Douglas PARTNERS

GROUNDED EXPERTISE

Groundwater Management Plan

Uniting War Memorial Hospital Waverley (Uniting Waverley)

Birrell Street, Bronte Road, Church Street and Carrington Road, Waverley NSW

Prepared for The Uniting Church in Australia Property Trust (NSW) for Uniting NSW.ACT

Project 204088.03

26 February 2025

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Document History

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The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

Signature	Date
Author	26 February 2025
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Douglas Partners acknowledges Australia's First Peoples as the Traditional Owners of the Land and Sea on which we operate. We pay our respects to Elders past and present and to all Aboriginal and Torres Strait Islander peoples across the many communities in which we live, visit and work. We recognise and respect their ongoing cultural and spiritual connection to Country.

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Groundwater Management Plan
Uniting War Memorial Hospital Waverley (Uniting Waverley)
Birrell Street, Bronte Road, Church Street and Carrington Road, Waverley NSW

1. Introduction

This Groundwater Management Plan (GMP) has been prepared by Douglas Partners Pty Ltd (Douglas) for the Waverley Uniting War Memorial Hospital development (Uniting Waverley) which is bounded by Birrell Street, Bronte Road, Church Street and Carrington Road, Waverley NSW (the site). The GMP was commissioned on behalf of The Uniting Church in Australia Property Trust (NSW) for Uniting NSW.ACT.

This GMP was prepared in response to the Planning Secretary's Environmental Assessment Requirements (SEARs) dated 18 August 2023 issued for the State Significant Development (SSD-61389706) application.

This GMP is based on the geological / hydrogeological conditions and laboratory test results on groundwater from geotechnical investigations undertaken for this project. It provides comments on groundwater management and dewatering for disposal off-site during and post construction.

As part of the submission for the SSD, Douglas has prepared a separate Groundwater Impact Assessment (ref: Report No. 204088.03.R.003.Rev0, dated January 2025), which provides the results of groundwater monitoring, hydraulic conductivity testing of bedrock and description of the subsurface conditions encountered in the geotechnical investigation, as well as an estimate of groundwater inflow rates to the basement and anticipated changes to groundwater levels on adjacent areas during construction and in the long term. The Groundwater Impact Assessment (GIA) should be read in conjunction with this GMP.

2. Proposed development

It is understood that the proposed development comprises a Residential Aged Care Facility (RACF), Independent Living Units (ILUs), Community and Ancillary Land Uses at the Uniting War Memorial Hospital Site.

The proposal involves the construction and operation of Seniors Housing at the Uniting War Memorial Hospital Site (Uniting Waverley), comprising:

- Earthworks involving cut and fill;
- Tree removal;
- Demolition of existing structures on the northern and western portion of the Subject Site;
- Demolition of Cadi Cottage;
- Adaptive Reuse of 3 heritage buildings (Ellerslie, Banksia and Wych Hazel, and Church St Cottages);

- Augmentation of existing services and infrastructure such as water, power, and sewer;
- Construction of basement car parking comprising 478 car parking spaces;
- Construction of a 6-storey Residential Aged Care Facility (RACF), including:
  - 105 beds;
  - Consulting rooms and staff administration areas;
  - Ancillary land uses including a salon, cafe, chapel; and
  - Community facilities including a seniors' gym.
- Construction of 4-7-storey Independent Living Unit (ILU) buildings , including:
  - 231 units (including Affordable Rental Housing units);
- Construction of proposed driveway on Bronte Road and secondary driveways on Birrell St; and
- Provision of associated landscaping.

It is understood that the proposed development will include two drained basements with multiple basement levels. These basements are:

- A connected two-level basement carparking under proposed buildings A, B, C and D (Basement A, Figure 4). Lowest finished floor levels (FFL) of Basement A are as follows:
  - RL 79 m AHD under Building D, B+C (western portion);
  - RL 82 m AHD under Building A (eastern portion);
- A one to two-level basement carparking under proposed buildings E, F and G (Basement B, Figure 4). The lowest finished floor level of Basement B is approximately RL 86 m AHD:

Basement A will be constructed first. Construction of Basement B will commence approximately two years later. Basement A and Basement B will eventually be connected.

An excerpt showing the basement outline is shown in Figure 1.

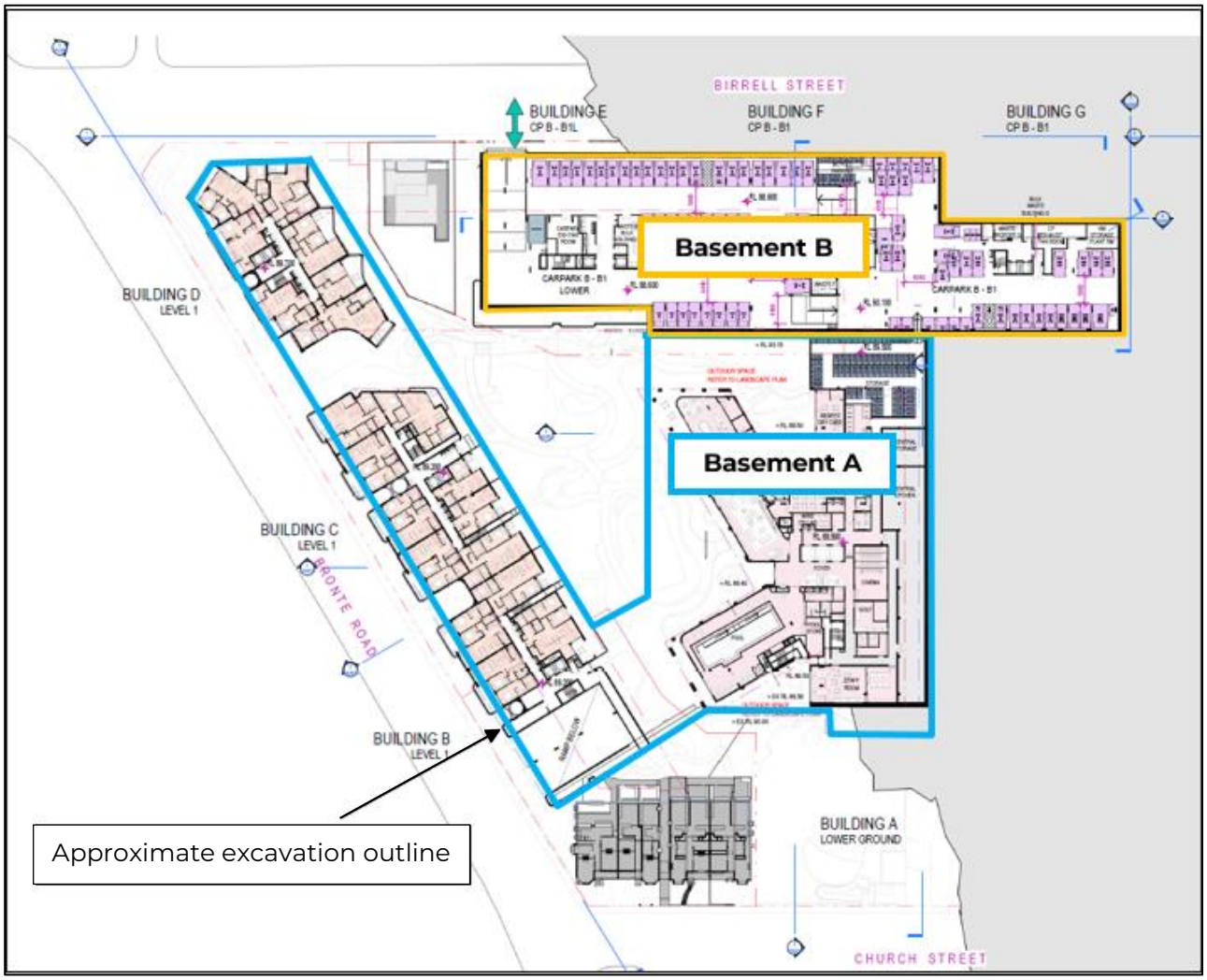

Figure 1: Excerpt of architectural drawings showing basement outline

It is also understood that the basement will feature a stepped profile, as shown in Figure 2. Based on the architectural drawings provided, it is anticipated that excavation of up to 13 m will be required in some areas of the site. Part of the basement excavation is therefore expected to intercept the water table and dewatering will be required.

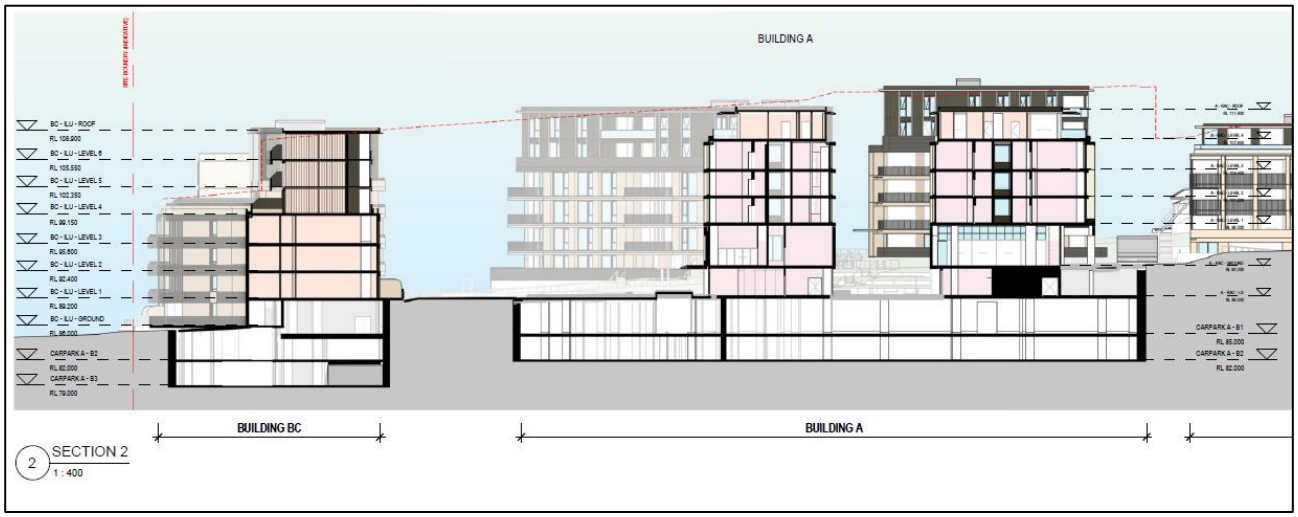

Figure 2: Excerpt of architectural drawings showing stepped basement profile

3. Groundwater conditions

The proposed basement will intercept groundwater and dewatering will be required. Groundwater level and quality monitoring has been undertaken as part of the geotechnical and groundwater investigation (Douglas, 2024). A summary of the results is provided below.

Four groundwater wells were installed within the site: BH1, BH3, BH6 and BH8 (Drawing 1, Appendix B). A summary of the well installation details is shown in Table 1.

Table 1: Summary of well installation details

Borehole	Surface Level (mAHD)	Screen Depth (m)	Screened Material
BH1	86.3	4.5 – 9.1	Sandstone
BH3	85.8	4.5 – 9.0	Sandstone
BH6	94.2	3.5 – 12.1	Sandstone
BH8	91.6	4.8 – 11.7	Sandstone

3.1 Groundwater levels

Downhole data-loggers were installed in the monitoring wells after the initial reading to allow long-term monitoring between August 2023 and October 2024 and were re-installed in December 2024 until January 2025. A summary of the logger data is provided in Table 2. The hydrographs are attached in Appendix B.

Groundwater levels have generally been observed between 84 m and 92 m AHD. Groundwater levels were generally stable and responded to climatic variations following significant rainfall events.

Spikes in response to rainfall were observed in BH6 until December 2023. From 2024, these spikes were no longer recorded and only attenuated responses to climatic variations were observed. The cause of these early groundwater level spikes that subsequently ceased is unknown.

Table 2: Summary of groundwater monitoring results (logger data)

Borehole (Well)	Screened lithology	Datalogger Installation Date	Groundwater Level During Monitoring Period (m AHD)		
			Minimum	Maximum	Average
BH1	Sandstone	09/08/2023	83.8 (07/12/2023)	84.7 (13/05/2024)	84.2
BH3	Sandstone	11/08/2023	83.5 (27/10/2023)	84.2 (21/01/2025)	83.8
BH6	Sandstone	04/08/2023	91.4 (27/10/2023)	94.3 (16/08/2023)	91.6
BH8	Sandstone	04/08/2023	89.2 (07/12/2023)	90.3 (07/06/2024)	89.6

The groundwater levels should be expected to fluctuate with climatic conditions and other factors.

3.2 Groundwater quality

3.2.1 Groundwater quality results

Groundwater quality testing was undertaken in the monitoring wells following their installation in August 2023, and in December 2024. The analyte list is consistent with recommendations of NSW DPIE (2021):

- Dissolved heavy metals: arsenic (As), cadmium (Cd), chromium (Cr), cobalt (Co), copper (Cu), iron (Fe), lead (Pb), manganese (Mn), mercury (Hg), zinc (Zn);
- Total recoverable hydrocarbon (TRH);
- Benzene, toluene, ethyl benzene (BTEX);
- Polycyclic aromatic hydrocarbons (PAH);
- Organochlorine pesticides (OCP);
- Organophosphorus pesticides (OPP);
- Polychlorinated biphenyls (PCB);
- Phenols;
- volatile chlorinated hydrocarbons (VOCs);
- Major anions: Sulfate (SO4), chloride (Cl), fluoride (F);
- Major cations: Calcium (Ca), magnesium (Mg), sodium (Na), potassium (K);
- Nutrients: Ammonia (NH3), nitrate (NO3), total nitrogen (N), total phosphorus (P);
- Electrical conductivity (EC);

- pH;
- Redox potential (Eh);
- Total dissolved solids (TDS);
- Total hardness; and
- Dissolved oxygen (DO).

