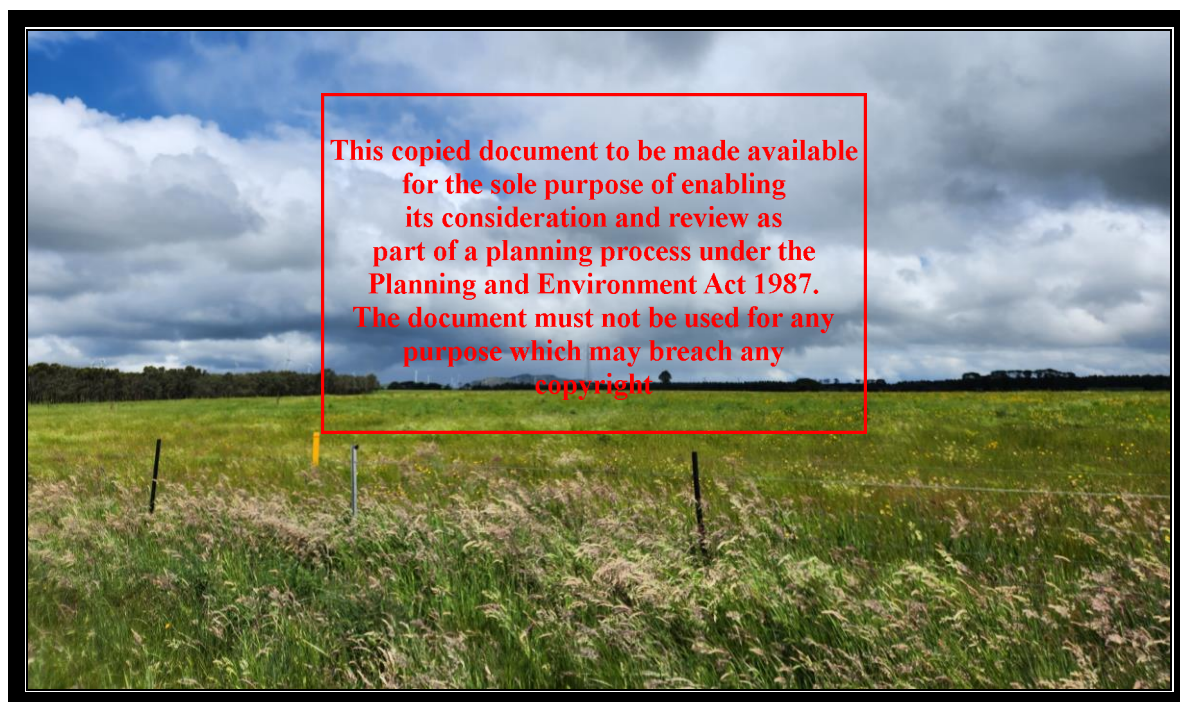


**Report No.: GW3426 (reissued, V2)**

# **GROUNDWATER MONITORING REPORT**

**PROPOSED BESS & SWITCHYARD:**

**438 LOBBS ROAD,  
GLENBRAE, VICTORIA**



*PREPARED FOR*

**ACENERGY PTY LTD**

**ADVERTISED  
PLAN**

**GeoPollution Management Pty Ltd**

5<sup>th</sup> May, 2023

Photo: View across the fence towards monitoring well MWBS (yellow riser cover), looking south east from Forest Road.



File No.: **GW3426 V.2**

Date: 5<sup>th</sup> May, 2023

ACEnergy Pty Ltd  
502, 689 Burke Road  
Camberwell Vic 3124

Attn: Jane Bai

**RE: GROUNDWATER MONITORING REPORT**

**Project: Proposed BESS & Switchyard:  
438 Lobbs Road, Glenbrae**

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Dear Jane,

As requested, a groundwater investigation was conducted at the above property. The site works involved installation of two groundwater monitoring (observation) wells, collection and analysis of groundwater samples and field testing of groundwater at the newly installed wells.

It is understood that the groundwater testing was required by the Pyrenees Shire Council due to the 'Environmental Significance Overlay' applicable to the property (it is located within a water supply catchment). The aim of the investigation was to determine the "potential groundwater contamination risk" at the site (J. Bai, email dated 13 October 2022).

Field work leading up to this report was conducted by technical and environmental field staff from our Ringwood office between the 9<sup>th</sup> and 15<sup>th</sup> November 2022.

## 1. Site Identification

The subject parcel of land corresponds to part of Allotment 1, Section 21 in the Parish of Ercildoun, Parcel Identifier 1-21/PP2597 (part of Council property No. 407002800) in the Shire of Pyrenees (see also attached property report from the maps and spatial data website ([www2.delwp.vic.gov.au](http://www2.delwp.vic.gov.au), copy in Appendix A). The parcel boundaries and the location of the proposed works area are illustrated on the Google Earth aerial photo overlay, also in Appendix A (Figure A).

The property is located at the southern end of the Pyrenees region of central Victoria, on the south east corner of Lobbs and Forest Roads, some 4.3km south west of the Sunraysia Highway. The site is distanced approximately 42km north west from the rural city of Ballarat, and situated approximately half way between the rural townships of Clunes (29.8 km to the north east) and Beaufort (approximately 21.4 km to the south west). The distance (north west thereof) from the Melbourne GPO is approximately 149 km (all distances by road, [www.whereis.com](http://www.whereis.com)).

## 2. Proposed Development

It is understood that a Battery Energy Storage System (BESS) will be installed on the eastern portion of the development footprint, associated with the switching station. The main components of the infrastructure will include an MV Power Station (including transformer), battery energy system containers, grid transformers, control room and switching station (J. Bai, email correspondence).

## 3. Observation Wells

Two groundwater wells, “MW1” and “MW2”, were installed along the northern boundary of the property. The wells were subsequently relabelled to MWBS and MWSY respectively to highlight the works area location of each well.

The wells were drilled by a licensed driller on the 9<sup>th</sup> November 2022, then allowed to rest overnight to observe preliminary water levels. The well installation was completed on the 10<sup>th</sup> November. The first well, MWBS, was installed to 20 metre depth, , the second well to 18 metres, both with a 6m screen (refer to well logs included in Appendix B).

The bore positions were cleared for underground services prior to drilling. Photographs of the well locations are shown below, as seen on the 10<sup>th</sup> November 2022.



The position of MWBS (yellow riser/monument cover), looking north towards Forest Road.



The monument (riser) cover of MWSY, looking Northwest, with Forest Road in the right background.

The well locations are shown on Figure 1 in Appendix A. The well logs, bore licence and completion reports are attached to this report in Appendix B.

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#### **4. Monitoring Well Development, Gauging & Field Testing**

On the 11<sup>th</sup> November 2022, the newly installed wells were developed by removing approximately three well volumes (or until the well was almost dry). The site was revisited on the 15<sup>th</sup> November 2022, when both wells were gauged, and a set of water samples was collected from each well.

Disposable (biodegradable) bailers were used both to develop the wells and for purging and sampling. The well field gauging sheet is attached in Appendix B.

##### **4.1 Depth to Water Table**

Upon well recharge after development, depths to water table (SWL) were measured as between 17.25m (MWSY) and 17.575m (MWBS) below top of casing (mbtoc). This equates to approximately 16.55m to 16.995m respectively below surface levels, as installed.

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## 5. Groundwater Sampling & Analysis

All samples were submitted to the NATA registered laboratory of EnviroLab, Croydon South, accompanied by chain of custody documentation (Appendix D), as reported in EnviroLab reports No.s 34586-R00 and 34586-DQAS.

### 5.1 Analytical Parameters

The groundwater samples were analysed, in addition to a Vic EPA screen, for parameters typically included, but not limited to, those in Groundwater Discharge Applications to Water Authorities. The analytical suite for the samples is summarized in Table 1 below.

**TABLE 1: Range and Number of Groundwater Analyses**

ANALYTICAL PARAMETERS	No. WATER SAMPLES
Dissolved Heavy Metals (19): Al, As, B, Ba, Be, Cd, Cr, Cu, Fe, Hg, Mn, Mo, Ni, Pb, Se, Si, Sn, Sr, Ti, V, Zn	2
NEPM 2013 & NEPM 1999 TRH Fractions: <C <sub>6</sub> -C <sub>10</sub> & C <sub>10</sub> -C <sub>40</sub> & F1-F4; & NEPM 1999 TRH Fraction <C <sub>6</sub> -C <sub>10</sub>	2
VOCs (Volatile Organic Compounds)	2
SVOCs (Semi-Volatile Organic Compounds)	2
Soil Reaction (pH Value)	2
Polycyclic Aromatic Hydrocarbons	2
Phenols (halogenated and non-halogenated)	2
Organochlorine (OC) Pesticides	2
Polychlorinated Biphenyl's (PCB's)	2
Chlorinated Hydrocarbons 1	2
Cyanide (total) 1	2
Fluoride (total) 1	2
TSS, TDS, iTDS & EC	2
BOD & % Anaerobic Inhibition	2
Total Phosphate (as P)	2
Total Sulphide (as S)	2
Total Oxidized Sulphur (Sulphates, Sulphites + Thiosulphate)	2
Ammonia (NH <sub>3</sub> ), Nitrate (NO <sub>3</sub> ) & Nitrite (NO <sub>2</sub> ) as N and TKN	2
Ionic Balance (Additional Parameters) Cations: Ca, K, Na, Mg Anions: SO <sub>4</sub> , Cl Alkalinity (as CaCO <sub>3</sub> ) Reactive Silica (SiO <sub>2</sub> ) Hardness	2
PFAS incl. PFOS, PFOA & PFH & S	2

## 5.2 Groundwater Analytical Results

The following table summarizes the analytical results for the wells.

**TABLE 2: Range of Concentrations – 2 Wells**

ANALYTE	RANGE OF CONCENTRATIONS
<b>Metals</b>	
Arsenic (As), Cadmium (Cd), Chromium (Cr), Hexavalent Chromium (CrVI), Mercury (Hg), Lead (Pb), Tin (Sn), Selenium (Se), Silver (Ag)	<LOR <sup>1</sup>
Aluminium (Al)	< LOR <sup>1</sup> - 35 µg/L
Boron (B)	< LOR <sup>1</sup> - 70 µg/L
Cobalt (Co)	3 - 4 µg/L
Copper (Cu)	< LOR <sup>1</sup> - 2 µg/L
Iron (Fe)	18 - 31 µg/L
Molybdenum (Mo)	2 µg/L
Nickel (Ni)	8 - 18 µg/L
Zinc (Zn)	4 - 7 µg/L
<b>Organics</b>	
NEPM 1999 TRH Fraction C <sub>6</sub> -C <sub>10</sub>	<LOR <sup>1</sup>
NEPM 2013 & NEPM 1999 TRH Fractions: C <sub>10</sub> -C <sub>40</sub> & F1 - F4	<LOR <sup>1</sup>
BTEXN: Toluene, Benzene, Ethyl benzene & Xylenes	<LOR <sup>1</sup>
Other VOCs & SVOCs	<LOR <sup>1</sup>
<b>Inorganics</b>	
Total Cyanide	<LOR <sup>1</sup>
Total Fluoride	<LOR <sup>1</sup> - 0.1 mg/L
Sulphide	<LOR <sup>1</sup>
Total Phosphate (as P)	0.019 - 0.023 mg/L
Total Oxidized Sulphur (Total Sulphur + HCl Extractable Sulphur)	30 - 50 mg/L
Silica (Reactive as SiO <sub>2</sub> )	29 - 30 mg/L
Nitrate (as N)	0.76 - 1.2 mg/L
Nitrite (as N)	0.014 - 0.024 mg/L
Ammonia (as N)	<LOR <sup>1</sup> - 0.076 mg/L
TKN	<LOR <sup>1</sup>
<b>Cations &amp; Anions</b>	
Calcium (Ca)	15 - 68 mg/L
Potassium (K)	3.3 - 7.2 mg/L
Sodium (Na)	100 - 140 mg/L
Magnesium (Mg)	18 - 100 mg/L
Ionic Balance	-0.34 - +1.8%
Hardness	110 - 580 mg CaCO <sub>3</sub> /L
Hydroxide Alkalinity	<LOR <sup>1</sup>
Bicarbonate Alkalinity	88 - 140 mg CaCO <sub>3</sub> /L
Carbonate Alkalinity	<LOR <sup>1</sup>
Total Alkalinity	88 - 140 mg CaCO <sub>3</sub> /L
Sulphate (SO <sub>4</sub> )	8 - 82 mg/L
Chloride (as Cl)	120 - 520 mg/L
<b>Salinity</b>	
TSS	4,000 - 7,400 mg/L
TDS	460 - 1,400 mg/L
iTDS	230 - 600 mg/L
EC	800 - 2,300 µS/cm
<b>Miscellaneous Other Parameters</b>	
pH	6.5 - 7.0
BOD % Anaerobic Inhibition	<LOR <sup>1</sup>
PFAS: Total PFHxS & PFOS	<LOR <sup>1</sup>
Total PFOS & PFOA	<LOR <sup>1</sup>
Total PFAS	<LOR <sup>1</sup>

