

T&P CHIMES DEVELOPMENT PTY LTD



Hydrogeological Report including Dewatering Management Plan and Groundwater Seepage Analysis

45-53 Macleay Street, Potts Point NSW

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1. INTRODUCTION

1.1 Background and Purpose

EI Australia (EI) was engaged by T&P Chimes Development Pty Ltd ('the client') to prepare a Hydrogeological Report including Dewatering Management Plan and Groundwater Seepage Analysis (the 'report') for 45-53 Macleay Street, Potts Point NSW ('the site').

The site is located approximately 1.5 km east of the Sydney central business district (CBD), within the Local Government Area of City of Sydney Council (**Figure A1, Appendix A**). The site is also identified as Strata Plan (SP) 934, and covers a total area of 1,289 m² (**Figure A2**). At the time of the investigation, the site was occupied by a 12-storey residential flat building comprising 80 studio apartments, and associated car parking.

Based on the provided documents and conversations with the Client, EI understands that the proposed development involves the demolition of the existing site structures and the construction of a sixteen-storey residential development overlying a four-level basement. As the proposed basement will likely intercept groundwater, site dewatering will be required for basement construction. Groundwater drawn into the dewatering system is proposed to be treated to comply with relevant water quality criteria for subsequent discharge into the local municipal stormwater system, subject to Council approval.

Hydrogeological conditions, including baseline groundwater quality and pre-dewatering groundwater levels, are described in **Section 3**, with tabulated field-based and laboratory data presented in **Appendix B**.

Due to characteristically low hydraulic conductivity of the water bearing lithology a drained basement design is proposed for long-term dewatering during the operational phase of the development, as detailed in **Section 4**. Discharge water quality trigger levels, water treatment, monitoring and reporting requirements are described **Section 5**, with tabulated management controls and dewatering contingency measures in **Section 6**.

Cumulative drawdown and water quality effects from long-term dewatering are assessed against the NSW Aquifer Interference Policy (AIP) in **Section 7**. Findings are reviewed for relevant factors including groundwater utility, ground settlement potential and water treatability, to demonstrate that the proposed drained basement would meet the minimal impact considerations, as described in the AIP.

The main purpose of this report is to describe groundwater conditions and management in order to achieve compliance with the requirements of Council and WaterNSW for construction phase and operational phase dewatering.

1.2 Proposed Development

Based on the proposed development plans (**Appendix C**), the development will involve the demolition of the existing site structures and the construction of a sixteen-storey residential development overlying a four-level basement. The lowest basement level is assumed to have a Finished Floor Level (FFL) of RL 15.2 m AHD. A Bulk Excavation Level (BEL) of RL 14.9 m AHD is assumed, which includes allowance for the construction of the basement slab. To achieve the BEL, excavation depths to 13 m Below Existing Ground Level (BEGL) is assumed, as documented in the Groundwater Seepage Analysis report (the 'GSA report'), attached in **Appendix D**. Locally deeper excavations may be necessary for footings, services trenches, crane pads, and lift overrun pits.

The completed basement will be draining structure that will be dewatered using a sump-and-pump seepage collection system for the occupational phase of the project.

1.3 Report Objectives

The objectives of this report are to:

- Describe the conceptual hydrogeological model for the site and summarise baseline groundwater conditions, including pre-dewatering groundwater depth and groundwater quality;
- Summarise relevant hydrogeological and groundwater modelling information, with reference to the GSA report;
- Describe the dewatering methodology, groundwater treatment requirements, monitoring and reporting procedures to be employed during construction phase dewatering;
- Provide effective management and contingency procedures, to ensure that dewatering discharge does not pose unacceptable risks to the receiving environment, in compliance with the *Protection of the Environment Operations Act 1997*;
- Detail post-construction monitoring and reporting procedures for the occupational phase of the development; and
- Provide relevant information on anticipated groundwater impacts, with reference to the NSW Aquifer Interference Policy to properly inform the regulatory approval process.

This report will form the basis for a Council permit application for connection and discharge to the municipal stormwater system and a water supply works (dewatering licence) application to WaterNSW and the Department of Climate Change, Energy, the Environment and Water (DCCEEW).

1.4 Scope of Work

With reference to the above report objectives, the following works were undertaken:

- A desktop study including:
 - › Review of the development proposal and proposed shoring/dewatering designs;
 - › Review of hydrogeological, landscape and acid sulfate soil risk maps for the area;
 - › Review of previous investigation reports and plans, which included:
 - o A search of registered bores located within a 500 m radius of the site to review local groundwater usage;
 - o Onsite drilling data, including sub-surface stratigraphic data and depth to water bearing zones;
 - o Potential onsite and offsite sources of contamination that may impact on dewatering discharge water quality and the beneficial use category of the groundwater source, particularly in relation to any local water supply bores.
- Groundwater monitoring event (GME), including sampling of existing monitoring wells and laboratory analysis for relevant analytical parameters to characterise baseline groundwater quality.
- Interpretation of groundwater quality results in relation to the relevant water quality criteria for the expected receiving waters.

This report also relies on information provided in the GSA report, which includes the findings from field-based hydraulic testing and computer-based groundwater modelling used to determine predicted groundwater take volumes and provide estimates for associated water level drawdown effects. GSA details and findings are incorporated into various parts of this report.

1.5 Regulatory Framework

The following regulatory framework and guidelines were considered during the preparation of this report:

Table 1-1 Regulatory Framework

NSW Legislation and Regulatory Instruments	Requirements / Objectives
<i>Contaminated Land Management Act 1997 (CLM Act)</i>	Promotes the effective management of contaminated land in NSW by setting out the roles and responsibilities of the NSW EPA and its rules.
<i>Environmental Planning and Assessment Act 1979 (EP&A Act)</i>	The EP&A Act stipulates the regulations and gives rise to state environmental planning policy (SEPP) to assist regulators with the protection of human and environmental health.
<i>Protection of the Environment Operations Act 1997 (POEO Act)</i>	The objective of the <i>POEO Act</i> is to achieve the protection, restoration and enhancement of the quality of the environment.
<i>NSW Water Management (General) Regulation 2018.</i>	Details relating to Water Access License requirements, if relevant.
<i>Water Management Act 2000 and Water Act 1912 (WM Act)</i>	Protects the health of rivers, streams and groundwater systems and gives rise to Water Sharing Plans and quality objectives for catchments within the state of NSW. Manages aquifer interference activities which involve: ▪ The penetration of an aquifer; ▪ The interference of water in an aquifer; ▪ The obstruction of water flow or taking of water from an aquifer when carrying out prescribed activities; and ▪ The disposal of water taken from an aquifer.
<i>NSW Aquifer Interference Policy (2012)</i>	Details the scope of aquifer interference activities, minimal impact assessment and provides specific guidance on the licensing and approval requirements for activities that interfere with aquifers.
Mosman Municipal Council Plans and Policies	Provides controls and guidelines for development in the area. Sydney Development Control Plan 2012; and Sydney Local Environmental Plan 2012. <u>Note:</u> For projects involving site dewatering, Council typically requires details for the proposed water disposal connection to the stormwater system, preferably in the form of engineering drawings and plans.
Relevant Guidelines (but not limited to)	▪ ANZG (2018) <i>Guidelines for Fresh and Marine Water Quality</i>; ▪ ANZECC & ARMCANZ (2000) <i>Guidelines for Fresh and Marine Water Quality, Vol. 1, Chapter 3, Aquatic Ecosystems</i>; ▪ DPE (2022) <i>Minimum requirements for building site groundwater investigations and reporting</i>; ▪ NHMRC (2008) <i>Guidelines for Managing Risks in Recreational Water</i>; and ▪ NSW DEC (2007) <i>Guidelines for the Assessment and Management of Groundwater Contamination</i>.

2. SITE DESCRIPTION

2.1 Property Identification, Location and Physical Setting

Site identification details and associated information are summarised in **Table 2-1**. Figures illustrating the site location and assessment area are provided in **Appendix A**.

Table 2-1 Site Identification, Location and Zoning

Attribute	Description
Street Address	45-53 Macleay Street, Potts Point NSW
Location Description & surrounding land uses	Approx. 1.6 km east of the Sydney CBD, bound by Macleay Street residential to the east, McDonald Lane to the west, McDonald Street to the north, residential and commercial land uses to the south. Neighbouring land use is described further in Section 2.2 .
Lots and DPs	SP3934
Site Area	1,289 m ² (Figure A2, Appendix A)
Site Coordinates	Northern-eastern corner of site (GDA2020-MGA56): ▪ Easting: -33.86839 ▪ Northing: 151.22548 (Source: https://maps.six.nsw.gov.au/)
LGA	City of Sydney Council
Current Zoning	MU1: Mixed Use (<i>Sydney Local Environmental Plan 2012</i>)
Current Site Use	At the time of investigation, the site was occupied by a ten-storey residential apartment building including paved common areas used for access and resident vehicle parking. An under-croft parking was located beneath the residential building, which provided access to the upper floors of the apartment. Basement was not observed during the inspection.

2.2 Surrounding Land Use

The site is situated within a residential and commercial area, as indicated in **Table 2-2**.

Table 2-2 Local Land Use

Direction	Land Use Description
North	Residential and commercial properties and department of Defence facility (HMAS Kuttabul)
South	Residential and commercial properties and three dry cleaners (Challis Avenue Laundry & Dry Cleaning, Macleay Street Laundrette and Potts Point Dry Cleaners & Laundry)
East	Residential and commercial properties and Elizabeth Bay
West	Residential properties and Woolloomooloo Bay

2.3 Regional Setting

A description of the regional environmental setting, including ground surface topography, hydrogeology, acid sulphate soil conditions and soil landscape, are summarised in **Table 2-3**.

Table 2-3 Environmental Setting Information

Attribute	Description
Topography	Based on spot elevations shown on the site survey plan (Appendix C), the ground slopes from east to west, with elevations ranging from 27 mAHD (north-east corner) to 29 mAHD (south-west corner).
Site Drainage	Consistent with the ground slope, rainfall is expected to drain west into Elizabeth Bay (approximately 180m east of the site), into Sydney Harbour.
Regional Geology	Information on regional sub-surface conditions, referenced from the <i>Sydney 1:100,000 Geological Series Sheet</i> (Herbert, 1983) indicates the site to be underlain by Hawkesbury Sandstone, which is characterised as medium to coarse grained quartz sandstone, with minor shale and laminate lenses.
Soil Landscape	The <i>Sydney 1:100,000 Soil Landscapes Sheet</i> (Chapman and Murphy, 1989) indicates the local area is situated on Gynea (gy) erosional landscape developed on undulating to rolling rises and low hills on Hawkesbury Sandstone. Local relief 20-80m slopes 10-25%. Rock outcrop <25%.
Acid Sulfate Soils (ASS) Risk	According to the <i>Acid Sulfate Soils Risk Mapping</i> (DCCEEW, 2024) indicates the subject land lies within an area having 'No Known Occurrence'. According to NSW Planning Portal search results, the subject land is subject to 'class 5' with respect to ASS outlined in Sydney LEP 2012 (NSW Legislation, 2025). Class 5 ASS land indicates that development consent is required to carry out: - Works within 500m of adjacent Class 1, 2, 3 or 4 land that is below 5m Australian Height Datum; and - Works by which the watertable is likely to be lowered below 1m Australian Height Datum on adjacent Class 1, 2, 3 or 4 lands. As the site is underlain by Hawkesbury Sandstone, "land management activities are not likely to be affected by ASS materials."
Nearest Water Feature	The nearest, primary receiving water body is Elizabeth Bay (approximately 170m east of the site), which forms a part of the Sydney Harbour.
Groundwater Flow Direction	Groundwater is anticipated to flow in an easterly direction, towards Elizabeth Bay, Sydney Harbour.

2.4 Local Groundwater Use

An online search for groundwater bores registered with WaterNSW was conducted on 21 October 2025 (Ref. <https://realtimedata.waternsw.com.au/water.stm>). The search identified one registered bore recorded within an approximate 500 m radius of the site, as summarised in **Table 2-4**. The bore was drilled to 2.0 mBGL by manual auger method and is designated for domestic water supply purposes. The marked-up registered bore location plan and relevant, archived bore record sheets are attached in **Appendix E**.

Given the distance/location of the bore in relation to the site, the risk of adverse impacts in regards to potential drawdown effects as a result of site dewatering was considered to be low. Potential dewatering impacts are assessed further, with reference to the NSW Aquifer Interference Policy, in **Section 7**.

Table 2-4 Summary of Registered Groundwater Bores within 500m of the site

Bore	Date Drilled	Drilled Depth (m)	SWL (mBGL)	Purpose	Distance / direction from site (m)
GW106471	22/11/2004	2.00	-	Domestic	185 m east

2.5 Potential Sources of Contamination

The site is located in a predominately commercial area with Sydney Harbour to the north, Woolloomooloo Bay to the west, and Elizabeth Bay to the east.

Potential contamination sources as noted from the JK Environments reports (JK, 2025a JK2025b, 2025c) were as follows:

2.5.1 Potential onsite sources

- Potential fill materials of unknown origin and quality, used to grade and level the site;
- Application of pesticides around building (footing) perimeters;
- Leakage from vehicles in parking areas and along the drive way; and
- Weathering of hazardous building materials (including ACMs, lead-based paint and metallic surfaces), present within/on the fabric of existing site structures;

Potential contamination attributed to imported fill materials and application of pesticides will be removed during bulk excavation for basement construction. Therefore, the potential for residual onsite contamination to impact water quality is deemed to be low.

2.5.2 Potential offsite sources

The site is located in an area that is predominantly used for residential and commercial purposes. JKE (2025a) reported former dry-cleaning businesses (operating from 1948 – 1993), to the south (i.e. up-hydraulic gradient) of the site, which were deemed to be potential off-site contamination sources. The closest dry cleaner was located approximately 60m to the south of the site.

Due to the absence of groundwater supply bores between the potential contamination sources and the proposed dewatering activity, the risk of groundwater quality deterioration of the groundwater source due to dewatering was therefore concluded to be low. Notwithstanding, the design of the water treatment system at the site dewatering activity should be mindful of, and able to respond to the potential detection of petroleum hydrocarbons and/or chlorinated solvent (dry cleaning) chemicals, should they be discovered at significant concentrations during dewatering monitoring. This is addressed under the contingency measures in **Section 6.5**.

2.6 Potential Environmental Receptors

It is assumed that water extracted from the site during the construction dewatering phase will be pumped through an onsite water treatment system, if found to be required on the basis of groundwater quality monitoring (as described in **Sections 3.4.9** and **5.5**). Treated water may then be discharged into the local municipal stormwater system, which is expected to drain into Sydney Harbour. Sydney Harbour is deemed to be a disturbed marine ecosystem for discharged water quality considerations, as described in **Section 5.2**.

2.7 Groundwater Dependent Ecosystems

A search of the NSW Water Sharing Plan for the Greater Metropolitan Region groundwater Sources 2023 – Schedule 4 was conducted on 20 October 2025. Elizabeth Bay is not listed as a high priority groundwater dependent ecosystem (GDE) on Table D of the plan and no other high priority GDE was listed within 40 m of the site.

This information is used in the minimal harm assessment considerations under the NSW Aquifer Interference Policy, as described in **Section 7**.

3. GROUNDWATER CONDITIONS

3.1 Previous Investigations

Previous site investigations have been documented in the following reports:

- JK (2023) *Geotechnical Investigation; 45-53 Macleay Street, Potts Point, NSW*, JK Environmental Ref. E34303Brpt, 12 September 2023 (the 'GI report');
- JK (2025a) *Preliminary Site Investigation; 45-53 Macleay Street, Potts Point, NSW*, JK Environmental Ref. E34303Brpt.Rev1, 12 February 2025 (the 'PSI report');
- JK (2025b) *Detailed Site Investigation; 45-53 Macleay Street, Potts Point, NSW*, JK Environmental Ref. E34303Brpt3.Rev2-DSI, 13 February 2025 (the 'DSI report');
- JK (2025c) *Remedial Action Plan; 45-53 Macleay Street, Potts Point, NSW*, JK Environmental Ref. E34303Brpt4.Rev2-RAP, 12 February 2025 (the 'RAP report');
- EI (2025a) *Groundwater Level Monitoring Report No. 1; 45-53 Macleay Street, Potts Point, NSW*, EI Australia, Ref. E26863.G11.GW02, 10 November 2025; and
- EI (2025b) *Groundwater Seepage Analysis; 1; 45-53 Macleay Street, Potts Point NSW*, EI Australia Ref. E26863.G12, 11 November 2025 (the 'GSA report');

Three groundwater monitoring wells (BH/MW1, BH/MW2 and BH/MW3), were installed as part of JK's Geotechnical Investigation (2023). Two additional groundwater monitoring wells (BH101M and BH102M), were installed by EI to provide data for EI's Groundwater Level Monitoring Report, as reported in EI (2025a) and (2025b). Monitoring well construction logs are presented in **Appendix F**.

The reports were reviewed and a brief summary of findings is outlined as follows:

- **JK (2023) Geotechnical Investigation** - aimed at informing the development design, the works included the drilling of three boreholes and groundwater monitoring wells screening the bedrock between 1.12m to 15.12m (BH1), 1.28m to 11.28m (BH2) and 1.0m to 11.0m (BH3).
- **JK (2025a) Preliminary Site Investigation** - This investigation was performed to assess the potential for contamination at the site. No visual or olfactory signs of contamination were identified during the site walkover inspection. A detailed Site Investigation (DSI) was recommended to characterise potential contamination.
- **JK (2025b) Detailed Site Investigation** - The works included soil sampling from nine locations, including seven boreholes and two test pits, soil vapour sampling from five sub-slab vapour pins and groundwater sampling from three monitoring wells (BH1, BH2 and BH3). Groundwater results indicated that heavy metals and low concentrations of benzene were detected, and the potential for migration of groundwater impacted by chlorinated solvents from the drycleaner located approximately 60m to the south of the site is low. The DSI concluded that site remediation will be required in relation to carcinogenic PAHs and TRHs in soil.. Additional investigation was also necessary to address outstanding data gaps.

- **JK (2025c) Remedial Action Plan** – The RAP was prepared to guide the management of fill contaminated with Carcinogenic PAHs and TRHs at two locations. The metals and benzene detected during the DSI were considered unlikely to pose an unacceptable risk.
- **EI (2025c) Groundwater Monitoring Report No.1** - The purpose of the report was to provide continuous groundwater level data for the monitoring period 5 August 2025 to 2 September 2025, using data loggers installed within monitoring wells BH1, BH101M and BH102M. A copy of the groundwater monitoring report is attached with the GSA report in **Appendix D**.
- **EI (2025d) Groundwater Seepage Analysis** - The GSA report was prepared by EI's geotechnical engineering group and provided details of the proposed excavation and site-specific groundwater modelling findings, including predicted groundwater level drawdowns, expected groundwater inflow and discharge volumes, and predicted, drawdown-induced ground settlement rates at varying distances from the basement excavation perimeter.

3.2 Conceptual Hydrogeological Model

Based on the findings of previous investigations, the conceptual hydrogeological model for the site is summarised as follows:

- Subsurface soil profile comprising:
 - Concrete: 0.16 to 0.20 in thickness; overlying
 - Fill (gravelly sand), down to 0.43 mBGL; overlying
 - Bedrock (sandstone), with top of bedrock occurring at between 0.40 and 0.43 mBGL.
- Groundwater in the bedrock is under pressure with standing water levels (SWLs) ranging between 19.70 and 25.92 mAHD, as measured in monitoring wells located outside of the proposed basement excavation footprint areas (see **Section 3.3**).
- Based on rising head tests completed at each onsite monitoring well, hydraulic conductivities of the sandstone bedrock were calculated as follows:
 - Sandstone Bedrock at BH1M – 4.00×10^{-8} ;
 - Sandstone Bedrock at BH101M – 1.70×10^{-8} m/s; and
 - Sandstone Bedrock at BH102M – 7.97×10^{-8} m/s.
- Groundwater flow is predominantly moving through the sandstone bedrock along bedding planes, joints and fractures. Flow direction and hydraulic gradient during high and low groundwater levels is assessed in **Section 3.3**.

3.3 Pre-Dewatering Groundwater Depth and Hydraulic Gradient

Over three months of continuous groundwater level monitoring was carried out at wells BH1, BH101M and BH102M from 5 August 2025 to 5 November 2025 (EI, 2025c). Monitoring results were reported as hydrographs with rainfall data overlays, as shown in an appendix to the GSA report (see **Appendix D**). The highest and lowest groundwater levels recorded at each well during the continuous water level monitoring period are summarised in **Table 3-1**. The maximum and minimum recorded levels for the monitoring period are highlighted as bold text values.

Groundwater level data for all three monitoring wells as at the timing of the maximum and minimum groundwater levels (as recorded during the three month monitoring period), were used to produce the groundwater contour maps presented in **Figure A3, Appendix A**. The analysis showed that:

Table 3-1 Summary of 3-month Groundwater Monitoring Results

Well ID	Average Groundwater RL (mAHD) ¹	Highest Groundwater RL (mAHD) / Date / Time	Lowest Groundwater RL (mAHD) / Date / Time	Contoured Groundwater Levels	
				Water depth at High GW (m AHD) ²	Water depth at Low GW (m AHD) ³
BH1	25.51	25.92 21.08.25 / 6:15pm	25.28 07.08.25 / 3:00pm	25.92	25.34
BH101M	21.16	21.55 28.08.25 / 8:45am	20.81 05.08.2025 5:15pm	21.16	21.21
BH102M	19.45	19.70 12.08.2025 / 8:15am	19.08 01.09.25 / 11:30pm	19.28	19.08

Note 1 – The average groundwater RL, as calculated for the recorded groundwater levels at each well, for the 3-month continuous groundwater level monitoring period.

Note 2 - The groundwater RL, at each well, for the exact time that the highest groundwater level was recorded during the continuous monitoring period.

Note 3 – The groundwater RL, at each well, for the exact time that the lowest groundwater level was recorded during the continuous monitoring period.

- The highest recorded groundwater level occurred at BH1 at 6:15 pm on 21 August 2025. Based on the contour analysis for water levels at this time, groundwater was inferred to be flowing in a south-east direction, under a hydraulic gradient of 0.39.
- The lowest recorded groundwater level occurred at BH102M at 11:15 pm on 1 September 2025. Based on the contour analysis for water levels at this time, groundwater was also inferred to be flowing in a south-east direction, under a hydraulic gradient of 0.37.

Groundwater level monitoring data showed no significant variation over the monitoring period, with water levels remaining close to the initial groundwater level as indicated in the hydrographs, included with the water level monitoring report. High (50mm to >95mm) rainfall events occurred around 10 August, 21 August and 14 September which caused minor groundwater level responses at monitoring well BH1, but no significant response at the other two wells, and flow direction remained unchanged throughout the period. It was therefore concluded that groundwater levels and flow direction did not vary significantly in response to short-term storm events.

As discussed in the GSA report, a design groundwater level of RL 26.9 m AHD was adopted for analysis of groundwater seepage inflow rates and groundwater seepage volumes within the basement excavation. This value was conservatively set at around 1.0 m above the highest recorded level to allow for potential seasonal groundwater level fluctuations, which was deemed to be reasonable based on EI experience of groundwater level fluctuations on other sites with similar hydrogeological conditions, within this part of the Sydney region.

No other construction dewatering activities were observed to be taking place in the vicinity of the site during baseline groundwater level monitoring. As draining basements may already exist at nearby properties, the determined design groundwater levels were considered to be indicative of ambient groundwater levels inclusive of any cumulative groundwater level declines that may have occurred as at the time of the assessment.

3.4 Baseline Groundwater Quality Assessment

3.4.1 Monitoring Well Locations

The data used for the baseline groundwater quality assessment was sourced from the results of the most recent GME carried out on 16 October 2025, as reported below. The samples were collected from monitoring wells originally installed by **JK (2023)** (BH/MW1, BH/MW2, and BH/MW3), which are referred to in this section as MW1, MW2, and MW3. All well locations are illustrated on **Figure A2**.

3.4.2 Sampling, Analysis and Quality Plan

The sampling, analytical and quality plan (SAQP) ensured that the data collected were representative of ambient groundwater at each respective sampling point and provided a robust basis for assessment decisions. The SAQP for the baseline GME included consideration of the following:

- Data quality objectives (DQO), including a summary of the objectives of the GME;
- Data quality indicators (DQI), applied to the field and laboratory quality control samples;
- Sampling methodology, including the wells to be sampled (sampling points), screening procedures, handling, preservation and storage, and details of the analytes to be monitored;
- Laboratory analysis methods;
- Appropriate water quality assessment criteria; and
- Analytical quality assurance / quality control (QA/QC).

3.4.3 Data Quality Assessment

Laboratory chain-of-custody, sample receipt documentation, internal laboratory QA/QC data and laboratory analytical reports are attached in **Appendix G**. A data quality assessment in relation to field water quality tests and laboratory QA/QC is provided in **Appendix H**. EI's data validation process found that the overall quality of field-based and laboratory analytical data produced for baseline groundwater samples were of an acceptable standard for interpretive use.

3.4.4 Groundwater Sampling Methodology

The groundwater sampling methodology followed during the most recent GME is described in **Table 3-2**.

Table 3-2 Summary of Groundwater Sampling Methodology

Activity/Item	Details
Fieldwork	One GME was conducted on 16 October 2025 at the monitoring wells (MW1, MW2 and MW3 formerly BH1, BH2 and BH3, respectively). Field work involved water level gauging followed by: well purging, on-site measurement of physiochemical water quality parameters and groundwater sampling, as described below.
Well depth and screen interval	▪ MW1(formerly BH1): total well depth 8.37 m BGL, screening 1.12m to 15.12m; ▪ MW2 (formerly BH2): total well depth 7.13 m BGL, screening 1.28m to 11.28m; and ▪ MW3 (formerly BH3): total well depth 10.62 m BGL, screening 1.0m to 11.0m. Monitoring bore logs are presented in Appendix F.
Well Gauging	Monitoring wells were gauged to determine standing water level (SWL) prior to groundwater purging and sampling. Gauging was conducted with a water/oil interface probe to assess for the presence of light non-aqueous phase liquid (LNAPL).

Activity/Item	Details
Well Purging, Water Quality Measurements and Sampling	After water level gauging, wells were purged of stagnant groundwater and representative groundwater was then sampled by low-flow / minimal draw-down method, using a peristaltic pump with dedicated tubing. During the well purging process, continuous field measurements were obtained for water temperature (Temp), electrical conductivity (EC), reduction-oxidation potential (Redox), dissolved oxygen (DO) and water pH, using a <i>Hanna Multi Parameter 9829</i> probe positioned within an open flow-through cell. Once water quality parameters stabilised (i.e. within $\pm 10\%$ for DO, $\pm 3\%$ for EC, ± 0.05 for pH, $\pm 0.2^\circ$ for temperature and $\pm 20\text{mV}$ for Redox), the measured values were recorded. Groundwater sampling was then undertaken by diverting the outlet of the pump (immediately before the flow cell) to the sampling vials and bottles for sample collection.
Decontamination Procedure	Sampling equipment (interface probe and water quality kit probes) were decontaminated between sampling locations by washing in a solution of potable water and Decon 90, followed by rinsing with potable water. Decontamination was not required for the sampling pump, as dedicated disposable tubing was used for sampling at each individual well. Dedicated gloves were used for the handling of equipment and collection of each sample.
Sample Preservation	Pre-preserved sample containers were supplied by the laboratory as follows: - one, 1 litre amber glass, acid-washed and solvent-rinsed bottle; - two, 40ml glass vials, pre-preserved with dilute hydrochloric acid and Teflon-sealed; - one, 250mL, HDPE bottle, pre-preserved with dilute nitric acid (1mL); - Additional bottles and preservatives were used for the more detailed suite of tested parameters, as listed and described in Section 3.4.5. Samples for metals analysis were field-filtered using 0.45 μm pore-size membrane filters. All containers were filled with sample to the brim then capped and stored in insulated chests (containing chilled and sealed 'ice' bricks), until completion of the fieldwork and during sample transit to the laboratory.
Sample Transport	After sampling, the chilled chests were transported to SGS Pty Ltd (SGS; the primary laboratory) using strict chain-of-custody (COC) procedures. Sample Receipt Advice (SRA) was provided by the laboratory to document sample condition upon receipt. Copies of the SRA and COC certificates are presented in Appendix G.
Quality Control (QC), Laboratory Analysis and Sample Transport	Groundwater samples were analysed by SGS for the requested analytes as detailed on the COC form. All samples were analysed within the required holding period, as documented in the corresponding laboratory reports (included in Appendix G). In addition to an inter-laboratory duplicate sample (analysed by Envirolab Services Pty Ltd, the secondary laboratory), QC analyses also included a blind (intra-laboratory) field duplicate sample that was analysed by SGS.

3.4.5 Tested Parameters

As summarised in **Table 3-3**, groundwater samples from wells MW2 and MW3 were analysed for a condensed, *Standard suite* of analytes; however, the sample from well MW1 was analysed for an extended *Baseline suite* of analytes, which included all mandatory groundwater quality test parameters listed under Appendix A of DPE (2022), plus a number of additional parameters selected by the EI investigation team for groundwater characterisation purposes.

In summary, the *Baseline test suite*, included:

- **Physical parameters:** Alkalinity (bicarbonate, carbonate, hydroxide and total), electrical conductivity (EC), pH, redox potential (Eh), total dissolved solids (TDS), total hardness, temperature, dissolved oxygen (DO);
- **Other physical parameters:** Turbidity (NTU), total suspended solids (TSS), total organic carbon (TOC), sodium absorption ratio (SAR);

- **Major anions:** Sulfate (SO₄), chloride (Cl), carbonates (CO₃), bromide (Br), fluoride (F);
- **Major cations:** Calcium (Ca), magnesium (Mg), sodium (Na), potassium (K);
- **Ionic balance:** Cation / anion balance (as a percentage);
- **Dissolved inorganics & metals:** Aluminium (Al), antimony (Sb), arsenic (As), barium (Ba), beryllium (Be), boron (B), cadmium (Cd), chromium (Cr), cobalt (Co), copper (Cu), iron (Fe), lead (Pb), lithium (Li), manganese (Mn), mercury (Hg), molybdenum (Mo), nickel (Ni), selenium (Se), silica (dissolved SiO₂), silver (Ag), strontium (Sr), uranium (U), vanadium (V), zinc (Zn);
- **Nutrients:** Ammonia (NH₃), nitrate (NO₃), total nitrogen (N), oxidised nitrogen (N), total phosphorus (P), reactive phosphorus (P);
- **Microbiological organisms:** Faecal coliforms, faecal streptococci, Escherichia coli;
- **Organics:** Benzene toluene ethylbenzene xylene (BTEX), polycyclic aromatic hydrocarbons (PAHs), total recoverable hydrocarbons (TRHs);
- **Other:** the following additional parameters were also analysed as part of the site characterisation process:
 - Volatile Organic Compounds (VOCs), including Chlorinated Volatile Organic Compounds (CVOC);
 - Total cyanide and total phenols; and
 - Perfluoroalkyl and polyfluoroalkyl substances (PFAS).

The *Standard test suite*, included:

- Physical parameters: pH, EC, TDS and Hardness.
- Dissolved metals: aluminium, arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc;
- Organics: TRHs, BTEX, PAHs, VOCs, SVOCs, chlorinated aliphatic compounds; and
- Total cyanide and total phenols.

Table 3-3 Summary of Groundwater Quality Test Parameters

Sampling Date	Monitoring Well	Testing
16/10/25	MW1 (formerly BH1)	Baseline suite
	MW2 (formerly BH2)	Standard suite
	MW3 (formerly BH3)	Standard suite

3.4.6 Assessment Criteria

Water quality results were assessed against discharge water criteria (the 'DWC') based on the default guideline values (DGVs) for marine ecosystems as published under ANZG (2018), and subsequent updates. These were the 95% Marine DGVs and 99% Marine DGVs for bio-accumulative toxicants (cadmium, mercury and benzo(a)pyrene). For parameters that are not currently addressed by the ANZG marine water DGVs, relevant alternative criteria were adopted, as detailed in **Section 5.2**.

The criteria values are presented alongside the groundwater analytical results in the corresponding summary tables (**Table B1** and **Table B2** in **Appendix B**).

3.4.7 Field-based Water Quality Testing and Observations

The field water quality parameters DO, pH, EC, Temperature and Redox potential, were measured onsite using a flow cell and recorded as presented in **Table 3-4**. The groundwater samples were also evaluated on the basis of odour and visual signs of contamination, with the following observations noted:

- Groundwater samples were observed to range in appearance from colourless to light brown, with low to moderate turbidity;
- No hydrocarbon odours or visual evidence of contamination were detected during well purging and groundwater sampling; and
- A portable photo-ionisation detector (PID) was used to screen the top of each well for VOCs and PID readings were low (<5ppm, i.e. less than background levels) at all three wells.

The field water quality data indicated that groundwater beneath the site is slightly acidic to near neutral (pH: 5.01 – 7.3), fresh in terms of water salinity (EC 240 – 638 $\mu\text{S}/\text{cm}$), oxygen depleted (DO: 2.33 – 3.27 mg/L) and under oxidising conditions, as indicated by the positive Eh values (273.5 – 333.9 mV).

Table 3-4 Groundwater Field Data (GME date: 16/10/2025)

Well ID	DO (mg/L)	pH	EC ($\mu\text{S}/\text{cm}$)	Temperature ($^{\circ}\text{C}$)	Eh ¹ (mV)
MW1	3.27	5.01	240	18.76	495.3
MW2	3.26	6.70	638	18.57	538.9
MW3	2.33	7.3	470	18.61	478.5

Notes:

DO – Dissolved Oxygen; EC – Electrical Conductivity;

¹ Eh (mV) values were calculated as field Redox adjusted to Standard Hydrogen Electrode (SHE) by adding field electrode potential (205mV).

3.4.8 Laboratory Analytical Results

Laboratory documentation is attached in **Appendix G**. With reference to the results summary tables presented as **Table B1** and **Table B2 (Appendix B)**, the results of the most recent GME (16 October 2025) showed groundwater concentrations are generally compliant with the discharge water criteria (DWC) in most samples, with the following exceptions:

- Aluminium concentration was above the DWC value (37 $\mu\text{g}/\text{L}$) in groundwater sampled at monitoring well MW1 (220 $\mu\text{g}/\text{L}$).
- Total Oxidised Nitrogen was above the DWC value (5 $\mu\text{g}/\text{L}$) in groundwater sampled at monitoring well MW3 (520 $\mu\text{g}/\text{L}$).
- Total Nitrogen was above the DWC value (120 $\mu\text{g}/\text{L}$) in groundwater sampled at monitoring well MW3 (1300 $\mu\text{g}/\text{L}$).
- Total Phosphorus was above the DWC value (25 $\mu\text{g}/\text{L}$) in groundwater sampled at monitoring well MW3 (570 $\mu\text{g}/\text{L}$).
- Filterable Reactive Phosphorus was above the DWC value (10 $\mu\text{g}/\text{L}$) in groundwater sampled at monitoring well MW3 (47 $\mu\text{g}/\text{L}$).
- Total recoverable hydrocarbons in the form of TRH C10 – C40 (360 $\mu\text{g}/\text{L}$) were detected using the silica gel clean-up method in groundwater sampled at MW1;
- Turbidity was above the DWC value (10 NTU) at all three monitoring wells: MW1 (64 NTU), MW2 (340 NTU) and MW3 (410 NTU); and

- Groundwater pH was outside the DWC range (6.5 – 8.4) at MW1 (field pH: 5.8).

3.4.9 Water Treatment Requirements

Treatment during Construction Phase Dewatering

The baseline groundwater quality data indicates water treatment is required prior to stormwater discharge in relation to:

- Aluminium;
- Nutrient parameters: Nitrogen and Phosphorus;
- Petroleum Hydrocarbons;
- Turbidity and pH.

In many cases neutralising water pH and lowering water turbidity through appropriate water treatment can significantly reduce the levels of other elevated water quality parameters. Potential water treatment options include pumping the water through a sediment settlement tank, where the following could also be implemented:

- Flocculation/Coagulation to promote precipitation and expedite the settling of suspended particles and associated reductions in turbidity;
- pH correction via the addition of sodium hydroxide (or equivalent) solution, implemented concurrently to increase water pH to the required range;
- Adjustment of the flow rate to allow sufficient residence time for flocculation/coagulation and settlement to take place;
- Adsorption filters using media such as Granular Activated Carbon (GAC) to treat TRH; and
- Technologies involving chemical (precipitation, ion exchange or electrochemical treatment), biological (bioreactors) or physical (adsorption or membrane filtration) treatment to lower nitrogen and phosphorus levels.

While the above provides basic guidance in relation to available treatment options, a water treatment specialist should be engaged to advise on appropriate technologies for water treatment. It would be appropriate to engage the water treatment specialist well in advance of project commencement to allow sufficient time for the design and mobilisation of the water treatment system, prior to the start of dewatering.

Testing of treated water quality is required prior to discharge to confirm that water treatment procedures are effectively achieving compliant discharge water quality. Further details on water quality monitoring and management are provided in **Section 5**. Additional information in regards to water treatment system design and maintenance are provided in **Section 5.5**.

Treatment during Operational Phase Dewatering

The water quality data set at the conclusion of the construction dewatering phase will be used to inform water treatment requirements, to ensure compliant discharge waters for the operational phase, as described in **Section 7.3**.

4. DEWATERING METHODOLOGY

4.1 Excavation and Shoring

As stated in **Section 1.2**, the proposed development will include a four-level basement, the lowest basement level with a BEL of RL 14.9 m AHD, with locally deeper excavations for footings, lift overrun pits, crane pads, and service trenches.

Based on the structural drawings, EI understands that excavation works involving vertical rock cuts are proposed for the construction of the basement. Hence, in this analysis, the excavation faces (or shoring system), were modelled to be fully permeable.

The GSA did not assess the overall stability and embedment depth of the shoring system. Once final designs are made available, this assessment should be revised accordingly.

4.2 Estimated Groundwater Take Volume and Dewatering Duration

As described in the GSA report, groundwater seepage analysis was undertaken using the software package PLAXIS 2D (Version 2024.1.0.1060). PLAXIS 2D is a finite element software package, which is appropriate for non-complex sites with laterally uniform subsurface conditions. The model estimates the seepage rate of water entering the excavation through and beneath the shoring wall; therefore, providing a predicted water take during basement construction dewatering.

Based on a specific set of assumptions and field test data, which included determination of the design groundwater level (**Section 3.3**), as well as the onsite, layer-specific hydraulic conductivities (as detailed in the GSA report), groundwater seepage flow draining through and beneath the shored walls into the excavation is predicted to be **1.5 ML** over a projected 365 days of construction dewatering (i.e. $4.11 \text{ m}^3 / \text{day}$).

For the long-term management of groundwater, the annual water take for the occupational phase is therefore estimated to be **1.5 ML/year**. As the basement will be designed as a draining structure for this project, groundwater mounding was not a consideration for modelling purposes.

It is noted that in accordance with the NSW *Water Management (General) Regulation 2018*, a Water Access Licence is required where the estimated groundwater take is more than 3 ML/year in the absence of any relevant exemption. Based on the modelled seepage volume, a Water Access License will not be required.

4.3 Dewatering Level, Drawdown-Induced Ground Settlement and Monitoring

Groundwater modelling indicated the maximum predicted groundwater drawdown at the basement boundary is anticipated to be 3.9 m. Based on the modelling results, ground settlement immediately outside the basement wall due to dewatering is estimated to be 1.2 mm.

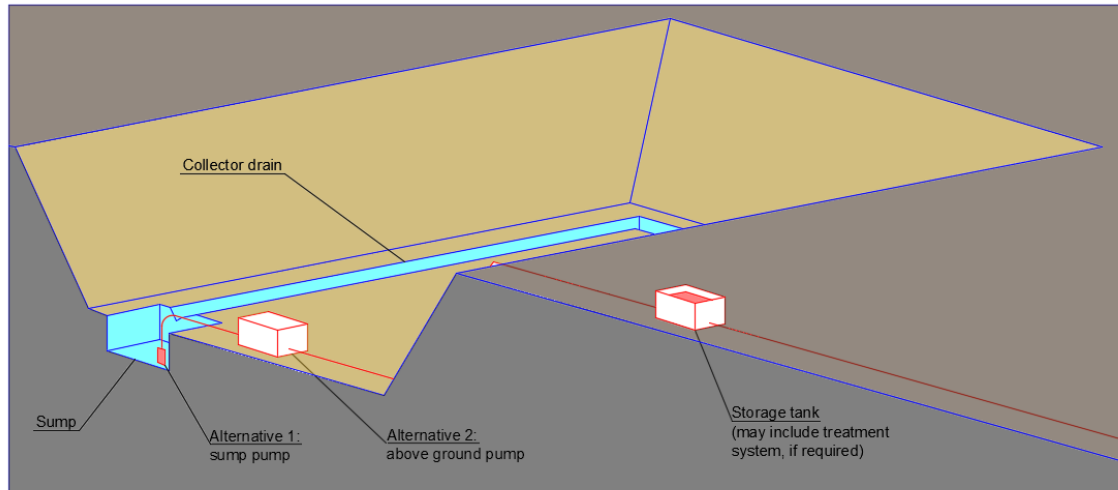
Ground settlements of less than 10mm are considered to pose a 'negligible' risk in terms of the category of damage risk due to dewatering, as defined by Cashman and Preene (2021).

Groundwater elevations will be monitored periodically during the construction dewatering period by measuring groundwater depth in selected monitoring wells. Groundwater depth monitoring may be adequately gauged manually by electric water contact meter during each dewatering monitoring event, as described in **Section 5.4**.

4.4 Dewatering Method

Due to the characteristically low hydraulic conductivity, dewatering of fractured bedrock aquifers is commonly performed using a sump and pump system. A typical sump and pump layout for the control of water seepage into the excavation during basement construction is illustrated in **Figure 4-1**.

Figure 4-1 Hypothetical layout of a Sump and Pump seepage collection system



4.4.1 Construction Phase Dewatering

During construction, seepage water is to be collected and appropriately treated prior to discharge to the stormwater system. A collection sump is typically located at the lowest part of the excavation, from which collected seepage waters are pumped into a storage tank for sediment settling. The preferred tank type will require capacity to accommodate the predicted rate of groundwater seepage inflows during basement construction, which was estimated at 4.11 m³/day (**Section 4.2**).

Groundwater treatment will be undertaken either in the settling tank, or via a water treatment system installed close to the tank prior to discharge. The treated water will then be discharged into the municipal storm water pit provided that prior approval for discharge has been obtained from the relevant consent authority.

The pumping system may operate on a full time or intermittent basis (as required), for the approved construction dewatering period.

The Site Manager, Dewatering Contractor and Water Treatment Specialist must agree on a dewatering strategy and appropriate position of the dewatering treatment system and water retention tanks, prior to the commencement of the excavation works.

4.4.2 Operational Phase Dewatering

A drained basement has been proposed for the operational (post-construction) phase of the development. This would involve collection of groundwater seepage via onsite detention storage (OSD tank, or equivalent), with discharge to the municipal stormwater system for the operational life of the project, with consent authority approval.

It is understood that WaterNSW may consider an application for long-term, operational phase dewatering, where minimal impact considerations under the NSW Aquifer Interference Policy (AIP) are satisfied. An assessment against the AIP was undertaken, which found minimal impact requirements would be satisfied, as described in **Section 7**.

4.5 Discharge Flow and Volume Monitoring

The volume of water discharged must be monitored by a calibrated flow meter (or equivalent alternative means) that is integrated as part of the dewatering system for the complete duration of the temporary construction dewatering period. The flow meter will therefore display cumulative volume discharged at any stage during dewatering, which will be documented as part of the dewatering monitoring records.

Flow monitoring data will be documented by a suitably trained site employee under the supervision of the Site Manager. Tabulated records should be maintained on site and made available to the Environmental Consultant for inclusion in the routine monitoring event reports.

These records will be used to calculate the actual groundwater volume taken from the site and will be included in the Construction Dewatering Completion Report (**Section 5.6**), to be issued to Council and WaterNSW after the completion of construction dewatering activities.

For the construction phase, water level and volume monitoring will be conducted during the same monitoring events described in **Section 5.4**. For the operation phase, these monitoring events will be conducted annually until consistent water quality is confirmed, as described in **Section 7.3**.

4.6 Potential Drawdown-Induced Impacts

A review of potential adverse effects of dewatering on neighbouring properties and groundwater dependent ecosystems was undertaken, as summarised in **Table 4-1**.

Table 4-1 Assessment of Potential Dewatering Effects

Attribute	Description
Water supply losses by neighbouring groundwater users	As described in Section 2.4 a review of registered bores within a 500 m radius of the site identified one registered water supply bore. This was a hand drilled, 2m deep bore located 185m east of the site. Given the distance of the bore from the site, and the fact that site dewatering will predominantly drain the fractured bedrock, drawdown-induced water supply losses due water level drawdown effects are unlikely to be experienced at the existing bore.
Potential impacts on groundwater quality resulting from contaminant migration	Any onsite contamination sources will be removed during basement excavation and the potential for residual onsite contamination to impact water quality was therefore deemed to be low. Two former dry-cleaning businesses (operating from 1948 – 1993), located up-hydraulic gradient of the site, were deemed to be potential off-site contamination sources, with the closest being around 60m to the south. Due to the absence of groundwater supply bores between the potential contamination sources and the proposed dewatering activity, the risk of lowering of the beneficial use category for the groundwater source due to site dewatering, was deemed to be low.
Proximity of Groundwater Dependent Ecosystems	No high priority groundwater dependent ecosystems were documented within a 40m radius of the site, as described in Section 2.6 .
Potential subsidence of neighbouring structures	Drawdown-induced ground settlement for the proposed development is predicted to be 1.2 mm. Ground settlements less than 10mm are considered to be a 'Negligible' risk in regards to category of damage risk due to dewatering, which is consistent with the fact that the dewatered lithology comprises competent bedrock.
Potential groundwater mounding	As the basement will be designed as a draining structure for this project, groundwater mounding will not be a consideration.

5. WATER QUALITY MANAGEMENT

5.1 Responsibility

The Principal Contractor or Site Manager, appointed for the construction works, will be responsible for implementing the water quality management procedures described in this report. Post-construction (i.e. occupational phase) water quality management, including water treatment and water quality monitoring will be overseen by strata management (see also **Section 7.3**).

5.2 Discharge Water Quality Guidelines

In accordance with statutory requirements for site dewatering operations, discharged waters must comply with the ANZG (2018) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*, or relevant default criteria where the ANZG (2018) guidelines do not provide values. This requirement is in compliance with the *Protection of the Environment Operations Act 1997*.

The nearest, primary receiving water body is Quakers Hat Bay, which is regarded as a moderately disturbed marine ecosystem (**Section 2.6**). The stringent ANZG (2018) *95% Marine Default Guideline Values (DGVs)* and subsequent updates, were therefore adopted as the Discharge Water Criteria (DWC), with the 99% *DGVs* to be adopted for bio-accumulative toxicants. These will be the water quality trigger levels for contingent actions (see **Section 6.5**) to ensure that water of an appropriate quality is discharged to the environment.

For water quality parameters that are not currently addressed by the ANZG marine DGVs, relevant alternative criteria have been adopted as the default DWC, as detailed in **Table 5-1**. The listed parameters and their respective criteria are to be applied as water quality trigger values for risk mitigation purposes, as described in **Section 6.5**.

The listed parameters and corresponding criteria will apply for both the initial (pre-dewatering) and on-going assessment of water quality of water being discharged to the storm water system during the construction and occupational phases of the development.

It is noted that specific analytical parameters are not mandatory after the baseline groundwater quality assessment, in accordance with the Routine water quality monitoring lists in Appendix A of DPE (2022). The appointed water quality specialist may therefore adjust the testing regime subject to consistent results, to maintain the required level of water quality monitoring.