A summary of the groundwater quality analytical results is presented in Appendix C. The results were compared to the ANZG (2018) guideline values for level of 95% level of protection for fresh aquatic ecosystems. Laboratory certificates (results of groundwater analysis) and chain of custody are also attached in Appendix C.

The stabilised groundwater field parameters were recorded within the temporary observation wells prior to sampling. The field parameters are summarised below:

- The dissolved oxygen levels indicated generally anoxic conditions;
- The pH was slightly acidic;
- The electrical conductivity values are typical of fresh water as would be expected of Hawkesbury Sandstone;
- Redox potential (Eh) indicates slightly oxidising conditions; and
- No light non-aqueous phase liquid (LNAPL) was observed whilst sampling or detected using the interface probe.

All results for PAH, phenol, OCP, OPP and PCB were below the PQLs (noting that the PQL for a number of OCP and OPP are higher than the guideline values). All concentrations of TRH, BTEX and VOC were below the guideline values.

Most analytical results for dissolved metals were below the guideline values with the exception of the following:

- Chromium at 5 µg/L (August 2023) and 6 µg/L (December 2024) in BH3 which exceeded the ANZG 95% level of protection (LOP) for fresh water of 1 µg/L;
- Copper in all samples (ranging from 2 to 6 µg/L) in August 2023, and in BH3 and BH6 (at 2 µg/L) in December 2024 which exceeded the 95% LOP for fresh water of 1.4 µg/L;
- Nickel 31 µg/L (August 2023) and 16 µg/L (December 2024) in BH3 which exceeded the 95% LOP for fresh water of 11 µg/L; and
- Zinc in all samples (ranging from 22 to 55 µg/L) which exceeded the 95 % LOP for fresh water of 8 µg/L.

Based on experience in the area, the concentrations of these metals in groundwater are considered likely to be attributed to the background concentrations that would be associated with the mineralogy of the sandstone and possibly urban influences.

As some metal concentrations exceeded the SAC adopted for the environmental assessments (Section 4.1) groundwater is likely to require treatment prior to disposal. These exceedances are typical in urban runoff and shallow groundwater, and do not usually preclude disposal to stormwater once surplus water has been treated.

3.3 Predicted groundwater inflow

Groundwater inflow modelling was carried out for the GIA (Douglas, 2025). It is understood that construction would take a total of 48 months (4 years). Basement A would be constructed during the first half of the construction period (i.e., during the first two years) and Basement B during the second half.

Modelling results suggest that during the early stages of construction, inflow rates will be higher and will then gradually decrease as the hydraulic gradient around the excavation decreases. Inflows during early dewatering works are predicted to be about 76 L/min. Towards the end of the first year of dewatering, inflows are predicted to be about 9 L/min and further reduce to about 4 L/min in the long-term. The predicted inflow is about 7 ML over the first year of excavation and an annual inflow of about 2 ML in the long term.

A summary of the inflow assessment results under baseline conditions is provided in Table 3. More information and results of the sensitivity analyses can be found in the GIA report (Douglas, 2025).

Table 3: Base case - simulated groundwater inflow with time

Year	Elapsed Time (days)	Dewatering Inflow Rate		
		Volume (m^3 / day)	Inflow rate (L / s)	Cumulative Inflow (ML)
1 (Basement A only)	1	102	1.3	7.0 (Cumulative during first year)
	2	84	1.0	
	5	70	0.8	
	11	55	0.7	
	22	42	0.5	
	45	31	0.4	
	91	23	0.3	
	182	17	0.2	
	365	14	0.2	
2 (Basement A only)	730	11	0.1	4.0
3 (Basements A + B)	1095	11	0.1	4.1
4 (Basements A + B)	1460	10	0.1	3.5
Long term				
> 5 (Basements A + B)	Post-construction	m^3 / day	L / min	ML / year
		6	0.1	2.3

4. Recommended dewatering management strategy

This section outlines the proposed management strategy. It is noted that this GMP is based on groundwater impact predictions, measured groundwater levels and quality conditions, and the proposed development with consideration of the immediate surrounding built environment. This GMP may require further review and revision if modifications of the proposed development, construction processes, groundwater management strategies occur or if an observed impact that was not predicted occurs.

4.1 Groundwater inflow control

Based on the groundwater impact assessment (Douglas, 2025), dewatering rates are expected to be relatively low (ranging from 1 to 0.1 L/s). These flows, both in the short and long term, should be readily controllable by pumping from sumps for discharge to the surrounding ground. Given the relatively low expected inflow volumes, standard subfloor drainage systems should be sufficient to direct the seepage water into the sumps.

Appropriate planning should be in place to monitor and compensate for possible variations in the actual inflow rate. If higher inflows are encountered, grouting would be required to reduce the inflows.

4.2 Water quality control

Groundwater removed from dewatering operations needs to be managed and disposed of in accordance with the requirements of the *Protection of the Environment Operations Act 1997* (POEO Act).

It is understood that dewatering of the site is planned to be undertaken with disposal of surplus water to the stormwater system, under approval from Waverley Council.

In line with Waverley Council's stormwater regulations, groundwater quality must be tested prior to discharge to prevent contamination and adverse impacts during construction. The recommended methodology for water quality testing (in line with Waverley Council's requirements) is as follows:

- Collection of water samples and quality control samples from dewatering wells;
- Measurement of general groundwater physical parameters (EC, pH and temperature) prior to sampling using a calibrated water quality meter;
- Analysis of the samples by a NATA accredited laboratory for the analytes presented in Table 4 below; and
- Review and update of this water quality testing methodology as required.

Water quality sampling should be conducted in accordance with Geoscience Australia's Groundwater Sampling and Analysis – A Field Guide (Geoscience Australia 2009).

Quality assurance / quality control (QA / QC) procedures should be used to establish accurate, reliable and precise results. QA / QC procedures should include calibration of equipment, analyses of samples within holding times, keeping samples chilled and wearing gloves during sampling.

Table 4: Proposed suite of analytes for water quality monitoring

Category	Analytes
Field parameters	T, EC, pH, turbidity
Physical properties	TDS, TSS
Major ions	Calcium, magnesium, sodium, potassium, chloride, sulphate and alkalinity (total, carbonate and bicarbonate)
Metals (total and dissolved)	Arsenic, aluminium, cadmium, chromium, copper, iron, mercury, manganese, nickel, lead and zinc
Nutrients	Total nitrogen, total Kjeldahl nitrogen, nitrite, nitrate, ammonia, total phosphorus and reactive phosphorus
Organics	TRH / TPH, BTEX, phenols, PAH, VOC, oil and grease
Other	PFAS

Notes: EC: electrical conductivity | TDS: total dissolved solids | TSS: total suspended solids
TRH: total recoverable hydrocarbons | TPH: total petroleum hydrocarbons
BTEX: benzene, toluene, ethylbenzene and xylenes
PAH: polycyclic aromatic hydrocarbons
VOC: volatile organic compounds
PFAS: per- and polyfluorinated substances

4.2.1 Acceptance criteria

Water quality results should be compared to selected assessment criteria (SAC) for each analyte. The SAC would be chosen based on site-specific groundwater quality results (Section 3.2), relevant guidelines and Council's requirements.

In line with Waverley Council's stormwater system and WateNSW's requirements, the following assessment criteria are recommended as a screening level for disposal to stormwater:

- ANZG, '*Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2018*' (ANZG, 2018);
- ANZECC, '*Australian Water Quality Guidelines 2000*', Tables 3.3.2 to 3.3.3 Default trigger values for physical and chemical stressors in south-east Australia for slightly disturbed ecosystems (ANZECC, 2000);
- Where the above guidelines do not specify trigger levels for any analytes present in the samples, the water discharge is to comply with endorsed guideline and recommendations issued by the EPA (Waverley Council, 2024); and
- NSW DPIE (2021) requirements.

For stormwater disposal, the recommended SAC are the 95% level of protection for non-bioaccumulating contaminants, and the 99% level of protection for bioaccumulating contaminants for freshwater ecosystems.

4.3 Management options

Any water requiring off-site disposal can be managed under the three management options shown below in Table 5.

The preferred disposal option is discharge to stormwater following on-site treatment (if required). Based on groundwater quality testing done for the site and predicted dewatering rates, this option is considered feasible.

As per Waverley Council's water management technical manual (Waverley Council, 2021), stormwater discharge of less than 25 L/s can be directed to the street kerb and gutter providing compliance with the requirements listed on page 18 of the manual. Predicted dewatering rates for the development range from 1 to 0.1 L/s (Section 3.3), and are therefore well below the 25 L/s limit for discharge to kerb and gutter. Ongoing monitoring and testing would be undertaken to confirm surplus water meet the stormwater acceptance criteria (refer to Section 4.2.1).

The other two options listed in Table 5 would be considered as contingency plans.

Table 5: Summary management options

Management Option	Comments
On-site treatment (if required) and disposal to stormwater.	Generally applicable where the treatment required is routine e.g., solids removal, alum dosing and pH adjustment. Treatment of specific contaminants may require more physical space and result in higher treatment costs. Stormwater disposed water is typically required to meet general NSW DPIE requirements (NSW DPIE 2021 & 2022), ANZG (2018) water quality standards for the relevant receiving water body and any associated uses. Further requirements may be enforced depending on the specific approval documentation.
Disposal to the sewer under a Trade Waste Agreement with Sydney Water.	Generally, will require further negotiation and establishment of water quality criteria prior to disposal. Water quality screening levels will depend on the specific trade waste agreement with Sydney Water.
Tanker off-site for disposal at an aqueous treatment plant by a suitably licenced contractor.	May be suitable for more heavily contaminated liquids where on-site treatment is not practicable. Appropriate as a contingency strategy. Can be limited in applicability for larger volumes of water. Water quality screening levels will depend on specific requirements of the contractor.

Sydney Water has a general policy of only issuing a trade waste agreement for disposal of water from excavations where all other options have been exhausted.

Off-site disposal of water by a tanker is generally only considered suitable in cases where periodic / batch disposal of groundwater is required (e.g., ephemeral water sources / rainfall / minor seepage only). Where continuous discharge is anticipated, this option is not feasible from an economic and / or environmental (i.e., emissions) perspective given the requirement to transport large volumes via truck at distance. It may be considered as a contingency strategy if any notable contamination which may be outside the operating capacity of the on-site treatment system is identified prior to disposal.

4.4 Monitoring and reporting requirements

The following monitoring program and associated reporting is to be adopted until the end of excavation and construction works on-site. Groundwater level monitoring should be continued to one month after construction. It should be noted that ongoing monitoring may also be required post-construction as an approval and licence condition.

Table 6: Monitoring and reporting requirements

Item	Monitoring requirements	Methodology
Visual inspection	No visible oil and grease, 'sheen' and / or no significant discolouration or odours. Inspections to be conducted from stored liquids in the intermediate flocculation tank.	Daily inspections (contractor). **HOLD POINT - If any of the visual inspection signs are noted, then any discharge will be suspended until further analytical testing is completed**.
Groundwater level monitoring	Groundwater level recording from the monitoring wells to assess drawdown in the vicinity of the site. Existing wells are proposed to be used for monitoring (Drawing 1, Appendix B). If destroyed during construction, they will need to be replaced.	Continuous groundwater level monitoring using data logger recording at six-hourly intervals (or more frequently) in monitoring wells in the vicinity of the site. Groundwater level monitoring is to be undertaken during construction and to be continued one month after cessation of dewatering. Quarterly manual groundwater level measurements in monitoring wells.
Water quality sampling and testing	Samples to be collected from the sumps for analysis of water parameters set out in Table 4.	Water quality testing is to be undertaken until the end of construction. Water quality testing should be conducted either monthly or at a minimum before each discharge event. Sample analysis by a NATA accredited laboratory. Samples will be recorded using industry standard documentation, including the date, name and signature of the sampler and sample ID. **HOLD POINT – If abstracted water concentrations exceed criteria, then**

Item	Monitoring requirements	Methodology
		discharge is to be halted. Contingency strategy to be adopted. Physical parameters (temperature, pH, turbidity and electrical conductivity, oil and grease) may be monitored using suitable on-site probes / testing kits once correlations are established with analytical results. Inclusion of results in a final water quality monitoring report.
Quality control sampling	Collection of replicate samples to verify quality of laboratory results. Testing suite to include: • Metals (dissolved); • TRH; • BTEX; and • PAH.	During each sampling event. Samples will be recorded using industry standard COC documentation, including the date, sample ID, name and signature of sampler, and transportation records to the NATA accredited laboratory. Inclusion of results in a final water quality monitoring report
Quantity of groundwater inflows	Measurements of groundwater volumes abstracted by dewatering system.	Weekly monitoring and recording of dewatering volumes. **HOLD POINT - If dewatering volumes are close to water access licence entitlements, construction will be halted to minimize inflows (e.g., grouting) and additional unit-shares may need to be acquired.** Weekly reporting of volumes to the Environmental Consultant. Inclusion of results in a final water monitoring report
Dewatering completion report	To be prepared by a suitably qualified consultant upon completion of all dewatering works. The summary report will incorporate the above information and: • Any on-site records kept by the contractor (e.g., visual observations, any unexpected finds records, etc.); • All analytical results (i.e., each batch of water disposed) compared to the adopted assessment criteria; • Quality control testing; • Record of dewatering volumes; and • Comment on any unexpected finds or non-conformances, and / or otherwise if the dewatering works have complied with this GMP.	

Notes: Testing frequency, assessment criteria and analysis requirements may be reviewed in consultation with the Environmental Consultant based on ongoing results.