<sup>1</sup>LOR: Level of Reporting

## 6. Comments

### 6.1 Analytical Results

From a pollution perspective, no concerns arise from the analytical results for the following reasons:

- Concentrations of the heavy metals copper and nickel at MWBS and of nitrate (as N) at MWSY were recorded above the NEPM (2013) “groundwater investigation” (GIL) levels; derived from ANZECC & ARMCANZ (2000) Water Quality Guidelines for 95% protection of aquatic (freshwater) ecosystems.
- PFAS compounds were not detected.
- All other analytes are below the groundwater investigations levels specified in the NEPM (2013)/ANZECC & ARMCANZ (2000) Water Quality Guidelines for 95% protection of aquatic ecosystems.

### 6.2 Conclusions

- ❖ The measured concentrations of heavy metals are considered likely to represent natural background levels.
- ❖ The detected elevated nitrate level in the western well (MWSY) may be related to the long-term use of fertilizers in the general area (not necessarily from the site itself), and therefore, reflect the regional background level.
- ❖ The groundwater values may be used as benchmark values prior to site development.

Should you have any queries regarding this report or require further advice, please do not hesitate to contact the undersigned.

Yours faithfully  
GeoPollution Management P/L



**KARIN B. SCHWAB** Ph.D., M. Env. Sc., B. Sc. (Hons)  
(Principal Environmental Scientist)

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**Appendices:**

- A: Site Identification: Property Report and Aerial Photograph; and Well Location Plan
- B: Well Documentation: Well Logs, Groundwater Gauging Record, Bore Construction Licence and Bore Completion Reports
- C: Chain of Custody Documentation
- D: Chemical Analysis Report (NATA Endorsed)
- E: Field Methods and QA/QC

---

**REFERENCES**

- Australian Government National Water Commission (2012) *Minimum Construction Requirements for Water Bores in Australia*, Edition 3
- ANZECC & ARMCANZ (2000) *National water quality management strategy. Australian and New Zealand guidelines for fresh and marine water quality*, Australian and New Zealand Conservation Council & Agriculture, and Resource Management Council of Australia and New Zealand, October
- NEPC (1999) National Environmental Protection (*Assessment of Site Contamination*) Measure. National Environment Protection Council Service Corporation
- NEPM (2013) National Environment Protection (*Assessment of Site Contamination*) Amendment Measure 2013 (No.1)
- State Environment Protection Policy (SEPP 2018) *Waters of Victoria*. Victoria Government Gazette No. S499, 23 October

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## APPENDICES

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# **APPENDIX A:**

## **SITE IDENTIFICATION: Property Report & Aerial Photograph Overlay & WELL LOCATION PLAN**

# PROPERTY REPORT

From [www.planning.vic.gov.au](http://www.planning.vic.gov.au) at 25 October 2022 07:53 PM

## PROPERTY DETAILS

Address: **438 LOBBS ROAD GLENBRAE 3352**  
Crown Description: **Allot. 1 Sec. 21 PARISH OF ERCILDOUN**  
Standard Parcel Identifier (SPI): **1-21\PP2597**  
Local Government Area (Council): **PYRENEES**  
Council Property Number: **407002800**  
Directory Reference: **Vicroads 58 A7**

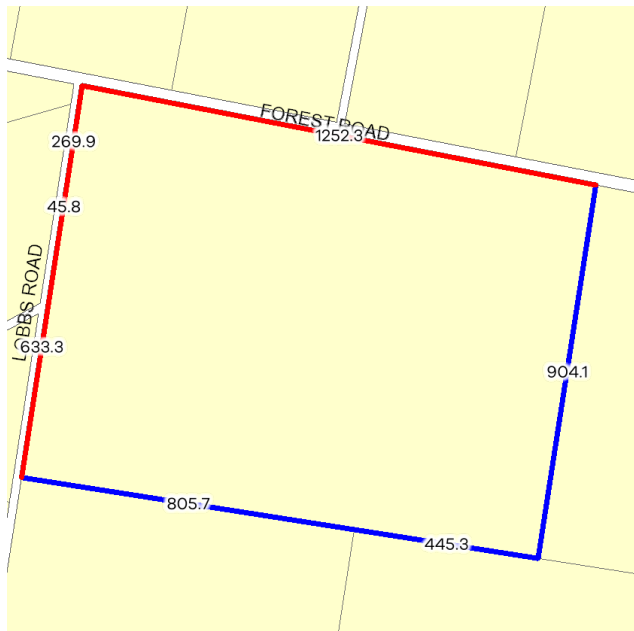
[www.pyrenees.vic.gov.au](http://www.pyrenees.vic.gov.au)

**This property is in a designated bushfire prone area.**  
**Special bushfire construction requirements apply. Planning provisions may apply.**

Further information about the building control system and building in bushfire prone areas can be found on the Victorian Building Authority website <https://www.vba.vic.gov.au>

## SITE DIMENSIONS

All dimensions and areas are approximate. They may not agree with those shown on a title or plan.



**Area:** 1159232 sq. m (115.92 ha)

**Perimeter:** 4356 m

For this property:

— Site boundaries

— Road frontages

Dimensions for individual parcels require a separate search, but dimensions for individual units are generally not available.

Calculating the area from the dimensions shown may give a different value to the area shown above

For more accurate dimensions get copy of plan at [Title and Property Certificates](#)

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## UTILITIES

Rural Water Corporation: **Southern Rural Water**  
Urban Water Corporation: **Central Highlands Water**  
Melbourne Water: **Outside drainage boundary**  
Power Distributor: **POWERCOR**

## STATE ELECTORATES

Legislative Council: **WESTERN VICTORIA**  
Legislative Assembly: **RIPON**

## PLANNING INFORMATION

**Planning Zone** [FARMING ZONE \(FZ\)](#)

[SCHEDULE TO THE FARMING ZONE \(FZ\)](#)

**Planning Overlay** [ENVIRONMENTAL SIGNIFICANCE OVERLAY \(ESO\)](#)

[ENVIRONMENTAL SIGNIFICANCE OVERLAY - SCHEDULE 1 \(ESO1\)](#)

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Read the full disclaimer at <https://www2.delwp.vic.gov.au/disclaimer>

Notwithstanding this disclaimer, a vendor may rely on the information in this report for the purpose of a statement that land is in a bushfire prone area as required by section 32C (b) of the Sale of Land 1962 (Vic).

# PROPERTY REPORT

Planning scheme data last updated on 19 October 2022.

A **planning scheme** sets out policies and requirements for the use, development and protection of land. This report provides information about the zone and overlay provisions that apply to the selected land. Information about the State and local policy, particular, general and operational provisions of the local planning scheme that may affect the use of this land can be obtained by contacting the local council or by visiting <https://www.planning.vic.gov.au>

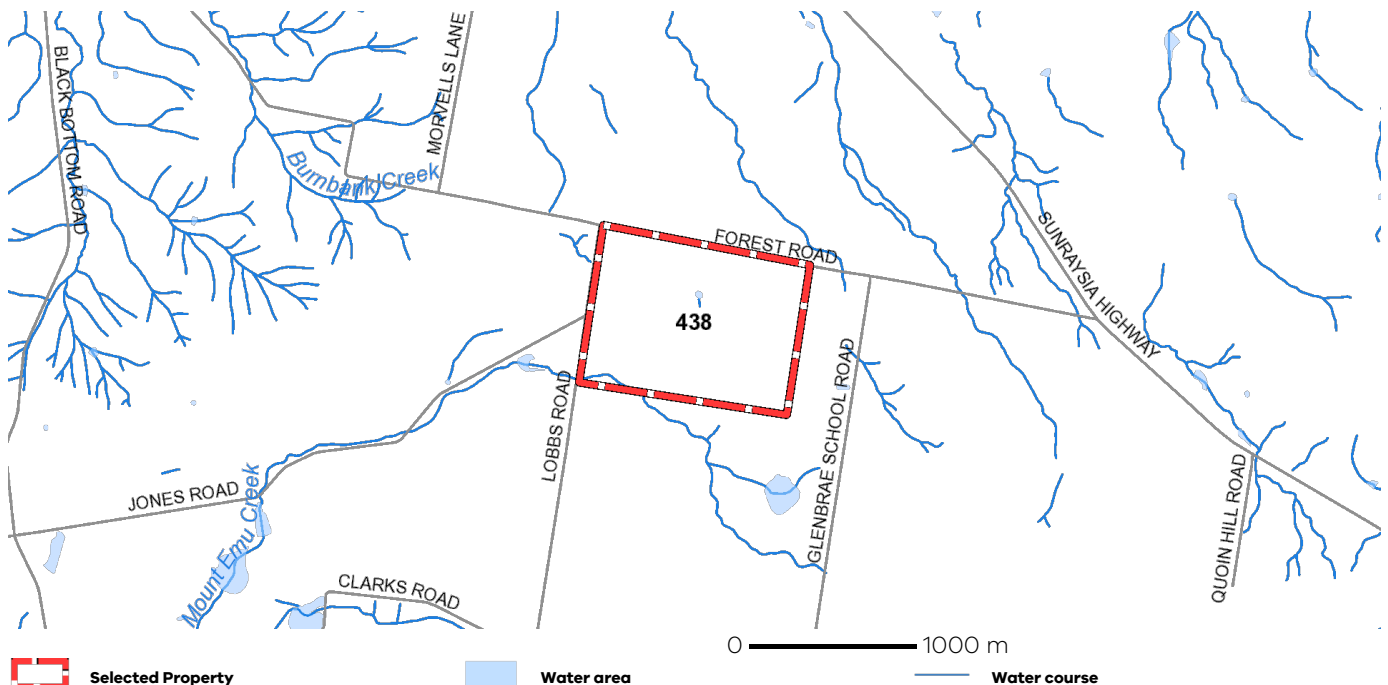
This report is NOT a **Planning Certificate** issued pursuant to Section 199 of the **Planning and Environment Act 1987**. It does not include information about exhibited planning scheme amendments, or zonings that may affect the land. To obtain a Planning Certificate go to Titles and Property Certificates at Landata - <https://www.landata.vic.gov.au>

For details of surrounding properties, use this service to get the Reports for properties of interest.

