA DOH, FA generally corresponds to material larger than 7 mm x 7 mm, although FA may be more difficult to visibly distinguish 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 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 purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess degree of friability.
HSG248	UK HSE HSG248, *Asbestos: The Analysts Guide*, 2nd Edition (2021).
HSG264	UK HSE HSG264, *Asbestos: The Survey Guide* (2012).
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)].
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 in accordance with AS 4964-2004.
PCM	Phase Contrast Microscopy. As used for Fibre Counting according to the MFM.
PLM	Polarised Light Microscopy. As used for Fibre Identification and Trace Analysis according to AS 4964-2004.
Sampling	Unless otherwise stated Eurofins are not responsible for sampling equipment or the sampling process.
SMF	Synthetic Mineral Fibre Detected. SMF may also refer to Man Made Vitreous Fibres. Identified in accordance with AS 4964-2004.
SRA	Sample Receipt Advice.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres (particularly asbestos) in a given sample matrix.
UK HSE HSG	United Kingdom, Health and Safety Executive, Health and Safety Guidance, publication.
UMF	Unidentified Mineral Fibre Detected. Fibrous minerals that are detected but have not been unequivocally identified by PLM with DS according the AS 4964-2004. May include (but not limited to) Actinolite, Anthophyllite or Tremolite asbestos.
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

24-Ja0016126, 24-Ja0016127, 24-Ja0016134, 24-Ja0016136 and 24-Ja0016138: Samples received were less than the nominal 500mL as recommended in Section 4.10 of the NEPM Schedule B1 - Guideline on Investigation Levels for Soil and Groundwater.

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:

Chamath JHM Annakkage	Senior Analyst-Asbestos

Authorised by:

Sayeed Abu	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.

eurofins Environment Testing

Certificate of Analysis

Stantec Australia Pty Ltd
Ground Floor, 16 Burelli Street
Wollongong
NSW 2500

NATA Accredited
Accreditation Number 1261
Site Number 18217

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:	**Katelyn Elliott**
Report	**1059638-S**
Project name	BOMADERRY
Project ID	304001019
Received Date	Jan 16, 2024

Client Sample ID			**BH04_0.1**	**TP107_0.1**	**TP108_0.1**	**TP108_0.3**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**W24-Ja0016061**	**W24-Ja0016126**	**W24-Ja0016127**	**W24-Ja0016128**
Date Sampled			**Jan 12, 2024**	**Jan 15, 2024**	**Jan 15, 2024**	**Jan 15, 2024**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	52
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	52
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	93	131	104	94
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			BH04_0.1	TP107_0.1	TP108_0.1	TP108_0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			W24-Ja0016061	W24-Ja0016126	W24-Ja0016127	W24-Ja0016128
Date Sampled			Jan 12, 2024	Jan 15, 2024	Jan 15, 2024	Jan 15, 2024
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	103	99	105	106
p-Terphenyl-d14 (surr.)	1	%	107	92	110	109
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	< 0.05	-
a-HCH	0.05	mg/kg	< 0.05	-	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
b-HCH	0.05	mg/kg	< 0.05	-	< 0.05	-
d-HCH	0.05	mg/kg	< 0.05	-	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.05	-
g-HCH (Lindane)	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.05	-
Methoxychlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Toxaphene	0.5	mg/kg	< 0.5	-	< 0.5	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	-	< 0.1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	-	< 0.1	-
Dibutylchlorendate (surr.)	1	%	80	-	84	-
Tetrachloro-m-xylene (surr.)	1	%	101	-	108	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	-	< 0.2	-
Bolstar	0.2	mg/kg	< 0.2	-	< 0.2	-
Chlorfenvinphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Chlorpyrifos	0.2	mg/kg	< 0.2	-	< 0.2	-
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	-	< 0.2	-
Coumaphos	2	mg/kg	< 2	-	< 2	-
Demeton-S	0.2	mg/kg	< 0.2	-	< 0.2	-
Demeton-O	0.2	mg/kg	< 0.2	-	< 0.2	-
Diazinon	0.2	mg/kg	< 0.2	-	< 0.2	-
Dichlorvos	0.2	mg/kg	< 0.2	-	< 0.2	-
Dimethoate	0.2	mg/kg	< 0.2	-	< 0.2	-
Disulfoton	0.2	mg/kg	< 0.2	-	< 0.2	-
EPN	0.2	mg/kg	< 0.2	-	< 0.2	-
Ethion	0.2	mg/kg	< 0.2	-	< 0.2	-

Client Sample ID			BH04_0.1	TP107_0.1	TP108_0.1	TP108_0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			W24-Ja0016061	W24-Ja0016126	W24-Ja0016127	W24-Ja0016128
Date Sampled			Jan 12, 2024	Jan 15, 2024	Jan 15, 2024	Jan 15, 2024
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Ethoprop	0.2	mg/kg	< 0.2	-	< 0.2	-
Ethyl parathion	0.2	mg/kg	< 0.2	-	< 0.2	-
Fenitrothion	0.2	mg/kg	< 0.2	-	< 0.2	-
Fensulfothion	0.2	mg/kg	< 0.2	-	< 0.2	-
Fenthion	0.2	mg/kg	< 0.2	-	< 0.2	-
Malathion	0.2	mg/kg	< 0.2	-	< 0.2	-
Merphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Methyl parathion	0.2	mg/kg	< 0.2	-	< 0.2	-
Mevinphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Monocrotophos	2	mg/kg	< 2	-	< 2	-
Naled	0.2	mg/kg	< 0.2	-	< 0.2	-
Omethoate	2	mg/kg	< 2	-	< 2	-
Phorate	0.2	mg/kg	< 0.2	-	< 0.2	-
Pirimiphos-methyl	0.2	mg/kg	< 0.2	-	< 0.2	-
Pyrazophos	0.2	mg/kg	< 0.2	-	< 0.2	-
Ronnel	0.2	mg/kg	< 0.2	-	< 0.2	-
Terbufos	0.2	mg/kg	< 0.2	-	< 0.2	-
Tetrachlorvinphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Tokuthion	0.2	mg/kg	< 0.2	-	< 0.2	-
Trichloronate	0.2	mg/kg	< 0.2	-	< 0.2	-
Triphenylphosphate (surr.)	1	%	97	-	94	-
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	%	80	-	84	-
Tetrachloro-m-xylene (surr.)	1	%	101	-	108	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Metals M8						
Arsenic	2	mg/kg	< 2	3.7	9.1	8.5
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	< 5	5.5	23	21
Copper	5	mg/kg	< 5	11	17	23
Lead	5	mg/kg	5.9	16	19	58
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	6.0	31
Zinc	5	mg/kg	6.8	39	130	1300
Sample Properties						
% Moisture	1	%	15	33	22	21

Client Sample ID			BH04_0.1	TP107_0.1	TP108_0.1	TP108_0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			W24-Ja0016061	W24-Ja0016126	W24-Ja0016127	W24-Ja0016128
Date Sampled			Jan 12, 2024	Jan 15, 2024	Jan 15, 2024	Jan 15, 2024
Test/Reference	LOR	Unit				
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	%	60	-	67	-
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	-	< 5	-
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	-	< 5	-
18O2-PFHxS (surr.)	1	%	107	-	97	-
13C8-PFOS (surr.)	1	%	95	-	91	-
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	-	< 5	-
13C8-PFOA (surr.)	1	%	100	-	97	-
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	-

Client Sample ID			TP109_0.1	TP110_0.1	TP110_0.5	TP111_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			W24-Ja0016129	W24-Ja0016130	W24-Ja0016131	W24-Ja0016132
Date Sampled			Jan 15, 2024	Jan 15, 2024	Jan 15, 2024	Jan 15, 2024
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	99	140	137	124
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			TP109_0.1	TP110_0.1	TP110_0.5	TP111_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			W24-Ja0016129	W24-Ja0016130	W24-Ja0016131	W24-Ja0016132
Date Sampled			Jan 15, 2024	Jan 15, 2024	Jan 15, 2024	Jan 15, 2024
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	85	102	75	92
p-Terphenyl-d14 (surr.)	1	%	87	108	83	100
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	< 0.1
4.4'-DDD	0.05	mg/kg	-	< 0.05	-	< 0.05
4.4'-DDE	0.05	mg/kg	-	< 0.05	-	< 0.05
4.4'-DDT	0.05	mg/kg	-	< 0.05	-	< 0.05
a-HCH	0.05	mg/kg	-	< 0.05	-	< 0.05
Aldrin	0.05	mg/kg	-	< 0.05	-	< 0.05
b-HCH	0.05	mg/kg	-	< 0.05	-	< 0.05
d-HCH	0.05	mg/kg	-	< 0.05	-	< 0.05
Dieldrin	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan I	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan II	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin ketone	0.05	mg/kg	-	< 0.05	-	< 0.05
g-HCH (Lindane)	0.05	mg/kg	-	< 0.05	-	< 0.05
Heptachlor	0.05	mg/kg	-	< 0.05	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	< 0.05
Methoxychlor	0.05	mg/kg	-	< 0.05	-	< 0.05
Toxaphene	0.5	mg/kg	-	< 0.5	-	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	-	< 0.1
Dibutylchlorendate (surr.)	1	%	-	86	-	102
Tetrachloro-m-xylene (surr.)	1	%	-	103	-	94
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	< 0.2	-	< 0.2
Bolstar	0.2	mg/kg	-	< 0.2	-	< 0.2
Chlorfenvinphos	0.2	mg/kg	-	< 0.2	-	< 0.2
Chlorpyrifos	0.2	mg/kg	-	< 0.2	-	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	-	< 0.2	-	< 0.2
Coumaphos	2	mg/kg	-	< 2	-	< 2
Demeton-S	0.2	mg/kg	-	< 0.2	-	< 0.2

Client Sample ID			TP109_0.1	TP110_0.1	TP110_0.5	TP111_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			W24-Ja0016129	W24-Ja0016130	W24-Ja0016131	W24-Ja0016132
Date Sampled			Jan 15, 2024	Jan 15, 2024	Jan 15, 2024	Jan 15, 2024
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Demeton-O	0.2	mg/kg	-	< 0.2	-	< 0.2
Diazinon	0.2	mg/kg	-	< 0.2	-	< 0.2
Dichlorvos	0.2	mg/kg	-	< 0.2	-	< 0.2
Dimethoate	0.2	mg/kg	-	< 0.2	-	< 0.2
Disulfoton	0.2	mg/kg	-	< 0.2	-	< 0.2
EPN	0.2	mg/kg	-	< 0.2	-	< 0.2
Ethion	0.2	mg/kg	-	< 0.2	-	< 0.2
Ethoprop	0.2	mg/kg	-	< 0.2	-	< 0.2
Ethyl parathion	0.2	mg/kg	-	< 0.2	-	< 0.2
Fenitrothion	0.2	mg/kg	-	< 0.2	-	< 0.2
Fensulfothion	0.2	mg/kg	-	< 0.2	-	< 0.2
Fenthion	0.2	mg/kg	-	< 0.2	-	< 0.2
Malathion	0.2	mg/kg	-	< 0.2	-	< 0.2
Merphos	0.2	mg/kg	-	< 0.2	-	< 0.2
Methyl parathion	0.2	mg/kg	-	< 0.2	-	< 0.2
Mevinphos	0.2	mg/kg	-	< 0.2	-	< 0.2
Monocrotophos	2	mg/kg	-	< 2	-	< 2
Naled	0.2	mg/kg	-	< 0.2	-	< 0.2
Omethoate	2	mg/kg	-	< 2	-	< 2
Phorate	0.2	mg/kg	-	< 0.2	-	< 0.2
Pirimiphos-methyl	0.2	mg/kg	-	< 0.2	-	< 0.2
Pyrazophos	0.2	mg/kg	-	< 0.2	-	< 0.2
Ronnel	0.2	mg/kg	-	< 0.2	-	< 0.2
Terbufos	0.2	mg/kg	-	< 0.2	-	< 0.2
Tetrachlorvinphos	0.2	mg/kg	-	< 0.2	-	< 0.2
Tokuthion	0.2	mg/kg	-	< 0.2	-	< 0.2
Trichloronate	0.2	mg/kg	-	< 0.2	-	< 0.2
Triphenylphosphate (surr.)	1	%	-	96	-	106
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	%	-	86	-	102
Tetrachloro-m-xylene (surr.)	1	%	-	103	-	94
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Metals M8						
Arsenic	2	mg/kg	10	3.7	2.7	3.2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	31	11	7.3	10
Copper	5	mg/kg	20	28	12	11

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Client Sample ID			TP109_0.1	TP110_0.1	TP110_0.5	TP111_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			W24-Ja0016129	W24-Ja0016130	W24-Ja0016131	W24-Ja0016132
Date Sampled			Jan 15, 2024	Jan 15, 2024	Jan 15, 2024	Jan 15, 2024
Test/Reference	LOR	Unit				
Metals M8						
Lead	5	mg/kg	22	11	9.6	37
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	8.3	< 5	< 5	< 5
Zinc	5	mg/kg	160	35	26	64
Sample Properties						
% Moisture	1	%	20	19	16	32
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	%	-	77	-	-
Perfluorohexanesulfonic acid (PFHxS)N11	5	ug/kg	-	< 5	-	-
Perfluorooctanesulfonic acid (PFOS)N11	5	ug/kg	-	< 5	-	-
18O2-PFHxS (surr.)	1	%	-	95	-	-
13C8-PFOS (surr.)	1	%	-	97	-	-
Perfluorooctanoic acid (PFOA)N11	5	ug/kg	-	< 5	-	-
13C8-PFOA (surr.)	1	%	-	94	-	-
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	-	-

Client Sample ID			TP111_0.3	TP112_0.1	TP112_0.5	TP113_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			W24-Ja0016133	W24-Ja0016134	W24-Ja0016135	W24-Ja0016136
Date Sampled			Jan 15, 2024	Jan 15, 2024	Jan 15, 2024	Jan 15, 2024
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	145	114	100	98
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
NaphthaleneN02	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)N01	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)N04	20	mg/kg	< 20	< 20	< 20	< 20

Client Sample ID			TP111_0.3	TP112_0.1	TP112_0.5	TP113_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			W24-Ja0016133	W24-Ja0016134	W24-Ja0016135	W24-Ja0016136
Date Sampled			Jan 15, 2024	Jan 15, 2024	Jan 15, 2024	Jan 15, 2024
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	89	114	75	96
p-Terphenyl-d14 (surr.)	1	%	102	114	67	89
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	< 0.1
4.4'-DDD	0.05	mg/kg	-	< 0.05	-	< 0.05
4.4'-DDE	0.05	mg/kg	-	< 0.05	-	< 0.05
4.4'-DDT	0.05	mg/kg	-	< 0.05	-	< 0.05
a-HCH	0.05	mg/kg	-	< 0.05	-	< 0.05
Aldrin	0.05	mg/kg	-	< 0.05	-	< 0.05
b-HCH	0.05	mg/kg	-	< 0.05	-	< 0.05
d-HCH	0.05	mg/kg	-	< 0.05	-	< 0.05
Dieldrin	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan I	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan II	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin ketone	0.05	mg/kg	-	< 0.05	-	< 0.05
g-HCH (Lindane)	0.05	mg/kg	-	< 0.05	-	< 0.05
Heptachlor	0.05	mg/kg	-	< 0.05	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	< 0.05
Methoxychlor	0.05	mg/kg	-	< 0.05	-	< 0.05
Toxaphene	0.5	mg/kg	-	< 0.5	-	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	-	< 0.1
Dibutylchlorendate (surr.)	1	%	-	93	-	87
Tetrachloro-m-xylene (surr.)	1	%	-	113	-	90

Client Sample ID			TP111_0.3	TP112_0.1	TP112_0.5	TP113_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			W24-Ja0016133	W24-Ja0016134	W24-Ja0016135	W24-Ja0016136
Date Sampled			Jan 15, 2024	Jan 15, 2024	Jan 15, 2024	Jan 15, 2024
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	< 0.2	-	< 0.2
Bolstar	0.2	mg/kg	-	< 0.2	-	< 0.2
Chlorfenvinphos	0.2	mg/kg	-	< 0.2	-	< 0.2
Chlorpyrifos	0.2	mg/kg	-	< 0.2	-	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	-	< 0.2	-	< 0.2
Coumaphos	2	mg/kg	-	< 2	-	< 2
Demeton-S	0.2	mg/kg	-	< 0.2	-	< 0.2
Demeton-O	0.2	mg/kg	-	< 0.2	-	< 0.2
Diazinon	0.2	mg/kg	-	< 0.2	-	< 0.2
Dichlorvos	0.2	mg/kg	-	< 0.2	-	< 0.2
Dimethoate	0.2	mg/kg	-	< 0.2	-	< 0.2
Disulfoton	0.2	mg/kg	-	< 0.2	-	< 0.2
EPN	0.2	mg/kg	-	< 0.2	-	< 0.2
Ethion	0.2	mg/kg	-	< 0.2	-	< 0.2
Ethoprop	0.2	mg/kg	-	< 0.2	-	< 0.2
Ethyl parathion	0.2	mg/kg	-	< 0.2	-	< 0.2
Fenitrothion	0.2	mg/kg	-	< 0.2	-	< 0.2
Fensulfothion	0.2	mg/kg	-	< 0.2	-	< 0.2
Fenthion	0.2	mg/kg	-	< 0.2	-	< 0.2
Malathion	0.2	mg/kg	-	< 0.2	-	< 0.2
Merphos	0.2	mg/kg	-	< 0.2	-	< 0.2
Methyl parathion	0.2	mg/kg	-	< 0.2	-	< 0.2
Mevinphos	0.2	mg/kg	-	< 0.2	-	< 0.2
Monocrotophos	2	mg/kg	-	< 2	-	< 2
Naled	0.2	mg/kg	-	< 0.2	-	< 0.2
Omethoate	2	mg/kg	-	< 2	-	< 2
Phorate	0.2	mg/kg	-	< 0.2	-	< 0.2
Pirimiphos-methyl	0.2	mg/kg	-	< 0.2	-	< 0.2
Pyrazophos	0.2	mg/kg	-	< 0.2	-	< 0.2
Ronnel	0.2	mg/kg	-	< 0.2	-	< 0.2
Terbufos	0.2	mg/kg	-	< 0.2	-	< 0.2
Tetrachlorvinphos	0.2	mg/kg	-	< 0.2	-	< 0.2
Tokuthion	0.2	mg/kg	-	< 0.2	-	< 0.2
Trichloronate	0.2	mg/kg	-	< 0.2	-	< 0.2
Triphenylphosphate (surr.)	1	%	-	100	-	90
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	%	-	93	-	87
Tetrachloro-m-xylene (surr.)	1	%	-	113	-	90

Client Sample ID			TP111_0.3	TP112_0.1	TP112_0.5	TP113_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			W24-Ja0016133	W24-Ja0016134	W24-Ja0016135	W24-Ja0016136
Date Sampled			Jan 15, 2024	Jan 15, 2024	Jan 15, 2024	Jan 15, 2024
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Metals M8						
Arsenic	2	mg/kg	5.4	10	2.2	10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	15	17	< 5	15
Copper	5	mg/kg	< 5	14	< 5	14
Lead	5	mg/kg	5.8	30	7.0	29
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	16	< 5	14
Zinc	5	mg/kg	< 5	100	8.8	120
Sample Properties						
% Moisture	1	%	13	28	13	27
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	%	-	48	-	-
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	-	< 5	-	-
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	-	< 5	-	-
18O2-PFHxS (surr.)	1	%	-	98	-	-
13C8-PFOS (surr.)	1	%	-	96	-	-
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	-	< 5	-	-
13C8-PFOA (surr.)	1	%	-	91	-	-
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	-	-

Client Sample ID			TP113_0.5	TP114_0.1	TP115_0.1	QA111
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			W24-Ja0016137	W24-Ja0016138	W24-Ja0016139	W24-Ja0016141
Date Sampled			Jan 15, 2024	Jan 15, 2024	Jan 15, 2024	Jan 15, 2024
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	104	84	141	143

eurofins Environment Testing

Client Sample ID			TP113_0.5	TP114_0.1	TP115_0.1	QA111
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			W24-Ja0016137	W24-Ja0016138	W24-Ja0016139	W24-Ja0016141
Date Sampled			Jan 15, 2024	Jan 15, 2024	Jan 15, 2024	Jan 15, 2024
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	97	103	107	105
p-Terphenyl-d14 (surr.)	1	%	88	92	98	92
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
a-HCH	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
b-HCH	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
d-HCH	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
g-HCH (Lindane)	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Toxaphene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5

Client Sample ID			TP113_0.5	TP114_0.1	TP115_0.1	QA111
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			W24-Ja0016137	W24-Ja0016138	W24-Ja0016139	W24-Ja0016141
Date Sampled			Jan 15, 2024	Jan 15, 2024	Jan 15, 2024	Jan 15, 2024
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	-	81	81	70
Tetrachloro-m-xylene (surr.)	1	%	-	94	100	98
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	-	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	-	< 2	< 2	< 2
Naled	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	-	< 2	< 2	< 2
Phorate	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	-	86	89	88
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Aroclor-1221	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Aroclor-1242	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Aroclor-1248	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Aroclor-1254	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1

Client Sample ID			TP113_0.5	TP114_0.1	TP115_0.1	QA111
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			W24-Ja0016137	W24-Ja0016138	W24-Ja0016139	W24-Ja0016141
Date Sampled			Jan 15, 2024	Jan 15, 2024	Jan 15, 2024	Jan 15, 2024
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Aroclor-1260	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Total PCB*	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	-	81	81	70
Tetrachloro-m-xylene (surr.)	1	%	-	94	100	98
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Metals M8						
Arsenic	2	mg/kg	8.9	3.5	11	8.9
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	14	10	19	17
Copper	5	mg/kg	< 5	19	15	19
Lead	5	mg/kg	16	30	24	27
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	13	16	14
Zinc	5	mg/kg	27	56	66	62
Sample Properties						
% Moisture	1	%	15	16	24	22
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	%	-	72	-	67
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	-	< 5	-	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	-	< 5	-	< 5
18O2-PFHxS (surr.)	1	%	-	98	-	101
13C8-PFOS (surr.)	1	%	-	96	-	96
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	-	< 5	-	< 5
13C8-PFOA (surr.)	1	%	-	97	-	94
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

Client Sample ID			TRIP SPIKE	TRIP BLANK	TRIP SPIKE	TRIP BLANK
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			W24-Ja0016144	W24-Ja0016145	W24-Ja0016147	W24-Ja0016148
Date Sampled			Jan 12, 2024	Jan 12, 2024	Jan 15, 2024	Jan 15, 2024
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	< 20	-	< 20
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

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Client Sample ID			TRIP SPIKE	TRIP BLANK	TRIP SPIKE	TRIP BLANK
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			W24-Ja0016144	W24-Ja0016145	W24-Ja0016147	W24-Ja0016148
Date Sampled			Jan 12, 2024	Jan 12, 2024	Jan 15, 2024	Jan 15, 2024
Test/Reference	LOR	Unit				
BTEX						
Xylenes - Total*	0.3	mg/kg	-	< 0.3	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	100	-	103
TRH C6-C10	1	%	98	-	100	-
Naphthalene[N02]	0.5	mg/kg	-	< 0.5	-	< 0.5
Total Recoverable Hydrocarbons						
Naphthalene	1	%	94	-	110	-
TRH C6-C9	1	%	98	-	99	-
TRH C6-C10	20	mg/kg	-	< 20	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	-	< 20
BTEX						
Benzene	1	%	98	-	100	-
Ethylbenzene	1	%	100	-	100	-
m&p-Xylenes	1	%	100	-	100	-
o-Xylene	1	%	98	-	100	-
Toluene	1	%	99	-	100	-
Xylenes - Total	1	%	99	-	100	-
4-Bromofluorobenzene (surr.)	1	%	60	-	98	-

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	Sydney	Jan 18, 2024	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Jan 23, 2024	14 Days
- Method: LTM-ORG-2010 BTEX and Volatile TRH			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jan 17, 2024	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons	Sydney	Jan 23, 2024	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Jan 17, 2024	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jan 17, 2024	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Metals M8	Sydney	Jan 17, 2024	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Eurofins Suite B15			
Organochlorine Pesticides	Sydney	Jan 17, 2024	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Sydney	Jan 17, 2024	14 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			
Polychlorinated Biphenyls	Sydney	Jan 17, 2024	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
% Moisture	Sydney	Jan 16, 2024	14 Days
- Method: LTM-GEN-7080 Moisture			
Per- and Polyfluoroalkyl Substances (PFASs) - Short	Sydney	Jan 17, 2024	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

Company Name: Stantec Australia Pty Ltd (Wollongong)
Address: Ground Floor, 16 Burelli Street
Wollongong
NSW 2500

Order No.:
Report #: 1059638
Phone: (02) 9493 9700
Fax:

Received: Jan 16, 2024 9:00 AM
Due: Jan 22, 2024
Priority: 5 Day
Contact Name: Katelyn Elliott

Project Name: BOMADERRY
Project ID: 304001019

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	BTEXN and Volatile TRH	Per- and Polyfluoroalkyl Substances (PFASs) - Short	BTEXN and Volatile TRH
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X	X	X	X	X	X
External Laboratory														
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**									
1	BH04_0.1	Jan 12, 2024		Soil	W24-Ja0016061	X			X	X	X		X	
2	TP107_0.1	Jan 15, 2024		Soil	W24-Ja0016126	X				X	X			
3	TP108_0.1	Jan 15, 2024		Soil	W24-Ja0016127	X			X	X	X		X	
4	TP108_0.3	Jan 15, 2024		Soil	W24-Ja0016128					X	X			
5	TP109_0.1	Jan 15, 2024		Soil	W24-Ja0016129	X				X	X			
6	TP110_0.1	Jan 15, 2024		Soil	W24-Ja0016130	X			X	X	X		X	
7	TP110_0.5	Jan 15, 2024		Soil	W24-Ja0016131					X	X			
8	TP111_0.1	Jan 15, 2024		Soil	W24-Ja0016132	X			X	X	X			
9	TP111_0.3	Jan 15, 2024		Soil	W24-Ja0016133					X	X			
10	TP112_0.1	Jan 15, 2024		Soil	W24-Ja0016134	X			X	X	X		X	
11	TP112_0.5	Jan 15, 2024		Soil	W24-Ja0016135	X				X	X			
12	TP113_0.1	Jan 15, 2024		Soil	W24-Ja0016136	X			X	X	X			
13	TP113_0.5	Jan 15, 2024		Soil	W24-Ja0016137					X	X			

Company Name: Stantec Australia Pty Ltd (Wollongong)
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NSW 2500

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Report #: 1059638
Phone: (02) 9493 9700
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Received: Jan 16, 2024 9:00 AM
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Contact Name: Katelyn Elliott

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	BTEXN and Volatile TRH	Per- and Polyfluoroalkyl Substances (PFASs) - Short	BTEXN and Volatile TRH
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X	X	X	X	X	X
14	TP114_0.1	Jan 15, 2024		Soil	W24-Ja0016138	X			X	X	X		X	
15	TP115_0.1	Jan 15, 2024		Soil	W24-Ja0016139	X			X	X	X			
16	SP01_ACM1	Jan 15, 2024		Building Materials	W24-Ja0016140		X							
17	QA111	Jan 15, 2024		Soil	W24-Ja0016141				X	X	X		X	
18	RIN_240112	Jan 12, 2024		Water	W24-Ja0016142			X						
19	RIN_240115	Jan 15, 2024		Water	W24-Ja0016143				X		X			
20	TRIP SPIKE	Jan 12, 2024		Water	W24-Ja0016144									X
21	TRIP BLANK	Jan 12, 2024		Water	W24-Ja0016145							X		
22	TRIP SPIKE LAB	Jan 12, 2024		Water	W24-Ja0016146									X
23	TRIP SPIKE	Jan 15, 2024		Water	W24-Ja0016147									X
24	TRIP BLANK	Jan 15, 2024		Water	W24-Ja0016148							X		
25	TRIP SPIKE LAB	Jan 15, 2024		Water	W24-Ja0016149									X
Test Counts						11	1	1	10	16	17	2	6	4

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. All soil/sediment/solid results are reported on a dry weight basis unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion unless otherwise stated.
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.
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 date of sampling; 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 7 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	

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 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should 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 70 – 130%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 5.4, 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.

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Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
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	
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	
TRH C6-C10	mg/kg	< 20			20	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							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-HCH	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-HCH	mg/kg	< 0.05			0.05	Pass	
d-HCH	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-HCH (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	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							

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Total Recoverable Hydrocarbons - 2013 NEPM Fractions									
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									
Metals M8									
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									
Naphthalene			mg/kg	< 0.5			0.5	Pass	
Method Blank									
Total Recoverable Hydrocarbons									
TRH C6-C10			mg/kg	< 20			20	Pass	
LCS - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions									
TRH C6-C9			%	103			70-130	Pass	
LCS - % Recovery									
BTEX									
Benzene			%	97			70-130	Pass	
Toluene			%	92			70-130	Pass	
Ethylbenzene			%	100			70-130	Pass	
m&p-Xylenes			%	107			70-130	Pass	
o-Xylene			%	104			70-130	Pass	
Xylenes - Total*			%	106			70-130	Pass	
LCS - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions									
Naphthalene			%	88			70-130	Pass	
TRH C6-C10			%	103			70-130	Pass	
LCS - % Recovery									
Naphthalene			%	103			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	W24-Ja0016061	CP	%	94			70-130	Pass	
TRH C10-C14	S24-Ja0015422	NCP	%	94			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	W24-Ja0016061	CP	%	87			70-130	Pass	
Toluene	W24-Ja0016061	CP	%	86			70-130	Pass	
Ethylbenzene	W24-Ja0016061	CP	%	87			70-130	Pass	
m&p-Xylenes	W24-Ja0016061	CP	%	93			70-130	Pass	
o-Xylene	W24-Ja0016061	CP	%	86			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Xylenes - Total*	W24-Ja0016061	CP	%	91			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S24-Ja0019199	NCP	%	81			70-130	Pass	
TRH C6-C10	W24-Ja0016061	CP	%	94			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
g-HCH (Lindane)	S24-Ja0021209	NCP	%	70			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1016	S24-Ja0021209	NCP	%	72			70-130	Pass	
Aroclor-1260	S24-Ja0021209	NCP	%	72			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S24-Ja0015422	NCP	%	88			70-130	Pass	
Spike - % Recovery									
Metals M8				Result 1					
Arsenic	S24-Ja0017852	NCP	%	85			75-125	Pass	
Cadmium	S24-Ja0017852	NCP	%	87			75-125	Pass	
Chromium	S24-Ja0017852	NCP	%	87			75-125	Pass	
Copper	S24-Ja0017852	NCP	%	87			75-125	Pass	
Lead	S24-Ja0017852	NCP	%	79			75-125	Pass	
Mercury	S24-Ja0017852	NCP	%	82			75-125	Pass	
Nickel	S24-Ja0017852	NCP	%	87			75-125	Pass	
Zinc	S24-Ja0017852	NCP	%	81			75-125	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	W24-Ja0016133	CP	%	79			70-130	Pass	
Acenaphthylene	W24-Ja0016133	CP	%	80			70-130	Pass	
Anthracene	W24-Ja0016133	CP	%	78			70-130	Pass	
Benz(a)anthracene	W24-Ja0016133	CP	%	80			70-130	Pass	
Benzo(a)pyrene	W24-Ja0016133	CP	%	86			70-130	Pass	
Benzo(b&j)fluoranthene	W24-Ja0016133	CP	%	81			70-130	Pass	
Benzo(g.h.i)perylene	W24-Ja0016133	CP	%	83			70-130	Pass	
Benzo(k)fluoranthene	W24-Ja0016133	CP	%	89			70-130	Pass	
Chrysene	W24-Ja0016133	CP	%	88			70-130	Pass	
Dibenz(a.h)anthracene	W24-Ja0016133	CP	%	81			70-130	Pass	
Fluoranthene	W24-Ja0016133	CP	%	76			70-130	Pass	
Fluorene	W24-Ja0016133	CP	%	80			70-130	Pass	
Indeno(1.2.3-cd)pyrene	W24-Ja0016133	CP	%	81			70-130	Pass	
Naphthalene	W24-Ja0016133	CP	%	81			70-130	Pass	
Phenanthrene	W24-Ja0016133	CP	%	73			70-130	Pass	
Pyrene	W24-Ja0016133	CP	%	78			70-130	Pass	
Spike - % Recovery									
Per- and Polyfluoroalkyl Substances (PFASs) - Short				Result 1					
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	W24-Ja0016134	CP	%	96			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	W24-Ja0016134	CP	%	100			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	W24-Ja0016134	CP	%	104			50-150	Pass	
Perfluorooctanoic acid (PFOA)	W24-Ja0016134	CP	%	109			50-150	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
a-HCH	S24-Ja0013716	NCP	%	77			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Diazinon	S24-Ja0021137	NCP	%	72			70-130	Pass	
Dimethoate	S24-Ja0013761	NCP	%	73			70-130	Pass	
Mevinphos	S24-Ja0013761	NCP	%	71			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
a-HCH	S24-Ja0017810	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
g-HCH (Lindane)	S24-Ja0017810	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Per- and Polyfluoroalkyl Substances (PFASs) - Short				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	S24-Ja0019010	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	S24-Ja0019010	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	S24-Ja0019010	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	S24-Ja0019010	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	W24-Ja0016129	CP	%	20	23	15	30%	Pass	
Duplicate									
Metals M8				Result 1	Result 2	RPD			
Arsenic	W24-Ja0016131	CP	mg/kg	2.7	2.3	13	30%	Pass	
Cadmium	W24-Ja0016131	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	W24-Ja0016131	CP	mg/kg	7.3	6.3	14	30%	Pass	
Copper	W24-Ja0016131	CP	mg/kg	12	11	14	30%	Pass	
Lead	W24-Ja0016131	CP	mg/kg	9.6	8.8	9.2	30%	Pass	
Mercury	W24-Ja0016131	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	W24-Ja0016131	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	W24-Ja0016131	CP	mg/kg	26	22	20	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	W24-Ja0016132	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	W24-Ja0016132	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	W24-Ja0016132	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	W24-Ja0016132	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	W24-Ja0016132	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	W24-Ja0016132	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	W24-Ja0016132	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	W24-Ja0016132	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	W24-Ja0016132	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	W24-Ja0016132	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	W24-Ja0016132	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	W24-Ja0016132	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	W24-Ja0016132	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	W24-Ja0016132	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	W24-Ja0016132	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	W24-Ja0016132	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	W24-Ja0016132	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	W24-Ja0016132	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	W24-Ja0016132	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	W24-Ja0016132	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	W24-Ja0016132	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-HCH	W24-Ja0016132	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-HCH	W24-Ja0016132	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	W24-Ja0016132	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	W24-Ja0016132	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	W24-Ja0016132	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	W24-Ja0016132	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	W24-Ja0016132	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	W24-Ja0016132	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	W24-Ja0016132	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	W24-Ja0016132	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	W24-Ja0016132	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	W24-Ja0016132	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	W24-Ja0016132	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	W24-Ja0016132	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	W24-Ja0016132	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	W24-Ja0016132	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	W24-Ja0016132	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	W24-Ja0016132	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	W24-Ja0016132	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	W24-Ja0016132	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	W24-Ja0016132	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	W24-Ja0016132	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	W24-Ja0016132	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	W24-Ja0016132	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	W24-Ja0016132	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	W24-Ja0016132	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	W24-Ja0016132	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	W24-Ja0016132	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	W24-Ja0016132	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	W24-Ja0016132	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	W24-Ja0016132	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	W24-Ja0016132	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	W24-Ja0016132	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	W24-Ja0016132	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	W24-Ja0016132	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	W24-Ja0016132	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	W24-Ja0016132	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	W24-Ja0016132	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	W24-Ja0016132	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	W24-Ja0016132	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	W24-Ja0016132	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	W24-Ja0016132	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	W24-Ja0016132	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	W24-Ja0016132	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	W24-Ja0016132	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	W24-Ja0016132	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	W24-Ja0016132	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	W24-Ja0016132	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	

Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	W24-Ja0016132	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	W24-Ja0016132	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	W24-Ja0016132	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	W24-Ja0016132	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	W24-Ja0016132	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	W24-Ja0016132	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	W24-Ja0016132	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB*	W24-Ja0016132	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	W24-Ja0016134	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	W24-Ja0016134	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	W24-Ja0016134	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	W24-Ja0016134	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	W24-Ja0016134	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	W24-Ja0016134	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	W24-Ja0016134	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	W24-Ja0016134	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	W24-Ja0016134	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	W24-Ja0016134	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	W24-Ja0016134	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	W24-Ja0016134	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	W24-Ja0016134	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	W24-Ja0016134	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	W24-Ja0016134	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	W24-Ja0016135	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	W24-Ja0016135	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	W24-Ja0016135	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	W24-Ja0016135	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	W24-Ja0016135	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	W24-Ja0016135	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	W24-Ja0016135	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	W24-Ja0016135	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	W24-Ja0016135	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	W24-Ja0016141	CP	%	22	23	4.5	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:

Ursula Long	Analytical Services Manager
Mickael Ros	Senior Analyst-Metal
Raymond Siu	Senior Analyst-Volatile
Roopesh Rangarajan	Senior Analyst-Organic
Roopesh Rangarajan	Senior Analyst-Volatile
Sayeed Abu	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.

eurofins | Environment Testing

Certificate of Analysis

Stantec Australia Pty Ltd
Ground Floor, 16 Burelli Street
Wollongong
NSW 2500

NATA Accredited
Accreditation Number 1261
Site Number 18217

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:	**Katelyn Elliott**
Report	**1059638-W**
Project name	BOMADERRY
Project ID	304001019
Received Date	Jan 16, 2024

Client Sample ID			**RIN_240115**
Sample Matrix			**Water**
Eurofins Sample No.			**W24-Ja0016143**
Date Sampled			**Jan 15, 2024**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
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
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	%	116
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene[N02]	0.01	mg/L	< 0.01
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05
TRH C6-C10	0.02	mg/L	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02
Polycyclic Aromatic Hydrocarbons			
Acenaphthene	0.001	mg/L	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001
Anthracene	0.001	mg/L	< 0.001
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
Chrysene	0.001	mg/L	< 0.001
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001
Fluoranthene	0.001	mg/L	< 0.001
Fluorene	0.001	mg/L	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001
Naphthalene	0.001	mg/L	< 0.001
Phenanthrene	0.001	mg/L	< 0.001
Pyrene	0.001	mg/L	< 0.001

Client Sample ID			RIN_240115
Sample Matrix			Water
Eurofins Sample No.			W24-Ja0016143
Date Sampled			Jan 15, 2024
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Total PAH*	0.001	mg/L	< 0.001
2-Fluorobiphenyl (surr.)	1	%	INT
p-Terphenyl-d14 (surr.)	1	%	INT
Organochlorine Pesticides			
Chlordanes - Total	0.002	mg/L	< 0.002
4.4'-DDD	0.0002	mg/L	< 0.0002
4.4'-DDE	0.0002	mg/L	< 0.0002
4.4'-DDT	0.0002	mg/L	< 0.0002
a-HCH	0.0002	mg/L	< 0.0002
Aldrin	0.0002	mg/L	< 0.0002
b-HCH	0.0002	mg/L	< 0.0002
d-HCH	0.0002	mg/L	< 0.0002
Dieldrin	0.0002	mg/L	< 0.0002
Endosulfan I	0.0002	mg/L	< 0.0002
Endosulfan II	0.0002	mg/L	< 0.0002
Endosulfan sulphate	0.0002	mg/L	< 0.0002
Endrin	0.0002	mg/L	< 0.0002
Endrin aldehyde	0.0002	mg/L	< 0.0002
Endrin ketone	0.0002	mg/L	< 0.0002
g-HCH (Lindane)	0.0002	mg/L	< 0.0002
Heptachlor	0.0002	mg/L	< 0.0002
Heptachlor epoxide	0.0002	mg/L	< 0.0002
Hexachlorobenzene	0.0002	mg/L	< 0.0002
Methoxychlor	0.0002	mg/L	< 0.0002
Toxaphene	0.005	mg/L	< 0.005
Aldrin and Dieldrin (Total)*	0.0002	mg/L	< 0.0002
DDT + DDE + DDD (Total)*	0.0002	mg/L	< 0.0002
Vic EPA IWRG 621 OCP (Total)*	0.002	mg/L	< 0.002
Vic EPA IWRG 621 Other OCP (Total)*	0.002	mg/L	< 0.002
Dibutylchlorendate (surr.)	1	%	127
Tetrachloro-m-xylene (surr.)	1	%	121
Organophosphorus Pesticides			
Azinphos-methyl	0.002	mg/L	< 0.002
Bolstar	0.002	mg/L	< 0.002
Chlorfenvinphos	0.02	mg/L	< 0.02
Chlorpyrifos	0.002	mg/L	< 0.002
Chlorpyrifos-methyl	0.002	mg/L	< 0.002
Coumaphos	0.02	mg/L	< 0.02
Demeton-S	0.002	mg/L	< 0.002
Demeton-O	0.002	mg/L	< 0.002
Diazinon	0.002	mg/L	< 0.002
Dichlorvos	0.002	mg/L	< 0.002
Dimethoate	0.002	mg/L	< 0.002
Disulfoton	0.002	mg/L	< 0.002
EPN	0.002	mg/L	< 0.002
Ethion	0.002	mg/L	< 0.002
Ethoprop	0.002	mg/L	< 0.002
Ethyl parathion	0.002	mg/L	< 0.002
Fenitrothion	0.002	mg/L	< 0.002