4.5 Contingency plan

As per Section 4.3, at any hold point if any non-conformance is encountered then dewatering will be suspended. The following general contingency plan will be enacted:

- Should water quality be deemed unsuitable for disposal, suspend dewatering and treat water prior to discharge;
- Should dewatering volumes be higher than predicted or higher than discharge limits provided by relevant authorities, suspend construction and reduce pumping rates. Options may include grouting to reduce groundwater inflows;
- Notify the Site Manager / Contractor and Environmental Consultant;
- Environmental Consultant to inspect the site / unexpected finds and collect additional water quality samples as advised; and
- Written confirmation by the Environmental Consultant that disposal may resume (e.g., upon receipt of laboratory results).

4.6 Dewatering approvals

Approval will need to be obtained from Waverley Council for dewatering and discharge into their stormwater systems. A Dewatering Management Plan (DMP) will be prepared and submitted with Waverley Council's dewatering application form (Waverley Council, 2024).

5. References

ANZECC. (2000). Australian Water Quality Guidelines 2000', Tables 3.3.2 to 3.3.3 Default trigger values for physical and chemical stressors in south-east Australia for slightly disturbed ecosystems .

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Waverley Council. (2024). Application for Temporary Dewatering form. Available at https://www.waverley.nsw.gov.au/__data/assets/pdf_file/0003/204465/Application_Temporary_Dewatering.pdf.

6. Limitations

Douglas Partners (Douglas) has prepared this report for this project at Birrell Street, Bronte Road, Church Street and Carrington Road, Waverley NSW in accordance with the contract and permission to proceed received from Don Wang on behalf of Uniting War Memorial Hospital Waverley (Uniting Waverley). The work was carried out under the existing contract between Uniting Waverley and Douglas. This report is provided for the exclusive use of Uniting Waverley for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of Douglas, does so entirely at its own risk and without recourse to Douglas for any loss or damage. In preparing this report Douglas has necessarily relied upon information provided by the client and / or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and / or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after Douglas' field testing has been completed.

Douglas' advice is based upon the conditions encountered during current and previous geotechnical investigations. The accuracy of the advice provided by Douglas in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and / or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

The assessment of atypical safety hazards arising from this advice is restricted to the geotechnical components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. Douglas cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by Douglas. This is because this report has been written as advice and opinion rather than instructions for construction.

The scope of work for this report did not include the assessment of surface or sub-surface materials or groundwater for contaminants, within or adjacent to the site. Should evidence of fill of unknown origin be noted in the report, and in particular the presence of building demolition materials, it should be recognised that there may be some risk that such fill may contain contaminants and hazardous building materials.

Appendix A

About This Report

About this Report

October 2024

Introduction

These notes have been provided to amplify Douglas' report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

Douglas' reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

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

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, Douglas will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, Douglas cannot always anticipate or assume responsibility for:

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

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

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, Douglas requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. Douglas would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

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

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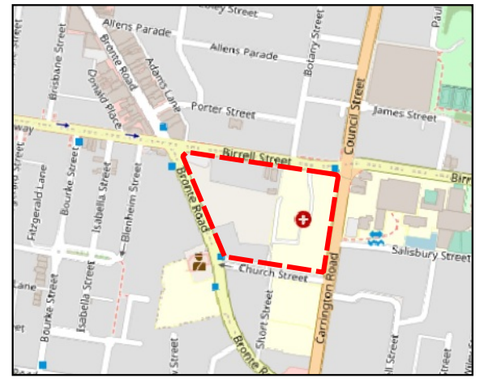
Appendix B

Drawing 1 – Locations of Boreholes and Groundwater Monitoring Wells

Hydrographs



Locality Plan

LEGEND

- Borehole Location
- Approximate Proposed Building Footprint
- Approximate Proposed Building Footprint
- Approximate Proposed Building Footprint
- Approximate Proposed Building G Footprint
- Approximate Site Boundary
- Geotechnical Cross Section

NOTE:
1: Basemap from Metromap (Dated 26.07.2023)
2: Proposed Ground Level and Basement 01-02 Outlines from Architectus, Project No. 170454.00, Drawing Nos. DA1100, 1099 & 1098, Issue C (Dated 07.08.2023)

0 10 20 30 40 50 60 70 80 90 100 m

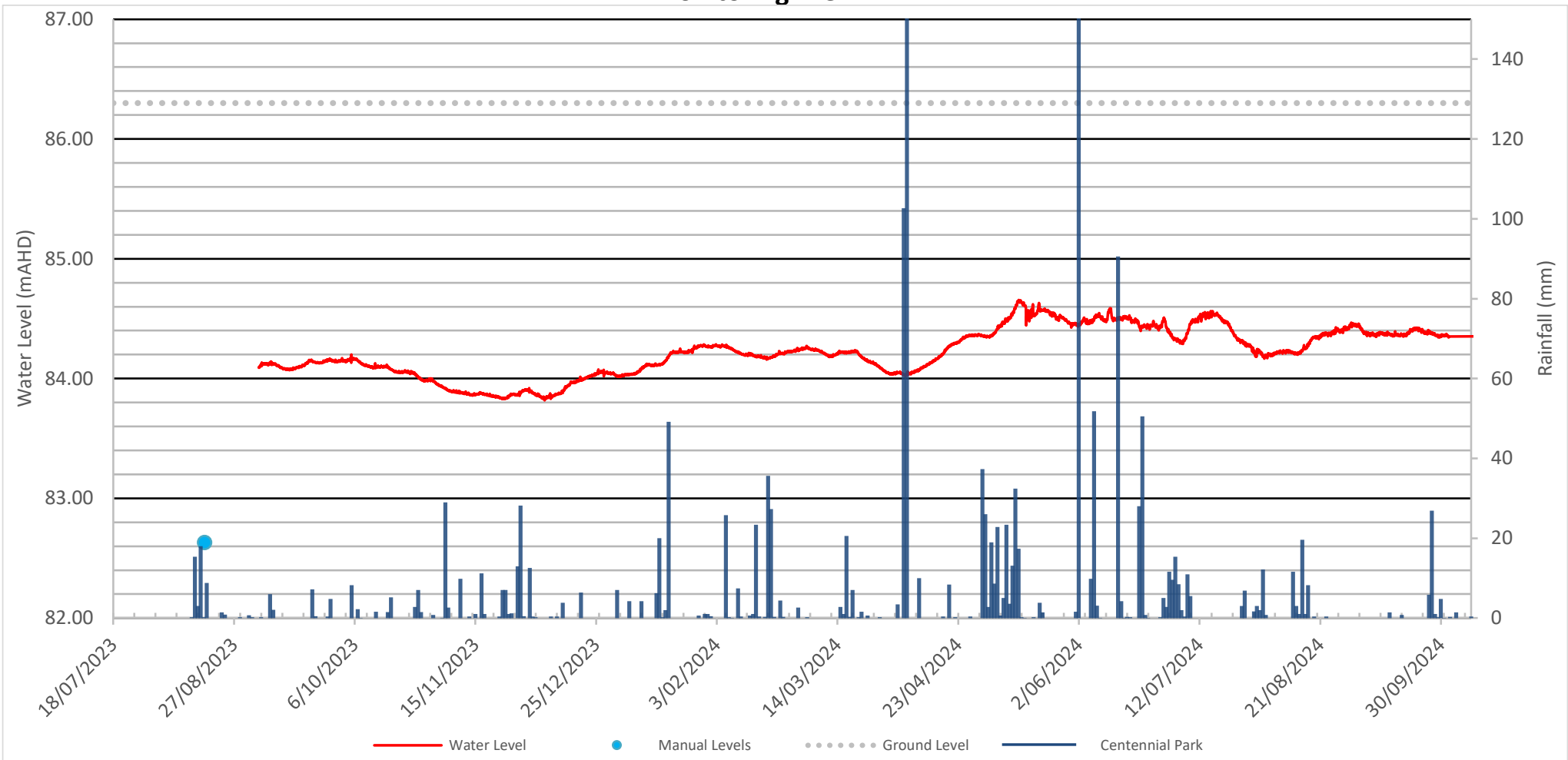
1:1000 @ A3

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: The Uniting Church in Australia Property Trust (NSW) for Uniting NSW.ACT		TITLE: **Test Location Plan**
OFFICE: Sydney	DRAWN BY: MN	**Proposed Redevelopment**
SCALE: 1:1000 @ A3	DATE: 07.09.2023	**Uniting Waverley, Birrell Street, Bronte Road and Church Street**