To view planning zones, overlay and heritage information in an interactive format visit <https://mapshare.vic.gov.au/vicplan>

For other information about planning in Victoria visit <https://www.planning.vic.gov.au>

## Area Map



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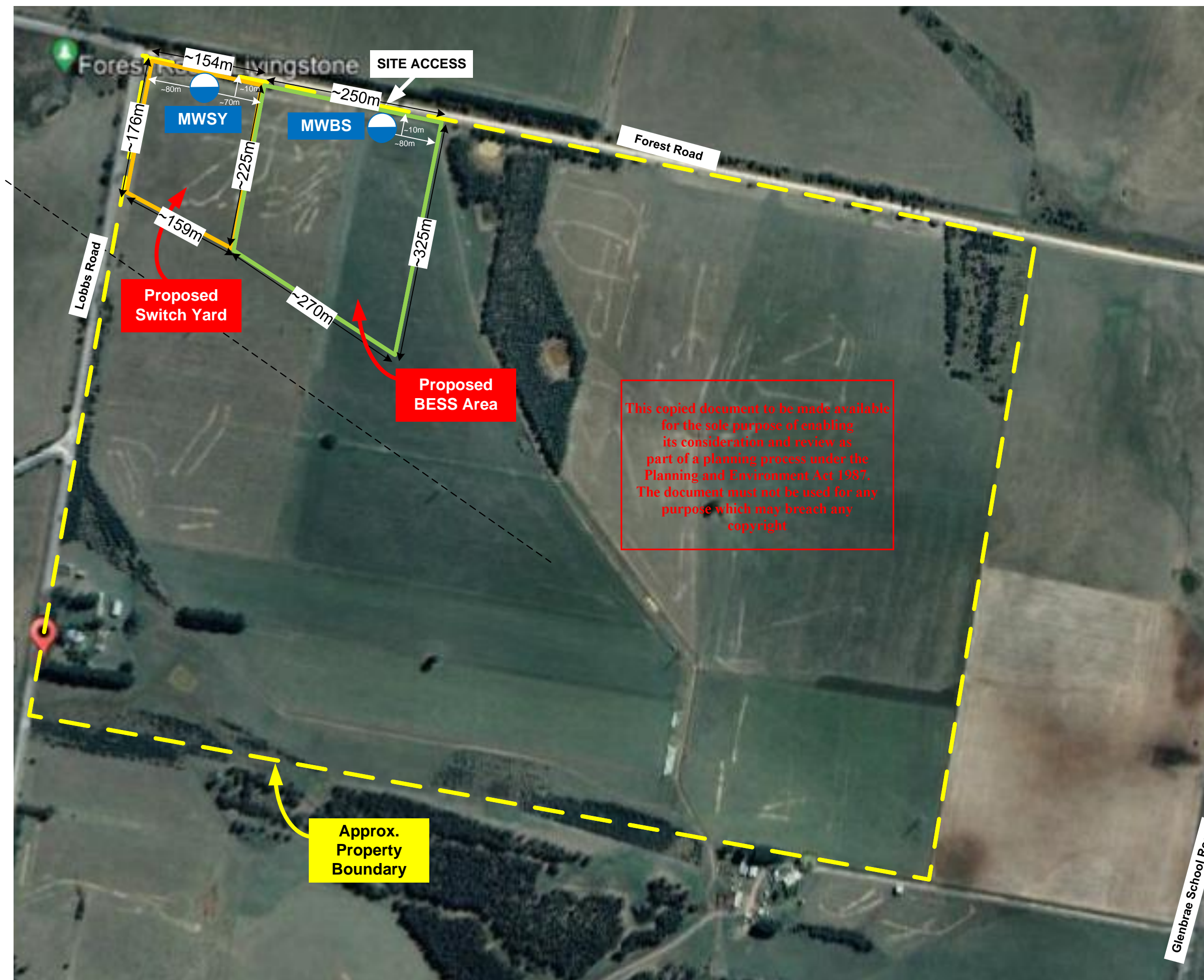
**Proposed BESS & Switchyard on Farm Land:**  
438 Lobbs Road, Glenbrae, Victoria

Dashed Yellow Outline: Approximate Property Boundaries  
Dashed Orange & Green Lines: Approximate Works Areas

Source: Google Earth, 16 March 2021







## POSITION OF GROUNDWATER WELLS

(& Boundary Offsets)

- Overlay over Google Aerial Photo  
(16 March 2021)

## ADVERTISED PLAN

### KEY:



Groundwater Monitoring Well

**MWSY**

Well installed in Switchyard Area (equates to MW2 in Bore Completion Report)

**MWBS**

Well installed in BESS Area (equates to MW1 in Bore Completion Report)

### SCALE :

Not to scale

### PROJECT/SITE ADDRESS:

Proposed Glenbrae BESS  
- 438 Lobbs Road, Glenbrae,  
Victoria



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## **APPENDIX B:**

**WELL DOCUMENTATION:**  
Well Log & Construction Diagrams,  
Well Field Gauging Sheet,  
Bore Construction Licence  
& Bore Completion Reports

**GeoPollution Management Pty Ltd**

Environmental Scientists and Engineers  
17-20 Summer Lane, Ringwood, Vic. 3134

**WELL No.:** MWBS (MW1)**JOB NO:** GW3426**INSTALLED BY:** P. Burgess**DATE:** 10-Nov-22**WELL LOG AND CONSTRUCTION DIAGRAM****PROJECT:** 438 Lobbs Road, Glenbrae**SCIENTIST:** Dr. K. Schwab**DRILL METHOD:** Solid Flight Auger**LOG OF BORING AND WELL INSTALLATION**

BORING					OBSERVATION WELL INFORMATION	
Depth (m)	Description	Profile	PID Borespace (BS)/Headspace (HS) [ppm]	Sample No.	Type of Well:	Groundwater Investigation
					Top of Casing Elevation:	~580mm above ground level
					Ground Elev:	
0.0	Grass Surface				Depth (m)	Standpipe (Stick up, 580mm), with "Monument" Cover
0.5	Clayey SILT, trace gravel, brown	Natural Soil			0.5	Cement Collar
1.0	Silty CLAY, brown / orange / red				1.0	Cement Grout
1.5					1.5	
2.0					2.0	
2.5					2.5	
3.0					3.0	
3.5		Rock			3.5	
4.0	Basalt Rock				4.0	
4.5					4.5	
5.0					5.0	
5.5					5.5	Soil Cuttings
6.0					6.0	
6.5					6.5	
7.0					7.0	
7.5					7.5	
8.0					8.0	
8.5					8.5	
9.0					9.0	
9.5					9.5	Casing
10.0					10.0	
10.5					10.5	
11.0					11.0	
11.5					11.5	
12.0					12.0	
12.5					12.5	
13.0					13.0	Bentonite Chips / Bentonite Grout
13.5					13.5	
14.0					14.0	
14.5					14.5	
15.0					15.0	
15.5					15.5	
16.0					16.0	
16.5					16.5	
17.0					17.0	PVC Bore Screen
17.5					17.5	
18.0	very moist/wet below 18m during drilling				18.0	Approx. Water Level
18.5					18.5	
19.0					19.0	Coarse Sand
19.5					19.5	
20.0					20.0	
	Drilled to 20m, Well Installed to 20m					
		Finish to Surface:	Cement	Length of Screen:	6.0m	
		I.D. of Riser Pipe:	NA	Size of Slot Opening:	0.4mm	
		Type of Pipe:	PVC, Class 18	Diameter of Screen:	50mm	
		Length of Casing:	14.58m	Type:	PVC Class 18	
		Backfill around Casing :	Coarse Sand	Bottom of Well Elev.:	20.0m bgl	
		Top of Seal Elev:	12/5m bgl	Bottom of Boring Elev.:	20.0m bgl	
		Type of Seal Material:	Bentonite Chips	Diameter of Boring:	110mm	
		Top Filter Elev:	13.5m bgl	Well developed (Y/N):	Y	
		Type of Filter Material:	Coarse Sand	Surface Cover (Surrounds):	Grass	

**GeoPollution Management Pty Ltd**

Environmental Scientists and Engineers  
17-20 Summer Lane, Ringwood, Vic. 3134

**WELL No.:** MWSY (MW2)**JOB NO:** GW3426**INSTALLED BY:** P. Burgess**DATE:** 10-Nov-22**WELL LOG AND CONSTRUCTION DIAGRAM****PROJECT:** 438 Lobbs Road, Glenbrae**SCIENTIST:** Dr. K. Schwab**DRILL METHOD:** Solid Flight Auger**LOG OF BORING AND WELL INSTALLATION**

BORING					OBSERVATION WELL INFORMATION	
Depth (m)	Description	Profile	PID Borespace (BS)/Headspace (HS) [ppm]	Sample No.	Type of Well:	Groundwater Investigation
					Top of Casing Elevation:	~700mm above ground level
					Ground Elev:	
0.0	Grass Surface				Depth (m)	Standpipe (Stick up, 700mm), with "Monument" Cover
0.5	Clayey SILT, trace gravel, brown	Natural Soil			0.5	Cement Collar
1.0	Silty CLAY, brown / orange / red				1.0	Cement Grout
1.5					1.5	
2.0					2.0	
2.5					2.5	
3.0					3.0	
3.5		Rock			3.5	
4.0	Basalt Rock				4.0	
4.5					4.5	
5.0					5.0	
5.5					5.5	Soil Cuttings
6.0					6.0	
6.5					6.5	
7.0					7.0	Casing
7.5					7.5	
8.0					8.0	
8.5					8.5	
9.0					9.0	
9.5					9.5	
10.0					10.0	
10.5					10.5	Bentonite Chips / Bentonite Grout
11.0					11.0	
11.5					11.5	
12.0					12.0	
12.5					12.5	
13.0					13.0	
13.5					13.5	
14.0					14.0	
14.5					14.5	PVC Bore Screen
15.0					15.0	
15.5					15.5	
16.0					16.0	
16.5					16.5	
17.0					17.0	
17.5					17.5	Approx. Water Level
18.0	very moist/wet below 17m during drilling				18.0	Coarse Sand
18.5					18.5	
19.0					19.0	
19.5					19.5	
20.0					20.0	
		Finish to Surface:		Cement	Length of Screen:	6.0m
		I.D. of Riser Pipe:		NA	Size of Slot Opening:	0.4mm
		Type of Pipe:		PVC, Class 18	Diameter of Screen:	50mm
		Length of Casing:		12.7m	Type:	PVC Class 18
		Backfill around Casing :		Coarse Sand	Bottom of Well Elev.:	18.0m bgl
		Top of Seal Elev:		10.0m bgl	Bottom of Boring Elev.:	18.0m bgl
		Type of Seal Material:		Bentonite Chips	Diameter of Boring:	110mm
		Top Filter Elev:		11.0m bgl	Well developed (Y/N):	Y
		Type of Filter Material:		Coarse Sand	Surface Cover (Surrounds):	Grass



## Well Field Gauging Record

**JOB No.:** GW3426

**SITE:** Farmland

**ADDRESS:** 438 Lobbs Road, Glenbrae, Victoria

WELL ID	DATE	TIME	Well Location	Stick Up (top of casing) of Standpipe above Ground Level [mm]	Depth to Product from top of casing (m)	Depth to Water from top of casing (m)	Depth to Bottom of Well measured (m btoc)	Observations
MWSY	11/11/2022	Before Development	Proposed Switchyard Area	70	-	17.26	18.00	Water turbid / muddy brown, no HC Odour, no SPH
	15/11/2022	Before Sampling				17.25		Water mostly clear to milky opaque, no HC Odour, no SPH
MWBS	11/11/2021	Before Development	Proposed BESS Area	58	-	17.51	19.80	Water clear, becoming turbid brown, no HC Odour, no SPH
	15/11/2021	Before Sampling				17.575		Water clear to slightly turbid brown, no HC Odour, no SPH

**KEY:**  
 HC: Hydrocarbon  
 SPH: Separate-Phase Hydrocarbon  
 DPH: Dissolved-Phase Hydrocarbon

nm: not measured  
 nc: not checked

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# COPY OF RECORD IN THE VICTORIAN WATER REGISTER LICENCE TO CONSTRUCT WORKS

*under Section 67 of the Water Act 1989*

*The information in this copy of record is as recorded at the time of printing. Current information should be obtained by a search of the register. The State of Victoria does not warrant the accuracy or completeness of this information and accepts no responsibility for any subsequent release, publication or reproduction of this information.*

*This licence does not remove the need to apply for any authorisation or permission necessary under any other Act of Parliament with respect to anything authorised by the works licence.*

*Water used under this licence is not fit for any use that may involve human consumption, directly or indirectly, without first being properly treated.*

*This licence is not to be interpreted as an endorsement of the design and/or construction of any works (including dams). The Authority does not accept any responsibility or liability for any suits or actions arising from injury, loss, damage or death to person or property which may arise from the maintenance, existence or use of the works.*

*Each person named as a licence holder is responsible for ensuring all the conditions of this licence are complied with.*

This licence authorises its holders to construct the described works, subject to the conditions.