Client Sample ID			RIN_240115
Sample Matrix			Water
Eurofins Sample No.			W24-Ja0016143
Date Sampled			Jan 15, 2024
Test/Reference	LOR	Unit	
Organophosphorus Pesticides			
Fensulfothion	0.002	mg/L	< 0.002
Fenthion	0.002	mg/L	< 0.002
Malathion	0.002	mg/L	< 0.002
Merphos	0.002	mg/L	< 0.002
Methyl parathion	0.002	mg/L	< 0.002
Mevinphos	0.002	mg/L	< 0.002
Monocrotophos	0.002	mg/L	< 0.002
Naled	0.002	mg/L	< 0.002
Omethoate	0.02	mg/L	< 0.02
Phorate	0.002	mg/L	< 0.002
Pirimiphos-methyl	0.02	mg/L	< 0.02
Pyrazophos	0.002	mg/L	< 0.002
Ronnel	0.002	mg/L	< 0.002
Terbufos	0.002	mg/L	< 0.002
Tetrachlorvinphos	0.002	mg/L	< 0.002
Tokuthion	0.002	mg/L	< 0.002
Trichloronate	0.002	mg/L	< 0.002
Triphenylphosphate (surr.)	1	%	INT
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	%	127
Tetrachloro-m-xylene (surr.)	1	%	121
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
TRH >C10-C16	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
Metals M8			
Arsenic	0.001	mg/L	< 0.001
Cadmium	0.0002	mg/L	< 0.0002
Chromium	0.001	mg/L	< 0.001
Copper	0.001	mg/L	< 0.001
Lead	0.001	mg/L	< 0.001
Mercury	0.0001	mg/L	< 0.0001
Nickel	0.001	mg/L	< 0.001
Zinc	0.005	mg/L	< 0.005

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	Sydney	Jan 17, 2024	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Jan 17, 2024	14 Days
- Method: LTM-ORG-2010 BTEX and Volatile TRH			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jan 17, 2024	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Jan 17, 2024	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jan 17, 2024	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Metals M8	Sydney	Jan 18, 2024	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Eurofins Suite B15			
Organochlorine Pesticides	Sydney	Jan 17, 2024	7 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Sydney	Jan 17, 2024	7 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			
Polychlorinated Biphenyls	Sydney	Jan 17, 2024	7 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			

Company Name: Stantec Australia Pty Ltd (Wollongong)
Address: Ground Floor, 16 Burelli Street
Wollongong
NSW 2500

Order No.:
Report #: 1059638
Phone: (02) 9493 9700
Fax:

Received: Jan 16, 2024 9:00 AM
Due: Jan 22, 2024
Priority: 5 Day
Contact Name: Katelyn Elliott

Project Name: BOMADERRY
Project ID: 304001019

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	BTEXN and Volatile TRH	Per- and Polyfluoroalkyl Substances (PFASs) - Short	BTEXN and Volatile TRH
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X	X	X	X	X	X
External Laboratory														
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**									
1	BH04_0.1	Jan 12, 2024		Soil	W24-Ja0016061	X			X	X	X		X	
2	TP107_0.1	Jan 15, 2024		Soil	W24-Ja0016126	X				X	X			
3	TP108_0.1	Jan 15, 2024		Soil	W24-Ja0016127	X			X	X	X		X	
4	TP108_0.3	Jan 15, 2024		Soil	W24-Ja0016128					X	X			
5	TP109_0.1	Jan 15, 2024		Soil	W24-Ja0016129	X				X	X			
6	TP110_0.1	Jan 15, 2024		Soil	W24-Ja0016130	X			X	X	X		X	
7	TP110_0.5	Jan 15, 2024		Soil	W24-Ja0016131					X	X			
8	TP111_0.1	Jan 15, 2024		Soil	W24-Ja0016132	X			X	X	X			
9	TP111_0.3	Jan 15, 2024		Soil	W24-Ja0016133					X	X			
10	TP112_0.1	Jan 15, 2024		Soil	W24-Ja0016134	X			X	X	X		X	
11	TP112_0.5	Jan 15, 2024		Soil	W24-Ja0016135	X				X	X			
12	TP113_0.1	Jan 15, 2024		Soil	W24-Ja0016136	X			X	X	X			
13	TP113_0.5	Jan 15, 2024		Soil	W24-Ja0016137					X	X			

Company Name:	Stantec Australia Pty Ltd (Wollongong)	**Order No.:**		**Received:**	Jan 16, 2024 9:00 AM
Address:	Ground Floor, 16 Burelli Street Wollongong NSW 2500	**Report #:**	1059638	**Due:**	Jan 22, 2024
		Phone:	(02) 9493 9700	**Priority:**	5 Day
		Fax:		**Contact Name:**	Katelyn Elliott
Project Name:	BOMADERRY				
Project ID:	304001019				

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	BTEXN and Volatile TRH	Per- and Polyfluoroalkyl Substances (PFASs) - Short	BTEXN and Volatile TRH
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X	X	X	X	X	X
14	TP114_0.1	Jan 15, 2024		Soil	W24-Ja0016138	X			X	X	X		X	
15	TP115_0.1	Jan 15, 2024		Soil	W24-Ja0016139	X			X	X	X			
16	SP01_ACM1	Jan 15, 2024		Building Materials	W24-Ja0016140		X							
17	QA111	Jan 15, 2024		Soil	W24-Ja0016141				X	X	X		X	
18	RIN_240112	Jan 12, 2024		Water	W24-Ja0016142			X						
19	RIN_240115	Jan 15, 2024		Water	W24-Ja0016143				X		X			
20	TRIP SPIKE	Jan 12, 2024		Water	W24-Ja0016144									X
21	TRIP BLANK	Jan 12, 2024		Water	W24-Ja0016145							X		
22	TRIP SPIKE LAB	Jan 12, 2024		Water	W24-Ja0016146									X
23	TRIP SPIKE	Jan 15, 2024		Water	W24-Ja0016147									X
24	TRIP BLANK	Jan 15, 2024		Water	W24-Ja0016148							X		
25	TRIP SPIKE LAB	Jan 15, 2024		Water	W24-Ja0016149									X
Test Counts						11	1	1	10	16	17	2	6	4

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. All soil/sediment/solid results are reported on a dry weight basis unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion unless otherwise stated.
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.
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 date of sampling; 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 7 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	

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 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should 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 70 – 130%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 5.4, 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.

eurofins | Environment Testing

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
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	
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							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	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	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/L	< 0.002			0.002	Pass	
4.4'-DDD	mg/L	< 0.0002			0.0002	Pass	
4.4'-DDE	mg/L	< 0.0002			0.0002	Pass	
4.4'-DDT	mg/L	< 0.0002			0.0002	Pass	
a-HCH	mg/L	< 0.0002			0.0002	Pass	
Aldrin	mg/L	< 0.0002			0.0002	Pass	
b-HCH	mg/L	< 0.0002			0.0002	Pass	
d-HCH	mg/L	< 0.0002			0.0002	Pass	
Dieldrin	mg/L	< 0.0002			0.0002	Pass	
Endosulfan I	mg/L	< 0.0002			0.0002	Pass	
Endosulfan II	mg/L	< 0.0002			0.0002	Pass	
Endosulfan sulphate	mg/L	< 0.0002			0.0002	Pass	
Endrin	mg/L	< 0.0002			0.0002	Pass	
Endrin aldehyde	mg/L	< 0.0002			0.0002	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin ketone	mg/L	< 0.0002			0.0002	Pass	
g-HCH (Lindane)	mg/L	< 0.0002			0.0002	Pass	
Heptachlor	mg/L	< 0.0002			0.0002	Pass	
Heptachlor epoxide	mg/L	< 0.0002			0.0002	Pass	
Hexachlorobenzene	mg/L	< 0.0002			0.0002	Pass	
Methoxychlor	mg/L	< 0.0002			0.0002	Pass	
Toxaphene	mg/L	< 0.005			0.005	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/L	< 0.002			0.002	Pass	
Bolstar	mg/L	< 0.002			0.002	Pass	
Chlorfenvinphos	mg/L	< 0.02			0.02	Pass	
Chlorpyrifos	mg/L	< 0.002			0.002	Pass	
Chlorpyrifos-methyl	mg/L	< 0.002			0.002	Pass	
Coumaphos	mg/L	< 0.02			0.02	Pass	
Demeton-S	mg/L	< 0.002			0.002	Pass	
Demeton-O	mg/L	< 0.002			0.002	Pass	
Diazinon	mg/L	< 0.002			0.002	Pass	
Dichlorvos	mg/L	< 0.002			0.002	Pass	
Dimethoate	mg/L	< 0.002			0.002	Pass	
Disulfoton	mg/L	< 0.002			0.002	Pass	
EPN	mg/L	< 0.002			0.002	Pass	
Ethion	mg/L	< 0.002			0.002	Pass	
Ethoprop	mg/L	< 0.002			0.002	Pass	
Ethyl parathion	mg/L	< 0.002			0.002	Pass	
Fenitrothion	mg/L	< 0.002			0.002	Pass	
Fensulfothion	mg/L	< 0.002			0.002	Pass	
Fenthion	mg/L	< 0.002			0.002	Pass	
Malathion	mg/L	< 0.002			0.002	Pass	
Merphos	mg/L	< 0.002			0.002	Pass	
Methyl parathion	mg/L	< 0.002			0.002	Pass	
Mevinphos	mg/L	< 0.002			0.002	Pass	
Monocrotophos	mg/L	< 0.002			0.002	Pass	
Naled	mg/L	< 0.002			0.002	Pass	
Omethoate	mg/L	< 0.02			0.02	Pass	
Phorate	mg/L	< 0.002			0.002	Pass	
Pirimiphos-methyl	mg/L	< 0.02			0.02	Pass	
Pyrazophos	mg/L	< 0.002			0.002	Pass	
Ronnel	mg/L	< 0.002			0.002	Pass	
Terbufos	mg/L	< 0.002			0.002	Pass	
Tetrachlorvinphos	mg/L	< 0.002			0.002	Pass	
Tokuthion	mg/L	< 0.002			0.002	Pass	
Trichloronate	mg/L	< 0.002			0.002	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							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
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							
Metals M8							
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	94			70-130	Pass	
TRH C10-C14	%	108			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	102			70-130	Pass	
Toluene	%	94			70-130	Pass	
Ethylbenzene	%	97			70-130	Pass	
m&p-Xylenes	%	101			70-130	Pass	
o-Xylene	%	96			70-130	Pass	
Xylenes - Total*	%	100			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	88			70-130	Pass	
TRH C6-C10	%	103			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	75			70-130	Pass	
Acenaphthylene	%	72			70-130	Pass	
Anthracene	%	86			70-130	Pass	
Benz(a)anthracene	%	93			70-130	Pass	
Benzo(a)pyrene	%	95			70-130	Pass	
Benzo(b&j)fluoranthene	%	91			70-130	Pass	
Benzo(g.h.i)perylene	%	100			70-130	Pass	
Benzo(k)fluoranthene	%	96			70-130	Pass	
Chrysene	%	99			70-130	Pass	
Dibenz(a.h)anthracene	%	97			70-130	Pass	
Fluoranthene	%	84			70-130	Pass	
Fluorene	%	82			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	95			70-130	Pass	
Phenanthrene	%	80			70-130	Pass	
Pyrene	%	86			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	81			70-130	Pass	
4.4'-DDD	%	73			70-130	Pass	
4.4'-DDE	%	78			70-130	Pass	
4.4'-DDT	%	73			70-130	Pass	
a-HCH	%	77			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Aldrin	%	77			70-130	Pass	
b-HCH	%	77			70-130	Pass	
d-HCH	%	76			70-130	Pass	
Dieldrin	%	79			70-130	Pass	
Endosulfan I	%	80			70-130	Pass	
Endosulfan II	%	80			70-130	Pass	
Endosulfan sulphate	%	76			70-130	Pass	
Endrin	%	76			70-130	Pass	
Endrin aldehyde	%	71			70-130	Pass	
Endrin ketone	%	81			70-130	Pass	
g-HCH (Lindane)	%	80			70-130	Pass	
Heptachlor	%	72			70-130	Pass	
Heptachlor epoxide	%	80			70-130	Pass	
Hexachlorobenzene	%	76			70-130	Pass	
Methoxychlor	%	75			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	78			70-130	Pass	
Dimethoate	%	71			70-130	Pass	
Ethion	%	81			70-130	Pass	
Methyl parathion	%	83			70-130	Pass	
Mevinphos	%	77			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1016	%	74			70-130	Pass	
Aroclor-1260	%	87			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	95			70-130	Pass	
LCS - % Recovery							
Metals M8							
Arsenic	%	89			80-120	Pass	
Cadmium	%	85			80-120	Pass	
Chromium	%	91			80-120	Pass	
Copper	%	89			80-120	Pass	
Lead	%	90			80-120	Pass	
Mercury	%	102			80-120	Pass	
Nickel	%	91			80-120	Pass	
Zinc	%	88			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S24-Ja0020084	NCP	%	88			70-130	Pass	
TRH C10-C14	N24-Ja0016319	NCP	%	97			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S24-Ja0020084	NCP	%	95			70-130	Pass	
Toluene	S24-Ja0020084	NCP	%	88			70-130	Pass	
Ethylbenzene	S24-Ja0020084	NCP	%	91			70-130	Pass	
m&p-Xylenes	S24-Ja0020084	NCP	%	92			70-130	Pass	
o-Xylene	S24-Ja0020084	NCP	%	90			70-130	Pass	
Xylenes - Total*	S24-Ja0020084	NCP	%	91			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Naphthalene	S24-Ja0020084	NCP	%	82			70-130	Pass	
TRH C6-C10	S24-Ja0020084	NCP	%	96			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S24-Ja0017510	NCP	%	70			70-130	Pass	
Dieldrin	S24-Ja0017510	NCP	%	70			70-130	Pass	
Endosulfan I	S24-Ja0017510	NCP	%	71			70-130	Pass	
Endosulfan II	S24-Ja0017510	NCP	%	72			70-130	Pass	
Endrin ketone	S24-Ja0017510	NCP	%	72			70-130	Pass	
g-HCH (Lindane)	S24-Ja0017510	NCP	%	70			70-130	Pass	
Methoxychlor	S24-Ja0017510	NCP	%	71			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Diazinon	S24-Ja0017510	NCP	%	71			70-130	Pass	
Ethion	S24-Ja0017510	NCP	%	73			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	S24-Ja0017510	NCP	%	74			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	N24-Ja0016319	NCP	%	91			70-130	Pass	
Spike - % Recovery									
Metals M8				Result 1					
Arsenic	S24-Ja0013197	NCP	%	97			75-125	Pass	
Cadmium	S24-Ja0013197	NCP	%	92			75-125	Pass	
Chromium	S24-Ja0013197	NCP	%	90			75-125	Pass	
Copper	S24-Ja0013197	NCP	%	89			75-125	Pass	
Lead	S24-Ja0013197	NCP	%	90			75-125	Pass	
Mercury	S24-Ja0013197	NCP	%	105			75-125	Pass	
Nickel	S24-Ja0013197	NCP	%	88			75-125	Pass	
Zinc	S24-Ja0013197	NCP	%	108			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	W24-Ja0016143	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	N24-Ja0016318	NCP	mg/L	0.18	0.19	7.5	30%	Pass	
TRH C15-C28	N24-Ja0016318	NCP	mg/L	0.2	0.2	13	30%	Pass	
TRH C29-C36	N24-Ja0016318	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	N24-Ja0014046	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	N24-Ja0014046	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	N24-Ja0014046	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	N24-Ja0014046	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	N24-Ja0014046	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total*	N24-Ja0014046	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	N24-Ja0014046	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	N24-Ja0014046	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S24-Ja0024638	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	S24-Ja0024638	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	S24-Ja0024638	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	S24-Ja0024638	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	S24-Ja0024638	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b&j)fluoranthene	S24-Ja0024638	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g.h.i)perylene	S24-Ja0024638	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(k)fluoranthene	S24-Ja0024638	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	S24-Ja0024638	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a.h)anthracene	S24-Ja0024638	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	S24-Ja0024638	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	S24-Ja0024638	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S24-Ja0024638	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	S24-Ja0024638	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phenanthrene	S24-Ja0024638	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	S24-Ja0024638	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S24-Ja0024638	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
4.4'-DDD	S24-Ja0024638	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
4.4'-DDE	S24-Ja0024638	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
4.4'-DDT	S24-Ja0024638	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Aldrin	S24-Ja0024638	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
b-HCH	S24-Ja0024638	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
d-HCH	S24-Ja0024638	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Dieldrin	S24-Ja0024638	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endosulfan I	S24-Ja0024638	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endosulfan II	S24-Ja0024638	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endosulfan sulphate	S24-Ja0024638	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endrin	S24-Ja0024638	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endrin aldehyde	S24-Ja0024638	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endrin ketone	S24-Ja0024638	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Heptachlor	S24-Ja0024638	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Heptachlor epoxide	S24-Ja0024638	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Hexachlorobenzene	S24-Ja0024638	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Methoxychlor	S24-Ja0024638	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Toxaphene	S24-Ja0024638	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	S24-Ja0024638	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Bolstar	S24-Ja0024638	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Chlorfenvinphos	S24-Ja0024638	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Chlorpyrifos	S24-Ja0024638	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Chlorpyrifos-methyl	S24-Ja0024638	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Coumaphos	S24-Ja0024638	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Demeton-S	S24-Ja0024638	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Demeton-O	S24-Ja0024638	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Diazinon	S24-Ja0024638	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Dimethoate	S24-Ja0024638	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Disulfoton	S24-Ja0024638	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
EPN	S24-Ja0024638	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Ethion	S24-Ja0024638	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Ethoprop	S24-Ja0024638	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Ethyl parathion	S24-Ja0024638	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	

Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Fenitrothion	S24-Ja0024638	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Fensulfothion	S24-Ja0024638	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Fenthion	S24-Ja0024638	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Malathion	S24-Ja0024638	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Merphos	S24-Ja0024638	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Methyl parathion	S24-Ja0024638	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Mevinphos	S24-Ja0024638	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Monocrotophos	S24-Ja0024638	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Naled	S24-Ja0024638	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Omethoate	S24-Ja0024638	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Phorate	S24-Ja0024638	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Pirimiphos-methyl	S24-Ja0024638	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Pyrazophos	S24-Ja0024638	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Ronnel	S24-Ja0024638	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Terbufos	S24-Ja0024638	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Tetrachlorvinphos	S24-Ja0024638	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Tokuthion	S24-Ja0024638	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Trichloronate	S24-Ja0024638	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S24-Ja0024638	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Aroclor-1221	S24-Ja0024638	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Aroclor-1232	S24-Ja0024638	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Aroclor-1242	S24-Ja0024638	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Aroclor-1248	S24-Ja0024638	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Aroclor-1254	S24-Ja0024638	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Aroclor-1260	S24-Ja0024638	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Total PCB*	S24-Ja0024638	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	N24-Ja0016318	NCP	mg/L	0.08	0.09	5.9	30%	Pass	
TRH >C16-C34	N24-Ja0016318	NCP	mg/L	0.1	0.1	23	30%	Pass	
TRH >C34-C40	N24-Ja0016318	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Metals M8				Result 1	Result 2	RPD			
Arsenic	W24-Ja0016143	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium	W24-Ja0016143	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	W24-Ja0016143	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper	W24-Ja0016143	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead	W24-Ja0016143	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury	W24-Ja0016143	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	W24-Ja0016143	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc	W24-Ja0016143	CP	mg/L	< 0.005	0.031	29	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

Authorised by:

Ursula Long	Analytical Services Manager
Mickael Ros	Senior Analyst-Metal
Roopesh Rangarajan	Senior Analyst-Organic
Roopesh Rangarajan	Senior Analyst-Volatile

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

Stantec

From: Stantec Wollongong
Address: Shop 1, Level 1
16 Burelli St
Wollongong NSW 2500
Phone: (02) 4231 9600
Attention: **katelyn.elliott@stantec.com**
Email: katelyn.elliott@stantec.com **mitch.blencowe@stantec.com**
Mobile: **0.047614411**

To: Eurofins Wollongong
Address: Unit 16
7 Investigator Dr
Unanderra NSW 2526
Phone: (02) 9900 8400
Email: EnviroSampleNSW@eurofins.com

Date: 18/01/2024
TAT: Std 5 days
Purchase Order: NA
Laboratory Quote ID: Stantec Rates
Project number: 304001019
Project name: Bomaderry
Data output format: PDF, Esdat

Attempt to chill evident: Y / N

Sample Temperature on Arrival: 22.4°C

Notes: Please note requirements for trace analysis, please analyse both filtered and unfiltered metals.

Container: Plastic Tube – PT, Bag – B, Petri Dish – PD, Plastic Bottle – PB, Plastic Jar - PJ, Glass Jar – GJ, Glass Bottle – GB, Glass Vial - GV

Analytes – Single Analytes

Laboratory Sample Number	Cardno Sample Number	Sample Date	Matrix	Container	TRH	TRH w/ Silica Gel	BTEXN	PAHS	OCP	OPP	PCB	Lead	M7 - Metals (exc. Hg)	M8 - Metals (inc. Hg)	Cr6)	Phenols - Speciated	VOCs	SVOC	TRH (trace)	PAH (trace)	PFAS (trace)	M8- Metals (trace)	OCP (trace)	OPP (trace)	Dup to 2nd Lab	Select Analyte or Delete to Clear	Applicable Suites	Sample Comments
	BH02	18/01/2024	Water	2xGB, 2xGV, 3xPB			1				1								1	1	1	1	1	1				
	BH03	18/01/2024	Water	2xGB, 2xGV, 3xPB			1				1								1	1	1	1	1	1				
	BH04	18/01/2024	Water	2xGB, 2xGV, 3xPB			1				1								1	1	1	1	1	1				
	QA200	18/01/2024	Water	2xGB, 2xGV, 3xPB			1				1								1	1	1	1	1	1				
	QC200	18/01/2024	Water	2xGB, 2xGV, 3xPB			1				1								1	1	1	1	1	1	1			Send dup to SGS
	RIN_240118	18/01/2024	Water	2xGB, 2xGV, 3xPB			1				1								1	1	1	1	1	1				
	Trip spike	18/01/2024	Water	2xGV	1		1																				B1	
	Trip blank	18/01/2024	Water	2xGV	1		1																				B1	
				Total	2		8				6								6	6	6	6	6					

Relinquished By: Katelyn Elliott
Company: Stantec
Time: 1:30pm
Date: 18/01/2024

Received By: Greg DeBattista
Company: Eurofins
Time: 2:12PM
Date: 18/1/24

Relinquished By:
Company:
Time:
Date:

Received By:
Company:
Time:
Date:

#1060537

04001019_COC03 Eurofins_18.01.2024.xlsx

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Company Name: Stantec Australia Pty Ltd (Wollongong)
Address: Ground Floor, 16 Burelli Street
Wollongong
NSW 2500

Project Name: BOMADERRY
Project ID: 304001019

Order No.:
Report #: 1060537
Phone: (02) 9493 9700
Fax:

Received: Jan 18, 2024 2:32 PM
Due: Feb 2, 2024
Priority: 1 Day
Contact Name: Katelyn Elliott

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Polychlorinated Biphenyls	Metals M8	Metals M8 filtered	Eurofins Suite B6 (filtered metals)	BTEXN and Volatile TRH	BTEXN and Volatile TRH	Polycyclic Aromatic Hydrocarbons (Trace level)	Per- and Polyfluoroalkyl Substances (PFASs) - Trace	Suite B14: OCP/OPP (trace level)
Melbourne Laboratory - NATA # 1261 Site # 1254												X		X
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X	X	X	X		
Brisbane Laboratory - NATA # 1261 Site # 20794													X	
External Laboratory														
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**									
1	BH02	Jan 18, 2024		Water	W24-Ja0022831	X	X	X				X	X	X
2	BH03	Jan 18, 2024		Water	W24-Ja0022832	X	X	X				X	X	X
3	BH04	Jan 18, 2024		Water	W24-Ja0022833	X	X	X				X	X	X
4	QA200	Jan 18, 2024		Water	W24-Ja0022834	X	X	X				X	X	X
5	RIN_240118	Jan 18, 2024		Water	W24-Ja0022835	X	X		X			X	X	X
6	TRIP SPIKE	Jan 18, 2024		Water	W24-Ja0022836						X			
7	TRIP BLANK	Jan 18, 2024		Water	W24-Ja0022837					X				
Test Counts						5	5	4	1	1	1	5	5	5

Stantec Australia Pty Ltd
Ground Floor, 16 Burelli Street
Wollongong
NSW 2500

Attention:	**Katelyn Elliott**
Report	**1060537-W**
Project name	BOMADERRY
Project ID	304001019
Received Date	Jan 18, 2024

Client Sample ID			**BH02**	**BH03**	**BH04**	**QA200**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**W24-Ja0022831**	**W24-Ja0022832**	**W24-Ja0022833**	**W24-Ja0022834**
Date Sampled			**Jan 18, 2024**	**Jan 18, 2024**	**Jan 18, 2024**	**Jan 18, 2024**
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Aroclor-1016	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Aroclor-1221	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Aroclor-1232	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Aroclor-1242	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Aroclor-1248	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Aroclor-1254	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Aroclor-1260	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Total PCB*	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Dibutylchlorendate (surr.)	1	%	100	123	103	96
Tetrachloro-m-xylene (surr.)	1	%	104	111	100	105
Polycyclic Aromatic Hydrocarbons (Trace level)						
Acenaphthene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Acenaphthylene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Anthracene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Benz(a)anthracene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Benzo(a)pyrene - low level	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Benzo(b&j)fluoranthene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Benzo(g.h.i)perylene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Benzo(k)fluoranthene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Chrysene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Dibenz(a.h)anthracene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Fluoranthene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Fluorene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Indeno(1.2.3-cd)pyrene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Naphthalene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Phenanthrene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Pyrene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Total PAH*	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
2-Fluorobiphenyl (surr.)	1	%	119	120	144	134
p-Terphenyl-d14 (surr.)	1	%	117	116	106	132
Organophosphorus Pesticides (Trace level)						
Azinphos-methyl	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bolstar	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chlorfenvinphos	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chlorpyrifos	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01

Client Sample ID			BH02	BH03	BH04	QA200
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			W24-Ja0022831	W24-Ja0022832	W24-Ja0022833	W24-Ja0022834
Date Sampled			Jan 18, 2024	Jan 18, 2024	Jan 18, 2024	Jan 18, 2024
Test/Reference	LOR	Unit				
Organophosphorus Pesticides (Trace level)						
Chlorpyrifos-methyl	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Coumaphos	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
Demeton-O	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Demeton-S	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
Diazinon	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dichlorvos	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dimethoate	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Disulfoton	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
EPN	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethion	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethoprop	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethyl parathion	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fenitrothion	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fensulfothion	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fenthion	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Malathion	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Merphos	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Methyl parathion	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Mevinphos	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Monocrotophos	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Naled	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Omethoate	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phorate	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pirimiphos-methyl	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
Pyrazophos	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ronnel	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Terbufos	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Tetrachlorvinphos	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Tokuthion	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Trichloronate	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Triphenylphosphate (surr.)	1	%	120	106	118	110
Organochlorine Pesticides (Trace level)						
4.4'-DDD	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
4.4'-DDE	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
4.4'-DDT	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
a-HCH	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Aldrin	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
b-HCH	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Chlordanes - Total	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
d-HCH	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Dieldrin	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Endosulfan I	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Endosulfan II	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Endosulfan sulphate	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Endrin	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Endrin aldehyde	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Endrin ketone	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
g-HCH (Lindane)	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Heptachlor	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001

Client Sample ID			BH02	BH03	BH04	QA200
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			W24-Ja0022831	W24-Ja0022832	W24-Ja0022833	W24-Ja0022834
Date Sampled			Jan 18, 2024	Jan 18, 2024	Jan 18, 2024	Jan 18, 2024
Test/Reference	LOR	Unit				
Organochlorine Pesticides (Trace level)						
Heptachlor epoxide	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Hexachlorobenzene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Methoxychlor	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Toxaphene	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
DDT + DDE + DDD (Total)*	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Aldrin and Dieldrin (Total)*	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Vic EPA IWRG 621 OCP (Total)*	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Vic EPA IWRG 621 Other OCP (Total)*	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Metals M8						
Arsenic	0.001	mg/L	< 0.001	0.004	0.013	< 0.001
Cadmium	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium	0.001	mg/L	0.003	0.010	0.007	0.003
Copper	0.001	mg/L	< 0.001	0.028	0.007	< 0.001
Lead	0.001	mg/L	0.001	0.005	0.007	< 0.001
Mercury	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel	0.001	mg/L	0.017	0.031	0.043	0.016
Zinc	0.005	mg/L	0.021	0.13	0.083	0.022
Metals M8 filtered						
Arsenic (filtered)	0.001	mg/L	< 0.001	< 0.001	0.004	< 0.001
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	0.0003	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001	0.002	0.002	0.001
Copper (filtered)	0.001	mg/L	0.002	0.041	0.006	0.002
Lead (filtered)	0.001	mg/L	0.001	0.001	0.002	0.001
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel (filtered)	0.001	mg/L	0.016	0.045	0.053	0.016
Zinc (filtered)	0.005	mg/L	0.023	0.17	0.074	0.028
PFASs Summations						
Sum (PFHxS + PFOS)*	0.001	ug/L	0.001	0.003	0.023	0.002
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.001	ug/L	0.001	0.003	0.025	0.002
Sum of PFASs (n=30)*	0.005	ug/L	0.021	0.022	0.083	0.037
Sum of US EPA PFAS (PFOS + PFOA)*	0.001	ug/L	0.001	0.001	0.004	0.002
Sum of WA DWER PFAS (n=10)*	0.005	ug/L	0.021	0.021	0.078	0.037
Perfluoroalkyl sulfonamido substances- Trace						
Perfluorooctane sulfonamide (FOSA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
13C8-FOSA (surr.)	1	%	51	72	61	56
D3-N-MeFOSA (surr.)	1	%	94	132	86	102
D5-N-EtFOSA (surr.)	1	%	82	122	70	86
D7-N-MeFOSE (surr.)	1	%	97	142	100	121
D9-N-EtFOSE (surr.)	1	%	91	136	95	101

Client Sample ID			BH02	BH03	BH04	QA200
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			W24-Ja0022831	W24-Ja0022832	W24-Ja0022833	W24-Ja0022834
Date Sampled			Jan 18, 2024	Jan 18, 2024	Jan 18, 2024	Jan 18, 2024
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances- Trace						
D5-N-EtFOSAA (surr.)	1	%	62	110	62	64
D3-N-MeFOSAA (surr.)	1	%	52	72	54	61
Perfluoroalkyl carboxylic acids (PFCAs) - Trace						
Perfluorobutanoic acid (PFBA)[N11]	0.005	ug/L	< 0.005	< 0.005	0.007	< 0.005
Perfluoropentanoic acid (PFPeA)[N11]	0.001	ug/L	< 0.001	< 0.001	0.004	< 0.001
Perfluorohexanoic acid (PFHxA)[N11]	0.001	ug/L	< 0.001	< 0.001	0.006	< 0.001
Perfluoroheptanoic acid (PFHpA)[N11]	0.001	ug/L	< 0.001	< 0.001	0.002	< 0.001
Perfluorooctanoic acid (PFOA)[N11]	0.001	ug/L	< 0.001	< 0.001	[N09]0.002	< 0.001
Perfluorononanoic acid (PFNA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorodecanoic acid (PFDA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorotridecanoic acid (PFTrDA)[N15]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluoroundecanoic acid (PFUnDA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorododecanoic acid (PFDoDA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
13C4-PFBA (surr.)	1	%	35	48	58	42
13C5-PFPeA (surr.)	1	%	42	72	89	74
13C5-PFHxA (surr.)	1	%	46	70	84	61
13C4-PFHpA (surr.)	1	%	55	96	91	72
13C8-PFOA (surr.)	1	%	55	86	109	92
13C5-PFNA (surr.)	1	%	33	49	52	34
13C6-PFDA (surr.)	1	%	44	65	64	48
13C2-PFUnDA (surr.)	1	%	51	67	58	55
13C2-PFDoDA (surr.)	1	%	48	65	53	56
13C2-PFTeDA (surr.)	1	%	70	137	99	80
Perfluoroalkyl sulfonic acids (PFSAs)- Trace						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.001	ug/L	< 0.001	0.004	0.008	0.002
Perfluorononanesulfonic acid (PFNS)[N15]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.001	ug/L	< 0.001	< 0.001	0.002	< 0.001
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.001	ug/L	< 0.001	[N09]0.001	[N09]0.003	< 0.001
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.001	ug/L	< 0.001	[N09]0.002	[N09]0.021	< 0.001
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorooctanesulfonic acid (PFOS)[N11]	0.001	ug/L	[N09]0.001	[N09]0.001	[N09]0.002	[N09]0.002
Perfluorodecanesulfonic acid (PFDS)[N15]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
13C3-PFBS (surr.)	1	%	73	97	119	97
18O2-PFHxS (surr.)	1	%	55	76	69	59
13C8-PFOS (surr.)	1	%	76	82	55	74
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Trace						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.005	ug/L	0.020	0.014	0.026	0.033
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
13C2-4:2 FTSA (surr.)	1	%	INT	11	13	57
13C2-6:2 FTSA (surr.)	1	%	62	103	51	133
13C2-8:2 FTSA (surr.)	1	%	80	109	105	86
13C2-10:2 FTSA (surr.)	1	%	82	112	86	89

Client Sample ID			RIN_240118	TRIP SPIKE	TRIP BLANK
Sample Matrix			Water	Water	Water
Eurofins Sample No.			W24-Ja0022835	W24-Ja0022836	W24-Ja0022837
Date Sampled			Jan 18, 2024	Jan 18, 2024	Jan 18, 2024
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	%	106	-	-
Tetrachloro-m-xylene (surr.)	1	%	103	-	-
Polycyclic Aromatic Hydrocarbons (Trace level)					
Acenaphthene	0.00001	mg/L	< 0.00001	-	-
Acenaphthylene	0.00001	mg/L	< 0.00001	-	-
Anthracene	0.00001	mg/L	< 0.00001	-	-
Benz(a)anthracene	0.00001	mg/L	< 0.00001	-	-
Benzo(a)pyrene - low level	0.00001	mg/L	< 0.00001	-	-
Benzo(b&j)fluoranthene	0.00001	mg/L	< 0.00001	-	-
Benzo(g.h.i)perylene	0.00001	mg/L	< 0.00001	-	-
Benzo(k)fluoranthene	0.00001	mg/L	< 0.00001	-	-
Chrysene	0.00001	mg/L	< 0.00001	-	-
Dibenz(a.h)anthracene	0.00001	mg/L	< 0.00001	-	-
Fluoranthene	0.00001	mg/L	< 0.00001	-	-
Fluorene	0.00001	mg/L	< 0.00001	-	-
Indeno(1.2.3-cd)pyrene	0.00001	mg/L	< 0.00001	-	-
Naphthalene	0.00001	mg/L	< 0.00001	-	-
Phenanthrene	0.00001	mg/L	< 0.00001	-	-
Pyrene	0.00001	mg/L	< 0.00001	-	-
Total PAH*	0.00001	mg/L	< 0.00001	-	-
2-Fluorobiphenyl (surr.)	1	%	54	-	-
p-Terphenyl-d14 (surr.)	1	%	121	-	-
Organophosphorus Pesticides (Trace level)					
Azinphos-methyl	0.001	mg/L	< 0.001	-	-
Bolstar	0.001	mg/L	< 0.001	-	-
Chlorfenvinphos	0.001	mg/L	< 0.001	-	-
Chlorpyrifos	0.01	mg/L	< 0.01	-	-
Chlorpyrifos-methyl	0.001	mg/L	< 0.001	-	-
Coumaphos	0.01	mg/L	< 0.01	-	-
Demeton-O	0.001	mg/L	< 0.001	-	-
Demeton-S	0.01	mg/L	< 0.01	-	-
Diazinon	0.001	mg/L	< 0.001	-	-
Dichlorvos	0.001	mg/L	< 0.001	-	-
Dimethoate	0.001	mg/L	< 0.001	-	-
Disulfoton	0.001	mg/L	< 0.001	-	-
EPN	0.001	mg/L	< 0.001	-	-
Ethion	0.001	mg/L	< 0.001	-	-
Ethoprop	0.001	mg/L	< 0.001	-	-
Ethyl parathion	0.001	mg/L	< 0.001	-	-
Fenitrothion	0.001	mg/L	< 0.001	-	-
Fensulfothion	0.001	mg/L	< 0.001	-	-

Client Sample ID			RIN_240118	TRIP SPIKE	TRIP BLANK
Sample Matrix			Water	Water	Water
Eurofins Sample No.			W24-Ja0022835	W24-Ja0022836	W24-Ja0022837
Date Sampled			Jan 18, 2024	Jan 18, 2024	Jan 18, 2024
Test/Reference	LOR	Unit			
Organophosphorus Pesticides (Trace level)					
Fenthion	0.001	mg/L	< 0.001	-	-
Malathion	0.001	mg/L	< 0.001	-	-
Merphos	0.001	mg/L	< 0.001	-	-
Methyl parathion	0.001	mg/L	< 0.001	-	-
Mevinphos	0.001	mg/L	< 0.001	-	-
Monocrotophos	0.001	mg/L	< 0.001	-	-
Naled	0.001	mg/L	< 0.001	-	-
Omethoate	0.001	mg/L	< 0.001	-	-
Phorate	0.001	mg/L	< 0.001	-	-
Pirimiphos-methyl	0.01	mg/L	< 0.01	-	-
Pyrazophos	0.001	mg/L	< 0.001	-	-
Ronnel	0.001	mg/L	< 0.001	-	-
Terbufos	0.001	mg/L	< 0.001	-	-
Tetrachlorvinphos	0.001	mg/L	< 0.001	-	-
Tokuthion	0.001	mg/L	< 0.001	-	-
Trichloronate	0.001	mg/L	< 0.001	-	-
Triphenylphosphate (surr.)	1	%	127	-	-
Organochlorine Pesticides (Trace level)					
4.4'-DDD	0.00001	mg/L	< 0.00001	-	-
4.4'-DDE	0.00001	mg/L	< 0.00001	-	-
4.4'-DDT	0.00001	mg/L	< 0.00001	-	-
a-HCH	0.00001	mg/L	< 0.00001	-	-
Aldrin	0.00001	mg/L	< 0.00001	-	-
b-HCH	0.00001	mg/L	< 0.00001	-	-
Chlordanes - Total	0.00001	mg/L	< 0.00001	-	-
d-HCH	0.00001	mg/L	< 0.00001	-	-
Dieldrin	0.00001	mg/L	< 0.00001	-	-
Endosulfan I	0.00001	mg/L	< 0.00001	-	-
Endosulfan II	0.00001	mg/L	< 0.00001	-	-
Endosulfan sulphate	0.00001	mg/L	< 0.00001	-	-
Endrin	0.00001	mg/L	< 0.00001	-	-
Endrin aldehyde	0.00001	mg/L	< 0.00001	-	-
Endrin ketone	0.00001	mg/L	< 0.00001	-	-
g-HCH (Lindane)	0.00001	mg/L	< 0.00001	-	-
Heptachlor	0.00001	mg/L	< 0.00001	-	-
Heptachlor epoxide	0.00001	mg/L	< 0.00001	-	-
Hexachlorobenzene	0.00001	mg/L	< 0.00001	-	-
Methoxychlor	0.00001	mg/L	< 0.00001	-	-
Toxaphene	0.002	mg/L	< 0.002	-	-
DDT + DDE + DDD (Total)*	0.00001	mg/L	< 0.00001	-	-
Aldrin and Dieldrin (Total)*	0.00001	mg/L	< 0.00001	-	-
Vic EPA IWRG 621 OCP (Total)*	0.00001	mg/L	< 0.00001	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.00001	mg/L	< 0.00001	-	-
Metals M8					
Arsenic	0.001	mg/L	< 0.001	-	-
Cadmium	0.0002	mg/L	< 0.0002	-	-
Chromium	0.001	mg/L	< 0.001	-	-
Copper	0.001	mg/L	< 0.001	-	-
Lead	0.001	mg/L	< 0.001	-	-