PROJECT No: 204088.00
DRAWING No: 1
REVISION: 0

Monitoring Well: BH1

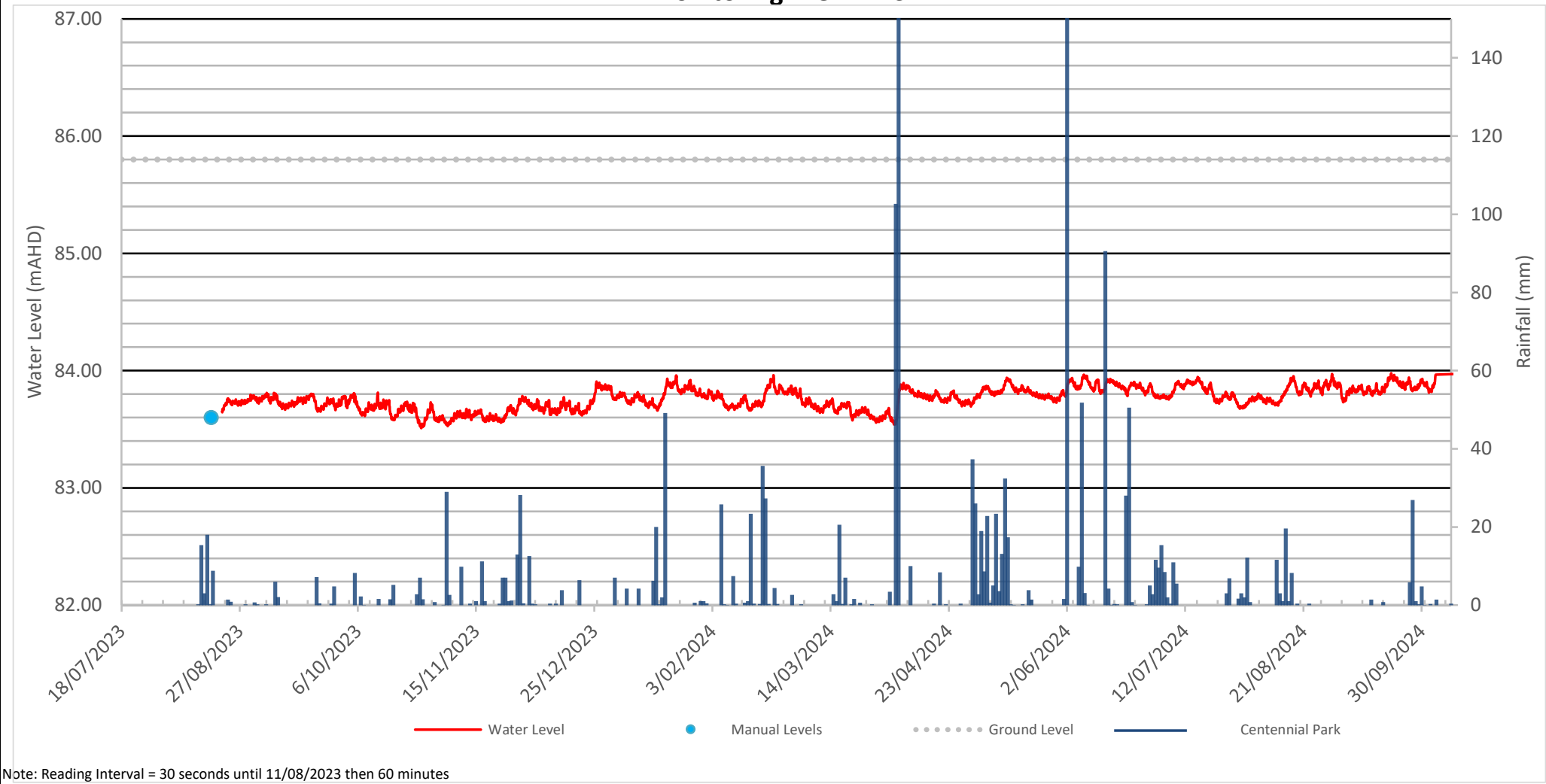


Note: Reading Interval = 30 seconds until 09/08/2023 then 60 minutes

Douglas PARTNERS

From	Drawn:
9/08/2023	LHS
To	**Date:**
2/10/2024	21/11/2024

Monitoring Well: BH3

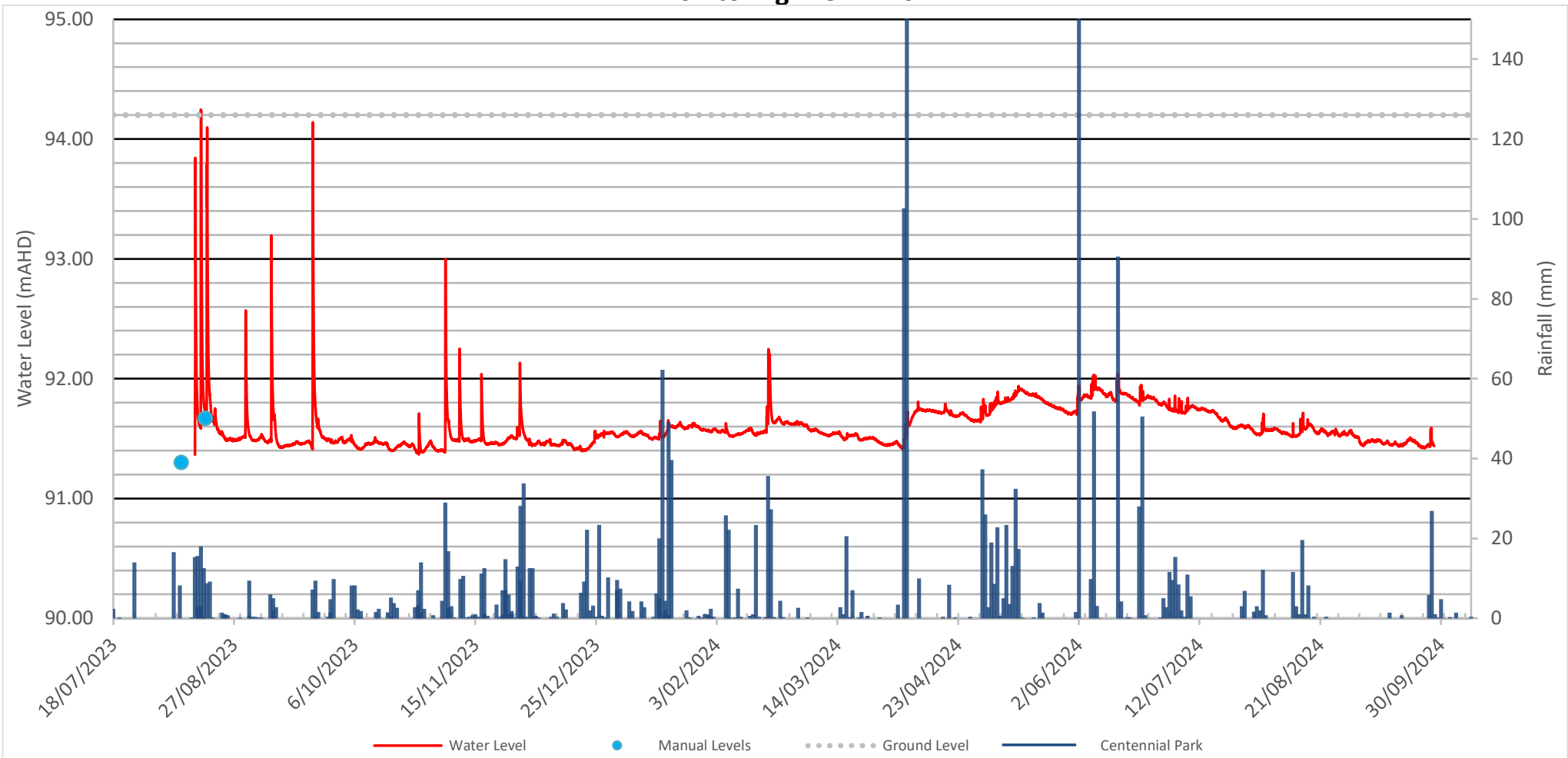


Note: Reading Interval = 30 seconds until 11/08/2023 then 60 minutes

Douglas PARTNERS

From	Drawn:
11/08/2023	LHS
To	**Date:**
4/10/2024	21/11/2024

Monitoring Well: BH6

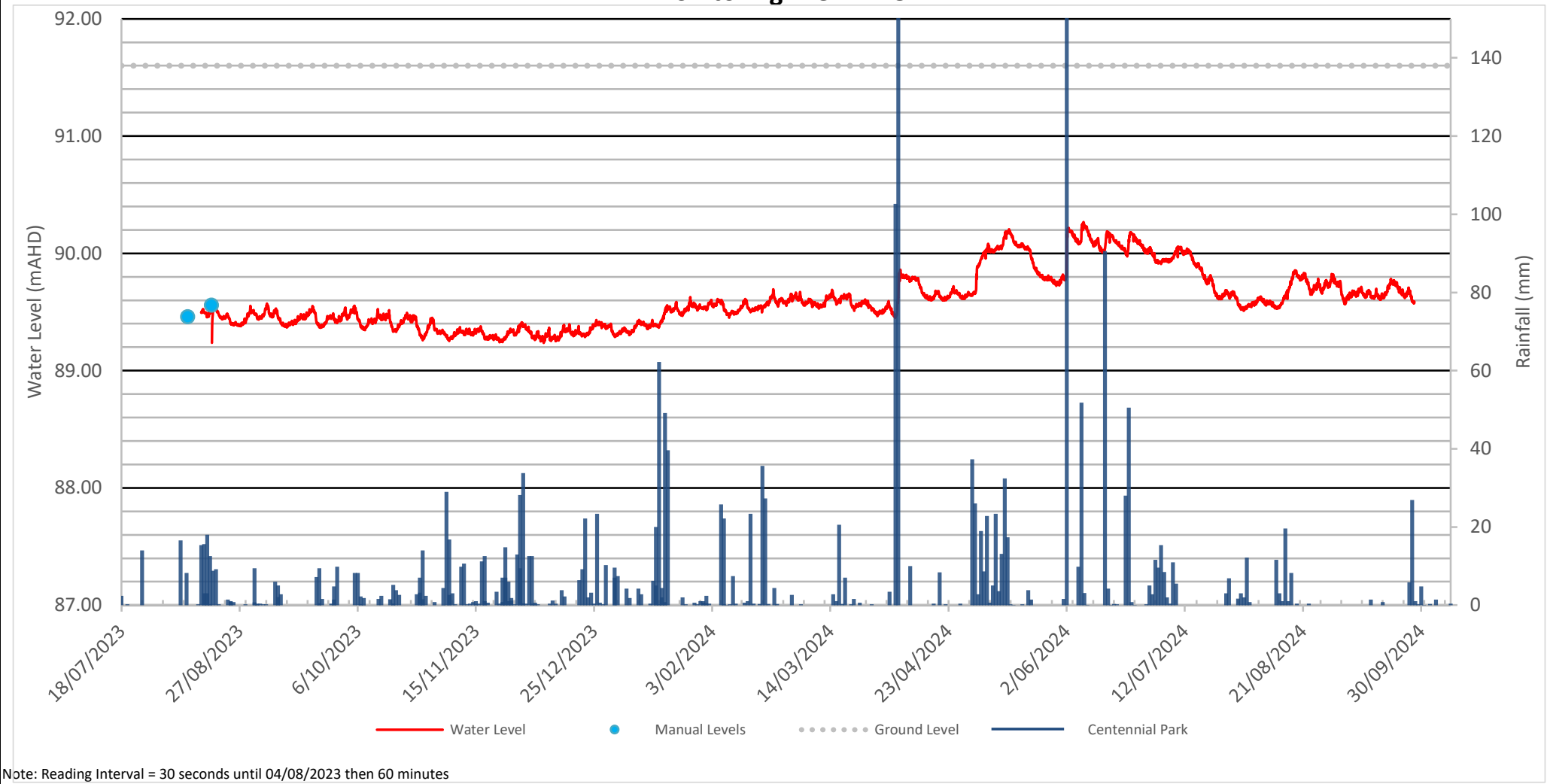


Note: Reading Interval = 30 seconds until 04/08/2023 then 60 minutes

Douglas PARTNERS

From	Drawn:
4/08/2023	LHS
To	**Date:**
27/09/2024	21/11/2024

Monitoring Well: BH8

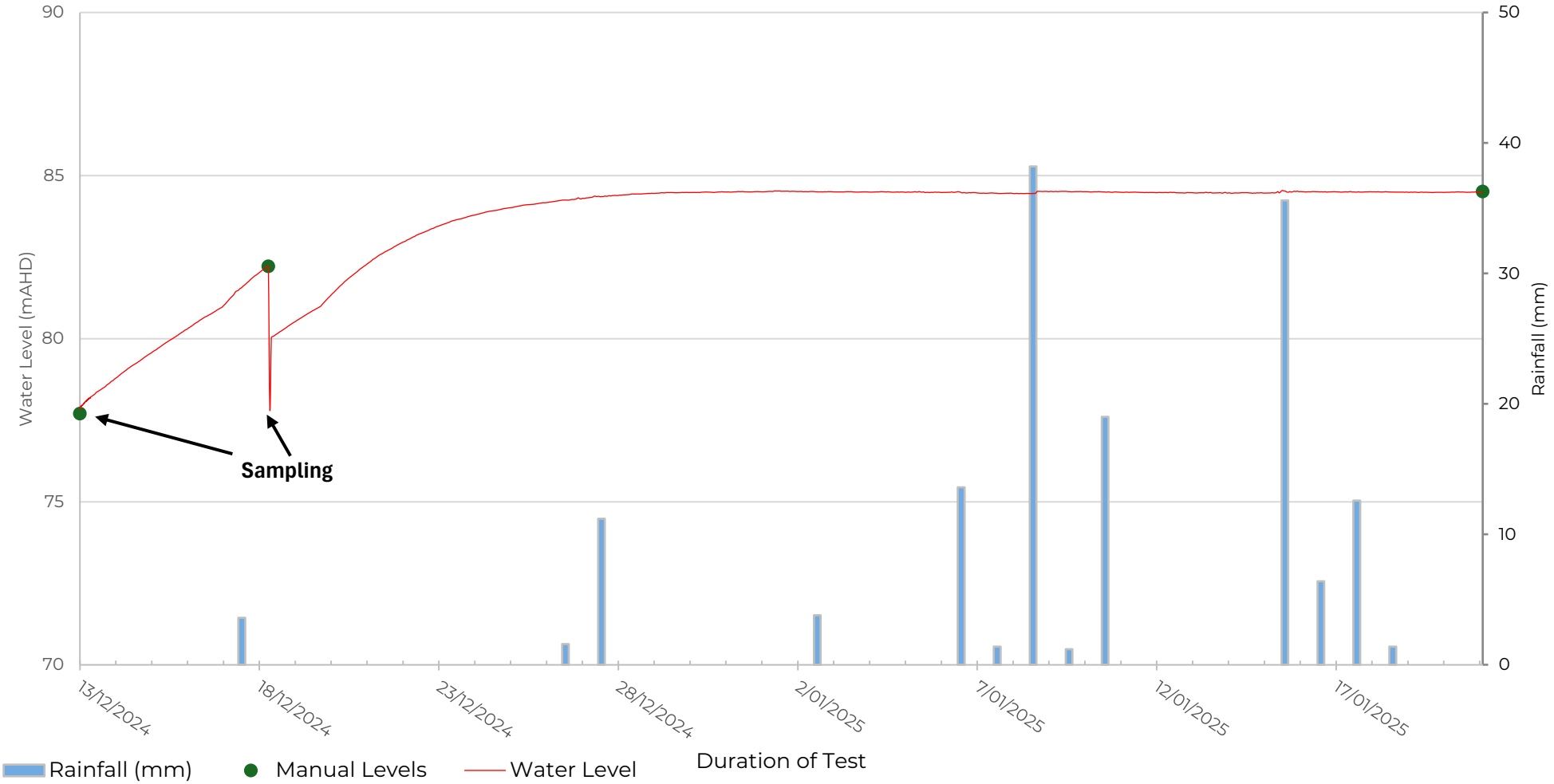


Note: Reading Interval = 30 seconds until 04/08/2023 then 60 minutes

Douglas PARTNERS

From	Drawn:
4/08/2023	LHS
To	**Date:**
27/09/2024	21/11/2024

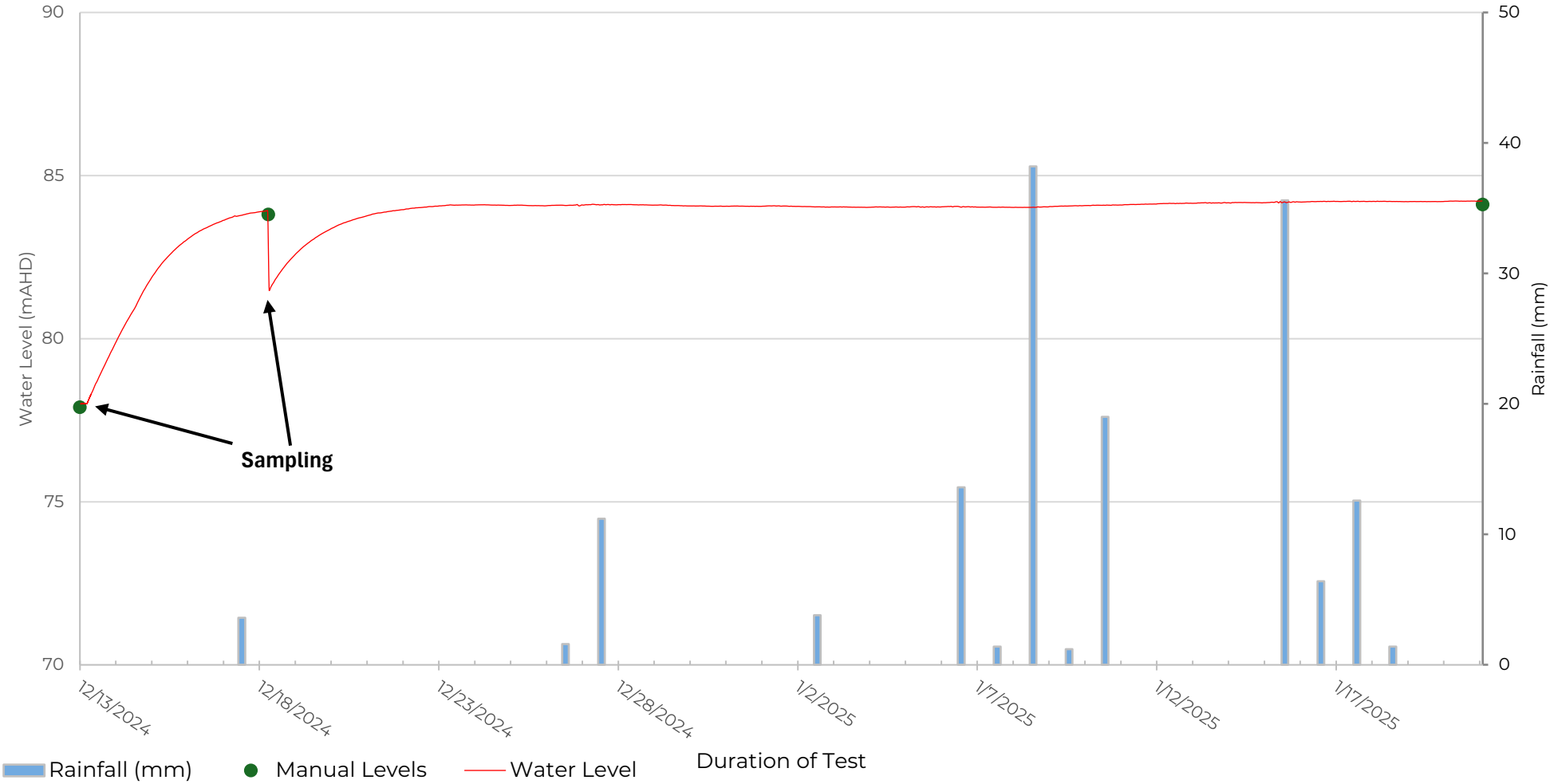
BH01 Groundwater Monitoring



Douglas PARTNERS | GROUNDED EXPERTISE

Borehole:	Borehole Depth: (mBGL)	From:	Drawn:
BH01	9	13/12/2024	ECB
Project:	**Surface RL: (mAHD)**	**To:**	**Checked:**
204088.03	86.3	21/01/2025	PH