## Licence Holder(s)

DAVID ROBERT CLARK of 425 GLENBRAE SCHOOL ROAD GLENBRAE VIC 3352

## Licence Contact Details

DR CLARK

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## Licence Details

Expiry date	09 Nov 2023
Status	Active
Authority	Goulburn-Murray Water
Name of waterway or aquifer	NA for construct/decommission
Water system	Loddon Highlands (GMU)

## Summary of Licensed Works

The details in this section are a summary only. They are subject to the conditions specified in this licence.

Works ID	Works type	Use of water
WRK134843	Bore	Observation
WRK134844	Bore	Observation

## Description of Licensed Works

**WORKS ID** WRK134843

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	Unrestricted

**Works location**

<i>Easting</i>	<i>Northing</i>	<i>Zone MGA</i>
726548.836	5866388.392	Zone 54

**Land description**

Volume 8180 Folio 130  
CA 1 Section 21 Parish of Ercildoun

**Property address**

438 LOBBS ROAD, GLENBRAE, VIC 3352

**Description of Licensed Works**

---

**WORKS ID** WRK134844

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	Unrestricted

**Works location**

<i>Easting</i>	<i>Northing</i>	<i>Zone MGA</i>
726623.121	5866369.233	Zone 54

**Land description**

Volume 8180 Folio 130  
CA 1 Section 21 Parish of Ercildoun

**Property address**

438 LOBBS ROAD, GLENBRAE, VIC 3352

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**Related Instruments**

<b>Related entitlements</b>	Nil
<b>Related water-use entities</b>	Nil

**Application History**

<i>Reference</i>	<i>Type</i>	<i>Status</i>	<i>Lodged date</i>	<i>Approved date</i>	<i>Recorded date</i>
WLI617369	Issue	Approved	09 Nov 2022	09 Nov 2022	

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## Conditions

Licence WLE084417 is subject to the following conditions:

### Siting and construction

- 1 The bore(s) must be drilled at the location specified in the application approved by the Authority.
- 2 If after drilling the bore is considered unsatisfactory a replacement bore may be drilled on the land specified in the licence.

### Preventing pollution

- 3 All earthworks must be carried out, and all drilling fluids and waters produced during construction and development must be disposed of, in ways that avoid contaminating native vegetation, waterways, aquifers, the riparian environment, the riverine environment or other people's property.
- 4 Construction must stop immediately if the Authority reasonably believes that fuel, lubricant, drilling fluid, soil or water produced during construction and development is at risk of being spilled into native vegetation, waterways, aquifers, the riparian environment, the riverine environment or other people's property.
- 5 The licence holder must construct and maintain bund walls, in accordance with the timeframe, specifications, guidelines or standards prescribed by the Authority, to prevent fuel, lubricant, drilling fluid, soil or water produced during construction and development from being spilled into native vegetation, waterways, aquifers, the riparian environment, the riverine environment or other people's property.

### Construction standards

- 6 The bore(s) must be constructed, and where relevant decommissioned, in accordance with the Minimum Construction Requirements for Water Bores in Australia, Edition 4 or its successor.

### Drilling licence and supervision requirements

- 7 The bore(s) must be constructed by, or under the supervision of, a driller licenced under the Water Act 1989 as follows: as a Class 1, 2 or 3 driller with appropriate drilling endorsement.
- 8 If artesian pressure is expected or encountered, then a driller licenced under the Water Act 1989, and endorsed as a class 3 driller, must install casing in the bore(s) to a suitable depth, and in a suitable manner, to prevent its outbreak. A suitable valve must also be fitted to the bore.

### Bore completion report

- 9 A Bore Completion Report must be submitted to the Authority within 28 working days of the bore(s) being completed.

### Protecting water resources

- 10 No more than 2 bore(s) may be brought to final development under this licence.
- 11 At the completion of drilling and before the drilling rig leaves the site, all but 2 bore(s) must be decommissioned so as to eliminate physical hazards, conserve aquifer yield, prevent groundwater contamination and prevent the intermingling of desirable and undesirable waters.
- 12 The bores(s) must be located at least 100 metres from any waterway unless otherwise authorised by the Authority.
- 13 The bores(s) must be located at least 50 metres from any bore(s) not operated by the licence holder unless authorised by the Authority.
- 14 The bore(s) must be located at least 30 metres from any authority's channel, reserve or easement unless authorised by the Authority.

### Protecting water quality

- 15 The bore(s) must be constructed so as to prevent aquifer contamination caused by vertical flow outside the casing.
- 16 If two or more aquifers are encountered, the bore(s) must be constructed to ensure that an impervious seal is made and maintained between each aquifer to prevent aquifer connection

through vertical flow outside the casing; under no circumstances are two or more aquifers to be screened within the one bore or in any other manner to allow connection between them.

- 17 Boreheads must be constructed, to ensure that no flood water, surface runoff or potential subsurface contaminated soakage can enter the bore or bore annulus.

**Protecting other water users**

- 18 The diameter of the drill casing must not exceed 130 millimetres.
- 19 The bore(s) must be constructed so that water levels in the bore(s) can be measured by an airline, a piezometer or a method approved in writing by the Authority.

**Fees and charges**

- 20 The licence holder must, when requested by the Authority, pay all fees, costs and other charges under the Water Act 1989 in respect of this licence.

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## Bore Completion Report (BCR)

BCR number

BCR031925

Report status

Approved

Works/bore ID

WRK134843

Works licence number

WLE084417

Licence Holder

DR CLARK

Drillers name

PHILIP ADAM BURGESS

Alternate bore ID

Name of plant operator

Gerard kuhn

Bore type

Drilled bore

Drilled depth (m)

20.0

Type of work carried out

Construct

Was bore decommissioned?

☐ Yes ☒ No

Bore use

Observation

Date work commenced?

07/11/2022

Date work completed

10/11/2022

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## Bore Location

Property address

438 LOBBS ROAD GLENBRAE 3352

Ground water management unit

Loddon Highlands (GMU)

Easting

726548.836

Northing

5866388.392

Zone

54

Datum

MGA94

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## Drilling Technique

Method	From (m)	To (m)	Bit Diam (mm)
Mechanical auger	0.0	20.0	100.0

## Water Intersection

Test Method	From (m)	To (m)	Static level (m)	Est rate (l/sec)	Draw down (m)	Casing at test (m)	Depth at test (m)	EC at 25C (μS/cm)
-------------	----------	--------	------------------	------------------	---------------	--------------------	-------------------	-------------------

## Casing and screens

Type	From (m)	To (m)	Inner diam (mm)	Outer diam (mm)	Material	Aperture (mm)	TradeName
Casing	0.0	14.0	50.0	50.0	PVC		
Screen	14.0	20.0	50.0	50.0	PVC SCREEN		

## Fittings

Well head fitting

Monument

Base of casing

Endcap

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## Grouting and filter pack

Material	From (m)	To (m)	Cement (bags)	Water (liters)	Cement installation method	Seal/packer type	Outer diam of seal (mm)	Filter pack gain size (mm)
Cement	0.0	0.2						
Bentonite	0.5	14.5						
Gravel	14.5	20.0						

## Final bore development

Method	Yield (l/sec)	Draw down (m)	Pumping time (min)	Recovery time (min)	Final static level (m)	EC at 25C (μS/cm)
						0.0

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**Driller pumping test**

Method	Static level (m)	Yield (l/sec)	Pumping level (m)	Draw down (m)	Pumping time (min)	Recovery time (min)	EC at 25C (µS/cm)
					0.0		0.0

**Samples**

☐ Material samples have been taken

☐ Water Samples have been taken

**Disinfection**

☐ The bore was disinfected

**Drillers log**

Material	From (m)	To (m)
SILT	0.0	1.0
CLAY	1.0	3.5
BASALT	3.5	20.0

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**Bore Completion Report (BCR)**

BCR number

BCR031926

Report status

Approved

Works/bore ID

WRK134844

Works licence number

WLE084417

Licence Holder

DR CLARK

Drillers name

PHILIP ADAM BURGESS

Alternate bore ID

Name of plant operator

Gerard kuhn

Bore type

Drilled bore

Drilled depth (m)

18.0

Type of work carried out

Construct

Was bore decommissioned?

☐ Yes ☒ No

Bore use

Observation

Date work commenced?

10/11/2022

Date work completed

10/11/2022

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**Bore Location**

Property address

438 LOBBS ROAD GLENBRAE 3352

Ground water management unit

Loddon Highlands (GMU)

Easting

726662.650

Northing

5866309.490

Zone

54

Datum

MGA94

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## Drilling Technique

Method	From (m)	To (m)	Bit Diam (mm)
Mechanical auger	0.0	18.0	100.0

## Water Intersection

Test Method	From (m)	To (m)	Static level (m)	Est rate (l/sec)	Draw down (m)	Casing at test (m)	Depth at test (m)	EC at 25C (μS/cm)
-------------	----------	--------	------------------	------------------	---------------	--------------------	-------------------	-------------------

## Casing and screens

Type	From (m)	To (m)	Inner diam (mm)	Outer diam (mm)	Material	Aperture (mm)	TradeName
Casing	0.0	12.0	50.0	63.0	PVC		
Screen	12.0	18.0	50.0	63.0	PVC SCREEN	0.4	

## Fittings

Well head fitting

Monument

Base of casing

Endcap

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## Grouting and filter pack

Material	From (m)	To (m)	Cement (bags)	Water (liters)	Cement installation method	Seal/packer type	Outer diam of seal (mm)	Filter pack gain size (mm)
Cement	0.0	10.0			POURED			
Bentonite	10.0	11.5						
Gravel	11.5	18.0						2.0

## Final bore development

Method	Yield (l/sec)	Draw down (m)	Pumping time (min)	Recovery time (min)	Final static level (m)	EC at 25C (μS/cm)
						0.0

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**Driller pumping test**

Method	Static level (m)	Yield (l/sec)	Pumping level (m)	Draw down (m)	Pumping time (min)	Recovery time (min)	EC at 25C (µS/cm)
					0.0		0.0

**Samples**☒ Material samples have been taken

From(m):

0.0

To(m):

18.0

☐ Water Samples have been taken

Samples taken by:

**Disinfection**☐ The bore was disinfected**Drillers log**

Material	From (m)	To (m)
silt	0.0	1.0
CLAY	1.0	3.5
BASALT	3.5	18.0

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## **APPENDIX C:**

# **CHAIN OF CUSTODY DOCUMENTATION**



## CHAIN OF CUSTODY AND ANALYSIS REQUEST

Job No.:	GW3926	Project:	Glenbrae	Laboratory:	EnviroLab
Request No.:	EL454	Date:	16/11/2022	Prepared by:	Dr Karin Schwab
Turnaround:	STANDARD	Sample Collection Date:	15/11/2022		
Dispatch Date:	16/11/2022	Method:	Courier	Quote No.:	A. Mathrick, email 14/11/22
Requested by:	Dr Karin Schwab	Date:	16/11/2022	Signature:	
Received by:	LOISER	Date:	16/11/22	Signature:	