Table 5-1 Discharge Water Criteria (DWC)

Analyte	DWC (µg/L) ¹
Dissolved Metals	
Aluminium (Al)	37
Antimony (Sb)	9 ²
Arsenic III (As III)	94 ²
Arsenic V (As V)	42 ²
Barium (Ba)	20,000 ⁹
Beryllium (Be)	600 ⁹
Boron (B)	1500 ²
Cadmium (Cd)	0.7

Chromium III (Cr III)	27
Chromium VI (Cr VI)	4.4
Cobalt (Co)	1
Copper (Cu)	13 ³
Iron (Fe)	3,000 ⁹
Lead (Pb)	4.4
Lithium (Li)	No Relevant Criteria
Manganese (Mn)	80
Mercury (total) (Hg)	0.1
Molybdenum (Mo)	34 ²
Nickel (Ni)	70
Selenium (Se)	18 ²
Silica (dissolved SiO ₂)	No Relevant Criteria
Silver (Ag)	1.4
Strontium (Sr)	No Relevant Criteria
Uranium (U)	0.5 ²
Vanadium (V)	100
Zinc (Zn)	80 ³
Petroleum Hydrocarbons / Total Recoverable Hydrocarbons (TRH)	
Oil and grease	No visible sheens, surface films or oil and grease ⁴
Volatile TPH (C ₆ – C ₉)	No Relevant Criteria
Semi-volatile to heavy TPH (C ₁₀ – C ₄₀)	No Relevant Criteria
Monocyclic Aromatic Hydrocarbons (BTEX)	
Benzene	700
Toluene	180
Ethylbenzene	80
o - xylene	470 ²
p - xylene	250 ²
m - xylene	75
Polycyclic Aromatic Hydrocarbons (PAH)	
Benzo(a)pyrene	0.1
Naphthalene	70
Microbiological Organisms	
Faecal coliforms	No Relevant Criteria
Faecal streptococci	No Relevant Criteria
Escherichia coli (E. coli)	Not detectable in 100 mL ⁹
Major Ions	
Anions: sulfate, chloride, carbonates, bromide, fluoride	No Relevant Criteria

Cations: calcium, magnesium, sodium, potassium	No Relevant Criteria
Ionic balance: cation / anion balance (as a percentage)	No Relevant Criteria
Nutrients	
Ammonia	910
Nitrate (NO ₃)	3,400 ⁵
Nitrite (NO ₂)	30,000 ⁹
Total Oxidised Nitrogen (NO _x)	5 ⁸
Total Nitrogen (TN)	120 ⁸
Total Phosphorus (TP)	25 ⁸
Reactive Phosphorus (FRP)	10 ⁸
Other	
Total Cyanide	4
Phenol	400
Physiochemical Parameters	
pH (pH units)	6.5 to 8.4 ⁶
Turbidity (NTU)	10 ⁷

- Note 1 Discharge water criteria are the ANZG (2018) 95% Default Guideline Values (DGVs) for the protection of slightly to moderately disturbed marine ecosystems, with the 99% DGVs applied for the bio-accumulative parameters *benzo(a)pyrene*, *cadmium* and *mercury*, unless otherwise indicated. The ANZG (2018) only provides marine criteria at an 'unknown' level (%) of species protection for *manganese*; therefore, these DGVs are applied.
- Note 2 The ANZG (2018) 90% Freshwater DGVs for highly disturbed freshwater ecosystems are applied for the indicated parameters (*arsenic*, *boron*, *selenium*, *o - xylene* and *p - xylene*), in the absence of *marine* water criteria. The ANZG (2018) only provides freshwater criteria at an 'unknown' level (%) of species protection for *antimony*, *molybdenum* and *uranium*; therefore, these DGVs are applied.
- Note 3 For the metals *copper* and *zinc*, which are commonly present as regional background components in groundwater at concentrations above the ANZG 2018 95% Marine DGVs, discharge water criteria are set at one order of magnitude (10 x) higher than the ANZG 2018 DGV.
- Note 4 NHMRC (2008) No Detectable Oil & Grease - OG test must find No visible film or sheen at the water surface and No detectable hydrocarbon odours, based on aesthetic aspects, as described in NHMRC (2008) *Guidelines for managing risks in recreational water*, Section 10.2.2.
- Note 5 In the absence of ANZG 2018 marine DGVs in relation to *nitrate*, the Freshwater 90% trigger value was sourced from ANZECC & ARMCANZ 2000 Table 3.4.1 *Trigger values for toxicants for moderately to highly disturbed systems*. A marine trigger value is not currently available under ANZECC/ARMCANZ 2000.
- Note 6 In the absence of ANZG (2018) criteria for *pH*, the ANZECC / ARMCANZ (2000) Table 3.3.2 Default trigger values for physical and chemical stressors for south-east Australia for slightly disturbed ecosystems are applied. The adopted pH range is between the lower and upper limit values for *Marine* water settings.
- Note 7 In the absence of ANZG (2018) criteria for *turbidity*, the ANZECC & ARMCANZ (2000) Table 3.3.3 upper default trigger value for *estuarine and marine* ecosystems is applied.
- Note 8 In the absence of ANZG (2018) criteria, alternative criteria from ANZECC / ARMCANZ (2000), Table 3.3.2, *Default trigger values for physical and chemical stressors for south-east Australia for slightly disturbed ecosystems*. The marine criteria for *total oxidised nitrogen (NO_x)*, *total phosphorus (TP)*, *reactive phosphorus (FRP)* and *total nitrogen (TN)* were adopted.
- Note 9 For chemical parameters not addressed by either ANZG (2018) or ANZECC / ARMCANZ (2000), i.e. *nitrite*, the NHMRC (2011) *Australian Drinking Water Guidelines, Vers. 3.8, Rev 2022*, Table 10.6 *Guideline values for physical and chemical characteristics*, address potential discharge to recreational beach settings. The discharge water criteria are set at one order of magnitude (10 x) higher than the Drinking water health-based value, or 10 x the aesthetic-based value, in the absence of a *drinking* value. Note: The Table 10.5 *Performance measure threshold* is applied for the microbiological parameter *Escherichia coli* (*E. coli*).

5.3 Additional Pre-dewatering Monitoring Event

As the baseline groundwater quality assessment included all mandatory parameters listed in Appendix A of DPE 2022 (as detailed in **Section 3.4.2**), an additional pre-dewatering GME is considered unwarranted.

5.4 Discharge Water Quality Monitoring

5.4.1 Visual and Odour Monitoring

Visual inspections of the dewatering measures and equipment should occur regularly (daily where possible) by the Site Manager and/or Dewatering Contractor, to ensure:

- The effective operation of all dewatering treatment equipment, including inspection that short-circuiting of water around baffles and filter media is not occurring within sediment retention tanks;
- No petrochemical sheens are visible on the water surface and no hydrocarbon odours are being generated by the treated groundwater or sediment; and
- No green, blue or extremely clear effluent, potentially indicating high levels of dissolved aluminium (if used in the treatment process).

The Site Manager must keep a record of all visual observations and operational measurements such as flow rates and water flow meter readings (if used), as detailed in **Section 5.6**.

5.4.2 Sample Collection and Analysis

On-going sample analysis must continue for the duration of construction dewatering activities, to establish that the treatment system (if required) is functioning as intended, and to confirm the quality of discharge water is acceptable for release into receiving water body.

Sample collection should be completed by a suitably qualified environmental scientist or equivalent, with the subsequent analyses performed by a reputable environmental laboratory using NATA-registered analytical methods. The analytical program is to include the parameters listed in **Table 5-1 (Section 5.2)** and/or the parameters in accordance with *Appendix A – Routine water quality monitoring lists* (DPE, 2022). Certain parameters may be removed from the testing suite, subject to laboratory analytical results, as advised by the appointed water quality specialist / environmental consultant.

The following activities are to be implemented for the on-going monitoring program:

Trial-Run Period

- Prior to the discharge of any extracted groundwater, a trial run will be completed as follows:
 - Water pumped from the seepage collection sump will be initially diverted into the excavation, until a reduction in suspended sediments is observed;
 - Once less turbid water is achieved, water from the sump may be pumped into the sediment settlement tank and passed through the water treatment system;
 - Samples of the treated water will be collected and laboratory analysed for the DPE 2022 mandatory water quality parameters; and
 - After confirmation that treated water quality complies with the DWC, the treated water may be discharged to the municipal storm water system, using the Council-approved connection point.
- As a minimum, two samples of treated water will be collected per week for the first two weeks during the designated trial-run period. The analytical results will be compared to the

DWC to assess the performance of the water treatment system and to make adjustments where necessary.

- Sampling for trial run purposes will cease once the target parameters stabilise (i.e. consecutive treated water tests are within $\pm 10\%$ of the previous test results) and contaminant concentrations are within the DWC for three consecutive sampling events. The trial-run period may be extended if stabilisation is not observed, or if the treated water does not satisfy the DWC (**Table 5-1**).
- The Dewatering Contractor / Water Treatment Specialist should seek advice from the Environmental Consultant regarding termination of the trial-run period.
- During the trial-run period, all collected groundwater seepage (including treated water) should be retained on-site and stored in appropriate bulk containers. No collected groundwater should be discharged until it is proven to meet the adopted DWC.

Construction Phase - Monitoring Frequency (Weekly, Fortnightly and Monthly)

- After the Trial-Run Period, and subject to statutory authority approval, treated water may be discharged to the storm water system. A weekly sampling frequency will be adopted for four weeks. The sampling program will involve the collection of one system discharge (i.e. treated) sample (as a minimum), to be analysed for the target parameters of concern, to confirm the system is functioning as intended.
- After four weeks, the weekly sampling frequency may be extended to fortnightly monitoring for one month and then monthly for the remaining duration of construction phase dewatering, provided the analytical monitoring results indicate the treated water quality consistently meets the adopted criteria. If this is not achieved, contingency measures must be implemented, with monitoring frequency going back to weekly until consistency in the discharged water results is re-established.

Operational Phase - Monitoring Frequency (Annual)

- Provided that the Discharge Monitoring Period shows consistent and compliant results, the monitoring frequency can be extended to annually during the operational period, until the end of year 3, as described in **Section 7.3**.
- As per the construction phase monitoring, contingency measures detailed in **Section 6.5** should be implemented if water quality results exceed the DWC for any one monitoring event.
- Any changes to the sampling frequency are to be determined by the appointed environmental consultant, and justification must be documented in the monitoring records.

5.4.3 Reporting of Water Quality Results

Dewatering management procedures and monitoring results will be reviewed by the appointed Environmental Consultant to ensure that the treatment procedures are effective, and that the discharge waters are in compliance with the adopted DWC (**Table 5-1**). Discharge water quality reporting will be required as follows:

- **Interim Monitoring Reports** will be prepared and issued to the Site Manager (during the construction phase), upon receipt of laboratory data for each round of water quality monitoring for the discharged waters. The interim reports will detail the sampling methods and procedures, provide a comparison between historical and current results, assess the results against the adopted criteria and provide recommendations on corrective actions, when required.
- **Interim Dewatering Completion Report** - Following completion of construction dewatering activities, an *Interim Dewatering Completion Report* ('interim DCR') will be prepared by the appointed Environmental Consultant, as described in **Section 5.6.1**. The interim report will

report on construction phase dewatering and must include copies of all analytical results and laboratory water quality test reports issued during the construction phase dewatering period. The interim DCR will be prepared using the pro-forma available for download through the WaterNSW website, as described in **Section 5.6**, and will be submitted to Council and Water NSW.

- **Annual Dewatering Monitoring Reports** will be prepared as described in **Section 5.6.2**, upon receipt of laboratory data for each annual round of water quality monitoring during the operational phase of the development, as described in **Section 7.3**.

5.4.4 Reporting of Other Information

The Site Manager must keep records of cumulative discharge volume and treatment methods and treatment chemicals applied to the water discharge, if any. In addition, any periods of dewatering stoppage should also be recorded. This information must also be compiled using the DCR pro-forma (see **Section 5.6**).

5.4.5 Groundwater Level Monitoring

Groundwater levels will be measured at each monitoring well during the dewatering period to monitor groundwater level drawdown. The data will be recorded and included in the DCR.

5.5 Water Treatment

5.5.1 Treatment System Design

Baseline groundwater quality data to date (Section 3.4) indicates that treatment of seeped groundwater will be necessary in relation to dissolved metals (aluminium), Total oxidised Nitrogen, Total Nitrogen, Total Phosphorus, Filterable Reactive Phosphorus, Petroleum Hydrocarbons; Turbidity; and pH prior to discharge to the storm water system.

EI suggests that the selection and design of the preferred water treatment system is made by the Dewatering Contractor / Water Treatment Specialist, in collaboration with the appointed Environmental Consultant. Alternative and/or additional water treatment options will be implemented, if necessary, depending on which parameters are found to exceed the DWC during the Trial-Run period described in **Section 5.4.2**.

The design and installation of the preferred system should consider:

- A treatment tank with minimum capacity capable of containing the expected inflow for the basement (as described in **Section 4.4.1**);
- Water filtration to reduce fine particulates;
- If applicable, automated in-line chemical dosing systems for the addition of buffering solutions and/or coagulants for the adjustment of pH and other parameters, which may be required as described in **Section 6.5 Dewatering Contingencies**;
- **Other** water treatment to reduce concentrations of contaminants exceeding the DWC to below the values presented in **Section 5.2**;
- Spare retention tank(s) (if required) to provide additional residence time and sedimentation, in the case that non-compliant water quality is identified during routine monitoring, triggering temporary redirection and storage while adjustments to the water treatment system are being implemented; and
- A means of monitoring flow rate to enable the accurate determination of total discharge volume.

Details of the water treatment system set-up may be provided by the water treatment specialist after the results of the additional pre-dewatering monitoring event are available.

5.5.2 The water treatment system should be installed, tested and operational prior to the commencement of dewatering, to ensure that only treated water that meets the DWC is allowed to drain to the storm water network. Treatment System Maintenance

The groundwater treatment system(s) must be regularly maintained by the Dewatering Contractor / Water Treatment Specialist. Maintenance must include (if applicable):

- Regular cleaning and or replacement of the geo-fabric / particle filters within the retention tanks;
- Media changeover (e.g. granular activated carbon) whenever breakthrough conditions are met; and
- Regular removal of sediment from the retention tanks by an appropriately-licensed waste contractor.

5.6 Reporting of Dewatering Information

5.6.1 Interim Report - Construction Dewatering

In accordance with WaterNSW requirements (Ref. WaterNSW Fact Sheet 260923, Link: https://www.waternsw.com.au/_data/assets/pdf_file/0005/155417/Fact-sheet-Completion-report-Construction-dewatering.pdf), a *completion report* will be prepared and submitted to WaterNSW, at the completion of site dewatering. The completion report must accompany an application to WaterNSW to surrender the *water supply work approval* at the time that site dewatering is ended.

As the proposed dewatering will involve operational dewatering, the first report to be submitted to WaterNSW for this site will be titled “*Interim Report – Construction Dewatering*” and will document all records collected from the beginning to the end of the construction dewatering period. A blank *Interim Report* form may be downloaded from the WaterNSW website using the internet link: https://www.waternsw.com.au/_data/assets/pdf_file/0004/167278/Completion-report-for-dewatering-work.pdf, and is to be used to record all of the required information, as listed on the form itself (see **Appendix I**).

The routine logging of flow meter readings at the start and finish of each dewatering event is to be completed by a responsible representative of the construction team (e.g. the Site Manager). Each flow meter entry will record a volume of water take associated with it, to enable the calculation of cumulative water take volume at any time during the site dewatering period.

Other records including water quality results, laboratory analytical reports and groundwater level monitoring records may be supplied by the appointed specialist contractors/consultants to the responsible person, who will compile and attach the relevant information to the Interim Report form. The Site Manager may authorise a qualified contractor/consultant to maintain the Interim Report on the Site Manager's behalf.

At the completion of the construction phase, the Interim Report will be submitted to WaterNSW for review.

5.6.2 Annual Reporting for Operational Dewatering

As site dewatering will continue during the occupational phase of the development, monitoring will continue under the responsibility of Strata Management through the occupational phase. This will require the same information as required for the *Interim Report* (described in **Section 5.6.1**), to be logged and submitted to WaterNSW on an annual basis under the report title “*Annual Report – Occupational Dewatering*”.

Monitoring frequencies for the occupational phase are detailed in **Section 7.3**.

All laboratory analytical results, flow meter logs and groundwater level monitoring records must be maintained by strata management, and should be made available upon request by Council and/or WaterNSW.

5.6.3 Dewatering Completion Report

A final “*Dewatering Completion Report*” will be submitted to WaterNSW at the termination of site dewatering, together with an application to surrender the water supply works approval (a copy of this form is also provided in **Appendix I**).

6. SITE MANAGEMENT AND CONTROLS

6.1 Deviations from this Plan

The Site Manager should seek advice from the Environmental Consultant if deviation from the agreed monitoring program is considered. To ensure the monitoring data set and the early warning objectives of the DMP are not compromised, variations will only be considered where technical justification exists, and any deviations that may be accepted will be documented within the corresponding reports, and must include all justifications for the variation accepted.

Should deviations from the DWC be considered technically justifiable, approval from Council and/or WaterNSW must be obtained before alternative discharge criteria are applied.

6.2 Contact Details for Key Personnel

Once the relevant personnel have been appointed, their names and contact information must be clearly displayed on-site, within the site office. An example format is as follows:

Site Manager	Name: To be confirmed Company: To be confirmed	Mobile phone: To be confirmed Email: To be confirmed
Dewatering Contractor	Name: To be confirmed Company: To be confirmed	Mobile phone: To be confirmed Email: To be confirmed
Water Treatment Specialist	Name: To be confirmed Company: To be confirmed	Mobile phone: To be confirmed Email: To be confirmed
Environmental Consultant (Water Quality Expert)	Name: To be confirmed Company: To be confirmed	Mobile phone: To be confirmed Email: To be confirmed

6.3 Summary of Specific Activities

The appointed contractors and/or Site Manager will be responsible for ensuring that the following activities (requirements) are undertaken during the dewatering program:

- Maintain erosion and sediment control measures in a functioning condition, until all earthwork activities are completed.
- Perform daily inspection of the recharge well(s), stormwater diversions and sediment / erosion control devices, ensuring it is operating effectively and at full capacity.
- Implement appropriate remedial measures where any controls or devices are not functioning effectively or are inappropriate.
- Collate records and comments on the condition of existing erosion and run-off controls (drains, silt fences, catch drains etc.), dewatering procedures and test results, and any site instructions issued to sub-contractors to undertake remedial works.
- Maintain rainfall data (to be filed on site).
- Confirm water quality parameters meet the relevant discharge limits, by disclosing supporting documentation upon request.
- Reporting any incidents of poor drainage or uncontrolled discharge.
- Recording all daily inspection reports, environmental incidents and controlled discharge volumes, which may be reviewed during any environmental audit performed on the site.

6.4 Vibration, Noise, and Odour Management

The following vibration, noise and odour risks must not occur during dewatering:

- Excessive vibration and noise levels associated with site plant / dewatering equipment; and
- Odours released from collected groundwater, which may pose a risk to human health and/or the aesthetic condition of the environment.

It is the responsibility of the Site Manager to ensure appropriate management of vibration, noise and odour during dewatering operations. Appropriate management methodologies include:

- Undertaking dilapidation surveys of neighbouring buildings, in accordance with potential for impacts in final design type.
- All sub-contractors to work only within defined hours set by the DA conditions.
- All reasonable steps shall be taken to muffle and acoustically baffle all plant and equipment. Noise and vibration levels generated by site works must be within the limits set by the DA conditions, the site specific environmental management plan and the *Protection of Environmental Operation Act 1997*.
- Give consideration to the noise emission of plant/equipment prior to its selection/mobilisation to site.
- Schedule the use of noisy equipment at the least-sensitive time of day.
- Situate noisy equipment at the greatest distance from the noise-sensitive area, or orient the equipment so that noise emissions are directed away from sensitive areas, to achieve the maximum attenuation of noise.
- Where there are several noisy pieces of equipment, schedule operations to minimise cumulative impacts.
- Keep equipment well maintained.
- Ensure engine shrouds (acoustic linings) are installed (where feasible).

6.5 Dewatering Contingencies

Contingent actions for scenarios that may arise during dewatering are detailed in **Table 6-1**.

Table 6-1 Mitigation Measures for Potential Dewatering Issues

Anticipated Problems	Preventive / Corrective Actions
Water Quality Criteria Non-compliance	
<i>Water Quality Criteria Exceedance</i> Laboratory analytical report for any monitoring event reveals that treated water quality does not satisfy the Water Quality Trigger Values.	<u>Water quality trigger values</u>, also referred to as the discharge water criteria (DWC), are detailed in Section 5.2, Table 5-1. Immediate action must be taken to halt the release of water into receiving water bodies, where water quality is found not to meet the DWC. Discharge of water must be suspended to enable the following procedure to be implemented: 1) Water will be redirected to storage retention basin/tanks; 2) A water sample will then be collected and sent to the laboratory for confirmation analysis for the non-compliant parameter(s) on an express (24hr) results turn-around basis; 3) Should the analytical result for the confirmation sample show that the previously non-compliant parameter(s) is/are now meet the adopted criteria, the treated water outlet may be redirected to receiving water bodies; however 4) Should the analytical result for the confirmation sample show

Anticipated Problems	Preventive / Corrective Actions
	that the discharge water quality does not comply with the adopted criteria, the environmental consultant / water treatment specialist will be required to modify the water treatment system, in order to achieve compliant discharge water quality. Collection of further treated water samples will be required to confirm the effectiveness of the modifications; 5) After laboratory confirmation that the revised treated water quality complies with criteria, extracted groundwater may be redirected to receiving water bodies; and 6) Weekly monitoring of treated discharge water quality monitoring will be required, until such time that contaminant concentrations are within the adopted criteria values for three consecutive sampling events. Once this is achieved, fortnightly monitoring may be reinstated. Note: Wastewater Removal - It may be necessary to have collected waters removed by a licensed wastewater contractor, should quantities exceed the on-site capacity for temporary storage. In this case, records must be maintained to document quantities of wastewater disposed in this way, with provision of wastewater disposal dockets issued by the contractor to be retained for audit and reporting purposes.
<i>Visible and Olfactory Impacts</i> Visual and/or olfactory anomalies (e.g. change in water colour, turbidity, odour, presence of oil / grease) are observed in extracted groundwater.	Similar to the above procedure (Steps 1 to 6) treated water will be redirected to an alternative retention vessel, while the treatment system is adjusted. It may be necessary to have collected waters removed by a licensed wastewater contractor, should retained quantities exceed the on-site capacity for temporary storage. The contractor is to seek advice from a suitably experienced environmental consultant in regard to the additional assessment and treatment that may be required for any observed changes to water appearance or detectable odours.
<i>Repeated Criteria Exceedances</i> After three non-compliances for discharge water quality.	Retain extracted water onsite in appropriate bulk containers for subsequent removal by a licensed wastewater contractor. Determine an alternative discharge method, if necessary, updating this report accordingly.
Groundwater Take Non-compliance	
<i>Excessive Extraction</i> The predicted daily inflow rate (specified in Section 4.2) is exceeded.	<u>Groundwater take trigger levels</u> are provided to ensure that appropriate measures are implemented to minimise the risk of exceeding the groundwater take limit, which would form a breach of the conditions of the WaterNSW Statement of Approval. The following trigger levels are based on the regular flow meter readings that are recorded during the dewatering monitoring program, as described in Section 5.6: <u>Trigger 1</u>: when the flow meter data indicates that 70% of the total approved groundwater take limit has been extracted, the monitoring manager is to notify the Site Manager and the Dewatering Contractor, to activate a review of construction progress against dewatering rate and to make adjustments if necessary, so as not to exceed the approved groundwater take limit. <u>Trigger 2</u>: at 80% of the total approved groundwater take limit, if basement construction is not close to completion, the monitoring consultant is to engage site management and the dewatering contractor to review the reasons for the increased dewatering rate and to explore options and take action to achieve sufficient lowering of the dewatering rate for compliance with the groundwater take limit. <u>Trigger 3</u>: at 90% of the total approved groundwater take limit, if effective reductions in dewatering rate cannot be implemented,

Anticipated Problems	Preventive / Corrective Actions
	WaterNSW should be contacted to review options, which may include a combination of: ▪ Applying for an increase to the groundwater take limit, which may require a Water Access License to be acquired. ▪ Temporary retention of tail water onsite in appropriate bulk containers for subsequent removal by a licensed waste contractor; ▪ Aquifer re-injection after obtaining regulatory approval; and/or ▪ Fast-tracking of construction works to complete dewatering sooner than the scheduled timeframe.
Drawdown-Induced Ground Settlement Risk	
<i>Excessive Water Level Drawdown</i>	<u>Groundwater drawdown trigger levels</u> will also apply to minimise the risk of unforeseen impacts in relation to ground settlement on neighbouring land. As documented in the GSA report (Appendix D), dewatering is expected to have negligible, adverse impact on the neighbouring properties, given that dewatering will occur in competent bedrock materials. Notwithstanding, should groundwater level monitoring during site dewatering reveal declining groundwater levels greater than the predicted, maximum drawdown outside of the basement boundary, the following contingency measures will apply at the indicated trigger levels: <u>Trigger 1</u>: when monitoring of groundwater levels indicates that the maximum predicted groundwater drawdown level has been reached in the vicinity of the shored excavation boundary wall, and groundwater levels are still falling, excavation works should cease (HOLD POINT) and the monitoring manager is to notify the Site Manager and the Geotechnical Engineer to review construction progress and confirm that works can effectively continue without significant, additional groundwater level decline. The review may find that further groundwater level decline may be greater than 25% of the predicted maximum drawdown outside of the shoring wall. <u>Trigger 2</u>: should the Trigger 1 review indicate that further groundwater level decline may be greater than 25% of the predicted maximum drawdown outside the shoring wall, the appointed Structural Engineer will be notified to assess whether this water level decline potentially poses adverse risks to neighbouring structures that would warrant mitigation measures to be implemented, and if so, to recommend relevant mitigation options for consideration and action prior to continuation of deepening the excavation.
System Performance Issues	
Dewatering System Failures	Ensure that spare equipment (where practical) is on hand. Ensure that the failed equipment can be serviced by site personnel or an appointed contractor who can rapidly report to site when needed.
Power Outages	Ensure that a backup generator is readily available. In this event, an assessment across the site and surrounding sites should also be completed in order to identify whether any other lights and electrical equipment are working so to identify if the issue is site specific or if it is across a whole area. In addition to having the back-up generator running, the contractor should also seek advice from an electrician in regard to the additional assessment and repairs that may be required.

Anticipated Problems	Preventive / Corrective Actions
Unexpected contaminants found during monitoring	Contact the appointed environmental consultant / water quality expert and collect samples for analysis, to assess the identified concentrations against relevant criteria. If the contaminant is found to exceed the adopted criteria, follow the corrective actions corresponding to <i>Water Quality Criteria Exceedance</i> above. Expand the adopted criteria accordingly.
Chemical/fuel spill and leaks from machinery	Stop earthworks, notify site manager. Use accessible soil or appropriate absorbent material to absorb the spill (if practicable). Stockpile the impacted material in a secure location, on builder's plastic to avoid cross contamination. Inspect groundwater and note any visual and/or changes. The contractor should seek advice from environmental consultant in regard to assessment and treatment requirements.
Excessive rainfall	Ensure sediment and surface water controls are in place and functioning as intended, as per the designs provided in the site-specific Soil and Water Management Plan. Any non-conformance is to be documented and rectified. The capacity of the dewatering system to dispose larger volumes of water should be evaluated and if required, a temporary system should be utilised following correspondence with Council / WaterNSW and the environmental consultant.
Excessive noise	Identify the source and isolate if possible. Modify the actions of the source or erect temporary noise barriers if required.
Impacts on the stability of adjacent structures	Contractor to seek advice from qualified professional (such as a geotechnical engineer and/or structural consultant) in regards to the additional assessment and monitoring that may be required.
Excessive organic odours / vapours	In accordance with Council's Contaminated Land Policy, no nuisance odours are to be detected at any site boundary during the dewatering stage. Should odour emissions be detected at a site boundary, the following measures will be implemented: 1) Stop work, to allow odour to subside. 2) Monitor ambient air across the site and boundaries with a portable photo-ionisation detector (PID). 3) Implement control measures, including respirators for on-site workers, use of odour suppressants and wetting down of excavated material. 4) Notify the occupants of adjoining premises regarding odour issues. Notification should be in writing, providing the contact details of the responsible site personnel. 5) Record logs for odours and volatile emissions using photo-ionisation detectors (PID), if applicable.
Complaint management	Notify client, site manager and environmental consultant (if required) logging and following up complaint. Reporting should follow management procedures. Implement control measures to address reason of complaint (if possible) and notify complainant of outcome.

7. MINIMAL HARM ASSESSMENT

7.1 Consideration of NSW Aquifer Interference Policy

In accordance with the NSW Water Management Act 2000 the taking of water from an aquifer and/or the disposal of water taken from an aquifer is defined as an aquifer interference activity. The NSW 2012 Aquifer Interference Policy (the 'NSW AIP') provides guidance for the assessment of potential impacts of dewatering on water users and groundwater dependent ecosystems. The NSW AIP assessment process was performed with due regard for all hydrogeological information collected for the site and is presented below.

7.1.1 Hydrogeological Model Summary

With reference to the site-specific, conceptual hydrogeological model (**Section 3.2**), for a bedrock aquifer with groundwater under pressure, groundwater seepage would enter the excavation flowing through joints, faults and bedding plane fractures within the bedrock. Lower seepage flow volumes may be expected during depressed groundwater levels in dry periods, with higher seepage flow after high rainfall events, which would be expected to cause temporary, elevated groundwater levels.

7.1.2 Groundwater source category

Under the NSW 2012 Aquifer Interference Policy (the 'NSW AIP') *highly productive groundwater* is defined as a groundwater source that:

- a) *has total dissolved solids (TDS) of less than 1,500 mg/L; and*
- b) *contains water supply works that can yield water at a rate greater than 5 L/sec.*

Baseline groundwater salinity was shown to be low with EC values ranging from 225 to 918 $\mu\text{S}/\text{cm}$ (**Section 3.4**), which is equivalent to approximately 144 to 588 mg/L TDS. Modelled inflow to the basement is predicted to be 0.05 L/sec (i.e. 4.11 m^3 / day, **Section 4.2**), during the construction and occupational phases of the development.

The aquifer at the site therefore meets the description of a "*less productive groundwater source*", as defined under Section 3.2.1 *Aquifer impact assessment* of the NSW AIP.

7.1.3 Minimal impact considerations

In accordance with the NSW AIP Table 1 "*If the predicted impacts are less than the Level 1 minimal impact considerations, then these impacts will be considered as acceptable.*"

Table 1 *Minimal Impact Considerations for Aquifer Interference Activities* of the NSW AIP shows that for *Less Productive Groundwater Sources* in low yielding porous and fractured rock water sources that are under groundwater pressure conditions, the following minimal impact considerations are applicable:

Drawdown

- *Level 1 – A cumulative pressure head decline of not more than 2m, at any water supply work.*
- *Level 2 – If the predicted pressure head decline is greater than the Level 1 requirement (above), then appropriate studies are required to demonstrate to the Minister's satisfaction that the decline will not prevent the long-term viability of the affected water supply works unless make good provisions apply.*

Water Quality

- *Level 1 - Any change in groundwater quality should not lower the beneficial use category of the groundwater source beyond 40m from the activity.*
- *Level 2 - If the Level 1 condition (above) is not met, then appropriate studies will need to demonstrate to the Minister's satisfaction that the change in groundwater quality will not prevent the long-term viability of the dependent ecosystem, significant site or affected water supply works.*

7.1.4 Impact Assessment Conclusions

The proposed dewatering for the construction and operational phases of the project are considered to be compliant with the NSW AIP minimal impact criteria for the following reasons:

- Although the estimated maximum cumulative pressure head decline (3.9 m) has been modelled to be greater than *Level 1 minimal impact considerations* in relation to drawdown, the drawdown will occur predominantly in competent bedrock, with 1.2 mm predicted ground settlement immediately outside of the shored wall. Drawdown-induced ground settlement would therefore have negligible impact on neighbouring properties, beyond the site boundary.
- The single registered water supply bore within 500m of the site (**Section 2.4**) indicates that groundwater is not relied on as a significant water supply source in surrounding areas. As the registered bore is very shallow (2m deep), located 185m east of the site, and dewatering will predominantly drain the fractured bedrock, drawdown-induced water supply losses are unlikely to be experienced at the existing bore.
- Potential offsite groundwater contamination sources were identified as two former drycleaners located 60m and beyond, up-hydraulic gradient in relation to the site (**Section 2.5.2**). As groundwater is not being utilised between the site and the potential sources, site dewatering would be unlikely to adversely impact the beneficial use category of the groundwater source and the *Level 1 Water Quality conditions* would be maintained.
- Potential onsite contamination sources will be effectively removed during basement excavation, and any residual groundwater impacts will be treated to comply with the approved discharge water criteria.
- There is no documented, high priority, groundwater dependant ecosystem within 40 m of the site.
- As the basement will be designed as a draining structure, potential groundwater mounding impacts as a result of the constructed structure are unlikely.

In addition to the above, the routine monitoring of treated water quality, groundwater drawdown and water take, as well as the dewatering contingencies tabulated in **Section 6.5**, are designed to ensure that potential impacts are minimised.

7.2 Assessment Inputs

The inputs for assessing the potential impacts of dewatering on the groundwater system are summarised in **Table 7-1**.

Table 7-1 Assessment inputs summary

Assessment Items	Comments
1. Estimated water take volume	As detailed in Section 4.2 , the water take volume is estimated to be 1.5 ML per year during the construction and operational phases of development.

Assessment Items	Comments
2. Suitability of volume estimation	Use of PLAXIS 2D (a finite element computer model), implemented by experienced Geotechnical Engineer and reviewed by Senior Geotechnical Engineer (see also the GSA report in Appendix D).
3. Ground elevation across the site	The site slopes to the north-east, with elevation ranging from approximately 27 mAHD (north-east corner) to 29 mAHD (south-west corner) (Appendix C).
4. Geotechnical ground characterisation	Refer to GSA report in Appendix D .
5. Water level measurements	Groundwater levels were measured at depths from 19.70 m AHD (minimum) to 25.92 m AHD (maximum), as detailed in Section 3.3 . Periodic groundwater level gauging will be conducted on an annual basis (i.e. 1 monitoring event per year) at monitoring wells during the operational phase, as described in Section 5.4.5 .
6. Required water level draw down and potential impacts	As described in Sections 4.6 and 7.1.4 drawdowns resulting from site dewatering are unlikely to adversely impact on ground settlement, groundwater access in existing water supply bores or lowering of beneficial use category of the groundwater source.
7. Works proposed for dewatering	A drained basement using drainage to a sump-and-pump system, with water treatment to achieve compliant discharge water quality, as described in Section 4.4 and Section 5.5 .
8. The base level of the aquifer	Sandstone bedrock extends below the proposed BEL, see Section 3.2 .
9. Excavation footprint dimensions	Refer to basement plan included in Appendix C .
10. Hydraulic conductivity of lithological units	Detailed in Table 1 of the GSA report (EI, 2025d) in Appendix D .
11. Anticipated duration of dewatering	Dewatering will be ongoing for the approved construction dewatering period, while operational dewatering will be ongoing for the life time of the project.
12. Depth of piling embedment beneath bulk excavation	Refer to Section 4.1 – embedment depth will be provided with final design and detailed shoring plans.

7.3 Operational (Occupational) Phase Dewatering Management

7.3.1 Operational Phase Water Treatment

The need for water treatment during the operational phase will be dependent on water quality, as characterised by routine monitoring during construction phase dewatering. To confirm for which parameters water treatment is still necessary, a pre-treatment water sample will be collected and laboratory analysed for the dewatering parameters listed in **Table 5-1**. Any exceedances of the DWC will indicate the need for water treatment for the non-compliant water quality parameter(s). An appropriate water treatment system will be established to ensure that discharge water quality (i.e. treated water) is appropriate for stormwater discharge.

It will be the responsibility of Strata Management to ensure that the water treatment is appropriately maintained to ensure that only compliant water quality is discharged from the site.

7.3.2 Monitoring Frequency and Reporting

Strata Management is also responsible for the engagement of a suitably qualified and appropriately experienced environmental consultant, to perform dewatering monitoring and annual reporting for the occupational phase of the project. The following procedure will be adhered to by strata management to ensure that the long-term dewatering system is managed appropriately:

- **Groundwater level monitoring:** Scheduled groundwater level monitoring is required for the first 36 months of the sump and pump operational phase in order to characterise seasonal groundwater level fluctuations for the operational (post-construction) phase of the development.

A quarterly groundwater level monitoring frequency (i.e. once every 3 months) will be adopted for the first twelve months of occupation. This will be followed by semi-annual water level monitoring (i.e. once every 6 months) for the second year; then annual monitoring (i.e. a monitoring event at the end of the third year). Groundwater levels will be measured at each of the onsite monitoring wells and data will be recorded on a data form which also documents date of monitoring, well identification number, reference point from where all water level measurements are consistently taken (e.g. top of well casing, or ground level), the depth to water and the name of the person conducting the monitoring.

Should it be discovered that the monitoring wells are no longer functional, Strata Management must be immediately notified to implement the Well Replacement Protocol described in **Section 7.3.3**.

- **Discharge volume monitoring:** The volume of water discharged to stormwater must be monitored by a calibrated flow meter (or equivalent alternative means) that is integrated as part of the long-term pumping system. The flow meter (or flow monitoring device) will display cumulative volume discharged, which will be recorded onto the same data form used to document groundwater level, at the time of each water level monitoring event. Discharge volume monitoring frequency will therefore be the same as for groundwater level monitoring, i.e. quarterly for the first year, every 6 months for year two, and a single monitoring event at the end of year three.
- **Water quality monitoring:** A single, post-treatment water sample will be collected on an annual basis during the final monitoring event in each year (i.e. at 12 months and 24 months of operation). Treated water samples will be laboratory analysed for the priority discharge water quality parameters (**Table 5-1**), to confirm that DWC compliance and show that discharge water quality is not deteriorating with time. Given that the groundwater is to be treated prior to offsite discharge, the risks presented to the human health and environment for the construction phase of the development are considered low and acceptable. Groundwater assessment of water quality parameters is required at the end of the construction phase to verify concentrations, and review or amend proposed operational phase water treatment if required.
- **Annual dewatering monitoring report:** A factual, 12-monthly *Interim Report – Operational Dewatering* will be prepared using the WaterNSW Completion Report form template (described in **Section 5.6.1**), after each 12 months of monitoring. Each report will document the groundwater level gauging results, groundwater quality results and the cumulative volume of water discharge from the seepage collection sump to the storm water system. Each annual monitoring report will also include a trend analysis of the monitoring data and provide a discussion to characterise discernible/statistical trends in groundwater quality, and/or groundwater levels as measured in the monitoring well(s) and water discharge volumes over time.
- **Cessation of monitoring:** Should the annual dewatering monitoring report after the 36th month of occupation confirm that groundwater quality, groundwater level fluctuations at the monitoring well(s) and annual groundwater discharge volumes are stable (i.e. not

statistically trending up or down), then it will be determined that equilibrium has been reached and termination of the monitoring program would be justified. If this is not the case then the dewatering program will be reviewed accordingly.

The appointed environmental consultant will provide notification to Council to document the termination or continuation of monitoring at this stage. Should monitoring be continued, a review of monitoring frequency will be undertaken and appropriate notification to Council will be issued by the appointed environmental consultant, through Strata management.

7.3.3 Monitoring Well Replacement Protocol

EI notes that all the existing groundwater monitoring wells are located outside the basement footprint. At least one of these wells (and if practical, all) should be preserved to enable groundwater level monitoring close to the basement.

Should the existing wells be damaged during the construction works, installation of a new groundwater monitoring well must be installed as follows:

- a) The replacement monitoring well must be appropriately located so as to avoid any damage or destruction during construction works;
- b) Well design should be in accordance with the design for water monitoring bores for water level monitoring as specified under the *Minimum Construction Requirements for Water Bores in Australia* (Ref. NUDLC, 2020);
- c) The well should be appropriately screened, with the water intake interval set across the lowermost basement level to monitor groundwater levels at the bulk excavation level, assuming uniform ground conditions; and
- d) All reasonable steps must be taken to have the replacement bore installed within one week of the damage having occurred, subject to licensed driller availability.

8. DEWATERING MANAGEMENT SUMMARY

The requirements of this report are summarised in **Table 8-1**.

Table 8-1 Dewatering Management Summary

Item	Requirement / Procedure
Objective	Ensure that the proposed dewatering operations do not impact on the quality of the receiving surface waters (i.e. at the point of groundwater discharge). Where necessary, groundwater will be treated to achieve an acceptable water quality prior to discharge: ▪ See Section 3 for groundwater conditions. ▪ See Section 5.2 for groundwater quality discharge requirements. ▪ See Section 5.5 for groundwater treatment options. Provide comment on groundwater level changes that occur during dewatering: ▪ See Section 4 for summary of groundwater take assessment and dewatering drawdown impacts. ▪ Refer to Appendix D for groundwater seepage analysis model. Provide relevant information demonstrating that post-construction, operational dewatering would pose minimal harm to the groundwater source: ▪ See Section 7.3 for operational phase dewatering management.
Person Responsible for Implementation of this Report	During basement excavation and construction, the Site Manager / Water Treatment Specialist will be responsible for ensuring the implementation of appropriate treatment of extracted groundwater, as outlined in this document. Occupation phase responsibility will rest with the Site Manager (yet to be determined).
Operation Dewatering Policy	To ensure that all extracted groundwater from dewatering is effectively treated prior to discharge to the receiving water bodies, as will be confirmed by the Operational Dewatering Management Procedure detailed in Section 7.3.
Pre-Dewatering Groundwater Assessment	As set out in Section 3, representative samples were collected prior to dewatering and tested for the identified potential contaminants, to provide baseline groundwater quality data and review the proposed discharge water quality requirements.
Geotechnical Monitoring Report	The geotechnical monitoring report, detailing 3 months of continuous groundwater level monitoring, is presented as an appendix in the GSA report in Appendix D.
Discharge Water Quality Criteria	All groundwater to be discharge into the local stormwater network is to meet (at the very least) the criteria outlined in Table 5-1, Section 5.2.
Implementation Strategy	All extracted groundwater will be monitored and treated (where necessary). On-going testing to be performed to confirm water quality meets the adopted Discharge Water Criteria (DWC) prior to release into the storm water network, which discharges to receiving water bodies. Additional treatment / wastewater disposal to be undertaken if the DWC values are not met.

Item	Requirement / Procedure
Monitoring Requirements for Construction Phase Dewatering	As specified in Section 5.3: ▪ 1. Initial Assessment = Prior to dewatering ▪ 2. Trial-Run Period = Twice per week* ▪ 3. Discharge Monitoring Period = Weekly for a month to fortnightly for a month then monthly* <i>*provided the analytical results indicate treated water quality meets the adopted criteria, or risks are considered to be significantly low. Should analytical results exceed the adopted discharge criteria, contingencies listed in Section 6.5 must be followed.</i>
Monitoring Requirements for Operational Phase Dewatering	As specified in Section 7.3: Quarterly for the first year, every 6 months for year two, and a single monitoring event at the end of year three.
Auditing	The appointed environmental consultant (water quality expert) will undertake weekly audits during the Trial-Run Period (if required), and monthly audits during the Monitoring Period, to ensure that all discharges comply with the criteria specified in Section 5.2.
Reporting	The contractor responsible for dewatering will keep records of all monitoring and laboratory test results, as well as quantities of treatment agents applied during the dewatering process. All records should be made available for inspection onsite during the construction phase.
Corrective Actions	As specified in the contingency measures, outlined in Section 6.5.

9. STATEMENT OF LIMITATIONS

This plan has been prepared for the exclusive use of T&P Chimes Development Pty Ltd, whom is the only intended beneficiary of EI's work. The scope of work completed for the purpose of this plan is limited to that agreed with T&P Chimes Development Pty Ltd.

No other party should rely on the document without the prior written consent of EI, and EI undertakes no duty, or accepts any responsibility or liability, to any third party who purports to rely upon this document without EI's approval.

EI has used a degree of care and skill ordinarily exercised in drafting similar plans by reputable members of the environmental industry in Australia, as at the date of this document. No other warranty, expressed or implied, is made or intended. Each section must be read in conjunction with the whole of this plan, including its appendices.

EI's professional opinions are reasonable and based on its judgment, experience, training and results from analytical data. EI may also have relied upon information provided by the client and other third parties to prepare this document, some of which may not have been verified by EI.

EI's professional opinions contained in this document are subject to modification if additional information is obtained through further investigation or observations. In some cases, further testing and analysis may be required, which may result in a further report with different conclusions.

Should you have any queries regarding this plan, please do not hesitate to contact EI.

10. REFERENCES

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ABBREVIATIONS

AIP	Aquifer Interference Policy
ANZECC	Australian and New Zealand Environment Conservation Council
ANZG	Australian and New Zealand Governments
ASS	Acid Sulfate Soil
BEL	Bulk Excavation Level
BTEX	Benzene, Toluene, Ethyl benzene, Xylene
CVOC	Chlorinated Volatile Organic Compounds
DGV	Default Guideline Values
DO	Dissolved Oxygen
DP	Deposited Plan
DWC	Discharge Water Criteria
EC	Electrical Conductivity
EI	EI Australia
FFL	Finished Floor Level
GME	Groundwater Monitoring Event
GSA	Groundwater Seepage Analysis
LGA	Local Government Area
LOR	Limit of Reporting (limit of laboratory reporting for analytical method; see PQL)
m	metres
mAHD	metres Australian Height Datum
mBGL	metres Below Ground Level
ML	Megalitres
mg/L	Milligrams per Litre
µg/L	Micrograms per Litre
µS/cm	Microsiemens per Centimetre
N/A	No Available Criterion
NATA	National Association of Testing Authorities
NTU	Nephelometric Turbidity Units
PAHs	Polycyclic Aromatic Hydrocarbons
PFAS	Perfluoroalkyl and Polyfluoroalkyl Substances
pH	Potential Hydrogen (a measure of the acidity or basicity of an aqueous solution)
PID	Photo-ionisation Detector
PQL	Practical Quantitation Limit (limit of reporting for analytical method; see LOR)
RL	Reduced Level
TDS	Total Dissolved Solids
TRH	Total Recoverable Hydrocarbons (non-specific analysis of organic compounds)
VOCs	Volatile Organic Compounds

(Note: Some of the above abbreviations may not have been used in this report)

Appendix A – Figures



Drawn:	C.T
Approved:	N.K
Date:	19-11-25
Scale:	Not To Scale



LEGEND (All locations are Approximate)

- Site boundary
- Proposed basement boundary
- Groundwater monitoring well location (EI, 2025)
- Groundwater monitoring well location (JK, 2025)



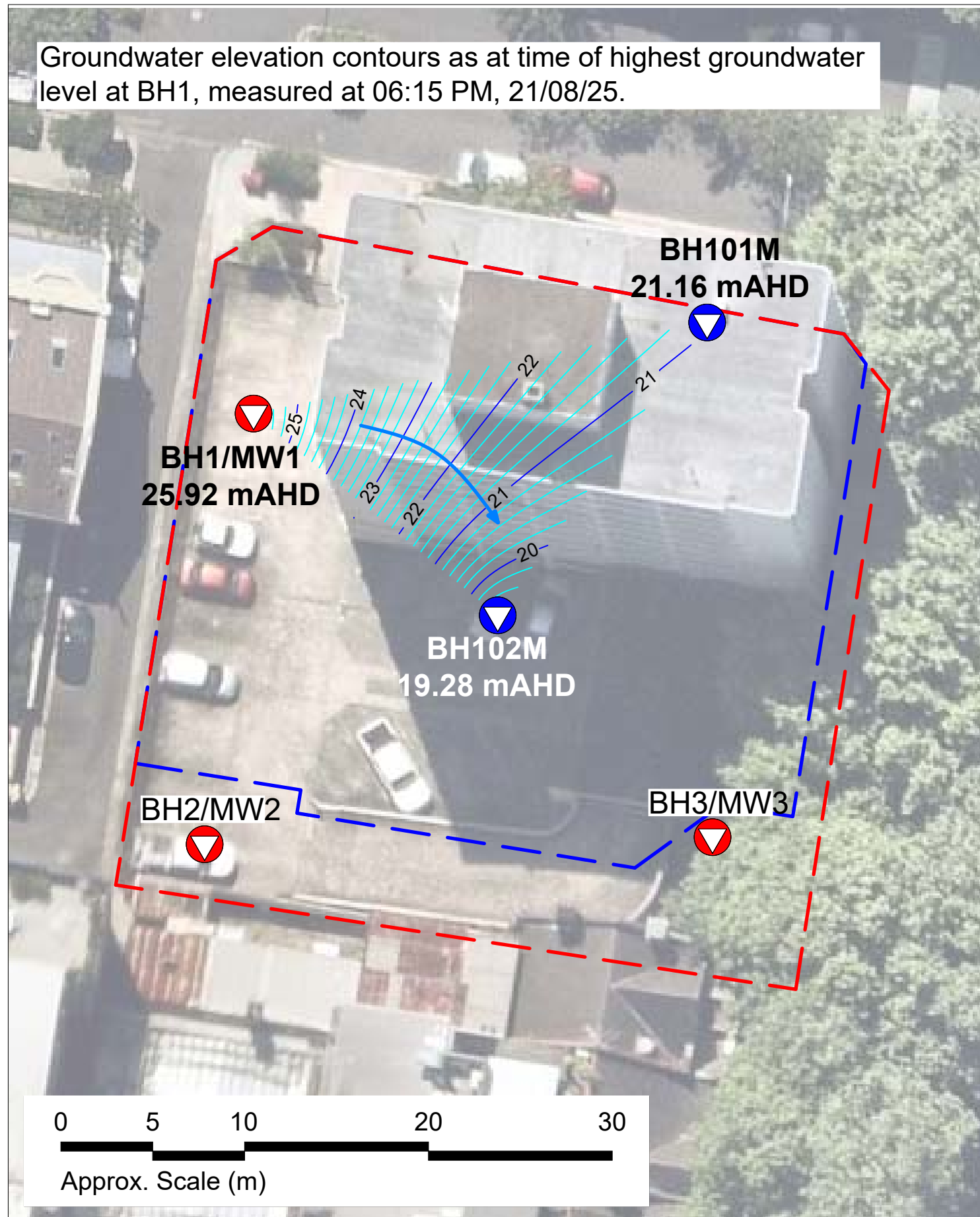
Suite 6.01, 55 Miller Street, PYRMONT 2009
Ph (02) 9516 0722 Fax (02) 9518 5088

Drawn:	C.T.
Approved:	N.K.
Date:	19-11-25

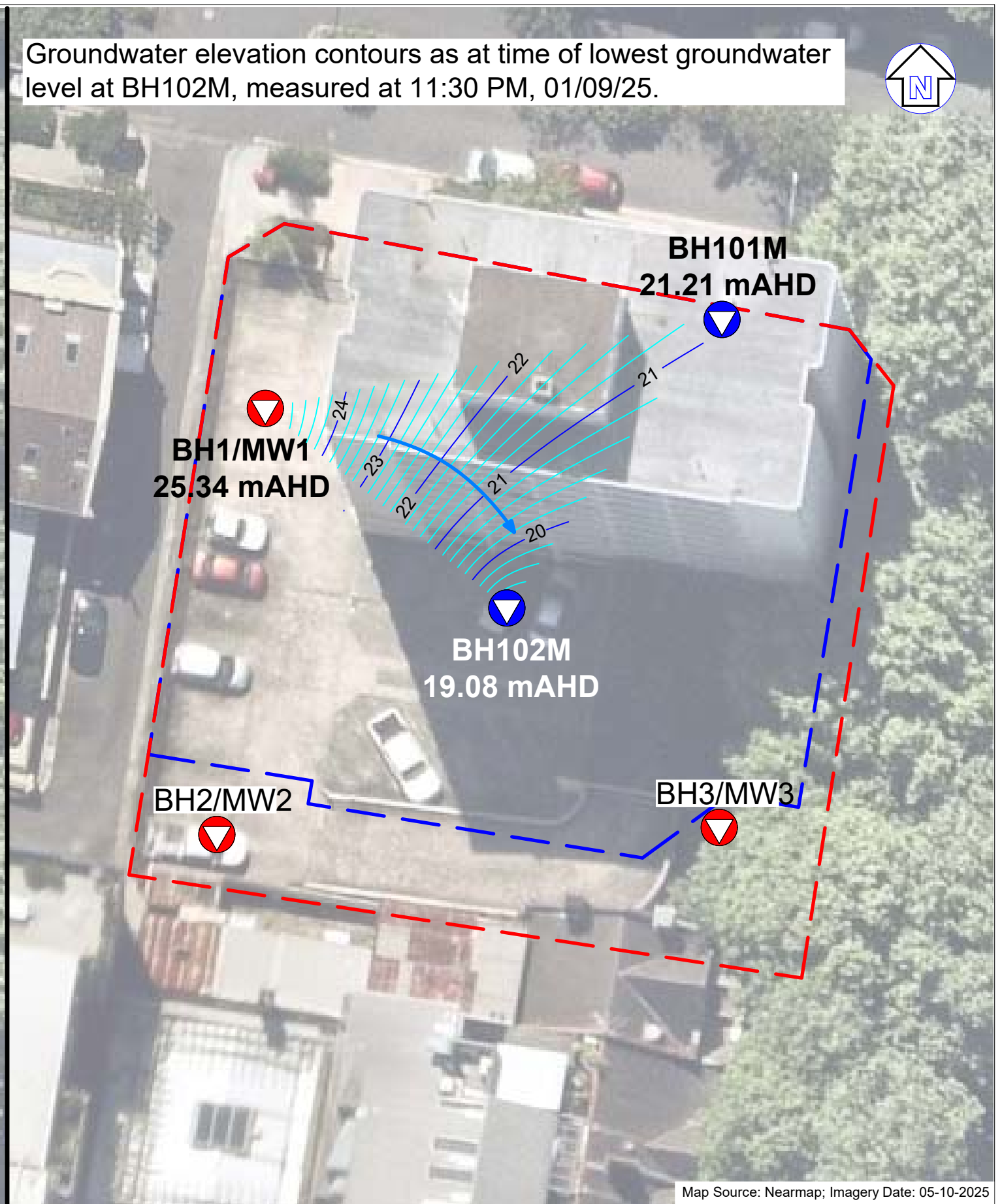
Time and Place Pty Ltd
Hydrogeological Report including DMP & GSA
45-53 Macleay Street, Potts Point NSW
Sampling Location Plan

Figure:
A2
Project: E26863.E16

Groundwater elevation contours as at time of highest groundwater level at BH1, measured at 06:15 PM, 21/08/25.