Client Sample ID			RIN_240118	TRIP SPIKE	TRIP BLANK
Sample Matrix			Water	Water	Water
Eurofins Sample No.			W24-Ja0022835	W24-Ja0022836	W24-Ja0022837
Date Sampled			Jan 18, 2024	Jan 18, 2024	Jan 18, 2024
Test/Reference	LOR	Unit			
Metals M8					
Mercury	0.0001	mg/L	< 0.0001	-	-
Nickel	0.001	mg/L	< 0.001	-	-
Zinc	0.005	mg/L	< 0.005	-	-
Metals M8 filtered					
Arsenic (filtered)	0.001	mg/L	< 0.001	-	-
Cadmium (filtered)	0.0002	mg/L	< 0.0002	-	-
Chromium (filtered)	0.001	mg/L	< 0.001	-	-
Copper (filtered)	0.001	mg/L	< 0.001	-	-
Lead (filtered)	0.001	mg/L	< 0.001	-	-
Mercury (filtered)	0.0001	mg/L	< 0.0001	-	-
Nickel (filtered)	0.001	mg/L	< 0.001	-	-
Zinc (filtered)	0.005	mg/L	< 0.005	-	-
PFASs Summations					
Sum (PFHxS + PFOS)*	0.001	ug/L	< 0.001	-	-
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.001	ug/L	< 0.001	-	-
Sum of PFASs (n=30)*	0.005	ug/L	< 0.005	-	-
Sum of US EPA PFAS (PFOS + PFOA)*	0.001	ug/L	< 0.001	-	-
Sum of WA DWER PFAS (n=10)*	0.005	ug/L	< 0.005	-	-
Perfluoroalkyl sulfonamido substances- Trace					
Perfluorooctane sulfonamide (FOSA)[N11]	0.005	ug/L	< 0.005	-	-
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.005	ug/L	< 0.005	-	-
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.005	ug/L	< 0.005	-	-
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.005	ug/L	< 0.005	-	-
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.005	ug/L	< 0.005	-	-
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.005	ug/L	< 0.005	-	-
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.005	ug/L	< 0.005	-	-
13C8-FOSA (surr.)	1	%	90	-	-
D3-N-MeFOSA (surr.)	1	%	INT	-	-
D5-N-EtFOSA (surr.)	1	%	INT	-	-
D7-N-MeFOSE (surr.)	1	%	189	-	-
D9-N-EtFOSE (surr.)	1	%	192	-	-
D5-N-EtFOSAA (surr.)	1	%	111	-	-
D3-N-MeFOSAA (surr.)	1	%	104	-	-
Perfluoroalkyl carboxylic acids (PFCAs) - Trace					
Perfluorobutanoic acid (PFBA)[N11]	0.005	ug/L	< 0.005	-	-
Perfluoropentanoic acid (PFPeA)[N11]	0.001	ug/L	< 0.001	-	-
Perfluorohexanoic acid (PFHxA)[N11]	0.001	ug/L	< 0.001	-	-
Perfluoroheptanoic acid (PFHpA)[N11]	0.001	ug/L	< 0.001	-	-
Perfluorooctanoic acid (PFOA)[N11]	0.001	ug/L	< 0.001	-	-
Perfluorononanoic acid (PFNA)[N11]	0.001	ug/L	< 0.001	-	-
Perfluorodecanoic acid (PFDA)[N11]	0.001	ug/L	< 0.001	-	-
Perfluorotridecanoic acid (PFTrDA)[N15]	0.001	ug/L	< 0.001	-	-
Perfluoroundecanoic acid (PFUnDA)[N11]	0.001	ug/L	< 0.001	-	-
Perfluorododecanoic acid (PFDoDA)[N11]	0.001	ug/L	< 0.001	-	-
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.001	ug/L	< 0.001	-	-

Client Sample ID			RIN_240118	TRIP SPIKE	TRIP BLANK
Sample Matrix			Water	Water	Water
Eurofins Sample No.			W24-Ja0022835	W24-Ja0022836	W24-Ja0022837
Date Sampled			Jan 18, 2024	Jan 18, 2024	Jan 18, 2024
Test/Reference	LOR	Unit			
Perfluoroalkyl carboxylic acids (PFCAs) - Trace					
13C4-PFBA (surr.)	1	%	144	-	-
13C5-PFPeA (surr.)	1	%	121	-	-
13C5-PFHxA (surr.)	1	%	89	-	-
13C4-PFHpA (surr.)	1	%	129	-	-
13C8-PFOA (surr.)	1	%	144	-	-
13C5-PFNA (surr.)	1	%	141	-	-
13C6-PFDA (surr.)	1	%	112	-	-
13C2-PFUnDA (surr.)	1	%	110	-	-
13C2-PFDoDA (surr.)	1	%	77	-	-
13C2-PFTeDA (surr.)	1	%	145	-	-
Perfluoroalkyl sulfonic acids (PFSAs)- Trace					
Perfluorobutanesulfonic acid (PFBS)[N11]	0.001	ug/L	< 0.001	-	-
Perfluorononanesulfonic acid (PFNS)[N15]	0.001	ug/L	< 0.001	-	-
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.001	ug/L	< 0.001	-	-
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.001	ug/L	< 0.001	-	-
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.001	ug/L	< 0.001	-	-
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.001	ug/L	< 0.001	-	-
Perfluorooctanesulfonic acid (PFOS)[N11]	0.001	ug/L	< 0.001	-	-
Perfluorodecanesulfonic acid (PFDS)[N15]	0.001	ug/L	< 0.001	-	-
13C3-PFBS (surr.)	1	%	133	-	-
18O2-PFHxS (surr.)	1	%	118	-	-
13C8-PFOS (surr.)	1	%	124	-	-
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Trace					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.001	ug/L	< 0.001	-	-
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.005	ug/L	< 0.005	-	-
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.001	ug/L	< 0.001	-	-
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.001	ug/L	< 0.001	-	-
13C2-4:2 FTSA (surr.)	1	%	98	-	-
13C2-6:2 FTSA (surr.)	1	%	126	-	-
13C2-8:2 FTSA (surr.)	1	%	88	-	-
13C2-10:2 FTSA (surr.)	1	%	105	-	-
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	0.02	mg/L	< 0.02	-	< 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	-	-
BTEX					
Benzene	0.001	mg/L	< 0.001	-	< 0.001
Toluene	0.001	mg/L	< 0.001	-	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	-	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	-	< 0.002
o-Xylene	0.001	mg/L	< 0.001	-	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	-	< 0.003
4-Bromofluorobenzene (surr.)	1	%	113	-	116

Client Sample ID			RIN_240118	TRIP SPIKE	TRIP BLANK
Sample Matrix			Water	Water	Water
Eurofins Sample No.			W24-Ja0022835	W24-Ja0022836	W24-Ja0022837
Date Sampled			Jan 18, 2024	Jan 18, 2024	Jan 18, 2024
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene[N02]	0.01	mg/L	< 0.01	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05	-	-
TRH C6-C10	0.02	mg/L	< 0.02	-	-
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
TRH >C10-C16	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	-	-
TRH C6-C10	1	%	-	84	-
Naphthalene[N02]	0.01	mg/L	-	-	< 0.01
Total Recoverable Hydrocarbons					
Naphthalene	1	%	-	96	-
TRH C6-C9	1	%	-	76	-
TRH C6-C10	0.02	mg/L	-	-	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	-	-	< 0.02
BTEX					
Benzene	1	%	-	93	-
Ethylbenzene	1	%	-	91	-
m&p-Xylenes	1	%	-	96	-
o-Xylene	1	%	-	92	-
Toluene	1	%	-	99	-
Xylenes - Total	1	%	-	93	-
4-Bromofluorobenzene (surr.)	1	%	-	108	-

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
Polychlorinated Biphenyls	Sydney	Jan 24, 2024	7 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Polycyclic Aromatic Hydrocarbons (Trace level)	Melbourne	Jan 20, 2024	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water (trace)			
Metals M8	Sydney	Jan 24, 2024	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Suite B14: OCP/OPP (trace level)			
Organophosphorus Pesticides (Trace level)	Melbourne	Jan 20, 2024	7 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS (USEPA 8270)			
Organochlorine Pesticides (Trace level)	Melbourne	Jan 20, 2024	7 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8270) trace			
Eurofins Suite B6 (filtered metals)			
Metals M8 filtered	Sydney	Jan 24, 2024	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Jan 24, 2024	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jan 19, 2024	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jan 24, 2024	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Per- and Polyfluoroalkyl Substances (PFASs) - Trace			
Perfluoroalkyl sulfonamido substances- Trace	Brisbane	Feb 05, 2024	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) - low level			
Perfluoroalkyl carboxylic acids (PFCAs) - Trace	Brisbane	Feb 05, 2024	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) - low level			
Perfluoroalkyl sulfonic acids (PFSAs)- Trace	Brisbane	Feb 05, 2024	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) - low level			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Trace	Brisbane	Feb 05, 2024	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) - low level			
BTEX	Sydney	Jan 19, 2024	14 Days
- Method: LTM-ORG-2010 BTEX and Volatile TRH			
Total Recoverable Hydrocarbons	Sydney	Jan 18, 2024	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			

Company Name: Stantec Australia Pty Ltd (Wollongong)
Address: Ground Floor, 16 Burelli Street
Wollongong
NSW 2500

Order No.:
Report #: 1060537
Phone: (02) 9493 9700
Fax:

Received: Jan 18, 2024 2:32 PM
Due: Feb 2, 2024
Priority: 1 Day
Contact Name: Katelyn Elliott

Project Name: BOMADERRY
Project ID: 304001019

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Polychlorinated Biphenyls	Metals M8	Metals M8 filtered	Eurofins Suite B6 (filtered metals)	BTEXN and Volatile TRH	BTEXN and Volatile TRH	Polycyclic Aromatic Hydrocarbons (Trace level)	Per- and Polyfluoroalkyl Substances (PFASs) - Trace	Suite B14: OCP/OPP (trace level)
Melbourne Laboratory - NATA # 1261 Site # 1254												X		X
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X	X	X	X		
Brisbane Laboratory - NATA # 1261 Site # 20794													X	
External Laboratory														
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**									
1	BH02	Jan 18, 2024		Water	W24-Ja0022831	X	X	X				X	X	X
2	BH03	Jan 18, 2024		Water	W24-Ja0022832	X	X	X				X	X	X
3	BH04	Jan 18, 2024		Water	W24-Ja0022833	X	X	X				X	X	X
4	QA200	Jan 18, 2024		Water	W24-Ja0022834	X	X	X				X	X	X
5	RIN_240118	Jan 18, 2024		Water	W24-Ja0022835	X	X		X			X	X	X
6	TRIP SPIKE	Jan 18, 2024		Water	W24-Ja0022836						X			
7	TRIP BLANK	Jan 18, 2024		Water	W24-Ja0022837					X				
Test Counts						5	5	4	1	1	1	5	5	5

eurofins | Environment Testing

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. All soil/sediment/solid results are reported on a dry weight basis unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion unless otherwise stated.
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.
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 date of sampling; 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 7 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	

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 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should 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 70 – 130%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 5.4, 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.

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Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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							
Polycyclic Aromatic Hydrocarbons (Trace level)							
Acenaphthene	mg/L	< 0.00001			0.00001	Pass	
Acenaphthylene	mg/L	< 0.00001			0.00001	Pass	
Anthracene	mg/L	< 0.00001			0.00001	Pass	
Benz(a)anthracene	mg/L	< 0.00001			0.00001	Pass	
Benzo(a)pyrene - low level	mg/L	< 0.00001			0.00001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.00001			0.00001	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.00001			0.00001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.00001			0.00001	Pass	
Chrysene	mg/L	< 0.00001			0.00001	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.00001			0.00001	Pass	
Fluoranthene	mg/L	< 0.00001			0.00001	Pass	
Fluorene	mg/L	< 0.00001			0.00001	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.00001			0.00001	Pass	
Naphthalene	mg/L	< 0.00001			0.00001	Pass	
Phenanthrene	mg/L	< 0.00001			0.00001	Pass	
Pyrene	mg/L	< 0.00001			0.00001	Pass	
Method Blank							
Organophosphorus Pesticides (Trace level)							
Azinphos-methyl	mg/L	< 0.001			0.001	Pass	
Bolstar	mg/L	< 0.001			0.001	Pass	
Chlorfenvinphos	mg/L	< 0.001			0.001	Pass	
Chlorpyrifos	mg/L	< 0.01			0.01	Pass	
Chlorpyrifos-methyl	mg/L	< 0.001			0.001	Pass	
Coumaphos	mg/L	< 0.01			0.01	Pass	
Demeton-O	mg/L	< 0.001			0.001	Pass	
Demeton-S	mg/L	< 0.01			0.01	Pass	
Diazinon	mg/L	< 0.001			0.001	Pass	
Dichlorvos	mg/L	< 0.001			0.001	Pass	
Dimethoate	mg/L	< 0.001			0.001	Pass	
Disulfoton	mg/L	< 0.001			0.001	Pass	
EPN	mg/L	< 0.001			0.001	Pass	
Ethion	mg/L	< 0.001			0.001	Pass	
Ethoprop	mg/L	< 0.001			0.001	Pass	
Ethyl parathion	mg/L	< 0.001			0.001	Pass	
Fenitrothion	mg/L	< 0.001			0.001	Pass	
Fensulfothion	mg/L	< 0.001			0.001	Pass	
Fenthion	mg/L	< 0.001			0.001	Pass	
Malathion	mg/L	< 0.001			0.001	Pass	
Merphos	mg/L	< 0.001			0.001	Pass	
Methyl parathion	mg/L	< 0.001			0.001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Mevinphos	mg/L	< 0.001			0.001	Pass	
Monocrotophos	mg/L	< 0.001			0.001	Pass	
Naled	mg/L	< 0.001			0.001	Pass	
Omethoate	mg/L	< 0.001			0.001	Pass	
Phorate	mg/L	< 0.001			0.001	Pass	
Pirimiphos-methyl	mg/L	< 0.01			0.01	Pass	
Pyrazophos	mg/L	< 0.001			0.001	Pass	
Ronnel	mg/L	< 0.001			0.001	Pass	
Terbufos	mg/L	< 0.001			0.001	Pass	
Tetrachlorvinphos	mg/L	< 0.001			0.001	Pass	
Tokuthion	mg/L	< 0.001			0.001	Pass	
Trichloronate	mg/L	< 0.001			0.001	Pass	
Method Blank							
Organochlorine Pesticides (Trace level)							
4.4'-DDD	mg/L	< 0.00001			0.00001	Pass	
4.4'-DDE	mg/L	< 0.00001			0.00001	Pass	
4.4'-DDT	mg/L	< 0.00001			0.00001	Pass	
a-HCH	mg/L	< 0.00001			0.00001	Pass	
Aldrin	mg/L	< 0.00001			0.00001	Pass	
b-HCH	mg/L	< 0.00001			0.00001	Pass	
Chlordanes - Total	mg/L	< 0.00001			0.00001	Pass	
d-HCH	mg/L	< 0.00001			0.00001	Pass	
Dieldrin	mg/L	< 0.00001			0.00001	Pass	
Endosulfan I	mg/L	< 0.00001			0.00001	Pass	
Endosulfan II	mg/L	< 0.00001			0.00001	Pass	
Endosulfan sulphate	mg/L	< 0.00001			0.00001	Pass	
Endrin	mg/L	< 0.00001			0.00001	Pass	
Endrin aldehyde	mg/L	< 0.00001			0.00001	Pass	
Endrin ketone	mg/L	< 0.00001			0.00001	Pass	
g-HCH (Lindane)	mg/L	< 0.00001			0.00001	Pass	
Heptachlor	mg/L	< 0.00001			0.00001	Pass	
Heptachlor epoxide	mg/L	< 0.00001			0.00001	Pass	
Hexachlorobenzene	mg/L	< 0.00001			0.00001	Pass	
Methoxychlor	mg/L	< 0.00001			0.00001	Pass	
Toxaphene	mg/L	< 0.002			0.002	Pass	
Method Blank							
Metals M8							
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
Method Blank							
Metals M8 filtered							
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances- Trace							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.005			0.005	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.005			0.005	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.005			0.005	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.005			0.005	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.005			0.005	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.005			0.005	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.005			0.005	Pass	
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs) - Trace							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.005			0.005	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.001			0.001	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.001			0.001	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.001			0.001	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.001			0.001	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.001			0.001	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.001			0.001	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.001			0.001	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.001			0.001	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.001			0.001	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.001			0.001	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)- Trace							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.001			0.001	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.001			0.001	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.001			0.001	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.001			0.001	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.001			0.001	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.001			0.001	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.001			0.001	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.001			0.001	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Trace							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.001			0.001	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.005			0.005	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.001			0.001	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.001			0.001	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
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	
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							

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Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
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	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1016	%	70			70-130	Pass	
Aroclor-1260	%	82			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons (Trace level)							
Acenaphthene	%	74			70-130	Pass	
Acenaphthylene	%	75			70-130	Pass	
Anthracene	%	108			70-130	Pass	
Benz(a)anthracene	%	125			70-130	Pass	
Benzo(a)pyrene - low level	%	117			70-130	Pass	
Benzo(b&j)fluoranthene	%	119			70-130	Pass	
Benzo(g.h.i)perylene	%	96			70-130	Pass	
Benzo(k)fluoranthene	%	125			70-130	Pass	
Chrysene	%	119			70-130	Pass	
Dibenz(a.h)anthracene	%	76			70-130	Pass	
Fluoranthene	%	126			70-130	Pass	
Fluorene	%	102			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	90			70-130	Pass	
Naphthalene	%	71			70-130	Pass	
Phenanthrene	%	119			70-130	Pass	
Pyrene	%	119			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides (Trace level)							
Diazinon	%	86			70-130	Pass	
Dimethoate	%	100			70-130	Pass	
Ethion	%	70			70-130	Pass	
Fenitrothion	%	84			70-130	Pass	
Methyl parathion	%	85			70-130	Pass	
Mevinphos	%	93			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides (Trace level)							
4.4'-DDD	%	93			70-130	Pass	
4.4'-DDE	%	85			70-130	Pass	
4.4'-DDT	%	71			70-130	Pass	
a-HCH	%	89			70-130	Pass	
Aldrin	%	74			70-130	Pass	
b-HCH	%	101			70-130	Pass	
Chlordanes - Total	%	81			70-130	Pass	
d-HCH	%	96			70-130	Pass	
Dieldrin	%	82			70-130	Pass	
Endosulfan I	%	81			70-130	Pass	
Endosulfan II	%	83			70-130	Pass	
Endosulfan sulphate	%	71			70-130	Pass	
Endrin	%	85			70-130	Pass	
Endrin aldehyde	%	76			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin ketone	%	98			70-130	Pass	
g-HCH (Lindane)	%	99			70-130	Pass	
Heptachlor	%	72			70-130	Pass	
Heptachlor epoxide	%	78			70-130	Pass	
Hexachlorobenzene	%	73			70-130	Pass	
Methoxychlor	%	92			70-130	Pass	
LCS - % Recovery							
Metals M8							
Arsenic	%	82			80-120	Pass	
Cadmium	%	82			80-120	Pass	
Chromium	%	88			80-120	Pass	
Copper	%	88			80-120	Pass	
Lead	%	86			80-120	Pass	
Mercury	%	92			80-120	Pass	
Nickel	%	87			80-120	Pass	
Zinc	%	85			80-120	Pass	
LCS - % Recovery							
Metals M8 filtered							
Arsenic (filtered)	%	97			80-120	Pass	
Cadmium (filtered)	%	97			80-120	Pass	
Chromium (filtered)	%	99			80-120	Pass	
Copper (filtered)	%	101			80-120	Pass	
Lead (filtered)	%	97			80-120	Pass	
Mercury (filtered)	%	97			80-120	Pass	
Nickel (filtered)	%	101			80-120	Pass	
Zinc (filtered)	%	101			80-120	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances- Trace							
Perfluorooctane sulfonamide (FOSA)	%	90			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	101			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	97			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	101			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	99			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	95			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	98			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs) - Trace							
Perfluorobutanoic acid (PFBA)	%	82			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	70			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	80			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	80			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	90			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	87			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	87			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	83			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	93			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	96			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	54			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)- Trace							
Perfluorobutanesulfonic acid (PFBS)	%	87			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	87			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	120			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	107			50-150	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorohexanesulfonic acid (PFHxS)			%	97			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)			%	97			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)			%	94			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)			%	63			50-150	Pass	
LCS - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Trace									
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)			%	96			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)			%	108			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)			%	98			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)			%	102			50-150	Pass	
LCS - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions									
TRH C6-C9			%	90			70-130	Pass	
TRH C10-C14			%	81			70-130	Pass	
LCS - % Recovery									
BTEX									
Benzene			%	94			70-130	Pass	
Toluene			%	87			70-130	Pass	
Ethylbenzene			%	92			70-130	Pass	
m&p-Xylenes			%	93			70-130	Pass	
o-Xylene			%	90			70-130	Pass	
Xylenes - Total*			%	92			70-130	Pass	
LCS - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions									
Naphthalene			%	96			70-130	Pass	
TRH C6-C10			%	94			70-130	Pass	
LCS - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions									
TRH >C10-C16			%	76			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons (Trace level)				Result 1					
Acenaphthene	N24-Ja0026167	NCP	%	120			70-130	Pass	
Acenaphthylene	N24-Ja0026167	NCP	%	125			70-130	Pass	
Anthracene	N24-Ja0026167	NCP	%	109			70-130	Pass	
Benz(a)anthracene	N24-Ja0026167	NCP	%	118			70-130	Pass	
Benzo(a)pyrene - low level	N24-Ja0026167	NCP	%	109			70-130	Pass	
Benzo(b&j)fluoranthene	N24-Ja0026167	NCP	%	93			70-130	Pass	
Benzo(g.h.i)perylene	N24-Ja0026167	NCP	%	115			70-130	Pass	
Benzo(k)fluoranthene	N24-Ja0026167	NCP	%	97			70-130	Pass	
Chrysene	N24-Ja0026167	NCP	%	128			70-130	Pass	
Dibenz(a.h)anthracene	N24-Ja0026167	NCP	%	91			70-130	Pass	
Fluoranthene	N24-Ja0026167	NCP	%	123			70-130	Pass	
Fluorene	N24-Ja0026167	NCP	%	117			70-130	Pass	
Indeno(1.2.3-cd)pyrene	N24-Ja0026167	NCP	%	97			70-130	Pass	
Naphthalene	N24-Ja0026167	NCP	%	128			70-130	Pass	
Phenanthrene	N24-Ja0026167	NCP	%	119			70-130	Pass	
Pyrene	N24-Ja0026167	NCP	%	129			70-130	Pass	
Spike - % Recovery									
Metals M8				Result 1					
Arsenic	S24-Ja0026117	NCP	%	82			75-125	Pass	
Cadmium	S24-Ja0026117	NCP	%	81			75-125	Pass	
Chromium	S24-Ja0026117	NCP	%	91			75-125	Pass	
Copper	S24-Ja0026117	NCP	%	93			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Lead	S24-Ja0026117	NCP	%	87			75-125	Pass	
Mercury	S24-Ja0026117	NCP	%	96			75-125	Pass	
Nickel	S24-Ja0026117	NCP	%	88			75-125	Pass	
Zinc	S24-Ja0026117	NCP	%	83			75-125	Pass	
Spike - % Recovery									
Metals M8 filtered				Result 1					
Arsenic (filtered)	S24-Ja0026117	NCP	%	87			75-125	Pass	
Cadmium (filtered)	S24-Ja0026117	NCP	%	87			75-125	Pass	
Chromium (filtered)	S24-Ja0026117	NCP	%	92			75-125	Pass	
Copper (filtered)	S24-Ja0026117	NCP	%	90			75-125	Pass	
Lead (filtered)	S24-Ja0026117	NCP	%	89			75-125	Pass	
Mercury (filtered)	S24-Ja0026117	NCP	%	84			75-125	Pass	
Nickel (filtered)	S24-Ja0026117	NCP	%	89			75-125	Pass	
Zinc (filtered)	S24-Ja0026117	NCP	%	86			75-125	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances- Trace				Result 1					
Perfluorooctane sulfonamide (FOSA)	W24-Ja0022832	CP	%	74			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	W24-Ja0022832	CP	%	74			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	W24-Ja0022832	CP	%	67			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	W24-Ja0022832	CP	%	72			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	W24-Ja0022832	CP	%	73			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	W24-Ja0022832	CP	%	75			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	W24-Ja0022832	CP	%	79			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs) - Trace				Result 1					
Perfluorobutanoic acid (PFBA)	W24-Ja0022832	CP	%	93			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	W24-Ja0022832	CP	%	104			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	W24-Ja0022832	CP	%	113			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	W24-Ja0022832	CP	%	101			50-150	Pass	
Perfluorooctanoic acid (PFOA)	W24-Ja0022832	CP	%	129			50-150	Pass	
Perfluorononanoic acid (PFNA)	W24-Ja0022832	CP	%	117			50-150	Pass	
Perfluorodecanoic acid (PFDA)	W24-Ja0022832	CP	%	92			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	W24-Ja0022832	CP	%	80			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	W24-Ja0022832	CP	%	83			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	W24-Ja0022832	CP	%	74			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	W24-Ja0022832	CP	%	50			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)- Trace				Result 1					
Perfluorobutanesulfonic acid (PFBS)	W24-Ja0022832	CP	%	98			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	W24-Ja0022832	CP	%	109			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	W24-Ja0022832	CP	%	96			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	W24-Ja0022832	CP	%	89			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluoroheptanesulfonic acid (PFHpS)	W24-Ja0022832	CP	%	118			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	W24-Ja0022832	CP	%	117			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Trace				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	W24-Ja0022832	CP	%	97			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	W24-Ja0022832	CP	%	95			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	W24-Ja0022832	CP	%	89			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	W24-Ja0022832	CP	%	82			50-150	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S24-Ja0029670	NCP	%	83			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S24-Ja0029670	NCP	%	77			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	W24-Ja0022837	CP	%	96			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	W24-Ja0022837	CP	%	95			70-130	Pass	
Toluene	W24-Ja0022837	CP	%	83			70-130	Pass	
Ethylbenzene	W24-Ja0022837	CP	%	94			70-130	Pass	
m&p-Xylenes	W24-Ja0022837	CP	%	97			70-130	Pass	
o-Xylene	W24-Ja0022837	CP	%	93			70-130	Pass	
Xylenes - Total*	W24-Ja0022837	CP	%	96			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	W24-Ja0022837	CP	%	86			70-130	Pass	
TRH C6-C10	W24-Ja0022837	CP	%	100			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S24-Ja0026061	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Aroclor-1221	S24-Ja0026061	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Aroclor-1232	S24-Ja0026061	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Aroclor-1242	S24-Ja0026061	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Aroclor-1248	S24-Ja0026061	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Aroclor-1254	S24-Ja0026061	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Aroclor-1260	S24-Ja0026061	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Total PCB*	S24-Ja0026061	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons (Trace level)				Result 1	Result 2	RPD			
Acenaphthene	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Acenaphthylene	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Anthracene	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Benz(a)anthracene	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Benzo(a)pyrene - low level	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons (Trace level)				Result 1	Result 2	RPD			
Benzo(b&j)fluoranthene	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Benzo(g.h.i)perylene	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Benzo(k)fluoranthene	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Chrysene	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Dibenz(a.h)anthracene	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Fluoranthene	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Fluorene	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Naphthalene	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Phenanthrene	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Pyrene	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides (Trace level)				Result 1	Result 2	RPD			
Azinphos-methyl	M24-Ja0019771	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bolstar	M24-Ja0019771	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chlorfenvinphos	M24-Ja0019771	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chlorpyrifos	M24-Ja0019771	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Chlorpyrifos-methyl	M24-Ja0019771	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Coumaphos	M24-Ja0019771	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Demeton-O	M24-Ja0019771	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Demeton-S	M24-Ja0019771	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Diazinon	M24-Ja0019771	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dichlorvos	M24-Ja0019771	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dimethoate	M24-Ja0019771	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Disulfoton	M24-Ja0019771	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
EPN	M24-Ja0019771	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethion	M24-Ja0019771	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethoprop	M24-Ja0019771	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethyl parathion	M24-Ja0019771	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fenitrothion	M24-Ja0019771	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fensulfothion	M24-Ja0019771	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fenthion	M24-Ja0019771	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Malathion	M24-Ja0019771	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Merphos	M24-Ja0019771	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Methyl parathion	M24-Ja0019771	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mevinphos	M24-Ja0019771	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Monocrotophos	M24-Ja0019771	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naled	M24-Ja0019771	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Omethoate	M24-Ja0019771	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phorate	M24-Ja0019771	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pirimiphos-methyl	M24-Ja0019771	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Pyrazophos	M24-Ja0019771	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ronnel	M24-Ja0019771	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Terbufos	M24-Ja0019771	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Tetrachlorvinphos	M24-Ja0019771	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Tokuthion	M24-Ja0019771	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Trichloronate	M24-Ja0019771	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides (Trace level)				Result 1	Result 2	RPD			
4.4'-DDD	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
4.4'-DDE	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
4.4'-DDT	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
a-HCH	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Aldrin	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides (Trace level)				Result 1	Result 2	RPD			
b-HCH	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Chlordanes - Total	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
d-HCH	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Dieldrin	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Endosulfan I	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Endosulfan II	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Endosulfan sulphate	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Endrin	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Endrin aldehyde	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Endrin ketone	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
g-HCH (Lindane)	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Heptachlor	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Heptachlor epoxide	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Hexachlorobenzene	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Methoxychlor	M24-Ja0019771	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Toxaphene	M24-Ja0019771	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Duplicate									
Metals M8				Result 1	Result 2	RPD			
Cadmium	W24-Ja0028902	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Lead	S24-Ja0031868	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances- Trace				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	W24-Ja0022831	CP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	W24-Ja0022831	CP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	W24-Ja0022831	CP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	W24-Ja0022831	CP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	W24-Ja0022831	CP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	W24-Ja0022831	CP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	W24-Ja0022831	CP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs) - Trace				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	W24-Ja0022831	CP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	W24-Ja0022831	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	W24-Ja0022831	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	W24-Ja0022831	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	W24-Ja0022831	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	W24-Ja0022831	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	W24-Ja0022831	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	W24-Ja0022831	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	W24-Ja0022831	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	W24-Ja0022831	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	W24-Ja0022831	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)- Trace				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	W24-Ja0022831	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	W24-Ja0022831	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	W24-Ja0022831	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	W24-Ja0022831	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	W24-Ja0022831	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	W24-Ja0022831	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	W24-Ja0022831	CP	ug/L	0.001	0.002	28	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	W24-Ja0022831	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Trace				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	W24-Ja0022831	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	W24-Ja0022831	CP	ug/L	0.020	0.023	15	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	W24-Ja0022831	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	W24-Ja0022831	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Metals M8 filtered				Result 1	Result 2	RPD			
Arsenic (filtered)	W24-Ja0022834	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium (filtered)	W24-Ja0022834	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	W24-Ja0022834	CP	mg/L	0.001	0.001	4.4	30%	Pass	
Copper (filtered)	W24-Ja0022834	CP	mg/L	0.002	0.002	<1	30%	Pass	
Lead (filtered)	W24-Ja0022834	CP	mg/L	0.001	0.001	4.3	30%	Pass	
Mercury (filtered)	W24-Ja0022834	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	W24-Ja0022834	CP	mg/L	0.016	0.016	<1	30%	Pass	
Zinc (filtered)	W24-Ja0022834	CP	mg/L	0.028	0.025	7.9	30%	Pass	
Duplicate									
Metals M8				Result 1	Result 2	RPD			
Arsenic	W24-Ja0022835	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chromium	W24-Ja0022835	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper	W24-Ja0022835	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury	W24-Ja0022835	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	W24-Ja0022835	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc	W24-Ja0022835	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Duplicate									
Metals M8 filtered				Result 1	Result 2	RPD			
Arsenic (filtered)	W24-Ja0022835	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium (filtered)	W24-Ja0022835	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	W24-Ja0022835	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	W24-Ja0022835	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead (filtered)	W24-Ja0022835	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury (filtered)	W24-Ja0022835	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	W24-Ja0022835	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc (filtered)	W24-Ja0022835	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances- Trace				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	W24-Ja0022835	CP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	W24-Ja0022835	CP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	W24-Ja0022835	CP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	W24-Ja0022835	CP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	W24-Ja0022835	CP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	W24-Ja0022835	CP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	W24-Ja0022835	CP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs) - Trace				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	W24-Ja0022835	CP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	W24-Ja0022835	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	W24-Ja0022835	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	W24-Ja0022835	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	W24-Ja0022835	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	W24-Ja0022835	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	W24-Ja0022835	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	W24-Ja0022835	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	W24-Ja0022835	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	W24-Ja0022835	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	W24-Ja0022835	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)- Trace				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	W24-Ja0022835	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	W24-Ja0022835	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	W24-Ja0022835	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	W24-Ja0022835	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	W24-Ja0022835	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	W24-Ja0022835	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	W24-Ja0022835	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	W24-Ja0022835	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Trace				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	W24-Ja0022835	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	W24-Ja0022835	CP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	W24-Ja0022835	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	W24-Ja0022835	CP	ug/L	< 0.001	< 0.001	<1	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	N24-Ja0022142	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	S24-Ja0029669	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	S24-Ja0029669	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	S24-Ja0029669	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	N24-Ja0022142	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	N24-Ja0022142	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	N24-Ja0022142	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	N24-Ja0022142	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	N24-Ja0022142	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total*	N24-Ja0022142	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	N24-Ja0022142	NCP	mg/L	0.02	0.02	<1	30%	Pass	
TRH C6-C10	N24-Ja0022142	NCP	mg/L	< 0.02	0.02	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S24-Ja0029669	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	S24-Ja0029669	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	S24-Ja0029669	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	

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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.
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.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Adam Bateup	Analytical Services Manager
Edward Lee	Senior Analyst-Organic
Fang Yee Tan	Senior Analyst-Metal
Jonathon Angell	Senior Analyst-PFAS
Mickael Ros	Senior Analyst-Metal
Roopesh Rangarajan	Senior Analyst-Organic
Roopesh Rangarajan	Senior Analyst-Volatile

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

Stantec

From: Stantec Wollongong
Address: Shop 1, Level 1
16 Burelli St
Wollongong NSW 2500
Phone: (02) 4231 9600
Attention: **katelyn.elliott@stantec.com**
Email: katelyn.elliott@stantec.com **mitch.blencowe@stantec.com**
Mobile: **0.047614411**

To: Eurofins Wollongong
Address: Unit 16
7 Investigator Dr
Unanderra NSW 2526
Phone: (02) 9900 8400
Email: EnviroSampleNSW@eurofins.com

Date: 18/01/2024
TAT: Std 5 days
Purchase Order: NA
Laboratory Quote ID: Stantec Rates
Project number: 304001019
Project name: Bomaderry
Data output format: PDF, Esdat

Attempt to chill evident: Y / N

Sample Temperature on Arrival: 22.4°C

Notes: Please note requirements for trace analysis, please analyse both filtered and unfiltered metals.

Laboratory Sample Number	Cardno Sample Number	Sample Date	Matrix	Container (Plastic Tube – PT, Bag – B, Petri Dish – PD, Plastic Bottle – PB, Plastic Jar - PJ, Glass Jar – GJ, Glass Bottle – GB, Glass Vial - GV)	TRH	TRH w/ Silica Gel	BTEXN	PAHS	OCP	OPP	PCB	Lead	M7 - Metals (exc. Hg)	M8 - Metals (inc. Hg)	Cr6)	Phenols - Speciated	VOCs	SVOC	TRH (trace)	PAH (trace)	PFAS (trace)	M8- Metals (trace)	OCP (trace)	OPP (trace)	Dup to 2nd Lab	Select Analyte or Delete to Clear	Applicable Suites	Sample Comments
	BH02	18/01/2024	Water	2xGB, 2xGV, 3xPB			1				1								1	1	1	1	1	1				
	BH03	18/01/2024	Water	2xGB, 2xGV, 3xPB			1				1								1	1	1	1	1	1				
	BH04	18/01/2024	Water	2xGB, 2xGV, 3xPB			1				1								1	1	1	1	1	1				
	QA200	18/01/2024	Water	2xGB, 2xGV, 3xPB			1				1								1	1	1	1	1	1				
	QC200	18/01/2024	Water	2xGB, 2xGV, 3xPB			1				1								1	1	1	1	1	1	1			Send dup to SGS
	RIN_240118	18/01/2024	Water	2xGB, 2xGV, 3xPB			1				1								1	1	1	1	1	1				
	Trip spike	18/01/2024	Water	2xGV	1		1																				B1	
	Trip blank	18/01/2024	Water	2xGV	1		1																				B1	
				Total	2		8				6								6	6	6	6	6					

Relinquished By: Katelyn Elliott
Company: Stantec
Time: 1:30pm
Date: 18/01/2024

Received By: Greg DeBattista
Company: Eurofins
Time: 2:12PM
Date: 18/1/24

Relinquished By:
Company:
Time:
Date:

Received By:
Company:
Time:
Date:

#1060537

Company Name: Stantec Australia Pty Ltd (Wollongong)
Address: Ground Floor, 16 Burelli Street
Wollongong
NSW 2500

Order No.:
Report #: 1060806
Phone: (02) 9493 9700
Fax:

Received: Jan 18, 2024 2:32 PM
Due: Jan 19, 2024
Priority: 1 Day
Contact Name: Katelyn Elliott

Project Name: BOMADERRY
Project ID: 304001019

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Eurofins Suite B1
Sydney Laboratory - NATA # 1261 Site # 18217						X
External Laboratory						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
1	BH02	Jan 18, 2024		Water	W24-Ja0024920	X
2	BH03	Jan 18, 2024		Water	W24-Ja0024921	X
3	BH04	Jan 18, 2024		Water	W24-Ja0024922	X
4	QA200	Jan 18, 2024		Water	W24-Ja0024923	X
Test Counts						4

Certificate of Analysis

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Environment Testing

Stantec Australia Pty Ltd
Ground Floor, 16 Burelli Street
Wollongong
NSW 2500

NATA Accredited
Accreditation Number 1261
Site Number 18217

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:	**Katelyn Elliott**
Report	**1060806-W**
Project name	BOMADERRY
Project ID	304001019
Received Date	Jan 18, 2024

Client Sample ID			**BH02**	**BH03**	**BH04**	**QA200**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**W24-Ja0024920**	**W24-Ja0024921**	**W24-Ja0024922**	**W24-Ja0024923**
Date Sampled			**Jan 18, 2024**	**Jan 18, 2024**	**Jan 18, 2024**	**Jan 18, 2024**
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	122	115	118	111
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Total Recoverable Hydrocarbons						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Eurofins Suite B1			
BTEX	Sydney	Jan 19, 2024	14 Days
- Method: LTM-ORG-2010 BTEX and Volatile TRH			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jan 19, 2024	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons	Sydney	Jan 19, 2024	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Jan 19, 2024	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jan 19, 2024	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			

Company Name: Stantec Australia Pty Ltd (Wollongong)
Address: Ground Floor, 16 Burelli Street
Wollongong
NSW 2500

Order No.:
Report #: 1060806
Phone: (02) 9493 9700
Fax:

Received: Jan 18, 2024 2:32 PM
Due: Jan 19, 2024
Priority: 1 Day
Contact Name: Katelyn Elliott

Project Name: BOMADERRY
Project ID: 304001019

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Eurofins Suite B1
Sydney Laboratory - NATA # 1261 Site # 18217						X
External Laboratory						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
1	BH02	Jan 18, 2024		Water	W24-Ja0024920	X
2	BH03	Jan 18, 2024		Water	W24-Ja0024921	X
3	BH04	Jan 18, 2024		Water	W24-Ja0024922	X
4	QA200	Jan 18, 2024		Water	W24-Ja0024923	X
Test Counts						4

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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. All soil/sediment/solid results are reported on a dry weight basis unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion unless otherwise stated.
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.
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 date of sampling; 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 7 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	

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 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should 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 70 – 130%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 5.4, 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.

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Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
Method Blank							
Total Recoverable Hydrocarbons							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
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	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
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	
LCS - % Recovery							
BTEX							
Benzene	%	111			70-130	Pass	
Toluene	%	108			70-130	Pass	
Ethylbenzene	%	114			70-130	Pass	
m&p-Xylenes	%	117			70-130	Pass	
o-Xylene	%	112			70-130	Pass	
Xylenes - Total*	%	115			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	108			70-130	Pass	
TRH C6-C10	%	115			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	105			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C10-C14	%	107			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	99			70-130	Pass	

eurofins Environment Testing

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
BTEX				Result 1					
Benzene	N24-Ja0016501	NCP	%	97			70-130	Pass	
Toluene	N24-Ja0016501	NCP	%	92			70-130	Pass	
Ethylbenzene	N24-Ja0016501	NCP	%	95			70-130	Pass	
m&p-Xylenes	N24-Ja0016501	NCP	%	97			70-130	Pass	
o-Xylene	N24-Ja0016501	NCP	%	93			70-130	Pass	
Xylenes - Total*	N24-Ja0016501	NCP	%	96			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	N24-Ja0016501	NCP	%	86			70-130	Pass	
TRH C6-C10	N24-Ja0016501	NCP	%	101			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH C6-C9	N24-Ja0016501	NCP	%	92			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	W24-Ja0024921	CP	%	116			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	W24-Ja0024921	CP	%	108			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S24-Ja0014734	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S24-Ja0014734	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	S24-Ja0014734	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S24-Ja0014734	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	S24-Ja0014734	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total*	S24-Ja0014734	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S24-Ja0014734	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	S24-Ja0014734	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C6-C9	S24-Ja0014734	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	W24-Ja0024920	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	W24-Ja0024920	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	W24-Ja0024920	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	W24-Ja0024920	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	W24-Ja0024920	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	W24-Ja0024920	CP	mg/L	< 0.1	< 0.1	<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.

Authorised by:

Ursula Long	Analytical Services Manager
Roopesh Rangarajan	Senior Analyst-Organic
Roopesh Rangarajan	Senior Analyst-Volatile

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.

1 DAY ADDITIONAL: FW: Eurofins Test Results, Invoice - Report 1060806 : Site BOMADERRY (304001019)

Ursula Long <UrsulaLong@eurofins.com>
Mon 2024-01-22 11:20 AM
To:#AU25_Enviro_Sample_NSW <EnviroSampleNSW@eurofins.com>

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

1 Day TAT additional on 1060806 please

Samples for VOC analysis

Kind regards,

Ursula Long
Analytical Services Manager

I work on a flexible work schedule and may send emails outside normal working hours. Your immediate response is not expected.

Eurofins | Environment Testing Australia Pty Ltd
179 Magowar Road
Girraween, NSW, 2145
Phone: 0428 845 495
Email: UrsulaLong@eurofins.com
Website: eurofins.com.au/environmental-testing

From: Blencowe, Mitch <mitch.blencowe@stantec.com>
Sent: Monday, 22 January 2024 11:16 AM
To: Ursula Long <UrsulaLong@eurofins.com>; Elliott, Katelyn <Katelyn.Elliott@stantec.com>
Subject: RE: Eurofins Test Results, Invoice - Report 1060806 : Site BOMADERRY (304001019)

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

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

Hi Ursula,

By COB tomorrow would be great, thank you.