SAMPLE No.	BORE No.	SAMPLE TYPE/ CONTAINERS	PARAMETERS REQUESTED
MWSY-1511	MWSY	4 x 100mL glass amber (unpres.), 2 x 40mL vials (Na2S2O3), 2 x plastic (500 ml, unpres.), 1 x 125mL plastic (HNO3, filtered), 1 x 125 mL plastic (H2SO4), 2 x 125mL plastic (unpres., grey label), 1 x 125mL plastic (NaOH, blue label), 1 x 125mL plastic (Zinc Acetate), 1 x 250mL NAOH (blue label), 1 x 250mL plastic (unpres., green label), 1 x 125mL plastic (unpres.), 2 x 500mL plastic (unpres., green label)	Vic EPA 1828.2 (2021) <sup>1</sup> ; BOD, TKN, Suspended Solids, TDS, ITDS, % Inhibition, Ammonia, PFAS, Total Sulphide, Anion & Cation Balance: Al, B, Co, Fe, Mg, Mn, Chloride, Ca, Nitrate & Nitrite, Conductivity (EC), Na, K, Reactive Phosphorus (Phosphate), Sulphate, Silica (reactive as SiO <sub>2</sub> ) Semi-volatiles & Volatiles Scan (GCMS): incl. Hexane, Alkanes, Alkenes, Alkadienes, Alkynes, Alcyclic Hydrocarbons
MWBS-1511	MWBS	4 x 100mL glass amber (unpres.), 2 x 40mL vials (Na2S2O3), 2 x plastic (500 ml, unpres.), 1 x 125mL plastic (HNO3, filtered), 1 x 125 mL plastic (H2SO4), 2 x 125mL plastic (unpres., grey label), 1 x 125mL plastic (NaOH, blue label), 1 x 125mL plastic (Zinc Acetate), 1 x 250mL NAOH (blue label), 1 x 250mL plastic (unpres., green label), 1 x 125mL plastic (unpres.), 2 x 500mL plastic (unpres., green label)	Vic EPA 1828.2 (2021) <sup>1</sup> ; BOD, TKN, Suspended Solids, TDS, ITDS, % Inhibition, Ammonia, PFAS, Total Sulphide, Anion & Cation Balance: Al, B, Co, Fe, Mg, Mn, Chloride, Ca, Nitrate & Nitrite, Conductivity (EC), Na, K, Reactive Phosphorus (Phosphate), Sulphate, Silica (reactive as SiO <sub>2</sub> ) Semi-volatiles & Volatiles Scan (GCMS): incl. Hexane, Alkanes, Alkenes, Alkadienes, Alkynes, Alcyclic Hydrocarbons

<sup>1</sup> Please include all analytes covered in the EPA1828.2 (Table 2) 2021 screen.

EnviroLab Services  
23 Research Drive  
Croydon South VIC 3136  
Ph: (03) 5763 2500

Job No: 34586

Date Received: 16/11/22

Time Received: 11:50am

Received by: LO

Temp: Cool Ambient

Cor ng: Polylock

Security: Intact/Broken/None

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## **APPENDIX D:**

# **CHEMICAL ANALYSIS REPORTS (NATA ENDORSED)**

## **CERTIFICATE OF ANALYSIS 34586**

### **Client Details**

<b>Client</b>	GeoPollution Management
<b>Attention</b>	Karin Schwab
<b>Address</b>	17-20 Summer Lane, Ringwood, VIC, 3134

### **Sample Details**

<b>Your Reference</b>	<b><u>GW3926 Glenbrae</u></b>
<b>Number of Samples</b>	2 Water
<b>Date samples received</b>	16/11/2022
<b>Date completed instructions received</b>	16/11/2022

### **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.

**Please refer to the last page of this report for any comments relating to the results.**

### **Report Details**

<b>Date results requested by</b>	24/11/2022
<b>Date of Issue</b>	24/11/2022
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. <b>Tests not covered by NATA are denoted with *</b>	

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#### **Results Approved By**

Chris De Luca, Operations Manager  
 Simon Mills, Group R&D Manager  
 Suk Lee, Organic Supervisor  
 Tara White, Metals Team Leader  
 Tianna Milburn, Chemist

#### **Authorised By**

*P. Adams*

Pamela Adams, Laboratory Manager

VOCs in water			
Our Reference		34586-1	34586-2
Your Reference	UNITS	MWSY-1511	MWBS-1511
Date Sampled		15/11/2022	15/11/2022
Type of sample		Water	Water
Date extracted	-	18/11/2022	18/11/2022
Date analysed	-	18/11/2022	18/11/2022
methylene chloride	µg/L	<10	<10
Dichlorodifluoromethane	µg/L	<10	<10
Chloromethane	µg/L	<10	<10
Vinyl Chloride	µg/L	<10	<10
Bromomethane	µg/L	<10	<10
Chloroethane	µg/L	<10	<10
Trichlorofluoromethane	µg/L	<10	<10
1,1-Dichloroethene	µg/L	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1
1,1-dichloroethane	µg/L	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1
Bromochloromethane	µg/L	<1	<1
Chloroform	µg/L	<1	2
2,2-dichloropropane	µg/L	<1	<1
1,2-dichloroethane	µg/L	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1
1,1-dichloropropene	µg/L	<1	<1
Cyclohexane	µg/L	<1	<1
Carbon tetrachloride	µg/L	<1	<1
Benzene	µg/L	<1	<1
Dibromomethane	µg/L	<1	<1
1,2-dichloropropane	µg/L	<1	<1
Trichloroethene	µg/L	<1	<1
Bromodichloromethane	µg/L	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1
Toluene	µg/L	<1	<1
1,3-dichloropropane	µg/L	<1	<1
Dibromochloromethane	µg/L	<1	<1
1,2-dibromoethane	µg/L	<1	<1
Tetrachloroethene	µg/L	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1
Chlorobenzene	µg/L	<1	<1

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VOCs in water			
Our Reference		34586-1	34586-2
Your Reference	UNITS	MWSY-1511	MWBS-1511
Date Sampled		15/11/2022	15/11/2022
Type of sample		Water	Water
Ethylbenzene	µg/L	<1	<1
Bromoform	µg/L	<1	<1
m+p-xylene	µg/L	<2	<2
Styrene	µg/L	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1
o-xylene	µg/L	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1
Isopropylbenzene	µg/L	<1	<1
Bromobenzene	µg/L	<1	<1
n-propyl benzene	µg/L	<1	<1
2-chlorotoluene	µg/L	<1	<1
4-chlorotoluene	µg/L	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1
Tert-butyl benzene	µg/L	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1
Sec-butyl benzene	µg/L	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1
4-isopropyl toluene	µg/L	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1
n-butyl benzene	µg/L	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1
Hexachlorobutadiene	µg/L	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1
Surrogate Dibromofluoromethane	%	110	105
Surrogate toluene-d8	%	104	102
Surrogate 4-BFB	%	99	99

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vTRH(C6-C10)/BTEXN in Water			
Our Reference		34586-1	34586-2
Your Reference	UNITS	MWSY-1511	MWBS-1511
Date Sampled		15/11/2022	15/11/2022
Type of sample		Water	Water
Date extracted	-	18/11/2022	18/11/2022
Date analysed	-	18/11/2022	18/11/2022
TRH C <sub>6</sub> - C <sub>9</sub>	µg/L	<10	<10
TRH C <sub>6</sub> - C <sub>10</sub>	µg/L	<10	<10
TRH C <sub>6</sub> -C <sub>10</sub> less BTEX (F1)	µg/L	<10	<10
Benzene	µg/L	<1	<1
Toluene	µg/L	<1	<1
Ethylbenzene	µg/L	<1	<1
m+p-xylene	µg/L	<2	<2
o-xylene	µg/L	<1	<1
Naphthalene	µg/L	<1	<1
Total +ve Xylenes	µg/L	<1	<1
Surrogate Dibromofluoromethane	%	112	107
Surrogate toluene-d8	%	108	105
Surrogate 4-BFB	%	99	98

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TRH Water(C10-C40) NEPM			
Our Reference		34586-1	34586-2
Your Reference	UNITS	MWSY-1511	MWBS-1511
Date Sampled		15/11/2022	15/11/2022
Type of sample		Water	Water
Date extracted	-	18/11/2022	18/11/2022
Date analysed	-	22/11/2022	22/11/2022
TRH C <sub>10</sub> - C <sub>14</sub>	µg/L	<50	<50
TRH C <sub>15</sub> - C <sub>28</sub>	µg/L	<100	<100
TRH C <sub>29</sub> - C <sub>36</sub>	µg/L	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50
TRH >C <sub>10</sub> - C <sub>16</sub>	µg/L	<50	<50
TRH >C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	µg/L	<50	<50
TRH >C <sub>16</sub> - C <sub>34</sub>	µg/L	<100	<100
TRH >C <sub>34</sub> - C <sub>40</sub>	µg/L	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50
Surrogate o-Terphenyl	%	45	74

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PAHs in Water			
Our Reference		34586-1	34586-2
Your Reference	UNITS	MWSY-1511	MWBS-1511
Date Sampled		15/11/2022	15/11/2022
Type of sample		Water	Water
Date extracted	-	18/11/2022	18/11/2022
Date analysed	-	22/11/2022	22/11/2022
Naphthalene	µg/L	<1	<1
Acenaphthylene	µg/L	<1	<1
Acenaphthene	µg/L	<1	<1
Fluorene	µg/L	<1	<1
Phenanthrene	µg/L	<1	<1
Anthracene	µg/L	<1	<1
Fluoranthene	µg/L	<1	<1
Pyrene	µg/L	<1	<1
Benzo(a)anthracene	µg/L	<1	<1
Chrysene	µg/L	<1	<1
Benzo(b,j&k)fluoranthene	µg/L	<2	<2
Benzo(a)pyrene	µg/L	<1	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1	<1
Dibenzo(a,h)anthracene	µg/L	<1	<1
Benzo(g,h,i)perylene	µg/L	<1	<1
Total +ve PAH's	µg/L	<1	<1
Benzo(a)pyrene TEQ	µg/L	<5	<5
Surrogate <i>p</i> -Terphenyl-d <sub>14</sub>	%	62	86

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PCBs in Water			
Our Reference		34586-1	34586-2
Your Reference	UNITS	MWSY-1511	MWBS-1511
Date Sampled		15/11/2022	15/11/2022
Type of sample		Water	Water
Date extracted	-	18/11/2022	18/11/2022
Date analysed	-	22/11/2022	22/11/2022
Aroclor 1016	µg/L	<2	<2
Aroclor 1221	µg/L	<2	<2
Aroclor 1232	µg/L	<2	<2
Aroclor 1242	µg/L	<2	<2
Aroclor 1248	µg/L	<2	<2
Aroclor 1254	µg/L	<2	<2
Aroclor 1260	µg/L	<2	<2
Surrogate <i>p</i> -Terphenyl	%	62	86