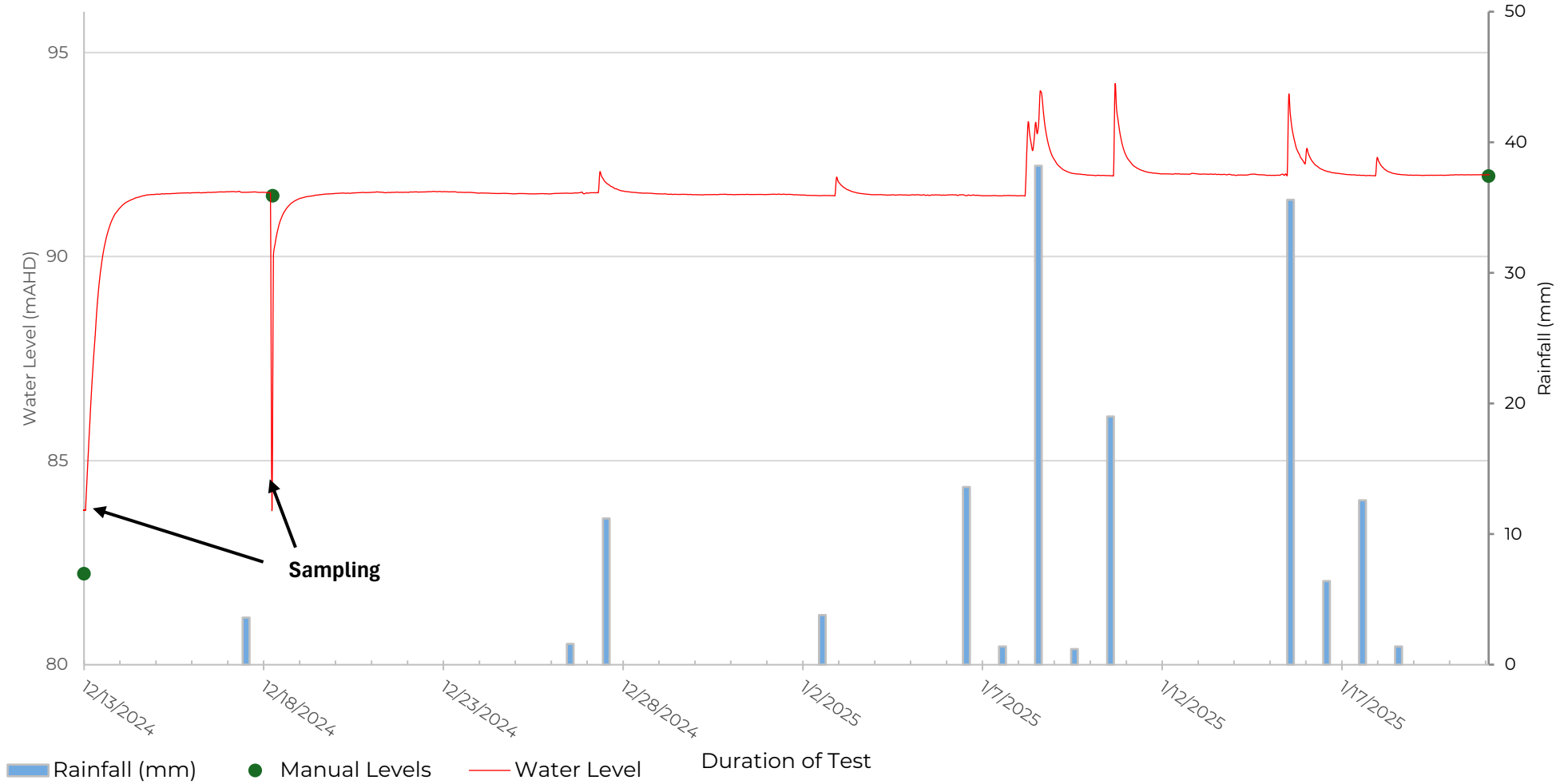
BH03 Groundwater Monitoring



Douglas PARTNERS | GROUNDED EXPERTISE

Borehole:	Borehole Depth: (mBGL)	From:	Drawn:
BH03	9	13/12/2024	ECB
Project:	**Surface RL: (mAHD)**	**To:**	**Checked:**
204088.03	85.8	21/01/2025	PH

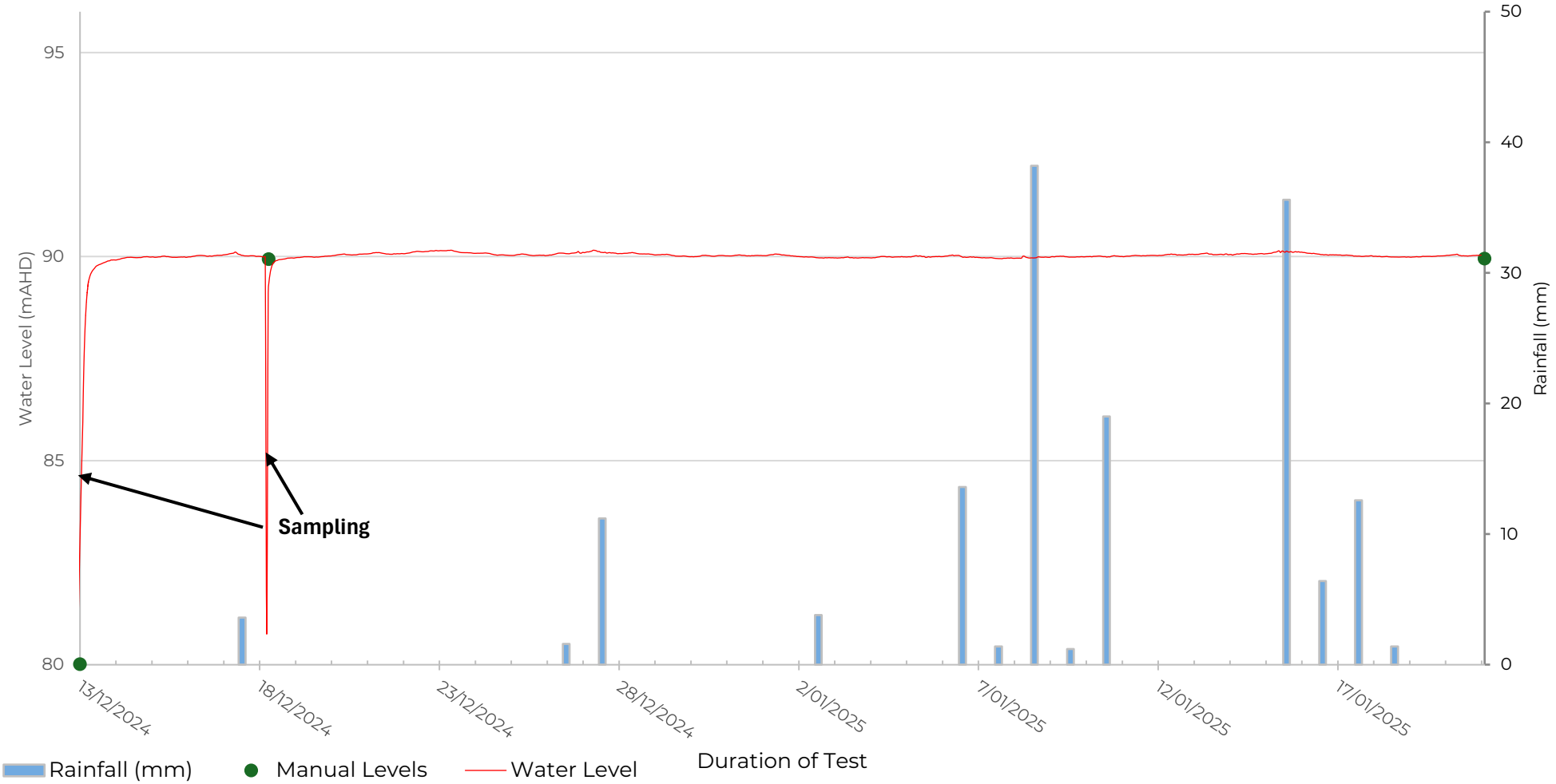
BH06 Groundwater Monitoring



Douglas PARTNERS | GROUNDED EXPERTISE

Borehole:	Borehole Depth: (mBGL)	From:	Drawn:
BH03	12.1	13/12/2024	ECB
Project:	**Surface RL: (mAHD)**	**To:**	**Checked:**
204088.03	94.2	21/01/2025	PH

BH08 Groundwater Monitoring



Douglas PARTNERS | GROUNDED EXPERTISE

Borehole:	Borehole Depth: (mBGL)	From:	Drawn:
BH08	12.1	13/12/2024	ECB
Project:	**Surface RL: (mAHD)**	**To:**	**Checked:**
204088.03	91.6	21/01/2025	PH

Appendix C

Results of Laboratory Tests on Groundwater

Chain of Custody

Table A1 – Summary of Results on Groundwater

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

CERTIFICATE OF ANALYSIS 330913

Client Details

Client	Douglas Partners Pty Ltd
Attention	Paul Gorman
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**204088.01 Waverley**
Number of Samples	3 Water
Date samples received	18/08/2023
Date completed instructions received	18/08/2023

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	25/08/2023
Date of Issue	24/08/2023

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Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Diego Bigolin, Inorganics Supervisor
Dragana Tomas, Senior Chemist
Loren Bardwell, Development Chemist
Steven Luong, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

VOCs in water				
Our Reference		330913-1	330913-2	330913-3
Your Reference	UNITS	BH1	BH3	BH8
Date Sampled		17/08/2023	17/08/2023	17/08/2023
Type of sample		Water	Water	Water
Date extracted	-	21/08/2023	21/08/2023	21/08/2023
Date analysed	-	22/08/2023	22/08/2023	22/08/2023
Dichlorodifluoromethane	µg/L	<10	<10	<10
Chloromethane	µg/L	<10	<10	<10
Vinyl Chloride	µg/L	<10	<10	<10
Bromomethane	µg/L	<10	<10	<10
Chloroethane	µg/L	<10	<10	<10
Trichlorofluoromethane	µg/L	<10	<10	<10
1,1-Dichloroethene	µg/L	<1	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1	<1
1,1-dichloroethane	µg/L	<1	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1
Chloroform	µg/L	1	<1	6
2,2-dichloropropane	µg/L	<1	<1	<1
1,2-dichloroethane	µg/L	<1	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1	<1
1,1-dichloropropene	µg/L	<1	<1	<1
Cyclohexane	µg/L	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1
Benzene	µg/L	<1	<1	<1
Dibromomethane	µg/L	<1	<1	<1
1,2-dichloropropane	µg/L	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1
Bromodichloromethane	µg/L	<1	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1	<1
Toluene	µg/L	<1	2	<1
1,3-dichloropropane	µg/L	<1	<1	<1
Dibromochloromethane	µg/L	<1	<1	<1
1,2-dibromoethane	µg/L	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1