Groundwater elevation contours as at time of lowest groundwater level at BH102M, measured at 11:30 PM, 01/09/25.



Map Source: Nearmap; Imagery Date: 05-10-2025

LEGEND (All locations are Approximate)

- Site boundary
- Proposed basement boundary
- Groundwater monitoring well location (EI, 2025)
- Groundwater monitoring well location (JK, 2025)
- Groundwater contour, 0.2m interval (mAHD)
- Inferred groundwater flow direction

Appendix B – Tables

Table B2 - Summary of Baseline Groundwater Quality - Chemical Parameters

E6863 - Potts Point
(DWC - Marine)

Sample ID	Sampling Date	Metals																						BTEX					VOCs	Chlorinated VOCs					
		Total As	Cd	¹ Total Cr	Cu	Pb	Hg	Ni	Zn	Al	Sb	Ba	Be	B	Co	Fe	Li (mg/L)	Mn	Mo	Se	SiO ₂ (mg/L)	Ag	Sr	U	V	Benzene	Toluene	Ethylbenzene	o-xylene	m/p-xylene	Total VOCs	Perchloroethylene, PCE	Trichloroethylene, TCE	cis-1,2-dichloroethene	Vinyl Chloride
Groundwater Investigation - (EI, 2025)																																			
MW1	16/10/2025	1	0.1	3	2	<1	<0.1	<0.1	41	220	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.5	<0.5	<0.5	<0.5	<1	<10	<0.5	<0.5	<0.5	<0.3
MW2		2	<0.1	1	5	<1	<0.1	<0.1	<5	53	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.5	<0.5	<0.5	<0.5	<1	<10	<0.5	<0.5	<0.5	<0.3
MW3		2	<0.1	<1	5	<1	<0.1	<0.1	<5	24	1	21	<1	130	<1	11	5	1	1	<1	1700	<1	150	<1	8	<0.5	<0.5	<0.5	<0.5	<1	<10	<0.5	<0.5	<0.5	<0.3
Discharge Water Criteria																																			
DWC - Marine		94 (As III) 42 (As V)	0.7	27 (Cr III) 4.4 (Cr VI)	13	4.4	0.1	70	80	37	9	20000	600	1500	1	3000		80	34	18		1.4		0.5	100	700	180	80	470	275		70		330	

Sample ID	Sampling Date	Petroleum Hydrocarbons			PAHs			Microbiological Organisms			Total Phenols	Total Cyanide	PFAS			Major Cations				Major Anions				Ionic Balance (%)	Nutrients									
		Oil & Grease	TRH C6 - C9	TRH C10 - C40	Total PAHs	Benzo(a)pyrene	Naphthalene	Faecal coliforms (MPN/100mL)	Faecal streptococci	Escherichia coli (E. coli)			PFOS	PFOS + PFHxS	PFOA	Fluoride (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Bromide (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Sodium (mg/L)	Potassium (mg/L)		Ammonia Nitrogen ³ NH as N	Nitrate Nitrogen NO3-N	Nitrite Nitrogen NO2 as N	Total Oxidised Nitrogen NOx-N	Total Kjeldahl Nitrogen	Total Nitrogen (calc)	Total Phosphorus (Kjeldahl) as P	Filterable Reactive Phosphorus as P		
Groundwater Investigation (EI, 2025)																																		
MW1	16/10/2025	NA	<40	360	<1	<0.1	<0.1	NA	NA	NA	<50	<4	NA	NA	NA	NA	NA	NA	NA	12	0.8	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA		
MW2		NA	<40	<320	<1	<0.1	<0.1	NA	NA	NA	<50	<4	NA	NA	NA	NA	NA	NA	NA	42	2.5	NA	NA		NA	NA	NA	NA	NA	NA	NA			
MW3		NA	<40	<320	NA	<0.1	<0.1	22	NA	4	<50	<4	0.050	0.06	0.02	320	30	0.510	<50	50	2.9	24	20		10	510	5	520	810	1300	570	47		
Discharge Water Criteria																																		
DWC - Marine		No detectable oil or grease	If TPH is detected analysis for BTEX and PAH is required			0.1	16		None detectable in 100mL		400	4	0.13		220										910	3400	30000	5		120	25	10		

Notes:
All values are µg/L unless stated otherwise
NA = Not Analysed
Water quality criteria are based on the ANZG, 2018 (Rev. Jan 2024) 95% marine water DGVs, or relevant default guidelines where ANZG marine water DGVs are not currently available, as explained in the footnotes to **Table 5-1**, in **Section 5** of the DMP.

1

This result was for Total Chromium. Note: When total chromium is above CrVI criterion, confirmatory speciation testing for CrVI is recommended.

2

TRH result was obtained using silica gel clean-up method, to allow quantification of non-natural organic sources only.

Highlighted value does not meet the adopted criteria

No relevant criteria are currently available

Table B1 – Summary of Baseline Groundwater Quality Results: Physical Parameters

Sample ID	Date sampled															Visual Assessment
		Electrical Conductivity Field EC (µS/cm)	Electrical Conductivity (µS/cm)	field pH	pH	Field Redox (mV)	Eh ¹	Total Dissolved Solids (mg/L)	Total Suspended Solids (TSS) (mg/L)	Turbidity (NTU)	Hardness (mg CaCO ₃ /L)	Field Water Temperature (°C)	Dissolved Oxygen Field DO (mg/L)	Dissolved Oxygen (mg/L)	Total Organic Carbon (TOC) as NPOC (mg/L)	Field Oil & Grease (Present/Absent)
Groundwater Investigation - (EI, 2025)																
MW1	16/10/2025	240	170	5.01	5.8	290.3	NA	120	NA	64	32	18.01	3.27	NA	NA	Absent
MW2		638	280	6.7	6.5	333.9	NA	180	NA	340	120	18.63	3.26	NA	NA	Absent
MW3		470	410	7.3	7.3	273.5	404	270	620	410	140	18.61	2.33	6.2	5.7	Absent
Discharge Water Criteria																
DWC - Marine				6.5 - 8.4	6.5 - 8.4					10						No visible sheens, surface films or oil and grease

Notes:

All values are in units as shown.
All parameters which state 'Field' were tested onsite using portable water quality test meters and probes, all other parameters were tested in the laboratory.
NA = Not Analysed

Water quality criteria are based on the ANZG, 2018 (Rev. Jan 2024) 95% marine water DGVs, or relevant default guidelines where ANZG marine water DGVs are not currently available, as explained in the footnotes to **Table 5-1**, in **Section**

Highlighted value does not meet the adopted criteria

No relevant criteria are currently available

¹ Eh in units of millivolts (mV) were calculated by adjusting Field Redox measurements to Standard hHydrogen Electrode (SHE) by adding instrument manufacturer's quoted electrode potential (205 mV)



Table B3 Summary of Results for the Field QC samples

Sample identification	Sampled Date	Description	TRH				BTEX				Heavy Metals							
			F1*	F2**	F3 (>C ₁₆ - C ₃₄)	F4 (>C ₃₄ - C ₄₀)	Benzene	Toluene	Ethylbenzene	Xylene (total)	Arsenic	Cadmium	Chromium (Total)	Copper	Lead	Mercury	Nickel	Zinc
Intra-laboratory Duplicate																		
MW3	16/10/2025	Groundwater	<50	<60	<500	<500	<0.5	<0.5	<0.5	<1.5	2	<0.1	<1	5	<1	<0.1	<1	<1
WQD1		Duplicate of MW3	<50	<60	<500	<500	<0.5	<0.5	<0.5	<1.5	2	<0.1	<1	5	<1	<0.1	<1	<5
RPD (%)			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA
Inter-laboratory Duplicate																		
MW3	16/10/2025	Groundwater	<50	<60	<500	<500	<0.5	<0.5	<0.5	<1.5	2	<0.1	<1	5	<1	<0.1	<1	<1
QT1		Duplicate of MW3	<10	<50	<100	<100	<1	<1	<1	<2	2	<0.1	<1	5	<1	<0.05	1	1
RPD (%)			NA	NA	NA	NA	NA	NA	NA	NA	0.0	0.0	0.0	0.0	0.0	NA	0.0	0.0
Groundwater																		
WTB	16/10/2025	Trip blank	-	-	-	-	<0.5	<0.5	<0.5	<1.5	-	-	-	-	-	-	-	-
WTS		Trip spike	-	-	-	-	[101%]	[101%]	[100%]	-	-	-	-	-	-	-	-	-
QR1		Rinsate	<50	<60	<500	<500	<0.5	<0.5	<0.5	<1.5	<1	<0.1	<1	<1	<1	<0.1	<1	<5

Indicates values where a single result is found to be less than detection, with the duplicate sample found to be over the detection limit.

RPD exceeds 30-50% range referenced from AS4482.1 (2005)

NOTE:

All soil results are reported in mg/kg . All water results are reported in µg/L.

* TRH-F1 was calculated as TPH C6 - C10 minus the sum concentration of BTEX

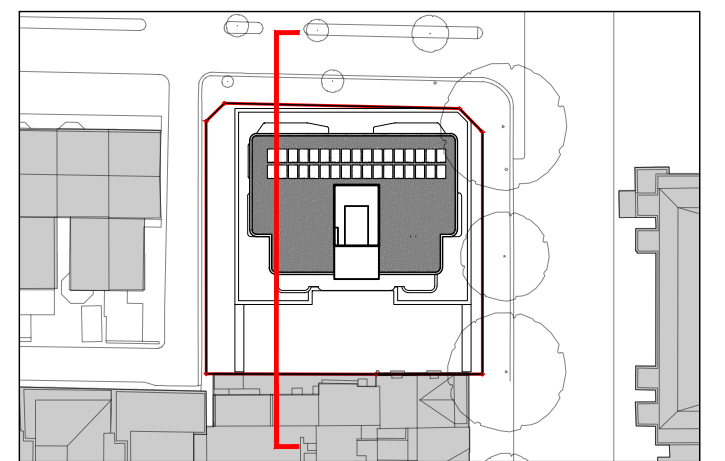
** TRH-F2 was calculated as TPH >C6 - C16 minus the concentration of naphthlene

Appendix C – Survey and Development Plans

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PROJECT	REF
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MACLEAY ST. POTTS POINT

ADDRESS
15-53 MACLEAY ST.
POTTS POINT, SYDNEY, NSW 2011

DRAWN	KHA
SCALE (@ A1)	1:200
DATE	10.10.2025

DRAWING TITLE

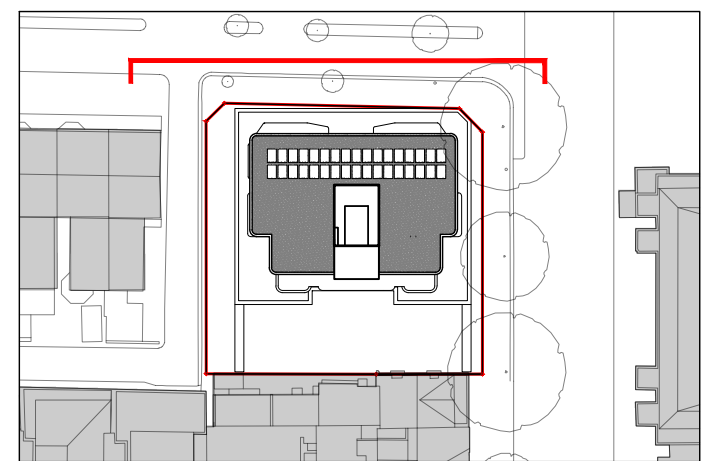
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PROJECT	REF
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MACLEAY ST. POTTS POINT 653

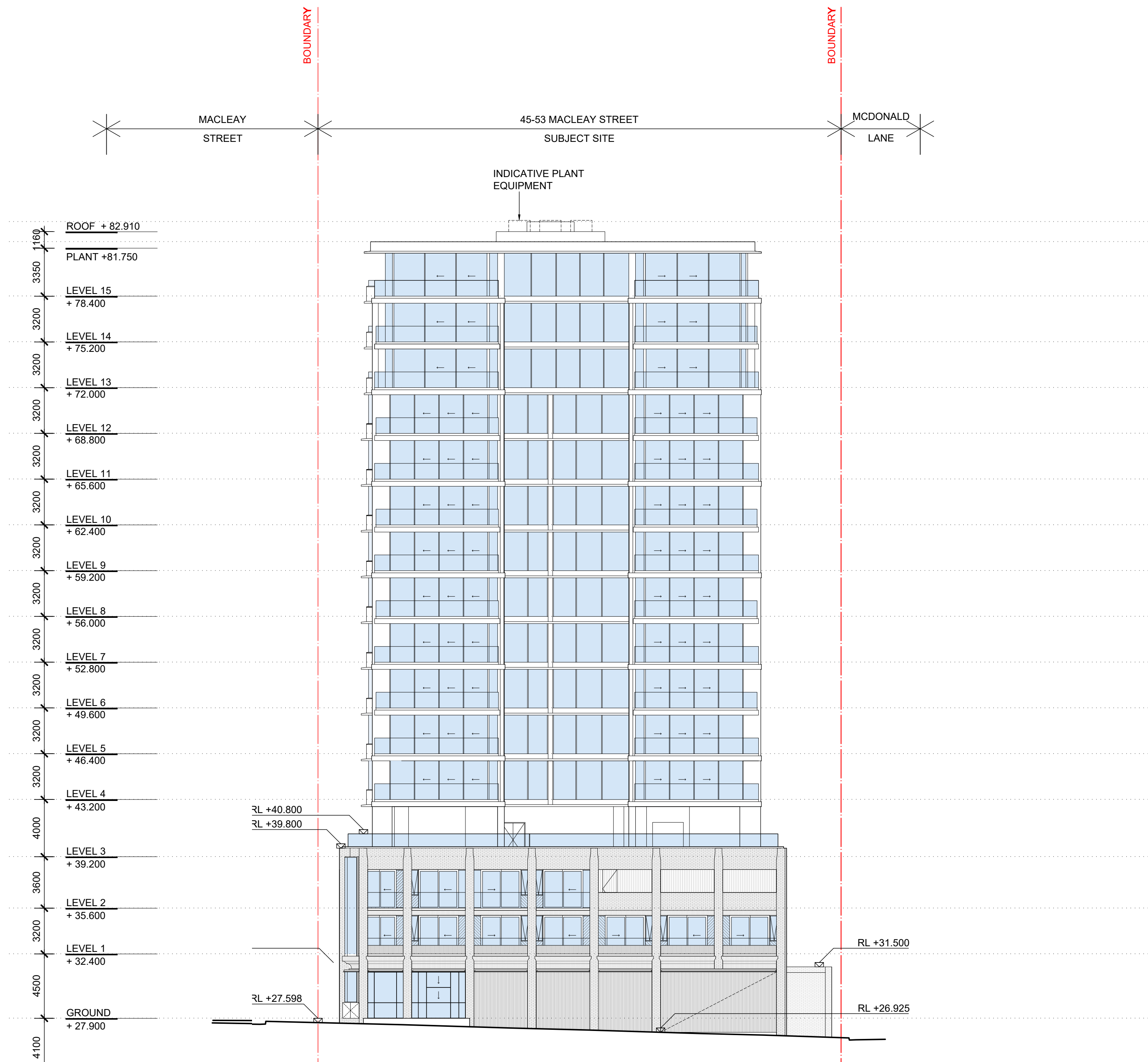
ADDRESS

45-53 MACLEAY ST.
POTTS POINT, SYDNEY, NSW 2011

DRAWN	KHA
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DRAWING TITLE
NORTH ELEVATION

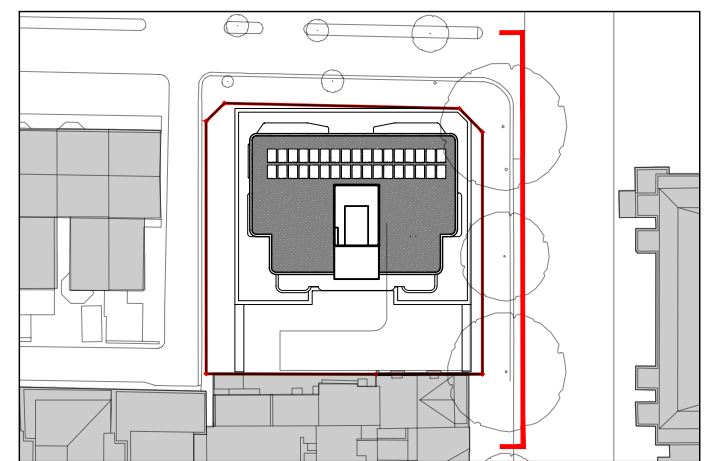
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LEGEND

— SITE BOUNDARY

[illegible]

STATUS

PRELIMINARY

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PROJECT	REF
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MACLEAY ST. POTTS POINT 653

ADDRESS
15-53 MACLEAY ST.
POTTS POINT, SYDNEY, NSW 2011

DRAWN	KHA
SCALE (@ A1)	1:200
DATE	10.10.2025

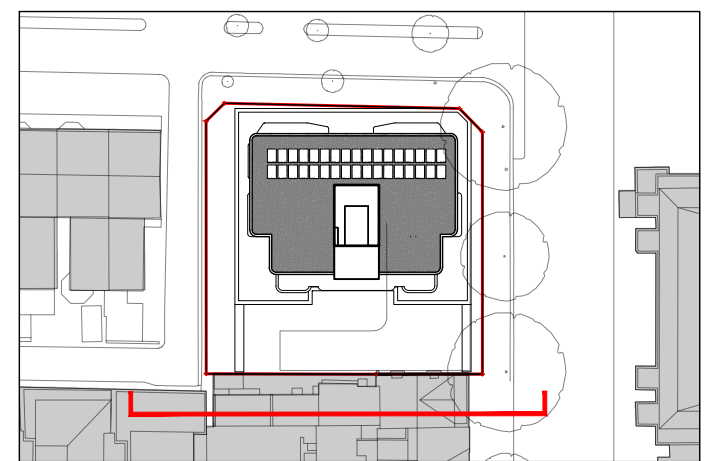
DRAWING TITLE
EAST ELEVATION

DRAWING NUMBER	ISSUE
A 3002	C

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LEGEND

— SITE BOUNDARY

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PROJECT	REF
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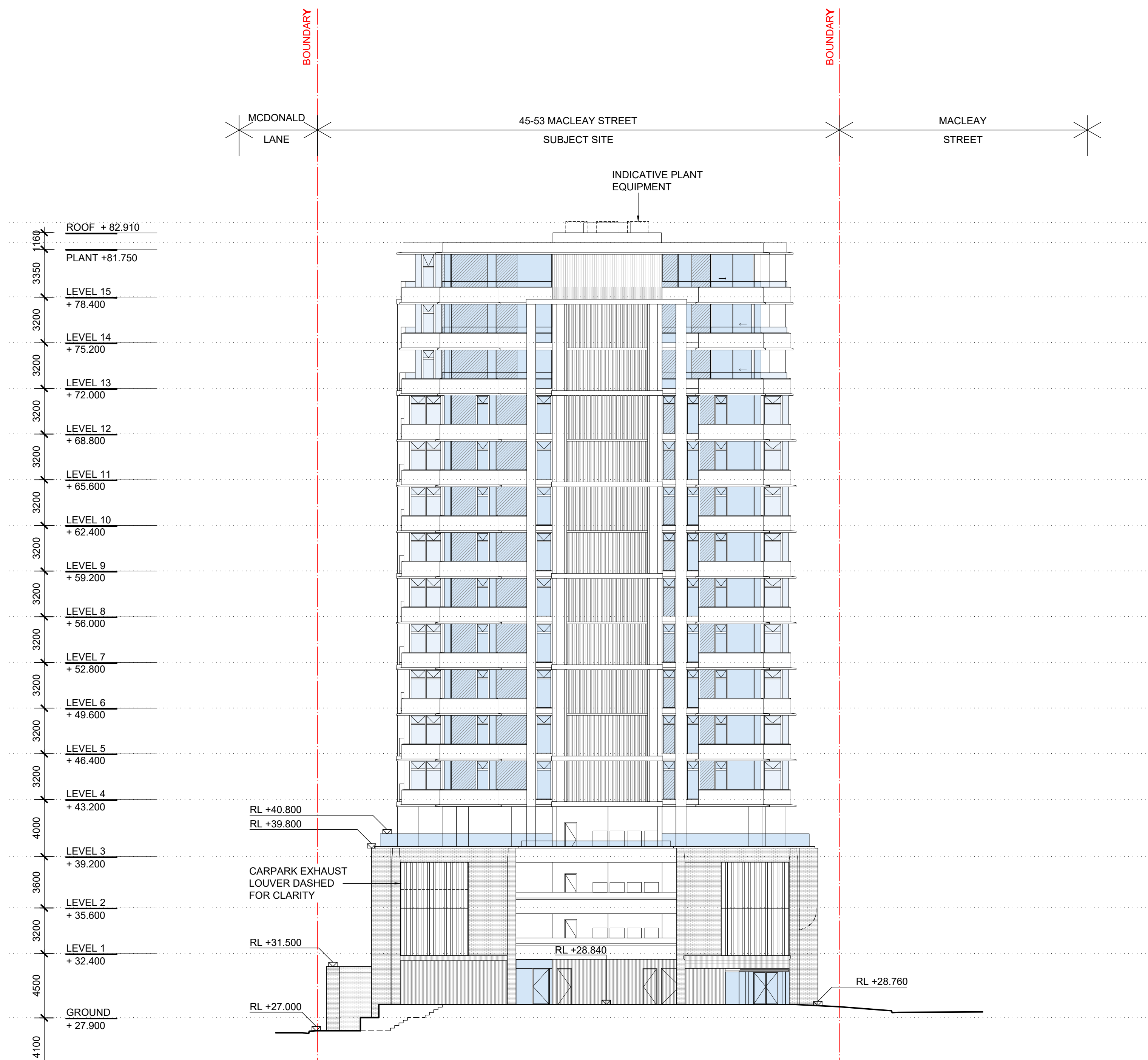
MACLEAY ST. POTTS POINT 653

ADDRESS
15-53 MACLEAY ST.
POTTS POINT, SYDNEY, NSW 2011

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SCALE (@ A1)	1:200
DATE	10.10.2025

DRAWING TITLE
SOUTH ELEVATION

DRAWING NUMBER	ISSUE
A 3003	C



Appendix D – Groundwater Seepage Analysis & Monitoring Report

11 November 2025
E26863.G12

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Groundwater Seepage Analysis 45-53 Macleay Street, Potts Point, NSW

1 INTRODUCTION

1.1 Background

At the request of Mr. Marc Yeo on behalf of THE CHIMES PP PARTNERSHIP PTY LTD (the Client), EI Australia (EI) has prepared this Groundwater Seepage Analysis (GSA) for a proposed development at 45-53 Macleay Street, Potts Point, NSW (the site).

The following documents, supplied by the Client, were used to assist in the preparation of this analysis:

- Geotechnical Investigation (GI) report prepared by JK Geotechnics – Referenced No. E34303RErpt, dated 12 September 2023;
- Architectural drawings prepared by KHA Architects, Reference No. 653, Drawing Nos. A1001 to A 1004 of Issue F and A 2002 of Issue C, last dated 10 October 2025;
- Site Survey Plan prepared by Colliers – Referenced 299-21, dated 25 September 2025.

EI has prepared the following reports for this site:

- Long-term Groundwater Level Monitoring Reports – Reference Nos. E26863.G11.GW01 and E26863.G11.GW02, last dated 10 November 2025; and
- Additional Geotechnical Investigation (AGI) report– Reference No. E26863.G04, dated 10 November 2025.

The datum adopted in the above documents is in Australian Height Datum (AHD), hence all Reduced Levels (RL) mentioned in this GSA report are henceforth in AHD.

Based on the provided documents and conversations with the Client, EI understands that the proposed development involves the demolition of the existing site structures and the construction of a fifteen-storey residential development overlying a four-level basement. The lowest basement level is assumed to have a Finished Floor Level (FFL) of RL 15.2 m AHD. A Bulk Excavation Level (BEL) of RL 14.9 m AHD is assumed, which includes allowance for the construction of the basement slab. To achieve the BEL, excavation depths to 13 m Below Existing Ground Level (BEGL) have been estimated. Locally deeper excavations may be required for footings, lift overrun pits, crane pads, and service trenches.

1.2 Assessment Objectives

The objective of this GSA is to provide an estimation of the groundwater take volumes that require pumping out during the construction and operational stages of the development, estimation of the groundwater drawdown as a result of the dewatering, and any associated ground settlements.

2 SITE MODEL

2.1 Modelled Sections

Since the site is situated on relatively flat terrain with minimal surface level variation, a single representative section (Section A–A) was selected for seepage modelling. This section extends along approximately half of the basement perimeter and was considered adequate to represent groundwater inflow conditions across the site. The location of the modelled section is shown in **Figure 1**.

2.2 Subsurface Conditions

For the purpose of this GSA, the average subsurface conditions outlined in JK's GI report and EI's AGI report has been adopted. A summary of the soil stratigraphy of the model and permeability values which were adopted for the assessment of groundwater take volumes are presented in **Table 1** below.

Table 1 Summary of Subsurface Conditions and Adopted Design Parameters

Material ¹	Adopted RL of Top of Unit (m AHD) ²	Adopted Permeability (m/s)	Permeability Anisotropy $k_{\text{Vertical}}/k_{\text{Horizontal}}$
Fill ³	27.9	1.00×10^{-5}	1.0
Class V Sandstone ⁴	26.3	5.00×10^{-8}	0.5
Class III Sandstone ⁵	21.7	2.60×10^{-8}	0.3

Notes:

- For more detailed descriptions of subsurface conditions reference should be made to JK's GI report and EI's AGI report.
- The subsurface profile associated with borehole BH1, representing the least favourable permeability conditions, was adopted in the numerical model.
- The permeability values were correlated using Look (2014).
- The permeability values were correlated using Pells et al. (2019).
- The permeability value was selected as the average of pump out tests conducted in BH101M and BH102M.

2.3 Groundwater Observations and Pump-Out Tests

2.3.1 Long Term Groundwater Monitoring

Long-term groundwater levels were monitored as part of EI's Groundwater Level Monitoring Report, with observations recorded between 5 August 2025 and 5 November 2025. Measurements were obtained from three monitoring wells installed by EI (BH1M, BH101M, and BH102M).

A summary of the observed groundwater levels is provided in **Table 2**, while full details and continuous monitoring records are presented in **Appendix C**.

Table 2 Summary of Observed Groundwater Levels

Monitoring Well ID	Observation Type	Date of Observation	Approximate Highest RL of Groundwater Level (m AHD)
BH1	EI Australia – Long term ground water monitoring	5 August 2025 to 5 November 2025	25.92
BH101M	EI Australia – Long term ground water monitoring	5 August 2025 to 5 November 2025	21.55
BH102M	EI Australia – Long term ground water monitoring	5 August 2025 to 5 November 2025	19.70

Based on the groundwater monitoring results, and applying a seasonal allowance of +1.0 m to the highest observed levels, a design groundwater level of RL 26.9 m AHD was adopted in the numerical model.

2.3.2 Pump-Out Testing

As part of the GSA scope, EI completed pump-out tests in three monitoring wells (BH1M, BH101M, and BH102M) at different occasions as shown in the **Table 3** below. The pump-out test involved initial removal of water from the well, then measuring the rise in water level at regular time intervals to assess the rate of water level recovery. The data was then used to calculate the hydraulic conductivity of the material screened by each well using the Hvorslev method (results are presented graphically in **Appendix B**. The monitoring wells and pump-out test results are summarised in **Table 3**.

Table 3 Monitoring Well Details and Pump Out Test Results

Monitoring Well/ Borehole ID	Total Well Depth (m BEGL)	Effective Screen Length (m)	Screened Section	Date of Test	Calculated Permeability (m/s)
BH1	15.0	14.0	Class III and Class V Sandstone	05-Aug-25	4.00×10^{-8}
				02-Sep-25	4.53×10^{-8}
				05-Nov-25	4.55×10^{-8}
BH101M	12.0	3.0	Class III Sandstone	05-Aug-25	1.70×10^{-8}
				02-Sep-25	1.09×10^{-8}
				05-Nov-25	1.16×10^{-8}
BH102M	15.0	6.0	Class III Sandstone	05-Aug-25	7.97×10^{-8}
				02-Sep-25	1.94×10^{-8}
				05-Nov-25	1.89×10^{-8}

2.4 THE MAXIMUM EXTENT OF THE CONE OF DEPRESSION

The estimated maximum extent of the cone of depression has been determined using Sichardt's Formula, as follows:

$$R = 3000 (H - h)\sqrt{k}$$

Where:

- R = Maximum extent of the cone of depression (m).
- H = Highest design groundwater level (m).
- h = Estimated groundwater level at the BEL due to full duration of dewatering (m).
- k = Hydraulic conductivity of the aquifer (m/s).

The coefficient of 3000 is based on empirical observations, predominantly for sandy aquifers. The lowest coefficient outlined in Sichardt's formula is approximately 1000, which would result in a smaller radius of influence. Therefore, using a coefficient of 3000 in this case is considered conservative.

Based on the formula above, the maximum extent of the cone of depression is estimated to be approximately 11 m from the basement outline. However, to maintain conservatism in the model when predicting the effective drawdown radius and potential drawdown-induced settlement due to the full duration of dewatering for the proposed development, a wider maximum extent of the cone of depression of 20 m from the basement outline has been adopted in the numerical model.

2.5 Shoring System

At the time of this assessment, shoring design details for the proposed excavation shoring system had not been provided by the Client. For the purposes of this seepage analysis, the excavation was assumed to be supported by a soldier pile wall. In the absence of detailed design, the shoring system has been conservatively modelled as fully permeable in the finite element analysis.

This assessment does not assess the overall stability and embedment depth of the shoring system. Once final designs are made available, this assessment should be revised accordingly.

3 GROUNDWATER TAKE ASSESSMENT

3.1 Groundwater Seepage Volumes during Construction Phase

Groundwater seepage analysis during construction has been undertaken using PLAXIS 2D. PLAXIS 2D is a commercially available finite element package intended for two dimensional analysis in geotechnical engineering. It is equipped with features to deal with various aspects of geotechnical structures and construction processes using robust and theoretically sound computational procedures. PLAXIS 2D estimates the seepage rate of water entering the excavation. This model estimates the volume of water which will be required to be dewatered during the construction of the basement and until the dewatering is turned off.

For the purpose of this modelling, it has been assumed that:

- The subsurface conditions were horizontal along the site and a representative **Section A-A** is considered in the analysis running along the basement perimeter.
- The permeability values presented in **Table 1** were adopted for modelling each of the units.
- The shoring system is assumed to be a fully permeable soldier pile wall.
- Dewatering was undertaken to the bulk excavation level of RL 14.9 m AHD.
- A “Close Flow” boundary is defined along the symmetric line (the centre of the excavation)
- The basement perimeter surrounding the basement excavation has a total length of about 132 m.
- An external design groundwater level of RL 26.9 m AHD was assumed to be constant at 20 m away from the shoring wall, as detailed in Section 2.3 of this report.

The PLAXIS 2D results are presented in **Appendix A. Table 4** below provides the estimated groundwater inflow rate into the basement.

Table 4 Summary of Analysis Results

Inflow per m length of perimeter wall (m ³ /day/m)	Inflow into excavation (m ³ /day)	Total Inflow per year (ML/year)
0.031	4.04	1.5

3.2 Assessment of Groundwater Take During Operational Phase

EI assumed a drained basement using sub-soil drainage and a sump-and-pump system will be adopted as the design for the proposed development. The estimated volume of groundwater to be removed during the operational phase of development is expected to be identical to the groundwater take value during construction phase, i.e. 1.5 ML / 365 days.

3.3 Groundwater Drawdown Induced Settlement

EI utilised PLAXIS 2D to estimate the potential drawdown-induced settlements as a result of dewatering. The maximum predicted groundwater drawdown and its associated maximum ground settlement surrounding the basement boundary are anticipated to be 3.9 m and 1.2 mm, respectively. It should be noted that the predicted settlement accounts only for water drawdown and does not consider other factors, such as shoring wall deflection, surcharge loading, and other construction-related influences. Figures illustrating the estimated drawdown-induced settlement are provided in **Appendix A**.

Based on the estimated settlements, the ground outside the shoring wall is expected to experience a maximum settlement of up to 1.2 mm. This level of settlement is considered to pose a 'negligible' risk in terms of the category of damage risk due to dewatering, as defined by Cashman and Preene (2021), as shown in the excerpt in **Plate 1**.

<i>Risk category^a</i>	<i>Maximum settlement (mm)^b</i>	<i>Building tilt^c</i>	<i>Anticipated effects</i>
Negligible	<10	<1/500	Superficial damage unlikely
Slight	10–50	1/500–1/200	Possible superficial damage; unlikely to have structural significance
Moderate	50–75	1/200–1/50	Expected superficial damage and possible structural damage to buildings; possible damage to rigid pipelines
Severe	75	>1/50	Expected structural damage to buildings and expected damage to rigid pipelines or possible damage to other pipelines

Source: Preene, M., *Proceedings of the Institution of Civil Engineers—Geotechnical Engineering*, 143(4), 177–190, 2000. With permission.

^a The risk category is to be based on the more severe of the settlement or tilt criteria.

^b Maximum settlement is based on the nearest edge of the structure to the groundwater control system.

^c Tilt is based on rigid body rotation, assuming that all of the maximum settlement occurs as differential settlement across the width of the structure or across an element of the structure.

Plate 1 Excerpt from Cashman and Preene (2021)

Although the PLAXIS modelling provides predicted drawdown-induced ground settlement values, it would be prudent for a thorough assessment of potential risks posed on neighbouring structures to be completed by a qualified and experienced structural engineer.

4 CONCLUSIONS AND COMMENTS

Based on the findings of this report and within the limitations of available data, EI concludes that:

- Construction phase groundwater take will be approximately 1.5 ML / 365 days for the proposed development.
- The above estimate is based on the following assumptions:
 - ▶ The shoring wall system is a permeable system as per Section 2.4 of this report;
 - ▶ Continuous dewatering in order to maintain the groundwater at BEL during construction; and
 - ▶ This assessment does not take into consideration any excavation that may be required for footings, service trenches, lift pits, or crane pads. This additional excavation, if required, is not expected to affect the retention or the dewatering system.
- The operational phase groundwater take with a drained basement system is estimated to be identical to the construction groundwater take, i.e. 1.5 ML / 365 days.
- The groundwater drawdown surrounding the basement boundary is predicted to be up to 3.9 m.
- The ground settlements due to the predicted groundwater drawdown behind the shoring wall, within the 20 m radius cone of depression, are estimated to be less than 1.2 mm. This level of settlement falls within the 'negligible' risk category for damage risk resulting from ground settlement due to dewatering, as per Cashman and Preene (2021). It would be prudent for potential risks to neighbouring structures to be assessed by a qualified and experienced structural engineer.
- Should any design or construction conditions differ from that adopted in this report; this GSA should be reviewed and updated as required.

5 LIMITATIONS

This report has been prepared for the exclusive use of THE CHIMES PP PARTNERSHIP PTY LTD who is the only intended beneficiary of EI's work. The scope of the inspections carried out for the purpose of this report is limited to those agreed with THE CHIMES PP PARTNERSHIP PTY LTD.

No other party should rely on the document without the prior written consent of EI, and EI undertakes no duty, or accepts any responsibility or liability, to any third party who purports to rely upon this document without EI's approval.

EI has used a degree of care and skill ordinarily exercised in similar tasks by reputable members of the geotechnical industry in Australia as at the date of this document. No other warranty, expressed or implied, is made or intended. Each section of this report must be read in conjunction with the whole of this report, including its appendices and attachments.

The conclusions presented in this report are based on a limited assessment of conditions, with specific locations chosen to be as representative as possible under the given circumstances.

EI's professional opinions are reasonable and based on its professional judgment, experience, training and results from analytical data. EI may also have relied upon information provided by the Client and other third parties to prepare this document, some of which may not have been verified by EI.

EI's professional opinions contained in this document are subject to modification if additional information is obtained through further investigation, observations, or validation testing and analysis during remedial activities. In some cases, further testing and analysis may be required, which may result in a further report with different conclusions.

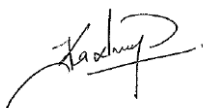
6 CLOSURE

Please do not hesitate to contact the undersigned should you have any questions.

For and on behalf of
EI Australia

Author

Technical Reviewer



Mihimal Kadurugamuwa
Geotechnical Engineer

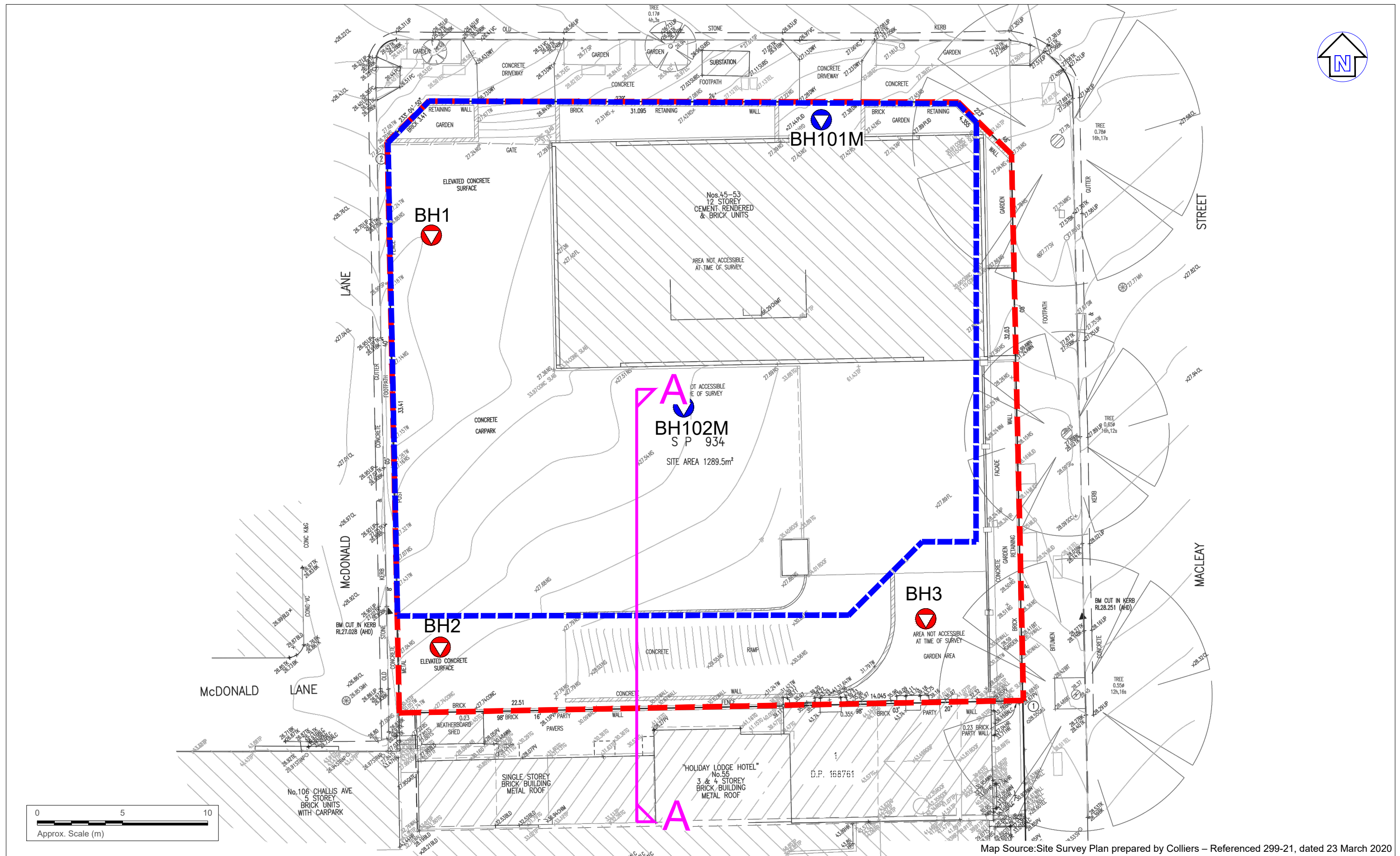
Huu Dang
Principal Design Engineer

Attachments:

- Figure 1 – Analysed Section Plan
- Appendix A – PLAXIS 2D Model and Results
- Appendix B – Pump Out Tests
- Appendix C – Groundwater Level Monitoring Report No. 2
- Appendix D – Important Information

Figures

Figure 1 Analysed Section Plan



LEGEND (Note: All locations shown are approximate)

- Site boundary
- Basement boundary
- Analysed section
- Borehole/monitoring well location (JKGeotechnics,2023)
- Borehole/monitoring well location (EI Australia, 2025)



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Drawn:	M.K.
Approved:	H.D.
Date:	03-10-25

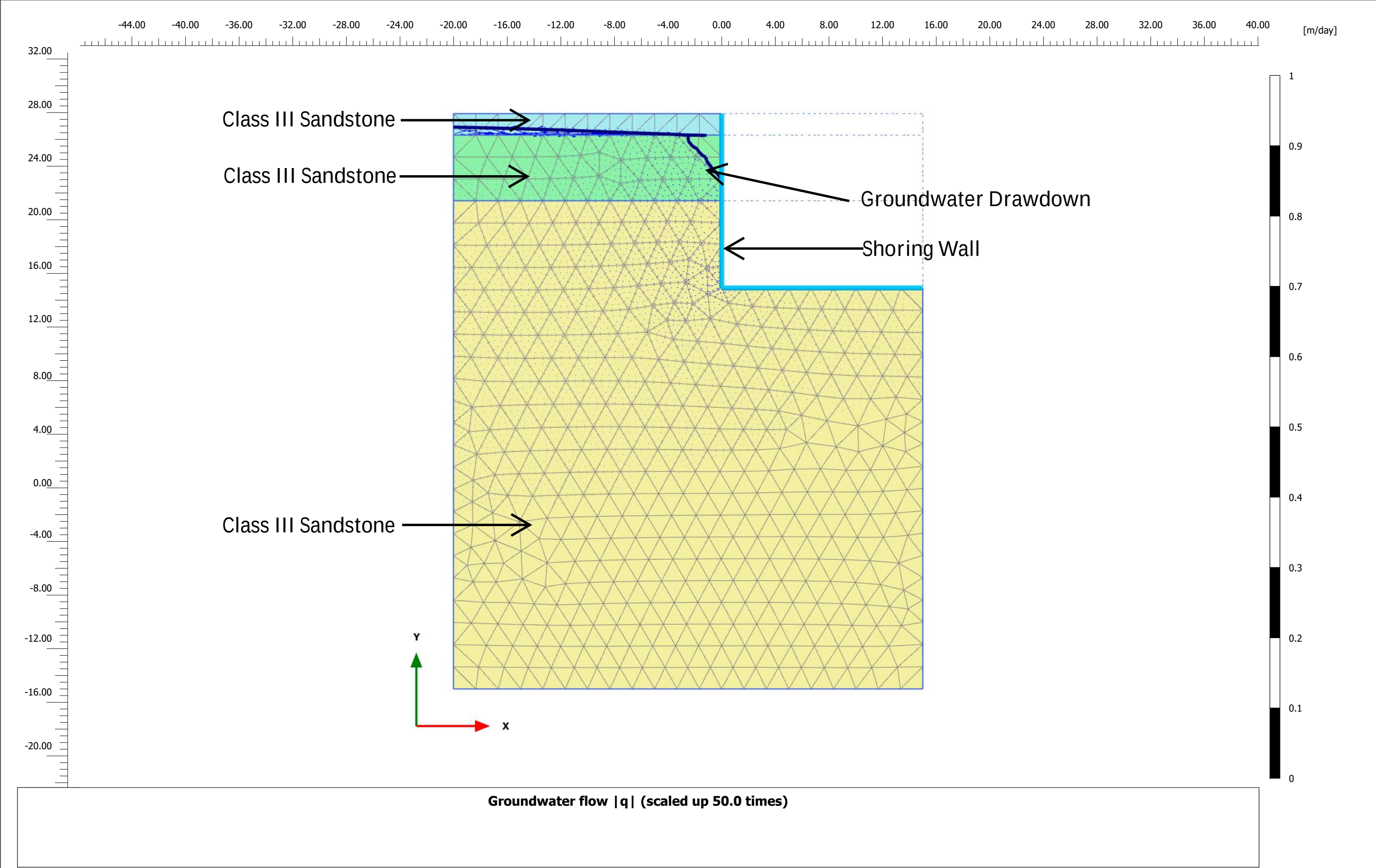
Time & PLACE
Groundwater Seepage Analysis
45-53 Macleay Street, Potts Point NSW
Analysed Section Plan

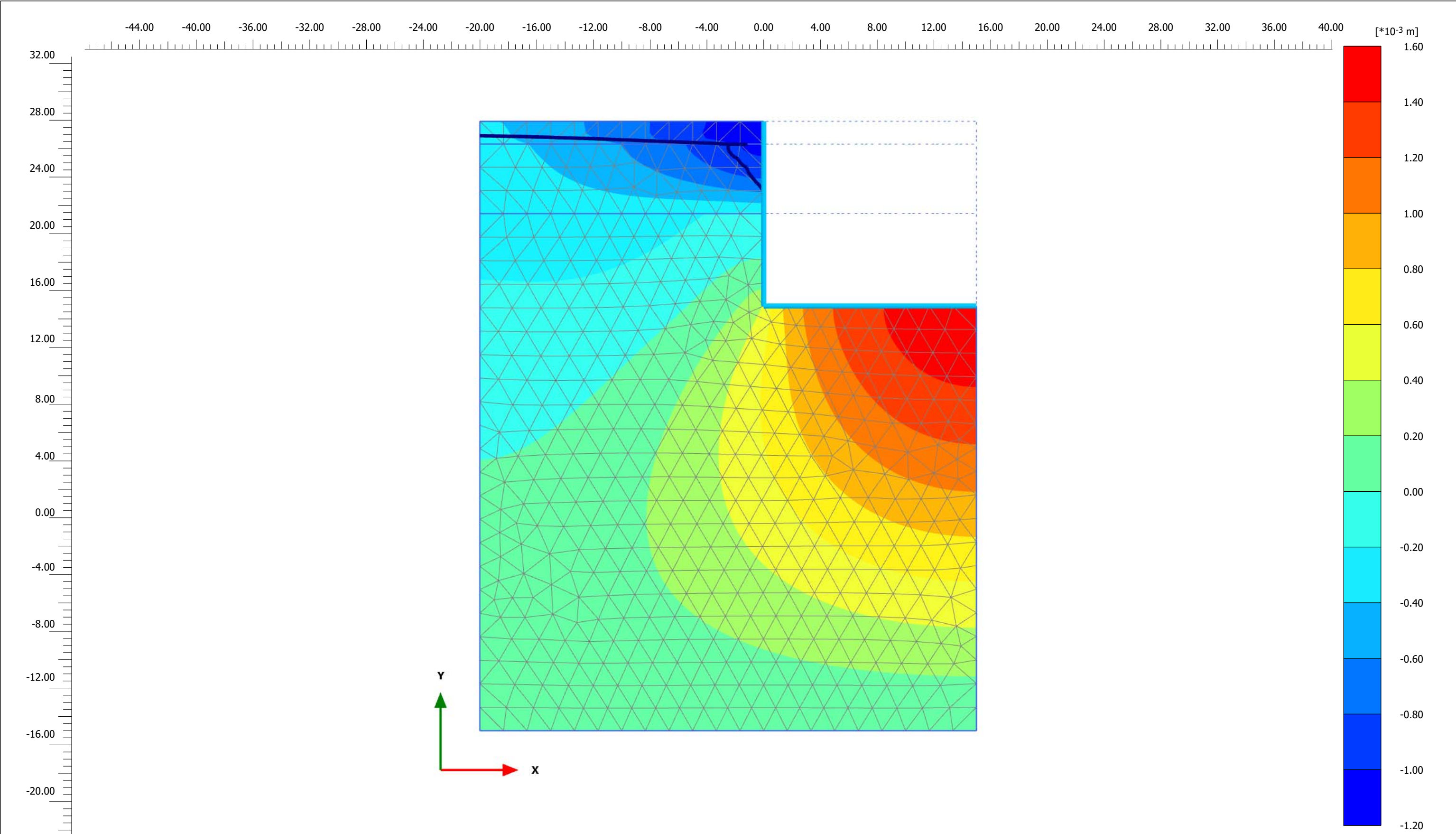
Figure:

1

Project: E26863.G12

Appendix A – PLAXIS 2D Model and Results





Total displacements u_y (scaled up 500 times)

Maximum value = 1.523×10^{-3} m (Element 313 at Node 508)

Minimum value = -1.145×10^{-3} m (Element 23 at Node 768)

		<i>Project description</i> E26863.G12 v01		<i>Date</i> 11/11/2025	
		<i>Project filename</i> E26863.G12 v01	<i>Step</i> 4	<i>Company</i> EI Australia	

Appendix B – Pump Out Tests

Rising Head Permeability Test



El Job No.	E26863.G11.02	Test Date	2/09/2025
By	HD	Location	BH101M

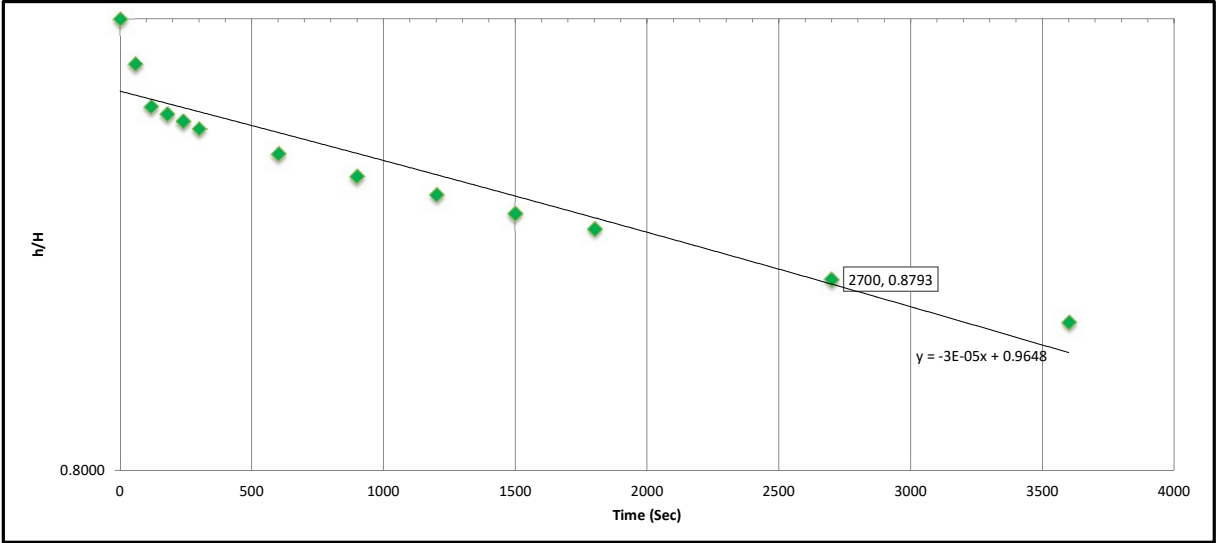
Borehole Detail	
BH No.	BH101M
Casing Stick-up (m)	-0.11
Effective Piezo Screen Length (m)	3
Piezo Radius r (m)	0.025
Bore radius (Auger Radius) (m)	0.05
Depth of the piezometer (m BGL)	11.97
Static Water Level (m BToC)	5.92
Lag time T0 (sec)	
Calculated Permeability k	1.09E-08 m/sec

Based on Hvorslev Method

$$K = \frac{r^2 \ln(L/R)}{2LT_0}$$

t1	1500
t2	3600
h1	0.9082
h2	0.8605

Time (mins)	Time (sec)	Depth to water (ft BToC)	Depth to water (m BToC)	Change in Level (m)	h/H
Static			5.92		
	0	0	11.8	5.88	1.0000
1	60		11.67	5.75	0.9779
2	120		11.55	5.63	0.9575
3	180		11.53	5.61	0.9541
4	240		11.51	5.59	0.9507
5	300		11.49	5.57	0.9473
10	600		11.42	5.50	0.9354
15	900		11.36	5.44	0.9252
20	1200		11.31	5.39	0.9167
25	1500		11.26	5.34	0.9082
30	1800		11.22	5.30	0.9014
45	2700		11.09	5.17	0.8793
60	3600		10.98	5.06	0.8605



Rising Head Permeability Test



El Job No.	E26863.G12	Test Date	2/09/2025
By	MS&HD	Location	BH102M

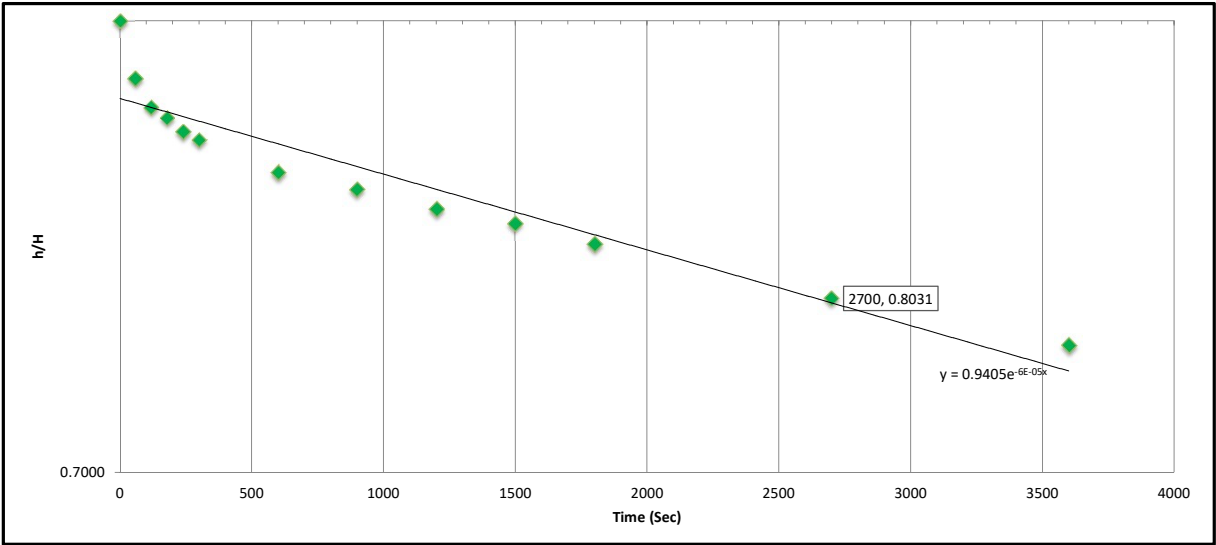
Borehole Detail	
BH No.	BH102M
Casing Stick-up (m)	-0.1
Effective Piezo Screen Length (m)	3
Piezo Radius r (m)	0.025
Bore radius (Auger Radius) (m)	0.05
Depth of the piezometer (m BGL)	15
Static Water Level (m BToC)	8.2
Lag time T0 (sec)	
Calculated Permeability k	1.94E-08 m/sec

Based on Hvorslev Method

$$K = \frac{r^2 \ln(L/R)}{2LT_o}$$

t1	900
t2	3600
h1	0.8752
h2	0.7739

Time (mins)	Time (sec)	Depth to water (ft BToC)	Depth to water (m BToC)	Change in Level (m)	h/H
Static			8.20		
	0	0	13.33	5.13	1.0000
1	60		13.1	4.90	0.9552
2	120		12.99	4.79	0.9337
3	180		12.95	4.75	0.9259
4	240		12.9	4.70	0.9162
5	300		12.87	4.67	0.9103
10	600		12.75	4.55	0.8869
15	900		12.69	4.49	0.8752
20	1200		12.62	4.42	0.8616
25	1500		12.57	4.37	0.8519
30	1800		12.5	4.30	0.8382
45	2700		12.32	4.12	0.8031
60	3600		12.17	3.97	0.7739



Rising Head Permeability Test

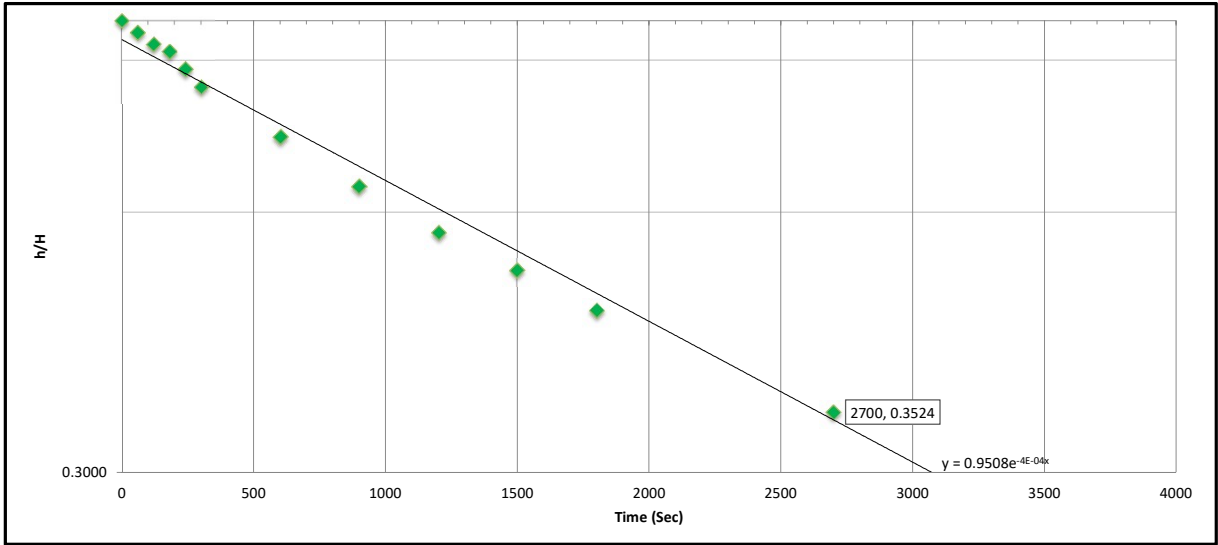


El Job No.	E25185.G12	Test Date	2/09/2025
By	HD	Location	BH1

Borehole Detail	
BH No.	BH1
Casing Stick-up (m)	-0.1
Effective Piezo Screen Length (m)	14
Piezo Radius r (m)	0.025
Bore radius (Auger Radius) (m)	0.05
Depth of the piezometer (m BGL)	15
Static Water Level (m BToC)	1.55
Lag time T0 (sec)	
Calculated Permeability k	4.53E-08 m/sec

Based on Hvorslev Method	
$K = \frac{r^2 \ln(L/R)}{2LT_0}$	
auger radius = 0.05; core radius is 0.038	
t1	240
t2	3600
h1	0.8801
h2	0.2626

Time (mins)	Time (sec)	Depth to water (ft BToC)	Depth to water (m BToC)	Change in Level (m)	h/H
Static			1.55		
	0	0	13.81	12.26	1.0000
1	60		13.43	11.88	0.9690
2	120		13.07	11.52	0.9396
3	180		12.85	11.30	0.9217
4	240		12.34	10.79	0.8801
5	300		11.84	10.29	0.8393
10	600		10.55	9.00	0.7341
15	900		9.42	7.87	0.6419
20	1200		8.52	6.97	0.5685
25	1500		7.85	6.30	0.5139
30	1800		7.22	5.67	0.4625
45	2700		5.87	4.32	0.3524
60	3600		4.77	3.22	0.2626



Rising Head Permeability Test



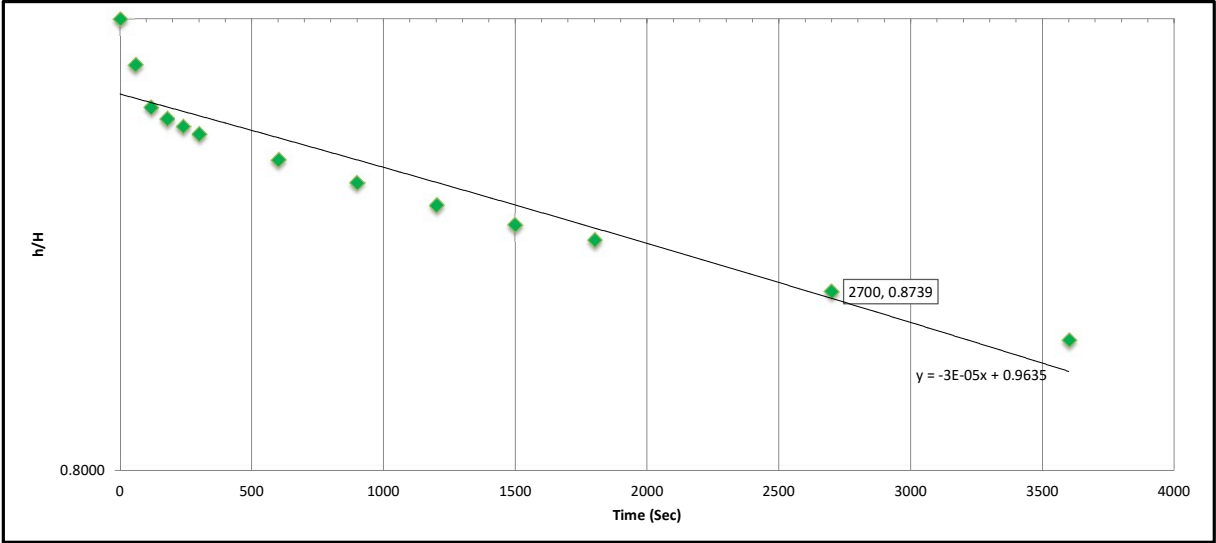
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By	HD	Location	BH101M

Borehole Detail	
BH No.	BH101M
Casing Stick-up (m)	-0.11
Effective Piezo Screen Length (m)	3
Piezo Radius r (m)	0.025
Bore radius (Auger Radius) (m)	0.05
Depth of the piezometer (m BGL)	11.97
Static Water Level (m BToC)	5.86
Lag time T0 (sec)	
Calculated Permeability k	1.16E-08 m/sec

Based on Hvorslev Method

t1	1500
t2	3600
h1	0.9033
h2	0.8532

Time (mins)	Time (sec)	Depth to water (ft BToC)	Depth to water (m BToC)	Change in Level (m)	h/H
Static			5.86		
	0	0	11.65	5.79	1.0000
1	60		11.52	5.66	0.9775
2	120		11.4	5.54	0.9568
3	180		11.37	5.51	0.9516
4	240		11.35	5.49	0.9482
5	300		11.33	5.47	0.9447
10	600		11.26	5.40	0.9326
15	900		11.2	5.34	0.9223
20	1200		11.14	5.28	0.9119
25	1500		11.09	5.23	0.9033
30	1800		11.05	5.19	0.8964
45	2700		10.92	5.06	0.8739
60	3600		10.80	4.94	0.8532



Rising Head Permeability Test



EI Job No.	E26863.G12	Test Date	5/08/2025
By	MS&HD	Location	BH201M

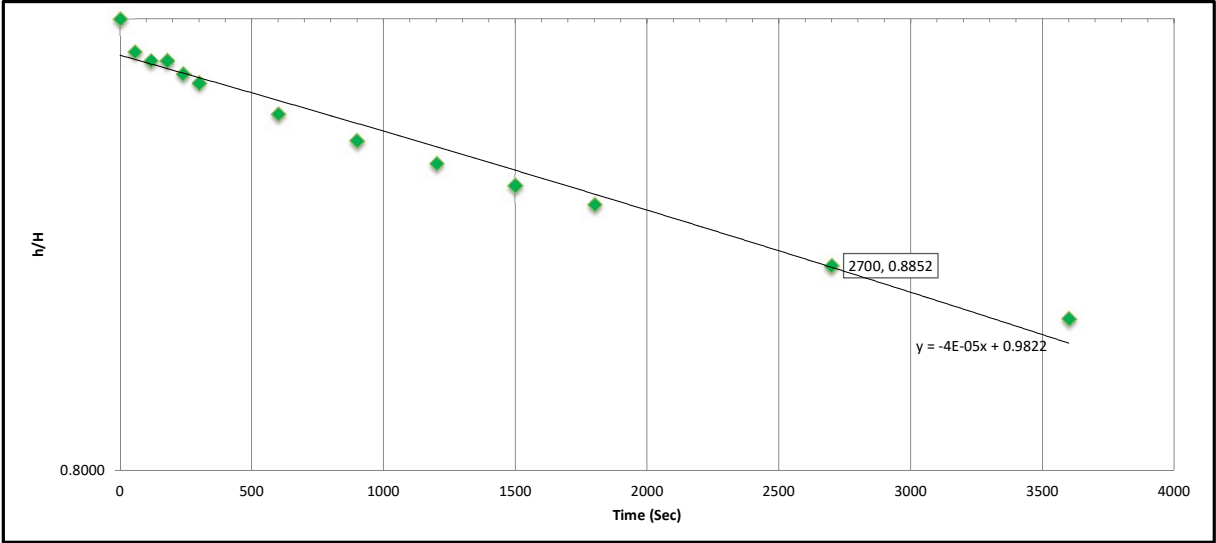
Borehole Detail	
BH No.	BH102M
Casing Stick-up (m)	-0.11
Effective Piezo Screen Length (m)	3
Piezo Radius r (m)	0.025
Bore radius (Auger Radius) (m)	0.05
Depth of the piezometer (m BGL)	11.97
Static Water Level (m BToC)	5.94
Lag time T0 (sec)	
Calculated Permeability k	1.33E-08 m/sec

Based on Hvorslev Method

$$K = \frac{r^2 \ln(L/R)}{2LT_0}$$

t1	1500
t2	3600
h1	0.9207
h2	0.8622

Time (mins)	Time (sec)	Depth to water (ft BToC)	Depth to water (m BToC)	Change in Level (m)	h/H
Static			5.94		
	0	0	10.73	4.79	1.0000
1	60		10.65	4.71	0.9833
2	120		10.63	4.69	0.9791
3	180		10.63	4.69	0.9791
4	240		10.6	4.66	0.9729
5	300		10.58	4.64	0.9687
10	600		10.51	4.57	0.9541
15	900		10.45	4.51	0.9415
20	1200		10.4	4.46	0.9311
25	1500		10.35	4.41	0.9207
30	1800		10.31	4.37	0.9123
45	2700		10.18	4.24	0.8852
60	3600		10.07	4.13	0.8622



Rising Head Permeability Test



El Job No.	E26863.G12	Test Date	5/08/2025
By	MS&HD	Location	BH101M

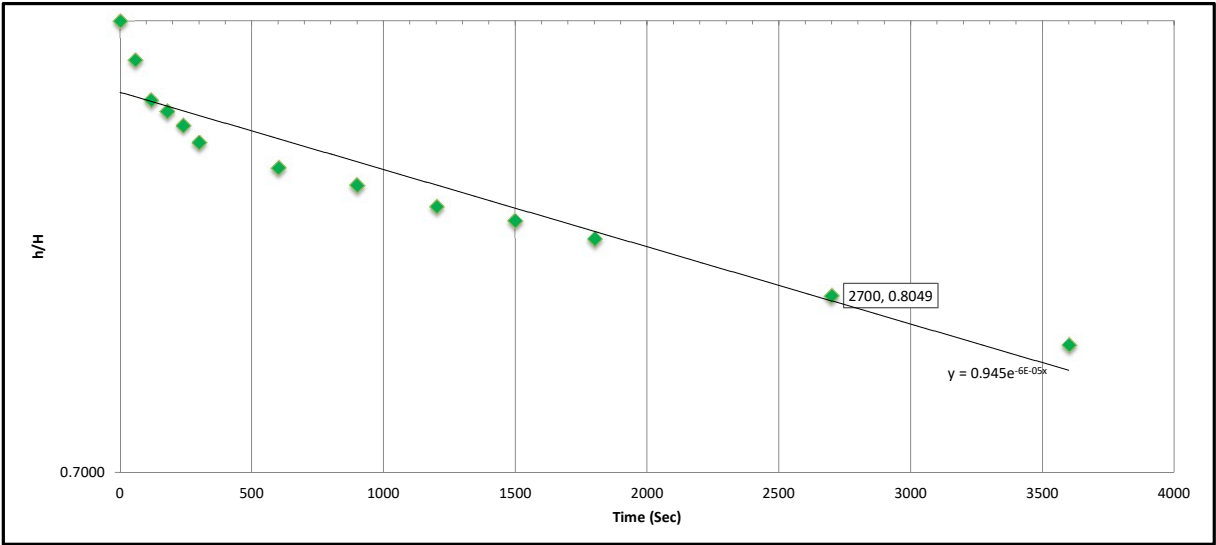
Borehole Detail	
BH No.	BH202M
Casing Stick-up (m)	-0.1
Effective Piezo Screen Length (m)	3
Piezo Radius r (m)	0.025
Bore radius (Auger Radius) (m)	0.05
Depth of the piezometer (m BGL)	15
Static Water Level (m BToC)	8.28
Lag time T0 (sec)	
Calculated Permeability k	1.98E-08 m/sec

Based on Hvorslev Method

$$K = \frac{r^2 \ln(L/R)}{2LT_0}$$

t1	900
t2	3600
h1	0.8780
h2	0.7744

Time (mins)	Time (sec)	Depth to water (ft BToC)	Depth to water (m BToC)	Change in Level (m)	h/H
Static			8.28		
	0	0	13.2	4.92	1.0000
1	60		13.05	4.77	0.9695
2	120		12.9	4.62	0.9390
3	180		12.86	4.58	0.9309
4	240		12.81	4.53	0.9207
5	300		12.75	4.47	0.9085
10	600		12.66	4.38	0.8902
15	900		12.6	4.32	0.8780
20	1200		12.53	4.25	0.8638
25	1500		12.48	4.20	0.8537
30	1800		12.42	4.14	0.8415
45	2700		12.24	3.96	0.8049
60	3600		12.09	3.81	0.7744



Rising Head Permeability Test

El Job No.	E25185.G12	Test Date	5/08/2025
By	MS&HD	Location	BH1

Borehole Detail

BH No.	BH4M
Casing Stick-up (m)	-0.1
Effective Piezo Screen Length (m)	3
Piezo Radius r (m)	0.025
Bore radius (Auger Radius) (m)	0.05
Depth of the piezometer (m BGL)	15
Static Water Level (m BToC)	1.43
Lag time T0 (sec)	
Calculated Permeability k	1.26E-07 m/sec

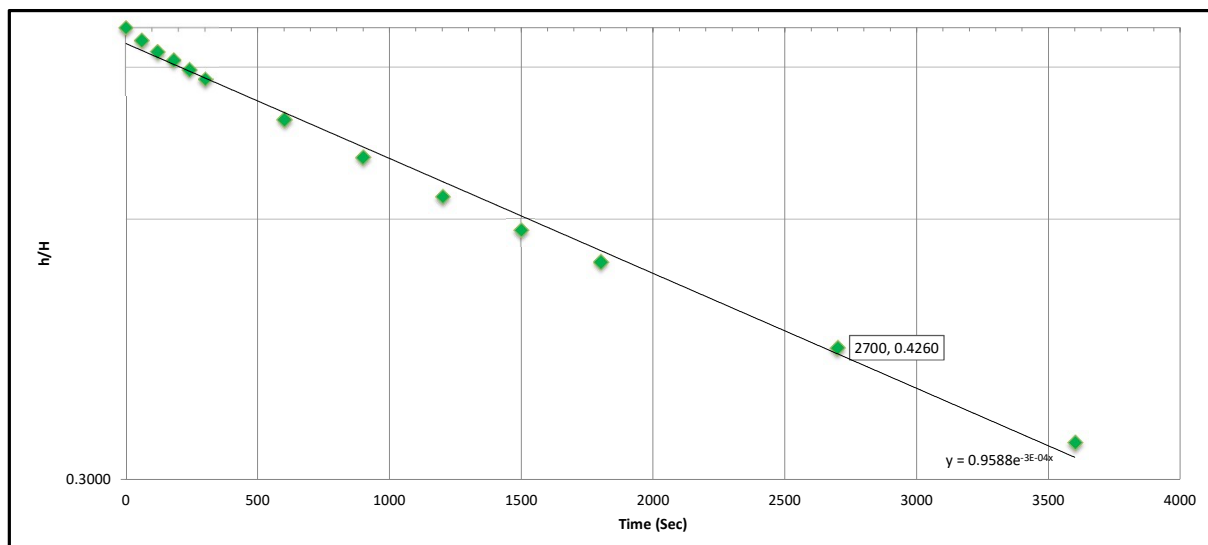
Based on Hvorslev Method

$$K = \frac{r^2 \ln(L/R)}{2LT_0}$$

auger radius = 0.05; core radius is 0.038

t1	240
t2	3600
h1	0.8947
h2	0.3312

Time (mins)	Time (sec)	Depth to water (ft BToC)	Depth to water (m BToC)	Change in Level (m)	h/H
Static			1.43		
	0	0	13.87	12.44	1.0000
1	60		13.46	12.03	0.9670
2	120		13.1	11.67	0.9381
3	180		12.85	11.42	0.9180
4	240		12.56	11.13	0.8947
5	300		12.29	10.86	0.8730
10	600		11.16	9.73	0.7822
15	900		10.24	8.81	0.7082
20	1200		9.36	7.93	0.6375
25	1500		8.68	7.25	0.5828
30	1800		8.1	6.67	0.5362
45	2700		6.73	5.30	0.4260
60	3600		5.55	4.12	0.3312



Appendix C – Groundwater Level Monitoring Report No.1

10 November 2025
E26863.G11.02

Marc Yeo
THE CHIMES PP PARTNERSHIP PTY LTD
Level 34 Suite 3402 264 George Street
SYDNEY NSW 2000

Groundwater Level Monitoring Report No. 2 45 - 53 Macleay Street, Potts Point, NSW

EI Australia (EI) has been engaged to prepare this factual letter report to provide continual groundwater levels at the above site. The monitoring period in this report is from Tuesday 5 August 2025 to Wednesday 5 November 2025.

Groundwater levels were collected using data loggers installed within monitoring wells. The data logger / monitoring well details and the groundwater levels observed during the monitoring period are summarised in Table 1 & 2 below.

Table 1 Summary of Data Logger & Well Installation Details

Monitoring Well ID	Top of Well RL (mAHD)	Existing Ground RL (mAHD)	Well Stickup (m)	Well Depth Below Ground (m) ¹	Sensor RL (mAHD)
BH1	26.90	27.00	-0.10	15.10	11.90
BH101M	27.15	27.25	-0.10	12.00	15.21
BH102M	27.45	27.55	-0.10	14.20	13.35

Note 1: The level of the bottom of the well is based on manual measurements after the well installation. The measurement accounts for any variation of the well depth caused by infilling of material through the well screen.

Table 2 Summary of Groundwater Levels

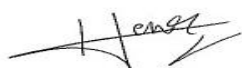
Monitoring Well ID	Average Groundwater RL (mAHD)	Highest Groundwater RL (mAHD)	Lowest Groundwater RL (mAHD)	Highest Groundwater Depth (m Below Ground)	Lowest Groundwater Depth (m Below Ground)
BH1	25.42	25.92	25.01	1.08	1.99
BH101M	21.32	21.55	20.81	5.70	6.44
BH102M	19.37	19.70	18.63	7.85	8.92

Please do not hesitate to contact the undersigned should you have any questions.

For and on behalf of:

EI AUSTRALIA

Author



Henry Dong
Graduate Geotechnical Engineer

Reviewer



Gokul Pothineni
Geotechnical Engineer

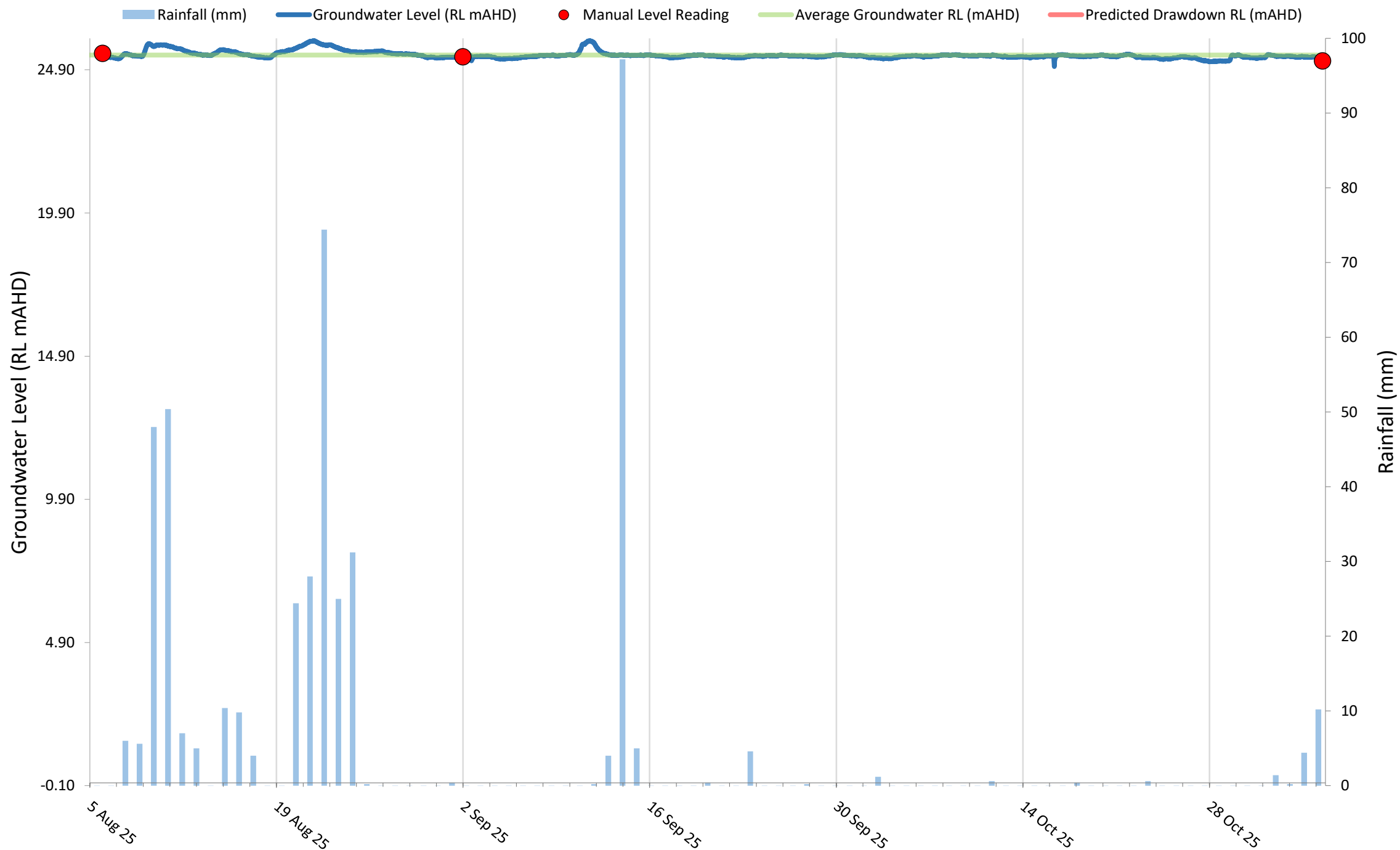
Attachments:

Figure 1:

Data Logger Location Plan

Figure 2-4: Groundwater Level, Daily Rainfall vs. Time From 5 August 2025 to 5 November 2025

Important Information



Suite 6.01, 55 Miller Street, PYRMONT 2009
Ph. (02) 9516 0722 Fax (02) 9518 5088

Drawn:

HD

Approved:

GP

Date:

10/11/2025

THE CHIMES PP PARTNERSHIP PTY LTD

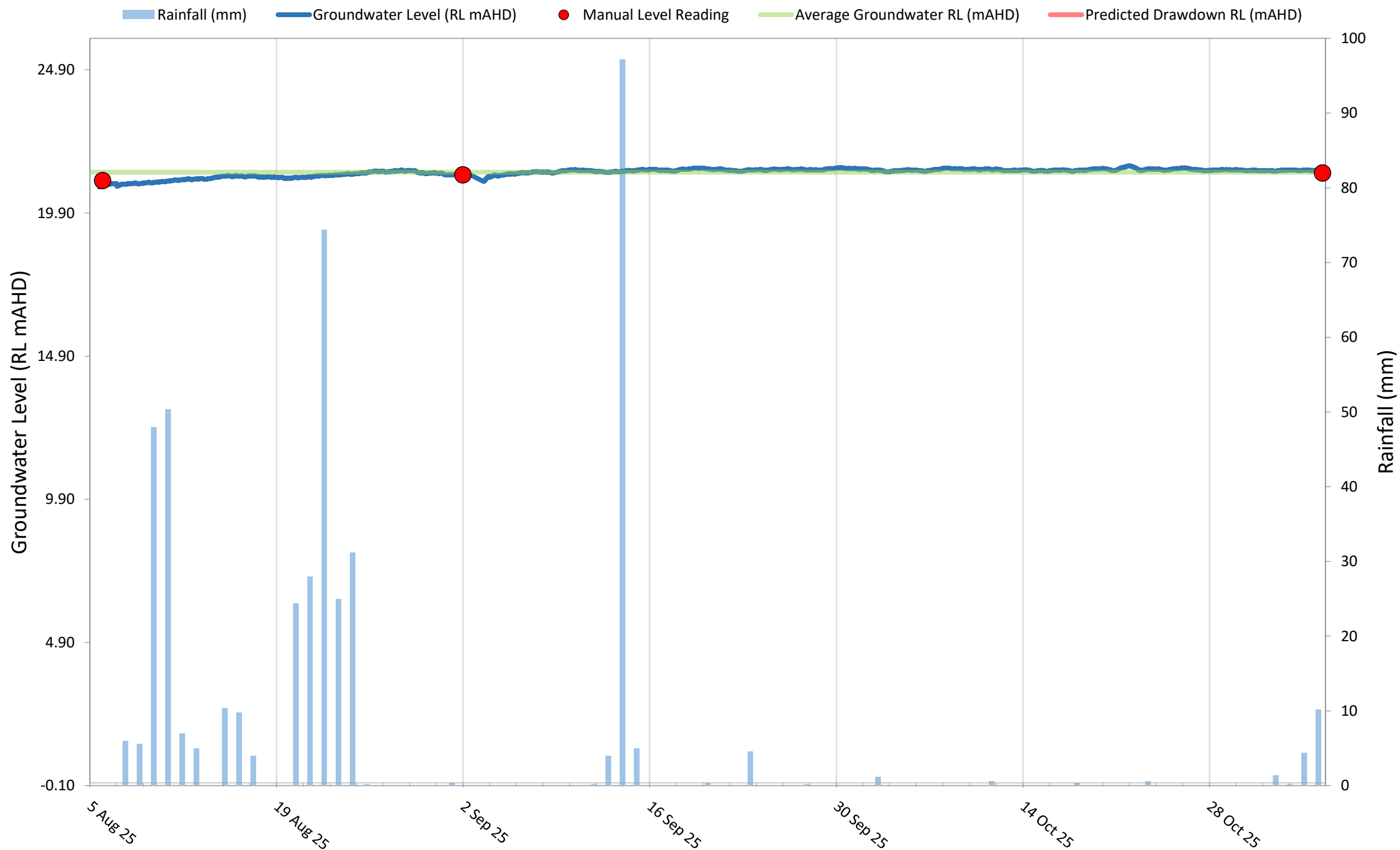
Groundwater Level Monitoring
45 - 53 Macleay Street, Potts Point, NSW

BH1

Figure:

2

Project: E26863.G11.02



Suite 6.01, 55 Miller Street, PYRMONT 2009
Ph. (02) 9516 0722 Fax (02) 9518 5088

Drawn:

HD

Approved:

GP

Date:

10/11/2025

THE CHIMES PP PARTNERSHIP PTY LTD

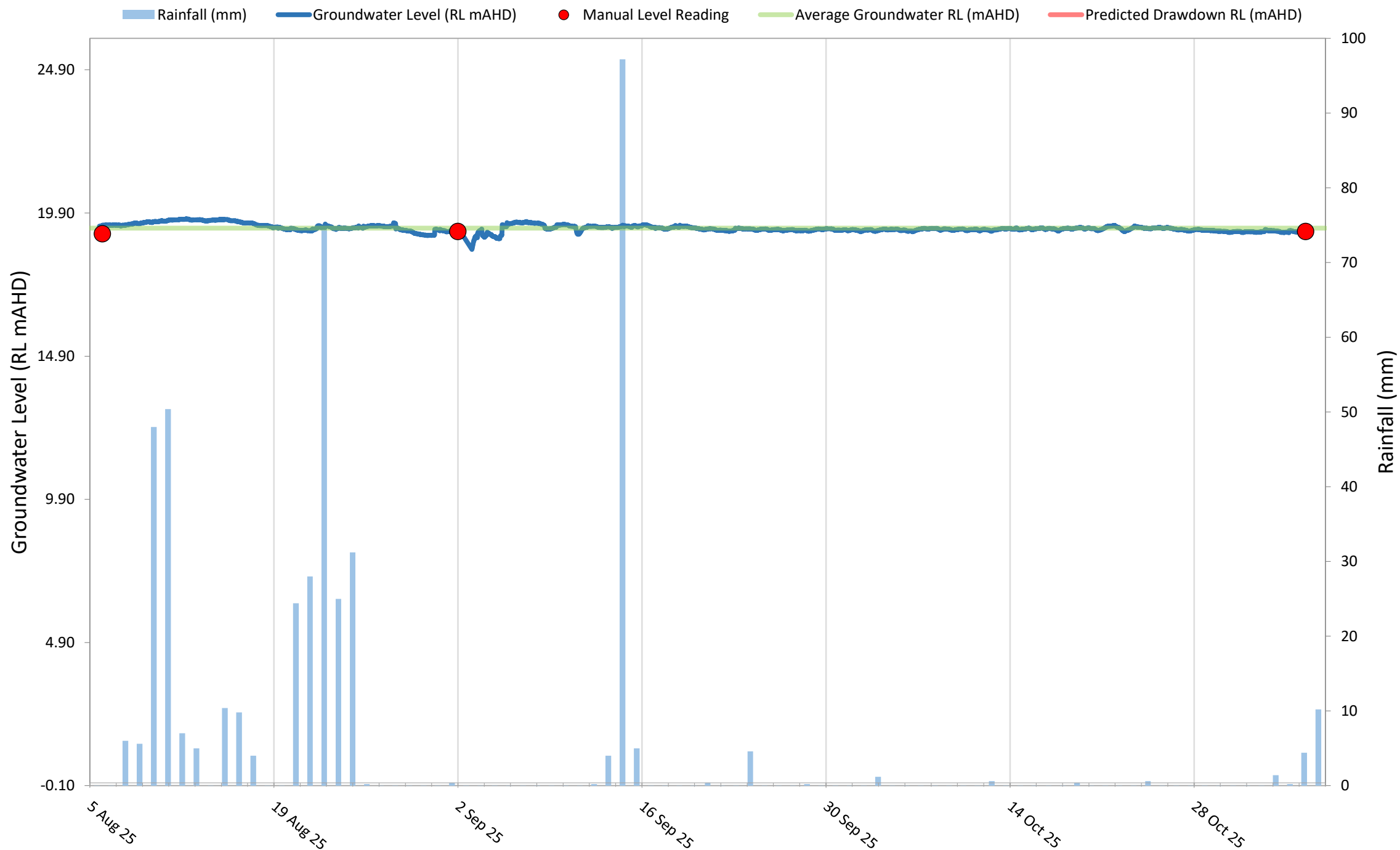
Groundwater Level Monitoring
45 - 53 Macleay Street, Potts Point, NSW

BH101M

Figure:

3

Project: E26863.G11.02



Suite 6.01, 55 Miller Street, PYRMONT 2009
Ph. (02) 9516 0722 Fax (02) 9518 5088

Drawn:

HD

Approved:

GP

Date:

10/11/2025

THE CHIMES PP PARTNERSHIP PTY LTD

Groundwater Level Monitoring
45 - 53 Macleay Street, Potts Point, NSW

BH102M

Figure:

4

Project: E26863.G11.02

Appendix D – Important Information

SCOPE OF SERVICES

The geotechnical report ("the report") has been prepared in accordance with the scope of services as set out in the contract, or as otherwise agreed, between the Client And EI Australia ("EI"). The scope of work may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints.

RELIANCE ON DATA

EI has relied on data provided by the Client and other individuals and organizations, to prepare the report. Such data may include surveys, analyses, designs, maps and plans. EI has not verified the accuracy or completeness of the data except as stated in the report. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations ("conclusions") are based in whole or part on the data, EI will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to EI.

GEOTECHNICAL ENGINEERING

Geotechnical engineering is based extensively on judgment and opinion. It is far less exact than other engineering disciplines. Geotechnical engineering reports are prepared for a specific client, for a specific project and to meet specific needs, and may not be adequate for other clients or other purposes (e.g. a report prepared for a consulting civil engineer may not be adequate for a construction contractor). The report should not be used for other than its intended purpose without seeking additional geotechnical advice. Also, unless further geotechnical advice is obtained, the report cannot be used where the nature and/or details of the proposed development are changed.

LIMITATIONS OF SITE INVESTIGATION

The investigation programme undertaken is a professional estimate of the scope of investigation required to provide a general profile of subsurface conditions. The data derived from the site investigation programme and subsequent laboratory testing are extrapolated across the site to form an inferred geological model, and an engineering opinion is rendered about overall subsurface conditions and their likely behaviour with regard to the proposed development. Despite investigation, the actual conditions at the site might differ from those inferred to exist, since no subsurface exploration program, no matter how comprehensive, can reveal all subsurface details and anomalies. The engineering logs are the subjective interpretation of subsurface conditions at a particular location and time, made by trained personnel. The actual interface between materials may be more gradual or abrupt than a report indicates.

SUBSURFACE CONDITIONS ARE TIME DEPENDENT

Subsurface conditions can be modified by changing natural forces or man-made influences. The report is based on conditions that existed at the time of subsurface exploration. Construction operations adjacent to the site, and natural events such as floods, or ground water fluctuations, may also affect subsurface conditions, and thus the continuing adequacy of a geotechnical report. EI should be kept apprised of any such events, and should be consulted to determine if any additional tests are necessary.

VERIFICATION OF SITE CONDITIONS

Where ground conditions encountered at the site differ significantly from those anticipated in the report, either due to natural variability of subsurface conditions or construction activities, it is a condition of the report that EI be notified of any variations and be provided with an opportunity to review the recommendations of this report. Recognition of change of soil and rock conditions requires experience and it is recommended that a suitably experienced geotechnical engineer be engaged to visit the site with sufficient frequency to detect if conditions have changed significantly.

REPRODUCTION OF REPORTS

This report is the subject of copyright and shall not be reproduced either totally or in part without the express permission of this Company. Where information from the accompanying report is to be included in contract documents or engineering specification for the project, the entire report should be included in order to minimize the likelihood of misinterpretation from logs.

REPORT FOR BENEFIT OF CLIENT

The report has been prepared for the benefit of the Client and no other party. EI assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including without limitation matters arising from any negligent act or omission of EI or for any loss or damage suffered by any other party relying upon the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions and should make their own inquiries and obtain independent advice in relation to such matters.

OTHER LIMITATIONS

EI will not be liable to update or revise the report to take into account any events or emergent circumstances or fact occurring or becoming apparent after the date of the report.

Appendix E – Registered Bore Search

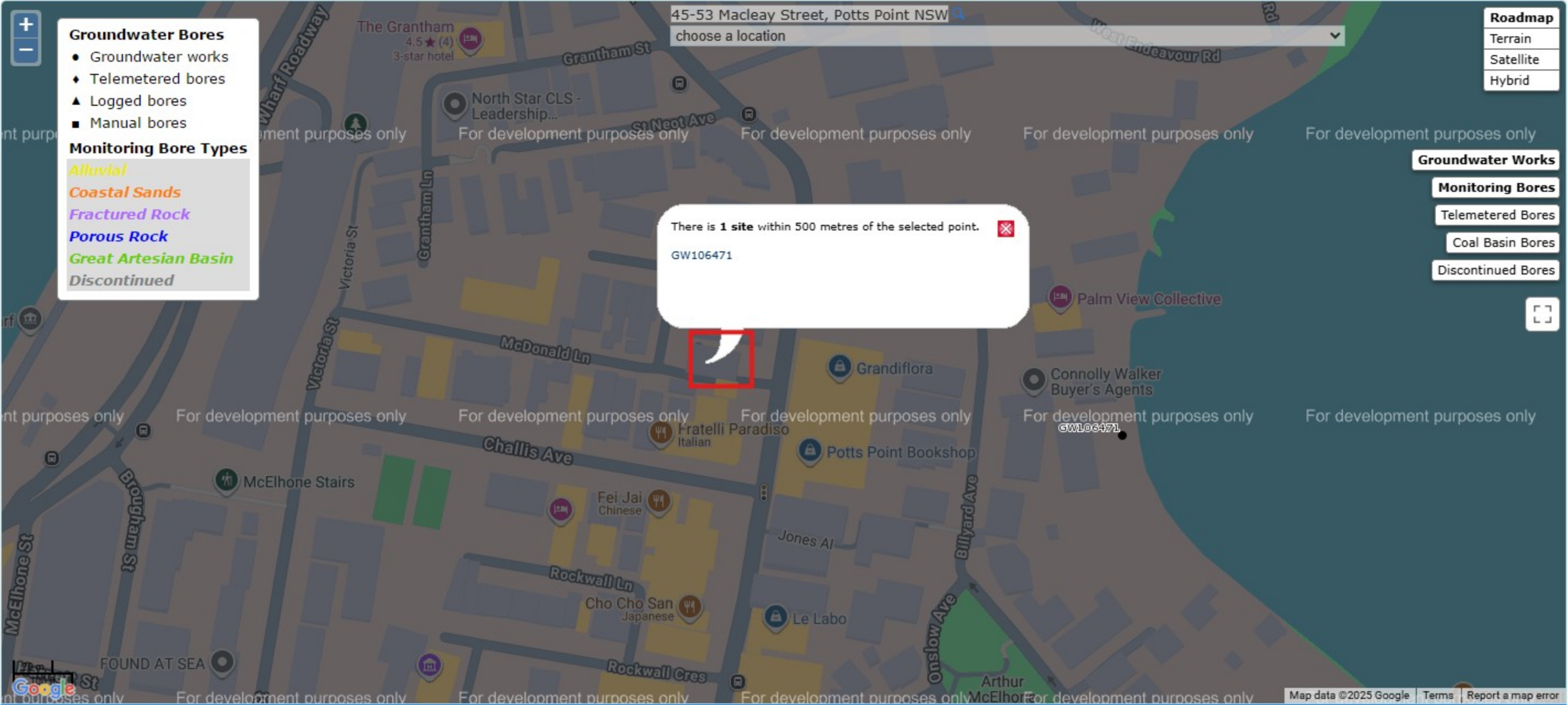
ALL GROUNDWATER MAP

bookmark this page

All data times are Eastern Standard Time

Map Info

current site: GW106471



WaterNSW

Work Summary

GW106471

Licence: 10WA108697	Licence Status: CURRENT
	Authorised Purpose(s): DOMESTIC
	Intended Purpose(s): DOMESTIC
Work Type: Spear	
Work Status: Supply Obtained	
Construct.Method: Hand Auger	
Owner Type: Private	
Commenced Date:	Final Depth: 2.00 m
Completion Date: 22/11/2004	Drilled Depth: 2.00 m
Contractor Name: B & B DRILLING INC	
Driller: Michael Gerard Barrett	
Assistant Driller:	
Property: STRATA PLAN 30419 12-16 Billyard Ave	Standing Water Level (m):
ELIZABETH BAY 2011 NSW	
GWMA:	Salinity Description:
GW Zone:	Yield (L/s):

Site Details

Site Chosen By:			
		County	Parish
		Form A: CUMBERLAND	ALEXANDRI
		Licensed: CUMBERLA	ALEXANDR
			Cadastre
			//30419
			Whole Lot/30419
Region: 10 - Sydney South Coast		CMA Map: 9130-3N	
River Basin: 213 - SYDNEY COAST - GEORGES RIVER		Grid Zone:	
Area/District:		Scale:	
Elevation: 0.00 m (A.H.D.)		Northing: 6250979.000	
Elevation Source: (Unknown)		Easting: 336045.000	
		Latitude: 33°52'07.6"S	
		Longitude: 151°13'38.7"E	
GS Map: -		MGA Zone: 56	
		Coordinate Source: GIS - Geogra	

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	2.00	90			Hand Auger

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.50	0.50	topsoil	Topsoil	
0.50	1.00	0.50	sandstone, fill	Sandstone	
1.00	2.00	1.00	clay, silty sand and sandstone fill	Clay	

Remarks

13/01/2010: attempted to drill abandoned
13/01/2010: updated from original form A

*** End of GW106471 ***

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

Appendix F – Borehole Logs



BOREHOLE LOG

BH ID: BH101M

Location	45-53 Macleay Steet, Potts Point NSW			Started	29 July 2025		
Client	The Chimes PP Partnership Pty Ltd			Completed	29 July 2025		
Job No.	E26863.G04			Logged By	MS	Date	29 July 2025
Sheets	1 of 3			Review By	ML	Date	29 September 2025
Drilling Contractor	Geosense Drilling Engineers			Surface RL	≈27.25 m (AHD)		
Plant	Comacchio Geo 205			Inclination	90°		
				Northing	6251032.8 (MGA 2020 Zone 56)		
				Easting	335869.2 (MGA 2020 Zone 56)		

METHOD	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	SAMPLE RECOVERY	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY / REL. DENSITY	MATERIAL ORIGIN & OBSERVATIONS
AD/T	GWNE			0.00		27.25	CONCRETE: 200mm thick	-		CONCRETE
				0.20		27.05	FILL: Gravelly SAND: medium to coarse grained, brown, with medium to cobbles sub-angular to angular gravels, trace brick	W	-	FILL
				0.40		26.85	SANDSTONE: fine to medium grained, brown, very low strength rock	-		BEDROCK
				0.70		26.55	Log continued on next page.			
				1						
				2						
				3						
				4						
				5						
				6						
				7						
				8						
				9						
				10						

This log should be read in conjunction with EI Australia's accompanying explanatory notes.