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OCP in water			
Our Reference		34586-1	34586-2
Your Reference	UNITS	MWSY-1511	MWBS-1511
Date Sampled		15/11/2022	15/11/2022
Type of sample		Water	Water
Date extracted	-	18/11/2022	18/11/2022
Date analysed	-	22/11/2022	22/11/2022
alpha-BHC	µg/L	<0.2	<0.2
HCB	µg/L	<0.2	<0.2
beta-BHC	µg/L	<0.2	<0.2
gamma-BHC	µg/L	<0.2	<0.2
Heptachlor	µg/L	<0.2	<0.2
delta-BHC	µg/L	<0.2	<0.2
Aldrin	µg/L	<0.2	<0.2
Heptachlor Epoxide	µg/L	<0.2	<0.2
gamma-Chlordane	µg/L	<0.2	<0.2
alpha-Chlordane	µg/L	<0.2	<0.2
Endosulfan I	µg/L	<0.2	<0.2
pp-DDE	µg/L	<0.2	<0.2
Dieldrin	µg/L	<0.2	<0.2
Endrin	µg/L	<0.2	<0.2
Endosulfan II	µg/L	<0.2	<0.2
pp-DDD	µg/L	<0.2	<0.2
Endrin Aldehyde	µg/L	<0.2	<0.2
pp-DDT	µg/L	<0.2	<0.2
Endosulfan Sulphate	µg/L	<0.2	<0.2
Methoxychlor	µg/L	<0.2	<0.2
Surrogate 2-chlorophenol-d4	%	36	68

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Speciated Phenols in water			
Our Reference		34586-1	34586-2
Your Reference	UNITS	MWSY-1511	MWBS-1511
Date Sampled		15/11/2022	15/11/2022
Type of sample		Water	Water
Date extracted	-	18/11/2022	18/11/2022
Date analysed	-	22/11/2022	22/11/2022
Phenol	µg/L	<10	<10
2-Chlorophenol	µg/L	<10	<10
2-Methylphenol	µg/L	<10	<10
3/4-Methylphenol	µg/L	<20	<20
2-Nitrophenol	µg/L	<10	<10
2,4-Dimethylphenol	µg/L	<10	<10
2,4-Dichlorophenol	µg/L	<10	<10
2,6-Dichlorophenol	µg/L	<10	<10
2,4,5-Trichlorophenol	µg/L	<10	<10
2,4,6-Trichlorophenol	µg/L	<10	<10
2,4-Dinitrophenol	µg/L	<100	<100
4-Nitrophenol	µg/L	<100	<100
2,3,4,6-Tetrachlorophenol	µg/L	<10	<10
2-methyl-4,6-dinitrophenol	µg/L	<100	<100
Pentachlorophenol	µg/L	<100	<100
4-Chloro-3-Methylphenol	µg/L	<10	<10
2,3,4,5-tetrachlorophenol	µg/L	<10	<10
2,3,5,6-tetrachlorophenol	µg/L	<10	<10
2-cyclohexyl-4,6-dinitrophenol	µg/L	<10	<10
dinoseb	µg/L	<10	<10
Surrogate Phenol-d <sub>6</sub>	%	#	34
Surrogate 2-fluorophenol	%	22	52

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SVOC's in water			
Our Reference		34586-1	34586-2
Your Reference	UNITS	MWSY-1511	MWBS-1511
Date Sampled		15/11/2022	15/11/2022
Type of sample		Water	Water
Date extracted	-	18/11/2022	18/11/2022
Date analysed	-	22/11/2022	22/11/2022
Naphthalene	µg/L	<2	<2
2-Methylnaphthalene	µg/L	<2	<2
Acenaphthylene	µg/L	<2	<2
Acenaphthene	µg/L	<2	<2
Fluorene	µg/L	<2	<2
Phenanthrene	µg/L	<2	<2
Anthracene	µg/L	<2	<2
Fluoranthene	µg/L	<2	<2
Pyrene	µg/L	<2	<2
Benzo(a)anthracene	µg/L	<2	<2
Chrysene	µg/L	<2	<2
Benzo(b,j+k)fluoranthene	µg/L	<4	<4
Benzo(a)pyrene	µg/L	<2	<2
Indeno(1,2,3-c,d)pyrene	µg/L	<2	<2
Dibenzo(a,h)anthracene	µg/L	<2	<2
Benzo(g,h,i)perylene	µg/L	<2	<2
2-Acetylaminofluorene	µg/L	<2	<2
3-Methylcholanthrene	µg/L	<2	<2
7,12-Dimethylbenz(a)anthracene	µg/L	<2	<2
2-Chloronaphthalene	µg/L	<2	<2
1-Chloronaphthalene	µg/L	<2	<2
a-BHC	µg/L	<2	<2
g-BHC	µg/L	<2	<2
b-BHC	µg/L	<2	<2
Heptachlor	µg/L	<2	<2
d-BHC	µg/L	<2	<2
Aldrin	µg/L	<2	<2
Heptachlor Epoxide	µg/L	<2	<2
g-Chlordane	µg/L	<2	<2
a-Chlordane	µg/L	<2	<2
Endosulfan I	µg/L	<2	<2
p,p'-DDE	µg/L	<2	<2
Dieldrin	µg/L	<2	<2
Endrin	µg/L	<2	<2

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SVOC's in water			
Our Reference		34586-1	34586-2
Your Reference	UNITS	MWSY-1511	MWBS-1511
Date Sampled		15/11/2022	15/11/2022
Type of sample		Water	Water
p,p'-DDD	µg/L	<2	<2
Endosulfan II	µg/L	<2	<2
p,p'-DDT	µg/L	<2	<2
Endrin Aldehyde	µg/L	<2	<2
Endrin Ketone	µg/L	<2	<2
Endosulfan Sulphate	µg/L	<2	<2
Methoxychlor	µg/L	<2	<2
Azinphos Methyl (Guthion)	µg/L	<2	<2
Bromophos Ethyl	µg/L	<2	<2
Chlorpyrifos	µg/L	<2	<2
Chlorpyrifos-methyl	µg/L	<2	<2
Coumaphos(Co-Ral)	µg/L	<2	<2
Diazinon (Dimpylate)	µg/L	<2	<2
Dichlorvos	µg/L	<2	<2
Dimethoate	µg/L	<2	<2
Disulfoton	µg/L	<2	<2
Ethion	µg/L	<2	<2
Fenamiphos	µg/L	<2	<2
Fenitrothion	µg/L	<2	<2
Fenthion	µg/L	<2	<2
Malathion (Maldison)	µg/L	<2	<2
Methidathion	µg/L	<2	<2
Mevinphos	µg/L	<2	<2
Parathion (parathion-ethyl)	µg/L	<2	<2
Parathion-methyl	µg/L	<2	<2
Phorate	µg/L	<2	<2
Phosalone	µg/L	<2	<2
Ronnel (fenchlorphos)	µg/L	<2	<2
Phenol	µg/L	<2	<2
2-Chlorophenol	µg/L	<2	<2
4-Chloro-3-Methyl Phenol	µg/L	<2	<2
2-Methylphenol	µg/L	<2	<2
3/4-Methylphenol	µg/L	<4	<4
2-Nitrophenol	µg/L	<2	<2
2,4-Dimethylphenol	µg/L	<2	<2
2,4-Dichlorophenol	µg/L	<2	<2
2,6-Dichlorophenol	µg/L	<2	<2

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SVOC's in water			
Our Reference		34586-1	34586-2
Your Reference	UNITS	MWSY-1511	MWBS-1511
Date Sampled		15/11/2022	15/11/2022
Type of sample		Water	Water
2,4,5-Trichlorophenol	µg/L	<2	<2
2,4,6-Trichlorophenol	µg/L	<2	<2
2,4-Dinitrophenol	µg/L	<20	<20
4-Nitrophenol	µg/L	<20	<20
2,3,4,6-Tetrachlorophenol	µg/L	<2	<2
2-methyl-4,6-dinitrophenol	µg/L	<20	<20
Pentachlorophenol	µg/L	<10	<10
Dinoseb	µg/L	<20	<20
1,2,4,5-Tetrachlorobenzene	µg/L	<2	<2
1,2,4-Trichlorobenzene	µg/L	<2	<2
1,2-Dichlorobenzene	µg/L	<2	<2
1,3-Dichlorobenzene	µg/L	<2	<2
1,4-Dichlorobenzene	µg/L	<2	<2
Hexachlorobenzene	µg/L	<2	<2
Hexachlorobutadiene	µg/L	<2	<2
Hexachlorocyclopentadiene	µg/L	<5	<5
Hexachloroethane	µg/L	<2	<2
Hexachloropropene-1	µg/L	<2	<2
Pentachlorobenzene	µg/L	<2	<2
Pentachloroethane	µg/L	<2	<2
Bis(2-ethylhexyl) phthalate	µg/L	<50	<50
Butylbenzylphthalate	µg/L	<10	<10
Diethyl phthalate	µg/L	<10	<10
Dimethyl phthalate	µg/L	<10	<10
Di-n-butylphthalate	µg/L	<50	<50
Di-n-octylphthalate	µg/L	<10	<10
bis (2-Chloroethoxy) methane	µg/L	<5	<5
Bis (2-chloroethyl) ether	µg/L	<5	<5
bis-(2-Chloroisopropyl) ether	µg/L	<5	<5
4-Bromophenylphenylether	µg/L	<5	<5
4-Chlorophenylphenylether	µg/L	<5	<5
Diphenylamine	µg/L	<5	<5
N-nitrosodi-n-butylamine	µg/L	<5	<5
N-nitrosodi-n-propylamine	µg/L	<5	<5
N-nitrosomorpholine	µg/L	<5	<5
N-nitrosopiperidine	µg/L	<5	<5
1,3-Dinitrobenzene	µg/L	<5	<5

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SVOC's in water			
Our Reference		34586-1	34586-2
Your Reference	UNITS	MWSY-1511	MWBS-1511
Date Sampled		15/11/2022	15/11/2022
Type of sample		Water	Water
2,6-Dinitrotoluene	µg/L	<5	<5
5-Nitro-o-toluidine	µg/L	<5	<5
Acetophenone	µg/L	<5	<5
Azobenzene	µg/L	<5	<5
Isophorone	µg/L	<5	<5
Nitrobenzene	µg/L	<5	<5
Pentachloronitrobenzene	µg/L	<5	<5
Phenacetin	µg/L	<5	<5
1-Naphthylamine	µg/L	<5	<5
2-Naphthylamine	µg/L	<5	<5
2-Nitroaniline	µg/L	<5	<5
3-Nitroaniline	µg/L	<5	<5
4-Chloroaniline	µg/L	<5	<5
4-Nitroaniline	µg/L	<5	<5
Aniline	µg/L	<5	<5
Dibenzofuran	µg/L	<5	<5
Benzyl alcohol	µg/L	<5	<5
Carbazole	µg/L	<5	<5
Ethylmethanesulfonate	µg/L	<5	<5
cis and trans-iso-Safrole	µg/L	<10	<10
Methapyrilene	µg/L	<10	<10
p-Dimethylaminoazobenzene	µg/L	<5	<5
Safrole	µg/L	<5	<5
Trifluralin	µg/L	<0.5	<0.5
Surrogate 2-fluorophenol	%	22	52
Surrogate Phenol-d <sub>6</sub>	%	#	34
Surrogate 2-chlorophenol-d <sub>4</sub>	%	36	68
Surrogate Nitrobenzene-d <sub>5</sub>	%	36	68
Surrogate 2-fluorobiphenyl	%	46	62
Surrogate p-Terphenyl-d <sub>14</sub>	%	62	86