Mitch

Mitch Blencowe
Principal Environmental Scientist

Direct: +61 2 4216 7258
mitch.blencowe@stantec.com

Stantec
Ground Floor, 16 Burelli Street
Wollongong NSW 2500
AUSTRALIA

From: Ursula Long <UrsulaLong@eurofins.com>
Sent: Monday, January 22, 2024 11:15 AM
To: Blencowe, Mitch <mitch.blencowe@stantec.com>; Elliott, Katelyn <Katelyn.Elliott@stantec.com>
Subject: RE: Eurofins Test Results, Invoice - Report 1060806 : Site BOMADERRY (304001019)

No problem, are you happy to add these on the standard TAT report, or was this needed sooner?

Kind regards,

Ursula Long
Analytical Services Manager

I work on a flexible work schedule and may send emails outside normal working hours. Your immediate response is not expected.

Eurofins | Environment Testing Australia Pty Ltd
179 Magowar Road
Girraween, NSW, 2145
Phone: 0428 845 495
Email: UrsulaLong@eurofins.com
Website: eurofins.com.au/environmental-testing

From: Blencowe, Mitch <mitch.blencowe@stantec.com>
Sent: Monday, 22 January 2024 6:29 AM
To: Ursula Long <UrsulaLong@eurofins.com>; Elliott, Katelyn <Katelyn.Elliott@stantec.com>
Subject: RE: Eurofins Test Results, Invoice - Report 1060806 : Site BOMADERRY (304001019)

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

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

Hi Ursula – thank you for sending these through. Are you able to also analyse for VOC suite based on the samples provided?

Many thanks
Mtch

Mitch Blencowe
Principal Environmental Scientist

Direct: +61 2 4216 7258
mitch.blencowe@stantec.com

Stantec
Ground Floor, 16 Burelli Street
Wollongong NSW 2500
AUSTRALIA

From: UrsulaLong@eurofins.com <UrsulaLong@eurofins.com>
Sent: Sunday, January 21, 2024 10:44 AM
To: Elliott, Katelyn <Katelyn.Elliott@stantec.com>
Cc: Blencowe, Mitch <mitch.blencowe@stantec.com>
Subject: Eurofins Test Results, Invoice - Report 1060806 : Site BOMADERRY (304001019)

Please find attached results and invoice for your project in the subject header.

Regards

Ursula Long

Eurofins
179 Magowar Road
Girraween NSW 2145
AUSTRALIA
Phone: +61 428 845 495
Email: UrsulaLong@eurofins.com
Website:[http://]environment.eurofins.com.au
View our latest EnviroNotes

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofins.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
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+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	T: +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	Site# 25079 & 25289

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ABN: 91 05 0159 898

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Site# 2370

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

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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: Stantec Australia Pty Ltd (Wollongong)
Address: Ground Floor, 16 Burelli Street
Wollongong
NSW 2500

Order No.:
Report #: 1061412
Phone: (02) 9493 9700
Fax:

Received: Jan 22, 2024 11:20 AM
Due: Jan 23, 2024
Priority: 1 Day
Contact Name: Katelyn Elliott

Project Name: ADDIITONAL: BOMADERRY
Project ID: ADDIITONAL: 304001019

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Volatile Organics
Sydney Laboratory - NATA # 1261 Site # 18217						X
External Laboratory						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
1	BH02	Jan 18, 2024		Water	S24-Ja0030656	X
2	BH03	Jan 18, 2024		Water	S24-Ja0030657	X
3	BH04	Jan 18, 2024		Water	S24-Ja0030658	X
4	QA200	Jan 18, 2024		Water	S24-Ja0030659	X
Test Counts						4

Certificate of Analysis

Stantec Australia Pty Ltd
Ground Floor, 16 Burelli Street
Wollongong
NSW 2500

NATA Accredited
Accreditation Number 1261
Site Number 18217

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: **Katelyn Elliott**

Report **1061412-W**
Project name ADDIITONAL: BOMADERRY
Project ID ADDIITONAL: 304001019
Received Date Jan 22, 2024

Client Sample ID			**BH02**	**BH03**	**BH04**	**QA200**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**S24-Ja0030656**	**S24-Ja0030657**	**S24-Ja0030658**	**S24-Ja0030659**
Date Sampled			**Jan 18, 2024**	**Jan 18, 2024**	**Jan 18, 2024**	**Jan 18, 2024**
Test/Reference	LOR	Unit				
Volatile Organics						
1.1-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.1-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.1.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.2-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.2.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dibromoethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2.3-Trichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2.4-Trimethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.3-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.3-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.3.5-Trimethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.4-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Butanone (MEK)	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
2-Propanone (Acetone)	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
4-Chlorotoluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
4-Methyl-2-pentanone (MIBK)	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Allyl chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromochloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromodichloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromoform	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromomethane	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Carbon disulfide	0.001	mg/L	< 0.001	< 0.001	0.001	< 0.001
Carbon Tetrachloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chloroethane	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Chloroform	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Chloromethane	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
cis-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
cis-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID			BH02	BH03	BH04	QA200
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**S24-Ja0030656**	**S24-Ja0030657**	**S24-Ja0030658**	**S24-Ja0030659**
Date Sampled			Jan 18, 2024	Jan 18, 2024	Jan 18, 2024	Jan 18, 2024
Test/Reference	LOR	Unit				
Volatile Organics						
Dibromochloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibromomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dichlorodifluoromethane	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Iodomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Isopropyl benzene (Cumene)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Methylene Chloride	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Styrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Tetrachloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
trans-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
trans-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Trichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Trichlorofluoromethane	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Vinyl chloride	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
Total MAH*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
Vic EPA IWRG 621 CHC (Total)*	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Vic EPA IWRG 621 Other CHC (Total)*	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
4-Bromofluorobenzene (surr.)	1	%	132	150	76	76
Toluene-d8 (surr.)	1	%	139	140	145	141

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
Volatile Organics	Sydney	Jan 22, 2024	7 Days

- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices

Company Name: Stantec Australia Pty Ltd (Wollongong)
Address: Ground Floor, 16 Burelli Street
Wollongong
NSW 2500

Order No.:
Report #: 1061412
Phone: (02) 9493 9700
Fax:

Received: Jan 22, 2024 11:20 AM
Due: Jan 23, 2024
Priority: 1 Day
Contact Name: Katelyn Elliott

Project Name: ADDIITONAL: BOMADERRY
Project ID: ADDIITONAL: 304001019

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Volatile Organics
Sydney Laboratory - NATA # 1261 Site # 18217						X
External Laboratory						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
1	BH02	Jan 18, 2024		Water	S24-Ja0030656	X
2	BH03	Jan 18, 2024		Water	S24-Ja0030657	X
3	BH04	Jan 18, 2024		Water	S24-Ja0030658	X
4	QA200	Jan 18, 2024		Water	S24-Ja0030659	X
Test Counts						4

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. All soil/sediment/solid results are reported on a dry weight basis unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion unless otherwise stated.
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.
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 date of sampling; 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 7 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	

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 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should 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 70 – 130%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 5.4, 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.

Eurofins Environment Testing

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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	
Benzene	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	
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	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
Iodomethane	mg/L	< 0.001			0.001	Pass	
Isopropyl benzene (Cumene)	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
Methylene Chloride	mg/L	< 0.005			0.005	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Styrene	mg/L	< 0.001			0.001	Pass	
Tetrachloroethene	mg/L	< 0.001			0.001	Pass	
Toluene	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	

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Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Trichlorofluoromethane			mg/L	< 0.005			0.005	Pass	
Vinyl chloride			mg/L	< 0.005			0.005	Pass	
Xylenes - Total*			mg/L	< 0.003			0.003	Pass	
LCS - % Recovery									
Volatile Organics									
1.1-Dichloroethene			%	92			70-130	Pass	
1.2-Dichlorobenzene			%	118			70-130	Pass	
1.2-Dichloroethane			%	76			70-130	Pass	
Benzene			%	80			70-130	Pass	
Ethylbenzene			%	101			70-130	Pass	
m&p-Xylenes			%	102			70-130	Pass	
o-Xylene			%	96			70-130	Pass	
Toluene			%	98			70-130	Pass	
Trichloroethene			%	75			70-130	Pass	
Xylenes - Total*			%	100			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Volatile Organics				Result 1					
1.2-Dichlorobenzene	S24-Ja0013203	NCP	%	102			70-130	Pass	
Benzene	S24-Ja0018819	NCP	%	101			70-130	Pass	
Ethylbenzene	S24-Ja0018819	NCP	%	112			70-130	Pass	
m&p-Xylenes	S24-Ja0018819	NCP	%	117			70-130	Pass	
o-Xylene	S24-Ja0018819	NCP	%	114			70-130	Pass	
Toluene	S24-Ja0018819	NCP	%	108			70-130	Pass	
Xylenes - Total*	S24-Ja0018819	NCP	%	116			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.1-Dichloroethane	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1-Dichloroethene	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1.1-Trichloroethane	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1.1.2-Tetrachloroethane	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1.2-Trichloroethane	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1.2.2-Tetrachloroethane	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2-Dibromoethane	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2-Dichlorobenzene	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2-Dichloroethane	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2-Dichloropropane	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2.3-Trichloropropane	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2.4-Trimethylbenzene	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.3-Dichlorobenzene	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.3-Dichloropropane	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.3.5-Trimethylbenzene	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.4-Dichlorobenzene	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
2-Butanone (MEK)	S24-Ja0013205	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
2-Propanone (Acetone)	S24-Ja0013205	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
4-Chlorotoluene	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
4-Methyl-2-pentanone (MIBK)	S24-Ja0013205	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Allyl chloride	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzene	S24-Ja0018818	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromobenzene	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromochloromethane	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromodichloromethane	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
Bromoform	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromomethane	S24-Ja0013205	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Carbon disulfide	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Carbon Tetrachloride	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chlorobenzene	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chloroethane	S24-Ja0013205	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Chloroform	S24-Ja0013205	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Chloromethane	S24-Ja0013205	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
cis-1.2-Dichloroethene	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
cis-1.3-Dichloropropene	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibromochloromethane	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibromomethane	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dichlorodifluoromethane	S24-Ja0013205	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Ethylbenzene	S24-Ja0018818	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Iodomethane	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Isopropyl benzene (Cumene)	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S24-Ja0018818	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Methylene Chloride	S24-Ja0013205	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
o-Xylene	S24-Ja0018818	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Styrene	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Tetrachloroethene	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S24-Ja0018818	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
trans-1.2-Dichloroethene	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
trans-1.3-Dichloropropene	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Trichloroethene	S24-Ja0013205	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Trichlorofluoromethane	S24-Ja0013205	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Vinyl chloride	S24-Ja0013205	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Xylenes - Total*	S24-Ja0018818	NCP	mg/L	< 0.003	< 0.003	<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

Authorised by:

Ursula Long	Analytical Services Manager
Raymond Siu	Senior Analyst-Volatile

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

Stantec

From: Stantec Wollongong
Address: Shop 1, Level 1
16 Burelli St
Wollongong NSW 2500
Phone: (02) 4231 9600
Attention: **Katelyn Elliot; Mitch Blencowe**
Email: ContamNSW@cardno.com.au **katelyn.elliott@stantec.com; mitch.blencowe@stantec.com**
Mobile: **476144110**

To: Eurofins Wollongong
Address: Unit 16
7 Investigator Dr
Unanderra NSW 2526
Phone: (02) 9900 8400
Email: EnviroSampleNSW@eurofins.com

Date: 27/02/2024
TAT: 5 day
Purchase Order: 304001019
Laboratory Quote ID: Stantec Blanket Quote
Project number: 304001019
Project name: BtR Bomaderry
Data output format: PDF, Esdat

Attempt to chill evident: Y / N

Sample Temperature on Arrival: 14.7°C

Notes: Please apply a relevant suite, as appropriate - -- sample QC300 to be provided to SGS for analysis --- sample RIN_240227 to be placed on hold

Laboratory Sample Number	Cardno Sample Number	Sample Date	Matrix	Container (Plastic Tube – PT, Bag – B, Petri Dish – PD, Plastic Bottle – PB, Plastic Jar - PJ, Glass Jar – GJ, Glass Bottle – GB, Glass Vial - GV)	TRH	TRH w/ Silica Gel	BTEXN	PAHS	OCP	OPP	PCB	Lead	S-2 - 7 Metals	S-1 - 8 Metals	S-3 - NEPM 15 Metals	Phenols	VOCs	SVOC	Sulphate	pH / EC	Biochemical Oxygen Demand	Chemical Oxygen Demand	Nitrate	Dissolved Methane	Hydrogen Sulphide	Dup to 2nd Lab	Applicable Suites	Sample Comments
	BH02	27/2/24	Water	1xGB 2xPB 3x GV															1	1	1	1	1	1	1			Please apply a relevant suite
	BH03	27/2/24	Water	1xGB 2xPB 3x GV															1	1	1	1	1	1	1			Please apply a relevant suite
	BH04	27/2/24	Water	1xGB 2xPB 3x GV															1	1	1	1	1	1	1			Please apply a relevant suite
	GG3	27/2/24	Water	1xGB 2xPB 3x GV															1	1	1	1	1	1	1			Please apply a relevant suite
	QA300	27/2/24	Water	1xGB 2xPB 3x GV															1	1	1	1	1	1	1			Please apply a relevant suite
	QC300	27/2/24	Water	1xGB 2xPB 3x GV															1	1	1	1	1	1	1	1		Please apply a relevant suite
	RIN_240227	27/2/24	Water	1xGB 2xPB 3x GV																								
				Total															6	6	6	6	6					

Relinquished By:
Company:
Time:
Date:

Received By: Greg DB
Company:
Time: 4:25PM
Date: 27/2/24

Relinquished By:
Company:
Time:
Date:

Received By:
Company:
Time:
Date:

#1072931

20240227_COC_BtRxlsx.xlsx

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

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Canberra Unit 1,2 Dacre Street Mitchell ACT 2911 +61 2 6113 8091 NATA# 1261 Site# 25466
Brisbane 1/21 Smallwood Place Murarrie QLD 4172 T: +61 7 3902 4600 NATA# 1261 Site# 20794
Newcastle 1/2 Frost Drive Mayfield West NSW 2304 +61 2 4968 8448 NATA# 1261 Site# 25079 & 25289

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Tauranga 1277 Cameron Road, Gate Pa, Tauranga 3112 +64 9 525 0568 IANZ# 1402

Company Name:	Stantec Australia Pty Ltd (Wollongong)	**Order No.:**		**Received:**	Feb 27, 2024 4:25 PM
Address:	Ground Floor, 16 Burelli Street Wollongong NSW 2500	**Report #:**	1072931	**Due:**	Mar 5, 2024
		Phone:	(02) 9493 9700	**Priority:**	5 Day
		Fax:		**Contact Name:**	Katelyn Elliott
Project Name:	BTR BOMADERRY				
Project ID:	304001019				

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Biochemical Oxygen Demand (BOD-5 Day)	Chemical Oxygen Demand (COD)	Conductivity (at 25 °C)	HOLD	Methane	Nitrate (as N)	pH (at 25 °C)	Sulphate (as SO4)	Sulphide (as S)
Melbourne Laboratory - NATA # 1261 Site # 1254							X			X	X			X
Sydney Laboratory - NATA # 1261 Site # 18217						X		X	X			X	X	
External Laboratory														
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**									
1	BH02	Feb 27, 2024		Water	W24-Fe0069326	X	X	X		X	X	X	X	X
2	BH03	Feb 27, 2024		Water	W24-Fe0069327	X	X	X		X	X	X	X	X
3	BH04	Feb 27, 2024		Water	W24-Fe0069328	X	X	X		X	X	X	X	X
4	GG3	Feb 27, 2024		Water	W24-Fe0069329	X	X	X		X	X	X	X	X
5	QA300	Feb 27, 2024		Water	W24-Fe0069330	X	X	X		X	X	X	X	X
6	RIN_240227	Feb 27, 2024		Water	W24-Fe0069331				X					
Test Counts						5	5	5	1	5	5	5	5	5

Certificate of Analysis

Environment Testing

Stantec Australia Pty Ltd
Ground Floor, 16 Burelli Street
Wollongong
NSW 2500

NATA Accredited
Accreditation Number 1261
Site Number 18217

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: **Katelyn Elliott**

Report **1072931-W**
Project name BTR BOMADERRY
Project ID 304001019
Received Date Feb 27, 2024

Client Sample ID			**BH02**	**BH03**	**BH04**	**GG3**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**W24-Fe0069326**	**W24-Fe0069327**	**W24-Fe0069328**	**W24-Fe0069329**
Date Sampled			**Feb 27, 2024**	**Feb 27, 2024**	**Feb 27, 2024**	**Feb 27, 2024**
Test/Reference	LOR	Unit				
Dissolved Gases						
Methane	0.05	mg/L	0.95	0.29	0.37	0.79
Biochemical Oxygen Demand (BOD-5 Day)	2	mg/L	< 2	< 2	< 2	< 2
Chemical Oxygen Demand (COD)	25	mg/L	57	57	190	340
Conductivity (at 25 °C)	10	uS/cm	310	550	430	260
Hydrogen Sulfide (unionised)(by calculation)*	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Nitrate (as N)	0.02	mg/L	< 0.02	0.03	< 0.02	< 0.02
pH (at 25 °C)	0.1	pH Units	4.3	4.6	3.7	6.1
Sulphate (as SO4)	2	mg/L	22	320	210	13

Client Sample ID			**QA300**
Sample Matrix			**Water**
Eurofins Sample No.			**W24-Fe0069330**
Date Sampled			**Feb 27, 2024**
Test/Reference	LOR	Unit	
Dissolved Gases			
Methane	0.05	mg/L	1.1
Biochemical Oxygen Demand (BOD-5 Day)	2	mg/L	< 2
Chemical Oxygen Demand (COD)	25	mg/L	47
Conductivity (at 25 °C)	10	uS/cm	330
Hydrogen Sulfide (unionised)(by calculation)*	0.05	mg/L	< 0.05
Nitrate (as N)	0.02	mg/L	< 0.02
pH (at 25 °C)	0.1	pH Units	4.3
Sulphate (as SO4)	2	mg/L	24

Environment Testing

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
Dissolved Gases	Melbourne	Mar 01, 2024	14 Days
- Method: in-house method LTM-ORG-2070 by Headspace GC-FID			
Biochemical Oxygen Demand (BOD-5 Day)	Sydney	Mar 04, 2024	2 Days
- Method: LTM-INO-4010 Biochemical Oxygen Demand (BOD5) in Water			
Chemical Oxygen Demand (COD)	Melbourne	Mar 01, 2024	28 Days
- Method: LTM-INO-4220 Determination of COD in Water			
Conductivity (at 25 °C)	Sydney	Feb 28, 2024	28 Days
- Method: LTM-INO-4030 Conductivity			
Hydrogen Sulfide (unionised)(by calculation)*	Melbourne	Feb 28, 2024	7 Days
- Method: APHA 4500-S C & D - Sulphide			
Nitrate (as N)	Melbourne	Mar 01, 2024	28 Days
- Method: LTM-INO-4450 Determination of Nitrogen Species by Discrete Analyser			
pH (at 25 °C)	Sydney	Feb 28, 2024	0 Hour
- Method: LTM-GEN-7090 pH in water by ISE			
Sulphate (as SO4)	Sydney	Mar 04, 2024	28 Days
- Method: In-house method LTM-INO-4270 Sulphate by Ion Chromatograph			

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Phone: (02) 9493 9700
Fax:

Received: Feb 27, 2024 4:25 PM
Due: Mar 5, 2024
Priority: 5 Day
Contact Name: Katelyn Elliott

Project Name: BTR BOMADERRY
Project ID: 304001019

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Biochemical Oxygen Demand (BOD-5 Day)	Chemical Oxygen Demand (COD)	Conductivity (at 25 °C)	HOLD	Methane	Nitrate (as N)	pH (at 25 °C)	Sulphate (as SO4)	Sulphide (as S)
Melbourne Laboratory - NATA # 1261 Site # 1254							X			X	X			X
Sydney Laboratory - NATA # 1261 Site # 18217						X		X	X			X	X	
External Laboratory														
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**									
1	BH02	Feb 27, 2024		Water	W24-Fe0069326	X	X	X		X	X	X	X	X
2	BH03	Feb 27, 2024		Water	W24-Fe0069327	X	X	X		X	X	X	X	X
3	BH04	Feb 27, 2024		Water	W24-Fe0069328	X	X	X		X	X	X	X	X
4	GG3	Feb 27, 2024		Water	W24-Fe0069329	X	X	X		X	X	X	X	X
5	QA300	Feb 27, 2024		Water	W24-Fe0069330	X	X	X		X	X	X	X	X
6	RIN_240227	Feb 27, 2024		Water	W24-Fe0069331				X					
Test Counts						5	5	5	1	5	5	5	5	5

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.
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 date of sampling; 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	

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 70 – 130%

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.

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Quality Control Results

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
Dissolved Gases									
Methane			mg/L	< 0.05			0.05	Pass	
Method Blank									
Biochemical Oxygen Demand (BOD-5 Day)			mg/L	< 2			2	Pass	
Chemical Oxygen Demand (COD)			mg/L	< 25			25	Pass	
Conductivity (at 25 °C)			uS/cm	< 10			10	Pass	
Hydrogen Sulfide (unionised)(by calculation)*			mg/L	< 0.05			0.05	Pass	
Nitrate (as N)			mg/L	< 0.02			0.02	Pass	
LCS - % Recovery									
Dissolved Gases									
Methane			%	85			70-130	Pass	
LCS - % Recovery									
Chemical Oxygen Demand (COD)			%	103			70-130	Pass	
Conductivity (at 25 °C)			%	85			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Dissolved Gases				Result 1					
Methane	S24-Fe0057946	NCP	%	109			70-130	Pass	
Spike - % Recovery									
				Result 1					
Chemical Oxygen Demand (COD)	M24-Ma0001098	NCP	%	105			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
				Result 1	Result 2	RPD			
Chemical Oxygen Demand (COD)	M24-Fe0066789	NCP	mg/L	1100	1100	14	30%	Pass	
Conductivity (at 25 °C)	N24-Fe0062850	NCP	uS/cm	1900	1800	2.4	30%	Pass	
Hydrogen Sulfide (unionised)(by calculation)*	N24-Ma0000817	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Dissolved Gases				Result 1	Result 2	RPD			
Methane	W24-Fe0069327	CP	mg/L	0.29	0.29	1.3	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:

Ursula Long	Analytical Services Manager
Joseph Edouard	Senior Analyst-Volatile
Mary Makarios	Senior Analyst-Inorganic
Ryan Phillips	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.

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS		LABORATORY DETAILS	
Contact	Katelyn Elliott	Manager	Huong Crawford
Client	STANTEC AUSTRALIA PTY LTD	Laboratory	SGS Alexandria Environmental
Address	LEVEL 22, 570 BOURKE STREET MELBOURNE VIC 3000	Address	Unit 16, 33 Maddox St Alexandria NSW 2015
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Facsimile	(Not specified)	Facsimile	+61 2 8594 0499
Email	Katelyn.Elliott@stantec.com	Email	au.environmental.sydney@sgs.com
Project	**304001019 Bomaderry**	SGS Reference	**SE259312 R0**
Order Number	**304001019**	Date Received	18/1/2024
Samples	1	Date Reported	1/2/2024

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

SIGNATORIES

Akheeqar BENIAMEEN
Chemist

Dong LIANG
Metals/Inorganics Team Leader

Huong CRAWFORD
Production Manager

Ly Kim HA
Organic Section Head

Shane MCDERMOTT
Inorganic/Metals Chemist

VOC's in Soil [AN433] Tested: 22/1/2024

PARAMETER	UOM	LOR	QC111 SOIL - 15/1/2024 SE259312.001
Benzene	mg/kg	0.1	<0.1
Toluene	mg/kg	0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2
o-xylene	mg/kg	0.1	<0.1
Total Xylenes*	mg/kg	0.3	<0.3
Total BTEX*	mg/kg	0.6	<0.6
Naphthalene (VOC)*	mg/kg	0.1	<0.1

Volatile Petroleum Hydrocarbons in Soil [AN433] Tested: 22/1/2024

PARAMETER	UOM	LOR	QC111 SOIL - 15/1/2024 SE259312.001
TRH C6-C9	mg/kg	20	<20
Benzene (F0)	mg/kg	0.1	<0.1
TRH C6-C10	mg/kg	25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 22/1/2024

PARAMETER	UOM	LOR	QC111 SOIL - 15/1/2024 SE259312.001
TRH C10-C14	mg/kg	20	<20
TRH C15-C28	mg/kg	45	<45
TRH C29-C36	mg/kg	45	<45
TRH C37-C40	mg/kg	100	<100
TRH >C10-C16	mg/kg	25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120
TRH C10-C36 Total	mg/kg	110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 22/1/2024

PARAMETER	UOM	LOR	QC111 SOIL - 15/1/2024 SE259312.001
Naphthalene	mg/kg	0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1
Fluorene	mg/kg	0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1
Anthracene	mg/kg	0.1	<0.1
Fluoranthene	mg/kg	0.1	**0.1**
Pyrene	mg/kg	0.1	**0.1**
Benzo(a)anthracene	mg/kg	0.1	<0.1
Chrysene	mg/kg	0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	**0.1**
Benzo(k)fluoranthene	mg/kg	0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	**0.1**
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0*	TEQ (mg/kg)	0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR*	TEQ (mg/kg)	0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2*	TEQ (mg/kg)	0.2	<0.2
Total PAH (18)	mg/kg	0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8

OC Pesticides in Soil [AN420] Tested: 22/1/2024

PARAMETER	UOM	LOR	QC111 SOIL - 15/1/2024 SE259312.001
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1
Lindane (gamma BHC)	mg/kg	0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1
Aldrin	mg/kg	0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1
o,p'-DDE*	mg/kg	0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2
Endrin	mg/kg	0.2	<0.2
o,p'-DDD*	mg/kg	0.1	<0.1
o,p'-DDT*	mg/kg	0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1
Endrin aldehyde	mg/kg	0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1
Endrin ketone	mg/kg	0.1	<0.1
Isodrin	mg/kg	0.1	<0.1
Mirex	mg/kg	0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1
Total OC VIC EPA	mg/kg	1	<1

OP Pesticides in Soil [AN420] Tested: 22/1/2024

PARAMETER	UOM	LOR	QC111 SOIL - 15/1/2024 SE259312.001
Dichlorvos	mg/kg	0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2
Malathion	mg/kg	0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2
Methidathion	mg/kg	0.5	<0.5
Ethion	mg/kg	0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7

PCBs in Soil [AN420] Tested: 22/1/2024

PARAMETER	UOM	LOR	QC111 SOIL - 15/1/2024 SE259312.001
Arochlor 1016	mg/kg	0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 22/1/2024

PARAMETER	UOM	LOR	QC111 SOIL - 15/1/2024 SE259312.001
Arsenic, As	mg/kg	1	**4**
Cadmium, Cd	mg/kg	0.3	<0.3
Chromium, Cr	mg/kg	0.5	**7.8**
Copper, Cu	mg/kg	0.5	**8.4**
Lead, Pb	mg/kg	1	**15**
Nickel, Ni	mg/kg	0.5	**5.5**
Zinc, Zn	mg/kg	2	**29**

Mercury in Soil [AN312] Tested: 22/1/2024

PARAMETER	UOM	LOR	QC111 SOIL - 15/1/2024 SE259312.001
Mercury	mg/kg	0.05	<0.05

Moisture Content [AN002] Tested: 22/1/2024

PARAMETER	UOM	LOR	QC111 SOIL - 15/1/2024 SE259312.001
% Moisture	%w/w	1	22.6

Per- and Polyfluoroalkyl Substances (PFAS) in Solid Samples [MA-1523] Tested: 1/2/2024

PARAMETER	UOM	LOR	QC111 SOIL - 15/1/2024 SE259312.001
Perfluorobutanoic acid (PFBA)	mg/kg	0.0016	<0.0016
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0016	<0.0016
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0016	<0.0016
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0016	<0.0016
Perfluorooctanoic Acid (PFOA)	mg/kg	0.0008	<0.0008
Perfluorobutane sulfonate (PFBS)	mg/kg	0.0016	<0.0016
Perfluoropentane sulfonate (PFPeS)	mg/kg	0.0016	<0.0016
Perfluorohexane sulfonate (PFHxS)	mg/kg	0.0016	<0.0016
Perfluoroheptane sulfonate (PFHpS)	mg/kg	0.0016	<0.0016
Perfluorooctane sulfonate (PFOS)	mg/kg	0.0016	<0.0016
Sum PFOS and PFHXS	mg/kg	0.0016	<0.0016
Perfluorononane sulfonate (PFNS)	mg/kg	0.0016	<0.0016
1H,1H,2H,2H-Perfluorohexane sulfonate (4:2) (4:2 FTS)	mg/kg	0.0016	<0.0016
1H,1H,2H,2H-Perfluorooctane sulfonate (6:2) (6:2 FTS)	mg/kg	0.0016	<0.0016
1H,1H,2H,2H-Perfluorodecane sulfonate (8:2) (8:2 FTS)	mg/kg	0.0016	<0.0016

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN040/AN320	A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.
AN040	A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analysis by AAS or ICP as per USEPA Method 200.8.
AN312	Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid, mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is reported directly and also corrected by subtracting Naphthalene (from VOC method AN433) where available.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Recoverable Hydrocarbons - Silica (TRH-Si) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents.
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D). Total PAH calculated from individual analyte detections at or above the limit of reporting.
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.
MA-1523	This method covers the analysis of per- and polyfluoroalkyl substances (PFAS) in aqueous, solid and biosolid samples and solvent extracts, determined as the total of linear and branched isomers. After spiking with isotopically labelled quantification surrogates and clean-up via SPE cartridges sample extracts are analysed by liquid chromatography/mass spectrometry (LC-MS/MS). PFAS concentrations are determined by isotope dilution quantification.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
**	Indicative data, theoretical holding time exceeded.	NVL	Not validated.	LOR	Limit of Reporting.
***	Indicates that both * and ** apply.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-gb/environment-health-and-safety.

STATEMENT OF QA/QC PERFORMANCE

SE259312 R0

CLIENT DETAILS

Contact	Katelyn Elliott
Client	STANTEC AUSTRALIA PTY LTD
Address	LEVEL 22, 570 BOURKE STREET MELBOURNE VIC 3000
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Email	Katelyn.Elliott@stantec.com
Project	**304001019 Bomaderry**
Order Number	**304001019**
Samples	1

LABORATORY DETAILS

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SGS Reference	**SE259312 R0**
Date Received	18 Jan 2024
Date Reported	01 Feb 2024

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document.
This QA/QC Statement must be read in conjunction with the referenced Analytical Report.
The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met with the exception of the following:

Duplicate	Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES	2 items

SAMPLE SUMMARY

Sample counts by matrix	1 Soil	Type of documentation received	COC
Date documentation received	18/01/2024	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	3.8°C
Sample container provider	Other Lab	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice	Samples clearly labelled	Yes
Complete documentation received	Yes		

HOLDING TIME SUMMARY

SE259312 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC111	SE259312.001	LB301816	15 Jan 2024	18 Jan 2024	12 Feb 2024	22 Jan 2024	12 Feb 2024	23 Jan 2024

Moisture Content

Method: ME-(AU)-[ENV]AN002

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC111	SE259312.001	LB301813	15 Jan 2024	18 Jan 2024	29 Jan 2024	22 Jan 2024	27 Jan 2024	23 Jan 2024

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC111	SE259312.001	LB301803	15 Jan 2024	18 Jan 2024	29 Jan 2024	22 Jan 2024	02 Mar 2024	23 Jan 2024

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC111	SE259312.001	LB301803	15 Jan 2024	18 Jan 2024	29 Jan 2024	22 Jan 2024	02 Mar 2024	23 Jan 2024

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC111	SE259312.001	LB301803	15 Jan 2024	18 Jan 2024	29 Jan 2024	22 Jan 2024	02 Mar 2024	23 Jan 2024

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC111	SE259312.001	LB301803	15 Jan 2024	18 Jan 2024	29 Jan 2024	22 Jan 2024	02 Mar 2024	23 Jan 2024

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC111	SE259312.001	LB301815	15 Jan 2024	18 Jan 2024	13 Jul 2024	22 Jan 2024	13 Jul 2024	23 Jan 2024

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC111	SE259312.001	LB301803	15 Jan 2024	18 Jan 2024	29 Jan 2024	22 Jan 2024	02 Mar 2024	23 Jan 2024

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC111	SE259312.001	LB301814	15 Jan 2024	18 Jan 2024	29 Jan 2024	22 Jan 2024	29 Jan 2024	23 Jan 2024

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC111	SE259312.001	LB301814	15 Jan 2024	18 Jan 2024	29 Jan 2024	22 Jan 2024	29 Jan 2024	23 Jan 2024

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

OC Pesticides in Soil
Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	QC111	SE259312.001	%	60 - 130%	115

OP Pesticides in Soil
Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	QC111	SE259312.001	%	60 - 130%	104
d14-p-terphenyl (Surrogate)	QC111	SE259312.001	%	60 - 130%	109

PAH (Polynuclear Aromatic Hydrocarbons) in Soil
Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	QC111	SE259312.001	%	70 - 130%	104
d14-p-terphenyl (Surrogate)	QC111	SE259312.001	%	70 - 130%	109
d5-nitrobenzene (Surrogate)	QC111	SE259312.001	%	70 - 130%	110

PCBs in Soil
Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
TCMX (Surrogate)	QC111	SE259312.001	%	60 - 130%	115

Per- and Polyfluoroalkyl Substances (PFAS) in Solid Samples
Method: MA-1523

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
(13C3-PFBS) Isotopically Labelled Internal Recovery Standard	QC111	SE259312.001	%	0 - 150%	115
(13C3-PFHxS) Isotopically Labelled Internal Recovery Standard	QC111	SE259312.001	%	0 - 150%	101
(13C4_PFOA) Isotopically Labelled Internal Recovery Standard	QC111	SE259312.001	%	0 - 150%	107
(13C4-PFBA) Isotopically Labelled Internal Recovery Standard	QC111	SE259312.001	%	0 - 150%	99
(13C4-PFHpA) Isotopically Labelled Internal Recovery Standard	QC111	SE259312.001	%	0 - 150%	110
(13C5-PFHxA) Isotopically Labelled Internal Recovery Standard	QC111	SE259312.001	%	0 - 150%	132
(13C5-PFPeA) Isotopically Labelled Internal Recovery Standard	QC111	SE259312.001	%	0 - 150%	96
(13C8-PFOS) Isotopically Labelled Internal Recovery Standard	QC111	SE259312.001	%	0 - 150%	89

VOC's in Soil
Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	QC111	SE259312.001	%	60 - 130%	92
d4-1,2-dichloroethane (Surrogate)	QC111	SE259312.001	%	60 - 130%	83
d8-toluene (Surrogate)	QC111	SE259312.001	%	60 - 130%	83

Volatile Petroleum Hydrocarbons in Soil
Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	QC111	SE259312.001	%	60 - 130%	92
d4-1,2-dichloroethane (Surrogate)	QC111	SE259312.001	%	60 - 130%	83
d8-toluene (Surrogate)	QC111	SE259312.001	%	60 - 130%	83

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number		Parameter	Units	LOR	Result
LB301816.001		Mercury	mg/kg	0.05	<0.05

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB301803.001		Alpha BHC	mg/kg	0.1	<0.1
		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
		Beta BHC	mg/kg	0.1	<0.1
		Lindane (gamma BHC)	mg/kg	0.1	<0.1
		Delta BHC	mg/kg	0.1	<0.1
		Heptachlor	mg/kg	0.1	<0.1
		Aldrin	mg/kg	0.1	<0.1
		Isodrin	mg/kg	0.1	<0.1
		Heptachlor epoxide	mg/kg	0.1	<0.1
		Gamma Chlordane	mg/kg	0.1	<0.1
		Alpha Chlordane	mg/kg	0.1	<0.1
		Alpha Endosulfan	mg/kg	0.2	<0.2
		p,p'-DDE	mg/kg	0.1	<0.1
		Dieldrin	mg/kg	0.2	<0.2
		Endrin	mg/kg	0.2	<0.2
		Beta Endosulfan	mg/kg	0.2	<0.2
		p,p'-DDD	mg/kg	0.1	<0.1
		Endrin aldehyde	mg/kg	0.1	<0.1
		Endosulfan sulphate	mg/kg	0.1	<0.1
		p,p'-DDT	mg/kg	0.1	<0.1
		Endrin ketone	mg/kg	0.1	<0.1
		Methoxychlor	mg/kg	0.1	<0.1
		Mirex	mg/kg	0.1	<0.1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	107

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB301803.001		Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2
		Bromophos Ethyl	mg/kg	0.2	<0.2
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2
		Diazinon (Dimpylate)	mg/kg	0.5	<0.5
		Dichlorvos	mg/kg	0.5	<0.5
		Dimethoate	mg/kg	0.5	<0.5
		Ethion	mg/kg	0.2	<0.2
		Fenitrothion	mg/kg	0.2	<0.2
		Malathion	mg/kg	0.2	<0.2
		Methidathion	mg/kg	0.5	<0.5
		Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2
	Surrogates	2-fluorobiphenyl (Surrogate)	%	-	95
		d14-p-terphenyl (Surrogate)	%	-	106

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB301803.001		Naphthalene	mg/kg	0.1	<0.1
		2-methylnaphthalene	mg/kg	0.1	<0.1
		1-methylnaphthalene	mg/kg	0.1	<0.1
		Acenaphthylene	mg/kg	0.1	<0.1
		Acenaphthene	mg/kg	0.1	<0.1
		Fluorene	mg/kg	0.1	<0.1
		Phenanthrene	mg/kg	0.1	<0.1
		Anthracene	mg/kg	0.1	<0.1
		Fluoranthene	mg/kg	0.1	<0.1
		Pyrene	mg/kg	0.1	<0.1
		Benzo(a)anthracene	mg/kg	0.1	<0.1
		Chrysene	mg/kg	0.1	<0.1
		Benzo(a)pyrene	mg/kg	0.1	<0.1

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB301803.001		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
		Benzo(ghi)perylene	mg/kg	0.1	<0.1
		Total PAH (18)	mg/kg	0.8	<0.8
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	109
		2-fluorobiphenyl (Surrogate)	%	-	95
		d14-p-terphenyl (Surrogate)	%	-	106

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB301803.001		Arochlor 1016	mg/kg	0.2	<0.2
		Arochlor 1221	mg/kg	0.2	<0.2
		Arochlor 1232	mg/kg	0.2	<0.2
		Arochlor 1242	mg/kg	0.2	<0.2
		Arochlor 1248	mg/kg	0.2	<0.2
		Arochlor 1254	mg/kg	0.2	<0.2
		Arochlor 1260	mg/kg	0.2	<0.2
		Arochlor 1262	mg/kg	0.2	<0.2
		Arochlor 1268	mg/kg	0.2	<0.2
		Total PCBs (Arochlors)	mg/kg	1	<1
	Surrogates	TCMX (Surrogate)	%	-	106

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number		Parameter	Units	LOR	Result
LB301815.001		Arsenic, As	mg/kg	1	<1
		Cadmium, Cd	mg/kg	0.3	<0.3
		Chromium, Cr	mg/kg	0.5	<0.5
		Copper, Cu	mg/kg	0.5	<0.5
		Nickel, Ni	mg/kg	0.5	<0.5
		Lead, Pb	mg/kg	1	<1
		Zinc, Zn	mg/kg	2	<2.0

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number		Parameter	Units	LOR	Result
LB301803.001		TRH C10-C14	mg/kg	20	<20
		TRH C15-C28	mg/kg	45	<45
		TRH C29-C36	mg/kg	45	<45
		TRH C37-C40	mg/kg	100	<100
		TRH C10-C36 Total	mg/kg	110	<110

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB301814.001	Monocyclic Aromatic Hydrocarbons	Benzene	mg/kg	0.1	<0.1
		Toluene	mg/kg	0.1	<0.1
		Ethylbenzene	mg/kg	0.1	<0.1
		m/p-xylene	mg/kg	0.2	<0.2
		o-xylene	mg/kg	0.1	<0.1
	Polycyclic VOCs	Naphthalene (VOC)*	mg/kg	0.1	<0.1
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	88
		d8-toluene (Surrogate)	%	-	91
		Bromofluorobenzene (Surrogate)	%	-	98
	Totals	Total BTEX*	mg/kg	0.6	<0.6

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB301814.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	88

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE259312.001	LB301816.014		Mercury	mg/kg	0.05	<0.05	<0.05	184	0
SE259387.004	LB301816.018		Mercury	mg/kg	0.05	<0.05	<0.05	200	0

Moisture Content

Method: ME-(AU)-[ENV]AN002

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE259312.001	LB301813.011		% Moisture	%w/w	1	22.6	22.5	34	1
SE259387.004	LB301813.016		% Moisture	%w/w	1	2.5	2.2	73	12

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE259245.001	LB301803.021		Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0
			Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Lindane (gamma BHC)	mg/kg	0.1	<0.1	<0.1	200	0
			Delta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor	mg/kg	0.1	<0.1	<0.1	200	0
			Aldrin	mg/kg	0.1	<0.1	<0.1	200	0
			Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	0
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			o,p'-DDE*	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Dieldrin	mg/kg	0.2	<0.2	<0.2	200	0
			Endrin	mg/kg	0.2	<0.2	<0.2	200	0
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			o,p'-DDD*	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDT*	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin ketone	mg/kg	0.1	<0.1	<0.1	200	0
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
			Mirex	mg/kg	0.1	<0.1	<0.1	200	0
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	0
			Total CLP OC Pesticides	mg/kg	1	<1	<1	200	0
			Total OC VIC EPA	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.17	0.16	30	4