BOREHOLE CORE LOG

BH ID: BH101M

Location	45-53 Macleay Steet, Potts Point NSW			Started	29 July 2025	
Client	The Chimes PP Partnership Pty Ltd			Completed	29 July 2025	
Job No.	E26863.G04			Logged By	MS	Date 29 July 2025
Sheets	2 of 3			Review By	ML	Date 29 September 2025
Drilling Contractor	Geosense Drilling Engineers		Surface RL	≈27.25 m (AHD)	Northing	6251032.8 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205		Inclination	90°	Easting	335869.2 (MGA 2020 Zone 56)

METHOD	Flush Return	TCR %	RQD %	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	WEATHERING	ESTIMATED STRENGTH Is(50) ▼ - Axial ▽ - Diametral	DISCONTINUITIES & ADDITIONAL DATA	FRACTURE SPACING
				0			Log continued from previous page.		VL 0-1 L 0-3 M 1 H 3 VH 10 EH		30 100 300 1000 3000
				1			SANDSTONE: fine to medium grained, brown, pale grey, thinly bedded		▼	0.72: DB 0.75: DB	
		100	98	2					▼	1.52: HB	
				3					▼	2.48-2.52: XWS 2.66: BP SM CN 2.81: BP SM Clay VN	
				3.55		23.70	From 3.55m, pale grey, thinly to medium bedded			3.13: HB 3.35: JT 10° PR SM CN	
		100	97	5						5.17: BP SM CN 5.36-5.46: XWS	
				5.35		21.90	From 5.35m, dark grey, grey with shale clay bands	FR			
				5.47		21.78	From 5.47m, pale grey, thinly to thickly bedded				
				6					▼		
				7						6.87: BP SM Clay VN 7.26-7.29: XWS 7.60: BP SM CN	
				7.75		19.50	From 7.75m, massive				
		96	96	8					▼		
				9							
				10					▼		

This log should be read in conjunction with EI Australia's accompanying explanatory notes.



BOREHOLE CORE LOG

BH ID: BH101M

Location	45-53 Macleay Steet, Potts Point NSW			Started	29 July 2025		
Client	The Chimes PP Partnership Pty Ltd			Completed	29 July 2025		
Job No.	E26863.G04			Logged By	MS	Date	29 July 2025
Sheets	3 of 3			Review By	ML	Date	29 September 2025
Drilling Contractor	Geosense Drilling Engineers		Surface RL	≈27.25 m (AHD)	Northing	6251032.8 (MGA 2020 Zone 56)	
Plant	Comacchio Geo 205		Inclination	90°	Easting	335869.2 (MGA 2020 Zone 56)	

METHOD	Flush Return	TCR %	RQD %	DEPTH (m)	GRAPHIC LOG	RL (m(AHD))	MATERIAL DESCRIPTION	WEATHERING	ESTIMATED STRENGTH Is(50) ▼ - Axial ▽ - Diametral	DISCONTINUITIES & ADDITIONAL DATA	FRACTURE SPACING
NMLC	100%	95	95								
							From 7.75m, massive				
				10.50		16.75	From 10.50m, medium to thickly bedded, pale grey with orange brown			10.52: BP SM CN 10.86: BP SM CN 11.30: BP SM CN 11.64: BP SM CN 11.80-11.90: JT 50° CU SM CN 12.30: HB 12.40: JT 10° PR SM CN 12.44-12.50: XWS	
				11							
				11.64		15.61	SILTSTONE: dark grey, thinly bedded with sandstone laminae				
				12							
				12.50		14.75	SANDSTONE: medium to coarse grained, pale grey, thickly bedded	FR			
				13							
				14						13.74: BP SM CN	
				14.37		12.88	From 14.37m to 14.44m, with siltstone band			14.38: BP SM CN	
				14.71		12.54	From 14.71m to 14.80m, with siltstone laminae			14.72: JT 10° CU SM CN	
				15		12.15	Terminated at 15.10m. Target Depth Reached.				
				16							
				17							
				18							
				19							
				20							

This log should be read in conjunction with EI Australia's accompanying explanatory notes.



MONITORING WELL LOG

BH ID: BH101M

Location	45-53 Macleay Steet, Potts Point NSW			Started	29 July 2025		
Client	The Chimes PP Partnership Pty Ltd			Completed	29 July 2025		
Job No.	E26863.G04			Logged By	MS	Date	29 July 2025
Sheets	1 of 2			Review By	ML	Date	29 September 2025
Drilling Contractor	Geosense Drilling Engineers			Surface RL	≈27.25 m (AHD)		
Plant	Comacchio Geo 205			Inclination	90°		
				Northing	6251032.8 (MGA 2020 Zone 56)		
				Easting	335869.2 (MGA 2020 Zone 56)		

WATER	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	MOISTURE CONDITION	BACKFILL DETAILS	STANDPIPE DETAILS
GWNE		0.00		27.25	CONCRETE: 200mm thick	-		Well Stickup =0.0m (RL 27.25m)
		0.20		27.05	FILL: Gravelly SAND: medium to coarse grained, brown, with medium to cobbles sub-angular to angular gravels, trace brick	W		
		0.40		26.85	SANDSTONE: fine to medium grained, brown, very low strength rock	-		
		0.70		26.65	SANDSTONE: fine to medium grained, brown, pale grey, thinly bedded			
		1						
		2						
		3						
		3.55		23.70	From 3.55m, pale grey, thinly to medium bedded			
		4						
		5						
		5.35		21.90	From 5.35m, dark grey, grey with shale clay bands			
		5.47		21.78	From 5.47m, pale grey, thinly to thickly bedded			
		6						
		7						
		7.75		19.60	From 7.75m, massive			
		8						
		9						
		10						

19/07/2025 10:24:11 PM

This log should be read in conjunction with EI Australia's accompanying explanatory notes.



MONITORING WELL LOG

BH ID: BH101M

Location	45-53 Macleay Steet, Potts Point NSW			Started	29 July 2025	
Client	The Chimes PP Partnership Pty Ltd			Completed	29 July 2025	
Job No.	E26863.G04			Logged By	MS	Date 29 July 2025
Sheets	2 of 2			Review By	ML	Date 29 September 2025
Drilling Contractor	Geosense Drilling Engineers		Surface RL	≈27.25 m (AHD)	Northing	6251032.8 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205		Inclination	90°	Easting	335869.2 (MGA 2020 Zone 56)

WATER	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	MOISTURE CONDITION	BACKFILL DETAILS	STANDPIPE DETAILS
100%		10.50		16.75	From 7.75m, massive		Sand 8.50m - 12.30m	9.30m - 12.30m PVC screen (50mm Ø)
		11			From 10.50m, medium to thickly bedded, pale grey with orange brown			
		11.64		15.61	SILTSTONE: dark grey, thinly bedded with sandstone laminae			
		12.50		14.75	SANDSTONE: medium to coarse grained, pale grey, thickly bedded			
		14.37		12.88	From 14.37m to 14.44m, with siltstone band			
		14.71		12.54	From 14.71m to 14.80m, with siltstone laminae		Sand 13.80m - 15.10m	
		15		12.15	Terminated at 15.10m. Target Depth Reached.			
		16						
		17						
		18						
		19						
		20						

This log should be read in conjunction with EI Australia's accompanying explanatory notes.



BOREHOLE LOG

BH ID: BH102M

Location	45-53 Macleay Steet, Potts Point NSW			Started	28 July 2025	
Client	The Chimes PP Partnership Pty Ltd			Completed	28 July 2025	
Job No.	E26863.G04			Logged By	MS	Date 28 July 2025
Sheets	1 of 4			Review By	ML	Date 29 September 2025
Drilling Contractor	Geosense Drilling Engineers		Surface RL	≈27.55 m (AHD)	Northing	6251016.4 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205		Inclination	90°	Easting	335859.5 (MGA 2020 Zone 56)

METHOD	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	SAMPLE RECOVERY	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY / REL. DENSITY	MATERIAL ORIGIN & OBSERVATIONS
AD/T	GWNE			0.00		27.55	CONCRETE: 160mm thick			CONCRETE
				0.16		27.39	SANDSTONE: fine to medium grained, pale grey, orange, very low to low strength rock	-	-	BEDROCK
				0.43		27.12	Log continued on next page.			
				1						
				2						
				3						
				4						
				5						
				6						
				7						
				8						
				9						
				10						

This log should be read in conjunction with EI Australia's accompanying explanatory notes.



BOREHOLE CORE LOG

BH ID: BH102M

Location	45-53 Macleay Steet, Potts Point NSW			Started	28 July 2025		
Client	The Chimes PP Partnership Pty Ltd			Completed	28 July 2025		
Job No.	E26863.G04			Logged By	MS	Date	28 July 2025
Sheets	2 of 4			Review By	ML	Date	29 September 2025
Drilling Contractor	Geosense Drilling Engineers			Surface RL	≈27.55 m (AHD)		
Plant	Comacchio Geo 205			Inclination	90°		
				Northing	6251016.4 (MGA 2020 Zone 56)		
				Easting	335859.5 (MGA 2020 Zone 56)		

METHOD	Flush Return	TCR %	RQD %	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	WEATHERING	ESTIMATED STRENGTH Is(50) ▼ - Axial ▽ - Diametral	DISCONTINUITIES & ADDITIONAL DATA	FRACTURE SPACING
				0			Log continued from previous page.		VL 0-1 L 0-3 M 1 H 3 VH 10 EH		30 100 300 1000 3000
				1			SANDSTONE: fine to medium grained, grey, mottled orange, thinly to medium bedded		▼	1.40: BP SM Clay VN 1.54: HB 1.73: BP SM CN	
		100	100	2							
				2.94		24.61	From 2.94m, grey		▼	3.09: HB	
				3							
				4						3.65: HB	
				5						3.98-4.00: XWS	
		97	97	6						4.59-4.63: XWS 4.67-4.69: XWS 4.91: BP SM Clay VN	
				7							
				8						6.37: BP SM Clay VN	
				9							
		96	96	10						7.08-7.12: XWS	

This log should be read in conjunction with EI Australia's accompanying explanatory notes.



BOREHOLE CORE LOG

BH ID: BH102M

Location	45-53 Macleay Steet, Potts Point NSW			Started	28 July 2025		
Client	The Chimes PP Partnership Pty Ltd			Completed	28 July 2025		
Job No.	E26863.G04			Logged By	MS	Date	28 July 2025
Sheets	3 of 4			Review By	ML	Date	29 September 2025
Drilling Contractor	Geosense Drilling Engineers			Surface RL	≈27.55 m (AHD)		
Plant	Comacchio Geo 205			Inclination	90°		
				Northing	6251016.4 (MGA 2020 Zone 56)		
				Easting	335859.5 (MGA 2020 Zone 56)		

METHOD	Flush Return	TCR %	RQD %	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	WEATHERING	ESTIMATED STRENGTH Is(50) ▼ - Axial ▽ - Diametral	DISCONTINUITIES & ADDITIONAL DATA	FRACTURE SPACING
									VL 0-1 L 0-3 M 1 H 3 VH 10 EH		30 100 300 1000 3000
NMLC	100%	100	100	11			From 2.94m, grey	FR		10.82: JT 40° CU SM CN	
				12						11.25: JT 15° CU SM CN 11.35: JT 10° CU SM CN	
				12.25		15.30	SILTSTONE: dark grey, thinly bedded with sandstone laminae	DW		11.80: JT 15° CU SM CN 11.95-12.00: HB 12.13: BP SM CN 12.26: DB 12.43: BP SM CN 12.63: BP SM CN	
				13		14.49	SANDSTONE: fine to medium grained, grey			12.90: BP SM CN 13.07: BP SM CN	
				14							
	90%	97	94	15						14.54: DB 14.72: BP SM CN	
				15.43		12.12	From 15.43m, thinly to medium bedded	FR		15.32: DB 15.51: BP SM CN	
				16							
				17						16.55: BP SM CN 16.72: HB	
				18						17.53: BP SM Clay VN	
				19						18.45: JT 15° CU SM CN	
				20						19.57: JT 15° CU SM CN	

This log should be read in conjunction with EI Australia's accompanying explanatory notes.



BOREHOLE CORE LOG

BH ID: BH102M

Location	45-53 Macleay Steet, Potts Point NSW			Started	28 July 2025		
Client	The Chimes PP Partnership Pty Ltd			Completed	28 July 2025		
Job No.	E26863.G04			Logged By	MS	Date	28 July 2025
Sheets	4 of 4			Review By	ML	Date	29 September 2025
Drilling Contractor	Geosense Drilling Engineers			Surface RL	≈27.55 m (AHD)		
Plant	Comacchio Geo 205			Inclination	90°		
				Northing	6251016.4 (MGA 2020 Zone 56)		
				Easting	335859.5 (MGA 2020 Zone 56)		

METHOD	Flush Return	TCR %	RQD %	DEPTH (m)	GRAPHIC LOG	RL (m(AHD))	MATERIAL DESCRIPTION	WEATHERING	ESTIMATED STRENGTH Is(50) ▼ - Axial ▽ - Diametral	DISCONTINUITIES & ADDITIONAL DATA	FRACTURE SPACING
									VL 0-1 L 0-3 M 1 H 3 VH 10 EH		30 100 300 1000 3000
NMLC	90%	99	99	21		5.85	From 15.43m, thinly to medium bedded	FR		20.20: JT 10° CU SM CN	
		99	99	21.70			From 21.70m, thinly bedded			20.45: JT 10° CU SM CN	
		100	100	22						21.45: BP SM CN	
		100	100	25			Terminated at 25.10m. Target Depth Reached.			24.82: BP SM CN	
				23							
				24							
				25		2.45					
				26							
				27							
				28							
				29							
				30							

This log should be read in conjunction with EI Australia's accompanying explanatory notes.



MONITORING WELL LOG

BH ID: BH102M

Location	45-53 Macleay Steet, Potts Point NSW			Started	28 July 2025	
Client	The Chimes PP Partnership Pty Ltd			Completed	28 July 2025	
Job No.	E26863.G04			Logged By	MS	Date 28 July 2025
Sheets	1 of 3			Review By	ML	Date 29 September 2025
Drilling Contractor	Geosense Drilling Engineers		Surface RL	≈27.55 m (AHD)	Northing	6251016.4 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205		Inclination	90°	Easting	335859.5 (MGA 2020 Zone 56)

WATER	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	MOISTURE CONDITION	BACKFILL DETAILS	STANDPIPE DETAILS
GWNE		0.00	▲▲▲▲▲	27.55	CONCRETE: 160mm thick	-		Well Stickup =0.0m (RL 27.55m)
		0.16	▲▲▲▲▲	27.55	SANDSTONE: fine to medium grained, pale grey, orange, very low to low strength rock			
		0.43	▲▲▲▲▲	27.12	SANDSTONE: fine to medium grained, grey, mottled orange, thinly to medium bedded			
		1						
		2						
		2.94		24.61	From 2.94m, grey			
		4					Sand 0.00m - 8.00m	
		5						0.0m - 9.0m PVC casing (50mm Ø)
		6						
		7						
		8					Bentonite 8.00m - 8.50m	
		9						
		10						

This log should be read in conjunction with EI Australia's accompanying explanatory notes.



MONITORING WELL LOG

BH ID: BH102M

Location	45-53 Macleay Steet, Potts Point NSW			Started	28 July 2025	
Client	The Chimes PP Partnership Pty Ltd			Completed	28 July 2025	
Job No.	E26863.G04			Logged By	MS	Date 28 July 2025
Sheets	2 of 3			Review By	ML	Date 29 September 2025
Drilling Contractor	Geosense Drilling Engineers			Surface RL	≈27.55 m (AHD)	
Plant	Comacchio Geo 205			Inclination	90°	
				Northing	6251016.4 (MGA 2020 Zone 56)	
				Easting	335859.5 (MGA 2020 Zone 56)	

WATER	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	MOISTURE CONDITION	BACKFILL DETAILS	STANDPIPE DETAILS
19/07/2025 02:48 PM 100%		11 12 12.25 13 13.06 14 15 15.43 16 17 18 19 20		15.30 14.49 12.12	From 2.94m, grey SILTSTONE: dark grey, thinly bedded with sandstone laminae SANDSTONE: fine to medium grained, grey From 15.43m, thinly to medium bedded		Sand 8.50m - 15.00m Bentonite 15.00m - 16.80m	9.0m - 15.0m PVC screen (50mm Ø)

This log should be read in conjunction with EI Australia's accompanying explanatory notes.



MONITORING WELL LOG

BH ID: BH102M

Location	45-53 Macleay Steet, Potts Point NSW			Started	28 July 2025		
Client	The Chimes PP Partnership Pty Ltd			Completed	28 July 2025		
Job No.	E26863.G04			Logged By	MS	Date	28 July 2025
Sheets	3 of 3			Review By	ML	Date	29 September 2025
Drilling Contractor	Geosense Drilling Engineers			Surface RL	≈27.55 m (AHD)		
Plant	Comacchio Geo 205			Inclination	90°		
				Northing	6251016.4 (MGA 2020 Zone 56)		
				Easting	335859.5 (MGA 2020 Zone 56)		

WATER	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	MOISTURE CONDITION	BACKFILL DETAILS	STANDPIPE DETAILS
90%		21		21.70	From 15.43m, thinly to medium bedded		Sand 16.80m - 25.10m	
		22		21.70	From 21.70m, thinly bedded			
		23		24				
		24		25				
		25		25	Terminated at 25.10m. Target Depth Reached.			
		26						
		27						
		28						
		29						
		30						

This log should be read in conjunction with EI Australia's accompanying explanatory notes.



BOREHOLE LOG

Client:TIME & PLACE DEVELOPENT PTY LTD

Project:PROPOSED REDEVELOPMENT

Location:45-53 MACLEAY STREET, POTTS POINT, NSW

Job No.:34303RE

Method:SPIRAL AUGER

R.L. Surface:~27.0 m

Date:31/7/23

Datum:AHD

Plant Type:JK309

Logged/Checked By:Q.V./M.E.

Groundwater Record	SAMPLES			Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
	ES	U50	DB										
DRY ON COMPLETION OF AUGERING									CONCRETE: 130mm.t over				10mm DIA. REINFORCEMENT, 70mm TOP COVER
									GRANULAR ROADBASE: 70mm.t	M			APPEARS POORLY COMPACTED
									FILL: Silty sand, fine to coarse grained, yellow brown, dark grey and grey, with fine to medium grained igneous and sandstone gravel, trace of clay fines.	SW	L - M		HAWKESBURY SANDSTONE
									SANDSTONE: fine to coarse grained, light grey and grey.				MODERATE 'TC' BIT RESISTANCE
									REFER TO CORED BOREHOLE LOG				GROUNDWATER MONITORING WELL INSTALLED TO 15.12m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 1.12m TO 15.12m. CASING 1.12m TO 0.05m. 2mm SAND FILTER PACK 1.0m TO 15.12m. BENTONITE SEAL 0.1m TO 1.0m. COMPLETED WITH A CONCRETED GATIC COVER.

CORED BOREHOLE LOG

Client: TIME & PLACE DEVELOPMENT PTY LTD																										
Project: PROPOSED REDEVELOPMENT																										
Location: 45-53 MACLEAY STREET, POTTS POINT, NSW																										
Job No.: 34303RE					Core Size: NMLC				R.L. Surface: ~27.0 m																	
Date: 31/7/23					Inclination: VERTICAL				Datum: AHD																	
Plant Type: JK309					Bearing: N/A				Logged/Checked By: Q.V./M.E.																	
Water Loss	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX I _s (50) VL-0.1 L-0.3 M-1 H-3 VH-10 EH	SPACING (mm) 600 200 60 20	DEFECT DETAILS		Formation														
										Specific	General															
ON 10/8/23 90% RETURN		25	2		START CORING AT 1.19m	SW	L - M					Hawkesbury Sandstone														
			SANDSTONE: fine to medium grained, light brown, with occasional dark grey laminae, bedded at 0-25°.																							
													as above, but light grey.													
															SANDSTONE: fine to medium grained, light grey, with occasional dark grey laminae, bedded at 0-20°.	FR										

CORED BOREHOLE LOG

Client: TIME & PLACE DEVELOPMENT PTY LTD
Project: PROPOSED REDEVELOPMENT
Location: 45-53 MACLEAY STREET, POTTS POINT, NSW

Job No.: 34303RE **Core Size:** NMLC **R.L. Surface:** ~27.0 m
Date: 31/7/23 **Inclination:** VERTICAL **Datum:** AHD
Plant Type: JK309 **Bearing:** N/A **Logged/Checked By:** Q.V./M.E.

Water Loss/Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX I _s (50)	DEFECT DETAILS		Formation
									SPACING (mm)	DESCRIPTION Type, orientation, defect shape and roughness, defect coatings and seams, openness and thickness	
100% RETURN		90% RETURN		100% RETURN		Specific		General			
		18	9		SANDSTONE: fine to coarse grained, light grey, bedded at 0-5°. (continued)	FR	M				Hawkesbury Sandstone
		17	10								
		16	11								
		15	12		SANDSTONE: fine to medium grained, grey and dark grey, bedded at 0-15°.	SW	L - M				
		14	13		LAMINITE: fine to medium grained, light grey and dark grey, very thinly to thickly bedded at 0-15°.	MW	VL				
		13	14		as above, but light brown and dark grey.	SW	M				
100% RETURN					as below,		H				

Borehole No.
1
4 / 4

[illegible]

BOREHOLE LOG

Client: TIME & PLACE DEVELOPMENT PTY LTD
Project: PROPOSED REDEVELOPMENT
Location: 45-53 MACLEAY STREET, POTTS POINT, NSW

Job No.: 34303RE **Method:** SPIRAL AUGER **R.L. Surface:** ~27.4 m
Date: 31/7/23 TO 1/8/23 **Datum:** AHD
Plant Type: JK309 **Logged/Checked By:** Q.V./M.E.

Groundwater Record	SAMPLES				Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
	ES	U50	DB	DS										
DRY ON COMPLETION OF AUGERING						27			-	CONCRETE: 120mm.t over GRANULAR ROADBASE: 30mm.t SANDSTONE: fine to coarse grained, light grey and orange brown.	SW	L		10mm DIA. REINFORCEMENT, 70mm TOP COVER HAWKESBURY SANDSTONE LOW TO MODERATE 'TC' BIT RESISTANCE
						1						L - M		
						26				REFER TO CORED BOREHOLE LOG				GROUNDWATER MONITORING WELL INSTALLED TO 11.28m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 1.28m TO 11.28m. CASING 0.05m TO 1.28m. 2mm SAND FILTER PACK 1.0m TO 11.28m. BENTONITE SEAL 0.5m TO 1.0m. BACKFILLED WITH SAND TO 0.05m. COMPLETED WITH A CONCRETED GATIC COVER.
						2								
						25								
						3								
						24								
						4								
						23								
						5								
						22								
						6								
						21								

CORED BOREHOLE LOG

Client: TIME & PLACE DEVELOPMENT PTY LTD
Project: PROPOSED REDEVELOPMENT
Location: 45-53 MACLEAY STREET, POTTS POINT, NSW

Job No.: 34303RE **Core Size:** NMLC **R.L. Surface:** ~27.4 m
Date: 31/7/23 TO 1/8/23 **Inclination:** VERTICAL **Datum:** AHD
Plant Type: JK309 **Bearing:** N/A **Logged/Checked By:** Q.V./M.E.

Water Loss/Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_p(50)$	SPACING (mm)	DEFECT DETAILS		Formation
										DESCRIPTION Type, orientation, defect shape and roughness, defect coatings and seams, openness and thickness	Specific General	
ON 10/8/23 90% RETURN		26	2		SANDSTONE: fine to medium grained, light grey, with occasional grey laminae, bedded at 0-20°.	SW	L	0.30	600	(1.36m) Be, 20°, P, R, Fe Vn (1.40m) Be, 10°, P, R, Fe Vn (1.63m) Be, 0°, P, R, Cn		Hawkesbury Sandstone
								0.20	200	(2.20m) Be, 20°, Un, R, Cn		
100% RETURN		25	3		SANDSTONE: fine to medium grained, light grey and grey, with occasional dark grey laminae, bedded at 0-20°.	FR	M	0.20	600	(2.79m) XWS, 0°, 10 mm.t		
								0.40	200	(3.01m) XWS, 0°, 65 mm.t		
								0.40	600	(3.78m) XWS, 0°, 30 mm.t		
								0.40	200	(4.29m) XWS, 0°, 40 mm.t		
								0.50	600	(4.87m) Be, 5°, P, R, Clay FILLED, 2 mm.t		
								0.70	200	(6.47m) Be, 5°, P, R, Clay FILLED, 1 mm.t		
								0.80	600	(7.12m) Be, 5°, P, R, Clay FILLED, 1 mm.t		
								0.80	200	(7.28m) XWS, 0°, 35 mm.t		
								0.80	600			
								0.80	200			

CORED BOREHOLE LOG

Client: TIME & PLACE DEVELOPMENT PTY LTD
Project: PROPOSED REDEVELOPMENT
Location: 45-53 MACLEAY STREET, POTTS POINT, NSW

Job No.: 34303RE **Core Size:** NMLC **R.L. Surface:** ~27.4 m
Date: 31/7/23 TO 1/8/23 **Inclination:** VERTICAL **Datum:** AHD
Plant Type: JK309 **Bearing:** N/A **Logged/Checked By:** Q.V./M.E.

Water Loss/Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_p(50)$	DEFECT DETAILS		Formation
									SPACING (mm)	DESCRIPTION Type, orientation, defect shape and roughness, defect coatings and seams, openness and thickness	
100% RETURN		19			SANDSTONE: fine to coarse grained, light grey, bedded at 0-5°. (continued)	FR	M	VL-0.1 L-0.3 M-1 H-3 VH-10 EH	600 200 60 20	Specific General	Hawkesbury Sandstone
		9									
		18									
		10									
		17									
		11									
		16			END OF BOREHOLE AT 11.28 m				600 200 60 20		
		12									
		15									
		13									
		14									
		14									
		13									



BOREHOLE LOG

Client:

TIME & PLACE DEVELOPENT PTY LTD

Project:

PROPOSED REDEVELOPMENT

Location:

45-53 MACLEAY STREET, POTTS POINT, NSW

Job No.:

34303RE

Method:

SPIRAL AUGER

R.L. Surface:

~27.9 m

Date:

2/8/23

Datum:

AHD

Plant Type:

JK205

Logged/Checked By:

Q.V./M.E.

Groundwater Record	SAMPLES			Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
	ES	U50	DB										
DRY ON COMPLETION OF AUGERING									CONCRETE: 200mm.t				
ON 10/8/23					27	1		-	SANDSTONE: fine to coarse grained, light grey and yellow brown.	SW	L - M		5mm DIA. REINFORCEMENT, 30mm & 160mm TOP COVER HAWKESBURY SANDSTONE LOW TO MODERATE 'TC' BIT RESISTANCE MODERATE RESISTANCE
					26	2			REFER TO CORED BOREHOLE LOG				GROUNDWATER MONITORING WELL INSTALLED TO 11.0m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 1.0m TO 11.0m. CASING 0.05m TO 1.0m. 2mm SAND FILTER PACK 0.9m TO 11.0m. BENTONITE SEAL 0.5m TO 0.9m. BACKFILLED WITH SAND TO 0.05m. COMPLETED WITH A CONCRETED GATIC COVER.
					25	3							
					24	4							
					23	5							
					22	6							
					21								

CORED BOREHOLE LOG

Client: TIME & PLACE DEVELOPMENT PTY LTD												
Project: PROPOSED REDEVELOPMENT												
Location: 45-53 MACLEAY STREET, POTTS POINT, NSW												
Job No.: 34303RE				Core Size: NMLC				R.L. Surface: ~27.9 m				
Date: 2/8/23				Inclination: VERTICAL				Datum: AHD				
Plant Type: JK205				Bearing: N/A				Logged/Checked By: Q.V./M.E.				
Water Loss/Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX I _s (50)	SPACING (mm)	DEFECT DETAILS		Formation
										DESCRIPTION Type, orientation, defect shape and roughness, defect coatings and seams, openness and thickness		
								V ^L -0.1 L -0.3 M -1 H -3 VH ² -10 EH	600 200 60 20	Specific	General	
					START CORING AT 1.25m							
90% RETURN			26		SANDSTONE: fine to coarse grained, light grey and light brown, bedded at 0-5°.	SW	L	0.10			(1.99m) XWS, 0°, 30 mm.t	Hawkesbury Sandstone
			2					0.20				
100% RETURN			25		SANDSTONE: fine to medium grained, light grey and grey, with occasional dark grey laminae, bedded at 0-20°.	FR	M	0.40		(2.70m) XWS, 0°, 27 mm.t		
			3					0.40		(3.05m) Be, 5°, P, R, Clay FILLED, 2 mm.t		
			24					0.40				
			23					0.30		(4.44m) XWS, 10°, 60 mm.t		
90% RETURN			22					0.50				
			6					0.40				
			21		SANDSTONE: fine to coarse grained, light grey, bedded at 0-5°.			0.50		(6.92m) Be, 0°, P, R, Clay FILLED, 1 mm.t (6.98m) XWS, 0°, 40 mm.t		
			7					0.60		(7.32m) Be, 0°, P, R, Cn		
			20					0.70				

CORED BOREHOLE LOG

Client: TIME & PLACE DEVELOPMENT PTY LTD
Project: PROPOSED REDEVELOPMENT
Location: 45-53 MACLEAY STREET, POTTS POINT, NSW

Job No.: 34303RE **Core Size:** NMLC **R.L. Surface:** ~27.9 m
Date: 2/8/23 **Inclination:** VERTICAL **Datum:** AHD
Plant Type: JK205 **Bearing:** N/A **Logged/Checked By:** Q.V./M.E.

Water Loss/Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX I _s (50)	DEFECT DETAILS		Formation		
									SPACING (mm)	DESCRIPTION Type, orientation, defect shape and roughness, defect coatings and seams, openness and thickness			
90% RETURN								VL-0.1 L-0.3 M-1 H-3 VH-10 EH	600 200 60 20	Specific	General		
		19	9		SANDSTONE: fine to coarse grained, light grey, bedded at 0-5°. <i>(continued)</i>	FR	M						
		18	10		SANDSTONE: fine to medium grained, light grey, with occasional grey laminae, bedded at 0-20°.								
		17	11										
					END OF BOREHOLE AT 11.00 m								
		16	12										
		15	13										
		14	14										
		13											

Appendix G – Laboratory Certificates and Analytical Reports

Sheet _1 of _1

Site: 45-53 Macleay Street, Potts Point, NSW

Project No: E26863

Laboratory: SGS Australia
Unit 16, 33 Maddox Street,
ALEXANDRIA NSW 2015
P: 02 8594 0400 F: 02 8594 0499

Sample ID Laboratory ID Container Type Sampling Date Time

SOIL

WATER

0.45 µm field filtered

OTHER

HM ^A /TRH (Including F1, F2, F3, F4)/
BTX/PAHs

HM ^A /TRH (Including F1, F2, F3,
F4)/BTX

BTEX

VOCs

PFAS

pH / Turbidity/ TDS/ EC/ Hardness

OP Pesticides

OC Pesticides

PCBs

Phenols

DPE AN2 Full Suite -
Mandatory and Other Parameters

Cyanide

Dewatering Suite

HOLD

Comments

HM ^A
Al, As, Cd, Cr, Cu, Pb, Hg, Ni, Zn
pH & EC
TDS / TDU
Hardness
Total Cyanide
Metals (Al, As, Cd, Cr,
Cu, Pb, Hg, Ni, Zn)
TRH (F1, F2, F3, F4)
BTX
PAH
Total Phenol
Dewatering Suite
pH & EC
TDS / TDU
Hardness
Total Cyanide
Metals (Al, As, Cd, Cr,
Cu, Pb, Hg, Ni, Zn)
TRH (F1, F2, F3, F4)
BTX
PAH
Total Phenol
DPE Suite - Mandatory and Other
Parameters
(Appendix A suite - see page 2 and 3)
Alkalinity (Bicarbonate, carbonate,
hydroxide & total)
EC pH, Redox Potential (Eh), TDS (NTU),
Total suspended solids (TSS), Total
organic carbon (TOC), Sodium
absorption ratio (SAR)
Major Anions
SO₄, Cl, CO₃, Br, F
Major Cations
Ca, Mg, Na, K
Ionic Balance
Metals (Al, Sb, As, Ba, Be, B, Cd, Cr, Co,
Cu, Fe, Pb, Li, Mn, Hg, Mo, Ni, Se, Si, Ag,
Sr, U, V, Zn)
Ammonia, Nitrate, Total nitrogen,
oxidised nitrogen, total phosphorus,
reactive phosphorus
E. Coli / F. Coliforms / F. Streptococci
TRH / BTX/ PAH
OCP, OPB, PCB
SVOC, VOC
Chlorinated aliphatics, Phenolic, PFAS

Container Type:
J = solvent washed, acid rinsed, Teflon sealed glass jar
S = solvent washed, acid rinsed glass bottle
P = natural HDPE plastic bottle
VC = glass vial, Teflon Septum
ZLB = Zip-Lock Bag

BB = Bulk Bag

Investigator: I attest that these samples were collected in accordance with standard EI field sampling procedures.

Sampler's Name (EI): Mariana Barbosa

Received by (SGS): Xiaotian Wei

Signature: [Signature]

Date: 16/10/2025

Signature: [Signature]

Date: 16/10/2025

IMPORTANT:
Please e-mail laboratory results to: lab@eiaustralia.com.au

Report with EI Waste Classification Table

Sampler's Comments:
Please cc Mariana and Sergio in results. Please forward QTI to Envirolab

LABORATORY
TURNAROUND
☒ Standard
☐ 24 Hours
☐ 48 Hours
☐ 72 Hours
☐ Other



eiaustralia

Contamination | Remediation | Development

Suite 6.01, 55 Miller Street,
PYRMONT NSW 2009
Ph: 9516 0722
lab@eiaustralia.com.au
COC Juss 2021 FORM V5 - SGS

SGS EHS Sydney COC

SE291185





SAMPLE RECEIPT ADVICE

SE291185

CLIENT DETAILS

Contact Mariana Barbosa
Client EIAUSTRALIA
Address SUITE 6.01
55 MILLER STREET
PYRMONT NSW 2009

Telephone 61 2 95160722
Facsimile (Not specified)
Email mariana.barbosa@eiaustralia.com.au

Project **E26863 45-53 Macleay St, Potts Point NSW**
Order Number **E26863**
Samples 7

LABORATORY DETAILS

Manager Shane McDermott
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

Samples Received Thu 16/10/2025
Report Due Thu 23/10/2025
SGS Reference **SE291185**

SUBMISSION DETAILS

This is to confirm that 7 samples were received on Thursday 16/10/2025. Results are expected to be ready by COB Thursday 23/10/2025. Please quote SGS reference SE291185 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Type of documentation received	COC	Date documentation received	16/10/2025
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	14.0°C	Sample container provider	SGS
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

Unless otherwise instructed, water and bulk samples will be held for one month from date of report, and soil samples will be held for two months.

COMMENTS

1 water sample has been placed on hold as no tests have been assigned for it. This sample will not be processed.
QT1 forwarded to Envirolab.

This document is issued by the Company under its General Conditions of Service accessible at www.sgs.com/en/Terms-and-Conditions.aspx. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

CLIENT DETAILS

Client **EI AUSTRALIA**

Project **E26863 45-53 Macleay St, Potts Point NSW**

SUMMARY OF ANALYSIS

No.	Sample ID	OC Pesticides in Water	OP Pesticides in Water	PAH (Polynuclear Aromatic Hydrocarbons) in Water	PCBs in Water	Total Cyanide in water by Discrete Analyser	TRH (Total Recoverable Hydrocarbons) in Water	VOCs in Water	Volatile Petroleum Hydrocarbons in Water
001	MW1	-	-	23	-	-	9	78	7
002	MW2	-	-	23	-	-	9	78	7
003	MW3	26	13	22	9	1	9	77	6
004	WQD1	-	-	-	-	-	9	11	7
005	QR1	-	-	-	-	-	9	11	7
006	WTS	-	-	-	-	-	-	11	-
007	WTB	-	-	-	-	-	-	11	-

CONTINUED OVERLEAF

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .



SAMPLE RECEIPT ADVICE

SE291185

CLIENT DETAILS

Client **EI AUSTRALIA**

Project **E26863 45-53 Macleay St, Potts Point NSW**

SUMMARY OF ANALYSIS

No.	Sample ID	Alkalinity	Anions by Ion Chromatography in Water	Conductivity and TDS by Calculation - Water	Dissolved Oxygen by Membrane Electrode	Full 8270 SVOC in Water	pH in water	Total and Volatile Suspended Solids (TSS /	Total Dissolved Solids (TDS) in water	Total Phenolics in Water	Turbidity
001	MW1	-	-	1	-	-	2	-	1	1	1
002	MW2	-	-	1	-	-	2	-	1	1	1
003	MW3	10	5	1	3	167	2	1	1	1	1

CONTINUED OVERLEAF

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
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Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

CLIENT DETAILS

Client **EI AUSTRALIA**

Project **E26863 45-53 Macleay St, Potts Point NSW**

SUMMARY OF ANALYSIS

No.	Sample ID	Ammonia Nitrogen by Discrete Analyser	Calculation of Anion-Cation Balance	Filterable Reactive Phosphorus (FRP)	Forms of Carbon	Metals in Water (Dissolved) by ICPOES	Nitrite in Water	Redox Potential (Eh) in water	TKN Kjeldahl Digestion by Discrete Analyser	Total Phosphorus by Kjeldahl Digestion DA in	Trace Metals (Dissolved) in Water by ICPMS
001	MW1	-	-	-	-	3	-	-	-	-	8
002	MW2	-	-	-	-	3	-	-	-	-	8
003	MW3	1	4	1	1	9	2	2	2	1	21
004	WQD1	-	-	-	-	-	-	-	-	-	7
005	QR1	-	-	-	-	-	-	-	-	-	7

CONTINUED OVERLEAF

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
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Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .



SAMPLE RECEIPT ADVICE

SE291185

CLIENT DETAILS

Client EI AUSTRALIA

Project E26863 45-53 Macleay St, Potts Point NSW

SUMMARY OF ANALYSIS

No.	Sample ID	E. coli and Thermotolerant coliforms in Water (CFU)	Enterococci in Water	Mercury (dissolved) in Water	Per- and Polyfluoroalkyl Substances (PFAS) in
001	MW1	-	-	1	-
002	MW2	-	-	1	-
003	MW3	3	3	1	60
004	WQD1	-	-	1	-
005	QR1	-	-	1	-

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

CLIENT DETAILS

Contact Mariana Barbosa
 Client EI AUSTRALIA
 Address SUITE 6.01
 55 MILLER STREET
 PYRMONT NSW 2009

Telephone 61 2 95160722
 Facsimile (Not specified)
 Email mariana.barbosa@eiaustralia.com.au

Project **E26863 45-53 Macleay St, Potts Point NSW**
 Order Number **E26863**
 Samples 7

LABORATORY DETAILS

Manager Shane McDermott
 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 **SE291185 R0**
 Date Received 16/10/2025
 Date Reported 23/10/2025

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

SIGNATORIES



Akheeqar BENIAMEEN
 Chemist



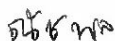
Dong LIANG
 Metals/Inorganics Team Leader



Ly Kim HA
 Organic Section Head



Shane MCDERMOTT
 Laboratory Manager



Tim MEEYAN
 Microbiologist



Ying Ying ZHANG
 Laboratory Technician

VOCs in Water [AN433] Tested: 17/10/2025

PARAMETER	UOM	LOR	MW1	MW2	MW3	WQD1	QR1
			WATER - 16/10/2025 SE291185.001	WATER - 16/10/2025 SE291185.002	WATER - 16/10/2025 SE291185.003	WATER - 16/10/2025 SE291185.004	WATER - 16/10/2025 SE291185.005
Benzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
m/p-xylene	µg/L	1	<1	<1	<1	<1	<1
o-xylene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Xylenes	µg/L	1.5	<1.5	<1.5	<1.5	<1.5	<1.5
Total BTEX	µg/L	3	<3	<3	<3	<3	<3
Naphthalene (VOC)*	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane (CFC-12)	µg/L	5	<5	<5	<5	-	-
Chloromethane	µg/L	5	<5	<5	<5	-	-
Vinyl chloride (Chloroethene)	µg/L	0.3	<0.3	<0.3	<0.3	-	-
Bromomethane	µg/L	10	<10	<10	<10	-	-
Chloroethane	µg/L	5	<5	<5	<5	-	-
Trichlorofluoromethane	µg/L	1	<1	<1	<1	-	-
Acetone (2-propanone)	µg/L	10	<10	<10	<10	-	-
Iodomethane	µg/L	5	<5	<5	<5	-	-
1,1-dichloroethene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Acrylonitrile	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Dichloromethane (Methylene chloride)	µg/L	5	<5	<5	<5	-	-
Allyl chloride	µg/L	2	<2	<2	<2	-	-
Carbon disulfide	µg/L	2	<2	<2	<2	-	-
trans-1,2-dichloroethene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
MIBE (Methyl-tert-butyl ether)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,1-dichloroethane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Vinyl acetate*	µg/L	10	<10	<10	<10	-	-
MEK (2-butanone)	µg/L	10	<10	<10	<10	-	-
cis-1,2-dichloroethene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Bromochloromethane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Chloroform (THM)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
2,2-dichloropropane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,2-dichloroethane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,1,1-trichloroethane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,1-dichloropropene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Carbon tetrachloride	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Dibromomethane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,2-dichloropropane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
2-nitropropane	µg/L	100	<100	<100	<100	-	-
Bromodichloromethane (THM)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
MIBK (4-methyl-2-pentanone)	µg/L	5	<5	<5	<5	-	-
cis-1,3-dichloropropene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
trans-1,3-dichloropropene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,1,2-trichloroethane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,3-dichloropropane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Dibromochloromethane (THM)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
2-hexanone (MBK)	µg/L	5	<5	<5	<5	-	-
1,2-dibromoethane (EDB)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,1,1,2-tetrachloroethane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Chlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Bromoform (THM)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Styrene (Vinyl benzene)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,1,2,2-tetrachloroethane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,2,3-trichloropropane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
trans-1,4-dichloro-2-butene	µg/L	1	<1	<1	<1	-	-
Isopropylbenzene (Cumene)	µg/L	0.5	<0.5	<0.5	<0.5	-	-

VOCs in Water [AN433] Tested: 17/10/2025 (continued)

PARAMETER	UOM	LOR	MW1	MW2	MW3	WQD1	QR1
			WATER	WATER	WATER	WATER	WATER
			16/10/2025 SE291185.001	16/10/2025 SE291185.002	16/10/2025 SE291185.003	16/10/2025 SE291185.004	16/10/2025 SE291185.005
Bromobenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
n-propylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
2-chlorotoluene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
4-chlorotoluene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,3,5-trimethylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
tert-butylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,2,4-trimethylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
sec-butylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,3-dichlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,4-dichlorobenzene	µg/L	0.3	<0.3	<0.3	<0.3	-	-
p-isopropyltoluene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,2-dichlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
n-butylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,2-dibromo-3-chloropropane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,2,4-trichlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Hexachlorobutadiene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,2,3-trichlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
cis-1,4-dichloro-2-butene	µg/L	1	-	-	-	-	-
Total VOC	µg/L	10	<10	<10	<10	-	-

VOCs in Water [AN433] Tested: 17/10/2025 (continued)

PARAMETER	UOM	LOR	WTS	WTB
			WATER - 16/10/2025 SE291185.006	WATER - 16/10/2025 SE291185.007
Benzene	µg/L	0.5	[101%]	<0.5
Toluene	µg/L	0.5	[101%]	<0.5
Ethylbenzene	µg/L	0.5	[100%]	<0.5
m/p-xylene	µg/L	1	[99%]	<1
o-xylene	µg/L	0.5	[101%]	<0.5
Total Xylenes	µg/L	1.5	-	<1.5
Total BTEX	µg/L	3	-	<3
Naphthalene (VOC)*	µg/L	0.5	[93%]	<0.5
Dichlorodifluoromethane (CFC-12)	µg/L	5	-	-
Chloromethane	µg/L	5	-	-
Vinyl chloride (Chloroethene)	µg/L	0.3	-	-
Bromomethane	µg/L	10	-	-
Chloroethane	µg/L	5	-	-
Trichlorofluoromethane	µg/L	1	-	-
Acetone (2-propanone)	µg/L	10	-	-
Iodomethane	µg/L	5	-	-
1,1-dichloroethene	µg/L	0.5	-	-
Acrylonitrile	µg/L	0.5	-	-
Dichloromethane (Methylene chloride)	µg/L	5	-	-
Allyl chloride	µg/L	2	-	-
Carbon disulfide	µg/L	2	-	-
trans-1,2-dichloroethene	µg/L	0.5	-	-
MIBE (Methyl-tert-butyl ether)	µg/L	0.5	-	-
1,1-dichloroethane	µg/L	0.5	-	-
Vinyl acetate*	µg/L	10	-	-
MEK (2-butanone)	µg/L	10	-	-
cis-1,2-dichloroethene	µg/L	0.5	-	-
Bromochloromethane	µg/L	0.5	-	-
Chloroform (THM)	µg/L	0.5	-	-
2,2-dichloropropane	µg/L	0.5	-	-
1,2-dichloroethane	µg/L	0.5	-	-
1,1,1-trichloroethane	µg/L	0.5	-	-
1,1-dichloropropene	µg/L	0.5	-	-
Carbon tetrachloride	µg/L	0.5	-	-
Dibromomethane	µg/L	0.5	-	-
1,2-dichloropropane	µg/L	0.5	-	-
Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	-	-
2-nitropropane	µg/L	100	-	-
Bromodichloromethane (THM)	µg/L	0.5	-	-
MIBK (4-methyl-2-pentanone)	µg/L	5	-	-
cis-1,3-dichloropropene	µg/L	0.5	-	-
trans-1,3-dichloropropene	µg/L	0.5	-	-
1,1,2-trichloroethane	µg/L	0.5	-	-
1,3-dichloropropane	µg/L	0.5	-	-
Dibromochloromethane (THM)	µg/L	0.5	-	-
2-hexanone (MBK)	µg/L	5	-	-
1,2-dibromoethane (EDB)	µg/L	0.5	-	-
Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	-	-
1,1,1,2-tetrachloroethane	µg/L	0.5	-	-
Chlorobenzene	µg/L	0.5	-	-
Bromoform (THM)	µg/L	0.5	-	-
Styrene (Vinyl benzene)	µg/L	0.5	-	-
1,1,2,2-tetrachloroethane	µg/L	0.5	-	-
1,2,3-trichloropropane	µg/L	0.5	-	-
trans-1,4-dichloro-2-butene	µg/L	1	-	-
Isopropylbenzene (Cumene)	µg/L	0.5	-	-

VOCs in Water [AN433] Tested: 17/10/2025 (continued)

PARAMETER	UOM	LOR	WTS	WTB
			WATER - 16/10/2025 SE291185.006	WATER - 16/10/2025 SE291185.007
Bromobenzene	µg/L	0.5	-	-
n-propylbenzene	µg/L	0.5	-	-
2-chlorotoluene	µg/L	0.5	-	-
4-chlorotoluene	µg/L	0.5	-	-
1,3,5-trimethylbenzene	µg/L	0.5	-	-
tert-butylbenzene	µg/L	0.5	-	-
1,2,4-trimethylbenzene	µg/L	0.5	-	-
sec-butylbenzene	µg/L	0.5	-	-
1,3-dichlorobenzene	µg/L	0.5	-	-
1,4-dichlorobenzene	µg/L	0.3	-	-
p-isopropyltoluene	µg/L	0.5	-	-
1,2-dichlorobenzene	µg/L	0.5	-	-
n-butylbenzene	µg/L	0.5	-	-
1,2-dibromo-3-chloropropane	µg/L	0.5	-	-
1,2,4-trichlorobenzene	µg/L	0.5	-	-
Hexachlorobutadiene	µg/L	0.5	-	-
1,2,3-trichlorobenzene	µg/L	0.5	-	-
cis-1,4-dichloro-2-butene	µg/L	1	-	-
Total VOC	µg/L	10	-	-

Volatile Petroleum Hydrocarbons in Water [AN433] Tested: 17/10/2025

PARAMETER	UOM	LOR	MW1	MW2	MW3	WQD1	QR1
			WATER	WATER	WATER	WATER	WATER
			-	-	-	-	-
			16/10/2025 SE291185.001	16/10/2025 SE291185.002	16/10/2025 SE291185.003	16/10/2025 SE291185.004	16/10/2025 SE291185.005
TRH C6-C9	µg/L	40	<40	<40	<40	<40	<40
Benzene (F0)	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TRH C6-C10	µg/L	50	<50	<50	<50	<50	<50
TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	<50	<50	<50	<50