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All metals in water-dissolved			
Our Reference		34586-1	34586-2
Your Reference	UNITS	MWSY-1511	MWBS-1511
Date Sampled		15/11/2022	15/11/2022
Type of sample		Water	Water
Date prepared	-	21/11/2022	21/11/2022
Date analysed	-	21/11/2022	21/11/2022
Aluminium-Dissolved	µg/L	35	<10
Boron-Dissolved	µg/L	<20	70
Cobalt-Dissolved	µg/L	7	7
Iron-Dissolved	µg/L	31	18
Manganese-Dissolved	µg/L	170	470
Arsenic-Dissolved	µg/L	<1	<1
Cadmium-Dissolved	µg/L	<0.1	<0.1
Chromium-Dissolved	µg/L	<1	<1
Copper-Dissolved	µg/L	<1	2
Lead-Dissolved	µg/L	<1	<1
Mercury-Dissolved	µg/L	<0.05	<0.05
Molybdenum-Dissolved	µg/L	2	2
Nickel-Dissolved	µg/L	8	18
Tin-Dissolved	µg/L	<1	<1
Selenium-Dissolved	µg/L	<1	<1
Silver-Dissolved	µg/L	<1	<1
Zinc-Dissolved	µg/L	4	7

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Miscellaneous Inorganics			
Our Reference		34586-1	34586-2
Your Reference	UNITS	MWSY-1511	MWBS-1511
Date Sampled		15/11/2022	15/11/2022
Type of sample		Water	Water
Date prepared	-	16/11/2022	16/11/2022
Date analysed	-	16/11/2022	16/11/2022
pH	pH Units	6.5	7.0
Total Cyanide	mg/L	<0.004	<0.004
Fluoride, F	mg/L	0.1	<0.1
Hexavalent Chromium, Cr <sup>6+</sup>	mg/L	<0.005	<0.005
Total Suspended Solids	mg/L	4,000	7,400
Total Dissolved Solids (grav)	mg/L	460	1,400
Total Dissolved Solids (grav)	mg/L	230	600
Ammonia as N in water	mg/L	0.076	<0.005
Electrical Conductivity	µS/cm	800	2,300
Nitrate as N in water	mg/L	1.2	0.76
Nitrite as N in water	mg/L	0.014	0.024
Phosphate as P in water	mg/L	0.023	0.019
BOD	mg/L	<5	<5
TKN in water	mg/L	<0.1	<0.1
Sulphide	mg/L	<0.5	<0.5
Silica (Reactive SiO <sub>2</sub> )	mg/L	53	57
Anaerobic Inhibition (ATOX), %	%	<5	<5

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Ion Balance			
Our Reference		34586-1	34586-2
Your Reference	UNITS	MWSY-1511	MWBS-1511
Date Sampled		15/11/2022	15/11/2022
Type of sample		Water	Water
Date prepared	-	22/11/2022	22/11/2022
Date analysed	-	22/11/2022	22/11/2022
Calcium - Dissolved	mg/L	15	68
Potassium - Dissolved	mg/L	3.3	7.2
Sodium - Dissolved	mg/L	100	140
Magnesium - Dissolved	mg/L	18	100
Hydroxide Alkalinity (OH <sup>-</sup> ) as CaCO <sub>3</sub>	mg/L	<5	<5
Bicarbonate Alkalinity as CaCO <sub>3</sub>	mg/L	88	140
Carbonate Alkalinity as CaCO <sub>3</sub>	mg/L	<5	<5
Total Alkalinity as CaCO <sub>3</sub>	mg/L	88	140
Sulphate, SO <sub>4</sub>	mg/L	82	8
Chloride, Cl	mg/L	120	520
Hardness	mgCaCO <sub>3</sub> /L	110	580
Ionic Balance	%	-0.34	1.8

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PFAS in Water Short			
Our Reference		34586-1	34586-2
Your Reference	UNITS	MWSY-1511	MWBS-1511
Date Sampled		15/11/2022	15/11/2022
Type of sample		Water	Water
Date prepared	-	17/11/2022	17/11/2022
Date analysed	-	17/11/2022	17/11/2022
Perfluorohexanesulfonic acid PFHxS	µg/L	<0.01	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	<0.01	<0.01
Perfluorooctanoic acid PFOA	µg/L	<0.01	<0.01
6:2 FTS	µg/L	<0.01	<0.01
8:2 FTS	µg/L	<0.02	<0.02
Surrogate <sup>13</sup> C <sub>8</sub> PFOS	%	98	98
Surrogate <sup>13</sup> C <sub>2</sub> PFOA	%	98	99
Extracted ISTD <sup>18</sup> O <sub>2</sub> PFHxS	%	96	99
Extracted ISTD <sup>13</sup> C <sub>4</sub> PFOS	%	100	100
Extracted ISTD <sup>13</sup> C <sub>4</sub> PFOA	%	109	108
Extracted ISTD <sup>13</sup> C <sub>2</sub> 6:2FTS	%	109	111
Extracted ISTD <sup>13</sup> C <sub>2</sub> 8:2FTS	%	103	99
Total Positive PFHxS & PFOS	µg/L	<0.01	<0.01
Total Positive PFOS & PFOA	µg/L	<0.01	<0.01
Total Positive PFAS	µg/L	<0.01	<0.01

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Method ID	Methodology Summary
<b>Ext-007</b>	Subcontracted to Levay & Co. (SA)
<b>Inorg-001</b>	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only as analysis outside of the APHA storage times.
<b>Inorg-002</b>	Conductivity and Salinity - measured using a conductivity cell at 25°C in accordance with APHA latest edition 2510 and Rayment & Lyons.
<b>Inorg-006</b>	Alkalinity - determined titrimetrically in accordance with APHA latest edition, 2320-B.
<b>Inorg-014</b>	Cyanide - free, total, weak acid dissociable by segmented flow analyser (in line dialysis with colourimetric finish).  Solids/Filters and sorbents are extracted in a caustic media prior to analysis. Impingers are pH adjusted as required prior to analysis.  Cyanides amenable to Chlorination - samples are analysed untreated and treated with hyperchlorite to assess the potential for chlorination of cyanide forms. Based on APHA latest edition, 4500-CN_G,H.
<b>Inorg-018</b>	Total Dissolved Solids - determined gravimetrically. The solids are dried at 180±10°C.
<b>Inorg-019</b>	Suspended Solids - determined gravimetrically by filtration of the sample. The samples are dried at 104±5°C.
<b>Inorg-026</b>	Fluoride determined by ion selective electrode (ISE) in accordance with APHA latest edition, 4500-F-C.
<b>Inorg-040</b>	The concentrations of the major ions (mg/L) are converted to milliequivalents and summed. The ionic balance should be within +/- 15% ie total anions = total cations +/-15%.
<b>Inorg-051</b>	Sulphide determined titrimetrically based on APHA latest edition 4500 S2- F. Note, the Sulphide is termed as Total Sulphide given any Sulphide contained in any sediment present may also included in the determination.
<b>Inorg-055</b>	Nitrate/Nitrite/NOx - determined colourimetrically. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
<b>Inorg-055</b>	Nitrate/Nitrite/NOx - determined colourimetrically. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
<b>Inorg-057</b>	Ammonia - determined colourimetrically. Water samples are filtered on receipt prior to analysis. Soils and OHS media are analysed following a water extraction. Alternatively, Ammonia can be extracted from soil using 1M KCl.
<b>Inorg-060</b>	Phosphate - determined colourimetrically using APHA latest edition 4500 P E. Water samples are filtered on receipt prior to analysis. Soils are analysed from a water extract. Total Phosphorus - determined colourimetrically using APHA latest edition 4500-P J.
<b>Inorg-062</b>	TKN - determined colourimetrically. Alternatively, TKN can be derived from calculation (Total N - NOx).
<b>Inorg-081</b>	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA 22nd ED, 4110-B. Water samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
<b>Inorg-091</b>	BOD-Analysed in accordance with APHA latest edition 5210D and in house INORG-091.
<b>INORG-118</b>	Hexavalent Chromium by Ion Chromatographic separation and colourimetric determination.
<b>Inorg-120</b>	Reactive Silica (SiO2) determined colorimetrically (Envirolab Sydney).
<b>Metals-020 ICP-AES</b>	Determination of various metals by ICP-AES.

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Method ID	Methodology Summary
<b>Metals-021 CV-AAS</b>	Determination of Mercury by Cold Vapour AAS.
<b>Metals-022 ICP-MS</b>	Determination of various metals by ICP-MS.
<b>Org-020</b>	<p>Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.</p> <p>F2 = (&gt;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.</p> <p>Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (&gt;C10-C40).</p>
<b>Org-021</b>	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
<b>Org-021</b>	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
<b>Org-022</b>	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
<b>Org-022</b>	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater 2013.
<b>Org-022</b>	Leachates are extracted with Dichloromethane and analysed by GC-MS.
<b>Org-023</b>	Water samples are analysed directly by purge and trap GC-MS.
<b>Org-023</b>	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
<b>Org-023</b>	<p>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)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.</p> <p>Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.</p>

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Method ID	Methodology Summary
Org-029	<p>Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLP/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3.</p> <p>Analysis is undertaken with LC-MS/MS.</p> <p>PFAS results include the sum of branched and linear isomers where applicable.</p> <p>Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.4 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components.</p> <p>Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER</p>

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QUALITY CONTROL: VOCs in water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			18/11/2022	[NT]	[NT]	[NT]	[NT]	18/11/2022	[NT]
Date analysed	-			18/11/2022	[NT]	[NT]	[NT]	[NT]	18/11/2022	[NT]
methylene chloride	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[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]	107	[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]	106	[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]	107	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	100	[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]	[NT]	[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]	99	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	105	[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]	[NT]	[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]	102	[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]	99	[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]	[NT]	[NT]
Bromoform	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Styrene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

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QUALITY CONTROL: VOCs in water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[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	105	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate toluene-d8	%		Org-023	101	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate 4-BFB	%		Org-023	98	[NT]	[NT]	[NT]	[NT]	98	[NT]

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QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			18/11/2022	[NT]	[NT]	[NT]	[NT]	18/11/2022	[NT]
Date analysed	-			18/11/2022	[NT]	[NT]	[NT]	[NT]	18/11/2022	[NT]
TRH C <sub>6</sub> - C <sub>9</sub>	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	113	[NT]
TRH C <sub>6</sub> - C <sub>10</sub>	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	113	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	114	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	114	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	115	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	111	[NT]
Naphthalene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	115	[NT]
Surrogate Dibromofluoromethane	%		Org-023	107	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate toluene-d8	%		Org-023	104	[NT]	[NT]	[NT]	[NT]	98	[NT]
Surrogate 4-BFB	%		Org-023	97	[NT]	[NT]	[NT]	[NT]	96	[NT]

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QUALITY CONTROL: TRH Water(C10-C40) NEPM						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			18/11/2022	[NT]	[NT]	[NT]	[NT]	18/11/2022	[NT]
Date analysed	-			21/11/2022	[NT]	[NT]	[NT]	[NT]	21/11/2022	[NT]
TRH C <sub>10</sub> - C <sub>14</sub>	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	76	[NT]
TRH C <sub>15</sub> - C <sub>28</sub>	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	87	[NT]
TRH C <sub>29</sub> - C <sub>36</sub>	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	107	[NT]
TRH >C <sub>10</sub> - C <sub>16</sub>	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	76	[NT]
TRH >C <sub>16</sub> - C <sub>34</sub>	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	87	[NT]
TRH >C <sub>34</sub> - C <sub>40</sub>	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	107	[NT]
Surrogate o-Terphenyl	%		Org-020	60	[NT]	[NT]	[NT]	[NT]	63	[NT]

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QUALITY CONTROL: PAHs in Water						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			18/11/2022	[NT]	[NT]	[NT]	[NT]	18/11/2022	[NT]
Date analysed	-			22/11/2022	[NT]	[NT]	[NT]	[NT]	22/11/2022	[NT]
Naphthalene	µg/L	1	Org-022	<1	[NT]	[NT]	[NT]	[NT]	80	[NT]
Acenaphthylene	µg/L	1	Org-022	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	1	Org-022	<1	[NT]	[NT]	[NT]	[NT]	80	[NT]
Fluorene	µg/L	1	Org-022	<1	[NT]	[NT]	[NT]	[NT]	78	[NT]
Phenanthrene	µg/L	1	Org-022	<1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Anthracene	µg/L	1	Org-022	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	1	Org-022	<1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Pyrene	µg/L	1	Org-022	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Benzo(a)anthracene	µg/L	1	Org-022	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	1	Org-022	<1	[NT]	[NT]	[NT]	[NT]	84	[NT]
Benzo(b,j&k)fluoranthene	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	1	Org-022	<1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-022	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	1	Org-022	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	1	Org-022	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate <i>p</i> -Terphenyl-d <sub>14</sub>	%		Org-022	82	[NT]	[NT]	[NT]	[NT]	82	[NT]