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE259312.001	LB301803.014		Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	200	0
			Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	200	0
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	200	0
			Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	200	0
			Dichlorvos	mg/kg	0.5	<0.5	<0.5	200	0
			Dimethoate	mg/kg	0.5	<0.5	<0.5	200	0
			Ethion	mg/kg	0.2	<0.2	<0.2	200	0
			Fenitrothion	mg/kg	0.2	<0.2	<0.2	200	0
			Malathion	mg/kg	0.2	<0.2	<0.2	200	0
			Methidathion	mg/kg	0.5	<0.5	<0.5	200	0
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	200	0
			Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	200	0
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	2
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	0

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued) — Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE259312.001	LB301803.014		Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
			Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
			Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluoranthene	mg/kg	0.1	0.1	0.1	128	0
			Pyrene	mg/kg	0.1	0.1	0.1	104	3
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	196	0
			Chrysene	mg/kg	0.1	<0.1	<0.1	159	0
			Benzo(b&j)fluoranthene	mg/kg	0.1	0.1	0.1	118	10
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)pyrene	mg/kg	0.1	0.1	0.1	124	10
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	159	0
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	153	0
			Carcinogenic PAHs, BaP TEQ <LOR=0*	mg/kg	0.2	<0.2	<0.2	198	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2*	mg/kg	0.2	<0.2	<0.2	123	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR*	mg/kg	0.3	<0.3	<0.3	131	0
			Total PAH (18)	mg/kg	0.8	<0.8	<0.8	59	4
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.6	30	3
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	2
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	0
SE259387.004	LB301803.018		Naphthalene	mg/kg	0.1	1.1	1.1	39	6
			2-methylnaphthalene	mg/kg	0.1	3.5	3.6	33	2
			1-methylnaphthalene	mg/kg	0.1	2.5	2.7	34	7
			Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthene	mg/kg	0.1	0.2	0.2	95	1
			Fluorene	mg/kg	0.1	0.2	0.2	80	4
			Phenanthrene	mg/kg	0.1	2.4	2.5	34	3
			Anthracene	mg/kg	0.1	<0.1	<0.1	164	0
			Fluoranthene	mg/kg	0.1	0.3	0.3	67	2
			Pyrene	mg/kg	0.1	0.4	0.4	58	6
			Benzo(a)anthracene	mg/kg	0.1	0.2	0.2	93	5
			Chrysene	mg/kg	0.1	0.4	0.5	51	13
			Benzo(b&j)fluoranthene	mg/kg	0.1	0.2	0.2	75	7
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)pyrene	mg/kg	0.1	0.1	0.1	125	5
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	165	0
			Benzo(ghi)perylene	mg/kg	0.1	0.1	0.1	119	0
			Carcinogenic PAHs, BaP TEQ <LOR=0*	mg/kg	0.2	<0.2	<0.2	142	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2*	mg/kg	0.2	0.2	0.2	107	4
			Carcinogenic PAHs, BaP TEQ <LOR=LOR*	mg/kg	0.3	<0.3	<0.3	125	0
			Total PAH (18)	mg/kg	0.8	12	12	31	4
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.6	0.6	30	4
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.6	30	2
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.6	30	5

PCBs in Soil — Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE259245.001	LB301803.021		Arochlor 1016	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1221	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1232	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1242	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1248	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1254	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1260	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

PCBs in Soil (continued) — Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE259245.001	LB301803.021		Arochlor 1268	mg/kg	0.2	<0.2	<0.2	200	0
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	200	0
		Surrogates	TCMX (Surrogate)	mg/kg	-	0	0	30	4

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES — Method: ME-(AU)-[ENV]AN040/AN320

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE259312.001	LB301815.014		Arsenic, As	mg/kg	1	4	6	49	31
			Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
			Chromium, Cr	mg/kg	0.5	7.8	10	35	30
			Copper, Cu	mg/kg	0.5	8.4	11	35	27
			Nickel, Ni	mg/kg	0.5	5.5	8.3	37	41 ②
			Lead, Pb	mg/kg	1	15	20	36	29
			Zinc, Zn	mg/kg	2	29	39	36	32
SE259387.004	LB301815.018		Arsenic, As	mg/kg	1	2	2	81	8
			Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
			Chromium, Cr	mg/kg	0.5	7.7	5.5	38	33
			Copper, Cu	mg/kg	0.5	9.3	9.0	35	3
			Nickel, Ni	mg/kg	0.5	2.6	2.5	50	4
			Lead, Pb	mg/kg	1	12	8	40	40 ②
			Zinc, Zn	mg/kg	2	77	79	33	3

TRH (Total Recoverable Hydrocarbons) in Soil — Method: ME-(AU)-[ENV]AN403

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE259312.001	LB301803.014		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0

VOC's in Soil — Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE259312.001	LB301814.014	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
			Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene (VOC)*	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.3	8.8	50	6
			d8-toluene (Surrogate)	mg/kg	-	8.3	8.8	50	6
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.2	9.1	50	1
		Totals	Total BTEX*	mg/kg	0.6	<0.6	<0.6	200	0
			Total Xylenes*	mg/kg	0.3	<0.3	<0.3	200	0
SE259387.001	LB301814.023	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
			Toluene	mg/kg	0.1	0.4	0.3	58	15
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	142	0
			m/p-xylene	mg/kg	0.2	0.7	0.6	62	17
			o-xylene	mg/kg	0.1	0.3	0.3	62	17
		Polycyclic	Naphthalene (VOC)*	mg/kg	0.1	0.3	0.2	73	15
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.3	8.2	50	12
			d8-toluene (Surrogate)	mg/kg	-	8.9	7.8	50	13
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.7	6.5	50	16
		Totals	Total BTEX*	mg/kg	0.6	1.4	1.2	53	17
			Total Xylenes*	mg/kg	0.3	1.0	0.9	62	17

Volatile Petroleum Hydrocarbons in Soil — Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

Volatile Petroleum Hydrocarbons in Soil (continued) Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE259312.001	LB301814.014		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.3	8.8	50	6
			d8-toluene (Surrogate)	mg/kg	-	8.3	8.8	50	6
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.2	9.1	50	1
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0
SE259387.001	LB301814.021		TRH C6-C10	mg/kg	25	<25	<25	188	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.3	8.2	50	12
			d8-toluene (Surrogate)	mg/kg	-	8.9	7.8	50	13
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.7	6.5	50	16
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB301816.002		Mercury	mg/kg	0.05	0.24	0.2	80 - 120	119

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB301803.002		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	104
		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	101
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	107
		Dieldrin	mg/kg	0.2	0.2	0.2	60 - 140	103
		Endrin	mg/kg	0.2	0.2	0.2	60 - 140	106
		p,p'-DDT	mg/kg	0.1	0.1	0.2	60 - 140	65
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.17	0.15	40 - 130	113

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB301803.002		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	1.8	2	60 - 140	88
		Diazinon (Dimpylate)	mg/kg	0.5	1.9	2	60 - 140	96
		Dichlorvos	mg/kg	0.5	1.4	2	60 - 140	71
		Ethion	mg/kg	0.2	1.8	2	60 - 140	88
	Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	107
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	100

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB301803.002		Naphthalene	mg/kg	0.1	4.4	4	60 - 140	110
		Acenaphthylene	mg/kg	0.1	4.4	4	60 - 140	109
		Acenaphthene	mg/kg	0.1	4.4	4	60 - 140	110
		Phenanthrene	mg/kg	0.1	4.3	4	60 - 140	109
		Anthracene	mg/kg	0.1	4.3	4	60 - 140	108
		Fluoranthene	mg/kg	0.1	4.3	4	60 - 140	107
		Pyrene	mg/kg	0.1	4.3	4	60 - 140	107
		Benzo(a)pyrene	mg/kg	0.1	4.6	4	60 - 140	115
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.6	0.5	40 - 130	114
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	107
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	100

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB301803.002		Arochlor 1260	mg/kg	0.2	0.3	0.4	60 - 140	85

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB301815.002		Arsenic, As	mg/kg	1	340	318.22	80 - 120	107
		Cadmium, Cd	mg/kg	0.3	4.0	4.81	70 - 130	84
		Chromium, Cr	mg/kg	0.5	41	38.31	80 - 120	107
		Copper, Cu	mg/kg	0.5	320	290	80 - 120	109
		Nickel, Ni	mg/kg	0.5	190	187	80 - 120	101
		Lead, Pb	mg/kg	1	90	89.9	80 - 120	100
		Zinc, Zn	mg/kg	2	270	273	80 - 120	100

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB301803.002		TRH C10-C14	mg/kg	20	40	40	60 - 140	100
		TRH C15-C28	mg/kg	45	<45	40	60 - 140	101
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	82
	TRH F Bands	TRH >C10-C16	mg/kg	25	39	40	60 - 140	97
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	97
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	84

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number	Parameter	Units	LOR

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

VOC's in Soil (continued)

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB301814.002	Monocyclic Aromatic	Benzene	mg/kg	0.1	4.2	5	60 - 140	85
		Toluene	mg/kg	0.1	4.3	5	60 - 140	86
		Ethylbenzene	mg/kg	0.1	4.5	5	60 - 140	89
		m/p-xylene	mg/kg	0.2	8.8	10	60 - 140	88
		o-xylene	mg/kg	0.1	4.4	5	60 - 140	88
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.4	10	70 - 130	104
		d8-toluene (Surrogate)	mg/kg	-	10.8	10	70 - 130	108
		Bromofluorobenzene (Surrogate)	mg/kg	-	9.9	10	70 - 130	99

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB301814.002		TRH C6-C10	mg/kg	25	74	92.5	60 - 140	79
		TRH C6-C9	mg/kg	20	65	80	60 - 140	82
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.4	10	70 - 130	104
		Bromofluorobenzene (Surrogate)	mg/kg	-	9.9	10	70 - 130	99
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	47	62.5	60 - 140	76

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE257466A.071	LB301816.004		Mercury	mg/kg	0.05	0.25	<0.05	0.2	109

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE259245.001	LB301803.020		Naphthalene	mg/kg	0.1	<0.1	4	110
			2-methylnaphthalene	mg/kg	0.1	<0.1	-	-
			1-methylnaphthalene	mg/kg	0.1	<0.1	-	-
			Acenaphthylene	mg/kg	0.1	<0.1	4	109
			Acenaphthene	mg/kg	0.1	<0.1	4	110
			Fluorene	mg/kg	0.1	<0.1	-	-
			Phenanthrene	mg/kg	0.1	<0.1	4	109
			Anthracene	mg/kg	0.1	<0.1	4	107
			Fluoranthene	mg/kg	0.1	0.1	4	113
			Pyrene	mg/kg	0.1	0.1	4	109
			Benzo(a)anthracene	mg/kg	0.1	<0.1	-	-
			Chrysene	mg/kg	0.1	<0.1	-	-
			Benzo(b&j)fluoranthene	mg/kg	0.1	0.2	-	-
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	-	-
			Benzo(a)pyrene	mg/kg	0.1	0.1	4	115
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	0.1	-	-
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	-	-
			Benzo(ghi)perylene	mg/kg	0.1	0.1	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=0*	TEQ (mg/kg)	0.2	<0.2	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2*	TEQ (mg/kg)	0.2	<0.2	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR*	TEQ (mg/kg)	0.3	<0.3	-	-
			Total PAH (18)	mg/kg	0.8	<0.8	-	-
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.6	-	111
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	-	112
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.6	-	101

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE257466A.071	LB301815.004		Arsenic, As	mg/kg	1	49	3	50	91
			Cadmium, Cd	mg/kg	0.3	44	<0.3	50	87
			Chromium, Cr	mg/kg	0.5	54	6.3	50	95
			Copper, Cu	mg/kg	0.5	57	10	50	94
			Nickel, Ni	mg/kg	0.5	48	2.3	50	92
			Lead, Pb	mg/kg	1	50	8	50	86
			Zinc, Zn	mg/kg	2	60	13	50	94

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE259245.001	LB301814.004	Monocyclic Aromatic	Benzene	mg/kg	0.1	3.5	<0.1	5	69
			Toluene	mg/kg	0.1	3.6	<0.1	5	72
			Ethylbenzene	mg/kg	0.1	3.8	<0.1	5	76
			m/p-xylene	mg/kg	0.2	7.6	<0.2	10	75
			o-xylene	mg/kg	0.1	3.8	<0.1	5	75
		Polycyclic	Naphthalene (VOC)*	mg/kg	0.1	<0.1	<0.1	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.7	7.1	10	87
			d8-toluene (Surrogate)	mg/kg	-	8.4	7.2	10	84
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.8	7.9	10	78
		Totals	Total BTEX*	mg/kg	0.6	22	<0.6	-	-
			Total Xylenes*	mg/kg	0.3	11	<0.3	-	-

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE259245.001	LB301814.004		TRH C6-C10	mg/kg	25	60	<25	92.5	65
			TRH C6-C9	mg/kg	20	53	<20	80	66
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.7	7.1	10	87
			d8-toluene (Surrogate)	mg/kg	-	8.4	7.2	10	84

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub-sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Volatile Petroleum Hydrocarbons in Soil (continued)

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE259245.001	LB301814.004	Surrogates	Bromofluorobenzene (Surrogate)	mg/kg	-	7.8	7.9	-	78
		VPH F Bands	Benzene (F0)	mg/kg	0.1	3.5	<0.1	-	-
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	38	<25	62.5	61

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here: https://www.sgs.com.au/~/media/Local/Australia/Documents/Technical Documents/MP-AU-ENV-QU-022 QA QC Plan.pdf

*	NATA accreditation does not cover the performance of this service.
**	Indicative data, theoretical holding time exceeded.
***	Indicates that both * and ** apply.
-	Sample not analysed for this analyte.
IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.
①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to relevant report comments for further information.

SGS EHS Sydney COC
SE259312

Stantec

From: Stantec Wollongong
Address: Shop 1, Level 1
16 Burelli St
Wollongong NSW 2500
Phone: (02) 4231 9600
Attention: **katelyn.elliott@stantec.com**
Email: katelyn.elliott@stantec.com **mitch.blencowe@stantec.com**
Mobile: **0.047614411**

Chain of Custody

To: Eurofins Wollongong
Address: Unit 16
7 Investigator Dr
Unanderra NSW 2526
Phone: (02) 9900 8400
Email: EnviroSampleNSW@eurofins.com

Date: 1/15/2024
TAT: Std 5 days
Purchase Order: NA
Laboratory Quote ID: Stantec Rates
Project number: 304001019
Project name: Bomaderry
Data output format: PDF, Esdat

Notes:

Attempt to chill evident: Y/N
Sample Temperature on Arrival: 3.8°C

Laboratory Sample Number	Cardno Sample Number	Sample Date	Matrix	Container (Plastic Tube – PT, Bag – B, Petri Dish – PD, Plastic Bottle – PB, Plastic Jar - PJ, Glass Jar – GJ, Glass Bottle – GB, Glass Vial - GV)	TRH	TRH w/ Silica Gel	BTEXN	PAHS	OCP	OPP	PCB	Lead	M7 - Metals (exc. Hg)	M8 - Metals (inc. Hg)	Cr6)	Phenols - Speciated	VOCs	SVOC	Asbestos in Soil (NEPM)	Asbestos in Building Mat.	PFAS Short Suite - Std LOR	Dup to 2nd Lab	Hold	Select Analyte or Delete to Clear	Select Analyte or Delete to Clear	Select Analyte or Delete to Clear	Applicable Suites	Sample Comments
	BH04_0.1	1/12/2024	Soil	GJ, PJ, B	1		1	1	1	1	1			1					1		1						B7 B15	
	TP107_0.1	1/15/2024	Soil	GJ, PJ, B	1		1	1						1					1								·B7	
	TP108_0.1	1/15/2024	Soil	GJ, PJ, B	1		1	1	1	1	1			1					1		1						B7 B15	
	TP108_0.3	1/15/2024	Soil	GJ, PJ, B	1		1	1						1													B7	
	TP109_0.1	1/15/2024	Soil	GJ, PJ, B	1		1	1						1					1								B7	
	TP110_0.1	1/15/2024	Soil	GJ, PJ, B	1		1	1	1	1	1			1					1		1						B7 B15	
	TP110_0.5	1/15/2024	Soil	GJ, PJ, B	1		1	1						1													B7	
	TP111_0.1	1/15/2024	Soil	GJ, PJ, B	1		1	1	1	1	1			1					1								B7 B15	
	TP111_0.3	1/15/2024	Soil	GJ, PJ, B	1		1	1						1													B7	
	TP112_0.1	1/15/2024	Soil	GJ, PJ, B	1		1	1	1	1	1			1					1		1						B7 B15	
	TP112_0.5	1/15/2024	Soil	GJ, PJ, B	1		1	1						1					1								B7	
	TP113_0.1	1/15/2024	Soil	GJ, PJ, B	1		1	1	1	1	1			1					1								B7 B15	
	TP113_0.5	1/15/2024	Soil	GJ, PJ, B	1		1	1						1													B7	
	TP114_0.1	1/15/2024	Soil	GJ, PJ, B	1		1	1	1	1	1			1					1		1						B7 B15	
	TP115_0.1	1/15/2024	Soil	GJ, PJ, B	1		1	1	1	1	1			1					1								B7 B15	
				Total	15		15	15	8	8	8			15					11		5							

Relinquished By: Katelyn Elliott
Company: Stantec
Time: 1:30pm
Date: 15/01/2024

Received By: Greg DB
Company: Eurofins
Time: 9:00AM
Date: 16/1/24

Relinquished By:
Company:
Time:
Date:

Received By:
Company: Sgs Sy
Time: 18.1.24
Date: 3:40

#10859639

304001019_COC02 Eurofins_15.01.2024.xlsx

Stantec

Chain of Custody

From: Stantec Wollongong
Address: Shop 1, Level 1
16 Burelli St
Wollongong NSW 2500
Phone: (02) 4231 9600
Attention: katelyn.elliott@stantec.com
Email: katelyn.elliott@stantec.com mitch.blencowe@stantec.com
Mobile: 0.047614411

To: Eurofins Wollongong
Address: Unit 16
7 Investigator Dr
Unanderra NSW 2526
Phone: (02) 9900 8400
Email: EnviroSampleNSW@eurofins.com

Date: 1/15/2024
TAT: Std 5 days
Purchase Order: NA
Laboratory Quote ID: Stantec Rates
Project number: 304001019
Project name: Bomaderry
Data output format: PDF, Esdat

Attempt to chill evident: Y/N

Sample Temperature on Arrival: 3.8°

Notes:

Laboratory Sample Number	Cardno Sample Number	Sample Date	Matrix	Container (Plastic Tube – PT, Bag – B, Petri Dish – PD, Plastic Bottle – PB, Plastic Jar - PJ, Glass Jar – GJ, Glass Bottle – GB, Glass Vial - GV)	TRH	TRH w/ Silica Gel	BTEXN	PAHS	OCP	OPP	PCB	Lead	M7 - Metals (exc. Hg)	M8 - Metals (inc. Hg)	Cr6)	Phenols - Speciated	VOCs	SVOC	Asbestos in Soil (NEPM)	Asbestos in Building Mat.	PFAS Short Suite - Std LOR	Dup to 2nd Lab	Hold	Select Analyte or Delete to Clear	Select Analyte or Delete to Clear	Select Analyte or Delete to Clear	Applicable Suites	Sample Comments
	SP01_ACM1	1/15/2024	Building Mat	B																1								
	QA111	1/15/2024	Soil	GJ, PJ	1		1	1	1	1	1			1							1						B7 B15	
	QC111	1/15/2024	Soil	GJ, PJ	1		1	1	1	1	1			1							1	1					B7 B15	Please send to SGS for testing
	RIN_240112	1/12/2024	Water	5x Bottles																			1					
	RIN_240115	1/15/2024	Water	5x Bottles	1		1	1	1	1	1			1													B7 B15	
	Trip spike	1/12/2024	Soil	2x GV	1		1																				B1	
	Trip blank	1/12/2024	Soil	2x GV	1		1																				B1	
	Trip spike	1/15/2024	Soil	2x GV	1		1																				B1	
	Trip blank	1/15/2024	Soil	2x GV	1		1																				B1	
				Total	7		7	3	3	3	3			3						1	2	1	1					

304001019_COC02 Eurofins_15.01.2024.xlsx

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS		LABORATORY DETAILS	
Contact	Huong Crawford	Manager	Adam Atkinson
Client	SGS I&E SYDNEY	Laboratory	SGS Melbourne EH&S
Address	Unit 16, 33 Maddox Street Alexandria NSW 2015	Address	10/585 Blackburn Road Notting Hill Victoria 3168
Telephone	02 8594 0400	Telephone	+61395743200
Facsimile	02 8594 0499	Facsimile	+61395743399
Email	au.environmental.sydney@sgs.com	Email	Au.SampleReceipt.Melbourne@sgs.com
Project	**304001019 Bomaderry**	SGS Reference	**ME345951 R0**
Order Number	**SE259312**	Date Received	22 Jan 2024
Samples	1	Date Reported	29 Jan 2024

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562 (14420/22793/24472).

SIGNATORIES

Adam ATKINSON
Australian Chemistry Manager

Andrew WRIGHT
Senior Chemist

Parameter	Units	LOR	Sample Number: ME345951.001 Sample Matrix: Soil Sample Date: 15 Jan 2024 Sample Name: SE259312.001

Per- and Polyfluoroalkyl Substances (PFAS) in Solid Samples Method: MA-1523 Tested: 24/1/2024

Perfluorobutanoic acid (PFBA)	mg/kg	0.0016	<0.0016
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0016	<0.0016
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0016	<0.0016
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0016	<0.0016
Perfluorooctanoic Acid (PFOA)	mg/kg	0.0008	<0.0008
Perfluorobutane sulfonate (PFBS)	mg/kg	0.0016	<0.0016
Perfluoropentane sulfonate (PFPeS)	mg/kg	0.0016	<0.0016
Perfluorohexane sulfonate (PFHxS)	mg/kg	0.0016	<0.0016
Perfluoroheptane sulfonate (PFHpS)	mg/kg	0.0016	<0.0016
Perfluorooctane sulfonate (PFOS)	mg/kg	0.0016	<0.0016
Sum PFOS and PFHXS	mg/kg	0.0016	<0.0016
Perfluorononane sulfonate (PFNS)	mg/kg	0.0016	<0.0016
1H,1H,2H,2H-Perfluorohexane sulfonate (4:2) (4:2 FTS)	mg/kg	0.0016	<0.0016
1H,1H,2H,2H-Perfluorooctane sulfonate (6:2) (6:2 FTS)	mg/kg	0.0016	<0.0016
1H,1H,2H,2H-Perfluorodecane sulfonate (8:2) (8:2 FTS)	mg/kg	0.0016	<0.0016
(13C4-PFBA) Isotopically Labelled Internal Recovery	%	-	99
(13C5-PFPeA) Isotopically Labelled Internal Recovery	%	-	96
(13C5-PFHxA) Isotopically Labelled Internal Recovery	%	-	132
(13C4-PFHpA) Isotopically Labelled Internal Recovery	%	-	110
(13C4_PFOA) Isotopically Labelled Internal Recovery	%	-	107
(13C3-PFBS) Isotopically Labelled Internal Recovery	%	-	115
(13C3-PFHxS) Isotopically Labelled Internal Recovery	%	-	101
(13C8-PFOS) Isotopically Labelled Internal Recovery	%	-	89

Moisture Content Method: AN002 Tested: 24/1/2024

% Moisture	%w/w	1	11.0

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Moisture Content   Method: ME-(AU)-[ENV]AN002

Parameter	QC Reference	Units	LOR	DUP %RPD
% Moisture	LB070991	%w/w	1	1 - 30%

Per- and Polyfluoroalkyl Substances (PFAS) in Solid Samples   Method: MA-1523

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Perfluorobutanoic acid (PFBA)	LB070986	mg/kg	0.0016	<0.0016	0%	NA
Perfluoropentanoic acid (PFPeA)	LB070986	mg/kg	0.0016	<0.0016	0%	NA
Perfluorohexanoic acid (PFHxA)	LB070986	mg/kg	0.0016	<0.0016	0%	NA
Perfluoroheptanoic acid (PFHpA)	LB070986	mg/kg	0.0016	<0.0016	0%	110%
Perfluorooctanoic Acid (PFOA)	LB070986	mg/kg	0.0008	<0.0008	0%	91%
Perfluorobutane sulfonate (PFBS)	LB070986	mg/kg	0.0016	<0.0016	0%	NA
Perfluoropentane sulfonate (PFPeS)	LB070986	mg/kg	0.0016	<0.0016	0%	NA
Perfluorohexane sulfonate (PFHxS)	LB070986	mg/kg	0.0016	<0.0016	0%	NA
Perfluoroheptane sulfonate (PFHpS)	LB070986	mg/kg	0.0016	<0.0016	0%	NA
Perfluorooctane sulfonate (PFOS)	LB070986	mg/kg	0.0016	<0.0016	0%	132%
Sum PFOS and PFHXS	LB070986	mg/kg	0.0016	<0.0016	0%	NA
Perfluorononane sulfonate (PFNS)	LB070986	mg/kg	0.0016	<0.0016	0%	NA
1H,1H,2H,2H-Perfluorohexane sulfonate (4:2) (4:2 FTS)	LB070986	mg/kg	0.0016	<0.0016	0%	NA
1H,1H,2H,2H-Perfluorooctane sulfonate (6:2) (6:2 FTS)	LB070986	mg/kg	0.0016	<0.0016	0%	NA
1H,1H,2H,2H-Perfluorodecane sulfonate (8:2) (8:2 FTS)	LB070986	mg/kg	0.0016	<0.0016	0%	NA
(13C4-PFBA) Isotopically Labelled Internal Recovery Standard	LB070986	%	-	98%	1 - 2%	97%
(13C5-PFPeA) Isotopically Labelled Internal Recovery Standard	LB070986	%	-	96%	1 - 3%	92%
(13C5-PFHxA) Isotopically Labelled Internal Recovery Standard	LB070986	%	-	127%	9 - 16%	120%
(13C4-PFHpA) Isotopically Labelled Internal Recovery Standard	LB070986	%	-	106%	10 - 13%	101%
(13C4_PFOA) Isotopically Labelled Internal Recovery Standard	LB070986	%	-	115%	7 - 12%	127%
(13C3-PFBS) Isotopically Labelled Internal Recovery Standard	LB070986	%	-	110%	5 - 12%	110%
(13C3-PFHxS) Isotopically Labelled Internal Recovery Standard	LB070986	%	-	98%	9%	102%
(13C8-PFOS) Isotopically Labelled Internal Recovery Standard	LB070986	%	-	85%	3 - 17%	82%

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
MA-1523	This method covers the analysis of per- and polyfluoroalkyl substances (PFAS) in aqueous, solid and biosolid samples and solvent extracts, determined as the total of linear and branched isomers. After spiking with isotopically labelled quantification surrogates and clean-up via SPE cartridges sample extracts are analysed by liquid chromatography/mass spectrometry (LC-MS/MS). PFAS concentrations are determined by isotope dilution quantification.

FOOTNOTES

IS	Insufficient sample for analysis.	LOR	Limit of Reporting
LNR	Sample listed, but not received.	↑↓	Raised or Lowered Limit of Reporting
*	NATA accreditation does not cover the performance of this service.	QFH	QC result is above the upper tolerance
		QFL	QC result is below the lower tolerance
**	Indicative data, theoretical holding time exceeded.	-	The sample was not analysed for this analyte
***	Indicates that both * and ** apply.	NVL	Not Validated

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calcuated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-gb/environment-health-and-safety.

STATEMENT OF QA/QC PERFORMANCE

ME345951 R0

CLIENT DETAILS		LABORATORY DETAILS	
Contact	Huong Crawford	Manager	Adam Atkinson
Client	SGS I&E SYDNEY	Laboratory	SGS Melbourne EH&S
Address	Unit 16, 33 Maddox Street Alexandria NSW 2015	Address	10/585 Blackburn Road Notting Hill Victoria 3168
Telephone	02 8594 0400	Telephone	+61395743200
Facsimile	02 8594 0499	Facsimile	+61395743399
Email	au.environmental.sydney@sgs.com	Email	Au.SampleReceipt.Melbourne@sgs.com
Project	**304001019 Bomaderry**	SGS Reference	**ME345951 R0**
Order Number	**SE259312**	Date Received	22 Jan 2024
Samples	1	Date Reported	29 Jan 2024

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document.
This QA/QC Statement must be read in conjunction with the referenced Analytical Report.
The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met (within the SGS Melbourne EH&S laboratory).

SAMPLE SUMMARY

Sample counts by matrix	1 Soil	Type of documentation received	COC
Date documentation received	22/1/2024	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	19.1°C
Sample container provider	SGS	Turnaround time requested	Three Days
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	2 Ice	Samples clearly labelled	Yes
Complete documentation received	Yes	Number of eskies/boxes received	2 Bag

HOLDING TIME SUMMARY

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Moisture Content — Method: ME-(AU)-[ENV]AN002

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SE259312.001	ME345951.001	LB070991	15 Jan 2024	22 Jan 2024	29 Jan 2024	24 Jan 2024	29 Jan 2024	29 Jan 2024

Per- and Polyfluoroalkyl Substances (PFAS) in Solid Samples — Method: MA-1523

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SE259312.001	ME345951.001	LB070986	15 Jan 2024	22 Jan 2024	12 Feb 2024	24 Jan 2024	21 Feb 2024	29 Jan 2024

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Per- and Polyfluoroalkyl Substances (PFAS) in Solid Samples

Method: MA-1523

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
(13C3-PFBS) Isotopically Labelled Internal Recovery Standard	SE259312.001	ME345951.001	%	0 - 150%	115
(13C3-PFHxS) Isotopically Labelled Internal Recovery Standard	SE259312.001	ME345951.001	%	0 - 150%	101
(13C4_PFOA) Isotopically Labelled Internal Recovery Standard	SE259312.001	ME345951.001	%	0 - 150%	107
(13C4-PFBA) Isotopically Labelled Internal Recovery Standard	SE259312.001	ME345951.001	%	0 - 150%	99
(13C4-PFHpA) Isotopically Labelled Internal Recovery Standard	SE259312.001	ME345951.001	%	0 - 150%	110
(13C5-PFHxA) Isotopically Labelled Internal Recovery Standard	SE259312.001	ME345951.001	%	0 - 150%	132
(13C5-PFPeA) Isotopically Labelled Internal Recovery Standard	SE259312.001	ME345951.001	%	0 - 150%	96
(13C8-PFOS) Isotopically Labelled Internal Recovery Standard	SE259312.001	ME345951.001	%	0 - 150%	89

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Per- and Polyfluoroalkyl Substances (PFAS) in Solid Samples

Method: MA-1523

Sample Number	Parameter	Units	LOR	Result
LB070986.001	Perfluorobutanoic acid (PFBA)	mg/kg	0.0016	<0.0016
	Perfluoropentanoic acid (PFPeA)	mg/kg	0.0016	<0.0016
	Perfluorohexanoic acid (PFHxA)	mg/kg	0.0016	<0.0016
	Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0016	<0.0016
	Perfluorooctanoic Acid (PFOA)	mg/kg	0.0008	<0.0008
	Perfluorobutane sulfonate (PFBS)	mg/kg	0.0016	<0.0016
	Perfluoropentane sulfonate (PFPeS)	mg/kg	0.0016	<0.0016
	Perfluorohexane sulfonate (PFHxS)	mg/kg	0.0016	<0.0016
	Perfluoroheptane sulfonate (PFHpS)	mg/kg	0.0016	<0.0016
	Perfluorooctane sulfonate (PFOS)	mg/kg	0.0016	<0.0016
	Sum PFOS and PFHXS	mg/kg	0.0016	<0.0016
	Perfluorononane sulfonate (PFNS)	mg/kg	0.0016	<0.0016
	1H,1H,2H,2H-Perfluorohexane sulfonate (4:2) (4:2 FTS)	mg/kg	0.0016	<0.0016
	1H,1H,2H,2H-Perfluorooctane sulfonate (6:2) (6:2 FTS)	mg/kg	0.0016	<0.0016
	1H,1H,2H,2H-Perfluorodecane sulfonate (8:2) (8:2 FTS)	mg/kg	0.0016	<0.0016
	(13C4-PFBA) Isotopically Labelled Internal Recovery Standard	%	-	98
	(13C5-PFPeA) Isotopically Labelled Internal Recovery Standard	%	-	96
	(13C5-PFHxA) Isotopically Labelled Internal Recovery Standard	%	-	127
	(13C4-PFHpA) Isotopically Labelled Internal Recovery Standard	%	-	106
	(13C4_PFOA) Isotopically Labelled Internal Recovery Standard	%	-	115
	(13C3-PFBS) Isotopically Labelled Internal Recovery Standard	%	-	110
	(13C3-PFHxS) Isotopically Labelled Internal Recovery Standard	%	-	98
	(13C8-PFOS) Isotopically Labelled Internal Recovery Standard	%	-	85

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean
The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR
Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may give a different calculated RPD.

Moisture Content — Method: ME-(AU)-[ENV]AN002

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
ME345951.001	LB070991.013	% Moisture	%w/w	1	11.0	8.2	40	30
ME345957.001	LB070991.002	% Moisture	%w/w	1	14.0625	14.183123877	37	1

Per- and Polyfluoroalkyl Substances (PFAS) in Solid Samples — Method: MA-1523

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
ME345951.001	LB070986.015	Perfluorobutanoic acid (PFBA)	mg/kg	0.0016	<0.0016	<0.0016	200	0
		Perfluoropentanoic acid (PFPeA)	mg/kg	0.0016	<0.0016	<0.0016	200	0
		Perfluorohexanoic acid (PFHxA)	mg/kg	0.0016	<0.0016	<0.0016	200	0
		Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0016	<0.0016	<0.0016	200	0
		Perfluorooctanoic Acid (PFOA)	mg/kg	0.0008	<0.0008	<0.0008	200	0
		Perfluorobutane sulfonate (PFBS)	mg/kg	0.0016	<0.0016	<0.0016	200	0
		Perfluoropentane sulfonate (PFPeS)	mg/kg	0.0016	<0.0016	<0.0016	200	0
		Perfluorohexane sulfonate (PFHxS)	mg/kg	0.0016	<0.0016	<0.0016	200	0
		Perfluoroheptane sulfonate (PFHpS)	mg/kg	0.0016	<0.0016	<0.0016	200	0
		Perfluorooctane sulfonate (PFOS)	mg/kg	0.0016	<0.0016	<0.0016	200	0
		Sum PFOS and PFHXS	mg/kg	0.0016	<0.0016	<0.0016	200	0
		Perfluorononane sulfonate (PFNS)	mg/kg	0.0016	<0.0016	<0.0016	200	0
		1H,1H,2H,2H-Perfluorohexane sulfonate (4:2) (4:2 FTS)	mg/kg	0.0016	<0.0016	<0.0016	200	0
		1H,1H,2H,2H-Perfluorooctane sulfonate (6:2) (6:2 FTS)	mg/kg	0.0016	<0.0016	<0.0016	200	0
		1H,1H,2H,2H-Perfluorodecane sulfonate (8:2) (8:2 FTS)	mg/kg	0.0016	<0.0016	<0.0016	200	0
		(13C4-PFBA) Isotopically Labelled Internal Recovery	mg/kg	-	9.85	9.65	200	2
		(13C5-PFPeA) Isotopically Labelled Internal Recovery	mg/kg	-	9.59	9.31	200	3
		(13C5-PFHxA) Isotopically Labelled Internal Recovery	mg/kg	-	13.2	11.2	200	16
		(13C4-PFHpA) Isotopically Labelled Internal Recovery	mg/kg	-	11.0	9.71	200	13
		(13C4_PFOA) Isotopically Labelled Internal Recovery	mg/kg	-	10.7	9.49	200	12
		(13C3-PFBS) Isotopically Labelled Internal Recovery	mg/kg	-	11.5	10.2	200	12
		(13C3-PFHxS) Isotopically Labelled Internal Recovery	mg/kg	-	10.1	9.20	200	9
		(13C8-PFOS) Isotopically Labelled Internal Recovery	mg/kg	-	8.91	10.5	200	17
ME345957.001	LB070986.004	Perfluorobutanoic acid (PFBA)	mg/kg	0.0016	0.0002589934	0.0001621117	200	0
		Perfluoropentanoic acid (PFPeA)	mg/kg	0.0016	5.9924778470	0	200	0
		Perfluorohexanoic acid (PFHxA)	mg/kg	0.0016	6.5866544794	2.2074731315	200	0
		Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0016	1.9770455196	1.1299661165	200	0
		Perfluorooctanoic Acid (PFOA)	mg/kg	0.0008	0	0	200	0
		Perfluorobutane sulfonate (PFBS)	mg/kg	0.0016	7.8255915327	0.0004345255	200	0
		Perfluoropentane sulfonate (PFPeS)	mg/kg	0.0016	0	1.1070954846	200	0
		Perfluorohexane sulfonate (PFHxS)	mg/kg	0.0016	0	0	200	0
		Perfluoroheptane sulfonate (PFHpS)	mg/kg	0.0016	7.0898041850	9.3128599542	200	0
		Perfluorooctane sulfonate (PFOS)	mg/kg	0.0016	0	0	200	0
		Sum PFOS and PFHXS	mg/kg	0.0016	0	0	200	0
		Perfluorononane sulfonate (PFNS)	mg/kg	0.0016	0	1.8109871294	200	0
		1H,1H,2H,2H-Perfluorohexane sulfonate (4:2) (4:2 FTS)	mg/kg	0.0016	7.5741810248	6.7017247082	200	0
		1H,1H,2H,2H-Perfluorooctane sulfonate (6:2) (6:2 FTS)	mg/kg	0.0016	1.9872435141	3.4525653594	200	0
		1H,1H,2H,2H-Perfluorodecane sulfonate (8:2) (8:2 FTS)	mg/kg	0.0016	0	0	200	0
		(13C4-PFBA) Isotopically Labelled Internal Recovery	mg/kg	-	9.6383508972	9.7454424388	200	1
		(13C5-PFPeA) Isotopically Labelled Internal Recovery	mg/kg	-	9.5824251657	9.6684488674	200	1
		(13C5-PFHxA) Isotopically Labelled Internal Recovery	mg/kg	-	10.820708102	11.831474349	200	9
		(13C4-PFHpA) Isotopically Labelled Internal Recovery	mg/kg	-	10.285115079	11.394307284	200	10
		(13C4_PFOA) Isotopically Labelled Internal Recovery	mg/kg	-	10.440513385	9.7667175234	200	7
		(13C3-PFBS) Isotopically Labelled Internal Recovery	mg/kg	-	11.178293639	10.595853263	200	5
		(13C3-PFHxS) Isotopically Labelled Internal Recovery	mg/kg	-	9.8656980749	8.9801952331	200	9
		(13C8-PFOS) Isotopically Labelled Internal Recovery	mg/kg	-	10.719475571	11.063458072	200	3

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Per- and Polyfluoroalkyl Substances (PFAS) in Solid Samples

Method: MA-1523

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB070986.002	Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0016	<0.0016	0.00022	30 - 150	110
	Perfluorooctanoic Acid (PFOA)	mg/kg	0.0008	<0.0008	0.00022	30 - 150	91
	Perfluorooctane sulfonate (PFOS)	mg/kg	0.0016	<0.0016	0.00022	30 - 150	132
	(13C4-PFBA) Isotopically Labelled Internal Recovery Standard	mg/kg	-	9.71	10	10 - 150	97
	(13C5-PFPeA) Isotopically Labelled Internal Recovery Standard	mg/kg	-	9.19	10	10 - 150	92
	(13C5-PFHxA) Isotopically Labelled Internal Recovery Standard	mg/kg	-	12.0	10	10 - 150	120
	(13C4-PFHpA) Isotopically Labelled Internal Recovery Standard	mg/kg	-	10.1	10	10 - 150	101
	(13C4_PFOA) Isotopically Labelled Internal Recovery Standard	mg/kg	-	12.7	10	10 - 150	127
	(13C3-PFBS) Isotopically Labelled Internal Recovery Standard	mg/kg	-	11.0	10	10 - 150	110
	(13C3-PFHxS) Isotopically Labelled Internal Recovery Standard	mg/kg	-	10.2	10	10 - 150	102
	(13C8-PFOS) Isotopically Labelled Internal Recovery Standard	mg/kg	-	8.25	10	10 - 150	82

MATRIX SPIKES

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No matrix spikes were required for this job.

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here: https://www.sgs.com.au/~/media/Local/Australia/Documents/Technical Documents/MP-AU-ENV-QU-022 QA QC Plan.pdf

*	NATA accreditation does not cover the performance of this service.
**	Indicative data, theoretical holding time exceeded.
***	Indicates that both * and ** apply.
-	Sample not analysed for this analyte.
IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.
①	Majority of surrogate recoveries are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
⑪	Majority of spike recoveries are within acceptance criteria.
†	Refer to relevant report comments for further information.