VOCs in water				
Our Reference		330913-1	330913-2	330913-3
Your Reference	UNITS	BH1	BH3	BH8
Date Sampled		17/08/2023	17/08/2023	17/08/2023
Type of sample		Water	Water	Water
Bromoform	µg/L	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2
Styrene	µg/L	<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1	<1
o-xylene	µg/L	<1	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1	<1
Isopropylbenzene	µg/L	<1	<1	<1
Bromobenzene	µg/L	<1	<1	<1
n-propyl benzene	µg/L	<1	<1	<1
2-chlorotoluene	µg/L	<1	<1	<1
4-chlorotoluene	µg/L	<1	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1	<1
Tert-butyl benzene	µg/L	<1	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1	<1
Sec-butyl benzene	µg/L	<1	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1	<1
4-isopropyl toluene	µg/L	<1	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1	<1
n-butyl benzene	µg/L	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1	<1
Surrogate Dibromofluoromethane	%	100	101	98
Surrogate toluene-d8	%	94	95	94
Surrogate 4-BFB	%	103	104	103

vTRH(C6-C10)/BTEXN in Water				
Our Reference	UNITS	330913-1	330913-2	330913-3
Your Reference		BH1	BH3	BH8
Date Sampled		17/08/2023	17/08/2023	17/08/2023
Type of sample		Water	Water	Water
Date extracted	-	21/08/2023	21/08/2023	21/08/2023
Date analysed	-	22/08/2023	22/08/2023	22/08/2023
TRH C_6 - C_9	µg/L	<10	<10	<10
TRH C_6 - C_{10}	µg/L	<10	<10	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10	<10
Benzene	µg/L	<1	<1	<1
Toluene	µg/L	<1	2	<1
Ethylbenzene	µg/L	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2
o-xylene	µg/L	<1	<1	<1
Naphthalene	µg/L	<1	<1	<1
Surrogate Dibromofluoromethane	%	100	101	98
Surrogate toluene-d8	%	94	95	94
Surrogate 4-BFB	%	103	104	103

svTRH (C10-C40) in Water				
Our Reference		330913-1	330913-2	330913-3
Your Reference	UNITS	BH1	BH3	BH8
Date Sampled		17/08/2023	17/08/2023	17/08/2023
Type of sample		Water	Water	Water
Date extracted	-	22/08/2023	22/08/2023	22/08/2023
Date analysed	-	23/08/2023	23/08/2023	23/08/2023
TRH C_{10} - C_{14}	µg/L	<50	150	<50
TRH C_{15} - C_{28}	µg/L	<100	<100	<100
TRH C_{29} - C_{36}	µg/L	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	150	<50
TRH >C_{10} - C_{16}	µg/L	<50	160	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50	160	<50
TRH >C_{16} - C_{34}	µg/L	<100	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	160	<50
Surrogate o-Terphenyl	%	81	75	80

PAHs in Water				
Our Reference		330913-1	330913-2	330913-3
Your Reference	UNITS	BH1	BH3	BH8
Date Sampled		17/08/2023	17/08/2023	17/08/2023
Type of sample		Water	Water	Water
Date extracted	-	22/08/2023	22/08/2023	22/08/2023
Date analysed	-	24/08/2023	24/08/2023	24/08/2023
Naphthalene	µg/L	<0.2	<0.2	<0.2
Acenaphthylene	µg/L	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d14	%	99	93	106

Organochlorine Pesticides in Water				
Our Reference		330913-1	330913-2	330913-3
Your Reference	UNITS	BH1	BH3	BH8
Date Sampled		17/08/2023	17/08/2023	17/08/2023
Type of sample		Water	Water	Water
Date extracted	-	22/08/2023	22/08/2023	22/08/2023
Date analysed	-	24/08/2023	24/08/2023	24/08/2023
alpha-BHC	µg/L	<0.2	<0.2	<0.2
HCB	µg/L	<0.2	<0.2	<0.2
beta-BHC	µg/L	<0.2	<0.2	<0.2
gamma-BHC	µg/L	<0.2	<0.2	<0.2
Heptachlor	µg/L	<0.2	<0.2	<0.2
delta-BHC	µg/L	<0.2	<0.2	<0.2
Aldrin	µg/L	<0.2	<0.2	<0.2
Heptachlor Epoxide	µg/L	<0.2	<0.2	<0.2
gamma-Chlordane	µg/L	<0.2	<0.2	<0.2
alpha-Chlordane	µg/L	<0.2	<0.2	<0.2
Endosulfan I	µg/L	<0.2	<0.2	<0.2
pp-DDE	µg/L	<0.2	<0.2	<0.2
Dieldrin	µg/L	<0.2	<0.2	<0.2
Endrin	µg/L	<0.2	<0.2	<0.2
Endosulfan II	µg/L	<0.2	<0.2	<0.2
pp-DDD	µg/L	<0.2	<0.2	<0.2
Endrin Aldehyde	µg/L	<0.2	<0.2	<0.2
pp-DDT	µg/L	<0.2	<0.2	<0.2
Endosulfan Sulphate	µg/L	<0.2	<0.2	<0.2
Methoxychlor	µg/L	<0.2	<0.2	<0.2
Mirex	ug/L	<0.2	<0.2	<0.2
Surrogate TCMX	%	112	101	114

OP Pesticides in Water				
Our Reference		330913-1	330913-2	330913-3
Your Reference	UNITS	BH1	BH3	BH8
Date Sampled		17/08/2023	17/08/2023	17/08/2023
Type of sample		Water	Water	Water
Date extracted	-	22/08/2023	22/08/2023	22/08/2023
Date analysed	-	24/08/2023	24/08/2023	24/08/2023
Dichlorvos	µg/L	<0.2	<0.2	<0.2
Mevinphos	µg/L	<0.2	<0.2	<0.2
Phorate	µg/L	<0.2	<0.2	<0.2
Dimethoate	µg/L	<0.2	<0.2	<0.2
Diazinon	µg/L	<0.2	<0.2	<0.2
Disulfoton	µg/L	<0.2	<0.2	<0.2
Chlorpyriphos-methyl	µg/L	<0.2	<0.2	<0.2
Parathion-Methyl	µg/L	<0.2	<0.2	<0.2
Ronnel	µg/L	<0.2	<0.2	<0.2
Fenitrothion	µg/L	<0.2	<0.2	<0.2
Malathion	µg/L	<0.2	<0.2	<0.2
Chlorpyriphos	µg/L	<0.2	<0.2	<0.2
Fenthion	µg/L	<0.2	<0.2	<0.2
Parathion	µg/L	<0.2	<0.2	<0.2
Bromophos ethyl	µg/L	<0.2	<0.2	<0.2
Methidathion	µg/L	<0.2	<0.2	<0.2
Fenamiphos	µg/L	<0.2	<0.2	<0.2
Ethion	µg/L	<0.2	<0.2	<0.2
Phosalone	µg/L	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	µg/L	<0.2	<0.2	<0.2
Coumaphos	µg/L	<0.2	<0.2	<0.2
Surrogate TCMX	%	112	101	114

PCBs in Water				
Our Reference		330913-1	330913-2	330913-3
Your Reference	UNITS	BH1	BH3	BH8
Date Sampled		17/08/2023	17/08/2023	17/08/2023
Type of sample		Water	Water	Water
Date extracted	-	22/08/2023	22/08/2023	22/08/2023
Date analysed	-	24/08/2023	24/08/2023	24/08/2023
Aroclor 1016	µg/L	<2	<2	<2
Aroclor 1221	µg/L	<2	<2	<2
Aroclor 1232	µg/L	<2	<2	<2
Aroclor 1242	µg/L	<2	<2	<2
Aroclor 1248	µg/L	<2	<2	<2
Aroclor 1254	µg/L	<2	<2	<2
Aroclor 1260	µg/L	<2	<2	<2
Surrogate TCMX	%	112	101	114

Total Phenolics in Water				
Our Reference		330913-1	330913-2	330913-3
Your Reference	UNITS	BH1	BH3	BH8
Date Sampled		17/08/2023	17/08/2023	17/08/2023
Type of sample		Water	Water	Water
Date extracted	-	21/08/2023	21/08/2023	21/08/2023
Date analysed	-	21/08/2023	21/08/2023	21/08/2023
Total Phenolics (as Phenol)	mg/L	<0.05	<0.05	<0.05

HM in water - dissolved				
Our Reference		330913-1	330913-2	330913-3
Your Reference	UNITS	BH1	BH3	BH8
Date Sampled		17/08/2023	17/08/2023	17/08/2023
Type of sample		Water	Water	Water
Date prepared	-	21/08/2023	21/08/2023	21/08/2023
Date analysed	-	21/08/2023	21/08/2023	21/08/2023
Arsenic-Dissolved	µg/L	<1	<1	<1
Cadmium-Dissolved	µg/L	<0.1	<0.1	0.1
Chromium-Dissolved	µg/L	<1	5	<1
Copper-Dissolved	µg/L	5	4	6
Lead-Dissolved	µg/L	<1	<1	<1
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05
Nickel-Dissolved	µg/L	11	31	8
Zinc-Dissolved	µg/L	29	55	27

Method ID	Methodology Summary
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

QUALITY CONTROL: VOCs in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			21/08/2023	1	21/08/2023	22/08/2023		21/08/2023	[NT]
Date analysed	-			22/08/2023	1	22/08/2023	23/08/2023		22/08/2023	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	108	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	1	1	2	67	114	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	106	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	105	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Dibromomethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	116	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	100	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	96	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	109	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromoform	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	[NT]	[NT]
Styrene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]

QUALITY CONTROL: VOCs in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	99	1	100	100	0	93	[NT]
Surrogate toluene-d8	%		Org-023	95	1	94	96	2	97	[NT]
Surrogate 4-BFB	%		Org-023	103	1	103	103	0	99	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			21/08/2023	1	21/08/2023	22/08/2023		21/08/2023	[NT]
Date analysed	-			22/08/2023	1	22/08/2023	23/08/2023		22/08/2023	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	1	<10	<10	0	109	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	1	<10	<10	0	109	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	107	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	108	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	110	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	109	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	109	[NT]
Naphthalene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	99	1	100	100	0	93	[NT]
Surrogate toluene-d8	%		Org-023	95	1	94	96	2	97	[NT]
Surrogate 4-BFB	%		Org-023	103	1	103	103	0	99	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Date extracted	-			22/08/2023	[NT]	[NT]	[NT]	[NT]	22/08/2023	[NT]
Date analysed	-			23/08/2023	[NT]	[NT]	[NT]	[NT]	23/08/2023	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	98	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	99	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	114	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	98	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	99	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	114	[NT]
Surrogate o-Terphenyl	%		Org-020	70	[NT]	[NT]	[NT]	[NT]	82	[NT]

QUALITY CONTROL: PAHs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Date extracted	-			22/08/2023	[NT]	[NT]	[NT]	[NT]	22/08/2023	[NT]
Date analysed	-			24/08/2023	[NT]	[NT]	[NT]	[NT]	24/08/2023	[NT]
Naphthalene	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	70	[NT]
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	68	[NT]
Fluorene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	67	[NT]
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	67	[NT]
Anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	64	[NT]
Pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	70	[NT]
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	63	[NT]
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	68	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	89	[NT]	[NT]	[NT]	[NT]	81	[NT]

QUALITY CONTROL: Organochlorine Pesticides in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Date extracted	-			22/08/2023	[NT]	[NT]	[NT]	[NT]	22/08/2023	[NT]
Date analysed	-			24/08/2023	[NT]	[NT]	[NT]	[NT]	24/08/2023	[NT]
alpha-BHC	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	66	[NT]
HCB	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	63	[NT]
gamma-BHC	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	63	[NT]
delta-BHC	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	65	[NT]
Heptachlor Epoxide	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	62	[NT]
gamma-Chlordane	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-Chlordane	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	69	[NT]
Dieldrin	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	70	[NT]
Endrin	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	64	[NT]
Endosulfan II	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	68	[NT]
Endrin Aldehyde	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	71	[NT]
Methoxychlor	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Mirex	ug/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	92	[NT]	[NT]	[NT]	[NT]	86	[NT]

QUALITY CONTROL: OP Pesticides in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Date extracted	-			22/08/2023	[NT]	[NT]	[NT]	[NT]	22/08/2023	[NT]
Date analysed	-			24/08/2023	[NT]	[NT]	[NT]	[NT]	24/08/2023	[NT]
Dichlorvos	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	73	[NT]
Mevinphos	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Phorate	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dimethoate	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Disulfoton	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyriphos-methyl	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Parathion-Methyl	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ronnel	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	64	[NT]
Fenitrothion	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	67	[NT]
Malathion	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	67	[NT]
Chlorpyriphos	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	65	[NT]
Fenthion	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Parathion	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	66	[NT]
Bromophos ethyl	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Methidathion	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fenamiphos	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	61	[NT]
Phosalone	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Azinphos-methyl (Guthion)	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Coumaphos	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	92	[NT]	[NT]	[NT]	[NT]	86	[NT]

QUALITY CONTROL: PCBs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Date extracted	-			22/08/2023	[NT]	[NT]	[NT]	[NT]	22/08/2023	[NT]
Date analysed	-			24/08/2023	[NT]	[NT]	[NT]	[NT]	24/08/2023	[NT]
Aroclor 1016	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	84	[NT]
Aroclor 1260	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-021	92	[NT]	[NT]	[NT]	[NT]	86	[NT]

QUALITY CONTROL: Total Phenolics in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	330913-2
Date extracted	-			21/08/2023	1	21/08/2023	21/08/2023		21/08/2023	21/08/2023
Date analysed	-			21/08/2023	1	21/08/2023	21/08/2023		21/08/2023	21/08/2023
Total Phenolics (as Phenol)	mg/L	0.05	Inorg-031	<0.05	1	<0.05	<0.05	0	104	95

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			21/08/2023	1	21/08/2023	21/08/2023		21/08/2023	[NT]
Date analysed	-			21/08/2023	1	21/08/2023	21/08/2023		21/08/2023	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	97	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	1	<0.1	<0.1	0	99	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	100	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	1	5	5	0	97	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	95	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	1	<0.05	<0.05	0	104	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	1	11	11	0	98	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	1	29	24	19	101	[NT]

Result Definitions

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

Quality Control Definitions

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

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

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

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

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	204088.01	**Suburb:**	Waverley	**To:**	Envirolab Services
Project Manager:	Paul Gorman	**Order Number:**	-	**Sampler:**	JBC
					12 Ashley St, Chatswood NSW 2067
Email:	Paul.Gorman@douglaspartners.com.au			**Attn:**	Sample Receipt
Turnaround time:	☑ Standard ☐ 72 hour ☐ 48 hour ☐ 24 hour ☐ Same day				(02) 9910 6200 samplereceipt@envirolab.com.au
Prior Storage:	☑ Fridge ☐ Freezer ☐ Esky ☐ Shelf	**Do samples contain 'potential' HBM?**	☑ No ☐ Yes		(If YES, then handle, transport and store in accordance with FPM HAZID)