TRH (Total Recoverable Hydrocarbons) in Water [AN403] Tested: 17/10/2025

PARAMETER	UOM	LOR	MW1	MW2	MW3	WQD1	QR1
			WATER	WATER	WATER	WATER	WATER
			16/10/2025 SE291185.001	16/10/2025 SE291185.002	16/10/2025 SE291185.003	16/10/2025 SE291185.004	16/10/2025 SE291185.005
TRH C10-C14	µg/L	50	58	<50	<50	<50	<50
TRH C15-C28	µg/L	200	<200	<200	<200	<200	<200
TRH C29-C36	µg/L	200	<200	<200	<200	<200	<200
TRH C37-C40	µg/L	200	<200	<200	<200	<200	<200
TRH >C10-C16	µg/L	60	110	<60	<60	<60	<60
TRH >C10-C16 - Naphthalene (F2)	µg/L	60	110	<60	<60	<60	<60
TRH >C16-C34 (F3)	µg/L	500	<500	<500	<500	<500	<500
TRH >C34-C40 (F4)	µg/L	500	<500	<500	<500	<500	<500
TRH C10-C40	µg/L	320	360	<320	<320	<320	<320

PAH (Polynuclear Aromatic Hydrocarbons) in Water [AN420] Tested: 17/10/2025

PARAMETER	UOM	LOR	MW1	MW2	MW3
			WATER - 16/10/2025 SE291185.001	WATER - 16/10/2025 SE291185.002	WATER - 16/10/2025 SE291185.003
Naphthalene	µg/L	0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	µg/L	0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	µg/L	0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L	0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	µg/L	0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	µg/L	0.1	<0.1	<0.1	<0.1
Benzo(b&j&k)fluoranthene	µg/L	0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1	<0.1	<0.1
Dibenzo(ah)anthracene	µg/L	0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	µg/L	0.1	<0.1	<0.1	<0.1
Total PAH (18)	µg/L	1	<1	<1	-

OC Pesticides in Water [AN420] Tested: 17/10/2025

			MW3
			WATER
			-
			16/10/2025
			SE291185.003
PARAMETER	UOM	LOR	
Alpha BHC	µg/L	0.1	<0.1
Hexachlorobenzene (HCB)	µg/L	0.1	<0.1
Beta BHC	µg/L	0.1	<0.1
Lindane (gamma BHC)	µg/L	0.1	<0.1
Delta BHC	µg/L	0.1	<0.1
Heptachlor	µg/L	0.1	<0.1
Aldrin	µg/L	0.1	<0.1
Heptachlor epoxide	µg/L	0.1	<0.1
Gamma Chlordane	µg/L	0.1	<0.1
Alpha Chlordane	µg/L	0.1	<0.1
Alpha Endosulfan	µg/L	0.1	<0.1
p,p'-DDE	µg/L	0.1	<0.1
Dieldrin	µg/L	0.1	<0.1
Endrin	µg/L	0.1	<0.1
Beta Endosulfan	µg/L	0.1	<0.1
p,p'-DDD	µg/L	0.1	<0.1
Endrin aldehyde	µg/L	0.1	<0.1
Endosulfan sulphate	µg/L	0.1	<0.1
p,p'-DDT	µg/L	0.1	<0.1
Endrin ketone	µg/L	0.1	<0.1
Methoxychlor	µg/L	0.1	<0.1
Mirex	µg/L	0.1	<0.1
Total OC	µg/L	1	<1
Total OC	µg/L	1	<1
Total Other OC VIC EPA	µg/L	1	<1

OP Pesticides in Water [AN420] Tested: 17/10/2025

			MW3
			WATER
			-
			16/10/2025
			SE291185.003
PARAMETER	UOM	LOR	
Azinphos-methyl	µg/L	0.2	<0.2
Bromophos Ethyl	µg/L	0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	µg/L	0.2	<0.2
Diazinon (Dimpylate)	µg/L	0.5	<0.5
Dichlorvos	µg/L	0.5	<0.5
Dimethoate	µg/L	0.5	<0.5
Ethion	µg/L	0.2	<0.2
Fenitrothion	µg/L	0.2	<0.2
Malathion	µg/L	0.2	<0.2
Methidathion	µg/L	0.5	<0.5
Parathion-ethyl (Parathion)	µg/L	0.2	<0.2



ANALYTICAL RESULTS

SE291185 R0

PCBs in Water [AN420] Tested: 17/10/2025

			MW3
			WATER
			-
			16/10/2025
			SE291185.003
PARAMETER	UOM	LOR	
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
Total Arochlors*	µg/L	5	<5



ANALYTICAL RESULTS

SE291185 R0

Total Cyanide in water by Discrete Analyser [AN077/AN287] Tested: 20/10/2025

			MW3
			WATER
			-
			16/10/2025
			SE291185.003
PARAMETER	UOM	LOR	
Total Cyanide	mg/L	0.004	<0.004

Full 8270 SVOC in Water [AN420] Tested: 17/10/2025

			MW3
			WATER
			-
			16/10/2025
			SE291185.003
PARAMETER	UOM	LOR	
Acenaphthene	µg/L	0.1	<0.1
Acenaphthylene	µg/L	0.1	<0.1
Anthracene	µg/L	0.1	<0.1
Benzo(a)anthracene	µg/L	0.1	<0.1
Benzo(b&j)fluoranthene	µg/L	0.1	<0.1
Benzo(b&j&k)fluoranthene	µg/L	0.2	<0.2
Benzo(k)fluoranthene	µg/L	0.1	<0.1
Benzo(ghi)perylene	µg/L	0.1	<0.1
Benzo(a)pyrene	µg/L	0.1	<0.1
Chrysene	µg/L	0.1	<0.1
Dibenzo(ah)anthracene	µg/L	0.1	<0.1
Fluoranthene	µg/L	0.1	<0.1
Fluorene	µg/L	0.1	<0.1
Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1
1-methylnaphthalene	µg/L	0.1	<0.1
2-methylnaphthalene	µg/L	0.1	<0.1
Naphthalene	µg/L	0.1	<0.1
Phenanthrene	µg/L	0.1	<0.1
Pyrene	µg/L	0.1	<0.1
2-acetylaminofluorene	µg/L	0.5	<0.5
7,12-dimethyl-benz(a)anthracene	µg/L	0.5	<0.5
3-methylcholanthrene	µg/L	0.5	<0.5
Aldrin	µg/L	0.1	<0.1
Alpha-BHC	µg/L	0.1	<0.1
Beta-BHC	µg/L	0.1	<0.1
Delta-BHC	µg/L	0.1	<0.1
Gamma-BHC (Lindane)	µg/L	0.1	<0.1
p,p-DDD	µg/L	0.1	<0.1
p,p-DDE	µg/L	0.1	<0.1
p,p-DDT	µg/L	0.1	<0.1
Dieldrin	µg/L	0.1	<0.1
Alpha-endosulfan	µg/L	0.1	<0.1
Beta-endosulfan	µg/L	0.1	<0.1
Endosulfan sulphate	µg/L	0.1	<0.1
Endrin	µg/L	0.1	<0.1
Heptachlor	µg/L	0.1	<0.1
Heptachlor epoxide	µg/L	0.1	<0.1
Methoxychlor	µg/L	0.1	<0.1
Mirex	µg/L	0.1	<0.1
Alpha-chlordane	µg/L	0.1	<0.1
Gamma-chlordane	µg/L	0.1	<0.1
Endrin ketone	µg/L	0.1	<0.1
Azinphos-methyl (Guthion)	µg/L	0.2	<0.2
Bromophos ethyl	µg/L	0.2	<0.2
Carbophenothion	µg/L	0.5	<0.5
Chlorfenvinphos-cis	µg/L	5	<5
Chlorfenvinphos-trans	µg/L	0.5	<0.5
Chlorpyrifos (Chlorpyrifos Ethyl)	µg/L	0.2	<0.2
Chlorpyrifos-methyl	µg/L	0.5	<0.5
Co-Ral (Coumaphos)	µg/L	0.5	<0.5
Diazinon (Dimpylate)	µg/L	0.5	<0.5
Dichlorvos	µg/L	0.5	<0.5
Demeton-S-methyl	µg/L	0.5	<0.5
Dimethoate	µg/L	0.5	<0.5
Disulfoton (Di-syston)	µg/L	0.5	<0.5
EPN*	µg/L	0.5	<0.5

Full 8270 SVOC in Water [AN420] Tested: 17/10/2025 (continued)

			MW3
			WATER
			-
			16/10/2025
			SE291185.003
PARAMETER	UOM	LOR	
Ethion	µg/L	0.2	<0.2
Ethoprophos (ethoprop or prophos)	µg/L	0.5	<0.5
Famphur (Famophos)	µg/L	0.5	<0.5
Fenamiphos (Phenamiphos)	µg/L	0.5	<0.5
Fenchlorophos (Ronnell)	µg/L	0.5	<0.5
Fenitrothion	µg/L	0.2	<0.2
Fenthion	µg/L	0.5	<0.5
Malathion (Maldison)	µg/L	0.2	<0.2
Methidathion	µg/L	0.5	<0.5
Mevinphos-cis/trans	µg/L	1	<1
o,o,o-triethyl phosphorothioate	µg/L	0.5	<0.5
Parathion ethyl (Parathion)	µg/L	0.2	<0.2
Parathion methyl	µg/L	0.5	<0.5
Phorate	µg/L	0.5	<0.5
Pirimiphos-ethyl	µg/L	0.5	<0.5
Pirimiphos-methyl	µg/L	0.5	<0.5
Profenofos	µg/L	0.5	<0.5
Prothiophos (Tokuthion)*	µg/L	0.5	<0.5
Sulfotepp	µg/L	0.5	<0.5
Tetrachlorvinphos (Stirophos)*	µg/L	0.5	<0.5
PCB Congener C28	µg/L	0.1	<0.1
PCB Congener C52	µg/L	0.1	<0.1
PCB Congener C101	µg/L	0.1	<0.1
PCB Congener C118	µg/L	0.1	<0.1
PCB Congener C138	µg/L	0.1	<0.1
PCB Congener C153	µg/L	0.1	<0.1
PCB Congener C180	µg/L	0.1	<0.1
Hexachlorobenzene (HCB)	µg/L	0.1	<0.1
1,2-dichlorobenzene	µg/L	0.5	<0.5
1,3-dichlorobenzene	µg/L	0.5	<0.5
1,4-dichlorobenzene	µg/L	0.5	<0.5
Hexachlorobutadiene	µg/L	0.5	<0.5
Hexachlorocyclopentadiene	µg/L	2	<2
Hexachloroethane	µg/L	0.5	<0.5
Hexachloropropene	µg/L	0.5	<0.5
Pentachlorobenzene	µg/L	0.5	<0.5
Pentachloroethane	µg/L	0.5	<0.5
1,2,3,5 and 1,2,4,5 -tetrachlorobenzene	µg/L	1	<1
1,2,3,4-tetrachlorobenzene	µg/L	0.5	<0.5
1/2-Chloronaphthalene	µg/L	1	<1
1,2,4-trichlorobenzene	µg/L	0.5	<0.5
Bis(2-ethylhexyl)phthalate	µg/L	10	<10
Bis(2-ethylhexyl)adipate	µg/L	1	<1
Butyl benzyl phthalate	µg/L	1	<1
Di-n-butyl phthalate	µg/L	10	<10
Diethyl phthalate	µg/L	5	<5
Dimethyl phthalate	µg/L	1	<1
Di-n-octyl phthalate	µg/L	1	<1
Carbofuran	µg/L	0.5	<0.5
Carbaryl	µg/L	0.5	<0.5
Trifluralin	µg/L	0.5	<0.5
N-nitroso-di-n-butylamine (NDBA)	µg/L	1	<1
N-nitroso-diethylamine (NDEA)	µg/L	1	<1
N-nitroso-di-n-propylamine (NDPA)	µg/L	1	<1
N-nitroso-morpholine (NMOR)	µg/L	1	<1
N-nitroso-piperidine (NPIP)	µg/L	1	<1

Full 8270 SVOC in Water [AN420] Tested: 17/10/2025 (continued)

			MW3
			WATER
			-
			16/10/2025
			SE291185.003
PARAMETER	UOM	LOR	
N-nitroso-pyrrolidine (NPYR)	µg/L	1	<1
4-amino biphenyl	µg/L	1	<1
Acetophenone	µg/L	1	<1
1,3-dinitrobenzene	µg/L	1	<1
2,4-dinitrotoluene	µg/L	1	<1
2,6-dinitrotoluene	µg/L	1	<1
Isophorone	µg/L	1	<1
Nitrobenzene	µg/L	1	<1
p-(dimethylamino) azobenzene	µg/L	1	<1
Phenacetin	µg/L	1	<1
Pentachloronitrobenzene (quintozene)	µg/L	1	<1
Aniline	µg/L	5	<5
4-chloroaniline	µg/L	1	<1
2-nitroaniline	µg/L	1	<1
3-nitroaniline	µg/L	1	<1
4-nitroaniline	µg/L	1	<1
Diphenylamine	µg/L	1	<1
o-toluidine	µg/L	1	<1
5-nitro-o-toluidine	µg/L	1	<1
1-naphthylamine	µg/L	2	<2
2-naphthylamine	µg/L	2	<2
Bis(2-chloroethoxy) methane	µg/L	1	<1
Bis(2-chloroethyl) ether	µg/L	1	<1
Bis(2-chloroisopropyl) ether	µg/L	1	<1
4-chlorophenyl phenyl ether	µg/L	1	<1
4-bromophenyl phenyl ether	µg/L	1	<1
Methyl methanesulfonate	µg/L	1	<1
Ethyl methanesulfonate	µg/L	1	<1
Dibenzofuran	µg/L	1	<1
Benzyl alcohol	µg/L	1	<1
Safrole	µg/L	1	<1
Isosafrole Isomer 1	µg/L	1	<1
Isosafrole Isomer 2	µg/L	1	<1
1,4-naphthoquinone	µg/L	1	<1
Thionazin	µg/L	1	<1
3/4-methyl phenol (m/p-cresol)	µg/L	1	<1
2-methyl phenol (o-cresol)	µg/L	0.5	<0.5
2,6-dichlorophenol	µg/L	0.5	<0.5
2,3,4,6-tetrachlorophenol	µg/L	0.5	<0.5
2,4,5-trichlorophenol	µg/L	0.5	<0.5
4-chloro-3-methylphenol	µg/L	2	<2
2-chlorophenol	µg/L	0.5	<0.5
2,4-dichlorophenol	µg/L	0.5	<0.5
2,4-dimethylphenol	µg/L	0.5	<0.5
2-nitrophenol	µg/L	0.5	<0.5
Phenol	µg/L	0.5	<0.5
2,4,6-trichlorophenol	µg/L	0.5	<0.5
Pentachlorophenol	µg/L	0.5	<0.5
4-nitrophenol	µg/L	1	<1
Total Endosulfan (alpha+beta+sulfate)	µg/L	0.2	<0.2



ANALYTICAL RESULTS

SE291185 R0

pH in water [AN101] Tested: 16/10/2025

			MW1	MW2	MW3
			WATER	WATER	WATER
			-	-	-
			16/10/2025	16/10/2025	16/10/2025
			SE291185.001	SE291185.002	SE291185.003
PARAMETER	UOM	LOR			
pH**	pH Units	0.1	5.8	6.5	7.3
Temperature of test*	°C	-	-	-	-



ANALYTICAL RESULTS

SE291185 R0

Conductivity and TDS by Calculation - Water [AN106] Tested: 16/10/2025

			MW1	MW2	MW3
			WATER	WATER	WATER
			-	-	-
			16/10/2025	16/10/2025	16/10/2025
			SE291185.001	SE291185.002	SE291185.003
PARAMETER	UOM	LOR			
Conductivity @ 25 C	µS/cm	2	170	280	410



ANALYTICAL RESULTS

SE291185 R0

Total Dissolved Solids (TDS) in water [AN113] Tested: 20/10/2025

			MW1	MW2	MW3
			WATER	WATER	WATER
			-	-	-
			16/10/2025	16/10/2025	16/10/2025
			SE291185.001	SE291185.002	SE291185.003
PARAMETER	UOM	LOR			
Total Dissolved Solids Dried at 175-185°C	mg/L	10	120	180	270



ANALYTICAL RESULTS

SE291185 R0

Turbidity [AN119] Tested: 16/10/2025

			MW1	MW2	MW3
			WATER	WATER	WATER
			-	-	-
			16/10/2025	16/10/2025	16/10/2025
			SE291185.001	SE291185.002	SE291185.003
PARAMETER	UOM	LOR			
Turbidity	NTU	0.5	64	340	410



ANALYTICAL RESULTS

SE291185 R0

Total Phenolics in Water [AN295] Tested: 21/10/2025

			MW1	MW2	MW3
			WATER	WATER	WATER
			-	-	-
			16/10/2025	16/10/2025	16/10/2025
PARAMETER	UOM	LOR	SE291185.001	SE291185.002	SE291185.003
Total Phenols	mg/L	0.05	<0.05	<0.05	<0.05

Anions by Ion Chromatography in Water [AN245] Tested: 21/10/2025

			MW3
			WATER
			-
			16/10/2025
			SE291185.003
PARAMETER	UOM	LOR	
Chloride	mg/L	0.05	30
Bromide	mg/L	0.05	<0.05
Fluoride	mg/L	0.1	0.32
Sulfate, SO ₄	mg/L	1	23
Nitrate Nitrogen, NO ₃ -N	mg/L	0.005	0.51

Alkalinity [AN135] Tested: 17/10/2025

			MW3
			WATER
			-
			16/10/2025
			SE291185.003
PARAMETER	UOM	LOR	
Bicarbonate Alkalinity as CaCO ₃	mg/L	5	140
Bicarbonate Alkalinity as HCO ₃	mg/L	5	170
Carbonate Alkalinity as CaCO ₃	mg/L	5	<5
Carbonate Alkalinity as CO ₃	mg/L	5	<5
Hydroxide Alkalinity as CaCO ₃	mg/L	5	<5
Hydroxide Alkalinity as OH	mg/L	5	<5
Total Alkalinity as CaCO ₃	mg/L	5	140
Carbonate Hardness as CaCO ₃ *	mg CaCO ₃ /L	2	141.14625
Non-Carbonate Hardness as CaCO ₃ *	mg CaCO ₃ /L	2	-
Negative Hardness as CaCO ₃ *	mg CaCO ₃ /L	-100	-



ANALYTICAL RESULTS

SE291185 R0

Dissolved Oxygen by Membrane Electrode [AN176] Tested: 16/10/2025

			MW3
			WATER
			-
			16/10/2025
PARAMETER	UOM	LOR	SE291185.003
Temperature*	°C	-	19.9
Dissolved Oxygen**	mg/L	0.5	6.2
Dissolved Oxygen (percent saturation)**	%	1	68.3



ANALYTICAL RESULTS

SE291185 R0

Total and Volatile Suspended Solids (TSS / VSS) [AN114] Tested: 17/10/2025

			MW3
			WATER
			-
			16/10/2025
			SE291185.003
PARAMETER	UOM	LOR	
Total Suspended Solids Dried at 103-105°C	mg/L	5	620



ANALYTICAL RESULTS

SE291185 R0

Forms of Carbon [AN190] Tested: 20/10/2025

			MW3
			WATER
			-
			16/10/2025
			SE291185.003
PARAMETER	UOM	LOR	
Total Organic Carbon as NPOC	mg/L	0.2	5.7



ANALYTICAL RESULTS

SE291185 R0

Ammonia Nitrogen by Discrete Analyser [AN291] Tested: 17/10/2025

			MW3
			WATER
			-
			16/10/2025
			SE291185.003
PARAMETER	UOM	LOR	
Ammonia Nitrogen, NH ₃ as N	mg/L	0.01	<0.01

Calculation of Anion-Cation Balance (SAR Calc) [AN121] Tested: 23/10/2025

			MW3
			WATER
			-
			16/10/2025
			SE291185.003
PARAMETER	UOM	LOR	
Sum of Ions*	mg/L	10	294
Anion-Cation Balance	%	-100	1.46
TFSS*	mg/L	10	294
Sodium Adsorption Ratio*	No unit	0.1	0.9



ANALYTICAL RESULTS

SE291185 R0

Nitrite in Water [AN277] Tested: 17/10/2025

			MW3
			WATER
			-
			16/10/2025
PARAMETER	UOM	LOR	SE291185.003
Nitrite Nitrogen, NO2 as N	mg/L	0.005	<0.005
Total Oxidised Nitrogen, NOx-N	mg/L	0.005	0.52



ANALYTICAL RESULTS

SE291185 R0

TKN Kjeldahl Digestion by Discrete Analyser [AN281/292] Tested: 20/10/2025

			MW3
			WATER
			-
			16/10/2025
PARAMETER	UOM	LOR	SE291185.003
Total Kjeldahl Nitrogen	mg/L	0.05	0.81
Total Nitrogen (calc)	mg/L	0.05	1.3



ANALYTICAL RESULTS

SE291185 R0

Total Phosphorus by Kjeldahl Digestion DA in Water [AN279/AN293] Tested: 20/10/2025

			MW3
			WATER
			-
			16/10/2025
			SE291185.003
PARAMETER	UOM	LOR	
Total Phosphorus (Kjeldahl Digestion) as P	mg/L	0.02	0.57



ANALYTICAL RESULTS

SE291185 R0

Filterable Reactive Phosphorus (FRP) [AN278] Tested: 17/10/2025

			MW3
			WATER
			-
			16/10/2025
			SE291185.003
PARAMETER	UOM	LOR	
Filterable Reactive Phosphorus as P	mg/L	0.005	0.047



ANALYTICAL RESULTS

SE291185 R0

Redox Potential (Eh) in water [AN240] Tested: 16/10/2025

			MW3
			WATER
			-
			16/10/2025
PARAMETER	UOM	LOR	SE291185.003
Eh of Sample Relative to Standard H+ Electrode***	mV	-500	404
Temperature of Sample*	°C	0.1	20.1

Metals in Water (Dissolved) by ICPOES [AN320] Tested: 20/10/2025

PARAMETER	UOM	LOR	MW1	MW2	MW3
			WATER - 16/10/2025 SE291185.001	WATER - 16/10/2025 SE291185.002	WATER - 16/10/2025 SE291185.003
Calcium, Ca	mg/L	0.2	12	42	50
Magnesium, Mg	mg/L	0.1	0.8	2.5	2.9
Total Hardness by Calculation	mg CaCO3/L	1	32	120	140
Sodium Adsorption Ratio	No unit	0.2	-	-	0.9
Sodium, Na	mg/L	0.5	-	-	24
Potassium, K	mg/L	0.1	-	-	20
Lithium, Li	mg/L	0.005	-	-	<0.005
Silicon, Si*	mg/L	0.05	-	-	7.8
Soluble Silicon as Silica, SiO2*	mg/L	0.1	-	-	17

Trace Metals (Dissolved) in Water by ICPMS [AN318] Tested: 20/10/2025

PARAMETER	UOM	LOR	MW1	MW2	MW3	WQD1	QR1
			WATER	WATER	WATER	WATER	WATER
			- 16/10/2025 SE291185.001	- 16/10/2025 SE291185.002	- 16/10/2025 SE291185.003	- 16/10/2025 SE291185.004	- 16/10/2025 SE291185.005
Arsenic	µg/L	1	1	2	2	2	<1
Cadmium	µg/L	0.1	0.1	<0.1	<0.1	<0.1	<0.1
Chromium	µg/L	1	3	1	<1	<1	<1
Copper	µg/L	1	2	5	5	5	<1
Lead	µg/L	1	<1	<1	<1	<1	<1
Nickel	µg/L	1	<1	<1	<1	<1	<1
Zinc	µg/L	5	41	<5	<5	<5	<5
Silver	µg/L	1	-	-	<1	-	-
Aluminium	µg/L	5	220	53	24	-	-
Antimony	µg/L	1	-	-	1	-	-
Barium	µg/L	1	-	-	21	-	-
Beryllium	µg/L	1	-	-	<1	-	-
Boron	µg/L	5	-	-	130	-	-
Cobalt	µg/L	1	-	-	<1	-	-
Iron	µg/L	5	-	-	11	-	-
Manganese	µg/L	1	-	-	1	-	-
Molybdenum	µg/L	1	-	-	3	-	-
Selenium	µg/L	1	-	-	<1	-	-
Strontium	µg/L	1	-	-	150	-	-
Uranium	µg/L	1	-	-	<1	-	-
Vanadium	µg/L	1	-	-	8	-	-



ANALYTICAL RESULTS

SE291185 R0

Mercury (dissolved) in Water [AN311(Perth)/AN312] Tested: 22/10/2025

			MW1	MW2	MW3	WQD1	QR1
			WATER	WATER	WATER	WATER	WATER
			-	-	-	-	-
			16/10/2025	16/10/2025	16/10/2025	16/10/2025	16/10/2025
PARAMETER	UOM	LOR	SE291185.001	SE291185.002	SE291185.003	SE291185.004	SE291185.005
Mercury, Hg	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous Samples [AN404] Tested: 20/10/2025

			MW3
			WATER
			-
			16/10/2025
PARAMETER	UOM	LOR	SE291185.003
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.05
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	0.05
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	0.08
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	0.01
Perfluorooctanoic acid (PFOA)	µg/L	0.01	0.02
Perfluoropropane sulfonic acid (PFPrS)	µg/L	0.01	<0.01
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.01
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.01
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.01
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.01
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0.05
Perfluorononane sulfonic acid (PFNS)	µg/L	0.01	<0.01
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	µg/L	0.01	<0.01
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	µg/L	0.01	<0.01
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	µg/L	0.01	<0.01
1H,1H,2H,2H-Perfluorododecane sulfonic acid (10:2)	µg/L	0.01	<0.01
Sum of PFOS and PFHxS	µg/L	0.01	0.06
Sum of enHealth PFAS (PFHxS+PFOS+PFOA)	µg/L	0.01	0.08
Sum of US EPA PFAS (PFOS+PFOA)	µg/L	0.01	0.07
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.01
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.01
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.01
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.01
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.01
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.01
Perfluorooctane sulfonamide (FOSA)	µg/L	0.01	<0.01
N-Methylperfluorooctane sulfonamide (N-MeFOSA)	µg/L	0.01	<0.01
N-Ethylperfluorooctane sulfonamide (N-EtFOSA)	µg/L	0.01	<0.01
N-Methylperfluorooctanesulfonamidoacetic acid	µg/L	0.05	<0.05
N-Ethylperfluorooctanesulfonamidoacetic acid	µg/L	0.05	<0.05
2-(N-Ethylperfluorooctane sulfonamido)-ethanol	µg/L	0.05	<0.05
2-(N-Methylperfluorooctane sulfonamido)-ethanol	µg/L	0.05	<0.05
Sum of PFAS A	µg/L	0.01	0.12
Sum of PFAS B	µg/L	0.01	<0.01
Sum of PFAS C	µg/L	0.01	0.10
Sum of Positive PFAS	µg/L	0.01	0.22



ANALYTICAL RESULTS

SE291185 R0

Enterococci in Water [AN705] Tested: 17/10/2025

			MW3
			WATER
			-
			16/10/2025
			SE291185.003
PARAMETER	UOM	LOR	
Date & Time Processed*	No unit	-	2025-10-17 20:04
Intestinal Enterococci*	CFU/100mL	1	260
Notes*	No unit	-	-



ANALYTICAL RESULTS

SE291185 R0

E. coli, Total and Faecal (Thermotolerant) coliforms in Water (MPN) [AN735] Tested: 17/10/2025

			MW3
			WATER
			-
			16/10/2025
			SE291185.003
PARAMETER	UOM	LOR	
Date & Time Processed*	No unit	-	2025-10-17 19:18
E. coli	MPN/100mL	1	4
Faecal Coliforms	MPN/100mL	1	22

METHOD

METHODOLOGY SUMMARY

AN020	Unpreserved water sample is filtered through a 0.45µm membrane filter and acidified with nitric acid similar to APHA3030B.
AN077	Hydrogen cyanide is liberated from an acidified sample by distillation and purging with air. The hydrogen cyanide gas is then collected by passing it through a sodium hydroxide scrubbing solution. The scrubbing solution will then be analysed for cyanide by the appropriate method.
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.
AN113	Total Dissolved Solids: A well-mixed filtered sample of known volume is evaporated to dryness at 180°C and the residue weighed. Approximate methods for correlating chemical analysis with dissolved solids are available. Reference APHA 2540 C.
AN113	The Total Dissolved Solids residue may also be ignited at 550 C and volatile TDS (Organic TDS) and non-volatile TDS (Inorganic) can be determined.
AN114	Total Suspended and Volatile Suspended Solids: The sample is homogenised by shaking and a known volume is filtered through a pre-weighed GF/C filter paper and washed well with deionised water. The filter paper is dried and reweighed. The TSS is the residue retained by the filter per unit volume of sample. Reference APHA 2540 D. Internal Reference AN114
AN119	Turbidity by Nephelometry: Small particles in a light beam scatter light at a range of angles. A turbidimeter measures this scatter and reports results compared to turbidity standards, in NTU. This procedure is not suitable for very dark coloured liquids or samples with high solids because light absorption causes artificially low light scatter and low turbidity. Reference APHA 2130B.
AN121	This method is used to calculate the balance of major Anions and Cations in water samples and converts major ion concentration to milliequivalents and then summed. Anions sum and Cation sum is calculated as a difference and expressed as a percentage.
AN135	Alkalinity (and forms of) by Titration: The sample is titrated with standard acid to pH 8.3 (P titre) and pH 4.5 (T titre) and permanent and/or total alkalinity calculated. The results are expressed as equivalents of calcium carbonate or recalculated as bicarbonate, carbonate and hydroxide. Reference APHA 2320. Internal Reference AN135
AN176	Dissolved Oxygen: DO can also be measured directly using an oxygen permeable membrane electrode and meter. Under steady state conditions the current is directly proportional to the DO conc. DO can also be measured via Luminescent dissolved oxygen probes (LDO) which also operates using an oxygen permeable membrane with an oxygen sensitive luminescent dye making up the second probe layer. The presence of oxygen causes changes in the lifetime and intensity of luminescence, which are then quantified. Zero headspace is required for sample analysis, if headspace is observed report comment will be recorded. Reference APHA 4500-C, G & O.
AN190	TOC and DOC in Water: A homogenised micro portion of sample is injected into a heated reaction chamber packed with an oxidative catalyst that converts organic carbon to carbon dioxide. The CO ₂ is measured using a non-dispersive infrared detector. The process is fully automated in a commercially available analyser. If required a sugar value can be calculated from the TOC result. Reference APHA 5310 B.
AN190	Chemical oxygen demand can be calculated/estimated based on the O ₂ /C relation as 2.67*NPOC (TOC). This is an estimate only and the factor will vary with sample matrix so results should be interpreted with caution.
AN240	Oxidation-Reduction Potential (Eh): Electrometric measurements are made by potentiometric determination of electron activity (or intensity) with an inert indicator electrode and a suitable reference electrode. At redox equilibrium, the potential difference between the two electrodes equals the redox potential of the system. This measurement is then corrected for the difference between the potential of the reference electrode and that of the standard hydrogen electrode.

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, NO ₂ , NO ₃ and SO ₄ 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
AN277	Nitrite ions, when reacted with a reagent containing sulphanilamide and N-(1-naphthyl)-ethylenediamine dihydrochloride produce a highly coloured azo dye that is measured photometrically at 540nm.
AN278	Filterable Reactive Phosphorus by DA (determined on filtered sample): Orthophosphate reacts with ammonium molybdate (Mo VI) and potassium antimonyl tartrate (Sb III) in acid medium to form an antimony-phosphomolybdate complex. This complex is subsequently reduced with ascorbic acid to form a blue colour and the absorbance is read at 880 nm. The sensitivity of the automated method is 10-20 times that of the macro method. Reference APHA 4500-P F
AN279/AN293(Sydney)	The sample is digested with Sulphuric acid, K ₂ SO ₄ and CuSO ₄ . All forms of phosphorus are converted into orthophosphate. The digest is cooled and placed on the discrete analyser for colorimetric analysis.
AN281	An unfiltered water or soil sample is first digested in a block digester with sulfuric acid, K ₂ SO ₄ and CuSO ₄ . The ammonia produced following digestion is then measured colourimetrically using the Discrete Analyser. A portion of the digested sample is buffered to an alkaline pH, and interfering cations are complexed. The ammonia then reacts with salicylate and hypochlorite to give a blue colour whose absorbance is measured at 660nm and compared with calibration standards. This is proportional to the concentration of Total Kjeldahl Nitrogen in the original sample.
AN287	A buffered distillate or water sample is treated with chloramine/barbituric acid reagents and the intensity of the colour developed is proportional to the cyanide concentration by DA.
AN291	Ammonia in solution reacts with hypochlorite ions from Sodium Dichloroisocyanate, and salicylate in the presence of Sodium Nitroprusside to form indophenol blue and measured at 660 nm by Discrete Analyser.
AN295	The water sample or extract of sample is distilled in a phosphoric acid stream. Phenolic compounds in the distillate react with a reagent stream of potassium hexacyanoferrate(III) and 4-Amino-2,3-dimethyl-3-pyrazolin-5-one in an alkaline medium to form a coloured complex which is analysed spectrophotometrically onboard a continuous flow analyser.
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).
AN320	Metals by ICP-OES: Samples are preserved with 10% nitric acid for a wide range of metals and some non-metals. This solution is measured by Inductively Coupled Plasma. Solutions are aspirated into an argon plasma at 8000-10000K and emit characteristic energy or light as a result of electron transitions through unique energy levels. The emitted light is focused onto a diffraction grating where it is separated into components .
AN320	Photomultipliers or CCDs are used to measure the light intensity at specific wavelengths. This intensity is directly proportional to concentration. Corrections are required to compensate for spectral overlap between elements . Reference APHA 3120 B.
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). Where F2 is corrected for Naphthalene, the VOC data for Naphthalene is used.
AN403	Additionally, the volatile C6-C9/C6-C10 fractions may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Recoverable Hydrocarbons - Silica (TRH-Silica) 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.

AN404	This method covers the analysis of per- and polyfluoroalkyl substances (PFAS) in aqueous, solid and biosolid samples and solvent extracts. After spiking with isotopically labelled quantification surrogates and sample extracts are analysed by liquid chromatography/mass spectrometry (LC-MS/MS). PFAS concentrations are determined by isotope dilution quantification. PFOS and PFHXS are determined as the total of linear and branched isomers.
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.
AN703	A known volume of water is passed through a membrane of known pore size. The membrane is placed on a selective agar plate and incubated. The volume of sample filtered depends upon the expected count. Referenced to AS4276.5.
AN705	A known volume of water is passed through a membrane of known pore size. The membrane is placed on a selective agar plate and incubated. The volume of sample filtered depends upon the expected count. Referenced to AS/NZS4276.9 (ISO 7899-2:2000 MOD).
AN735	The Colilert matrix contains two nutrient indicators, ONPG (ortho-nitro-phenyl B-d- galactopyranoside) and MUG (4-methyl-umbelliferyl B-d-glucuronide). As coliforms grow, they use B-galactosidase to metabolise ONPG which causes yellow colouration of the matrix via the nitro-phenyl. E.coli possesses an additional enzyme, B-glucuronidase, which it uses to metabolise MUG and display florescence (caused by the 4 methyl-umbelliferyl). Incubation at 37°C.
AN735	Non target organisms are suppressed by a combination of high salts, detergents etc. present within the matrix . Faecal coliforms are thermotolerant, thus they can be enumerated by testing at 44.5°C.
Calculation	Free and Total Carbon Dioxide may be calculated using alkalinity forms only when the samples TDS is <500mg/L. If TDS is >500mg/L free or total carbon dioxide cannot be reported . APHA4500CO2 D.

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.
NAD	No Asbestos Detected.	LNR	Sample listed, but not received.		
		NA	Not Applicable.		

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:

- 1 Bq is equivalent to 27 pCi
- 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: <https://www.sgs.com/en-au/industry/environmental-health-and-safety>.

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STATEMENT OF QA/QC PERFORMANCE

SE291185 R0

CLIENT DETAILS

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Order Number **E26863**
Samples 7

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SGS Reference **SE291185 R0**
Date Received 16 Oct 2025
Date Reported 23 Oct 2025

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:

Analysis Date

Nitrite in Water

1 item

SAMPLE SUMMARY

Type of documentation received	COC	Date documentation received	16/10/2025
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	14.0°C	Sample container provider	SGS
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

Alkalinity

Method: ME-(AU)-[ENV]AN135

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW3	SE291185.003	LB365277	16 Oct 2025	16 Oct 2025	30 Oct 2025	17 Oct 2025	30 Oct 2025	20 Oct 2025

Ammonia Nitrogen by Discrete Analyser

Method: ME-(AU)-[ENV]AN291

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW3	SE291185.003	LB365246	16 Oct 2025	16 Oct 2025	13 Nov 2025	17 Oct 2025	13 Nov 2025	17 Oct 2025

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
MW3	SE291185.003	LB365505	16 Oct 2025	16 Oct 2025	13 Nov 2025	21 Oct 2025	13 Nov 2025	22 Oct 2025

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
MW1	SE291185.001	LB365120	16 Oct 2025	16 Oct 2025	13 Nov 2025	16 Oct 2025	13 Nov 2025	16 Oct 2025
MW2	SE291185.002	LB365120	16 Oct 2025	16 Oct 2025	13 Nov 2025	16 Oct 2025	13 Nov 2025	16 Oct 2025
MW3	SE291185.003	LB365120	16 Oct 2025	16 Oct 2025	13 Nov 2025	16 Oct 2025	13 Nov 2025	16 Oct 2025

Dissolved Oxygen by Membrane Electrode

Method: ME-(AU)-[ENV]AN176

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW3	SE291185.003	LB365123	16 Oct 2025	16 Oct 2025	17 Oct 2025	16 Oct 2025	17 Oct 2025	16 Oct 2025

E. coli, Total and Faecal (Thermotolerant) coliforms in Water (MPN)

Method: ME-(AU)-[ENV]AN735

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW3	SE291185.003	LB365269	16 Oct 2025	16 Oct 2025	17 Oct 2025	17 Oct 2025	20 Oct 2025	17 Oct 2025

Enterococci in Water

Method: ME-(AU)-[ENV]AN705

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW3	SE291185.003	LB365269	16 Oct 2025	16 Oct 2025	17 Oct 2025	17 Oct 2025	20 Oct 2025	17 Oct 2025

Filterable Reactive Phosphorus (FRP)

Method: ME-(AU)-[ENV]AN278

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW3	SE291185.003	LB365246	16 Oct 2025	16 Oct 2025	13 Nov 2025	17 Oct 2025	13 Nov 2025	17 Oct 2025

Forms of Carbon

Method: ME-(AU)-[ENV]AN190

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW3	SE291185.003	LB365203	16 Oct 2025	16 Oct 2025	23 Oct 2025	20 Oct 2025	23 Oct 2025	20 Oct 2025

Full 8270 SVOC in Water

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	SE291185.001	LB365142	16 Oct 2025	16 Oct 2025	23 Oct 2025	17 Oct 2025	26 Nov 2025	23 Oct 2025
MW2	SE291185.002	LB365142	16 Oct 2025	16 Oct 2025	23 Oct 2025	17 Oct 2025	26 Nov 2025	23 Oct 2025
MW3	SE291185.003	LB365142	16 Oct 2025	16 Oct 2025	23 Oct 2025	17 Oct 2025	26 Nov 2025	23 Oct 2025
WQD1	SE291185.004	LB365142	16 Oct 2025	16 Oct 2025	23 Oct 2025	17 Oct 2025	26 Nov 2025	23 Oct 2025
QR1	SE291185.005	LB365142	16 Oct 2025	16 Oct 2025	23 Oct 2025	17 Oct 2025	26 Nov 2025	23 Oct 2025

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
MW1	SE291185.001	LB365712	16 Oct 2025	16 Oct 2025	13 Nov 2025	22 Oct 2025	13 Nov 2025	23 Oct 2025
MW2	SE291185.002	LB365712	16 Oct 2025	16 Oct 2025	13 Nov 2025	22 Oct 2025	13 Nov 2025	23 Oct 2025
MW3	SE291185.003	LB365712	16 Oct 2025	16 Oct 2025	13 Nov 2025	22 Oct 2025	13 Nov 2025	23 Oct 2025
WQD1	SE291185.004	LB365712	16 Oct 2025	16 Oct 2025	13 Nov 2025	22 Oct 2025	13 Nov 2025	23 Oct 2025
QR1	SE291185.005	LB365712	16 Oct 2025	16 Oct 2025	13 Nov 2025	22 Oct 2025	13 Nov 2025	23 Oct 2025

Metals in Water (Dissolved) by ICPOES

Method: ME-(AU)-[ENV]AN320

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	SE291185.001	LB365313	16 Oct 2025	16 Oct 2025	14 Apr 2026	20 Oct 2025	14 Apr 2026	21 Oct 2025
MW2	SE291185.002	LB365313	16 Oct 2025	16 Oct 2025	14 Apr 2026	20 Oct 2025	14 Apr 2026	21 Oct 2025
MW3	SE291185.003	LB365313	16 Oct 2025	16 Oct 2025	14 Apr 2026	20 Oct 2025	14 Apr 2026	21 Oct 2025

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

Nitrite in Water

Method: ME-(AU)-ENVJAN277

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW3	SE291185.003	LB365246	16 Oct 2025	16 Oct 2025	20 Oct 2025	17 Oct 2025	20 Oct 2025	23 Oct 2025†

OC Pesticides in Water

Method: ME-(AU)-ENVJAN270

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	SE291185.001	LB365142	16 Oct 2025	16 Oct 2025	23 Oct 2025	17 Oct 2025	26 Nov 2025	22 Oct 2025
MW2	SE291185.002	LB365142	16 Oct 2025	16 Oct 2025	23 Oct 2025	17 Oct 2025	26 Nov 2025	22 Oct 2025
MW3	SE291185.003	LB365142	16 Oct 2025	16 Oct 2025	23 Oct 2025	17 Oct 2025	26 Nov 2025	22 Oct 2025
WQD1	SE291185.004	LB365142	16 Oct 2025	16 Oct 2025	23 Oct 2025	17 Oct 2025	26 Nov 2025	22 Oct 2025
QR1	SE291185.005	LB365142	16 Oct 2025	16 Oct 2025	23 Oct 2025	17 Oct 2025	26 Nov 2025	22 Oct 2025

OP Pesticides in Water

Method: ME-(AU)-ENVJAN270

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	SE291185.001	LB365142	16 Oct 2025	16 Oct 2025	23 Oct 2025	17 Oct 2025	26 Nov 2025	23 Oct 2025
MW2	SE291185.002	LB365142	16 Oct 2025	16 Oct 2025	23 Oct 2025	17 Oct 2025	26 Nov 2025	23 Oct 2025
MW3	SE291185.003	LB365142	16 Oct 2025	16 Oct 2025	23 Oct 2025	17 Oct 2025	26 Nov 2025	21 Oct 2025
WQD1	SE291185.004	LB365142	16 Oct 2025	16 Oct 2025	23 Oct 2025	17 Oct 2025	26 Nov 2025	23 Oct 2025
QR1	SE291185.005	LB365142	16 Oct 2025	16 Oct 2025	23 Oct 2025	17 Oct 2025	26 Nov 2025	23 Oct 2025

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-ENVJAN270

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	SE291185.001	LB365142	16 Oct 2025	16 Oct 2025	23 Oct 2025	17 Oct 2025	26 Nov 2025	21 Oct 2025
MW2	SE291185.002	LB365142	16 Oct 2025	16 Oct 2025	23 Oct 2025	17 Oct 2025	26 Nov 2025	21 Oct 2025
MW3	SE291185.003	LB365142	16 Oct 2025	16 Oct 2025	23 Oct 2025	17 Oct 2025	26 Nov 2025	21 Oct 2025
WQD1	SE291185.004	LB365142	16 Oct 2025	16 Oct 2025	23 Oct 2025	17 Oct 2025	26 Nov 2025	23 Oct 2025
QR1	SE291185.005	LB365142	16 Oct 2025	16 Oct 2025	23 Oct 2025	17 Oct 2025	26 Nov 2025	23 Oct 2025

PCBs in Water

Method: ME-(AU)-ENVJAN270

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	SE291185.001	LB365142	16 Oct 2025	16 Oct 2025	23 Oct 2025	17 Oct 2025	26 Nov 2025	22 Oct 2025
MW2	SE291185.002	LB365142	16 Oct 2025	16 Oct 2025	23 Oct 2025	17 Oct 2025	26 Nov 2025	22 Oct 2025
MW3	SE291185.003	LB365142	16 Oct 2025	16 Oct 2025	23 Oct 2025	17 Oct 2025	26 Nov 2025	22 Oct 2025
WQD1	SE291185.004	LB365142	16 Oct 2025	16 Oct 2025	23 Oct 2025	17 Oct 2025	26 Nov 2025	22 Oct 2025
QR1	SE291185.005	LB365142	16 Oct 2025	16 Oct 2025	23 Oct 2025	17 Oct 2025	26 Nov 2025	22 Oct 2025

Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous Samples

Method: ME-(AU)-ENVJAN404

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW3	SE291185.003	LB365358	16 Oct 2025	16 Oct 2025	13 Nov 2025	20 Oct 2025	17 Nov 2025	22 Oct 2025

pH in water

Method: ME-(AU)-ENVJAN101

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	SE291185.001	LB365120	16 Oct 2025	16 Oct 2025	17 Oct 2025	16 Oct 2025	17 Oct 2025	16 Oct 2025
MW2	SE291185.002	LB365120	16 Oct 2025	16 Oct 2025	17 Oct 2025	16 Oct 2025	17 Oct 2025	16 Oct 2025
MW3	SE291185.003	LB365120	16 Oct 2025	16 Oct 2025	17 Oct 2025	16 Oct 2025	17 Oct 2025	16 Oct 2025

Redox Potential (Eh) in water

Method: ME-(AU)-ENVJAN240

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW3	SE291185.003	LB365121	16 Oct 2025	16 Oct 2025	17 Oct 2025	16 Oct 2025	17 Oct 2025	16 Oct 2025

TKN Kjeldahl Digestion by Discrete Analyser

Method: ME-(AU)-ENVJAN281/292

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW3	SE291185.003	LB365355	16 Oct 2025	16 Oct 2025	13 Nov 2025	20 Oct 2025	13 Nov 2025	23 Oct 2025

Total and Volatile Suspended Solids (TSS / VSS)

Method: ME-(AU)-ENVJAN114

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW3	SE291185.003	LB365292	16 Oct 2025	16 Oct 2025	23 Oct 2025	17 Oct 2025	24 Oct 2025	20 Oct 2025

Total Cyanide in water by Discrete Analyser

Method: ME-(AU)-ENVJAN077/AN287

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW3	SE291185.003	LB365400	16 Oct 2025	16 Oct 2025	30 Oct 2025	20 Oct 2025	30 Oct 2025	20 Oct 2025



HOLDING TIME SUMMARY

SE291185 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

Total Dissolved Solids (TDS) in water

Method: ME-(AU)-ENVJAN113

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	SE291185.001	LB365417	16 Oct 2025	16 Oct 2025	23 Oct 2025	20 Oct 2025	23 Oct 2025	21 Oct 2025
MW2	SE291185.002	LB365417	16 Oct 2025	16 Oct 2025	23 Oct 2025	20 Oct 2025	23 Oct 2025	21 Oct 2025
MW3	SE291185.003	LB365417	16 Oct 2025	16 Oct 2025	23 Oct 2025	20 Oct 2025	23 Oct 2025	21 Oct 2025

Total Phenolics in Water

Method: ME-(AU)-ENVJAN295

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	SE291185.001	LB365506	16 Oct 2025	16 Oct 2025	30 Oct 2025	21 Oct 2025	30 Oct 2025	21 Oct 2025
MW2	SE291185.002	LB365506	16 Oct 2025	16 Oct 2025	30 Oct 2025	21 Oct 2025	30 Oct 2025	21 Oct 2025
MW3	SE291185.003	LB365506	16 Oct 2025	16 Oct 2025	30 Oct 2025	21 Oct 2025	30 Oct 2025	21 Oct 2025

Total Phosphorus by Kjeldahl Digestion DA in Water

Method: ME-(AU)-ENVJAN279/AN293

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW3	SE291185.003	LB365355	16 Oct 2025	16 Oct 2025	13 Nov 2025	20 Oct 2025	13 Nov 2025	20 Oct 2025

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-ENVJAN318

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	SE291185.001	LB365316	16 Oct 2025	16 Oct 2025	14 Apr 2026	20 Oct 2025	14 Apr 2026	20 Oct 2025
MW2	SE291185.002	LB365316	16 Oct 2025	16 Oct 2025	14 Apr 2026	20 Oct 2025	14 Apr 2026	20 Oct 2025
MW3	SE291185.003	LB365316	16 Oct 2025	16 Oct 2025	14 Apr 2026	20 Oct 2025	14 Apr 2026	20 Oct 2025
WQD1	SE291185.004	LB365316	16 Oct 2025	16 Oct 2025	14 Apr 2026	20 Oct 2025	14 Apr 2026	20 Oct 2025
QR1	SE291185.005	LB365316	16 Oct 2025	16 Oct 2025	14 Apr 2026	20 Oct 2025	14 Apr 2026	20 Oct 2025

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-ENVJAN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	SE291185.001	LB365142	16 Oct 2025	16 Oct 2025	23 Oct 2025	17 Oct 2025	26 Nov 2025	21 Oct 2025
MW2	SE291185.002	LB365142	16 Oct 2025	16 Oct 2025	23 Oct 2025	17 Oct 2025	26 Nov 2025	21 Oct 2025
MW3	SE291185.003	LB365142	16 Oct 2025	16 Oct 2025	23 Oct 2025	17 Oct 2025	26 Nov 2025	21 Oct 2025
WQD1	SE291185.004	LB365142	16 Oct 2025	16 Oct 2025	23 Oct 2025	17 Oct 2025	26 Nov 2025	21 Oct 2025
QR1	SE291185.005	LB365142	16 Oct 2025	16 Oct 2025	23 Oct 2025	17 Oct 2025	26 Nov 2025	21 Oct 2025