CHAIN OF CUSTODY RECORD

COC#: SE259312

Owner job:

Ship to: XML	Project Name:	Due date: 25/01/2024 3:40:33 PM
	Client: STANTEC AUSTRALI F700101_LIQ102_17880909	Send Results to: AUENVSE
	Sampler Name: Client	
Carrier:	Airbill #:	

Field Sample ID	Client ID	Date sampling	Time	Matrix	# of Containers	Analyses Requested: 152301										Comments
SE259312.001	QC111	15/01/2024	0:00:00	Soil		X										

SGS EHS Melbourne COC
ME345951
SE259312 SUBCON
Received: 18 – Jan – 2024

Sample Condition Upon Receipt at Laboratory:	Cooler temperature:
Special Instructions/Comments: Job Booked by:- Loggin Checked by:-	

#1 Released by: (Sig)	Date:	#2 Released by: (Sig)	Date:	#3 Released by: (Sig)	Date:
Company Name:	Time	Company Name:	Time	Company Name:	Time
#1 Received by: (Sig) C Muue	Date 22/1/24	#2 Received by: (Sig)	Date	#3 Received by: (Sig)	Date
Company Name: SGS MELBOURNE	Time: 10:00	Company Name:	Time:	Company Name:	Time:

SGS Notting Hill Bottle Map for Water & Soil Samples

Temperature	19.1°C	Ice Brick	5	Ice	2	Ice Pack	0	Esky	0	Bag	2	Box	0	Bucket	0
Name + Date	C. Guile 22/1/24														

Bottle Type And Preservation Type

	Sample ID	Tray #	Soil	Water	Oil	1L Unpreserved Plastic	1L HNO3 Preserved Plastic	1L Unpreserved Glass	500mL Unpreserved Plastic	500mL Unpreserved Glass	250mL Unpreserved Plastic Bottle	250mL Unpreserved Plastic Jar	250mL H2SO4 Plastic	250mL Zn acetate & NaOH Plastic	250mL Unpreserved Glass Jar	200mL Unpreserved Glass	150mL Unpreserved Plastic Jar	125mL Unpreserved Plastic Bottle	125mL HNO3 (Filtered) Plastic (Dissolved meta	125mL HNO3 (Unfiltered) Plastic (Total Metals)	125mL NaOH Preserved Plastic Bottle	125mL H2SO4 Plastic	125mL Unpreserved Glass Jar	100mL Unpreserved Glass	~~70mL~~ 100mL Unpreserved Plastic Container	50mL Unpreserved Plastic	40mL Unpreserved Glass vial	40mL Na2S2O3 Glass vial	40mL H2SO4 Glass vial	40mL NH4Cl Glass vial	40mL Diluted HCl Glass vial	10mL Unpreserved Glass	Plastic bag	Number of labels to be printed per sample ID
1	SE259312.001	K4	X																						1									1
2																																		
3																																		
4																																		
5																																		
6																																		
7																																		
8																																		
9																																		
10																																		

Comments:

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Katelyn Elliott
Client	STANTEC AUSTRALIA PTY LTD
Address	LEVEL 22, 570 BOURKE STREET MELBOURNE VIC 3000
Telephone	61 3 85547000
Facsimile	(Not specified)
Email	Katelyn.Elliott@stantec.com
Project	**304001019 Bomaderry**
Order Number	**304001019**
Samples	1

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
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Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE259463 R0**
Date Received	22/1/2024
Date Reported	6/2/2024

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

PFAS subcontracted to SGS Melbourne, 10/585 Blackburn Road, Notting Hill, VIC, NATA Accreditation Number. 2562/14420. Report No. ME346115.

SIGNATORIES

Akheeqar BENIAMEEN
Chemist

Dong LIANG
Metals/Inorganics Team Leader

Huong CRAWFORD
Production Manager

Kamrul AHSAN
Senior Chemist

Ly Kim HA
Organic Section Head

Teresa NGUYEN
Organic Chemist

VOCs in Water [AN433] Tested: 25/1/2024

PARAMETER	UOM	LOR	QC200 WATER - 18/1/2024 SE259463.001
Benzene	µg/L	0.5	<0.5
Toluene	µg/L	0.5	<0.5
Ethylbenzene	µg/L	0.5	<0.5
m/p-xylene	µg/L	1	<1
o-xylene	µg/L	0.5	<0.5
Naphthalene (VOC)*	µg/L	0.5	<0.5
Total Xylenes	µg/L	1.5	<1.5
Total BTEX	µg/L	3	<3

Low Level Volatile Petroleum Hydrocarbons in Water [AN433] Tested: 25/1/2024

PARAMETER	UOM	LOR	QC200 WATER - 18/1/2024 SE259463.001
TRH C6-C10	μg/L	10	<10
TRH C6-C9	μg/L	10	<10
Benzene (F0)	μg/L	0.1	<0.1
TRH C6-C10 minus BTEX (F1)	μg/L	10	<10
Benzene	μg/L	0.1	<0.1
Toluene	μg/L	0.1	<0.1
Ethylbenzene	μg/L	0.1	<0.1
m/p-xylene	μg/L	0.2	<0.2
o-xylene	μg/L	0.1	<0.1
Naphthalene (VOC)*	μg/L	0.1	<0.1
Total BTEX*	μg/L	0.6	<0.6

Low Level TRH (Total Recoverable Hydrocarbons) in Water [AN403] Tested: 25/1/2024

PARAMETER	UOM	LOR	QC200 WATER - 18/1/2024 SE259463.001
LLTRH C10-C14	µg/L	50	<50
LLTRH C15-C28	µg/L	100	<100
LLTRH C29-C36	µg/L	50	<50
LLTRH >C10-C16	µg/L	50	<50
LLTRH >C16-C34 (F3)	µg/L	100	<100
LLTRH >C34-C40 (F4)	µg/L	100	<100
TRH Sum C10-C36	µg/L	100	<100
LLTRH C37-C40	µg/L	100	<100

Low Level PAH (Poly Aromatic Hydrocarbons) in Water [AN420] Tested: 25/1/2024

PARAMETER	UOM	LOR	QC200 WATER - 18/1/2024 SE259463.001
Naphthalene	µg/L	0.02	<0.02
2-methylnaphthalene	µg/L	0.01	<0.01
1-methylnaphthalene	µg/L	0.01	<0.01
Acenaphthylene	µg/L	0.01	<0.01
Acenaphthene	µg/L	0.01	<0.01
Fluorene	µg/L	0.01	<0.01
Phenanthrene	µg/L	0.01	<0.01
Anthracene	µg/L	0.01	<0.01
Fluoranthene	µg/L	0.01	<0.01
Pyrene	µg/L	0.01	<0.01
Benzo(a)anthracene	µg/L	0.01	<0.01
Chrysene	µg/L	0.01	<0.01
Benzo(b&j&k)fluoranthene	µg/L	0.02	<0.02
Benzo(a)pyrene	µg/L	0.01	<0.01
Indeno(1,2,3-cd)pyrene	µg/L	0.01	<0.01
Dibenzo(ah)anthracene	µg/L	0.01	<0.01
Benzo(ghi)perylene	µg/L	0.01	<0.01
Carcinogenic PAHs (as BaP TEQ) - assume non	TEQ (µg/L)	0.012	<0.012
Total PAH VIC EPA Guidelines (16)*	µg/L	0.1	<0.1
Total PAH (18)*	µg/L	0.1	<0.1

Low Level OC Pesticides in Water [AN420] Tested: 25/1/2024

PARAMETER	UOM	LOR	QC200 WATER - 18/1/2024 SE259463.001
Hexachlorobenzene (HCB)	µg/L	0.01	<0.01
Alpha BHC	µg/L	0.05	<0.05
Lindane (gamma BHC)	µg/L	0.05	<0.05
Heptachlor	µg/L	0.02	<0.02
Aldrin	µg/L	0.01	<0.01
Beta BHC	µg/L	0.05	<0.05
Delta BHC	µg/L	0.05	<0.05
Heptachlor epoxide	µg/L	0.02	<0.02
Alpha Endosulfan	µg/L	0.02	<0.02
Gamma Chlordane	µg/L	0.01	<0.01
Alpha Chlordane	µg/L	0.01	<0.01
p,p'-DDE	µg/L	0.01	<0.01
Dieldrin	µg/L	0.01	<0.01
Endrin	µg/L	0.02	<0.02
Beta Endosulfan	µg/L	0.02	<0.02
p,p'-DDD	µg/L	0.01	<0.01
p,p'-DDT	µg/L	0.01	<0.01
Endosulfan sulphate	µg/L	0.02	<0.02
Endrin Aldehyde	µg/L	0.02	<0.02
Methoxychlor	µg/L	0.1	<0.1
Endrin Ketone	µg/L	0.05	<0.05
Isodrin	µg/L	0.02	<0.02
Mirex	µg/L	0.01	<0.01
Oxychlordane	µg/L	0.01	<0.01
Total OC	µg/L	1	<1

Low Level OP Pesticides in Water [AN420] Tested: 25/1/2024

PARAMETER	UOM	LOR	QC200 WATER - 18/1/2024 SE259463.001
Dichlorvos	µg/L	0.5	<0.5
Dimethoate	µg/L	0.15	<0.15
Diazinon (Dimpylate)	µg/L	0.01	<0.01
Fenitrothion	µg/L	0.2	<0.2
Malathion	µg/L	0.05	<0.05
Chlorpyrifos (Chlorpyrifos Ethyl)	µg/L	0.01	<0.01
Parathion-ethyl (Parathion)	µg/L	0.01	<0.01
Bromophos Ethyl	µg/L	0.05	<0.05
Methidathion	µg/L	0.05	<0.05
Ethion	µg/L	0.05	<0.05
Azinphos-methyl (Guthion)	µg/L	0.05	<0.05

PCBs in Water [AN420] Tested: 25/1/2024

PARAMETER	UOM	LOR	QC200 WATER - 18/1/2024 SE259463.001
Arochlor 1016	µg/L	1	<1
Arochlor 1221	µg/L	1	<1
Arochlor 1232	µg/L	1	<1
Arochlor 1242	µg/L	1	<1
Arochlor 1248	µg/L	1	<1
Arochlor 1254	µg/L	1	<1
Arochlor 1260	µg/L	1	<1
Arochlor 1262	µg/L	1	<1
Arochlor 1268	µg/L	1	<1
Total Arochlors*	µg/L	5	<5

Trace Metals (Dissolved) in Water by ICPMS [AN318] Tested: 25/1/2024

			QC200 WATER - 18/1/2024
PARAMETER	UOM	LOR	SE259463.001
Arsenic	μg/L	1	<1
Cadmium	μg/L	0.1	<0.1
Copper	μg/L	1	**3**
Chromium	μg/L	1	**2**
Nickel	μg/L	1	**17**
Lead	μg/L	1	<1
Zinc	μg/L	5	**27**

Mercury (dissolved) in Water [AN311(Perth)/AN312] Tested: 29/1/2024

PARAMETER	UOM	LOR	QC200 WATER - 18/1/2024 SE259463.001
Mercury	mg/L	0.0001	<0.0001

Trace Metals (Total) in Water by ICPMS [AN022/AN318] Tested: 25/1/2024

PARAMETER	UOM	LOR	QC200 WATER - 18/1/2024 SE259463.001
Total Arsenic	µg/L	1	<1
Total Cadmium	µg/L	0.1	<0.1
Total Chromium	µg/L	1	**2**
Total Copper	µg/L	1	<1
Total Nickel	µg/L	1	**18**
Total Lead	µg/L	1	**2**
Total Zinc	µg/L	5	**25**

Mercury (total) in Water [AN311(Perth) /AN312] Tested: 29/1/2024

PARAMETER	UOM	LOR	QC200 WATER - 18/1/2024 SE259463.001
Total Mercury	mg/L	0.0001	<0.0001

Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous Samples - Low Level [MA-1523] Tested: 5/2/2024

PARAMETER	UOM	LOR	QC200 WATER - 18/1/2024 SE259463.001
Perfluorobutanoic acid (PFBA)	µg/L	0.0005	<0.0005
Perfluoropentanoic acid (PFPeA)	µg/L	0.0005	<0.0005
Perfluorohexanoic acid (PFHxA)	µg/L	0.0005	<0.0005
Perfluoroheptanoic acid (PFHpA)	µg/L	0.0005	<0.0005
Perfluorooctanoic Acid (PFOA)	µg/L	0.0005	<0.0005
Perfluorononanoic acid (PFNA)	µg/L	0.001	<0.001
Perfluorodecanoic acid (PFDA)	µg/L	0.001	<0.001
Perfluoroundecanoic acid (PFUnA)	µg/L	0.001	<0.001
Perfluorododecanoic acid (PFDoA)	µg/L	0.001	<0.001
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.001	<0.001
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.001	<0.001
Perfluorohexadecanoic acid (PFHxDA)	µg/L	0.002	<0.002
Perfluorobutane sulfonate (PFBS)	µg/L	0.001	<0.001
Perfluoropentane sulfonate (PFPeS)	µg/L	0.001	<0.001
Perfluorohexane sulfonate (PFHxS)	µg/L	0.0002	0.0003
Perfluoroheptane sulfonate (PFHpS)	µg/L	0.0002	<0.0002
Perfluorooctane sulfonate (PFOS)	µg/L	0.0002	<0.0002
Sum of PFHxS and PFOS	µg/L	0.0002	0.0003
Perfluorononane sulfonate (PFNS)	µg/L	0.0005	<0.0005
Perfluorodecane sulfonate (PFDS)	µg/L	0.0005	<0.0005
Perfluorododecane sulfonate (PFDoS)	µg/L	0.0005	<0.0005
1H,1H,2H,2H-Perfluorohexane sulfonate (4:2) (4:2 FTS)	µg/L	0.0005	<0.0005
1H,1H,2H,2H-Perfluorooctane sulfonate (6:2) (6:2 FTS)	µg/L	0.0005	<0.0005
1H,1H,2H,2H-Perfluorodecane sulfonate (8:2) (8:2 FTS)	µg/L	0.0005	<0.0005
Perfluoroctane sulfonamide (PFOSA)	µg/L	0.002	<0.002
N-Methylperfluoroctane sulfonamide (N-MeFOSA)	µg/L	0.0025	<0.0025
N-Ethylperfluoroctane sulfonamide (N-EtFOSA)	µg/L	0.0025	<0.0025
2-(N-Methylperfluorooctane sulfonamido)-ethanol	µg/L	0.0025	<0.0025
2-(N-Ethylperfluorooctane sulfonamido)-ethanol	µg/L	0.0025	<0.0025
N-Methylperfluorooctanesulfonamidoacetic acid	µg/L	0.0025	<0.0025
N-Ethylperfluorooctanesulfonamidoacetic Acid	µg/L	0.0025	<0.0025
Total PFAS (n=30)	µg/L	0.006	<0.0060

METHOD	METHODOLOGY SUMMARY
AN020	Unpreserved water sample is filtered through a 0.45µm membrane filter and acidified with nitric acid similar to APHA3030B.
AN022/AN318	Following acid digestion of un filtered sample, determination of elements at trace level in waters by ICP -MS technique, referenced to USEPA 6020B and USEPA 200.8 (5.4).
AN022	The water sample is digested with Nitric Acid and made up to the original volume similar to APHA3030E.
AN311(Perth) /AN312	Mercury by Cold Vapour AAS in Waters: Mercury ions taken from unfiltered sample are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500.
AN311(Perth)/AN312	Mercury by Cold Vapour AAS in Waters: Mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500.
AN318	Determination of elements at trace level in waters by ICP-MS technique,, referenced to USEPA 6020B and USEPA 200.8 (5.4).
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is not corrected for Naphthalene.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Recoverable Hydrocarbons - Silica (TRH-Si) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents .
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken . This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	PAH Compounds: The determination the concentration of polynuclear aromatic hydrocarbons (PAH) in solid waste matrices, soils and waters by Gas Chromatography with Mass Spectrometric Detection (Based on USEPA 3500C and 8270D). Total PAH calculated from individual analyte detections at or above the limit of reporting .
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.
MA-1523	This method covers the analysis of per- and polyfluoroalkyl substances (PFAS) in aqueous, solid and biosolid samples and solvent extracts, determined as the total of linear and branched isomers. After spiking with isotopically labelled quantification surrogates and clean-up via SPE cartridges sample extracts are analysed by liquid chromatography/mass spectrometry (LC-MS/MS). PFAS concentrations are determined by isotope dilution quantification.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
**	Indicative data, theoretical holding time exceeded.	NVL	Not validated.	LOR	Limit of Reporting.
***	Indicates that both * and ** apply.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-gb/environment-health-and-safety.

STATEMENT OF QA/QC PERFORMANCE

SE259463 R0

CLIENT DETAILS

Contact	Katelyn Elliott
Client	STANTEC AUSTRALIA PTY LTD
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Email	Katelyn.Elliott@stantec.com
Project	**304001019 Bomaderry**
Order Number	**304001019**
Samples	1

LABORATORY DETAILS

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SGS Reference	**SE259463 R0**
Date Received	22 Jan 2024
Date Reported	06 Feb 2024

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document.
This QA/QC Statement must be read in conjunction with the referenced Analytical Report.
The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met with the exception of the following:

Surrogate	Low Level OC Pesticides in Water	1 item

SAMPLE SUMMARY

Sample counts by matrix	1 Water	Type of documentation received	COC
Date documentation received	22/1/2024	Samples received in good order	Yes
Samples received without headspace	N/A	Sample temperature upon receipt	15.2°C
Sample container provider	Other Lab	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice Bricks	Samples clearly labelled	Yes
Complete documentation received	Yes		

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

Low Level OC Pesticides in Water

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC200	SE259463.001	LB302223	18 Jan 2024	22 Jan 2024	25 Jan 2024	25 Jan 2024	05 Mar 2024	29 Jan 2024

Low Level OP Pesticides in Water

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC200	SE259463.001	LB302223	18 Jan 2024	22 Jan 2024	25 Jan 2024	25 Jan 2024	05 Mar 2024	29 Jan 2024

Low Level PAH (Poly Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC200	SE259463.001	LB302223	18 Jan 2024	22 Jan 2024	25 Jan 2024	25 Jan 2024	05 Mar 2024	29 Jan 2024

Low Level TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC200	SE259463.001	LB302223	18 Jan 2024	22 Jan 2024	25 Jan 2024	25 Jan 2024	05 Mar 2024	29 Jan 2024

Low Level Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC200	SE259463.001	LB302244	18 Jan 2024	22 Jan 2024	01 Feb 2024	25 Jan 2024	01 Feb 2024	29 Jan 2024

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC200	SE259463.001	LB302343	18 Jan 2024	22 Jan 2024	15 Feb 2024	29 Jan 2024	15 Feb 2024	30 Jan 2024

Mercury (total) in Water

Method: ME-(AU)-[ENV]AN311(Perth) /AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC200	SE259463.001	LB302345	18 Jan 2024	22 Jan 2024	15 Feb 2024	29 Jan 2024	15 Feb 2024	30 Jan 2024

PCBs in Water

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC200	SE259463.001	LB302223	18 Jan 2024	22 Jan 2024	25 Jan 2024	25 Jan 2024	05 Mar 2024	29 Jan 2024

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC200	SE259463.001	LB302218	18 Jan 2024	22 Jan 2024	16 Jul 2024	25 Jan 2024	16 Jul 2024	25 Jan 2024

Trace Metals (Total) in Water by ICPMS

Method: ME-(AU)-[ENV]AN022/AN318

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC200	SE259463.001	LB302219	18 Jan 2024	22 Jan 2024	16 Jul 2024	25 Jan 2024	16 Jul 2024	25 Jan 2024

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC200	SE259463.001	LB302244	18 Jan 2024	22 Jan 2024	01 Feb 2024	25 Jan 2024	01 Feb 2024	29 Jan 2024

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Low Level OC Pesticides in Water

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
d14-p-terphenyl (Surrogate)	QC200	SE259463.001	%	40 - 130%	0 †
Tetrachloro-m-xylene (TCMX) (Surrogate)	QC200	SE259463.001	%	40 - 130%	86

Low Level OP Pesticides in Water

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	QC200	SE259463.001	%	40 - 130%	66
d14-p-terphenyl (Surrogate)	QC200	SE259463.001	%	40 - 130%	77

Low Level PAH (Poly Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	QC200	SE259463.001	%	40 - 130%	66
d14-p-terphenyl (Surrogate)	QC200	SE259463.001	%	40 - 130%	77
d5-nitrobenzene (Surrogate)	QC200	SE259463.001	%	40 - 130%	60

Low Level Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	QC200	SE259463.001	%	40 - 130%	103
d4-1,2-dichloroethane (Surrogate)	QC200	SE259463.001	%	60 - 130%	96
d8-toluene (Surrogate)	QC200	SE259463.001	%	40 - 130%	102

PCBs in Water

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
TCMX (Surrogate)	QC200	SE259463.001	%	40 - 130%	85

Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous Samples - Low Level

Method: MA-1523

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
(13C2_PFTeDA) Isotopically Labelled Internal Recovery Standard	QC200	SE259463.001	%	10 - 150%	98
(13C2-4:2 FTS) Isotopically Labelled Internal Recovery Standard	QC200	SE259463.001	%	10 - 150%	114
(13C2-6:2 FTS) Isotopically Labelled Internal Recovery Standard	QC200	SE259463.001	%	10 - 150%	108
(13C2-8:2 FTS) Isotopically Labelled Internal Recovery Standard	QC200	SE259463.001	%	10 - 150%	100
(13C2-PFDoA) Isotopically Labelled Internal Recovery Standard	QC200	SE259463.001	%	10 - 150%	84
(13C2-PFHxDA) Isotopically Labelled Internal Recovery Standard	QC200	SE259463.001	%	10 - 150%	114
(13C3-PFBS) Isotopically Labelled Internal Recovery Standard	QC200	SE259463.001	%	10 - 150%	103
(13C3-PFHxS) Isotopically Labelled Internal Recovery Standard	QC200	SE259463.001	%	10 - 150%	98
(13C4_PFOA) Isotopically Labelled Internal Recovery Standard	QC200	SE259463.001	%	10 - 150%	85
(13C4-PFBA) Isotopically Labelled Internal Recovery Standard	QC200	SE259463.001	%	10 - 150%	98
(13C4-PFHpA) Isotopically Labelled Internal Recovery Standard	QC200	SE259463.001	%	10 - 150%	89
(13C5-PFHxA) Isotopically Labelled Internal Recovery Standard	QC200	SE259463.001	%	10 - 150%	97
(13C5-PFPeA) Isotopically Labelled Internal Recovery Standard	QC200	SE259463.001	%	10 - 150%	95
(13C6-PFDA) Isotopically Labelled Internal Recovery Standard	QC200	SE259463.001	%	10 - 150%	81
(13C7-PFUdA) Isotopically Labelled Internal Recovery Standard	QC200	SE259463.001	%	10 - 150%	89
(13C8-PFOS) Isotopically Labelled Internal Recovery Standard	QC200	SE259463.001	%	10 - 150%	103
(13C8-PFOSA) Isotopically Labelled Internal Recovery Standard	QC200	SE259463.001	%	10 - 150%	87
(13C9-PFNA) Isotopically Labelled Internal Recovery Standard	QC200	SE259463.001	%	10 - 150%	105
(D3-N-MeFOSA) Isotopically Labelled Internal Recovery Standard	QC200	SE259463.001	%	10 - 150%	106
(D3-N-MeFOSAA) Isotopically Labelled Internal Recovery Standard	QC200	SE259463.001	%	10 - 150%	85
(D5-N-EtFOSA) Isotopically Labelled Internal Recovery Standard	QC200	SE259463.001	%	10 - 150%	111
(D5-N-EtFOSAA) Isotopically Labelled Internal Recovery Standard	QC200	SE259463.001	%	10 - 150%	92
(D7-N-MeFOSE) Isotopically Labelled Internal Recovery Standard	QC200	SE259463.001	%	10 - 150%	94
(D9-N-EtFOSE) Isotopically Labelled Internal Recovery Standard	QC200	SE259463.001	%	10 - 150%	91

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	QC200	SE259463.001	%	40 - 130%	103
d4-1,2-dichloroethane (Surrogate)	QC200	SE259463.001	%	40 - 130%	96
d8-toluene (Surrogate)	QC200	SE259463.001	%	40 - 130%	102

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Low Level OC Pesticides in Water

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB302223.001		Hexachlorobenzene (HCB)	µg/L	0.01	<0.01
		Alpha BHC	µg/L	0.05	<0.05
		Lindane (gamma BHC)	µg/L	0.05	<0.05
		Heptachlor	µg/L	0.02	<0.02
		Aldrin	µg/L	0.01	<0.01
		Beta BHC	µg/L	0.05	<0.05
		Delta BHC	µg/L	0.05	<0.05
		Heptachlor epoxide	µg/L	0.02	<0.02
		Alpha Endosulfan	µg/L	0.02	<0.02
		Gamma Chlordane	µg/L	0.01	<0.01
		Alpha Chlordane	µg/L	0.01	<0.01
		Dieldrin	µg/L	0.01	<0.01
		Endrin	µg/L	0.02	<0.02
		Beta Endosulfan	µg/L	0.02	<0.02
		Endosulfan sulphate	µg/L	0.02	<0.02
		Endrin Aldehyde	µg/L	0.02	<0.02
		Methoxychlor	µg/L	0.1	<0.1
		Endrin Ketone	µg/L	0.05	<0.05
		Mirex	µg/L	0.01	<0.01
		Oxychlordane	µg/L	0.01	<0.01

Low Level OP Pesticides in Water

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB302223.001		Dichlorvos	µg/L	0.5	<0.5
		Dimethoate	µg/L	0.15	<0.15
		Diazinon (Dimpylate)	µg/L	0.01	<0.01
		Fenitrothion	µg/L	0.2	<0.2
		Malathion	µg/L	0.05	<0.05
		Chlorpyrifos (Chlorpyrifos Ethyl)	µg/L	0.01	<0.01
		Parathion-ethyl (Parathion)	µg/L	0.01	<0.01
		Bromophos Ethyl	µg/L	0.05	<0.05
		Methidathion	µg/L	0.05	<0.05
		Ethion	µg/L	0.05	<0.05
		Azinphos-methyl (Guthion)	µg/L	0.05	<0.05
	Surrogates	d14-p-terphenyl (Surrogate)	%	-	88

Low Level PAH (Poly Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB302223.001		Naphthalene	µg/L	0.02	<0.02
		2-methylnaphthalene	µg/L	0.01	<0.01
		1-methylnaphthalene	µg/L	0.01	<0.01
		Acenaphthylene	µg/L	0.01	<0.01
		Acenaphthene	µg/L	0.01	<0.01
		Fluorene	µg/L	0.01	<0.01
		Phenanthrene	µg/L	0.01	<0.01
		Anthracene	µg/L	0.01	<0.01
		Fluoranthene	µg/L	0.01	<0.01
		Pyrene	µg/L	0.01	<0.01
		Benzo(a)anthracene	µg/L	0.01	<0.01
		Chrysene	µg/L	0.01	<0.01
		Benzo(b&j&k)fluoranthene	µg/L	0.02	<0.02
		Benzo(a)pyrene	µg/L	0.01	<0.01
		Indeno(1,2,3-cd)pyrene	µg/L	0.01	<0.01
		Dibenzo(ah)anthracene	µg/L	0.01	<0.01
		Benzo(ghi)perylene	µg/L	0.01	<0.01
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	67
		2-fluorobiphenyl (Surrogate)	%	-	72
		d14-p-terphenyl (Surrogate)	%	-	88

Low Level TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Low Level TRH (Total Recoverable Hydrocarbons) in Water (continued) — Method: ME-(AU)-[ENV]AN403

Sample Number		Parameter	Units	LOR	Result
LB302223.001		LLTRH C10-C14	µg/L	50	<50
		LLTRH C15-C28	µg/L	100	<100
		LLTRH C29-C36	µg/L	50	<50

Low Level Volatile Petroleum Hydrocarbons in Water — Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB302244.001		TRH C6-C9	µg/L	10	<10
		Benzene	µg/L	0.1	<0.1
		Toluene	µg/L	0.1	<0.1
		Ethylbenzene	µg/L	0.1	<0.1
		m/p-xylene	µg/L	0.2	<0.2
		o-xylene	µg/L	0.1	<0.1
		Total BTEX*	µg/L	0.6	<0.6
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	99
		d8-toluene (Surrogate)	%	-	98
		Bromofluorobenzene (Surrogate)	%	-	103

Mercury (dissolved) in Water — Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Sample Number	Parameter	Units	LOR	Result
LB302343.001	Mercury	mg/L	0.0001	<0.0001

PCBs in Water — Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result
LB302223.001	Arochlor 1016	µg/L	1	<1
	Arochlor 1221	µg/L	1	<1
	Arochlor 1232	µg/L	1	<1
	Arochlor 1242	µg/L	1	<1
	Arochlor 1248	µg/L	1	<1
	Arochlor 1254	µg/L	1	<1
	Arochlor 1260	µg/L	1	<1
	Arochlor 1262	µg/L	1	<1
	Arochlor 1268	µg/L	1	<1

Trace Metals (Dissolved) in Water by ICPMS — Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result
LB302218.001	Arsenic	µg/L	1	<1
	Cadmium	µg/L	0.1	<0.1
	Chromium	µg/L	1	<1
	Copper	µg/L	1	<1
	Lead	µg/L	1	<1
	Nickel	µg/L	1	<1
	Zinc	µg/L	5	<5

Trace Metals (Total) in Water by ICPMS — Method: ME-(AU)-[ENV]AN022/AN318

Sample Number	Parameter	Units	LOR	Result
LB302219.001	Total Arsenic	µg/L	1	<1
	Total Cadmium	µg/L	0.1	<0.1
	Total Chromium	µg/L	1	<1
	Total Copper	µg/L	1	<1
	Total Lead	µg/L	1	<1
	Total Nickel	µg/L	1	<1
	Total Zinc	µg/L	5	<5

VOCs in Water — Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB302244.001	Monocyclic Aromatic Hydrocarbons	Benzene	µg/L	0.5	<0.5
		Toluene	µg/L	0.5	<0.5
		Ethylbenzene	µg/L	0.5	<0.5
		m/p-xylene	µg/L	1	<1
		o-xylene	µg/L	0.5	<0.5
	Polycyclic VOCs	Naphthalene (VOC)*	µg/L	0.5	<0.5
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	99

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

VOCs in Water (continued) Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB302244.001	Surrogates	d8-toluene (Surrogate)	%	-	98
		Bromofluorobenzene (Surrogate)	%	-	103

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE259554.003	LB302343.014	Mercury	µg/L	0.0001	<0.0001	<0.0001	92	3

Mercury (total) in Water

Method: ME-(AU)-[ENV]AN311(Perth) /AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE259554.006	LB302345.014	Total Mercury	µg/L	0.0001	0.00007	0.00006	87	14

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE259554.002	LB302218.014	Arsenic	µg/L	1	<1	<1	197	0
		Cadmium	µg/L	0.1	<0.1	<0.1	200	0
		Chromium	µg/L	1	<1	<1	123	0
		Copper	µg/L	1	<1	1	116	2
		Lead	µg/L	1	<1	<1	200	0
		Nickel	µg/L	1	<1	<1	165	0
		Zinc	µg/L	5	6	<5	113	15
SE259578.001	LB302218.020	Arsenic	µg/L	1	2	2	64	2
		Cadmium	µg/L	0.1	<0.1	<0.1	200	0
		Chromium	µg/L	1	<1	<1	168	0
		Copper	µg/L	1	6	6	31	1
		Lead	µg/L	1	<1	<1	200	0
		Nickel	µg/L	1	<1	<1	170	0
		Zinc	µg/L	5	<5	<5	196	0

Trace Metals (Total) in Water by ICPMS

Method: ME-(AU)-[ENV]AN022/AN318

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE259554.006	LB302219.014	Total Arsenic	µg/L	1	<1	<1	200	0
		Total Cadmium	µg/L	0.1	<0.1	<0.1	200	0
		Total Chromium	µg/L	1	<1	<1	200	0
		Total Copper	µg/L	1	<1	<1	124	0
		Total Lead	µg/L	1	<1	<1	200	0
		Total Nickel	µg/L	1	<1	<1	200	0
		Total Zinc	µg/L	5	<5	5	121	5
SE259561.002	LB302219.017	Total Arsenic	µg/L	1	<1	<1	200	0
		Total Cadmium	µg/L	0.1	<0.1	<0.1	200	0
		Total Copper	µg/L	1	<1	<1	200	0
		Total Lead	µg/L	1	<1	<1	200	0
		Total Nickel	µg/L	1	<1	<1	200	0
		Total Zinc	µg/L	5	<5	5	115	6

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE259461.003	LB302244.024	Monocyclic Aromatic	Benzene	µg/L	0.5	<0.5	<0.5	200	0
			Toluene	µg/L	0.5	<0.5	<0.5	200	0
			Ethylbenzene	µg/L	0.5	<0.5	<0.5	200	0
			m/p-xylene	µg/L	1	<1	<1	200	0
			o-xylene	µg/L	0.5	<0.5	<0.5	200	0
		Polycyclic	Naphthalene (VOC)*	µg/L	0.5	<0.5	<0.5	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.8	9.5	30	3
			d8-toluene (Surrogate)	µg/L	-	10.0	10.2	30	2
			Bromofluorobenzene (Surrogate)	µg/L	-	10.6	10.9	30	3
		Totals	Total BTEX	µg/L	3	<3	<3	200	0

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Low Level OC Pesticides in Water

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB302223.002		Heptachlor	µg/L	0.02	0.22	0.2	60 - 140	110
		Aldrin	µg/L	0.01	0.24	0.2	60 - 140	120
		Delta BHC	µg/L	0.05	0.24	0.2	60 - 140	120
		Dieldrin	µg/L	0.01	0.24	0.2	60 - 140	120
		Endrin	µg/L	0.02	0.22	0.2	60 - 140	110
		p,p'-DDT	µg/L	0.01	0.22	0.2	60 - 140	110

Low Level OP Pesticides in Water

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB302223.002		Dichlorvos	µg/L	0.5	<0.5	0.125	60 - 140	111
		Diazinon (Dimpylate)	µg/L	0.01	0.16	0.125	60 - 140	125
		Chlorpyrifos (Chlorpyrifos Ethyl)	µg/L	0.01	0.16	0.125	60 - 140	129
		Ethion	µg/L	0.05	0.14	0.125	60 - 140	116
	Surrogates	d14-p-terphenyl (Surrogate)	%	-	0.8	1.08	39 - 130	78

Low Level PAH (Poly Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB302223.002		Naphthalene	µg/L	0.02	37	40	60 - 140	93
		Acenaphthylene	µg/L	0.01	44	40	60 - 140	110
		Acenaphthene	µg/L	0.01	44	40	60 - 140	109
		Phenanthrene	µg/L	0.01	43	40	60 - 140	107
		Anthracene	µg/L	0.01	41	40	60 - 140	102
		Fluoranthene	µg/L	0.01	45	40	60 - 140	111
		Pyrene	µg/L	0.01	39	40	60 - 140	97
		Benzo(a)pyrene	µg/L	0.01	47	40	60 - 140	118
	Surrogates	d14-p-terphenyl (Surrogate)	%	-	0.8	1.08	39 - 130	78

Low Level TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB302223.002	LLTRH C10-C14	µg/L	50	1100	1200	60 - 140	91
	LLTRH C15-C28	µg/L	100	1400	1200	60 - 140	115
	LLTRH C29-C36	µg/L	50	1500	1200	60 - 140	127

Low Level Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB302244.002	TRH C6-C10	µg/L	10	800	946.63	60 - 140	85
	TRH C6-C9	µg/L	10	670	818.71	60 - 140	82
	TRH C6-C10 minus BTEX (F1)	µg/L	10	520	639.67	60 - 140	81
	Benzene	µg/L	0.1	46	51	60 - 140	91
	Toluene	µg/L	0.1	49	51	60 - 140	95
	Ethylbenzene	µg/L	0.1	53	51	60 - 140	103
	m/p-xylene	µg/L	0.2	110	102	60 - 140	104
	o-xylene	µg/L	0.1	31	51	60 - 140	60

PCBs in Water

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB302223.002	Arochlor 1260	µg/L	1	<1	0.4	60 - 140	88

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB302218.002	Arsenic	µg/L	1	20	20	80 - 120	101
	Cadmium	µg/L	0.1	20	20	80 - 120	100
	Chromium	µg/L	1	20	20	80 - 120	99
	Copper	µg/L	1	20	20	80 - 120	98
	Lead	µg/L	1	20	20	80 - 120	99
	Nickel	µg/L	1	20	20	80 - 120	100
	Zinc	µg/L	5	21	20	80 - 120	103

Trace Metals (Total) in Water by ICPMS

Method: ME-(AU)-[ENV]AN022/AN318

Sample Number	Parameter	Units	LOR

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Trace Metals (Total) in Water by ICPMS (continued) — Method: ME-(AU)-[ENV]AN022/AN318

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB302219.002		Total Arsenic	µg/L	1	21	20	80 - 120	107
		Total Cadmium	µg/L	0.1	21	20	80 - 120	104
		Total Chromium	µg/L	1	20	20	80 - 120	102
		Total Copper	µg/L	1	21	20	80 - 120	104
		Total Lead	µg/L	1	20	20	80 - 120	99
		Total Nickel	µg/L	1	21	20	80 - 120	105
		Total Zinc	µg/L	5	20	20	80 - 120	100

VOCs in Water — Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB302244.002	Monocyclic Aromatic	Benzene	µg/L	0.5	46	45.45	60 - 140	102
		Toluene	µg/L	0.5	49	45.45	60 - 140	107
		Ethylbenzene	µg/L	0.5	53	45.45	60 - 140	116
		m/p-xylene	µg/L	1	110	90.9	60 - 140	117
		o-xylene	µg/L	0.5	31	45.45	60 - 140	67
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	11.0	10	60 - 140	110
		d8-toluene (Surrogate)	µg/L	-	10.9	10	70 - 130	109
		Bromofluorobenzene (Surrogate)	µg/L	-	10.3	10	70 - 130	103

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Trace Metals (Dissolved) in Water by ICPMS — Method: ME-(AU)-[ENV]AN318

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE259463.001	LB302218.004		Arsenic	µg/L	1	22	<1	20	105
			Cadmium	µg/L	0.1	20	<0.1	20	100
			Chromium	µg/L	1	22	2	20	99
			Copper	µg/L	1	22	3	20	97
			Lead	µg/L	1	19	<1	20	96
			Nickel	µg/L	1	37	17	20	99
			Zinc	µg/L	5	47	27	20	103

VOCs in Water — Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE259418.001	LB302244.025	Monocyclic Aromatic	Benzene	µg/L	0.5	50	<0.5	45.45	110
			Toluene	µg/L	0.5	53	<0.5	45.45	117
			Ethylbenzene	µg/L	0.5	52	<0.5	45.45	114
			m/p-xylene	µg/L	1	100	<1	90.9	115
			o-xylene	µg/L	0.5	30	<0.5	45.45	66
		Polycyclic	Naphthalene (VOC)*	µg/L	0.5	50	<0.5	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10	9.6	-	105
			d8-toluene (Surrogate)	µg/L	-	12	10	-	116
			Bromofluorobenzene (Surrogate)	µg/L	-	11	11	-	107
		Totals	Total BTEX	µg/L	3	290	<3	-	-

MATRIX SPIKE DUPLICATES

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here: https://www.sgs.com.au/~/media/Local/Australia/Documents/Technical Documents/MP-AU-ENV-QU-022 QA QC Plan.pdf

*	NATA accreditation does not cover the performance of this service.
**	Indicative data, theoretical holding time exceeded.
***	Indicates that both * and ** apply.
-	Sample not analysed for this analyte.
IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.
①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to relevant report comments for further information.

Chain of Custody

Stantec

From: Stantec Wollongong
Address: Shop 1, Level 1
16 Burelli St
Wollongong NSW 2500
Phone: (02) 4231 9600
Attention: **katelyn.elliott@stantec.com**
Email: katelyn.elliott@stantec.com **mitch.blencowe@stantec.com**
Mobile: **0.047614411**

To: Eurofins Wollongong
Address: Unit 16
7 Investigator Dr
Unanderra NSW 2526
Phone: (02) 9900 8400
Email: EnviroSampleNSW@eurofins.com

Date: 18/01/2024
TAT: Std 5 days
Purchase Order: NA
Laboratory Quote ID: Stantec Rates
Project number: 304001019
Project name: Bomaderry
Data output format: PDF, Esdat

Attempt to chill evident: Y / N Sample Temperature on Arrival: 12.2

Notes: Please note requirements for trace analysis, please analyse both filtered and unfiltered metals.