Lab ID	Sample ID: Location / Other ID	Depth From	Depth To	Date Sampled	Sample Type: S - soil W - water M - Material	Container Type: G - glass P - plastic	Analytes: Heavy Metals (low level)	TRH / BTEX	PAH (low level)	OCP, OPP, PCB (standard level)	Phenol	VOC						Notes/ Preservation/ Additional Requirements
1	BH1			17/08/23	W	G/P	x	x	x	x	x	x						
2	BH3			17/08/23	W	G/P	x	x	x	x	x	x						
3	BH8			17/08/23	W	G/P	x	x	x	x	x	x						

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

Job No: 330913
Date Received: 18/8/23
Time Received: 1545
Received By: EW
Temp: Cool/Ambient
Cooling: Ice/Icepack 5°C.
Security: Intact/Broken/None

Metals to analyse:		**LAB RECEIPT**	
Number of samples in container:		**Transported to laboratory by:**	**Lab Ref. No:**
Send results to:	Douglas Partners Pty Ltd		**Received by:** EMILY (W)
Address:	96 Hermitage Road, West Ryde NSW 211	**Phone:** (02) 9809 0666	**Date & Time:** 18/8/23 1545.
Relinquished by:	JBC	**Date:** 18/08/2023 **Signed:** JBC	**Signed:** EW

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

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd
Attention	Paul Gorman

Sample Login Details

Your reference	204088.01 Waverley
Envirolab Reference	330913
Date Sample Received	18/08/2023
Date Instructions Received	18/08/2023
Date Results Expected to be Reported	25/08/2023

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	3 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	5
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

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

Sample ID	VOCs in water	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHs in Water	Organochlorine Pesticides in Water	OP Pesticides in Water	PCBs in Water	Total Phenolics in Water	HM in water - dissolved
BH1	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH3	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH8	✓	✓	✓	✓	✓	✓	✓	✓	✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

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CERTIFICATE OF ANALYSIS 369507

Client Details

Client	Douglas Partners Pty Ltd
Attention	Peter Hunt
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**204088.03 Birrell Street**
Number of Samples	5 Water
Date samples received	19/12/2024
Date completed instructions received	19/12/2024

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	03/01/2025
Date of Issue	03/01/2025

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Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Liam Timmins, Organics Supervisor
Nick Sarlamis, Assistant Operation Manager
Tabitha Roberts, Senior Chemist
Timothy Toll, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

VOCs in water					
Our Reference		369507-1	369507-2	369507-3	369507-4
Your Reference	UNITS	BH1	BH3	BH6	BH8
Date Sampled		18/12/2024	18/12/2024	18/12/2024	18/12/2024
Type of sample		Water	Water	Water	Water
Date Extracted	-	21/12/2024	21/12/2024	21/12/2024	21/12/2024
Date Analysed	-	21/12/2024	21/12/2024	21/12/2024	21/12/2024
Dichlorodifluoromethane	µg/L	<10	<10	<10	<10
Chloromethane	µg/L	<10	<10	<10	<10
Vinyl Chloride	µg/L	<10	<10	<10	<10
Bromomethane	µg/L	<10	<10	<10	<10
Chloroethane	µg/L	<10	<10	<10	<10
Trichlorofluoromethane	µg/L	<10	<10	<10	<10
1,1-Dichloroethene	µg/L	<1	<1	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1	<1	<1
1,1-dichloroethane	µg/L	<1	<1	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1	<1
Chloroform	µg/L	<1	<1	<1	<1
2,2-dichloropropane	µg/L	<1	<1	<1	<1
1,2-dichloroethane	µg/L	<1	<1	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1	<1	<1
1,1-dichloropropene	µg/L	<1	<1	<1	<1
Cyclohexane	µg/L	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1
Benzene	µg/L	<1	<1	<1	<1
Dibromomethane	µg/L	<1	<1	<1	<1
1,2-dichloropropane	µg/L	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1
Bromodichloromethane	µg/L	<1	<1	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1
1,3-dichloropropane	µg/L	<1	<1	<1	<1
Dibromochloromethane	µg/L	<1	<1	<1	<1
1,2-dibromoethane	µg/L	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1

VOCs in water					
Our Reference		369507-1	369507-2	369507-3	369507-4
Your Reference	UNITS	BH1	BH3	BH6	BH8
Date Sampled		18/12/2024	18/12/2024	18/12/2024	18/12/2024
Type of sample		Water	Water	Water	Water
Bromoform	µg/L	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2
Styrene	µg/L	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1	<1	<1
o-xylene	µg/L	<1	<1	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1	<1	<1
Isopropylbenzene	µg/L	<1	<1	<1	<1
Bromobenzene	µg/L	<1	<1	<1	<1
n-propyl benzene	µg/L	<1	<1	<1	<1
2-chlorotoluene	µg/L	<1	<1	<1	<1
4-chlorotoluene	µg/L	<1	<1	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1	<1	<1
Tert-butyl benzene	µg/L	<1	<1	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1	<1	<1
Sec-butyl benzene	µg/L	<1	<1	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1	<1	<1
4-isopropyl toluene	µg/L	<1	<1	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1	<1	<1
n-butyl benzene	µg/L	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	102	99	103	103
Surrogate Toluene-d8	%	99	98	99	100
Surrogate 4-Bromofluorobenzene	%	96	88	95	94

vTRH(C6-C10)/BTEXN in Water					
Our Reference		369507-1	369507-2	369507-3	369507-4
Your Reference	UNITS	BH1	BH3	BH6	BH8
Date Sampled		18/12/2024	18/12/2024	18/12/2024	18/12/2024
Type of sample		Water	Water	Water	Water
Date extracted	-	21/12/2024	21/12/2024	21/12/2024	21/12/2024
Date analysed	-	21/12/2024	21/12/2024	21/12/2024	21/12/2024
TRH C_6 - C_9	µg/L	<10	<10	<10	<10
TRH C_6 - C_{10}	µg/L	<10	<10	<10	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10	<10	<10
Benzene	µg/L	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2
o-xylene	µg/L	<1	<1	<1	<1
Naphthalene	µg/L	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	102	99	103	103
Surrogate Toluene-d8	%	99	98	99	100
Surrogate 4-Bromofluorobenzene	%	96	88	95	94

svTRH (C10-C40) in Water					
Our Reference	UNITS	369507-1	369507-2	369507-3	369507-4
Your Reference		BH1	BH3	BH6	BH8
Date Sampled		18/12/2024	18/12/2024	18/12/2024	18/12/2024
Type of sample		Water	Water	Water	Water
Date extracted	-	20/12/2024	20/12/2024	20/12/2024	20/12/2024
Date analysed	-	20/12/2024	20/12/2024	20/12/2024	20/12/2024
TRH C_{10} - C_{14}	µg/L	<50	<50	<50	<50
TRH C_{15} - C_{28}	µg/L	<100	<100	<100	<100
TRH C_{29} - C_{36}	µg/L	<100	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50	<50	<50
TRH >C_{10} - C_{16}	µg/L	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50	<50	<50	<50
TRH >C_{16} - C_{34}	µg/L	<100	120	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	120	<50	<50
Surrogate o-Terphenyl	%	71	86	76	94

PAHs in Water					
Our Reference		369507-1	369507-2	369507-3	369507-4
Your Reference	UNITS	BH1	BH3	BH6	BH8
Date Sampled		18/12/2024	18/12/2024	18/12/2024	18/12/2024
Type of sample		Water	Water	Water	Water
Date extracted	-	20/12/2024	20/12/2024	20/12/2024	20/12/2024
Date analysed	-	23/12/2024	23/12/2024	23/12/2024	23/12/2024
Naphthalene	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+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-c,d)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d14	%	97	112	87	106

HM in water - dissolved					
Our Reference		369507-1	369507-2	369507-3	369507-4
Your Reference	UNITS	BH1	BH3	BH6	BH8
Date Sampled		18/12/2024	18/12/2024	18/12/2024	18/12/2024
Type of sample		Water	Water	Water	Water
Date prepared	-	20/12/2024	20/12/2024	20/12/2024	20/12/2024
Date analysed	-	20/12/2024	20/12/2024	20/12/2024	20/12/2024
Arsenic-Dissolved	µg/L	<1	<1	<1	<1
Cadmium-Dissolved	µg/L	<0.1	<0.1	<0.1	0.1
Chromium-Dissolved	µg/L	<1	6	<1	<1
Copper-Dissolved	µg/L	1	2	2	1
Lead-Dissolved	µg/L	<1	<1	<1	<1
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05
Nickel-Dissolved	µg/L	6	16	5	5
Zinc-Dissolved	µg/L	22	44	44	39

HM in water - total					
Our Reference		369507-1	369507-2	369507-3	369507-4
Your Reference	UNITS	BH1	BH3	BH6	BH8
Date Sampled		18/12/2024	18/12/2024	18/12/2024	18/12/2024
Type of sample		Water	Water	Water	Water
Date prepared	-	23/12/2024	23/12/2024	23/12/2024	23/12/2024
Date analysed	-	23/12/2024	23/12/2024	23/12/2024	23/12/2024
Arsenic-Total	µg/L	<1	2	<1	<1
Cadmium-Total	µg/L	<0.1	<0.1	<0.1	0.2
Chromium-Total	µg/L	2	8	<1	1
Copper-Total	µg/L	2	3	2	2
Lead-Total	µg/L	<1	3	5	1
Mercury-Total	µg/L	<0.05	<0.05	<0.05	<0.05
Nickel-Total	µg/L	5	14	4	4
Zinc-Total	µg/L	17	37	37	35

Miscellaneous Inorganics					
Our Reference		369507-1	369507-2	369507-3	369507-4
Your Reference	UNITS	BH1	BH3	BH6	BH8
Date Sampled		18/12/2024	18/12/2024	18/12/2024	18/12/2024
Type of sample		Water	Water	Water	Water
Date prepared	-	02/01/2025	02/01/2025	02/01/2025	02/01/2025
Date analysed	-	02/01/2025	02/01/2025	02/01/2025	02/01/2025
Oil & Grease (LLE)	mg/L	9	13	<5	5

Method ID	Methodology Summary
Inorg-003	Oil & Grease - determine gravimetrically following extraction with Hexane, in accordance with APHA latest edition, 5520-B.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements. Salt forms (e.g. FeO, PbO, ZnO) are determined stoichiometrically from the base metal concentration.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

QUALITY CONTROL: VOCs in water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date Extracted	-			21/12/2024	[NT]	[NT]	[NT]	[NT]	21/12/2024	[NT]
Date Analysed	-			21/12/2024	[NT]	[NT]	[NT]	[NT]	21/12/2024	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	109	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Dibromomethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	109	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	111	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Bromoform	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	99	[NT]
Styrene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

QUALITY CONTROL: VOCs in water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	102	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate Toluene-d8	%		Org-023	100	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	95	[NT]	[NT]	[NT]	[NT]	97	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			21/12/2024	[NT]	[NT]	[NT]	[NT]	21/12/2024	[NT]
Date analysed	-			21/12/2024	[NT]	[NT]	[NT]	[NT]	21/12/2024	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	98	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	98	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	99	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Naphthalene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	102	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate Toluene-d8	%		Org-023	100	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	95	[NT]	[NT]	[NT]	[NT]	97	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	369507-2
Date extracted	-			20/12/2024	1	20/12/2024	20/12/2024		20/12/2024	20/12/2024
Date analysed	-			20/12/2024	1	20/12/2024	20/12/2024		20/12/2024	20/12/2024
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	1	<50	<50	0	105	104
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	1	<100	<100	0	104	106
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	1	<100	<100	0	100	99
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	1	<50	<50	0	105	104
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	1	<100	<100	0	104	106
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	1	<100	<100	0	100	99
Surrogate o-Terphenyl	%		Org-020	74	1	71	63	12	84	106

QUALITY CONTROL: PAHs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	369507-2
Date extracted	-			20/12/2024	1	20/12/2024	20/12/2024		20/12/2024	20/12/2024
Date analysed	-			23/12/2024	1	23/12/2024	23/12/2024		23/12/2024	23/12/2024
Naphthalene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	93	106
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	87	84
Fluorene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	92	102
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	97	116
Anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	92	99
Pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	96	104
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	91	101
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	76	85
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	89	1	97	100	3	109	108

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	369507-2
Date prepared	-			20/12/2024	1	20/12/2024	20/12/2024		20/12/2024	20/12/2024
Date analysed	-			20/12/2024	1	20/12/2024	20/12/2024		20/12/2024	20/12/2024
Arsenic-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		98	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	1	<0.1	[NT]		97	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		107	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	1	1	[NT]		102	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		99	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	1	<0.05	<0.05	0	117	109
Nickel-Dissolved	µg/L	1	Metals-022	<1	1	6	[NT]		104	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	1	22	[NT]		105	[NT]

QUALITY CONTROL: HM in water - total						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	369507-2
Date prepared	-			23/12/2024	1	23/12/2024	23/12/2024		23/12/2024	23/12/2024
Date analysed	-			23/12/2024	1	23/12/2024	23/12/2024		23/12/2024	23/12/2024
Arsenic-Total	µg/L	1	Metals-022	<1	1	<1	<1	0	95	93
Cadmium-Total	µg/L	0.1	Metals-022	<0.1	1	<0.1	<0.1	0	91	94
Chromium-Total	µg/L	1	Metals-022	<1	1	2	2	0	86	89
Copper-Total	µg/L	1	Metals-022	<1	1	2	2	0	89	93
Lead-Total	µg/L	1	Metals-022	<1	1	<1	<1	0	83	86
Mercury-Total	µg/L	0.05	Metals-021	<0.05	1	<0.05	<0.05	0	116	109
Nickel-Total	µg/L	1	Metals-022	<1	1	5	5	0	89	91
Zinc-Total	µg/L	1	Metals-022	<1	1	17	18	6	86	90