Turbidity

Method: ME-(AU)-ENVJAN119

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	SE291185.001	LB365116	16 Oct 2025	16 Oct 2025	17 Oct 2025	16 Oct 2025	17 Oct 2025	16 Oct 2025
MW2	SE291185.002	LB365116	16 Oct 2025	16 Oct 2025	17 Oct 2025	16 Oct 2025	17 Oct 2025	16 Oct 2025
MW3	SE291185.003	LB365116	16 Oct 2025	16 Oct 2025	17 Oct 2025	16 Oct 2025	17 Oct 2025	16 Oct 2025

VOCs in Water

Method: ME-(AU)-ENVJAN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	SE291185.001	LB365155	16 Oct 2025	16 Oct 2025	30 Oct 2025	17 Oct 2025	30 Oct 2025	21 Oct 2025
MW2	SE291185.002	LB365155	16 Oct 2025	16 Oct 2025	30 Oct 2025	17 Oct 2025	30 Oct 2025	21 Oct 2025
MW3	SE291185.003	LB365155	16 Oct 2025	16 Oct 2025	30 Oct 2025	17 Oct 2025	30 Oct 2025	21 Oct 2025
WQD1	SE291185.004	LB365155	16 Oct 2025	16 Oct 2025	30 Oct 2025	17 Oct 2025	30 Oct 2025	21 Oct 2025
QR1	SE291185.005	LB365155	16 Oct 2025	16 Oct 2025	30 Oct 2025	17 Oct 2025	30 Oct 2025	21 Oct 2025
WTS	SE291185.006	LB365155	16 Oct 2025	16 Oct 2025	30 Oct 2025	17 Oct 2025	30 Oct 2025	21 Oct 2025
WTB	SE291185.007	LB365155	16 Oct 2025	16 Oct 2025	30 Oct 2025	17 Oct 2025	30 Oct 2025	21 Oct 2025

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-ENVJAN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	SE291185.001	LB365155	16 Oct 2025	16 Oct 2025	30 Oct 2025	17 Oct 2025	30 Oct 2025	21 Oct 2025
MW2	SE291185.002	LB365155	16 Oct 2025	16 Oct 2025	30 Oct 2025	17 Oct 2025	30 Oct 2025	21 Oct 2025
MW3	SE291185.003	LB365155	16 Oct 2025	16 Oct 2025	30 Oct 2025	17 Oct 2025	30 Oct 2025	21 Oct 2025
WQD1	SE291185.004	LB365155	16 Oct 2025	16 Oct 2025	30 Oct 2025	17 Oct 2025	30 Oct 2025	21 Oct 2025
QR1	SE291185.005	LB365155	16 Oct 2025	16 Oct 2025	30 Oct 2025	17 Oct 2025	30 Oct 2025	21 Oct 2025
WTS	SE291185.006	LB365155	16 Oct 2025	16 Oct 2025	30 Oct 2025	17 Oct 2025	30 Oct 2025	21 Oct 2025
WTB	SE291185.007	LB365155	16 Oct 2025	16 Oct 2025	30 Oct 2025	17 Oct 2025	30 Oct 2025	21 Oct 2025

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 identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Full 8270 SVOC in Water

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2,4,6-Tribromophenol (Surrogate)	MW3	SE291185.003	%	40 - 130%	88
2-fluorobiphenyl (Surrogate)	MW3	SE291185.003	%	40 - 130%	90
d14-p-terphenyl (Surrogate)	MW3	SE291185.003	%	40 - 130%	90
d5-nitrobenzene (Surrogate)	MW3	SE291185.003	%	40 - 130%	80
d5-phenol (Surrogate)	MW3	SE291185.003	%	20 - 130%	81

OC Pesticides in Water

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	MW3	SE291185.003	%	40 - 130%	75

OP Pesticides in Water

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	MW3	SE291185.003	%	40 - 130%	73
d14-p-terphenyl (Surrogate)	MW3	SE291185.003	%	40 - 130%	77

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	MW1	SE291185.001	%	40 - 130%	61
	MW2	SE291185.002	%	40 - 130%	66
	MW3	SE291185.003	%	40 - 130%	73
d14-p-terphenyl (Surrogate)	MW1	SE291185.001	%	40 - 130%	72
	MW2	SE291185.002	%	40 - 130%	83
	MW3	SE291185.003	%	40 - 130%	77
d5-nitrobenzene (Surrogate)	MW1	SE291185.001	%	40 - 130%	63
	MW2	SE291185.002	%	40 - 130%	69
	MW3	SE291185.003	%	40 - 130%	77

PCBs in Water

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
TCMX (Surrogate)	MW3	SE291185.003	%	40 - 130%	75

Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous Samples

Method: ME-(AU)-[ENV]AN404

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
(13C2_PFTeDA) Isotopically Labelled Internal Recovery Standard	MW3	SE291185.003	%	10 - 150%	74
(13C2-4:2 FTS) Isotopically Labelled Internal Recovery Standard	MW3	SE291185.003	%	40 - 300%	106
(13C2-6:2 FTS) Isotopically Labelled Internal Recovery Standard	MW3	SE291185.003	%	40 - 300%	102
(13C2-8:2 FTS) Isotopically Labelled Internal Recovery Standard	MW3	SE291185.003	%	40 - 300%	140
(13C2-PFDoA) Isotopically Labelled Internal Recovery Standard	MW3	SE291185.003	%	10 - 150%	65
(13C3-PFBS) Isotopically Labelled Internal Recovery Standard	MW3	SE291185.003	%	40 - 150%	119
(13C3-PFHxS) Isotopically Labelled Internal Recovery Standard	MW3	SE291185.003	%	40 - 150%	114
(13C4_PFOA) Isotopically Labelled Internal Recovery Standard	MW3	SE291185.003	%	40 - 150%	149
(13C4-PFBA) Isotopically Labelled Internal Recovery Standard	MW3	SE291185.003	%	5 - 150%	105
(13C4-PFHpA) Isotopically Labelled Internal Recovery Standard	MW3	SE291185.003	%	40 - 150%	108
(13C5-PFHxA) Isotopically Labelled Internal Recovery Standard	MW3	SE291185.003	%	40 - 150%	111
(13C5-PFPeA) Isotopically Labelled Internal Recovery Standard	MW3	SE291185.003	%	35 - 150%	103
(13C6-PFDA) Isotopically Labelled Internal Recovery Standard	MW3	SE291185.003	%	40 - 150%	124
(13C7-PFUDa) Isotopically Labelled Internal Recovery Standard	MW3	SE291185.003	%	30 - 150%	131
(13C8-PFOS) Isotopically Labelled Internal Recovery Standard	MW3	SE291185.003	%	40 - 150%	62
(13C8-PFOSA) Isotopically Labelled Internal Recovery Standard	MW3	SE291185.003	%	20 - 150%	104
(13C9-PFNA) Isotopically Labelled Internal Recovery Standard	MW3	SE291185.003	%	40 - 150%	123
(D3-N-MeFOSA) Isotopically Labelled Internal Recovery Standard	MW3	SE291185.003	%	10 - 150%	48
(D3-N-MeFOSAA) Isotopically Labelled Internal Recovery Standard	MW3	SE291185.003	%	30 - 170%	89
(D5-N-EiFOSA) Isotopically Labelled Internal Recovery Standard	MW3	SE291185.003	%	10 - 150%	52
(D5-N-EiFOSAA) Isotopically Labelled Internal Recovery Standard	MW3	SE291185.003	%	20 - 150%	66
(D7-N-MeFOSE) Isotopically Labelled Internal Recovery Standard	MW3	SE291185.003	%	10 - 150%	49
(D9-N-EiFOSE) Isotopically Labelled Internal Recovery Standard	MW3	SE291185.003	%	10 - 150%	51

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units
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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 identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOCs in Water (continued)

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	MW1	SE291185.001	%	40 - 130%	103
	MW2	SE291185.002	%	40 - 130%	103
	MW3	SE291185.003	%	40 - 130%	105
	WQD1	SE291185.004	%	40 - 130%	101
	QR1	SE291185.005	%	40 - 130%	102
	WTS	SE291185.006	%	40 - 130%	99
	WTB	SE291185.007	%	40 - 130%	101
d4-1,2-dichloroethane (Surrogate)	MW1	SE291185.001	%	40 - 130%	90
	MW2	SE291185.002	%	40 - 130%	90
	MW3	SE291185.003	%	40 - 130%	90
	WQD1	SE291185.004	%	40 - 130%	92
	QR1	SE291185.005	%	40 - 130%	88
	WTS	SE291185.006	%	40 - 130%	103
	WTB	SE291185.007	%	40 - 130%	87
d8-toluene (Surrogate)	MW1	SE291185.001	%	40 - 130%	89
	MW2	SE291185.002	%	40 - 130%	89
	MW3	SE291185.003	%	40 - 130%	89
	WQD1	SE291185.004	%	40 - 130%	89
	QR1	SE291185.005	%	40 - 130%	89
	WTS	SE291185.006	%	40 - 130%	102
	WTB	SE291185.007	%	40 - 130%	89

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	MW1	SE291185.001	%	40 - 130%	103
	MW2	SE291185.002	%	40 - 130%	103
	MW3	SE291185.003	%	40 - 130%	105
	WQD1	SE291185.004	%	40 - 130%	101
	QR1	SE291185.005	%	40 - 130%	102
d4-1,2-dichloroethane (Surrogate)	MW1	SE291185.001	%	60 - 130%	90
	MW2	SE291185.002	%	60 - 130%	90
	MW3	SE291185.003	%	60 - 130%	90
	WQD1	SE291185.004	%	60 - 130%	92
	QR1	SE291185.005	%	60 - 130%	88
d8-toluene (Surrogate)	MW1	SE291185.001	%	40 - 130%	89
	MW2	SE291185.002	%	40 - 130%	89
	MW3	SE291185.003	%	40 - 130%	89
	WQD1	SE291185.004	%	40 - 130%	89
	QR1	SE291185.005	%	40 - 130%	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.

Alkalinity

Method: ME-(AU)-[ENV]AN135

Sample Number	Parameter	Units	LOR	Result
LB365277.001	Bicarbonate Alkalinity as CaCO ₃	mg/L	5	<5
	Carbonate Alkalinity as CaCO ₃	mg/L	5	<5
	Total Alkalinity as CaCO ₃	mg/L	5	<5

Ammonia Nitrogen by Discrete Analyser

Method: ME-(AU)-[ENV]AN291

Sample Number	Parameter	Units	LOR	Result
LB365246.001	Ammonia Nitrogen, NH ₃ as N	mg/L	0.01	<0.01

Anions by Ion Chromatography in Water

Method: ME-(AU)-[ENV]AN245

Sample Number	Parameter	Units	LOR	Result
LB365505.001	Fluoride	mg/L	0.1	<0.10
	Chloride	mg/L	0.05	<0.05
	Bromide	mg/L	0.05	<0.05
	Nitrate Nitrogen, NO ₃ -N	mg/L	0.005	<0.005
	Sulfate, SO ₄	mg/L	1	<1.0

Conductivity and TDS by Calculation - Water

Method: ME-(AU)-[ENV]AN106

Sample Number	Parameter	Units	LOR	Result
LB365120.001	Conductivity @ 25 C	µS/cm	2	<2

Dissolved Oxygen by Membrane Electrode

Method: ME-(AU)-[ENV]AN176

Sample Number	Parameter	Units	LOR	Result
LB365123.001	Dissolved Oxygen**	mg/L	0.5	<0.5

Filterable Reactive Phosphorus (FRP)

Method: ME-(AU)-[ENV]AN278

Sample Number	Parameter	Units	LOR	Result
LB365246.001	Filterable Reactive Phosphorus as P	mg/L	0.005	<0.005

Forms of Carbon

Method: ME-(AU)-[ENV]AN190

Sample Number	Parameter	Units	LOR	Result
LB365203.001	Total Organic Carbon as NPOC	mg/L	0.2	<0.2

Full 8270 SVOC in Water

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB365142.001	01-PAHs	Acenaphthene	µg/L	0.1	<0.1
		Acenaphthylene	µg/L	0.1	<0.1
		Anthracene	µg/L	0.1	<0.1
		Benzo(a)anthracene	µg/L	0.1	<0.1
		Benzo(b&j&k)fluoranthene	µg/L	0.2	<0.2
		Benzo(a)pyrene	µg/L	0.1	<0.1
		Chrysene	µg/L	0.1	<0.1
		Dibenzo(ah)anthracene	µg/L	0.1	<0.1
		Fluoranthene	µg/L	0.1	<0.1
		Fluorene	µg/L	0.1	<0.1
		1-methylnaphthalene	µg/L	0.1	<0.1
		2-methylnaphthalene	µg/L	0.1	<0.1
		Naphthalene	µg/L	0.1	<0.1
		Phenanthrene	µg/L	0.1	<0.1
		Pyrene	µg/L	0.1	<0.1
		2-acetylaminofluorene	µg/L	0.5	<0.5
		7,12-dimethyl-benz(a)anthracene	µg/L	0.5	<0.5
		3-methylcholanthrene	µg/L	0.5	<0.5
	02-OCs	Aldrin	µg/L	0.1	<0.1
		Alpha-BHC	µg/L	0.1	<0.1

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Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Full 8270 SVOC in Water (continued)

Method: ME-(AU)-ENVJAN420

Sample Number		Parameter	Units	LOR	Result	
LB365142.001	02-OCs	Beta-BHC	µg/L	0.1	<0.1	
		Delta-BHC	µg/L	0.1	<0.1	
		Gamma-BHC (Lindane)	µg/L	0.1	<0.1	
		p,p-DDD	µg/L	0.1	<0.1	
		p,p-DDE	µg/L	0.1	<0.1	
		p,p-DDT	µg/L	0.1	<0.1	
		Dieldrin	µg/L	0.1	<0.1	
		Alpha-endosulfan	µg/L	0.1	<0.1	
		Beta-endosulfan	µg/L	0.1	<0.1	
		Endosulfan sulphate	µg/L	0.1	<0.1	
		Endrin	µg/L	0.1	<0.1	
		Heptachlor	µg/L	0.1	<0.1	
		Heptachlor epoxide	µg/L	0.1	<0.1	
		Methoxychlor	µg/L	0.1	<0.1	
		Mirex	µg/L	0.1	<0.1	
		Alpha-chlordane	µg/L	0.1	<0.1	
		Gamma-chlordane	µg/L	0.1	<0.1	
		Endrin ketone	µg/L	0.1	<0.1	
		03-OPs	Azinphos-methyl (Guthion)	µg/L	0.2	<0.2
			Bromophos ethyl	µg/L	0.2	<0.2
			Carbophenothion	µg/L	0.5	<0.5
	Chlorfenvinphos-cis		µg/L	5	<5	
	Chlorfenvinphos-trans		µg/L	0.5	<0.5	
	Chlorpyrifos (Chlorpyrifos Ethyl)		µg/L	0.2	<0.2	
	Chlorpyrifos-methyl		µg/L	0.5	<0.5	
	Co-Ral (Coumaphos)		µg/L	0.5	<0.5	
	Diazinon (Dimpylate)		µg/L	0.5	<0.5	
	Dichlorvos		µg/L	0.5	<0.5	
	Demeton-S-methyl		µg/L	0.5	<0.5	
	Dimethoate		µg/L	0.5	<0.5	
	Disulfoton (Di-syston)		µg/L	0.5	<0.5	
	EPN*		µg/L	0.5	<0.5	
	Ethion		µg/L	0.2	<0.2	
	Ethoprophos (ethoprop or prophos)		µg/L	0.5	<0.5	
	Famphur (Famophos)		µg/L	0.5	<0.5	
	Fenamiphos (Phenamiphos)		µg/L	0.5	<0.5	
	Fenchlorophos (RonneI)		µg/L	0.5	<0.5	
	Fenitrothion		µg/L	0.2	<0.2	
	Fenthion		µg/L	0.5	<0.5	
	Malathion (Maldison)		µg/L	0.2	<0.2	
	Methidathion		µg/L	0.5	<0.5	
	Mevinphos-cis/trans		µg/L	1	<1	
	o,o,o-triethyl phosphorothioate		µg/L	0.5	<0.5	
	Parathion ethyl (Parathion)		µg/L	0.2	<0.2	
	Parathion methyl		µg/L	0.5	<0.5	
	Phorate		µg/L	0.5	<0.5	
	Pirimiphos-ethyl		µg/L	0.5	<0.5	
	Pirimiphos-methyl		µg/L	0.5	<0.5	
	Profenofos	µg/L	0.5	<0.5		
	Prothiophos (Tokuthion)*	µg/L	0.5	<0.5		
	Sulfotepp	µg/L	0.5	<0.5		
04-PCB UPAC(7) Congeners	PCB Congener C28	µg/L	0.1	<0.1		
	PCB Congener C52	µg/L	0.1	<0.1		
	PCB Congener C101	µg/L	0.1	<0.1		
	PCB Congener C118	µg/L	0.1	<0.1		
	PCB Congener C138	µg/L	0.1	<0.1		
	PCB Congener C153	µg/L	0.1	<0.1		
	PCB Congener C180	µg/L	0.1	<0.1		
05-SVCH (Cl Benzenes, Hydrocarbons & VOCs)	Hexachlorobenzene (HCB)	µg/L	0.1	<0.1		
	1,2-dichlorobenzene	µg/L	0.5	<0.5		
	1,3-dichlorobenzene	µg/L	0.5	<0.5		

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.

Full 8270 SVOC in Water (continued)

Method: ME-(AU)-ENVJAN420

Sample Number		Parameter	Units	LOR	Result	
LB365142.001	05-SVCH (CI Benzenes, Hydrocarbons & VOCs)	1,4-dichlorobenzene	µg/L	0.5	<0.5	
		Hexachlorobutadiene	µg/L	0.5	<0.5	
		Hexachlorocyclopentadiene	µg/L	2	<2	
		Hexachloroethane	µg/L	0.5	<0.5	
		Hexachloropropene	µg/L	0.5	<0.5	
		Pentachlorobenzene	µg/L	0.5	<0.5	
		Pentachloroethane	µg/L	0.5	<0.5	
		1,2,3,5 and 1,2,4,5 -tetrachlorobenzene	µg/L	1	<1	
		1,2,3,4-tetrachlorobenzene	µg/L	0.5	<0.5	
		1/2-Chloronaphthalene	µg/L	1	<1	
		1,2,4-trichlorobenzene	µg/L	0.5	<0.5	
		06-Phthalates	Bis(2-ethylhexyl)phthalate	µg/L	10	<10
			Bis(2-ethylhexyl)adipate	µg/L	1	<1
	Butyl benzyl phthalate		µg/L	1	<1	
	Di-n-butyl phthalate		µg/L	10	<10	
	Diethyl phthalate		µg/L	5	<5	
	Dimethyl phthalate		µg/L	1	<1	
	Di-n-octyl phthalate		µg/L	1	<1	
	07-Carbamates	Carbofuran	µg/L	0.5	<0.5	
		Carbaryl	µg/L	0.5	<0.5	
	08-Herbicides (normal)	Trifluralin	µg/L	0.5	<0.5	
	09-Nitrosamines	N-nitroso-di-n-butylamine (NDBA)	µg/L	1	<1	
		N-nitroso-diethylamine (NDEA)	µg/L	1	<1	
		N-nitroso-di-n-propylamine (NDPA)	µg/L	1	<1	
		N-nitroso-morpholine (NMOR)	µg/L	1	<1	
		N-nitroso-piperidine (NPIP)	µg/L	1	<1	
		N-nitroso-pyrrolidine (NPYR)	µg/L	1	<1	
		4-amino biphenyl	µg/L	1	<1	
	10-Nitroaromatics and Ketones	Acetophenone	µg/L	1	<1	
		1,3-dinitrobenzene	µg/L	1	<1	
		2,4-dinitrotoluene	µg/L	1	<1	
		2,6-dinitrotoluene	µg/L	1	<1	
		Isophorone	µg/L	1	<1	
		Nitrobenzene	µg/L	1	<1	
		p-(dimethylamino) azobenzene	µg/L	1	<1	
		Phenacetin	µg/L	1	<1	
	11-Anilines and Amines	Pentachloronitrobenzene (quintozene)	µg/L	1	<1	
		Aniline	µg/L	5	<5	
		4-chloroaniline	µg/L	1	<1	
		2-nitroaniline	µg/L	1	<1	
		3-nitroaniline	µg/L	1	<1	
		4-nitroaniline	µg/L	1	<1	
		Diphenylamine	µg/L	1	<1	
		o-toluidine	µg/L	1	<1	
		5-nitro-o-toluidine	µg/L	1	<1	
		1-naphthylamine	µg/L	2	<2	
	12-Haloethers	2-naphthylamine	µg/L	2	<2	
Bis(2-chloroethoxy) methane		µg/L	1	<1		
Bis(2-chloroethyl) ether		µg/L	1	<1		
Bis(2-chloroisopropyl) ether		µg/L	1	<1		
4-chlorophenyl phenyl ether		µg/L	1	<1		
13-Other SVOCs	4-bromophenyl phenyl ether	µg/L	1	<1		
	Methyl methanesulfonate	µg/L	1	<1		
	Ethyl methanesulfonate	µg/L	1	<1		
	Dibenzofuran	µg/L	1	<1		
	Benzyl alcohol	µg/L	1	<1		
	Safrole	µg/L	1	<1		
	Isosafrole Isomer 1	µg/L	1	<1		
	Isosafrole Isomer 2	µg/L	1	<1		
	1,4-naphthoquinone	µg/L	1	<1		
Thionazin		µg/L	1	<1		

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Full 8270 SVOC in Water (continued)

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB365142.001	14-Speciated Routine Phenols	3/4-methyl phenol (m/p-cresol)	µg/L	1	<1
		2-methyl phenol (o-cresol)	µg/L	0.5	<0.5
		2,6-dichlorophenol	µg/L	0.5	<0.5
		2,4,5-trichlorophenol	µg/L	0.5	<0.5
		4-chloro-3-methylphenol	µg/L	2	<2
		2-chlorophenol	µg/L	0.5	<0.5
		2,4-dichlorophenol	µg/L	0.5	<0.5
		2,4-dimethylphenol	µg/L	0.5	<0.5
		2-nitrophenol	µg/L	0.5	<0.5
		Phenol	µg/L	0.5	<0.5
		2,4,6-trichlorophenol	µg/L	0.5	<0.5
		Pentachlorophenol	µg/L	0.5	<0.5
		4-nitrophenol	µg/L	1	<1
	Surrogates	d5-phenol (Surrogate)	%	-	121
		d5-nitrobenzene (Surrogate)	%	-	118
		2-fluorobiphenyl (Surrogate)	%	-	122
		2,4,6-Tribromophenol (Surrogate)	%	-	117
		d14-p-terphenyl (Surrogate)	%	-	120

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Sample Number	Parameter	Units	LOR	Result
LB365712.001	Mercury, Hg	mg/L	0.0001	<0.0001

Metals in Water (Dissolved) by ICPOES

Method: ME-(AU)-[ENV]AN320

Sample Number	Parameter	Units	LOR	Result
LB365313.001	Calcium, Ca	mg/L	0.2	<0.2
	Magnesium, Mg	mg/L	0.1	<0.1
	Potassium, K	mg/L	0.1	<0.1
	Silicon, Si*	mg/L	0.05	<0.05
	Sodium, Na	mg/L	0.5	<0.5

Nitrite in Water

Method: ME-(AU)-[ENV]AN277

Sample Number	Parameter	Units	LOR	Result
LB365246.001	Nitrite Nitrogen, NO2 as N	mg/L	0.005	<0.005

OC Pesticides in Water

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result
LB365142.001	Alpha BHC	µg/L	0.1	<0.1
	Hexachlorobenzene (HCB)	µg/L	0.1	<0.1
	Beta BHC	µg/L	0.1	<0.1
	Lindane (gamma BHC)	µg/L	0.1	<0.1
	Delta BHC	µg/L	0.1	<0.1
	Heptachlor	µg/L	0.1	<0.1
	Aldrin	µg/L	0.1	<0.1
	Heptachlor epoxide	µg/L	0.1	<0.1
	Gamma Chlordane	µg/L	0.1	<0.1
	Alpha Chlordane	µg/L	0.1	<0.1
	Alpha Endosulfan	µg/L	0.1	<0.1
	p,p'-DDE	µg/L	0.1	<0.1
	Dieldrin	µg/L	0.1	<0.1
	Endrin	µg/L	0.1	<0.1
	Beta Endosulfan	µg/L	0.1	<0.1
	p,p'-DDD	µg/L	0.1	<0.1
	Endrin aldehyde	µg/L	0.1	<0.1
	Endosulfan sulphate	µg/L	0.1	<0.1
	p,p'-DDT	µg/L	0.1	<0.1
	Endrin ketone	µg/L	0.1	<0.1
	Methoxychlor	µg/L	0.1	<0.1
	Mirex	µg/L	0.1	<0.1

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OC Pesticides in Water (continued)

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result
LB365142.001	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-
				104

OP Pesticides in Water

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result
LB365142.001	Azinphos-methyl	µg/L	0.2	<0.2
	Bromophos Ethyl	µg/L	0.2	<0.2
	Chlorpyrifos (Chlorpyrifos Ethyl)	µg/L	0.2	<0.2
	Diazinon (Dimpylate)	µg/L	0.5	<0.5
	Dichlorvos	µg/L	0.5	<0.5
	Dimethoate	µg/L	0.5	<0.5
	Ethion	µg/L	0.2	<0.2
	Fenitrothion	µg/L	0.2	<0.2
	Malathion	µg/L	0.2	<0.2
	Methidathion	µg/L	0.5	<0.5
	Parathion-ethyl (Parathion)	µg/L	0.2	<0.2
	Surrogates	2-fluorobiphenyl (Surrogate)	%	-
				56
		d14-p-terphenyl (Surrogate)	%	-
				61

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result
LB365142.001	Naphthalene	µg/L	0.1	<0.1
	2-methylnaphthalene	µg/L	0.1	<0.1
	1-methylnaphthalene	µg/L	0.1	<0.1
	Acenaphthylene	µg/L	0.1	<0.1
	Acenaphthene	µg/L	0.1	<0.1
	Fluorene	µg/L	0.1	<0.1
	Phenanthrene	µg/L	0.1	<0.1
	Anthracene	µg/L	0.1	<0.1
	Fluoranthene	µg/L	0.1	<0.1
	Pyrene	µg/L	0.1	<0.1
	Benzo(a)anthracene	µg/L	0.1	<0.1
	Chrysene	µg/L	0.1	<0.1
	Benzo(b&j&k)fluoranthene	µg/L	0.2	<0.2
	Benzo(a)pyrene	µg/L	0.1	<0.1
	Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1
	Dibenzo(ah)anthracene	µg/L	0.1	<0.1
	Benzo(ghi)perylene	µg/L	0.1	<0.1
	Surrogates	d5-nitrobenzene (Surrogate)	%	-
				60
		2-fluorobiphenyl (Surrogate)	%	-
				56
		d14-p-terphenyl (Surrogate)	%	-
				61

PCBs in Water

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result
LB365142.001	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

Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous Samples

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result
LB365358.001	Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.05
	Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.01
	Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.01
	Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.01
	Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01
	Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.01
	Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.01
	Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.01
	Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.01
	Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.01

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 Aqueous Samples (continued)

Method: ME-(AU)-[ENV]AN404

Sample Number	Parameter	Units	LOR	Result
LB365358.001	Perfluorotridecanoic acid (PFTTrDA)	µg/L	0.01	<0.01
	Perfluoropropane sulfonic acid (PFPrS)	µg/L	0.01	<0.01
	Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.01
	Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.01
	Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01
	Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.01
	Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01
	Perfluorononane sulfonic acid (PFNS)	µg/L	0.01	<0.01
	Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.01
	1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	µg/L	0.01	<0.01
	1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	µg/L	0.01	<0.01
	1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	µg/L	0.01	<0.01
	1H,1H,2H,2H-Perfluorododecane sulfonic acid (10:2 FTS)	µg/L	0.01	<0.01
	Perfluorooctane sulfonamide (FOSA)	µg/L	0.01	<0.01
	N-Methylperfluorooctane sulfonamide (N-MeFOSA)	µg/L	0.01	<0.01
	N-Ethylperfluorooctane sulfonamide (N-EtFOSA)	µg/L	0.01	<0.01
	N-Methylperfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	µg/L	0.05	<0.05
	N-Ethylperfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	µg/L	0.05	<0.05
	2-(N-Methylperfluorooctane sulfonamido)-ethanol (N-MeFOSE)	µg/L	0.05	<0.05
	2-(N-Ethylperfluorooctane sulfonamido)-ethanol (N-EtFOSE)	µg/L	0.05	<0.05

Total and Volatile Suspended Solids (TSS / VSS)

Method: ME-(AU)-[ENV]AN114

Sample Number	Parameter	Units	LOR	Result
LB365292.001	Total Suspended Solids Dried at 103-105°C	mg/L	5	<5

Total Cyanide in water by Discrete Analyser

Method: ME-(AU)-[ENV]AN077/AN287

Sample Number	Parameter	Units	LOR	Result
LB365400.001	Total Cyanide	mg/L	0.004	<0.004

Total Dissolved Solids (TDS) in water

Method: ME-(AU)-[ENV]AN113

Sample Number	Parameter	Units	LOR	Result
LB365417.001	Total Dissolved Solids Dried at 175-185°C	mg/L	10	<10

Total Phenolics in Water

Method: ME-(AU)-[ENV]AN295

Sample Number	Parameter	Units	LOR	Result
LB365506.001	Total Phenols	mg/L	0.05	<0.05

Total Phosphorus by Kjeldahl Digestion DA in Water

Method: ME-(AU)-[ENV]AN279/AN293

Sample Number	Parameter	Units	LOR	Result
LB365355.001	Total Phosphorus (Kjeldahl Digestion) as P	mg/L	0.02	<0.02

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result
LB365316.001	Aluminium	µg/L	5	<5
	Antimony	µg/L	1	<1
	Arsenic	µg/L	1	<1
	Barium	µg/L	1	<1
	Beryllium	µg/L	1	<1
	Boron	µg/L	5	<5
	Cadmium	µg/L	0.1	<0.1
	Chromium	µg/L	1	<1
	Cobalt	µg/L	1	<1
	Copper	µg/L	1	<1
	Iron	µg/L	5	<5

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.

Trace Metals (Dissolved) in Water by ICPMS (continued)

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result
LB365316.001	Lead	µg/L	1	<1
	Manganese	µg/L	1	<1
	Molybdenum	µg/L	1	<1
	Nickel	µg/L	1	<1
	Selenium	µg/L	1	<1
	Silver	µg/L	1	<1
	Strontium	µg/L	1	<1
	Uranium	µg/L	1	<1
	Vanadium	µg/L	1	<1
	Zinc	µg/L	5	<5

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result
LB365142.001	TRH C10-C14	µg/L	50	<50
	TRH C15-C28	µg/L	200	<200
	TRH C29-C36	µg/L	200	<200
	TRH C37-C40	µg/L	200	<200

Turbidity

Method: ME-(AU)-[ENV]AN119

Sample Number	Parameter	Units	LOR	Result
LB365116.001	Turbidity	NTU	0.5	<0.5

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	
LB365155.001	Fumigants	2,2-dichloropropane	µg/L	0.5	<0.5	
		1,2-dichloropropane	µg/L	0.5	<0.5	
		cis-1,3-dichloropropene	µg/L	0.5	<0.5	
		trans-1,3-dichloropropene	µg/L	0.5	<0.5	
	Halogenated Aliphatics	1,2-dibromoethane (EDB)	µg/L	0.5	<0.5	
		Dichlorodifluoromethane (CFC-12)	µg/L	5	<5	
		Chloromethane	µg/L	5	<5	
		Vinyl chloride (Chloroethene)	µg/L	0.3	<0.3	
		Bromomethane	µg/L	10	<10	
		Chloroethane	µg/L	5	<5	
		Trichlorofluoromethane	µg/L	1	<1	
		1,1-dichloroethene	µg/L	0.5	<0.5	
		Iodomethane	µg/L	5	<5	
		Dichloromethane (Methylene chloride)	µg/L	5	<5	
		Allyl chloride	µg/L	2	<2	
		trans-1,2-dichloroethene	µg/L	0.5	<0.5	
		1,1-dichloroethane	µg/L	0.5	<0.5	
		cis-1,2-dichloroethene	µg/L	0.5	<0.5	
		Bromochloromethane	µg/L	0.5	<0.5	
		1,2-dichloroethane	µg/L	0.5	<0.5	
		1,1,1-trichloroethane	µg/L	0.5	<0.5	
		1,1-dichloropropene	µg/L	0.5	<0.5	
		Carbon tetrachloride	µg/L	0.5	<0.5	
		Dibromomethane	µg/L	0.5	<0.5	
		Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	<0.5	
		1,1,2-trichloroethane	µg/L	0.5	<0.5	
		1,3-dichloropropane	µg/L	0.5	<0.5	
		Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	<0.5	
		1,1,1,2-tetrachloroethane	µg/L	0.5	<0.5	
		1,1,2,2-tetrachloroethane	µg/L	0.5	<0.5	
		1,2,3-trichloropropane	µg/L	0.5	<0.5	
		trans-1,4-dichloro-2-butene	µg/L	1	<1	
		1,2-dibromo-3-chloropropane	µg/L	0.5	<0.5	
		Hexachlorobutadiene	µg/L	0.5	<0.5	
		Halogenated Aromatics	Chlorobenzene	µg/L	0.5	<0.5
			Bromobenzene	µg/L	0.5	<0.5

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)-ENVJAN433

Sample Number		Parameter	Units	LOR	Result
LB365155.001	Halogenated Aromatics	2-chlorotoluene	µg/L	0.5	<0.5
		4-chlorotoluene	µg/L	0.5	<0.5
		1,3-dichlorobenzene	µg/L	0.5	<0.5
		1,4-dichlorobenzene	µg/L	0.3	<0.3
		1,2-dichlorobenzene	µg/L	0.5	<0.5
		1,2,4-trichlorobenzene	µg/L	0.5	<0.5
		1,2,3-trichlorobenzene	µg/L	0.5	<0.5
	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
		Styrene (Vinyl benzene)	µg/L	0.5	<0.5
		o-xylene	µg/L	0.5	<0.5
		Isopropylbenzene (Cumene)	µg/L	0.5	<0.5
		n-propylbenzene	µg/L	0.5	<0.5
		1,3,5-trimethylbenzene	µg/L	0.5	<0.5
		tert-butylbenzene	µg/L	0.5	<0.5
		1,2,4-trimethylbenzene	µg/L	0.5	<0.5
		sec-butylbenzene	µg/L	0.5	<0.5
		p-isopropyltoluene	µg/L	0.5	<0.5
		n-butylbenzene	µg/L	0.5	<0.5
	Nitrogenous Compounds	Acrylonitrile	µg/L	0.5	<0.5
	Oxygenated Compounds	Acetone (2-propanone)	µg/L	10	<10
		MtBE (Methyl-tert-butyl ether)	µg/L	0.5	<0.5
		Vinyl acetate*	µg/L	10	<10
		MEK (2-butanone)	µg/L	10	<10
		MIBK (4-methyl-2-pentanone)	µg/L	5	<5
		2-hexanone (MBK)	µg/L	5	<5
	Polycyclic VOCs	Naphthalene (VOC)*	µg/L	0.5	<0.5
	Sulphonated	Carbon disulfide	µg/L	2	<2
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	84
		d8-toluene (Surrogate)	%	-	87
		Bromofluorobenzene (Surrogate)	%	-	99
	Trihalomethanes	Chloroform (THM)	µg/L	0.5	<0.5
		Bromodichloromethane (THM)	µg/L	0.5	<0.5
		Dibromochloromethane (THM)	µg/L	0.5	<0.5
		Bromoform (THM)	µg/L	0.5	<0.5

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-ENVJAN433

Sample Number		Parameter	Units	LOR	Result
LB365155.001	Surrogates	TRH C6-C9	µg/L	40	<40
		d4-1,2-dichloroethane (Surrogate)	%	-	84
		d8-toluene (Surrogate)	%	-	87
		Bromofluorobenzene (Surrogate)	%	-	99

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

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: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

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 identifier 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

Alkalinity

Method: ME-(AU)-[ENV]AN135

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE291187.010	LB365277.013	Bicarbonate Alkalinity as CaCO ₃	mg/L	5	270	270	17	1
		Carbonate Alkalinity as CaCO ₃	mg/L	5	<1	<1	200	0
		Total Alkalinity as CaCO ₃	mg/L	5	270	270	17	1
SE291267.004	LB365277.025	Bicarbonate Alkalinity as CaCO ₃	mg/L	5	250	250	17	1
		Carbonate Alkalinity as CaCO ₃	mg/L	5	<1	<1	200	0
		Total Alkalinity as CaCO ₃	mg/L	5	250	250	17	1

Ammonia Nitrogen by Discrete Analyser

Method: ME-(AU)-[ENV]AN291

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE291211.001	LB365246.014	Ammonia Nitrogen, NH ₃ as N	mg/L	0.01	12	12	15	1
SE291224.001	LB365246.025	Ammonia Nitrogen, NH ₃ as N	mg/L	0.01	44	44	15	0

Anions by Ion Chromatography in Water

Method: ME-(AU)-[ENV]AN245

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE291201.001	LB365505.014	Sulfate, SO ₄	mg/L	1	38	37	18	2
SE291210.001	LB365505.025	Nitrate Nitrogen, NO ₃ -N	mg/L	0.005	0.26	0.24	17	8

Conductivity and TDS by Calculation - Water

Method: ME-(AU)-[ENV]AN106

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE291185.003	LB365120.009	Conductivity @ 25 C	µS/cm	2	410	420	15	1

Filterable Reactive Phosphorus (FRP)

Method: ME-(AU)-[ENV]AN278

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE291211.001	LB365246.014	Filterable Reactive Phosphorus as P	mg/L	0.005	2.4	2.4	15	0
SE291224.001	LB365246.025	Filterable Reactive Phosphorus as P	mg/L	0.005	5.5	5.4	15	1

Forms of Carbon

Method: ME-(AU)-[ENV]AN190

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE291054.009	LB365203.015	Total Organic Carbon as NPOC	mg/L	0.2	7.1	7.2	18	1
SE291185.003	LB365203.022	Total Organic Carbon as NPOC	mg/L	0.2	5.7	5.7	19	1

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE291185.005	LB365712.023	Mercury, Hg	µg/L	0.0001	<0.0001	<0.0001	200	0

Metals in Water (Dissolved) by ICPOES

Method: ME-(AU)-[ENV]AN320

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE291185.001	LB365313.014	Calcium, Ca	mg/L	0.2	12	12	17	0
		Magnesium, Mg	mg/L	0.1	0.8	0.8	28	1

Nitrite in Water

Method: ME-(AU)-[ENV]AN277

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE291211.001	LB365246.014	Nitrite Nitrogen, NO ₂ as N	mg/L	0.005	0.34	0.34	16	0
SE291224.001	LB365246.025	Nitrite Nitrogen, NO ₂ as N	mg/L	0.005	<0.005	<0.005	200	0

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE291182.008	LB365142.026	Naphthalene	µg/L	0.1	<0.1	<0.1	200	0
		2-methylnaphthalene	µg/L	0.1	<0.1	<0.1	200	0
		1-methylnaphthalene	µg/L	0.1	<0.1	<0.1	200	0
		Acenaphthylene	µg/L	0.1	<0.1	<0.1	200	0
		Acenaphthene	µg/L	0.1	<0.1	<0.1	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

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: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

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 identifier 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 Water (continued)

Method: ME-(AU)-[ENV]AN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %	
SE291182.008	LB365142.026	Fluorene	µg/L	0.1	<0.1	<0.1	200	0	
		Phenanthrene	µg/L	0.1	<0.1	<0.1	200	0	
		Anthracene	µg/L	0.1	<0.1	<0.1	200	0	
		Fluoranthene	µg/L	0.1	<0.1	<0.1	200	0	
		Pyrene	µg/L	0.1	<0.1	<0.1	200	0	
		Benzo(a)anthracene	µg/L	0.1	<0.1	<0.1	200	0	
		Chrysene	µg/L	0.1	<0.1	<0.1	200	0	
		Benzo(b&j)fluoranthene	µg/L	0.1	<0.1	<0.1	200	0	
		Benzo(k)fluoranthene	µg/L	0.1	<0.1	<0.1	200	0	
		Benzo(b&j&k)fluoranthene	µg/L	0.2	<0.2	<0.2	200	0	
		Benzo(a)pyrene	µg/L	0.1	<0.1	<0.1	200	0	
		Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1	<0.1	200	0	
		Dibenzo(ah)anthracene	µg/L	0.1	<0.1	<0.1	200	0	
		Benzo(ghi)perylene	µg/L	0.1	<0.1	<0.1	200	0	
		Surrogates	d5-nitrobenzene (Surrogate)	µg/L	-	0.4	0.3	30	2
			2-fluorobiphenyl (Surrogate)	µg/L	-	0.3	0.3	30	1
d14-p-terphenyl (Surrogate)	µg/L		-	0.4	0.4	30	2		
SE291185.002	LB365142.025	Naphthalene	µg/L	0.1	<0.1	<0.1	200	0	
		2-methylnaphthalene	µg/L	0.1	<0.1	<0.1	200	0	
		1-methylnaphthalene	µg/L	0.1	<0.1	<0.1	200	0	
		Acenaphthylene	µg/L	0.1	<0.1	<0.1	200	0	
		Acenaphthene	µg/L	0.1	<0.1	<0.1	200	0	
		Fluorene	µg/L	0.1	<0.1	<0.1	200	0	
		Phenanthrene	µg/L	0.1	<0.1	<0.1	200	0	
		Anthracene	µg/L	0.1	<0.1	<0.1	200	0	
		Fluoranthene	µg/L	0.1	<0.1	<0.1	200	0	
		Pyrene	µg/L	0.1	<0.1	<0.1	200	0	
		Benzo(a)anthracene	µg/L	0.1	<0.1	<0.1	200	0	
		Chrysene	µg/L	0.1	<0.1	<0.1	200	0	
		Benzo(b&j)fluoranthene	µg/L	0.1	<0.1	<0.1	200	0	
		Benzo(k)fluoranthene	µg/L	0.1	<0.1	<0.1	200	0	
		Benzo(b&j&k)fluoranthene	µg/L	0.2	<0.2	<0.2	200	0	
		Benzo(a)pyrene	µg/L	0.1	<0.1	<0.1	200	0	
		Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1	<0.1	200	0	
		Dibenzo(ah)anthracene	µg/L	0.1	<0.1	<0.1	200	0	
		Benzo(ghi)perylene	µg/L	0.1	<0.1	<0.1	200	0	
		Surrogates	d5-nitrobenzene (Surrogate)	µg/L	-	0.35	0.3	30	0
			2-fluorobiphenyl (Surrogate)	µg/L	-	0.33	0.3	30	2
			d14-p-terphenyl (Surrogate)	µg/L	-	0.42	0.4	30	1

Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous Samples

Method: ME-(AU)-[ENV]AN404

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE291072.001	LB365358.004	Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.05	<0.05	200	0
		Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.01	<0.01	200	0
		Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.01	<0.01	200	0
		Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.01	<0.01	200	0
		Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	200	0
		Perfluoropropane sulfonic acid (PFPrS)	µg/L	0.01	<0.01	<0.01	200	0
		Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.01	<0.01	200	0
		Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.01	<0.01	200	0
		Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.03	0.03	200	10
		Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.01	<0.01	200	0
		Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0.03	0.02	200	25
		Perfluorononane sulfonic acid (PFNS)	µg/L	0.01	<0.01	<0.01	200	0
		1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	µg/L	0.01	<0.01	<0.01	200	0
		1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	µg/L	0.01	<0.01	<0.01	200	0
		1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	µg/L	0.01	<0.01	<0.01	200	0
		1H,1H,2H,2H-Perfluorododecane sulfonic acid (10:2)	µg/L	0.01	<0.01	<0.01	200	0
		Sum of PFOS and PFHxS	µg/L	0.01	0.06	0.05	200	17
		Sum of enHealth PFAS (PFHxS+PFOS+PFOA)	µg/L	0.01	0.06	0.05	200	17
		Sum of US EPA PFAS (PFOS+PFOA)	µg/L	0.01	0.03	0.02	200	25

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

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: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

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 identifier 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

Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous Samples (continued)

Method: ME-(AU)-[ENV]AN404

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE291072.001	LB365358.004	(13C4-PFBA) Isotopically Labelled Internal Recovery	%	-	102	110	200	7
		(13C5-PFPeA) Isotopically Labelled Internal Recovery	%	-	102	111	200	8
		(13C5-PFHxA) Isotopically Labelled Internal Recovery	%	-	108	118	200	10
		(13C4-PFHpA) Isotopically Labelled Internal Recovery	%	-	109	120	200	9
		(13C4_PFOA) Isotopically Labelled Internal Recovery	%	-	148	148	200	1
		(13C3-PFBS) Isotopically Labelled Internal Recovery	%	-	114	132	200	15
		(13C3-PFHxS) Isotopically Labelled Internal Recovery	%	-	111	120	200	7
		(13C8-PFOS) Isotopically Labelled Internal Recovery	%	-	63	71	200	12
		(13C2-4:2 FTS) Isotopically Labelled Internal Recovery	%	-	107	113	200	5
		(13C2-6:2 FTS) Isotopically Labelled Internal Recovery	%	-	109	106	200	3
		(13C2-8:2 FTS) Isotopically Labelled Internal Recovery	%	-	176	154	200	14

pH in water

Method: ME-(AU)-[ENV]AN101

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE291185.003	LB365120.009	pH**	pH Units	0.1	7.3	7.3	16	0

Redox Potential (Eh) in water

Method: ME-(AU)-[ENV]AN240

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE291185.003	LB365121.003	Eh of Sample Relative to Standard H+ Electrode***	mV	-500	404	401	15	1

TKN Kjeldahl Digestion by Discrete Analyser

Method: ME-(AU)-[ENV]AN281/292

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE290965.001	LB365355.014	Total Kjeldahl Nitrogen	mg/L	0.05	98	98	15	0
SE291204.001	LB365355.027	Total Kjeldahl Nitrogen	mg/L	0.05	7.8	7.7	16	2

Total and Volatile Suspended Solids (TSS / VSS)

Method: ME-(AU)-[ENV]AN114

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE291267.001	LB365292.013	Total Suspended Solids Dried at 103-105°C	mg/L	5	28	26	34	7
SE291270.001	LB365292.022	Total Suspended Solids Dried at 103-105°C	mg/L	5	<5	<5	200	0

Total Dissolved Solids (TDS) in water

Method: ME-(AU)-[ENV]AN113

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE291177.003	LB365417.013	Total Dissolved Solids Dried at 175-185°C	mg/L	10	<10	<10	200	0
SE291262.001	LB365417.024	Total Dissolved Solids Dried at 175-185°C	mg/L	10	2400	2400	15	2

Total Phenolics in Water

Method: ME-(AU)-[ENV]AN295

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE291292.003	LB365506.014	Total Phenols	mg/L	0.05	<0.05	<0.05	200	0
SE291343.001	LB365506.019	Total Phenols	mg/L	0.05	<0.05	<0.05	200	0

Total Phosphorus by Kjeldahl Digestion DA in Water

Method: ME-(AU)-[ENV]AN279/AN293

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE290965.001	LB365355.014	Total Phosphorus (Kjeldahl Digestion) as P	mg/L	0.02	14	14	15	0
SE291204.001	LB365355.027	Total Phosphorus (Kjeldahl Digestion) as P	mg/L	0.02	7.5	7.3	15	2

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE291185.005	LB365316.011	Arsenic	µg/L	1	<1	<1	200	0
		Cadmium	µg/L	0.1	<0.1	<0.1	200	0
		Chromium	µg/L	1	<1	<1	200	0
		Copper	µg/L	1	<1	<1	200	0
		Lead	µg/L	1	<1	<1	200	0
		Nickel	µg/L	1	<1	<1	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

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: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

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 identifier 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

Trace Metals (Dissolved) in Water by ICPMS (continued)

Method: ME-(AU)-[ENV]AN318

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE291185.005	LB365316.011	Zinc	µg/L	5	<5	<5	200	0

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE291182.008	LB365142.026	TRH C10-C14	µg/L	50	<50	<50	200	0
		TRH C15-C28	µg/L	200	<200	<200	200	0
		TRH C29-C36	µg/L	200	<200	<200	200	0
		TRH C37-C40	µg/L	200	<200	<200	200	0
		TRH C10-C40	µg/L	320	<320	<320	200	0
		TRH F Bands	µg/L	60	<60	<60	200	0
		TRH >C10-C16	µg/L	60	<60	<60	200	0
		TRH >C10-C16 - Naphthalene (F2)	µg/L	60	<60	<60	200	0
		TRH >C16-C34 (F3)	µg/L	500	<500	<500	200	0
		TRH >C34-C40 (F4)	µg/L	500	<500	<500	200	0
SE291185.002	LB365142.025	TRH C10-C14	µg/L	50	<50	<50	200	0
		TRH C15-C28	µg/L	200	<200	<200	200	0
		TRH C29-C36	µg/L	200	<200	<200	200	0
		TRH C37-C40	µg/L	200	<200	<200	200	0
		TRH C10-C40	µg/L	320	<320	<320	200	0
		TRH F Bands	µg/L	60	<60	<60	200	0
		TRH >C10-C16	µg/L	60	<60	<60	200	0
		TRH >C10-C16 - Naphthalene (F2)	µg/L	60	<60	<60	200	0
		TRH >C16-C34 (F3)	µg/L	500	<500	<500	200	0
		TRH >C34-C40 (F4)	µg/L	500	<500	<500	200	0

Turbidity

Method: ME-(AU)-[ENV]AN119

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE291177.006	LB365116.011	Turbidity	NTU	0.5	0.34	0.34	162	0