Laboratory Sample Number	Cardno Sample Number	Sample Date	Matrix	Container (Plastic Tube – PT, Bag – B, Petri Dish – PD, Plastic Bottle – PB, Plastic Jar - PJ, Glass Jar – GJ, Glass Bottle – GB, Glass Vial - GV)	TRH	TRH w/ Silica Gel	BTEXN	PAHS	OCP	OPP	PCB	Lead	M7 - Metals (exc. Hg)	M8 - Metals (inc. Hg)	Cr6)	Phenols - Speciated	VOCs	SVOC	TRH (trace)	PAH (trace)	PFAS (trace)	M8- Metals (trace)	OCP (trace)	OPP (trace)	Dup to 2nd Lab	Select Analyte or Delete to Clear	Applicable Suites	Sample Comments
	BH02	18/01/2024	Water	2xGB, 2xGV, 3xPB			1				1								1	1	1	1	1	1				
	BH03	18/01/2024	Water	2xGB, 2xGV, 3xPB			1				1								1	1	1	1	1	1				
	BH04	18/01/2024	Water	2xGB, 2xGV, 3xPB			1				1								1	1	1	1	1	1				
	QA200	18/01/2024	Water	2xGB, 2xGV, 3xPB			1				1								1	1	1	1	1	1				
1	QC200	18/01/2024	Water	2xGB, 2xGV, 3xPB			1				1								1	1	1	1	1	1	1			Send dup to SGS
	RIN_240118	18/01/2024	Water	2xGB, 2xGV, 3xPB			1				1								1	1	1	1	1	1				
	Trip spike	18/01/2024	Water	2xGV	1		1																				B1	
	Trip blank	18/01/2024	Water	2xGV	1		1																				B1	
				Total	2		8				6								6	6	6	6	6					

Relinquished By: Katelyn Elliott
Company: Stantec
Time: 1:30pm
Date: 18/01/2024

Received By: Brandon Cawley
Company: Eur
Time: 18/1/24 2:52
Date:

Relinquished By:
Company:
Time:
Date:

Received By: [signature]
Company: SGS
Time: 15:55pm
Date: 22/1/24

SGS EHS Sydney COC
SE259463

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS		LABORATORY DETAILS	
Contact	Katelyn Elliott	Manager	Huong Crawford
Client	STANTEC AUSTRALIA PTY LTD	Laboratory	SGS Alexandria Environmental
Address	LEVEL 22, 570 BOURKE STREET MELBOURNE VIC 3000	Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	61 3 85547000	Telephone	+61 2 8594 0400
Facsimile	(Not specified)	Facsimile	+61 2 8594 0499
Email	Katelyn.Elliott@stantec.com	Email	au.environmental.sydney@sgs.com
Project	**304001019 BtR Bomaderry**	SGS Reference	**SE261551 R0**
Order Number	**304001019**	Date Received	1/3/2024
Samples	1	Date Reported	8/3/2024

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

SIGNATORIES

Dong LIANG	**Minh NGUYEN**	**Ying Ying ZHANG**
Metals/Inorganics Team Leader	Technical Development Mananger	Laboratory Technician

pH in water [AN101] Tested: 1/3/2024

PARAMETER	UOM	LOR	QC300 WATER - 27/2/2024 SE261551.001
pH**	No unit	-	3.9

Conductivity and TDS by Calculation - Water [AN106] Tested: 1/3/2024

PARAMETER	UOM	LOR	QC300 WATER - 27/2/2024 SE261551.001
Conductivity @ 25 C	µS/cm	2	380
Total Dissolved Solids (by calculation)	mg/L	2	230

BOD5 [AN183] Tested: 1/3/2024

PARAMETER	UOM	LOR	QC300 WATER - 27/2/2024 SE261551.001
Biochemical Oxygen Demand (BOD5)	mg/L	5	10

COD in Water [AN179/AN181] Tested: 6/3/2024

PARAMETER	UOM	LOR	QC300 WATER - 27/2/2024 SE261551.001
Chemical Oxygen Demand	mg/L	10	31

Sulfide by Titration in Water [AN149] Tested: 4/3/2024

PARAMETER	UOM	LOR	QC300 WATER - 27/2/2024 SE261551.001
Sulfide	mg/L	0.5	<0.5
Hydrogen Sulfide	mg/L	0.25	<0.25
Temperature at which unionised H2S Calculated*	°C	-	-

Anions by Ion Chromatography in Water [AN245] Tested: 5/3/2024

PARAMETER	UOM	LOR	QC300 WATER - 27/2/2024 SE261551.001
Sulfate, SO4	mg/L	1	20
Nitrate Nitrogen, NO3-N	mg/L	0.005	<0.005

C1 to C4 Hydrocarbons in water [AN459] Tested: 7/3/2024

PARAMETER	UOM	LOR	QC300 WATER - 27/2/2024 SE261551.001
Methane	mg/L	0.005	0.23

METHOD	METHODOLOGY SUMMARY
AN101	pH in Soil Sludge Sediment and Water: pH is measured electrometrically using a combination electrode (glass plus reference electrode) and is calibrated against 3 buffers purchased commercially. For soils, an extract with water is made at a ratio of 1:5 and the pH determined and reported on the extract. Reference APHA 4500-H+.
AN106	Conductivity and TDS by Calculation: Conductivity is measured by meter with temperature compensation and is calibrated against a standard solution of potassium chloride. Conductivity is generally reported as µmhos /cm or µS/cm @ 25°C. For soils, an extract with water is made at a ratio of 1:5 and the EC determined and reported on the extract, or calculated back to the as-received sample. Total Dissolved Salts can be estimated from conductivity using a conversion factor, which for natural waters, is in the range 0.55 to 0.75. SGS use 0.6. Reference APHA 2510 B.
AN106	Salinity may be calculated in terms of NaCl from the sample conductivity. This assumes all soluble salts present , measured by the conductivity, are present as NaCl.
AN149	sulfide by Iodometric Titration: sulfide is precipitated as zinc sulfide to overcome interferences with sulphite and thiosulfate. After filtration, sulfide is determined titrimetrically. Reference APHA 4500-S2-
AN181	Analysis of COD by Semi Closed Reflux: The sample is refluxed with strong acid and a known excess of oxidant . After digestion the unreduced oxidant is back titrated to determine the amount of oxidant consumed. The chemically oxidised matter is calculated in terms of oxygen equivalents. Reference APHA 5220 B.
AN183	BOD: Serial dilutions of the sample are firstly combined with various reagents to aid bacterial growth and the sample is incubated for 5 days at 20°C. The difference between the initial and final oxygen contents of the sample is the amount of oxygen consumed by the bacteria. This is related to the organic loading of the sample therefore cBOD is the measure of the digestibility or bioavailability of organic matter in the sample. Reference APHA 5210 B. Internal Reference AN183
AN245	Anions by Ion Chromatography: A water sample is injected into an eluent stream that passes through the ion chromatographic system where the anions of interest ie Br, Cl, NO2, NO3 and SO4 are separated on their relative affinities for the active sites on the column packing material. Changes to the conductivity and the UV-visible absorbance of the eluent enable identification and quantitation of the anions based on their retention time and peak height or area. APHA 4110 B
AN459	An inert gas is injected, via the septum, into a BTEX vial containing the water sample to create a headspace. After equilibration at 25oC, the headspace is analysed for the target gas/es by calibrated GC/FID. The method follows USEPA Technical Guidance for the Natural Attenuation Indicators: Methane, Ethane and Ethene 2001, and is based on the procedure described by Kampbell et al published in the Journal of Chromatography Vol 36 1998.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
**	Indicative data, theoretical holding time exceeded.	NVL	Not validated.	LOR	Limit of Reporting.
***	Indicates that both * and ** apply.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:
a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-gb/environment-health-and-safety.

STATEMENT OF QA/QC PERFORMANCE

SE261551 R0

CLIENT DETAILS

Contact	Katelyn Elliott
Client	STANTEC AUSTRALIA PTY LTD
Address	LEVEL 22, 570 BOURKE STREET MELBOURNE VIC 3000
Telephone	61 3 85547000
Facsimile	(Not specified)
Email	Katelyn.Elliott@stantec.com
Project	**304001019 BtR Bomaderry**
Order Number	**304001019**
Samples	1

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE261551 R0**
Date Received	01 Mar 2024
Date Reported	08 Mar 2024

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document.
This QA/QC Statement must be read in conjunction with the referenced Analytical Report.
The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met with the exception of the following:

Extraction Date	BOD5	1 item
	pH in water	1 item
Analysis Date	pH in water	1 item

SAMPLE SUMMARY

Sample counts by matrix	1 Water	Type of documentation received	COC
Date documentation received	1/6/2024	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	19.9°C
Sample container provider	Other Lab	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice Bricks	Samples clearly labelled	Yes
Complete documentation received	Yes		

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

Anions by Ion Chromatography in Water

Method: ME-(AU)-[ENV]AN245

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC300	SE261551.001	LB305834	27 Feb 2024	01 Mar 2024	26 Mar 2024	05 Mar 2024	26 Mar 2024	08 Mar 2024

BOD5

Method: ME-(AU)-[ENV]AN183

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC300	SE261551.001	LB305648	27 Feb 2024	01 Mar 2024	29 Feb 2024	01 Mar 2024†	08 Mar 2024	06 Mar 2024

C1 to C4 Hydrocarbons in water

Method: ME-(AU)-[ENV]AN459

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC300	SE261551.001	LB306190	27 Feb 2024	01 Mar 2024	12 Mar 2024	07 Mar 2024	12 Mar 2024	07 Mar 2024

COD in Water

Method: ME-(AU)-[ENV]AN179/AN181

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC300	SE261551.001	LB305962	27 Feb 2024	01 Mar 2024	26 Mar 2024	06 Mar 2024	26 Mar 2024	07 Mar 2024

Conductivity and TDS by Calculation - Water

Method: ME-(AU)-[ENV]AN106

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC300	SE261551.001	LB305646	27 Feb 2024	01 Mar 2024	26 Mar 2024	01 Mar 2024	26 Mar 2024	04 Mar 2024

pH in water

Method: ME-(AU)-[ENV]AN101

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC300	SE261551.001	LB305646	27 Feb 2024	01 Mar 2024	28 Feb 2024	01 Mar 2024†	28 Feb 2024	04 Mar 2024†

Sulfide by Titration in Water

Method: ME-(AU)-[ENV]AN149

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC300	SE261551.001	LB305421	27 Feb 2024	01 Mar 2024	05 Mar 2024	04 Mar 2024	05 Mar 2024	04 Mar 2024

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No surrogates were required for this job.

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Anions by Ion Chromatography in Water

Method: ME-(AU)-[ENV]AN245

Sample Number	Parameter	Units	LOR	Result
LB305834.001	Nitrate Nitrogen, NO3-N	mg/L	0.005	<0.005
	Sulfate, SO4	mg/L	1	<1.0

COD in Water

Method: ME-(AU)-[ENV]AN179/AN181

Sample Number	Parameter	Units	LOR	Result
LB305962.001	Chemical Oxygen Demand	mg/L	10	<10

Conductivity and TDS by Calculation - Water

Method: ME-(AU)-[ENV]AN106

Sample Number	Parameter	Units	LOR	Result
LB305646.001	Conductivity @ 25 C	µS/cm	2	<2
	Total Dissolved Solids (by calculation)	mg/L	2	<2

Sulfide by Titration in Water

Method: ME-(AU)-[ENV]AN149

Sample Number	Parameter	Units	LOR	Result
LB305421.001	Sulfide	mg/L	0.5	<0.5

DUPLICATES

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

Anions by Ion Chromatography in Water

Method: ME-(AU)-[ENV]AN245

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE261494.001	LB305834.014	Nitrate Nitrogen, NO3-N	mg/L	0.005	0.095	0.099	20	4
SE261550.003	LB305834.025	Sulfate, SO4	mg/L	1	18	18	21	1

BOD5

Method: ME-(AU)-[ENV]AN183

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE261415.018	LB305648.019	Biochemical Oxygen Demand (BOD5)	mg/L	5	<5	<5	200	0
SE261415.019	LB305648.020	Biochemical Oxygen Demand (BOD5)	mg/L	5	<5	<5	200	0

C1 to C4 Hydrocarbons in water

Method: ME-(AU)-[ENV]AN459

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE261551.001	LB306190.004	Methane	mg/L	0.005	0.23	0.24	32	4

COD in Water

Method: ME-(AU)-[ENV]AN179/AN181

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE261640.001	LB305962.012	Chemical Oxygen Demand	mg/L	10	531.710397643	517.560648011	16	1

Conductivity and TDS by Calculation - Water

Method: ME-(AU)-[ENV]AN106

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE261482.003	LB305646.020	Conductivity @ 25 C	µS/cm	2	6100	6100	15	1
SE261550.001	LB305646.014	Conductivity @ 25 C	µS/cm	2	190	190	16	3
		Total Dissolved Solids (by calculation)	mg/L	2	120	110	17	3

pH in water

Method: ME-(AU)-[ENV]AN101

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE261482.003	LB305646.020	pH**	pH Units	-	8.5	8.4	16	1
SE261550.001	LB305646.014	pH**	pH Units	-	6.6	6.9	16	4

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Anions by Ion Chromatography in Water — Method: ME-(AU)-[ENV]AN245

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB305834.002	Nitrate Nitrogen, NO3-N	mg/L	0.005	2.0	2	80 - 120	102
	Sulfate, SO4	mg/L	1	19	20	80 - 120	96

C1 to C4 Hydrocarbons in water — Method: ME-(AU)-[ENV]AN459

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB306190.002	Methane	mg/L	0.005	0.047	0.07	60 - 140	67

COD in Water — Method: ME-(AU)-[ENV]AN179/AN181

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB305962.002	Chemical Oxygen Demand	mg/L	10	54	50	70 - 130	109

Conductivity and TDS by Calculation - Water — Method: ME-(AU)-[ENV]AN106

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB305646.002	Conductivity @ 25 C	µS/cm	2	320	303	90 - 110	107
	Total Dissolved Solids (by calculation)	mg/L	2	190	181	85 - 115	107

pH in water — Method: ME-(AU)-[ENV]AN101

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB305646.003	pH**	No unit	-	7.4	7.415	98 - 102	100

Sulfide by Titration in Water — Method: ME-(AU)-[ENV]AN149

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB305421.002	Sulfide	mg/L	0.5	100	100	70 - 130	102

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Anions by Ion Chromatography in Water

Method: ME-(AU)-[ENV]AN245

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE261368.019	LB305834.004	Nitrate Nitrogen, NO3-N	mg/L	0.005	2.1	0	2	103
		Sulfate, SO4	mg/L	1	40	21.39	20	92

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here: https://www.sgs.com.au/~/media/Local/Australia/Documents/Technical Documents/MP-AU-ENV-QU-022 QA QC Plan.pdf

*	NATA accreditation does not cover the performance of this service.
**	Indicative data, theoretical holding time exceeded.
***	Indicates that both * and ** apply.
-	Sample not analysed for this analyte.
IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.
①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to relevant report comments for further information.

Stantec

Chain of Custody

From: Stantec Wollongong
Address: Shop 1, Level 1
16 Burelli St
Wollongong NSW 2500
Phone: (02) 4231 9600
Attention: Katelyn Elliot; Mitch Blencowe
Email: ~~ContamNSW@cardno.com.au~~ katelyn.elliott@stantec.com; mitch.blencowe@stantec.com
Mobile: 476144110

To: Eurofins Wollongong
Address: Unit 16
7 Investigator Dr
Unanderra NSW 2526
Phone: (02) 9900 8400
Email: EnviroSampleNSW@eurofins.com

Date: 27/02/2024
TAT: 5 day
Purchase Order: 304001019
Laboratory Quote ID: Stantec Blanket Quote
Project number: 304001019
Project name: BtR Bomaderry
Data output format: PDF, Esdat

Attempt to chill evident: Y/N
Sample Temperature on Arrival: ~~11.7°C~~ 19.2°C GD

Notes: Please apply a relevant suite, as appropriate - -- sample QC300 to be provided to SGS for analysis --- sample RIN_240227 to be placed on hold

Laboratory Sample Number	Cardno Sample Number	Sample Date	Matrix	Container (Plastic Tube – PT, Bag – B, Petri Dish – PD, Plastic Bottle – PB, Plastic Jar – PJ, Glass Jar – GJ, Glass Bottle – GB, Glass Vial – GV)	TRH	TRH w/ Silica Gel	BTEXN	PAHS	OCP	OPP	PCB	Lead	S-2 - 7 Metals	S-1 - 8 Metals	S-3 - NEPM 15 Metals	Phenols	VOCs	SVOC	Sulphate	pH / EC	Biochemical Oxygen Demand	Chemical Oxygen Demand	Nitrate	Dissolved Methane	Hydrogen Sulphide	Dup to 2nd Lab	Applicable Suites	Sample Comments
	BH02	27/2/24	Water	1xGB 2xPB 3x GV															1	1	1	1	1	1	1			Please apply a relevant suite
	BH03	27/2/24	Water	1xGB 2xPB 3x GV															1	1	1	1	1	1	1			Please apply a relevant suite
	BH04	27/2/24	Water	1xGB 2xPB 3x GV															1	1	1	1	1	1	1			Please apply a relevant suite
	GG3	27/2/24	Water	1xGB 2xPB 3x GV															1	1	1	1	1	1	1			Please apply a relevant suite
	QA300	27/2/24	Water	1xGB 2xPB 3x GV															1	1	1	1	1	1	1			Please apply a relevant suite
	QC300	27/2/24	Water	1xGB 2xPB 3x GV															1	1	1	1	1	1	1	1		Please apply a relevant suite
	RIN_240227	27/2/24	Water	1xGB 2xPB 3x GV																								
				Total														6	6	6	6	6						

Relinquished By:
Company:
Time:
Date:
Received By: Greg DB
Company:
Time: 4:25pm
Date: 27/2/24

Relinquished By:
Company:
Time:
Date:
Received By:
Company:
Time: 4:30
Date: 27.2.24

SGS EHS Sydney COC
SE261551

#1072931

20240227_COC_BtR.xlsx

APPENDIX F

Field Forms / Field Records

F3.04 – Groundwater Sampling Field Record

Site / Project: Bombadery			Bore ID Number:
Client: [redacted] Landcom			Job No.: BH04
Person Sampling: Katelyn Elliott			Initials: KE
Bore / Site Details			
Bore Condition / Locked? ✓	Type Protect. Cap / Cover: Gatic		Bore Depth (bTOC): 4.88
Inner casing/screen type & diameter: 50mm	Screen interval (bgl):		SWL (bTOC) 2.37
WL Measurement Point TOC	SWL date: 27/2/24		SWL Time: 10:00
Other Observations on Bore/Site		PID (ppm): 0.0	
Bore Purge Data			
Purge method: low flow	Bore Volume ~~(L)~~: 2.51 cm		Purge Date: 27/2/24
Purge rate (L/min): 14.0 1.0	Total Purge volume (L):		LNAPL / PSH Thickness (mm) None / ....mm

Purge Field Physicochemical Measurements:

	Reading1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8
Start Time:	10:00	10.05	10:10	10:15	10:20	10:25		
DO (mg/L) ±10% (or ±0.2 if DO<2 mg/L)	4.6 0.46	0 0	0.7 0.05	1.0 0.09	2.1 0.14	1.7 0.15		
EC (µS/Cm) ±3%	425.9	423.6	441.9	422.3	434.9	433.3		
pH ±0.1	3.92	3.92	3.66	4.15	4.00	4.14		
Eh (mV) ±10mV	-209.1	-191.6	-164.9	-174.8	-157.9	-152.5		
Temp (°C)	21.5	21.6	21.8	21.6	21.7	21.7		
SWL (m) after	2.55	2.83	3.18	3.41	3.81	4.05		
Cum. Volume (L)								
Water Colour	Cloudy →			Brown →				
Turbidity ±10%	10% →			50-60% →		30%		
Other Observations / Notes	Slight odour							

Sample Container & Preservation Data

Number of sample container: (Include QC samples)	1	2	3	4	5
Container Type	GB	PB	GV		
Filtration				FS	
QC Dup Sample No.:					

F3.04 – Groundwater Sampling Field Record

Site / Project: Bombaderry	Bore ID Number: BH02
Client: [redacted] Landcomb	Job No.: 304001019
Person Sampling: Katelyn Elliott	Initials: KE

Bore / Site Details

Bore Condition / Locked? ✓	Type Protect. Cap / Cover: Gatic	Bore Depth (bTOC): 11.53
Inner casing/screen type & diameter: 50mm	Screen interval (bgl):	SWL (bTOC) 4.82
WL Measurement Point TOC	SWL date: 27/2/24	SWL Time: 11:00
Other Observations on Bore/Site	PID (ppm): 2.2	

Bore Purge Data

Purge method: low flow	Bore Volume (L): 6.71	Purge Date: 27/2/24
Purge rate (L/min): 19.0 1.0	Total Purge volume (L):	LNAPL / PSH Thickness (mm) None /............mm

Purge Field Physicochemical Measurements:

	Reading1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8
Start Time:	11:05	11:10	11:15	11:20	11:25			
DO (mg/L) ±10% (or ±0.2 if DO<2 mg/L)	26.7 2.43	11.2 1.03	4.5 0.41	3.4 0.36	3.3 0.31			
EC (µS/Cm) ±3%	368.1	367.7	364.9	359.3	360.6			
pH ±0.1	4.51	4.43	4.36	4.38	4.33			
Eh (mV) ±10mV	-137.9	-119.0	-112.4	-113.9	-113.0			
Temp (°C)	19.5	19.5	19.5	19.5	19.5			
SWL (m) after	4.07	4.12	4.22	4.25	4.26			
Cum. Volume (L)								
Water Colour	Clear →	cloudy grey →						
Turbidity ±10%	0% →	low →						
Other Observations / Notes								

Sample Container & Preservation Data

Number of sample container: (Include QC samples)	1	2	3	4	5
Container Type	GB	PB	GV		
Filtration				FS	
QC Dup Sample No.: QA/QC300					

F3.04 – Groundwater Sampling Field Record

Site / Project:		Bore ID Number: BH03
Client: Anglicare		Job No.:
Person Sampling: Katelyn Elliott		Initials: KE
Bore / Site Details		
Bore Condition / Locked? ✓	Type Protect. Cap / Cover: Gatic	Bore Depth (bTOC):
Inner casing/screen type & diameter: 50mm	Screen interval (bgl):	SWL (bTOC) 6.42
WL Measurement Point TOC	SWL date: 27/2/24	SWL Time: 1:45
Other Observations on Bore/Site	PID (ppm): 0.0 ppm	
Bore Purge Data		
Purge method: Low flow	Bore Volume ~~(L)~~:	Purge Date: ~~28~~/2/24
Purge rate (L/min): 14.0 1.0	Total Purge volume (L):	LNAPL / PSH Thickness (mm) None / ....mm

Purge Field Physicochemical Measurements:

	Reading1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8
Start Time:	1:50	1:55	2:00	2:05				
DO (mg/L) ±10% (or ±0.2 if DO<2 mg/L)	50.9 4.56	42.4 3.83	40.5 3.65	40.5 3.65				
EC (µS/Cm) ±3%	615	617	584	576				
pH ±0.1	4.87	4.77	4.61	4.55				
Eh (mV) ±10mV	-8.7	45.7	85.3	94.3				
Temp (°C)	20.6	20.4	20.3	20.3				
SWL (m) after	6.90	7.1	7.24	7.42				
Cum. Volume (L)								
Water Colour	Clear	→	→	→				
Turbidity ±10%	–	→	→	→				
Other Observations / Notes								

Sample Container & Preservation Data

Number of sample container: (Include QC samples)	1	2	3	4	5
Container Type					
Filtration					
QC Dup Sample No.:					

F3.04 – Groundwater Sampling Field Record

Site / Project:		Bore ID Number: GG3
Client: Anglicare		Job No.:
Person Sampling: Katelyn Elliott		Initials: KE
Bore / Site Details		
Bore Condition / Locked? ✓	Type Protect. Cap / Cover: Gatic	Bore Depth (bTOC): 1.75
Inner casing/screen type & diameter: 50mm	Screen interval (bgl):	SWL (bTOC) 0.98
WL Measurement Point TOC	SWL date: 27/2/24	SWL Time: 2:30
Other Observations on Bore/Site	PID (ppm): 0.1	
Bore Purge Data		
Purge method: Bailer	Bore Volume (L):	Purge Date: 27/2/24
Purge rate (L/min):	Total Purge volume (L):	LNAPL / PSH Thickness (mm) *None* / ....*mm*

Purge Field Physicochemical Measurements:

	Reading1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8
Start Time:	2:35							
DO (mg/L) ±10% (or ±0.2 if DO<2 mg/L)	17.8 1.57							
EC (µS/Cm) ±3%	283.0							
pH ±0.1	5.68							
Eh (mV) ±10mV	-94.9							
Temp (^{o}C)	21.4							
SWL (m) after	1.69							
Cum. Volume (L)	Cloudy	yellow						
Water Colour								
Turbidity ±10%	Low							
Other Observations / Notes								

Sample Container & Preservation Data

Number of sample container: (Include QC samples)	1	2	3	4	5
Container Type					
Filtration					
QC Dup Sample No.:					

Groundwater Monitoring Bore Development Record

Project Details	
Project Name:	**Job Number:**
Site Address:	**PP/PM:**
Client Company/Contact:	**Date:**
Persons Present:	**Notes By:**

Field Data

Bore Information (attach bore log)

Bore Number: BH3	Drilled Depth (m BGL):
Screen Interval (m BGL):	Stick-up (m):
Other Observations:	

Pre Purge Information

PSH Top (m TOC): –	PSH Bottom (m TOC): –
Standing Water Level (m TOC): 6.62	Well Depth (measured) (m TOC): 10.33
Water column (m):	PID reading:

Well Volume Estimation (WI3.04 'Field Calculation of GW Bore Volumes' for accurate calcs)

Drilled/ Casing Diameter	100/25 (mm)	125/50 (mm)	150/50 (mm)	250/100 (mm)
Conversion Factor	2.7	5.1	6.7	20

Well Volume (L) = water column x conversion factor = x 3 =

Development Record

3 Bore Volumes Removed: Yes/No:	Purged Water Clear: Yes/No

Development Method (Disposable Bailer; S/Steel Bailer; Submersible Pump; Waterra; Waterra with Surge Block; Air; Other – Specify):

Volume Removed (L)	*SWL (mTOC)*	*Time*	*Comments (e.g. colour, turbidity, odour, water quality parameters)*
19	7.25	1047	grey, moderate turbidity, faint/mod sulfur odour
29	8.05	1055	"
39	6.42	1135	"
49	8.01	1140	as above but faint sulfur odour.
59	9.20	1145	"
68	10.20		
	* 14.02	m	total depth following dev.
	* fine	grey	sand observed in bucket.
68L	= Total Volume Removed		

Subsurface Gas Monitoring

Job Number:	Well ID: GG1
SWL (m): 1.68 | 1.72	Well Depth (m): 1.75
Weather conditions: Sunny / Overcast / Raining	Date: 27/2/24 Time: 9:10
Flow rate (L/hr): Peak- 1.8 Stable- 0.9	PID (ppm): 0.0 | 0.0
Relative pressure (mb): 3.89 | 4.13	Barometric pressure (mb): 1021

R1 R2 FR=0.5

Time	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)	
0 seconds	0	0.1	20.7	0	0	
30 seconds	0.1	0.7	20.4	0	0	
1 minute	0.1	0.9	20.3	0	0	Round 1
1 minute 30 seconds	0.1	1.1	20.2	0	0	
2 minutes	0.1	1.2	20.2	0	0	
2 minutes 30 seconds			Pump failed			
~~3 minutes~~ 0	0	0	20.7	0	0	
~~3 minutes~~ 30 seconds	0	0.1	20.7	0	0	
1 minutes	0	0.2	20.7	0	0	Round 2
1 minutes 30 seconds	0	0.2	20.7	0	0	
2 minutes	0	0.3	20.6	0	0	
2 minutes 30 seconds		Pump Failed				

Job Number:	Well ID: GG2
SWL (m): 1.52	Well Depth (m): 1.65
Weather conditions: Sunny / Overcast / Raining	Date: 27/2/24 Time: 9:20
Flow rate (L/hr): Peak- 2.3 Stable- 1.4	PID (ppm): 0.0 | 0.0
Relative pressure (mb): 5.88 | 17.96	Barometric pressure (mb): 1021

* Upwards pressure on cap R1 R2 FR= 3.9

Time	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)	
0 seconds	0	0.1	20.6	0	0	
30 seconds	0	0.1	20.5	0	0	
1 minute	0	0.1	20.5	0	0	
1 minute 30 seconds	0	0.2	20.4	0	0	Round 1
2 minutes	0	0.2	20.3	0	0	
2 minutes 30 seconds	0	0.3	20.3	0	0	
~~3 minutes~~ 0	0	0 Pump	Failed	0	0	
~~3 minutes~~ 30 seconds	0	0.6	20.4 20.4	0	0	
1 minutes	0	0.7	20.3	0	0	
1 minutes 30 seconds	0	0.8	20.2	0	0	Round 2
2 minutes	0	1.0	20.1	0	0	
2 minutes 30 seconds	0	1.1	20.0	0	0	

Pump Failed

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Subsurface Gas Monitoring

Job Number:	Well ID: ~~[illegible]~~ 443
SWL (m):	Well Depth (m):
Weather conditions: Sunny / Overcast / Raining	Date: 27/2/24 Time: 9:30
Flow rate (L/hr): Peak- 0-1 Stable- 0.1	PID (ppm): 1.0
Relative pressure (mb): 0.60	Barometric pressure (mb): 1021

Time	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)
0 seconds	0	0	20.4	0	0
30 seconds	0	0.1	20.5	0	0
1 minute	0	0.1	20.4	0	0
1 minute 30 seconds	0	0.2	20.5	0	0
2 minutes	0	0.2	20.4	0	0
2 minutes 30 seconds	0	0.3	20.4	0	0
3 minutes	0	0.5	20.3	0	0
3 minutes 30 seconds	0	0.7	20.0	0	5
4 minutes	0.1	2.3	19.8	0	12
4 minutes 30 seconds	0	2.4	19.9	0	15
5 minutes	0.1	2.3	19.8	0	16
5 minutes 30 seconds					

Job Number:	Well ID: BH04
SWL (m): 4.18	Well Depth (m): 4.88
Weather conditions: Sunny / Overcast / Raining	Date: 27/2/24 Time: 10:50
Flow rate (L/hr): Peak- 5.2 Stable- 5.0	PID (ppm): 0.0
Relative pressure (mb): 9.80	Barometric pressure (mb): 1021

Time	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)
0 seconds	0	0.1	20.6	0	0
30 seconds	0	1.7	20.5	0	0
1 minute	0	1.9	20.2	0	0
1 minute 30 seconds	0	2.2	20.2	0	0
2 minutes	0	2.4	20.1	0	0
2 minutes 30 seconds	0	2.5	20.1	0	0
3 minutes	0	2.8	20.0	0	0
3 minutes 30 seconds	0	2.9	20.0	0	0
4 minutes					
4 minutes 30 seconds					
5 minutes					
5 minutes 30 seconds					

GG3 Round 2 PID = 0.1 SWL = 0.78

12:30pm RP = 15.99 FR = 6.7 BD = 1.75

	CH_4	CO_2	O_2	CO	H_2S
0	0	0	20.8	0	0
30	0	2.2	18.8	0	1
1	0	2.3	18.8	0	1
1.30	0	2.3	18.8	0	1
2	0	2.4	18.7	0	1
2.30	0	2.4	18.6	0	1
3	0	2.5	18.4	0	0
3.30	0	3.2	17.3	0	6
4	0	4.2	15.9	0	16
4.30	0	4.8	15.1	0	26
5	0	5.1	14.5	0	34
5.30	0	5.2	14.1	0	39
6	0	5.3	13.8	0	44
6.30	0	5.3	13.5	0	47
7	0	5.4	13.3	0	49

BH04 Round 2 PID = 0.0 SWL = 3.43

2:50pm RP = 14.85 FR = 0.0 BD = 4.88

	CH_4	CO_2	O_2	CO	H_2S
0	0	0	20.6	0	0
30	0.1	3.6	18.7	0	0
1	0.2	3.9	18.4	0	0
1.30	0.2	4.2	18.1	0	0
2	0.2	4.3	18.0	0	0
2.30	0.3	4.5	17.7	0	0
3	0.3	4.7	17.5	0	0
3.30	0.4	4.9	17.3	0	0
4					
4.30					
5					

Subsurface Gas Monitoring

Job Number:	Well ID: BH04
SWL (m): 2.39	Well Depth (m): 4.83
Weather conditions: Sunny / Overcast / Raining	Date: 5/3/24 Time: 10:22
Flow rate (L/hr): Peak- -1.1 Stable- -1.1	PID (ppm): 0.1
Relative pressure (mb): -3.23	Barometric pressure (mb): 1025

Time	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)
0 seconds	0	0	20.5	0	0
30 seconds	0.8	11.0	8.6	0	0
1 minute	0.8	11.4	8.3	0	0
1 minute 30 seconds	0.8	11.3	8.4	0	0
2 minutes	0.8	11.1	8.6	0	0
2 minutes 30 seconds	0.8	10.6	9.1	0	0
3 minutes	0.7	10.1	9.4	0	0
3 minutes 30 seconds	0.7	10.0	9.5	0	0
4 minutes	0.7	9.9	9.7	0	0
4 minutes 30 seconds					
5 minutes					
5 minutes 30 seconds					

Job Number:	Well ID: BH04
SWL (m): 2.39	Well Depth (m): 4.83
Weather conditions: Sunny / Overcast / Raining	Date: 5/3/24 Time: 12:20
Flow rate (L/hr): Peak- -1.8 Stable- -1.8	PID (ppm): 0.0
Relative pressure (mb): -5.04	Barometric pressure (mb): 1025

Time	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)
0 seconds	0	0	20.5	0	0
30 seconds	0.1	2.2	17.3	1	0
1 minute	0.1	2.5	16.9	0	0
1 minute 30 seconds	0.2	2.9	16.5	0	0
2 minutes	0.3	3.5	15.8	0	0
2 minutes 30 seconds	0.3	4.0	15.3	0	0
3 minutes	0.3	4.7	14.7	0	0
3 minutes 30 seconds	0.4	5.4	13.9	0	0
4 minutes	0.4	6.1	13.3	0	0
4 minutes 30 seconds	0.5	6.7	12.6	1	0
5 minutes		Pump	Failed		
5 minutes 30 seconds					

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Subsurface Gas Monitoring

Job Number:	Well ID: GG1
SWL (m): 1.49	Well Depth (m): 1.76
Weather conditions: Sunny / Overcast / Raining	Date: 5/3/23 Time: 9:45
Flow rate (L/hr): Peak- 11.2 Stable- 2.0	PID (ppm): 0.0
Relative pressure (mb): 52.81	Barometric pressure (mb): 1025

Time	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)
0 seconds	0	0	20.5	0	0
30 seconds	0	3.9	18.7	0	0
1 minute	0	3.9	18.6	0	0
1 minute 30 seconds	0	3.9	18.5	0	0
2 minutes		Pump	Failed		
2 minutes 30 seconds					
3 minutes					
3 minutes 30 seconds					
4 minutes					
4 minutes 30 seconds					
5 minutes					
5 minutes 30 seconds					

Job Number:	Well ID: GG1
SWL (m): 1.49	Well Depth (m): 1.76
Weather conditions: Sunny / Overcast / Raining	Date: 5/3/23 Time: 11:54
Flow rate (L/hr): Peak- 3.8 Stable- 1.7	PID (ppm): 0.0
Relative pressure (mb): 11.48	Barometric pressure (mb): 1025

Time	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)
0 seconds	0	0	21.1	0	0
30 seconds	0	1.8	19.8	0	0
1 minute	0	1.8	19.8	0	0
1 minute 30 seconds	0	2.0	19.8	0	0
2 minutes		Pump	Failed		
2 minutes 30 seconds					
3 minutes					
3 minutes 30 seconds					
4 minutes					
4 minutes 30 seconds					
5 minutes					
5 minutes 30 seconds					

Subsurface Gas Monitoring

Job Number:	Well ID: GG2
SWL (m): 1.32	Well Depth (m): 1.64
Weather conditions: Sunny / Overcast / Raining	Date: 5/3/24 Time: 9:56
Flow rate (L/hr): Peak- 8.7 Stable- 7.0	PID (ppm): 0.0
Relative pressure (mb): 45.26	Barometric pressure (mb): 1025

Time	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)
0 seconds	0	0	20.5	0	0
30 seconds	0	4.4	18.0	0	0
1 minute	0	4.4	17.9	0	0
1 minute 30 seconds	0	4.3	17.9	0	0
2 minutes	0	4.3	17.9	0	0
2 minutes 30 seconds		Pump	Failed		
3 minutes					
3 minutes 30 seconds					
4 minutes					
4 minutes 30 seconds					
5 minutes					
5 minutes 30 seconds					

Job Number:	Well ID: GG2
SWL (m): 1.32	Well Depth (m): 1.64
Weather conditions: Sunny / Overcast / Raining	Date: 5/3/24 Time: 12:01
Flow rate (L/hr): Peak- 9.7 Stable- 6.5	PID (ppm): 0.0
Relative pressure (mb): 37.82	Barometric pressure (mb): 1021

Time	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)
0 seconds	0	0	20.9	0	0
30 seconds	0	2.1	19.5	0	0
1 minute	0	2.3	19.2	0	0
1 minute 30 seconds	0	2.5	19.0	0	0
2 minutes		Pump	Failed		
2 minutes 30 seconds					
3 minutes					
3 minutes 30 seconds					
4 minutes					
4 minutes 30 seconds					
5 minutes					
5 minutes 30 seconds					

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Subsurface Gas Monitoring

Job Number:	Well ID: GG3
SWL (m): 1.06	Well Depth (m): 1.75
Weather conditions: Sunny / Overcast / Raining	Date: 5/3/24 Time: 10:10
Flow rate (L/hr): Peak- 0.4 Stable- 0.4	PID (ppm): 0.1
Relative pressure (mb): 1.24	Barometric pressure (mb): 1025

Time	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)
0 seconds	0	0	20.5	0	0
30 seconds	0	0.4	19.6	0	0
1 minute	0	0.4	19.6	0	0
1 minute 30 seconds	0	0.5	19.5	0	0
2 minutes	0	0.7	19.2	0	0
2 minutes 30 seconds	0	1.0	19.0	0	0
3 minutes	0	1.3	18.7	0	0
3 minutes 30 seconds	0	2.6	17.1	0	0
4 minutes	0	5.0	14.1	0	0
4 minutes 30 seconds	0	6.3	12.6	0	0
5 minutes	0	6.6	12.3	0	0
5 minutes 30 seconds	0	6.8	12.1	0	0

Removed Water - Left for 1hr

Job Number:	Well ID: GG3
SWL (m): 1.06	Well Depth (m): 1.75
Weather conditions: Sunny / Overcast / Raining	Date: 5/3/24 Time: 11:36
Flow rate (L/hr): Peak- 0.8 Stable- 0.8	PID (ppm): 0.0
Relative pressure (mb): 0.03	Barometric pressure (mb): 1025

Time	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)
0 seconds	0	0	20.8	0	0
30 seconds	0	0.3	20.5	0	0
1 minute	0	0.3	20.5	0	0
1 minute 30 seconds	0	0.3	20.5	0	0
2 minutes	0	0.5	20.5	0	0
2 minutes 30 seconds	0	0.8	20.3	0	0
3 minutes	0	1.1	20.2	0	0
3 minutes 30 seconds	0	1.6	20.0	0	0
4 minutes	0	2.5	19.3	0	6
4 minutes 30 seconds	0	3.3	18.8	0	13
5 minutes	0	3.6	18.4	0	20
5 minutes 30 seconds	0	4.0	17.9	0	24
6	0	4.3	17.3	0	27
6 30	0	4.7	16.5	0	29
7	0	5.0	15.9	0	30
7 30	0	5.3	15.3	0	30
8	0	5.4	15.0	0	30
8 30	0	5.5	14.8	0	29

← Strong odour

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Subsurface Gas Monitoring field sheet

Subsurface Gas Monitoring

Job Number:	~~Well ID:~~ Houses
~~SWL (m):~~	~~Well Depth (m):~~
Weather conditions: Sunny / Overcast / Raining	Date: 5/3/24 Time: 11:00 – 11:30
~~Flow rate (L/hr): Peak- Stable-~~	~~PID (ppm):~~
~~Relative pressure (mb):~~	Barometric pressure (mb): 1025

~~Time~~ Location	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)	
~~0 seconds~~ 57	0	0	20.3	0	0	Outside
~~30 seconds~~ Bolong	0	0	20.1	0	0	Inside
~~1 minute~~ road	0	0	20.3	0	0	Under
~~1 minute 30 seconds~~						
~~2 minutes~~ 53 Bolong	0	0	20.3	0	0	Outside
~~2 minutes 30 seconds~~	0	0	20.3	0	0	Inside
~~3 minutes~~ road						
~~3 minutes 30 seconds~~						
~~4 minutes~~						
~~4 minutes 30 seconds~~						
~~5 minutes~~						
~~5 minutes 30 seconds~~						

Job Number:	Well ID: GG3A
SWL (m): —	Well Depth (m): 0.
Weather conditions: Sunny / Overcast / Raining	Date: 5/3/24 Time:
Flow rate (L/hr): Peak- 0.0 Stable- 0.0	PID (ppm):
Relative pressure (mb): 0.03	Barometric pressure (mb): 1025

Time	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)
0 seconds	0	0	20.5	0	0
30 seconds	0	0.6	20.1	1	0
1 minute	0	0.5	20.0	1	0
1 minute 30 seconds	0	0.4	20.1	1	0
2 minutes	0	0.3	20.3	0	0
2 minutes 30 seconds	0	0.3	20.3	0	0
3 minutes	0	0.3	20.3	0	0
3 minutes 30 seconds	0	0.3	20.4	0	0
4 minutes					
4 minutes 30 seconds					
5 minutes					
5 minutes 30 seconds					

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Subsurface Gas Monitoring field sheet

Subsurface Gas Monitoring

Job Number:	Well ID: GG1
SWL (m):	Well Depth (m):
Weather conditions: Sunny / Overcast / Raining	Date: 12/3/24 Time: 9:38
Flow rate (L/hr): Peak- 5.7 Stable- 3.9	PID (ppm): 0.0
Relative pressure (mb): 18.31	Barometric pressure (mb): 1017

Time	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)
0 seconds	0	0	20.7	0	0
30 seconds	0	3.9	18.0	0	0
1 minute	0	3.9	17.9	0	0
1 minute 30 seconds	0	3.9	17.9	0	0
2 minutes	0	3.9	17.9	0	0
2 minutes 30 seconds	0	0 Pump	Failed 20.7	0	0
R2 ~~3 minutes~~	0	2.6	19.8	0	0
~~3 minutes 30 seconds~~	0	2.6	19.8	0	0
~~4 minutes~~	0	2.6	19.8	0	0
~~4 minutes 30 seconds~~	0	2.7	19.9	0	0
~~5 minutes~~		Pump	Failed		
~~5 minutes 30 seconds~~					

Job Number:	Well ID: GG2
SWL (m):	Well Depth (m):
Weather conditions: Sunny / Overcast / Raining	Date: 12/3/24 Time: 9:49
Flow rate (L/hr): Peak- 8.3 Stable- 5.5	PID (ppm): 0.0
Relative pressure (mb): 32.83	Barometric pressure (mb): 1017