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			02/01/2025	[NT]	[NT]	[NT]	[NT]	02/01/2025	[NT]
Date analysed	-			02/01/2025	[NT]	[NT]	[NT]	[NT]	02/01/2025	[NT]
Oil & Grease (LLE)	mg/L	5	Inorg-003	<5	[NT]	[NT]	[NT]	[NT]	86	[NT]

Result Definitions

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

Quality Control Definitions

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

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

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

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

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

COC: 19/12/24 0948

Douglas PARTNERS | GROUNDED EXPERTISE

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	204088.03	**Suburb:**	Birrell Street	**To:**	Envirolab Services
Project Manager:	Peter Hunt	**Order Number:**		**Sampler:** JBC	12 Ashley St, Chatswood NSW 2067
Email:	Peter.Hunt@douglaspartners.com.au; paul.gorman@douglaspartners.com.au			**Attn:**	Sample Receipt
Turnaround time:	☑ Standard ☐ 72 hour ☐ 48 hour ☐ 24 hour ☐ Same day				(02) 9910 6200 samplereceipt@envirolab.cor
Prior Storage:	☑ Fridge ☐ Freezer ☐ Esky ☐ Shelf	**Do samples contain 'potential' HBM?**	☑ No ☐ Yes (YES, then handle, transport and store in accordance with FPM HAZID)		

Lab ID	Sample ID: Location / Other ID	Depth From	Depth To	Date Sampled	Sample Type: S - soil W - water M - Material	Container Type: G - glass P - plastic	Analytes: Metals (dissolved and total)	TRH	BTEX	PAH	VOC	Oil and grease	HOLD					Notes/ Preservation/ Additional Requirements
1	BH1			18/12/24	W	G/P	x	x	x	x	x	x						
2	BH3			18/12/24	W	G/P	x	x	x	x	x	x						
3	BH6			18/12/24	W	G/P	x	x	x	x	x	x						
4	BH8			18/12/24	W	G/P	x	x	x	x	x	x						
5	BD1/20241218			18/12/24	W	G/P							x					

ENVIROLAB GROUP
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 369507
Date Received: 19/12/24
Time Received: 1530
Received By: LC
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Metals to analyse: HM8 (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)

Number of samples in container:		**Transported to laboratory by:**	Courier
Send results to:	Douglas Partners Pty Ltd		
Address:	96 Hermitage Road, West Ryde NSW 211	**Phone:**	(02) 9809 0666
Relinquished by:		**Date:**	**Signed:**

LAB RECEIPT

Lab Ref. No:	369507
Received by:	LC
Date & Time	19/12/24 1530
Signed:	LC

Douglas PARTNERS

Table C1: Summary of Laboratory Results – Metals, TRH, BTEX, PAH, VOC (excluding BTEX)

		METALS - Dissolved								TRH				BTEX						PAH					Phenol			
		Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	o-Xylene	m+p-Xylene	Total Xylenes	Anthracene	Naphthalene	Benzo(a)pyrene (BaP)	Fluoranthene	Phenanthrene	Total Phenolics	Aldrin	DDE	DDT
	PQL	1	0.1	1	1	1	0.05	1	1	10	50	100	100	1	1	1	1	2	1	0.1	0.2	0.1	0.1	0.1	0.05	0.2	0.2	0.2
ANZG (2018) 95% LOP Fresh		24	0.2	1	1.4	3.4	0.06	11	8					950	180	80	350	275		0.01	16	0.1	1	0.6	320	0.001		0.006
NEPC (2013) HSL 2-4m										1000	1000			800	NL	NL			NL		NL							
Sample ID	Sample Date	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L
BH1	17/08/23	<1	<0.1	<1	5	<1	<0.05	11	29	<10	<50	<100	<100	<1	<1	<1	<1	<2	<1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.5	<0.2	<0.2	<0.2
BH3	17/08/23	<1	<0.1	5	4	<1	<0.05	31	55	<10	160	<100	<100	<1	2	<1	<1	<2	<1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.5	<0.2	<0.2	<0.2
BH8	17/08/23	<1	0.1	<1	6	<1	<0.05	8	27	<10	<50	<100	<100	<1	<1	<1	<1	<2	<1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.5	<0.2	<0.2	<0.2

Notes:

*	QA/QC replicate of sample listed directly below the primary sample
PQL	Practical quantitation limit
-	No criterion / not defined / not tested / not applicable
	Shaded cell is exceedance of guideline value
	Where one or more guideline value is exceeded, the cell is shaded to the colour of the highest guideline value exceeded
	NEPC (2013) National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013), health screening level Sand 2-4m
	ANZG (2018) Australian and New Zealand Guidelines for Fresh and Marine Water Quality, 95% level of protection of species for Fresh aquatic ecosystems [NB: 99% level of protection adopted for bioaccumulative chemicals]
	ANZG (2018) Australian and New Zealand Guidelines for Fresh and Marine Water Quality, 95% level of protection of species for Marine aquatic ecosystems [NB: 99% level of protection adopted for bioaccumulative chemicals]
	NHMRC (2008) Guidelines for Managing Risk in Recreational Water

Table C1: Summary of Laboratory Results – Metals, TRH, BTEX, PAH, VOC (excluding BTEX)

		OCP														OPP												
		delta-BHC	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan Sulphate	Endrin	Heptachlor	Hexachlorobenzene	Lindane	Methoxychlor	Mirex	DDD	Total OCP	Aldrin + Dieldrin (calculated)	Azinphos methyl (Guthion)	Bromophos-ethyl	Chlorpyriphos	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenitrothion	Fenthion	Malathion	Parathion	Parathion-methyl	Total OPP
	PQL	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
ANZG (2018) 95% LOP Fresh			0.01				0.01	0.01	0.1	0.2	0.005	0.04				0.02		0.00004	0.01		0.15		0.2		0.05	0.004		
NEPC (2013) HSL 2-4m																												
Sample ID	Sample Date	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
BH1	17/08/23	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH3	17/08/23	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH8	17/08/23	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

Notes:

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Table C1: Summary of Laboratory Results – Metals, TRH, BTEX, PAH, VOC (excluding BTEX)

		PCB			VOC																								
		Arochlor 1242	Arochlor 1254	Total PCB	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	Tetrachloroethene	1,1,2-Trichloroethane	1,1,2-Trichloroethylene	1,1-Dichloroethene	1,2,3-Trichlorobenzene	1,2,4-Trichlorobenzene	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3-Dichlorobenzene	1,3-Dichloropropane	1,4-Dichlorobenzene	Carbon Tetrachloride	Vinyl Chloride	Chloroform	Isopropylbenzene (cumene)	1,2-Dibromoethane	Hexachlorobutadiene	Bromomethane	Monochlorobenzene	Styrene (vinylbenzene)	Total VOC
	PQL	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	10	1	1	1	1	10	1	1	1
ANZG (2018) 95% LOP Fresh		0.3	0.01		270	400	70	6500	330	700	3	85	160	1900	900	260	1100	60	240	100	770	30					55		
NEPC (2013) HSL 2-4m																													
Sample ID	Sample Date	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
BH1	17/08/23	<2	<2	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	1	<1	<1	<1	<10	<1	<1	<1	1
BH3	17/08/23	<2	<2	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<10	<1	<1	<1	<1
BH8	17/08/23	<2	<2	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	6	<1	<1	<1	<10	<1	<1	<1	6

Notes:

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PQL	Practical quantitation limit
-	No criterion / not defined / not tested / not applicable
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	NHMRC (2008) Guidelines for Managing Risk in Recreational Water

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Table C2: Summary of Laboratory Results – Metals, TRH, BTEX, PAH, VOC (excluding BTEX)

		Metals - Dissolved								TRH				BTEX						PAH										
		Total Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	o-Xylene	m+p-Xylene	Total Xylenes	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Naphthalene	Benzo(a)pyrene (BaP)	Benzo(b,j+k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene
	PQL	1	0.1	1	1	1	0.05	1	1	10	50	100	100	1	1	1	1	2	1	0.1	0.1	0.1	0.1	1	0.1	0.2	0.1	0.1	0.1	0.1
ANZG (2018) 95% LOP Fresh		13	0.2	1	1.4	3.4	**0.06**	11	8					950	180	80	350	75				**0.01**		16	**0.1**					**1**
NEPC (2013) HSL 2-4m										1000	1000			800	NL	NL			NL					NL						
Sample ID	Sample Date	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
BH1	18/12/24	<1	<0.1	<1	**1**	<1	<0.05	**6**	**22**	<10	<50	<100	<100	<1	<1	<1	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1
BH3	18/12/24	<1	<0.1	**6**	**2**	<1	<0.05	**16**	**44**	<10	<50	**120**	<100	<1	<1	<1	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1
BH6	18/12/24	<1	<0.1	<1	**2**	<1	<0.05	**5**	**44**	<10	<50	<100	<100	<1	<1	<1	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1
BH8	18/12/24	<1	**0.1**	<1	**1**	<1	<0.05	**5**	**39**	<10	<50	<100	<100	<1	<1	<1	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1

Notes:

- No criterion / not defined / not tested / not applicable

PQL Practical quantitation limit

NL Not limiting

Shaded cell is exceedance of guideline value

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Underlining of ANZG (2018) criteria indicates a criteria with an 'unknown' level of protection.

ANZG (2018) DGV adopted for most conservative species of following analytes: DGV for xylene (m) adopted for xylene (m+p); DGV for CrVI adopted for total chromium; DGV for AsV adopted for total arsenic

ANZG (2018) DGV adopted for aluminium in freshwater is for receiving waters with pH >6.5. For receiving waters with pH <6.5 suitability of the more conservative, low reliability DGV of unknown LOP should be considered

ANZG (2018) Ammonia DGV is pH and temperature dependant. DGV for a pH of 8 provided in table.

Table C2: Summary of Laboratory Results – Metals, TRH, BTEX, PAH, VOC (excluding BTEX)

		Fluorene	Indeno[1,2,3-c,d]pyrene	Phenanthrene	Pyrene	Sum of detected PAH	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	tetrachloroethene	1,1,2-trichloroethane	1,1,2-trichloroethylene	1,1-dichloroethane	1,1-Dichloroethene	1,1-dichloropropene	1,2,3-trichlorobenzene	1,2,3-trichloropropane	1,2,4-trichlorobenzene	1,2,4-trimethyl benzene	1,2-dibromo-3-chloropropane	1,2-dichlorobenzene	1,2-dichloroethane	1,2-dichloropropane	1,3,5-trimethyl benzene	1,3-dichlorobenzene	1,3-dichloropropane	1,4-dichlorobenzene	2,2-dichloropropane	2-chlorotoluene	4-chlorotoluene
	PQL	0.1	0.1	0.1	0.1	0.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ANZG (2018) 95% LOP Fresh				**0.6**				270	400	70	6,500	330		700		**3**		**85**			160	1,900	900		260	1,100	60			
NEPC (2013) HSL 2-4m																														
Sample ID	Sample Date	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
BH1	18/12/24	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH3	18/12/24	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH6	18/12/24	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH8	18/12/24	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

Notes:

- No criterion / not defined / not tested / not applicable

PQL Practical quantitation limit

NL Not limiting

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Table C2: Summary of Laboratory Results – Metals, TRH, BTEX, PAH, VOC (excluding BTEX)

		VOC (excluding BTEX)																												
		4-isopropyl toluene	Bromobenzene	Bromochloromethane	Bromodichloromethane	Bromoform	carbon tetrachloride	Chloroethane	Vinyl Chloride	Chloroform	Chloromethane	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Isopropylbenzene (cumene)	Cyclohexane	dibromochloromethane	Dibromomethane	Dichlorodifluoromethane	1,2-dibromoethane	hexachlorobutadiene	Bromomethane	Monochlorobenzene	n-butyl benzene	n-propyl benzene	sec-butyl benzene	Styrene (vinylbenzene)	Tert-butyl benzene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Trichlorofluoromethane
	PQL	1	1	1	1	1	1	10	10	1	10	1	1	1	1	1	1	10	1	1	10	1	1	1	1	1	1	1	1	10
ANZG (2018) 95% LOP Fresh							240		100	770				30								55								
NEPC (2013) HSL 2-4m																														
Sample ID	Sample Date	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
BH1	18/12/24	<1	<1	<1	<1	<1	<1	<10	<10	<1	<10	<1	<1	<1	<1	<1	<1	<10	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<10
BH3	18/12/24	<1	<1	<1	<1	<1	<1	<10	<10	<1	<10	<1	<1	<1	<1	<1	<1	<10	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<10
BH6	18/12/24	<1	<1	<1	<1	<1	<1	<10	<10	<1	<10	<1	<1	<1	<1	<1	<1	<10	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<10
BH8	18/12/24	<1	<1	<1	<1	<1	<1	<10	<10	<1	<10	<1	<1	<1	<1	<1	<1	<10	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<10

Notes:

- No criterion / not defined / not tested / not applicable

PQL Practical quantitation limit

NL Not limiting

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ANZG (2018) Ammonia DGV is pH and temperature dependant. DGV for a pH of 8 provided in table.

Table C2: Summa

		Sum of detected VOC
	PQL	1
ANZG (2018) 95% LOP Fresh		
NEPC (2013) HSL 2-4m		
Sample ID	Sample Date	µg/L
BH1	18/12/24	<1
BH3	18/12/24	<1
BH6	18/12/24	<1
BH8	18/12/24	<1

Notes:

-	No criterion / n
PQL	Practical quant
NL	Not limiting
	Shaded cell is e
	Where one or r
	ANZG (2018) Au
	ANZG (2018) Au
	Underlining of
	ANZG (2018) Dr
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