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE291072.001	LB365155.023	Fumigants	2,2-dichloropropane	µg/L	0.5	<0.5	<0.5	200	0
			1,2-dichloropropane	µg/L	0.5	<0.5	<0.5	200	0
			cis-1,3-dichloropropene	µg/L	0.5	<0.5	<0.5	200	0
			trans-1,3-dichloropropene	µg/L	0.5	<0.5	<0.5	200	0
			1,2-dibromoethane (EDB)	µg/L	0.5	<0.5	<0.5	200	0
		Halogenated	Dichlorodifluoromethane (CFC-12)	µg/L	5	<5	<5	200	0
			Aliphatics	Chloromethane	µg/L	5	<5	<5	200
		Vinyl chloride (Chloroethene)		µg/L	0.3	<0.3	<0.3	200	0
		Bromomethane		µg/L	10	<10	<10	200	0
		Chloroethane		µg/L	5	<5	<5	200	0
		Trichlorofluoromethane		µg/L	1	<1	<1	200	0
		1,1-dichloroethene		µg/L	0.5	<0.5	<0.5	200	0
		Iodomethane		µg/L	5	<5	<5	200	0
		Dichloromethane (Methylene chloride)		µg/L	5	<5	<5	200	0
		Allyl chloride		µg/L	2	<2	<2	200	0
		trans-1,2-dichloroethene		µg/L	0.5	<0.5	<0.5	200	0
		1,1-dichloroethane		µg/L	0.5	<0.5	<0.5	200	0
		cis-1,2-dichloroethene		µg/L	0.5	<0.5	<0.5	200	0
		Bromochloromethane		µg/L	0.5	<0.5	<0.5	200	0
		1,2-dichloroethane		µg/L	0.5	<0.5	<0.5	200	0
		1,1,1-trichloroethane		µg/L	0.5	<0.5	<0.5	200	0
		1,1-dichloropropene		µg/L	0.5	<0.5	<0.5	200	0
		Carbon tetrachloride		µg/L	0.5	<0.5	<0.5	200	0
		Dibromomethane		µg/L	0.5	<0.5	<0.5	200	0
		Trichloroethene (Trichloroethylene,TCE)		µg/L	0.5	<0.5	<0.5	200	0
		1,1,2-trichloroethane		µg/L	0.5	<0.5	<0.5	200	0
		1,3-dichloropropane		µg/L	0.5	<0.5	<0.5	200	0
		Tetrachloroethene (Perchloroethylene,PCE)		µg/L	0.5	<0.5	<0.5	200	0
		1,1,1,2-tetrachloroethane		µg/L	0.5	<0.5	<0.5	200	0
		1,1,2,2-tetrachloroethane		µg/L	0.5	<0.5	<0.5	200	0
		1,2,3-trichloropropane		µg/L	0.5	<0.5	<0.5	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

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: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

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 identifier 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

VOCs in Water (continued)

Method: ME-(AU)-ENVJAN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %	
SE291072.001	LB365155.023	Halogenated Aliphatics	trans-1,4-dichloro-2-butene	µg/L	1	<1	<1	200	0	
			1,2-dibromo-3-chloropropane	µg/L	0.5	<0.5	<0.5	200	0	
			Hexachlorobutadiene	µg/L	0.5	<0.5	<0.5	200	0	
		Halogenated Aromatics	Chlorobenzene	µg/L	0.5	<0.5	<0.5	200	0	
			Bromobenzene	µg/L	0.5	<0.5	<0.5	200	0	
			2-chlorotoluene	µg/L	0.5	<0.5	<0.5	200	0	
			4-chlorotoluene	µg/L	0.5	<0.5	<0.5	200	0	
			1,3-dichlorobenzene	µg/L	0.5	<0.5	<0.5	200	0	
			1,4-dichlorobenzene	µg/L	0.3	<0.3	<0.3	200	0	
			1,2-dichlorobenzene	µg/L	0.5	<0.5	<0.5	200	0	
			1,2,4-trichlorobenzene	µg/L	0.5	<0.5	<0.5	200	0	
			1,2,3-trichlorobenzene	µg/L	0.5	<0.5	<0.5	200	0	
			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	
		Styrene (Vinyl benzene)		µg/L	0.5	0.00460938190.0046315624	200	0		
		o-xylene		µg/L	0.5	<0.5	<0.5	200	0	
		Isopropylbenzene (Cumene)		µg/L	0.5	0.00156236480.0047851436	200	0		
		n-propylbenzene		µg/L	0.5	0.00088508990.0005638673	200	0		
		1,3,5-trimethylbenzene		µg/L	0.5	0.00269410380.0020475726	200	0		
		tert-butylbenzene		µg/L	0.5	0.00070175610.0003749874	200	0		
		1,2,4-trimethylbenzene		µg/L	0.5	0.00458203360.0041011131	200	0		
		sec-butylbenzene		µg/L	0.5	0.00037569340.0012581014	200	0		
		p-isopropyltoluene		µg/L	0.5	0.00644170530.0137224927	200	0		
		n-butylbenzene		µg/L	0.5	0.0009125852	0	200	0	
		Nitrogenous Compounds		Acrylonitrile	µg/L	0.5	0.01794682890.0225167433	200	0	
				2-nitropropane	µg/L	100	0	0	200	0
		Oxygenated Compounds		Acetone (2-propanone)	µg/L	10	0	0	200	0
				MtBE (Methyl-tert-butyl ether)	µg/L	0.5	0.00162688790.0022192586	200	0	
			Vinyl acetate*	µg/L	10	0.01859558950.0235476945	200	0		
			MEK (2-butanone)	µg/L	10	0.12077370970.1722669666	200	0		
			MIBK (4-methyl-2-pentanone)	µg/L	5	0.01986698500.0107824176	200	0		
			2-hexanone (MBK)	µg/L	5	0	0	200	0	
		Polycyclic	Naphthalene (VOC)*	µg/L	0.5	<0.5	<0.5	200	0	
		Sulphonated	Carbon disulfide	µg/L	2	0.02702484140.0300354354	200	0		
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	8.8	8.8	30	0	
			d8-toluene (Surrogate)	µg/L	-	8.9	8.8	30	2	
			Bromofluorobenzene (Surrogate)	µg/L	-	10.3	9.9	30	5	
		Totals	Total BTEX	µg/L	3	<3	<3	200	0	
			Total VOC	µg/L	10	0.08278042470.0556791902	200	0		
		Trihalomethanes	Chloroform (THM)	µg/L	0.5	<0.5	<0.5	200	0	
			Bromodichloromethane (THM)	µg/L	0.5	<0.5	<0.5	200	0	
			Dibromochloromethane (THM)	µg/L	0.5	<0.5	<0.5	200	0	
			Bromoform (THM)	µg/L	0.5	<0.5	<0.5	200	0	
SE291072.003	LB365155.024	Fumigants	2,2-dichloropropane	µg/L	0.5	<0.5	<0.5	200	0	
			1,2-dichloropropane	µg/L	0.5	<0.5	<0.5	200	0	
			cis-1,3-dichloropropene	µg/L	0.5	<0.5	<0.5	200	0	
			trans-1,3-dichloropropene	µg/L	0.5	<0.5	<0.5	200	0	
			1,2-dibromoethane (EDB)	µg/L	0.5	<0.5	<0.5	200	0	
		Halogenated Aliphatics	Dichlorodifluoromethane (CFC-12)	µg/L	5	<5	<5	200	0	
			Chloromethane	µg/L	5	<5	<5	200	0	
			Vinyl chloride (Chloroethene)	µg/L	0.3	<0.3	<0.3	200	0	
			Bromomethane	µg/L	10	<10	<10	200	0	
			Chloroethane	µg/L	5	<5	<5	200	0	
			Trichlorofluoromethane	µg/L	1	<1	<1	200	0	
			1,1-dichloroethene	µg/L	0.5	<0.5	<0.5	200	0	
			Iodomethane	µg/L	5	<5	<5	200	0	
			Dichloromethane (Methylene chloride)	µg/L	5	<5	<5	200	0	
			Allyl chloride	µg/L	2	<2	<2	200	0	
			trans-1,2-dichloroethene	µg/L	0.5	<0.5	<0.5	200	0	

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

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: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

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 identifier 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

VOCs in Water (continued)

Method: ME-(AU)-ENVJAN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %	
SE291072.003	LB365155.024	Halogenated Aliphatics	1,1-dichloroethane	µg/L	0.5	<0.5	<0.5	200	0	
			cis-1,2-dichloroethene	µg/L	0.5	<0.5	<0.5	200	0	
			Bromochloromethane	µg/L	0.5	<0.5	<0.5	200	0	
			1,2-dichloroethane	µg/L	0.5	<0.5	<0.5	200	0	
			1,1,1-trichloroethane	µg/L	0.5	<0.5	<0.5	200	0	
			1,1-dichloropropene	µg/L	0.5	<0.5	<0.5	200	0	
			Carbon tetrachloride	µg/L	0.5	<0.5	<0.5	200	0	
			Dibromomethane	µg/L	0.5	<0.5	<0.5	200	0	
			Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	<0.5	<0.5	200	0	
			1,1,2-trichloroethane	µg/L	0.5	<0.5	<0.5	200	0	
			1,3-dichloropropane	µg/L	0.5	<0.5	<0.5	200	0	
			Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	<0.5	<0.5	200	0	
			1,1,1,2-tetrachloroethane	µg/L	0.5	<0.5	<0.5	200	0	
			1,1,2,2-tetrachloroethane	µg/L	0.5	<0.5	<0.5	200	0	
			1,2,3-trichloropropane	µg/L	0.5	<0.5	<0.5	200	0	
			trans-1,4-dichloro-2-butene	µg/L	1	<1	<1	200	0	
			1,2-dibromo-3-chloropropane	µg/L	0.5	<0.5	<0.5	200	0	
			Hexachlorobutadiene	µg/L	0.5	<0.5	<0.5	200	0	
		Halogenated Aromatics	Chlorobenzene	µg/L	0.5	<0.5	<0.5	200	0	
			Bromobenzene	µg/L	0.5	<0.5	<0.5	200	0	
			2-chlorotoluene	µg/L	0.5	<0.5	<0.5	200	0	
			4-chlorotoluene	µg/L	0.5	<0.5	<0.5	200	0	
			1,3-dichlorobenzene	µg/L	0.5	<0.5	<0.5	200	0	
			1,4-dichlorobenzene	µg/L	0.3	<0.3	<0.3	200	0	
			1,2-dichlorobenzene	µg/L	0.5	<0.5	<0.5	200	0	
			1,2,4-trichlorobenzene	µg/L	0.5	<0.5	<0.5	200	0	
			1,2,3-trichlorobenzene	µg/L	0.5	<0.5	<0.5	200	0	
			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	
		Styrene (Vinyl benzene)		µg/L	0.5	0.01510386230.0160095458	200	0		
		o-xylene		µg/L	0.5	<0.5	<0.5	200	0	
		Isopropylbenzene (Cumene)		µg/L	0.5	0.00231350770.0011748068	200	0		
		n-propylbenzene		µg/L	0.5	0.00070326090.0008820959	200	0		
		1,3,5-trimethylbenzene		µg/L	0.5	0.00333533440.0037328418	200	0		
		tert-butylbenzene		µg/L	0.5	0.00023736250.0004793975	200	0		
		1,2,4-trimethylbenzene		µg/L	0.5	0.00359992930.0033455011	200	0		
		sec-butylbenzene		µg/L	0.5	0.00146664460.0003929463	200	0		
		p-isopropyltoluene		µg/L	0.5	0.01606501830.0096940324	200	0		
		n-butylbenzene		µg/L	0.5	0.00185127740.0017367259	200	0		
		Nitrogenous Compounds		Acrylonitrile	µg/L	0.5	0.02503669000.0644031528	200	0	
				2-nitropropane	µg/L	100	0	0	200	0
		Oxygenated Compounds		Acetone (2-propanone)	µg/L	10	0	0	200	0
				MtBE (Methyl-tert-butyl ether)	µg/L	0.5	0.00212624960.0014891408	200	0	
			Vinyl acetate*	µg/L	10	0.02865903200.0290274687	200	0		
			MEK (2-butanone)	µg/L	10	0.23594678010.2195934144	200	0		
			MIBK (4-methyl-2-pentanone)	µg/L	5	0.02422311700.0204389312	200	0		
			2-hexanone (MBK)	µg/L	5	0	0	200	0	
		Polycyclic	Naphthalene (VOC)*	µg/L	0.5	<0.5	<0.5	200	0	
		Sulphonated	Carbon disulfide	µg/L	2	0.06566346790.0540964121	200	0		
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	8.8	8.9	30	1	
			d8-toluene (Surrogate)	µg/L	-	8.9	8.9	30	0	
			Bromofluorobenzene (Surrogate)	µg/L	-	10.2	10.2	30	0	
		Totals	Total BTEX	µg/L	3	<3	<3	200	0	
			Total VOC	µg/L	10	0.06278621660.0578641284	200	0		
		Trihalomethan es	Chloroform (THM)	µg/L	0.5	<0.5	<0.5	200	0	
			Bromodichloromethane (THM)	µg/L	0.5	<0.5	<0.5	200	0	
			Dibromochloromethane (THM)	µg/L	0.5	<0.5	<0.5	200	0	
			Bromoform (THM)	µg/L	0.5	<0.5	<0.5	200	0	

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

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: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

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 identifier 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 Water

Method: ME-(AU)-ENVJAN433

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE291072.001	LB365155.023	TRH C6-C10	µg/L	50	<50	<50	200	0
		TRH C6-C9	µg/L	40	<40	<40	200	0
		Surrogates						
		d4-1,2-dichloroethane (Surrogate)	µg/L	-	8.8	8.8	30	0
		d8-toluene (Surrogate)	µg/L	-	8.9	8.8	30	2
		Bromofluorobenzene (Surrogate)	µg/L	-	10.3	9.9	30	5
		VPH F Bands						
		Benzene (F0)	µg/L	0.5	<0.5	<0.5	200	0
SE291072.003	LB365155.024	TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	<50	200	0
		TRH C6-C10	µg/L	50	<50	<50	200	0
		TRH C6-C9	µg/L	40	<40	<40	200	0
		Surrogates						
		d4-1,2-dichloroethane (Surrogate)	µg/L	-	8.8	8.9	30	1
		d8-toluene (Surrogate)	µg/L	-	8.9	8.9	30	0
		Bromofluorobenzene (Surrogate)	µg/L	-	10.2	10.2	30	0
		VPH F Bands						
		Benzene (F0)	µg/L	0.5	<0.5	<0.5	200	0
		TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	<50	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.

Ammonia Nitrogen by Discrete Analyser

Method: ME-(AU)-[ENV]AN291

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB365246.002	Ammonia Nitrogen, NH ₃ as N	mg/L	0.01	2.5	2.5	80 - 120	99

Anions by Ion Chromatography in Water

Method: ME-(AU)-[ENV]AN245

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB365505.002	Fluoride	mg/L	0.1	2.1	2	80 - 120	104
	Chloride	mg/L	0.05	19	20	80 - 120	97
	Bromide	mg/L	0.05	1.9	2	80 - 120	95
	Nitrate Nitrogen, NO ₃ -N	mg/L	0.005	1.8	2	80 - 120	90
	Sulfate, SO ₄	mg/L	1	20	20	80 - 120	100

Conductivity and TDS by Calculation - Water

Method: ME-(AU)-[ENV]AN106

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB365120.002	Conductivity @ 25 C	µS/cm	2	1000	1015	85 - 115	99

Filterable Reactive Phosphorus (FRP)

Method: ME-(AU)-[ENV]AN278

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB365246.002	Filterable Reactive Phosphorus as P	mg/L	0.005	0.091	0.1	80 - 120	91

Forms of Carbon

Method: ME-(AU)-[ENV]AN190

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB365203.002	Total Organic Carbon as NPOC	mg/L	0.2	19	20	80 - 120	96

Full 8270 SVOC in Water

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %	
LB365142.002	01-PAHs	Acenaphthene	µg/L	0.1	53	40	60 - 140	134
		Acenaphthylene	µg/L	0.1	51	40	60 - 140	127
		Anthracene	µg/L	0.1	53	40	60 - 140	133
		Benzo(a)pyrene	µg/L	0.1	56	40	60 - 140	140
		Fluoranthene	µg/L	0.1	52	40	60 - 140	129
		Naphthalene	µg/L	0.1	50	40	60 - 140	126
		Phenanthrene	µg/L	0.1	52	40	60 - 140	131
		Pyrene	µg/L	0.1	51	40	60 - 140	128
	02-OCs	Aldrin	µg/L	0.1	4.1	4	60 - 140	102
		Delta-BHC	µg/L	0.1	5.1	4	60 - 140	126
		p,p-DDT	µg/L	0.1	3.7	4	60 - 140	93
		Dieldrin	µg/L	0.1	5.2	4	60 - 140	131
		Endrin	µg/L	0.1	3.8	4	60 - 140	94
		Heptachlor	µg/L	0.1	3.5	4	60 - 140	87
	03-OPs	Chlorpyrifos (Chlorpyrifos Ethyl)	µg/L	0.2	11	8	60 - 140	136
		Diazinon (Dimpylate)	µg/L	0.5	11	8	60 - 140	136
		Dichlorvos	µg/L	0.5	11	8	60 - 140	137
		Ethion	µg/L	0.2	11	8	60 - 140	133
	05-SVCH (Cl Benzenes,	Hexachlorobenzene (HCB)	µg/L	0.1	5.2	4	60 - 140	130
		Hexachlorobutadiene	µg/L	0.5	5.1	4	60 - 140	127
		Hexachloroethane	µg/L	0.5	5.1	4	60 - 140	127
		Pentachlorobenzene	µg/L	0.5	5.0	4	60 - 140	125
		1,2,3,4-tetrachlorobenzene	µg/L	0.5	5.3	4	60 - 140	133
	06-Phthalates	Bis(2-ethylhexyl)phthalate	µg/L	10	11	8	60 - 140	135
		Butyl benzyl phthalate	µg/L	1	9	8	60 - 140	114
		Di-n-butyl phthalate	µg/L	10	<10	8	60 - 140	124
		Diethyl phthalate	µg/L	5	11	8	60 - 140	135
		Dimethyl phthalate	µg/L	1	9	8	60 - 140	114
		Di-n-octyl phthalate	µg/L	1	11	8	60 - 140	137
		09-Nitrosamine	N-nitroso-di-n-propylamine (NDPA)	µg/L	1	34	32	60 - 140
	10-Nitroaromat	Pentachloronitrobenzene (quintozene)	µg/L	1	5	4	60 - 140	123

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.

Full 8270 SVOC in Water (continued)

Method: ME-(AU)-[ENV]JAN420

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB365142.002	14-Speciated Routine	2,4-dichlorophenol	µg/L	0.5	54	40	60 - 140 136
		Phenol	µg/L	0.5	49	40	60 - 140 122
		2,4,6-trichlorophenol	µg/L	0.5	53	40	60 - 140 132
		Pentachlorophenol	µg/L	0.5	54	40	60 - 140 134
	Surrogates	d5-phenol (Surrogate)	µg/L	-	2.5	2	40 - 130 127
		d5-nitrobenzene (Surrogate)	µg/L	-	0.63	0.5	40 - 130 126
		2-fluorobiphenyl (Surrogate)	µg/L	-	0.64	0.5	40 - 130 128
		2,4,6-Tribromophenol (Surrogate)	µg/L	-	6.3	5	40 - 130 125
		d14-p-terphenyl (Surrogate)	µg/L	-	0.61	0.5	40 - 130 122

Metals in Water (Dissolved) by ICPOES

Method: ME-(AU)-[ENV]JAN320

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB365313.002	Calcium, Ca	mg/L	0.2	57	50.5	80 - 120	113
	Lithium, Li	mg/L	0.005	0.097	0.1	80 - 120	97
	Magnesium, Mg	mg/L	0.1	53	50.5	80 - 120	106
	Potassium, K	mg/L	0.1	56	55	80 - 120	102
	Silicon, Si*	mg/L	0.05	0.27	0.25	80 - 120	107
	Sodium, Na	mg/L	0.5	54	50.5	80 - 120	106

Nitrite in Water

Method: ME-(AU)-[ENV]JAN277

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB365246.002	Nitrite Nitrogen, NO2 as N	mg/L	0.005	0.10	0.1	80 - 120	101

OC Pesticides in Water

Method: ME-(AU)-[ENV]JAN420

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB365142.002	Delta BHC	µg/L	0.1	0.2	0.2	60 - 140	109
	Heptachlor	µg/L	0.1	0.2	0.2	60 - 140	102
	Aldrin	µg/L	0.1	0.2	0.2	60 - 140	101
	Dieldrin	µg/L	0.1	0.2	0.2	60 - 140	109
	Endrin	µg/L	0.1	0.2	0.2	60 - 140	104
	p,p'-DDT	µg/L	0.1	0.2	0.2	60 - 140	96
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	µg/L	-	0.13	0.15	40 - 130 85

OP Pesticides in Water

Method: ME-(AU)-[ENV]JAN420

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB365142.002	Chlorpyrifos (Chlorpyrifos Ethyl)	µg/L	0.2	5.6	8	60 - 140	71
	Diazinon (Dimpylate)	µg/L	0.5	6.5	8	60 - 140	81
	Dichlorvos	µg/L	0.5	5.5	8	60 - 140	68
	Ethion	µg/L	0.2	6.8	8	60 - 140	85
	Surrogates	2-fluorobiphenyl (Surrogate)	µg/L	-	0.32	0.5	40 - 130 65
		d14-p-terphenyl (Surrogate)	µg/L	-	0.33	0.5	40 - 130 66

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]JAN420

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB365142.002	Naphthalene	µg/L	0.1	26	40	60 - 140	65
	Acenaphthylene	µg/L	0.1	28	40	60 - 140	71
	Acenaphthene	µg/L	0.1	27	40	60 - 140	67
	Phenanthrene	µg/L	0.1	29	40	60 - 140	72
	Anthracene	µg/L	0.1	28	40	60 - 140	70
	Fluoranthene	µg/L	0.1	29	40	60 - 140	72
	Pyrene	µg/L	0.1	30	40	60 - 140	74
	Benzo(a)pyrene	µg/L	0.1	28	40	60 - 140	71
	Surrogates	d5-nitrobenzene (Surrogate)	µg/L	-	0.32	0.5	40 - 130 64
		2-fluorobiphenyl (Surrogate)	µg/L	-	0.32	0.5	40 - 130 65
		d14-p-terphenyl (Surrogate)	µg/L	-	0.33	0.5	40 - 130 66

PCBs in Water

Method: ME-(AU)-[ENV]JAN420

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB365142.002	Arochlor 1260	µg/L	1	<1	0.4	60 - 140	113

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 Aqueous Samples

Method: ME-(AU)-[ENV]AN404

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB365358.002	Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	0.24	0.2	40 - 160	119
	Perfluorooctanoic acid (PFOA)	µg/L	0.01	0.17	0.2	40 - 160	84
	Perfluorononanoic acid (PFNA)	µg/L	0.01	0.23	0.2	40 - 160	113
	Perfluorodecanoic acid (PFDA)	µg/L	0.01	0.18	0.2	40 - 160	92
	Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	0.14	0.2	40 - 160	72
	Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	0.20	0.2	40 - 160	102
	Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0.21	0.2	40 - 160	106
	Perfluorooctane sulfonamide (FOSA)	µg/L	0.01	0.19	0.2	40 - 160	95

pH in water

Method: ME-(AU)-[ENV]AN101

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB365120.003	pH**	pH Units	0.1	7.4	7.415	98 - 102	100

Redox Potential (Eh) in water

Method: ME-(AU)-[ENV]AN240

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB365121.001	Eh of Sample Relative to Standard H+ Electrode***	mV	-500	428	428	90 - 110	100

Total and Volatile Suspended Solids (TSS / VSS)

Method: ME-(AU)-[ENV]AN114

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB365292.002	Total Suspended Solids Dried at 103-105°C	mg/L	5	99	100	80 - 120	99

Total Cyanide in water by Discrete Analyser

Method: ME-(AU)-[ENV]AN077/AN287

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB365400.002	Total Cyanide	mg/L	0.004	0.026	0.025	80 - 120	103

Total Phenolics in Water

Method: ME-(AU)-[ENV]AN295

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB365506.002	Total Phenols	mg/L	0.05	0.20	0.2	80 - 120	100

Total Phosphorus by Kjeldahl Digestion DA in Water

Method: ME-(AU)-[ENV]AN279/AN293

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB365355.002	Total Phosphorus (Kjeldahl Digestion) as P	mg/L	0.02	1.1	1	80 - 120	107

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB365316.002	Aluminium	µg/L	5	21	20	80 - 120	105
	Antimony	µg/L	1	20	20	80 - 120	98
	Arsenic	µg/L	1	20	20	80 - 120	99
	Barium	µg/L	1	21	20	80 - 120	105
	Beryllium	µg/L	1	20	20	80 - 120	101
	Boron	µg/L	5	22	20	80 - 120	108
	Cadmium	µg/L	0.1	21	20	80 - 120	104
	Chromium	µg/L	1	21	20	80 - 120	103
	Cobalt	µg/L	1	21	20	80 - 120	105
	Copper	µg/L	1	21	20	80 - 120	106
	Iron	µg/L	5	21	20	80 - 120	106
	Lead	µg/L	1	21	20	80 - 120	104
	Manganese	µg/L	1	21	20	80 - 120	103
	Molybdenum	µg/L	1	20	20	80 - 120	102
	Nickel	µg/L	1	21	20	80 - 120	104
	Selenium	µg/L	1	19	20	80 - 120	97
	Silver	µg/L	1	16	20	80 - 120	81

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 (Dissolved) in Water by ICPMS (continued)

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB365316.002	Strontium	µg/L	1	21	20	80 - 120	105
	Uranium	µg/L	1	22	20	80 - 120	111
	Vanadium	µg/L	1	20	20	80 - 120	102
	Zinc	µg/L	5	21	20	80 - 120	106

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB365142.002	TRH C10-C14	µg/L	50	790	1000	60 - 140	79
	TRH F Bands TRH >C10-C16	µg/L	60	800	1000	60 - 140	80

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB365155.002	Halogenated	1,1-dichloroethene	µg/L	0.5	63	45.45	60 - 140	139
	Aliphatics	1,2-dichloroethane	µg/L	0.5	49	45.45	60 - 140	108
		Trichloroethene (Trichloroethylene,TCE)		µg/L	0.5	50	45.45	60 - 140
	Halogenated	Chlorobenzene	µg/L	0.5	37	45.45	60 - 140	82
	Monocyclic	Benzene	µg/L	0.5	26	25	60 - 140	104
	Aromatic	Toluene	µg/L	0.5	27	25	60 - 140	107
		Ethylbenzene	µg/L	0.5	29	25	60 - 140	114
		m/p-xylene	µg/L	1	60	50	60 - 140	121
		o-xylene	µg/L	0.5	31	25	60 - 140	123
	Trihalomethan	Chloroform (THM)	µg/L	0.5	59	45.45	60 - 140	130

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB365155.002	TRH C6-C10	µg/L	50	380	400	60 - 140	95
	TRH C6-C9	µg/L	40	340	350	60 - 140	96

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 identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Ammonia Nitrogen by Discrete Analyser

Method: ME-(AU)-[ENV]AN291

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE291185.003	LB365246.004	Ammonia Nitrogen, NH ₃ as N	mg/L	0.01	2.4	<0.01	2.5	96

Anions by Ion Chromatography in Water

Method: ME-(AU)-[ENV]AN245

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE291211.001	LB365505.026	Nitrate Nitrogen, NO ₃ -N	mg/L	0.005	3.2	1.2	2	99

Filterable Reactive Phosphorus (FRP)

Method: ME-(AU)-[ENV]AN278

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE291185.003	LB365246.004	Filterable Reactive Phosphorus as P	mg/L	0.005	0.14	0.047	0.1	95

Forms of Carbon

Method: ME-(AU)-[ENV]AN190

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE291187.013	LB365203.005	Total Organic Carbon as NPOC	mg/L	0.2	61	19	50	85

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE291163.010	LB365712.004	Mercury, Hg	mg/L	0.0001	0.0021	<0.0001	0.008	106

Metals in Water (Dissolved) by ICPOES

Method: ME-(AU)-[ENV]AN320

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE291080.001	LB365313.004	Calcium, Ca	mg/L	0.2	66	10	50.5	111
		Magnesium, Mg	mg/L	0.1	57	3.4	50.5	105
		Potassium, K	mg/L	0.1	60	1.7	55	106
		Sodium, Na	mg/L	0.5	65	10	50.5	108

Nitrite in Water

Method: ME-(AU)-[ENV]AN277

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE291185.003	LB365246.004	Nitrite Nitrogen, NO ₂ as N	mg/L	0.005	0.088	<0.005	0.1	87

Total Cyanide in water by Discrete Analyser

Method: ME-(AU)-[ENV]AN077/AN287

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE291247.001	LB365400.014	Total Cyanide	mg/L	0.004	0.027	<0.004	0.025	105

Total Phenolics in Water

Method: ME-(AU)-[ENV]AN295

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE291307.001	LB365506.004	Total Phenols	mg/L	0.05	0.19	<0.05	0.2	98

Total Phosphorus by Kjeldahl Digestion DA in Water

Method: ME-(AU)-[ENV]AN279/AN293

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE291276.001	LB365355.028	Total Phosphorus (Kjeldahl Digestion) as P	mg/L	0.02	1.1	<0.02	1	106

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

QC Sample	Sample Number	Parameter	Units	LOR
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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 identifier 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 (continued)

Method: ME-(AU)-[ENV]AN318

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE291276.001	LB365316.004	Aluminium	µg/L	5	23	<5	20	110
		Arsenic	µg/L	1	22	<1	20	110
		Cadmium	µg/L	0.1	21	<0.1	20	104
		Chromium	µg/L	1	21	<1	20	103
		Copper	µg/L	1	21	<1	20	100
		Iron	µg/L	5	23	<5	20	112
		Lead	µg/L	1	21	<1	20	103
		Nickel	µg/L	1	21	1	20	99
		Zinc	µg/L	5	24	<5	20	102

VOCs in Water

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%	
SE291072.002	LB365155.025	Monocyclic	Benzene	µg/L	0.5	0	25	128	
			Aromatic	Toluene	µg/L	0.5	0.39642989860	25	122
				Ethylbenzene	µg/L	0.5	0	25	122
				m/p-xylene	µg/L	1	0.13269537289	50	121
				o-xylene	µg/L	0.5	0.05354996321	25	127
		Polycyclic	Naphthalene (VOC)*	µg/L	0.5	0.02656441859	-	-	
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	8.94258647823	-	98	
			d8-toluene (Surrogate)	µg/L	-	8.89861088001	-	101	
			Bromofluorobenzene (Surrogate)	µg/L	-	10.31805998860	-	96	
		Totals	Total BTEX	µg/L	3	0	-	-	

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number	Parameter	Units	LOR	Original	Spike	Recovery%	
SE291072.002	LB365155.025	TRH C6-C10	µg/L	50	0	400	88	
		TRH C6-C9	µg/L	40	0	350	92	
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	8.94258647823	-	98
			d8-toluene (Surrogate)	µg/L	-	8.89861088001	-	101
			Bromofluorobenzene (Surrogate)	µg/L	-	10.31805998860	-	96
		VPH F	Benzene (F0)	µg/L	0.5	0	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	0	-	-

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

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: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

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 identifier 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/en-au/industry/environmental-health-and-safety>

- * 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.
- NA Not Applicable
- 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.

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Appendix H – QA/QC Assessment

H1 QUALITY ASSURANCE / QUALITY CONTROL PROGRAM

Quality assurance comprises an assessment of the reliability of the field procedures and laboratory results against standard industry practices and the SAQP. A summary of the project QA/QC measures incorporated into this investigation is presented in **Table H-1**.

Table H-1 Project QC Measures

Task	Description	Project
Field QA/QC		
General	Work was to be undertaken following standard field procedures which are based on industry accepted standard practice.	Groundwater samples were obtained using sample bottles/vials provided by the laboratory.
	All fieldwork was supervised by a suitably qualified and experienced scientist or engineer.	Yes
Soil Screening with PID	The PID was serviced and calibrated as per manufacturer requirements. PID calibrated at the beginning of each day of fieldwork.	Yes
Equipment Decontamination	Sampling equipment to be decontaminated after the collection of each soil sample by washing with phosphate-free detergent and potable water, followed by a final distilled water rinse. One rinsate blank would be collected and analysed for the primary contaminants. All results should be non-detect.	All concentrations were reported as below the detection limits.
Transport	Samples stored in a chilled cooler box and transported to the laboratories. To ensure the integrity of the samples from collection to receipt by the analytical laboratory, samples were sent by courier to the laboratories under 'chain of custody' describing sample preservation and transport duration.	Yes
Trip Blanks	Trip blank samples were to be prepared and analysed by the primary laboratory for BTEX. Analytical results to be below the laboratory LOR, indicating satisfactory sample transport and handling conditions were achieved.	Yes
Trip Spikes	Trip spike samples were to be prepared and analysed by the primary laboratory for BTEX. Analytical results to be within 80-120% recovery, indicating satisfactory sample transport and handling conditions were achieved.	Yes

Task	Description	Project
Field Duplicates	Field duplicate samples were to be analysed as follows (as per NEPM): - intra-laboratory duplicates at a rate of 1 in 20 primary samples; and - inter-laboratory duplicates at a rate of 1 in 20 primary samples. Field and laboratory acceptable limits between 30-50% RPD as stated by AS4482.1-2005. RPDs that exceed this range may be considered acceptable where: - Results are less than 10 times the limits of reporting (LOR); - Results are less than 20 times the LOR and the RPD is less than 50%; or - Heterogeneous materials or volatile compounds are encountered. Non-compliance is to be documented in the report and the sample re-analysed or a higher level conservatively adopted.	Laboratory duplicates prepared and analysed. Minor non-conformance, with negligible effects on data use for interpretative purposes. Non-conformance included: Metals: Nitrite in water for samples MW3. Field QC samples and calculated RPD values are presented in Table H-5 at the end of this Appendix. Copies of laboratory reports are included in Appendix G.
<u>Laboratory QA/QC</u>		
Laboratory Analysis	The laboratories selected are NATA accredited for the analytes selected and perform their own internal QA/QC programs.	Yes SGS - primary laboratory EnviroLab - secondary laboratory Laboratory QA/QC analyses are included in Appendix G.
	Appropriate detection limits were used for the analyses to be undertaken.	Practical Quantitation Limits for all tested parameters during the investigation are presented in laboratory analytical reports in Appendix G.
Holding Times	Holding times are the maximum permissible elapsed time in days from the collection of the sample to its extraction and/or analysis. All extraction and analyses should be completed within standard guidelines.	Yes
Method Blanks	A method blank contains the reagents used to prepare the sample for final analysis. The purpose of this procedure is to identify contamination in the reagent materials and assess potential bias in the sample analysis due to contaminated reagents. The QC criterion aims to find no detectable contamination in the reagents. Each analysis procedure should be subject to a method blank analysis. The results of each should indicate that contaminants were not detected.	Yes

Task	Description	Project
Laboratory Duplicates	Laboratory duplicates are field samples that are split in the laboratory and subsequently analysed a number of times in the same batch. These sub-samples are selected by the laboratory to assess the accuracy and precision of the analytical method. The selected laboratories should undertake QA/QC procedures such as calibration standards, laboratory control samples, surrogates, reference materials, sample duplicates and matrix spikes. Intra-laboratory duplicates should be performed at a frequency of 1 per 10 samples.	Assessment of laboratory duplicates has been undertaken by the laboratory. All laboratory control standards were within acceptable ranges.
Laboratory Control Standard	A laboratory control standard is a standard reference material used in preparing primary standards. The concentration should be equivalent to a mid-range standard to confirm the primary calibration. Laboratory control samples should be performed on a frequency of 1 per 20 samples or at least one per analytical run.	Assessment of laboratory control standard has been undertaken by the laboratory. All laboratory control standards were within acceptable ranges.
Matrix Spikes	Matrix spikes are field samples to which a predetermined stock solution of known concentration has been added. The samples are then analysed for recovery of the known addition. Recoveries should be within the stated laboratory control limits of 70 to 130% and duplicates should have RPDs of less than 50%.	Assessment of matrix spikes has been undertaken by the laboratory. All laboratory control standards were within acceptable ranges.
Surrogate Spikes	Surrogate spikes provide a means of checking, for every analysis that no gross errors have occurred at any stage of the procedure leading to significant analyte loss. Recoveries should be within the stated laboratory control limits of 70 to 130%.	Assessment of surrogate spikes has been undertaken by the laboratory. All data quality objectives were met.
Conclusion	The QA/QC indicators should either all comply with the required standards or showed no variations that would have no significant effect on the quality of the data.	Assessment of the investigation QA/QC is presented in the following sections.

H2 RELATIVE PERCENTAGE DIFFERENCE (RPD) CALCULATION

The RPD values were calculated using the following equation:

$$RPD = \frac{|C_O - C_R|}{[(C_O + C_R)/2]} \times 100$$

Where:

C_O = Concentration obtained for the primary sample; and

C_R = Concentration obtained for the blind replicate or split duplicate sample.

H3 FIELD QA/QC

H3.1 Field QC Samples

The field (intra- / inter- laboratory) duplicate samples collected during the investigation are summarised in **Table H-2**. Inter-laboratory duplicates were analysed by the secondary laboratory, Envirolab.

Table H-2 Field QC Sampling Program

Matrix	Primary QA Sample	Duplicate (Primary Lab)	Triplicate (Secondary Lab)	Total Duplicates
Groundwater	MW3 (formerly BH3)	QD1	QT1	2

H3.2 Field QC Summary

Review of the field data quality indicators is presented in **Table H-3** below.

Table H-3 Field Data Quality Indicators

QA Component	Data Quality Indicator(s)	Conformance
Accuracy – a quantitative measure of the closeness of reported data to the “true” value	SOPs appropriate and complied with	Yes
	Results for inter-laboratory (split field) duplicates acceptable	Yes
Precision – A quantitative measure of the variability (or reproducibility) of data	SOPs appropriate and complied with	Yes
	Results for intra-laboratory (blind field) duplicates acceptable	Yes
Completeness – A measure of the amount of useable data from a data collection activity	Each critical location sampled	Yes
	Samples collected at targeted locations and depth	Yes
	SAQP appropriate and complied with	Yes
	Experienced sampler	Yes
	Field documentation correct	Yes

QA Component	Data Quality Indicator(s)	Conformance
Comparability – The confidence (expressed qualitatively) that data may be considered to be equivalent for each sampling and analytical event	Same sampling method used on each occasion/location	Yes
	Experienced sampler	Yes
	Same type of samples collected (filtered, size, fractions)	Yes
Representativeness – The confidence (expressed qualitatively) that data are representative of each medium present onsite	Appropriate media sampled according to SAQP	Yes
	Each media identified in SAQP sampled	Yes
	Appropriate sample collection methodologies, handling, storage and preservation techniques used	Yes

H3.3 Conclusion for the Field QA/QC

All field work, including equipment decontamination and sample preservation and transport, was conducted in general accordance with the SAQP, which were devised with reference to industry-approved guidelines. Appropriate QC measures were integrated into each sampling event and the DQIs were met.

All samples, including field QC samples, were transported to the primary and secondary laboratories under refrigerated conditions, using strict COC procedures. Relevant documents (COC forms) were presented with the samples at the times of delivery. All supporting documents (COCs and SRAs) were completed in full and signed, where appropriate. EI considered the field QA/QC program carried out during this investigation to be appropriate.

H4 LABORATORY QA/QC

H4.1 Laboratory Accreditation

Primary and intra-laboratory duplicate samples were analysed by SGS (located in Alexandria NSW), with inter-laboratory duplicate samples analysed by Envirolab (located in Chatswood NSW). All laboratories are accredited by NATA for the analyses undertaken.

H4.2 Laboratory QC Summary

Review of the laboratory data quality indicators is presented in **Table H-4** below.

Table H-4 Laboratory Data Quality Indicators

DQI	Item	Conformance
Completeness A measure of the amount of useable data (expressed as %) from a data collection activity	All critical samples analysed according to SAQP and proposal	Yes
	All analytes analysed according to SAQP in proposal	Yes
	Appropriate methods and PQLs	Yes
	Sample documentation complete	Yes

DQI	Item	Conformance
	Sample holding times complied with	Part
Comparability The confidence (expressed qualitatively) that data may be considered to be equivalent for each sampling and analytical event	Sample analytical methods used (including clean-up)	Yes
	Sample PQLs (justify/ quantify if different)	Yes
	Same laboratories (justify/ quantify if different)	Yes
	Same units (justify/ quantify if different)	Yes
Representativeness Confidence that data are representative of each media	All key samples analysed according to SAQP in the proposal	Yes
Precision A quantitative measure of the variability (or reproducibility) of data	Analysis of laboratory duplicates	Yes
	Analysis of field duplicates	Yes
	Analysis of laboratory-prepared volatile trip spikes	No
Accuracy A quantitative measure of the closeness of reported data to the true value	Analysis of field blanks	Yes
	Analysis of rinsate / rinsate blanks	Yes
	Analysis of method blanks	Yes
	Analysis of matrix spikes (MS)	Yes
	Analysis of surrogate spikes	Yes
	Analysis of reference materials	Not applicable
	Analysis of laboratory control samples	Yes

H4.3 Conclusion for the Laboratory QA/QC

All contracted laboratories (SGS and Envirolab) were accredited by NATA for the analyses undertaken. All analytical procedures used were industry recognised and endorsed standard methods. Appropriate QC measures were integrated into each testing batch and the DQIs were met, or if not, the variability was suitably justified.

All final reports were submitted in full and included all requested analyses, as per the signed COC forms. EI considered the laboratory QA/QC programs carried out during this investigation to be appropriate.

H5 SUMMARY OF PROJECT QA/QC

The sampling (including sample preservation, transport and decontamination procedures) and laboratory methods followed during this investigation were consistent with EI protocols. The project DQOs specified in **Section 3.4.1** were considered to have been achieved. The adopted QA/QC program ensured that the data collated during the GME were accurate, precise and representative of the site condition. It was therefore considered that the data were sufficiently precise and accurate and that the results could be used for interpretative purposes.

Appendix I – DCR and Works Surrender Form

Completion report for dewatering work

Providing a completion report is a condition of the approval and a copy of the completed form **must** be supplied **when or before you surrender the approval** to finalise the dewatering activity. You cannot surrender the approval without it.

All the information to be supplied is specified within this form.



To complete the form, you will be required to gather data at the commencement of works and during the dewatering activity.

How to use this form

Use this form to record and report groundwater taken by aquifer interference activities¹

Section A to E:

These sections require information on the following:

Approval held, dewatering duration/groundwater source, details of person taking water, activity description and location.

Section F to I:

For these sections you will be required to gather data at the commencement of works and during the dewatering activity.

Information to enter includes:

Summary of total water taken, record of metered volumes taken, summary of water level measurements from monitoring bores and water testing undertaken.

Note:

- Information must be supplied in accordance with approval held, refer to approval.
- To measure volumes, a meter must be used⁷.
- Excel soft copies of measurement data may also be required. Please ensure these are provided in accordance with the instructions shown in that section.

Section J:

Complete form declaration.

Refer to the end of the form for information on:

- Returning completed forms and any attachments
- Where to get help
- Privacy Statement
- Notes section

Section A: Approval held

Report submission date	
Dewatering approval number	
Approval expiry date	
Date received (Office use only)	

Section B: Dewatering duration / groundwater source

Dewatering duration	Days/Weeks/Months/Years
Dewatering start date	
Dewatering end date	
Groundwater source ²	

Section C: Details of person taking water³

Full name		
Company/organisation (including ACN/ABN)		
Postal address		
Suburb	State	Postcode
Phone number		
Email		

Section D: Activity description

Project name
Describe the activity/s resulting in groundwater being taken ⁴
Describe the means by which the groundwater is being taken ⁵
Is your dewatering activity exempt from obtaining a water access licence under the Water Management (General) Regulation 2018 ☐ Yes ☐ No
If no, please provide your water access licence number

Section E: Activity location

Address		
Suburb	State	Postcode
or		
Lot / Deposited Plan / Section		
or		
GPS coordinates ⁶ (for example, 32.25316 S 148.60022 E)		

Section F: Summary of total water taken

Provide the below in accordance to approval held. **Important:** a meter must be used to measure volumes⁷.

1. Duration of dewatering (pumping) ⁸ either a) or b):		
a) ☐ for water year	1 July	to 30 June
b) ☐ during dewatering period	From	to
2. Total volume pumped in either a), b) or c) units ⁹		
a) ☐ in Litres		L
b) ☐ in Kilolitres		kL
c) ☐ in Megalitres		ML

Section G: Record of metered volumes taken

Complete this section to record **metered** volumes taken. Either **daily** or **weekly** readings are required.

Refer to the conditions of your approval and the exemption (if applicable) to determine the reading frequency you need to provide.

Notes:

- A meter must be used to measure volumes⁷.
- Please update the table required.
- If entries are longer than 5 lines, provide an Excel spreadsheet soft copy with the data. If a soft copy is provided - use the same headings and naming conventions as per the required daily or weekly table following.

Daily

Are any attachments included? ☐ Yes ☐ No
If yes, provide attachment name/s

Meter brand type		Meter serial number	
------------------	--	---------------------	--

Start date and time	Start meter reading	End date and time	End meter reading	Volume taken	Units (L, kL, ML)	Date and time record made

Weekly

If entries are longer than 5 lines, provide an Excel spreadsheet soft copy with the data. If provided in soft copy - use the same headings and naming conventions as per the table below.

Are any attachments included? ☐ Yes ☐ No
If yes, provide attachment name/s

Meter brand type		Meter serial number	
------------------	--	---------------------	--

Week ending	Start date and time	Start meter reading	End date and time	End meter reading	Volume taken	Units (L, kL, ML)	Date and time record made

Section H: Summary of water level measurements from monitoring bores

Refer to the approval you hold to determine if required. If required, enter information in the table below and provide all measurement data separately in an Excel spreadsheet (soft copy).

If automatic loggers are used, the default Excel output soft copy, will be accepted provided it includes all the relevant measurement data and units.

If automatic loggers are not used, the Excel output soft copy must include as a minimum the following:

- Bore ID
- Date
- Time
- Water level measurement (m below MP)
- Measuring point description
- Measuring point RL (m AHD)
- Comments.

Are any attachments included? ☐ Yes ☐ No
If yes, provide attachment name/s

Bore ID	Measuring point RL (m AHD)	Depth to water before dewatering (m)	Depth to water during dewatering (m)	Depth to water after dewatering (m)	File name of measurements spreadsheet attached
<i>For Example: MB1</i>	<i>1.000</i>	<i>0.5</i>	<i>4.0</i>	<i>0.6</i>	<i>MB1.xlsx</i>

Section I: Water testing undertaken

Information supporting these entries must be captured and supplied as an attachment in Excel soft copy form:

Are any attachments included?	☐ Yes	☐ No
If yes, provide attachment name/s		

a) Range in pH measured	
b) Range in electrical conductivity (Salinity) in ($\mu\text{S}/\text{cm}$)	
c) Any other exceedance of water quality criteria?	☐ Yes (specify below) ☐ No

Exceedance(s)

Section J: Declaration

I declare all information contained in this record is accurate, true and complete.

Signature		Date	
Name/Company officeholder			
Position		Phone	
Address			
Suburb		State	Postcode
Email			

Giving false or misleading information is a serious offence under Part 5A of the *Crimes Act 1900*. It is an offence under section 91J of the *Water Management Act 2000* for a person to make a statement or furnish information in or in connection with a metering record required to be kept that the person knows to be false or misleading in a material particular.

Privacy statement

The personal information that is provided in this form will be managed by WaterNSW in accordance with its Privacy Procedure, or other such Policy document as updated from time to time. The information provided in this form is being collected and used for purposes relating to the Record confirmation of specified matters before water is taken described in this form to the *Water Management Act 2000* (NSW). The information provided in this form may be disclosed to public authorities and other authorised parties as required.

If you choose not to provide the requested information in this form, you may not be able to take water and you may be in breach of the *Water Management Act 2000*. You have the right to request access to, and correct details of, your personal information held by WaterNSW. Further information regarding privacy can be obtained from waternsw.com.au/privacy.

Returning completed forms

Please return your completed form/s and any attachments to:

Customer.Helpdesk@waternsw.com.au

In the subject line: Dewatering completion report - Approval (Approval reference number)
or

WaterNSW
PO Box 398
Parramatta NSW 2124

Where to get help

Further information is available at:

waternsw.com.au/dewatering | 1300 662 077 | Customer.Helpdesk@waternsw.com.au

Notes

1. **Aquifer interference activity** has the same meaning as set out in the Dictionary to the *Water Management Act 2000* which is an activity involving any of the following:
 - a. the penetration of an aquifer,
 - b. the interference with water in an aquifer,
 - c. the obstruction of the flow of water in an aquifer,
 - d. the taking of water from an aquifer in the course of carrying out mining, or any other activity prescribed by the regulations,
 - e. the disposal of water taken from an aquifer as referred to in paragraph d).
2. Refer to your approval for the **groundwater source** you are taking water from.
3. For infrastructure or construction projects this may be the **applicants' representative** for example a contractor.
4. **Describe the activity/s taking groundwater** while conducting the aquifer interference activity, and the number of works involved.
For example:
 - extraction using a battery of 15 spear points to dewater a building construction site
 - groundwater extracted from a permanent sump in a building basement
 - groundwater extracted from a trench or excavation
5. Examples of the **means by which the groundwater is taken** include surface pump, airlift, downhole/submersible pump, bailer, water removed with ground materials, water freely draining from a cutting, pit seepage / inflow, evaporation from artificial lake that has filled from groundwater. Where several means of take are involved please identify the number and type of each.
6. Please provide GPS coordinates as longitude and latitude in decimal degrees.
7. Metering equipment must be used to measure volumes. Metering equipment consists of a meter and a data logger. **Telemetry is not required.** However, other metering equipment and standards may be specified by a condition of the water supply work approval.
In the **event metering equipment becomes faulty**, you must report within 24 hours to WaterNSW at waternsw.com.au/s91i. An offence applies under section 91A of the *Water Management Act 2000* for failing to report faulty metering equipment within 24 hours.
8. For Section F - I: Duration of dewatering (pumping) is elapsed time between the start and end dates for a period of continuous take. If the period of take extends over more than one water year, annual reporting may be required. This record must be retained for five years.
9. Record the **total volume of groundwater taken** in the water year/s for the groundwater source in either litres (L), kilolitres (kL) or megalitres (ML).