Time	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)
0 seconds	0	0	20.7	0	0
30 seconds	0	4.1	17.6	0	0
1 minute	0	4.1	17.5	0	0
1 minute 30 seconds	0	4.1	17.4	0	0
2 minutes	0	4.1	17.4	0	0
2 minutes 30 seconds	0	0 Pump	Failed 20.7	0	0
R2 ~~3 minutes~~	0	2.6	18.9	0	0
~~3 minutes 30 seconds~~	0	2.6	19.0	0	0
~~4 minutes~~	0	2.7	19.0	0	0
~~4 minutes 30 seconds~~	0	2.7	19.0	0	0
~~5 minutes~~		Pump	Failed		
~~5 minutes 30 seconds~~					

Stantec

Subsurface Gas Monitoring field sheet

Subsurface Gas Monitoring

Job Number:	Well ID: GG3
SWL (m):	Well Depth (m):
Weather conditions: Sunny / Overcast / Raining	Date: 12/3/24 Time: 10:16
Flow rate (L/hr): Peak- 0.1 Stable- 0.1	PID (ppm): 0.6
Relative pressure (mb): 0.00	Barometric pressure (mb): 1017

Time	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)
0 seconds	0	0	20.7	0	0
30 seconds	0	0.4	19.8	0	0
1 minute	0	0.4	19.8	0	0
1 minute 30 seconds	0	0.5	19.7	0	0
2 minutes	0	0.6	19.5	0	0
2 minutes 30 seconds	0	0.9	19.3	0	0
3 minutes	0	1.2	19.0	0	0
3 minutes 30 seconds	0	1.7	18.5	0	0
4 minutes	0	2.5	17.8	0	0
4 minutes 30 seconds	0	2.9	17.3	0	0
5 minutes	0	3.2	17.0	0	0
5 minutes 30 seconds	0	3.4	16.7	0	0

Job Number:	Well ID: GG3
SWL (m):	Well Depth (m):
Weather conditions: Sunny / Overcast / Raining	Date: 12/3/24 Time: 10:46
Flow rate (L/hr): Peak- 0 Stable- 0	PID (ppm): 0.3
Relative pressure (mb): 0.00	Barometric pressure (mb): 1017

Time	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)
0 seconds	0	0	20.7	0	0
30 seconds	0	4.2	15.4	0	0
1 minute	0	4.5	15.1	0	0
1 minute 30 seconds	0	4.8	14.8	0	0
2 minutes	0	5.1	14.5	0	0
2 minutes 30 seconds	0	5.3	14.2	0	0
3 minutes	0	5.5	14.0	0	0
3 minutes 30 seconds	0	5.7	13.7	0	0
4 minutes	0	5.8	13.5	0	0
4 minutes 30 seconds					
5 minutes					
5 minutes 30 seconds					

Stantec

Subsurface Gas Monitoring field sheet

Subsurface Gas Monitoring

Job Number:	Well ID: BH04
SWL (m):	Well Depth (m):
Weather conditions: Sunny / Overcast / Raining	Date: 12/3/24 Time: 10:07am
Flow rate (L/hr): Peak- -4.7 Stable- -3.8	PID (ppm): 0.0
Relative pressure (mb): -10.78	Barometric pressure (mb): 1017

Time	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)
0 seconds	0	0	20.7	0	0
30 seconds	0	6.6	14.4	0	0
1 minute	0	9.3	10.4	0	0
1 minute 30 seconds	0	10.0	9.5	0	0
2 minutes	0	9.8	9.6	0	0
2 minutes 30 seconds	0	9.7	9.6	0	0
3 minutes	0	9.6	9.7	0	0
3 minutes 30 seconds	0	9.5	9.7	0	0
4 minutes					
4 minutes 30 seconds					
5 minutes					
5 minutes 30 seconds					

Job Number:	Well ID:
SWL (m):	Well Depth (m):
Weather conditions: Sunny / Overcast / Raining	Date: 12/3/24 Time: 10:59
Flow rate (L/hr): Peak- -6.2 Stable- -6.1	PID (ppm): 0.0
Relative pressure (mb): - 19.18	Barometric pressure (mb): 1017

Time	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)
0 seconds	0	0	20.7	0	0
30 seconds	0	1.3	17.8	0	0
1 minute	0	1.7	17.3	0	0
1 minute 30 seconds	0	2.4	16.6	0	0
2 minutes	0	3.3	15.7	0	0
2 minutes 30 seconds	0	4.3	14.7	0	0
3 minutes	0	5.2	13.8	0	0
3 minutes 30 seconds	0	6.1	12.9	0	0
4 minutes	0	7.0	12.0	0	0
4 minutes 30 seconds	0	7.5	11.9	0	0
5 minutes		Pump	Failed		
5 minutes 30 seconds					

Stantec

Subsurface Gas Monitoring

Job Number:	Well ID: 6A1
SWL (m): 1.54	Well Depth (m):
Weather conditions: Sunny / Overcast / Raining	Date: 19/3/24 Time: 9:20
Flow rate (L/hr): Peak- 4.3 Stable- 4.1	PID (ppm): 0.0
Relative pressure (mb): 8.64	Barometric pressure (mb): 1017

Time	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)
0 seconds	0	0	20.9	0	0
30 seconds	0	0.4	18.6	0	0
1 minute	0	0.4	18.6	0	0
1 minute 30 seconds	0	0.4	18.5	0	0
2 minutes	0	0.5	18.5	0	0
2 minutes 30 seconds			Pump Failed		
3 minutes					
3 minutes 30 seconds					
4 minutes					
4 minutes 30 seconds					
5 minutes					
5 minutes 30 seconds					

Job Number:	Well ID: GG1
SWL (m): 1.54	Well Depth (m):
Weather conditions: Sunny / Overcast / Raining	Date: 19/3/24 Time: 10:30
Flow rate (L/hr): Peak- 2.6 Stable- 2.3	PID (ppm): 0.0
Relative pressure (mb): 5.54	Barometric pressure (mb): 1017

Time	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)
0 seconds	0	0	20.9	0	0
30 seconds	0	0.1	20.0	0	0
1 minute	0	0.1	20.0	0	0
1 minute 30 seconds	0	0.1	20.0	0	0
2 minutes	0	0.2	19.9	0	0
2 minutes 30 seconds		Pump	Failed		
3 minutes					
3 minutes 30 seconds					
4 minutes					
4 minutes 30 seconds					
5 minutes					
5 minutes 30 seconds					

Stantec

Subsurface Gas Monitoring

Job Number:	Well ID: GG2
SWL (m): 1.31	Well Depth (m):
Weather conditions: Sunny / Overcast / Raining	Date: 19/3/24 Time: ~~10:07~~ 9:30
Flow rate (L/hr): Peak- 16.3 Stable- 11.2	PID (ppm): 0.0
Relative pressure (mb): 21.18	Barometric pressure (mb): 1017

Time	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)
0 seconds	0	0	20.9	0	0
30 seconds	0	5.3	17.6	0	
1 minute	0	5.2	17.6	0	0
1 minute 30 seconds	0	5.2	17.6	0	0
2 minutes	0	5.2	17.5	0	0
2 minutes 30 seconds		Pump	Failed	0	0
3 minutes					
3 minutes 30 seconds					
4 minutes					
4 minutes 30 seconds					
5 minutes					
5 minutes 30 seconds					

Job Number:	Well ID: GG2
SWL (m): 1.31	Well Depth (m):
Weather conditions: Sunny / Overcast / Raining	Date: 19/3/24 Time: 10:17
Flow rate (L/hr): Peak- 6.8 Stable- 4.0	PID (ppm): 0.0
Relative pressure (mb): 21.18	Barometric pressure (mb): 1017

Time	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)
0 seconds	0	0	20.9	0	0
30 seconds	0	0.1	19.9	0	0
1 minute	0	0.2	19.9	0	0
1 minute 30 seconds	0	0.2	19.8	0	0
2 minutes	0	0.3	19.8	0	0
2 minutes 30 seconds		Pump	Failed		
3 minutes					
3 minutes 30 seconds					
4 minutes					
4 minutes 30 seconds					
5 minutes					
5 minutes 30 seconds					

Subsurface Gas Monitoring

Job Number:	Well ID: GG3
SWL (m): 0.05	Well Depth (m):
Weather conditions: Sunny / Overcast / Raining	Date: 19/3/24 Time: 9:50
Flow rate (L/hr): Peak- 14.5 Stable- 14.5	PID (ppm):
Relative pressure (mb): 59.07	Barometric pressure (mb): 1017

Time	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)
0 seconds	0	0	20.9	0	0
30 seconds	0	7.1	11.5	0	0
1 minute	0	7.1	11.4	0	0
1 minute 30 seconds	0	7.1	11.3	0	0
2 minutes	0	7.1	11.3	0	0
2 minutes 30 seconds	0	7.1	11.3	0	0
3 minutes	0	7.1	11.3	0	0
3 minutes 30 seconds		Pump	Failed		
4 minutes		Water	in		
4 minutes 30 seconds			tube		
5 minutes					
5 minutes 30 seconds					

Job Number:	Well ID:
SWL (m):	Well Depth (m):
Weather conditions: Sunny / Overcast / Raining	Date: Time:
Flow rate (L/hr): Peak- Stable-	PID (ppm):
Relative pressure (mb):	Barometric pressure (mb):

Time	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)
0 seconds					
30 seconds					
1 minute					
1 minute 30 seconds					
2 minutes					
2 minutes 30 seconds					
3 minutes					
3 minutes 30 seconds					
4 minutes					
4 minutes 30 seconds					
5 minutes					
5 minutes 30 seconds					

Subsurface Gas Monitoring

Job Number:	Well ID: BH04
SWL (m): 1.98	Well Depth (m):
Weather conditions: Sunny / Overcast / Raining	Date: 19/3/24 Time: 9:40
Flow rate (L/hr): Peak- -12.3 Stable- -7.1	PID (ppm): 0.0
Relative pressure (mb): -40.24	Barometric pressure (mb): 1017

Time	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)
0 seconds	0	0	20.9	0	0
30 seconds	0	3.5	17.1	1	0
1 minute	0	7.1	12.8	0	0
1 minute 30 seconds	0	7.9	11.9	0	0
2 minutes	0	8.1	11.7	0	0
2 minutes 30 seconds	0	8.1	11.6	0	0
3 minutes		Pump	Failed		
3 minutes 30 seconds					
4 minutes					
4 minutes 30 seconds					
5 minutes					
5 minutes 30 seconds					

Job Number:	Well ID: BH04
SWL (m): 1.98	Well Depth (m):
Weather conditions: Sunny / Overcast / Raining	Date: 19/3/24 Time: 10:40
Flow rate (L/hr): Peak- -4.8 Stable- -4.4	PID (ppm): 0.0
Relative pressure (mb): -13.37	Barometric pressure (mb): 1017

Time	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)
0 seconds	0	0	20.9	0	0
30 seconds	0	0.5	19.6	0	0
1 minute	0	1.0	18.9	0	0
1 minute 30 seconds	0	1.5	18.4	0	0
2 minutes	0	2.0	17.8	0	0
2 minutes 30 seconds	0	2.4	17.3	0	0
3 minutes	0	3.0	16.7	0	0
3 minutes 30 seconds	0	3.7	16.0	0	0
4 minutes					
4 minutes 30 seconds					
5 minutes					
5 minutes 30 seconds					

APPENDIX G

Calibration Certificates

Calibration and Service Report

ABN: 74 619 717 350
Contact: 02 9730 2019
Email: rentals@experttesting.com.au
9/171 Power Street, Glendenning NSW 2761
Web: www.experttesting.com.au

Company:	Expert Testing Services (Hire) Pty Ltd	Manufacturer:	QED	Serial #:	1762
Address:	9/171 Power Street GLENDENNING NSW 2761	Instrum./Model:	MP15	Cable:	60m
Phone:	02 9730 2019	Client Company:	Stantec	Client Email:	
Email:	rentals@experttesting.com.au	Client Name:	Katelyn	Client Phone:	

Equipment Check

MP Kit QMP15

Customer:	Stantec	**Manufacturer:**	QED
Contact:	Katelyn	**Instrument:**	QMP15
Order:		**Serial #:**	1762
		Pump S/N #:	145037
		Cable length:	60m

Item	Test	Pass	Comments
QMP15	Condition	✓	
	Gas Regulator	✓	
	Wrench & Tube cutter	✓	
Pump	Decontaminated	✓	
	Condition	✓	
	Bladder Fitted	✓	
	Fittings	✓	New
CO2 Gas Bottle	Full	✓	
Spare CO2	1 Spare Bottles	✓	
MP Kit: QMP15 and Pump Test	Operation checked	✓	
Instruction manual	Included	✓	

Comments

1 spare bottles.

This is to certify that the above instrument has been checked and is in good working order.

Checked By: Milenko Sisic

Check Date: 16.01.2024 Due for Check: 16.07.2024

Calibration and Service Report

ABN: 74 619 717 350
Contact: 02 9730 2019
Email: rentals@experttesting.com.au
9/171 Power Street, Glendenning NSW 2761
Web: www.experttesting.com.au

Company:	Expert Testing Services (Hire) Pty Ltd	Manufacturer:	Solinst	Serial #:	484568
Address:	9/171 Power Street GLENDENNING NSW 2761	Instrum./Model:	Interface Probe 122	Tape Length:	30m
Phone:	02 9730 2019	Client Company:	Stantec	Client Email:	
Email:	rentals@experttesting.com.au	Client Name:	Katelyn	Client Phone:	

Equipment Check

Oil/Water Interface Meter - Solinst 122 Interface Meter

Customer:	Stantec	**Manufacturer:**	Solinst
Contact:	Katelyn	**Instrument:**	Interface Meter Model 122
Order:		**Serial #:**	484568
		Tape length:	30m

Item	Test	Pass	Comments
Battery	Voltage (2 x 9v battery)	✓	Voltage above 7.9v
	Fuses	✓	
	Capacity	✓	
Probe	Decontaminated	✓	
	Condition	✓	
	Operation	✓	
Connectors	Condition	✓	
Tape Check	Condition	✓	
	Decontaminated	✓	
Instrument Test	At surface level	✓	Tap water and Petrol
Speaker	Operation	✓	

Comments

New unit.

This is to certify that the above instrument has been checked and is in good working order.

Checked By: Milenko Sisic

Check Date: 16.01.2024 Due for Check: 16.07.2024

Calibration and Service Report

EXPERT TESTING SERVICES
ABN: 74 619 717 350
Contact: 02 9730 2019
Email: rentals@experttesting.com.au
9/171 Power Street, Glendenning NSW 2761
Web: www.experttesting.com.au

Company:	Expert Testing Services (Hire) Pty Ltd	Manufacturer:	YSI	Serial #:	21J102886
Address:	9/171 Power Street	Instrum./Model:	Pro Quatro	Cable S/N:	21M100418
	GLENDENNING NSW 2761				
Phone:	02 9730 2019	Client Company:	Stantec	Client Email:	
Email:	rentals@experttesting.com.au	Client Name:	Katelyn	Client Phone:	

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 60 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	0.0.79
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	
pH slope		✓	55 to 60 mV/pH; ideal 59mV
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	Variance range ± 20mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	Galvanic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

				Instrument Readings		
Parameter	Standards	Reference	Calibration Point	Before	After	Units
Temperature	Hanna HI98509; SN:31E0C9	Room Temp.	26.0	N/A	26.0	°C
pH	pH 4.00	385495	4.01	3.91	4.01	pH
pH	pH 7.00	382472	7.00	6.88	7.00	pH
Conductivity	2760 µs/cm at 25°C	411815	2760	2765	2760	µs/cm
ORP (Ref. check only)	Zobell A & B	12606A & 12606B	226.4	234.3	226.4	mV
Zero Dissolved Oxygen	NaSO3 in distilled water	123302	0.0	0.2	0.0	%
100% Dissolved Oxygen	100% Air Saturation	Fresh Air	99.6	98.8	99.6	%

Checked By: Milenko Sisic
Check Date: 16.01.2024 Due for Check: 16.07.2024

APPENDIX H

Data Quality Assessment

APPENDIX H QAQC DATA QUALITY ASSESSMENT

A. FIELD QUALITY ASSESSMENT

Quality of field assessment is provided in **Table 1A** below.

Table 1A Data Quality Indicators

QA/QC Measure	Field Quality Indicator	Conformance
Precision: A quantitative measure of the variability (or reproducibility) of data	SOPs are appropriate and complied with.	Yes. Reusable equipment, where used, was decontaminated on site and rinsates collected / analysed to confirm the effectiveness of the decontamination procedure.
	Field duplicates and Blind field duplicates are collected and analysed at a rate of 5% (1 per 20 samples).	Yes, refer to **Table 3A** below.
	Use of calibrated equipment.	Yes, refer to **Appendix G**.
Accuracy: A quantitative measure of the closeness of reported data to the "true" value	SOPs are appropriate and complied with.	Yes, all fieldwork sampling techniques / methods were in accordance with Stantec's Standard Operating Procedures (SOP).
	Use of calibrated equipment.	Yes, refer to **Appendix G**.
	Field interlaboratory duplicates sampled and analysed at a rate of 1 per 20 samples.	Yes, refer to **Table 4A** below.
	<30% Relative Percentage Difference (RPD)	Refer to **Table 5A** below.
	Analysis of rinsate sample collected at rate of 1 per day.	Yes. Rinsate samples collected during both soil sampling and groundwater sampling.
	Trip spike and trip blanks were used.	Yes
Representativeness: The confidence (expressed qualitatively) that data are representative of each media present on site and the conditions encountered in the field	Appropriate media sampled.	Yes
	Preservation and storage of samples upon collection and during transport to the laboratory occurs.	Yes
	Sampling is undertaken by an experienced sampler.	Yes
Completeness: A measure of the amount of useable data from the data collected during the fieldwork program	All critical locations sampled.	Yes
	All samples collected (from grid and at depth).	Yes
	Standard operating practices (SOPs) appropriate and complied with.	Yes
	Sampling is undertaken by an experienced sampler.	Yes

QA/QC Measure	Field Quality Indicator	Conformance
	Suitable records of field work are documented.	Yes. See **Appendix F**.
	Completed laboratory sample chain-of-custody and documentation.	Yes. See **Appendix E**.
Comparability: The confidence (expressed qualitatively) that may be considered to be equivalent for each sampling and analytical event	Same SOP is used on each field occasion.	Yes
	Climatic conditions are documented.	Yes
	Experienced sampler	Yes
	Sample type, preservation and handling are consistent at sampling events.	Yes
	Use of calibrated equipment.	Yes. See **Appendix G**.

A.1 LABORATORY QUALITY ASSESSMENT

Quality of laboratory assessment is provided in **Table 2A** below.

Table 2A Data Quality Indicators

QA/QC Measure	Laboratory Quality Indicator	Conformance
Precision: A quantitative measure of the variability (or reproducibility) of data	Laboratory analyses of laboratory and inter-laboratory duplicates, field duplicates, laboratory prepared volatile trip spikes.	Yes. See **Appendix C** and **Appendix E**.
	Relative Percent Difference (RPD) calculation results: <30% Relative Percentage Difference (RPD).	Partly, refer to **Table 6A**. See **Appendix C**.
	The RPD values are calculated using the following equation: $RPD = \frac{\mid C_O - C_R \mid}{[(C_O + C_R) / 2]} \times 100$ Where, C_O = Analyte concentration of the original sample C_R = Analyte concertation of the duplicate sample	Yes. See **Appendix C**.
Accuracy: A quantitative measure of the closeness of reported data to the "true" value	Laboratory holds NATA-accreditation for the analyses.	Yes
	Laboratory limit of reporting is below the adopted investigation level.	Yes
	Laboratory analysis of: field blanks, rinsate blank, reagent blank, method blank, matrix spike, matrix spike duplicate, surrogate spike, reference material, laboratory control sample, laboratory-prepared spikes. The nominal	Yes

QA/QC Measure	Laboratory Quality Indicator	Conformance
	acceptance limits on laboratory control samples are: Laboratory spikes: 70-130% recovery for metals 60-140% for organics Laboratory duplicates. If contaminant concentration is: < 10 x PQL, no RPD limit 10-20 x PQL, RPD is 0% to 50% >20 x PQL, RPD is 0% to 20% Laboratory surrogates: 60-140% recovery. Laboratory blanks: <PQL	
	Laboratory control samples, 70-130% recovery	Yes
Representativeness: The confidence (expressed qualitatively) that data are representative of each media present on site and the conditions encountered in the field	Blank samples run in parallel with field samples to confirm there are no unacceptable instances of laboratory artefacts.	Yes
	Review of RPD values for field and laboratory duplicates to provide an indication that the samples are generally homogeneous, with no unacceptable instances of significant sample matrix heterogeneities	Yes, refer to **Table 6A**.
	The appropriateness of collection methodologies, handling, storage and preservation techniques will be assessed to ensure/confirm there was minimal opportunity for sample interference or degradation (i.e. volatile loss during transport due to incorrect preservation / transport methods).	Yes
	Rinsate samples used when sampling equipment is reused have analytical results <LOR.	Yes. See **Appendix C**.
Completeness: A measure of the amount of useable data from the data collected during the fieldwork program	All critical samples are analysed according to the SAQP.	Yes
	All COPC are analysed.	Yes
	Appropriate methods and PQLs are implemented.	Yes
	Sample documentation is complete.	Yes. See **Appendix F**.
	Samples are analysed within holding times.	Yes
Comparability: The confidence (expressed	Sample analytical methods used (including clean-up)	Yes

QA/QC Measure	Laboratory Quality Indicator	Conformance
qualitatively) that may be considered to be equivalent for each sampling and analytical event	Sample PQLs (justify/quantify if different)	Yes
	Same laboratories are used and justification is given where differences occur.	Yes
	Same analytical methods, Practical Quantification Limits (PQLs), and units of measurement are used.	Yes

The QA/QC samples collected during the sampling program are summarised below in **Table 3A** including inter- and intra-laboratory duplicate pairings. Relative Percentile Differences between primary and duplicate samples are presented in the data summary tables in **Appendix C**.

Table 3A Summary of Field Inter/Intra Laboratory Duplicates

Sample Type	Matrix	Primary Sample	Laboratory Duplicate	Inter-lab Replicate
Field Replicates	Soil	TP115_0.1	QA111	QC111
	Water	BH02	QA200	QC200
		BH02	QA300	QC300

A.2 REPLICATE SAMPLES

With the exception of the RPD exceedances noted in **Table 4A**, all RPD results were within the acceptance criteria nominated in **Table 6-1**. The variation between samples is generally minor and likely the result of heterogeneity within the soil profile. Further to this, the exceedances noted are not considered to impact the suitability of the report findings as generally, results were either both above or below criteria and replicate results have been considered as primary results for the purposes of establishing site suitability and risk to receptors.

Table 4A RPD exceedances summary

Primary Sample	Replicate Sample	Analyte	Primary Result (mg/kg)	Replicate Result (mg/kg)	RPD (%)
Soil					
TP115_0.1	QC111	Arsenic	11	4	93
		Chromium (III+VI)	19	7.8	84
		Copper	15	8.4	56
		Lead	24	15	46
		Nickel	16	5.5	98
		Zinc	66	29	78
		Benzo(a)pyrene TEQ (Half LOR)_1	0.6	<0.2	100

		Benzo(a)pyrene TEQ (Full LOR)	1.5	<0.3	120
Water					
BH02 18th January 2024	QA200	Sum of WA DWER PFAS (n=10)*	0.021	0.037	55
		Sum of US EPA PFAS (PFOS + PFOA)*	0.001	0.002	67
		Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.001	0.002	67
	QC200	Chromium (III+VI)	3	2	40
		Chromium (III+VI) (filtered)	<1	2	67
		Copper (filtered)	2	3	40
		Lead	1	2	67
		Sum of PFAS	0.021	<0.006	111
		Sum of PFHxS and PFOS	0.001	0.0003	108
BH02 27th February 2024	QC300	Methane	950	230	122

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

Replicate samples were collected during the field sampling program at the rates shown in **Table 5A**.

Table 5A Replicate Sampling Rates

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OCP	3	1	1:3	1	1:3
OPP	3	1	1:3	1	1:3
PCB	3	1	1:3	1	1:3
Organics	4	1	1:4	1	1:4
Solvents	3	1	1:3	0	0:3
SVOCs	3	1	1:3	1	1:3
Chlorinated Hydrocarbons	3	1	1:3	0	0:3
Halogenated Hydrocarbons	3	1	1:3	0	0:3
PFAS	3	1	1:3	1	1:3

A.3 RINSATE BLANKS

A total of two (2) rinsate samples were collected during the investigation as outlined below:

- RIN_240115, collected on 15th of January 2024 during soil sampling.
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Analysis indicated that all analytes were below the laboratory LOR, indicating the sampling equipment used was adequately decontaminated to prevent cross-contamination during sampling.

A.4 LABORATORY QA/QC

In accordance with Stantec's Quality Assurance and Quality Control (QA/QC) procedures and AS4482.1 (2005), samples were stored in insulated transport containers containing ice and delivered to the designated laboratories under Chain of Custody documentation following sample collection. Chain of Custody records are included in **Appendix E**.

Eurofins and SGS, the chosen analytical laboratories are NATA accredited and undertook internal QA/QC procedures which include the analysis of method blanks, internal duplicate samples, laboratory control samples, matrix spikes and surrogate recovery. Additionally, laboratory QA/QC procedures include sample receipt, logging, storage, preservation and analysis within the method specified holding time.

A review of the laboratory QA/QC procedures indicated that, with the exception of the outliers noted in **Table 6A,** laboratory QA/QC were recorded within acceptance criteria, samples were received and stored appropriately, and all samples were analysed within the specified holding time.

Table 6A Laboratory QA/QC outlier's summary

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			W24-Ja0022834		
		13C4-PFBA	W24-Ja0022831		
			W24-Ja0022834		
		18O2-PFHxS	W24-Ja0022831		
			W24-Ja0022834		
		13C2-4:2 FTSA	W24-Ja0022831		
			W24-Ja0022834		
SGS	SE259321	Nickel	SE259321.001	RPD failed acceptance	Reason for failure not stated by laboratory,

Laboratory	Report ID	Analyte	Sample	QA/QC Outlier	Notes
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	SE261551	Holding time exceedances	QC300	Date sampled was 27/02/24 and the date extracted and analysed was 01/03/24, with the laboratory reporting that the following were analysed outside of holding time: pH in water	Recommended holding for pH in water is stated "This analyte should be determined in the field, these tests will not be measured for compliance to holding time but are analysed on receipt". Analysis was completed on day 3 so the analysis was calculated as outside of the recommended period.

A.5 DATA USEABILITY

The data validation procedure employed in the assessment of the field and laboratory QA/QC data and shown above and in **Table 1A** and **Table 2A**and have indicated that the reported analytical results are representative of the conditions at the sample locations and that the analytical data can be relied upon for the purpose of these works. It is concluded that overall, the quality of the analytical data produced is acceptable and reliable for the intended purpose.

APPENDIX A

Figures

APPENDIX B

Photographic Log

APPENDIX C

Data Summary Tables

APPENDIX D

Geological Logs / Construction Details

APPENDIX E

Laboratory Certificates

APPENDIX F

Field Forms / Field Records

APPENDIX G

Calibration Certificates

APPENDIX H

Data Quality Assessment

APPENDIX H QAQC DATA QUALITY ASSESSMENT

A. FIELD QUALITY ASSESSMENT

Quality of field assessment is provided in **Table 1A** below.

Table 1A Data Quality Indicators

QA/QC Measure	Field Quality Indicator	Conformance
Precision: A quantitative measure of the variability (or reproducibility) of data	SOPs are appropriate and complied with.	Yes. Reusable equipment, where used, was decontaminated on site and rinsates collected / analysed to confirm the effectiveness of the decontamination procedure.
	Field duplicates and Blind field duplicates are collected and analysed at a rate of 5% (1 per 20 samples).	Yes, refer to **Table 3A** below.
	Use of calibrated equipment.	Yes, refer to **Appendix G**.
Accuracy: A quantitative measure of the closeness of reported data to the "true" value	SOPs are appropriate and complied with.	Yes, all fieldwork sampling techniques / methods were in accordance with Stantec's Standard Operating Procedures (SOP).
	Use of calibrated equipment.	Yes, refer to **Appendix G**.
	Field interlaboratory duplicates sampled and analysed at a rate of 1 per 20 samples.	Yes, refer to **Table 4A** below.
	<30% Relative Percentage Difference (RPD)	Refer to **Table 5A** below.
	Analysis of rinsate sample collected at rate of 1 per day.	Yes. Rinsate samples collected during both soil sampling and groundwater sampling.
	Trip spike and trip blanks were used.	Yes
Representativeness: The confidence (expressed qualitatively) that data are representative of each media present on site and the conditions encountered in the field	Appropriate media sampled.	Yes
	Preservation and storage of samples upon collection and during transport to the laboratory occurs.	Yes
	Sampling is undertaken by an experienced sampler.	Yes
Completeness: A measure of the amount of useable data from the data collected during the fieldwork program	All critical locations sampled.	Yes
	All samples collected (from grid and at depth).	Yes
	Standard operating practices (SOPs) appropriate and complied with.	Yes
	Sampling is undertaken by an experienced sampler.	Yes

QA/QC Measure	Field Quality Indicator	Conformance
	Suitable records of field work are documented.	Yes. See **Appendix F**.
	Completed laboratory sample chain-of-custody and documentation.	Yes. See **Appendix E**.
Comparability: The confidence (expressed qualitatively) that may be considered to be equivalent for each sampling and analytical event	Same SOP is used on each field occasion.	Yes
	Climatic conditions are documented.	Yes
	Experienced sampler	Yes
	Sample type, preservation and handling are consistent at sampling events.	Yes
	Use of calibrated equipment.	Yes. See **Appendix G**.

A.1 LABORATORY QUALITY ASSESSMENT

Quality of laboratory assessment is provided in **Table 2A** below.

Table 2A Data Quality Indicators

QA/QC Measure	Laboratory Quality Indicator	Conformance
Precision: A quantitative measure of the variability (or reproducibility) of data	Laboratory analyses of laboratory and inter-laboratory duplicates, field duplicates, laboratory prepared volatile trip spikes.	Yes. See **Appendix C** and **Appendix E**.
	Relative Percent Difference (RPD) calculation results: <30% Relative Percentage Difference (RPD).	Partly, refer to **Table 6A**. See **Appendix C**.
	The RPD values are calculated using the following equation: $RPD = \frac{\lvert C_O - C_R \rvert}{[(C_O + C_R) / 2]} \times 100$ Where, C_O = Analyte concentration of the original sample C_R = Analyte concertation of the duplicate sample	Yes. See **Appendix C**.
Accuracy: A quantitative measure of the closeness of reported data to the "true" value	Laboratory holds NATA-accreditation for the analyses.	Yes
	Laboratory limit of reporting is below the adopted investigation level.	Yes
	Laboratory analysis of: field blanks, rinsate blank, reagent blank, method blank, matrix spike, matrix spike duplicate, surrogate spike, reference material, laboratory control sample, laboratory-prepared spikes. The nominal	Yes

QA/QC Measure	Laboratory Quality Indicator	Conformance
	acceptance limits on laboratory control samples are: Laboratory spikes: 70-130% recovery for metals 60-140% for organics Laboratory duplicates. If contaminant concentration is: < 10 x PQL, no RPD limit 10-20 x PQL, RPD is 0% to 50% >20 x PQL, RPD is 0% to 20% Laboratory surrogates: 60-140% recovery. Laboratory blanks: <PQL	
	Laboratory control samples, 70-130% recovery	Yes
Representativeness: The confidence (expressed qualitatively) that data are representative of each media present on site and the conditions encountered in the field	Blank samples run in parallel with field samples to confirm there are no unacceptable instances of laboratory artefacts.	Yes
	Review of RPD values for field and laboratory duplicates to provide an indication that the samples are generally homogeneous, with no unacceptable instances of significant sample matrix heterogeneities	Yes, refer to **Table 6A**.
	The appropriateness of collection methodologies, handling, storage and preservation techniques will be assessed to ensure/confirm there was minimal opportunity for sample interference or degradation (i.e. volatile loss during transport due to incorrect preservation / transport methods).	Yes
	Rinsate samples used when sampling equipment is reused have analytical results <LOR.	Yes. See **Appendix C**.
Completeness: A measure of the amount of useable data from the data collected during the fieldwork program	All critical samples are analysed according to the SAQP.	Yes
	All COPC are analysed.	Yes
	Appropriate methods and PQLs are implemented.	Yes
	Sample documentation is complete.	Yes. See **Appendix F**.
	Samples are analysed within holding times.	Yes
Comparability: The confidence (expressed	Sample analytical methods used (including clean-up)	Yes

QA/QC Measure	Laboratory Quality Indicator	Conformance
qualitatively) that may be considered to be equivalent for each sampling and analytical event	Sample PQLs (justify/quantify if different)	Yes
	Same laboratories are used and justification is given where differences occur.	Yes
	Same analytical methods, Practical Quantification Limits (PQLs), and units of measurement are used.	Yes

The QA/QC samples collected during the sampling program are summarised below in **Table 3A** including inter- and intra-laboratory duplicate pairings. Relative Percentile Differences between primary and duplicate samples are presented in the data summary tables in **Appendix C**.

Table 3A Summary of Field Inter/Intra Laboratory Duplicates

Sample Type	Matrix	Primary Sample	Laboratory Duplicate	Inter-lab Replicate
Field Replicates	Soil	TP115_0.1	QA111	QC111
	Water	BH02	QA200	QC200
		BH02	QA300	QC300

A.2 REPLICATE SAMPLES

With the exception of the RPD exceedances noted in **Table 4A**, all RPD results were within the acceptance criteria nominated in **Table 6-1**. The variation between samples is generally minor and likely the result of heterogeneity within the soil profile. Further to this, the exceedances noted are not considered to impact the suitability of the report findings as generally, results were either both above or below criteria and replicate results have been considered as primary results for the purposes of establishing site suitability and risk to receptors.

Table 4A RPD exceedances summary

Primary Sample	Replicate Sample	Analyte	Primary Result (mg/kg)	Replicate Result (mg/kg)	RPD (%)
Soil					
TP115_0.1	QC111	Arsenic	11	4	93
		Chromium (III+VI)	19	7.8	84
		Copper	15	8.4	56
		Lead	24	15	46
		Nickel	16	5.5	98
		Zinc	66	29	78
		Benzo(a)pyrene TEQ (Half LOR)_1	0.6	<0.2	100

		Benzo(a)pyrene TEQ (Full LOR)	1.5	<0.3	120
Water					
BH02 18th January 2024	QA200	Sum of WA DWER PFAS (n=10)*	0.021	0.037	55
		Sum of US EPA PFAS (PFOS + PFOA)*	0.001	0.002	67
		Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.001	0.002	67
	QC200	Chromium (III+VI)	3	2	40
		Chromium (III+VI) (filtered)	<1	2	67
		Copper (filtered)	2	3	40
		Lead	1	2	67
		Sum of PFAS	0.021	<0.006	111
		Sum of PFHxS and PFOS	0.001	0.0003	108
BH02 27th February 2024	QC300	Methane	950	230	122

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

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APPENDIX I

Ground Gas Protection System – Conceptual Advice

BGL Nominees Pty Ltd
ABN: 77 632 687 515
1/44 Orbis Drive, Ravenhall VIC 3023
Ph: 0407 092 230

12 June 2024

Stantec
Level 9, The Forum
203 Pacific Highway
Sydney NSW 2065

Via Email: Darren Hanvey – Senior Principal Environmental Engineer (darren.hanvey@stantec.com)

c.c: Mitch Blencowe – Principal Environmental Scientist (mitch.blencowe@stantec.com)

Ben Hetherington (ben.hetherington@stantec.com)

Dear Darren,

Project: Ground Gas Protection System (GGPS) – Conceptual Advice
Bomaderry BTR
53 & 57 Bolong Road and 4 Beinda Street, Bomaderry NSW 2541

1. Introduction

This letter has been prepared to a consider conclusions drawn by Stantec with respect to site specific ground gas issues at the abovementioned site and whether mitigation is feasible. Based on the information provided by Stantec, BGL provide commentary on conceptual solutions to be considered as part of detailed design.

2. Background

The following summary of information was provided to BGL via email, noting that reporting is still under development:

- Maximum methane of 2.8% v/v was measured in GG3 while a lesser concentration of 1.9% v/v was measured in BH04. Both of these wells are located on the eastern side of the site. Methane in all other monitored wells was generally below 0.1% v/v.
- Maximum carbon dioxide of 11.4% v/v was measured in BH04 while a lesser concentration of 10% v/v was measured in GG3. It is considered that a natural background carbon dioxide of at least 4% v/v is present at the site and this would result in a criteria in the order of 5.5% v/v in the subsurface. The additional carbon dioxide in BH04 and GG3 may be a result of natural attenuation of methane to carbon dioxide in the presence of oxygen in the shallower environment.
- Maximum carbon monoxide of 344 ppm was measured in GG3 while a lesser concentration of 37 ppm was measured in GG1. The carbon monoxide in GG3 reached its peak within 9 days of well installation and then diminished to generally less than 25 ppm within an additional 5 days. This data indicates an introduced carbon monoxide as part of the well drilling process with stable carbon monoxide within a normal range of less than 10 ppm.

BELOW GROUND LEVEL

- Maximum hydrogen sulfide of 49 ppm was measured in GG3 while no other monitoring well recorded hydrogen sulfide greater than the detection limit of the equipment (1 ppm). The semi-continuous monitoring data in GG3 indicated a maximum hydrogen sulfide concentration of 4 ppm. During groundwater sampling, hydrogen sulfide odours were noted in BH02 (very strong to strong), BH04 (slight), and GG3 (slight).
- The elevated flow rates measured in the wells may be attributable to groundwater fluctuations observed during monitoring following significant storm events, and as such are not considered representative of likely sustained gas flows from the ground.

The following drawings were provided to BGL for consideration:

- St. Clair Architecture (5 January 2024) Site & Roof Plan – Preliminary Issue
- Stantec (11 April 2024) Site and Sampling Plan – REV 6

3. BGL Comments For Consideration

Based on the background information, BGL provide the following for consideration:

- The available published guidance for design and verification of gas protection measures at the site are as follows:
    - *NSW EPA (2020) Contaminated Land Guidelines: Assessment and Management of Hazardous Ground Gases*
    - *BS8485:2015 + A1:2019 Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for New Buildings*
    - *CIRIA C735 (2014) Good Practice on the Testing and Verification of Protection Systems for Buildings against Hazardous Ground Gas*
- The reported Contaminants of Concern (CoC) and their associated concentration indicates that the site may be assigned a Site Characteristic Situation (CS) score of CS2 or CS3 when considering NSW EPA (2020) provided flow rates are within the typical ranges seen on similar sites (naturally occurring ground gas)
- The guidance provides a framework for a point scoring system, however, additional site specific assessment should consider the risk profile to the site and its future occupants:
    - This considers what the protection levels are and how they will be successfully integrated into the built form
- Consideration for sub-slab ventilation and/or an independently tested gas membrane are commonplace to the presented risk profile at the site and BGL provide an example cross section for illustrative purposes

BELOW GROUND LEVEL

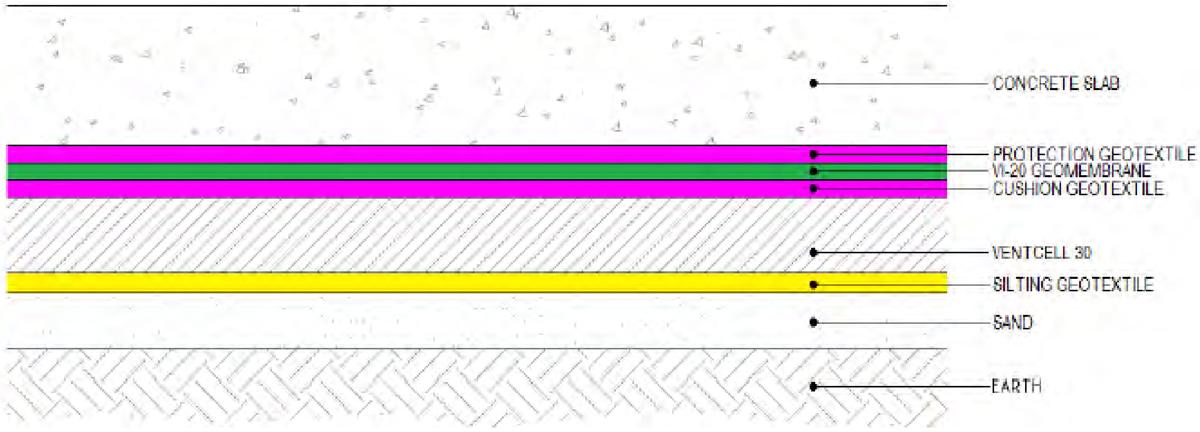

Figure 1 – Typical GGPS Cross Section

- These types of mitigation approaches have been performed within the Australian market over the last 20 years and can be integrated into the built form without significant changes to the building design
- BGL encourage early consultation with the development of working drawings in the interest of generating the highest level of protection in a cost effective and time efficient manner
- The development of a detailed design and technical specification can only be generated upon provision of relevant information including but not limited to:
    - Environmental Investigations and any related reports to the condition of site
    - Geotechnical Investigation
    - Structural Design
    - Architectural Design (where sub-slab ventilation is considered)
    - Civil Design

4. Conclusions

This letter has been prepared to consider conclusions drawn by Stantec and determine whether risks associated with naturally occurring ground gases can be mitigated appropriately by design into the built form.

Based on the available information, BGL consider the scenario presented as typical of those we commonly encounter and by adoption of similar protection measures to those outlined above, a solution can be integrated into the built form without significant change.

5. Closure

We trust that the foregoing meets your immediate requirements. However, if you have any queries or wish to discuss any points in greater detail then please do not hesitate to contact us.

Yours sincerely,

Michael Novak
BGL Nominees Pty Limited
0407 092 230
michael@belowground.com.au