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QUALITY CONTROL: PCBs in Water						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			18/11/2022	[NT]	[NT]	[NT]	[NT]	18/11/2022	[NT]
Date analysed	-			22/11/2022	[NT]	[NT]	[NT]	[NT]	22/11/2022	[NT]
Aroclor 1016	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	101	[NT]
Aroclor 1260	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate <i>p</i> -Terphenyl	%		Org-021	82	[NT]	[NT]	[NT]	[NT]	82	[NT]

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QUALITY CONTROL: OCP in water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			18/11/2022	[NT]	[NT]	[NT]	[NT]	18/11/2022	[NT]
Date analysed	-			22/11/2022	[NT]	[NT]	[NT]	[NT]	22/11/2022	[NT]
alpha-BHC	µg/L	0.2	Org-022	<0.2	[NT]	[NT]	[NT]	[NT]	86	[NT]
HCB	µg/L	0.2	Org-022	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	µg/L	0.2	Org-022	<0.2	[NT]	[NT]	[NT]	[NT]	84	[NT]
gamma-BHC	µg/L	0.2	Org-022	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	µg/L	0.2	Org-022	<0.2	[NT]	[NT]	[NT]	[NT]	70	[NT]
delta-BHC	µg/L	0.2	Org-022	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	µg/L	0.2	Org-022	<0.2	[NT]	[NT]	[NT]	[NT]	68	[NT]
Heptachlor Epoxide	µg/L	0.2	Org-022	<0.2	[NT]	[NT]	[NT]	[NT]	94	[NT]
gamma-Chlordane	µg/L	0.2	Org-022	<0.2	[NT]	[NT]	[NT]	[NT]	98	[NT]
alpha-Chlordane	µg/L	0.2	Org-022	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	µg/L	0.2	Org-022	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	µg/L	0.2	Org-022	<0.2	[NT]	[NT]	[NT]	[NT]	90	[NT]
Dieldrin	µg/L	0.2	Org-022	<0.2	[NT]	[NT]	[NT]	[NT]	90	[NT]
Endrin	µg/L	0.2	Org-022	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan II	µg/L	0.2	Org-022	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	µg/L	0.2	Org-022	<0.2	[NT]	[NT]	[NT]	[NT]	100	[NT]
Endrin Aldehyde	µg/L	0.2	Org-022	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	µg/L	0.2	Org-022	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	µg/L	0.2	Org-022	<0.2	[NT]	[NT]	[NT]	[NT]	92	[NT]
Methoxychlor	µg/L	0.2	Org-022	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 2-chlorophenol-d4	%		Org-022	54	[NT]	[NT]	[NT]	[NT]	66	[NT]

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QUALITY CONTROL: Speciated Phenols in water						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			18/11/2022	[NT]	[NT]	[NT]	[NT]	18/11/2022	[NT]
Date analysed	-			22/11/2022	[NT]	[NT]	[NT]	[NT]	22/11/2022	[NT]
Phenol	µg/L	10	Org-022	<10	[NT]	[NT]	[NT]	[NT]	42	[NT]
2-Chlorophenol	µg/L	10	Org-022	<10	[NT]	[NT]	[NT]	[NT]	72	[NT]
2-Methylphenol	µg/L	10	Org-022	<10	[NT]	[NT]	[NT]	[NT]	64	[NT]
3/4-Methylphenol	µg/L	20	Org-022	<20	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-Nitrophenol	µg/L	10	Org-022	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,4-Dimethylphenol	µg/L	10	Org-022	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,4-Dichlorophenol	µg/L	10	Org-022	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,6-Dichlorophenol	µg/L	10	Org-022	<10	[NT]	[NT]	[NT]	[NT]	74	[NT]
2,4,5-Trichlorophenol	µg/L	10	Org-022	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,4,6-Trichlorophenol	µg/L	10	Org-022	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,4-Dinitrophenol	µg/L	100	Org-022	<100	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-Nitrophenol	µg/L	100	Org-022	<100	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,3,4,6-Tetrachlorophenol	µg/L	10	Org-022	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-methyl-4,6-dinitrophenol	µg/L	100	Org-022	<100	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Pentachlorophenol	µg/L	100	Org-022	<100	[NT]	[NT]	[NT]	[NT]	78	[NT]
4-Chloro-3-Methylphenol	µg/L	10	Org-022	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,3,4,5-tetrachlorophenol	µg/L	10	Org-022	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,3,5,6-tetrachlorophenol	µg/L	10	Org-022	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-cyclohexyl-4,6-dinitrophenol	µg/L	10	Org-022	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
dinoseb	µg/L	10	Org-022	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Phenol-d <sub>6</sub>	%		Org-022	52	[NT]	[NT]	[NT]	[NT]	54	[NT]
Surrogate 2-fluorophenol	%		Org-022	34	[NT]	[NT]	[NT]	[NT]	36	[NT]

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QUALITY CONTROL: SVOC's in water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			18/11/2022	[NT]	[NT]	[NT]	[NT]	18/11/2022	[NT]
Date analysed	-			22/11/2022	[NT]	[NT]	[NT]	[NT]	22/11/2022	[NT]
Naphthalene	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	80	[NT]
2-Methylnaphthalene	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthylene	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	80	[NT]
Fluorene	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	78	[NT]
Phenanthrene	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	82	[NT]
Anthracene	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	90	[NT]
Pyrene	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	96	[NT]
Benzo(a)anthracene	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	84	[NT]
Benzo(b,j+k)fluoranthene	µg/L	4	Org-022	<4	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	90	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-Acetylaminofluorene	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
3-Methylcholanthrene	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
7,12-Dimethylbenz(a)anthracene	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-Chloronaphthalene	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1-Chloronaphthalene	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
a-BHC	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	86	[NT]
g-BHC	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
b-BHC	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	84	[NT]
Heptachlor	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	70	[NT]
d-BHC	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	68	[NT]
Heptachlor Epoxide	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	94	[NT]
g-Chlordane	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	98	[NT]
a-Chlordane	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
p,p'-DDE	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	90	[NT]
Dieldrin	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	90	[NT]
Endrin	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
p,p'-DDD	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	100	[NT]
Endosulfan II	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
p,p'-DDT	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

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QUALITY CONTROL: SVOC's in water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Endrin Aldehyde	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endrin Ketone	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	92	[NT]
Methoxychlor	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Azinphos Methyl (Guthion)	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromophos Ethyl	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyrifos	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	90	[NT]
Chlorpyrifos-methyl	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	88	[NT]
Coumaphos(Co-Ral)	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon (Dimpylate)	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	80	[NT]
Dichlorvos	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dimethoate	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Disulfoton	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	88	[NT]
Fenamiphos	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fenitrothion	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	76	[NT]
Fenthion	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Malathion (Maldison)	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Methidathion	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Mevinphos	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Parathion (parathion-ethyl)	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Parathion-methyl	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Phorate	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Phosalone	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ronnel (fenchlorphos)	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Phenol	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	42	[NT]
2-Chlorophenol	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	72	[NT]
4-Chloro-3-Methyl Phenol	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-Methylphenol	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	64	[NT]
3/4-Methylphenol	µg/L	4	Org-022	<4	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-Nitrophenol	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,4-Dimethylphenol	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,4-Dichlorophenol	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,6-Dichlorophenol	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	74	[NT]
2,4,5-Trichlorophenol	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,4,6-Trichlorophenol	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,4-Dinitrophenol	µg/L	20	Org-022	<20	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-Nitrophenol	µg/L	20	Org-022	<20	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,3,4,6-Tetrachlorophenol	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-methyl-4,6-dinitrophenol	µg/L	20	Org-022	<20	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

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QUALITY CONTROL: SVOC's in water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Pentachlorophenol	µg/L	10	Org-022	<10	[NT]	[NT]	[NT]	[NT]	78	[NT]
Dinoseb	µg/L	20	Org-022	<20	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4,5-Tetrachlorobenzene	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-Trichlorobenzene	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	76	[NT]
1,2-Dichlorobenzene	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	76	[NT]
1,3-Dichlorobenzene	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	74	[NT]
1,4-Dichlorobenzene	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	76	[NT]
Hexachlorobenzene	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Hexachlorobutadiene	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	92	[NT]
Hexachlorocyclopentadiene	µg/L	5	Org-022	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Hexachloroethane	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Hexachloropropene-1	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Pentachlorobenzene	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Pentachloroethane	µg/L	2	Org-022	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bis(2-ethylhexyl) phthalate	µg/L	50	Org-022	<50	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Butylbenzylphthalate	µg/L	10	Org-022	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diethyl phthalate	µg/L	10	Org-022	<10	[NT]	[NT]	[NT]	[NT]	92	[NT]
Dimethyl phthalate	µg/L	10	Org-022	<10	[NT]	[NT]	[NT]	[NT]	80	[NT]
Di-n-butylphthalate	µg/L	50	Org-022	<50	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Di-n-octylphthalate	µg/L	10	Org-022	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
bis (2-Chloroethoxy) methane	µg/L	5	Org-022	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bis (2-chloroethyl) ether	µg/L	5	Org-022	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
bis-(2-Chloroisopropyl) ether	µg/L	5	Org-022	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-Bromophenylphenylether	µg/L	5	Org-022	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-Chlorophenylphenylether	µg/L	5	Org-022	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diphenylamine	µg/L	5	Org-022	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
N-nitrosodi-n-butylamine	µg/L	5	Org-022	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
N-nitrosodi-n-propylamine	µg/L	5	Org-022	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
N-nitrosomorpholine	µg/L	5	Org-022	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
N-nitrosopiperidine	µg/L	5	Org-022	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-Dinitrobenzene	µg/L	5	Org-022	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,6-Dinitrotoluene	µg/L	5	Org-022	<5	[NT]	[NT]	[NT]	[NT]	64	[NT]
5-Nitro-o-toluidine	µg/L	5	Org-022	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acetophenone	µg/L	5	Org-022	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Azobenzene	µg/L	5	Org-022	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Isophorone	µg/L	5	Org-022	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Nitrobenzene	µg/L	5	Org-022	<5	[NT]	[NT]	[NT]	[NT]	82	[NT]
Pentachloronitrobenzene	µg/L	5	Org-022	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Phenacetin	µg/L	5	Org-022	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1-Naphthylamine	µg/L	5	Org-022	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

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QUALITY CONTROL: SVOC's in water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
2-Naphthylamine	µg/L	5	Org-022	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-Nitroaniline	µg/L	5	Org-022	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
3-Nitroaniline	µg/L	5	Org-022	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-Chloroaniline	µg/L	5	Org-022	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-Nitroaniline	µg/L	5	Org-022	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aniline	µg/L	5	Org-022	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzofuran	µg/L	5	Org-022	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzyl alcohol	µg/L	5	Org-022	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Carbazole	µg/L	5	Org-022	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethylmethanesulfonate	µg/L	5	Org-022	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
cis and trans-iso-Safrole	µg/L	10	Org-021	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Methapyrilene	µg/L	10	Org-022	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
p-Dimethylaminoazobenzene	µg/L	5	Org-022	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Safrole	µg/L	5	Org-022	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trifluralin	µg/L	0.5	Org-021	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 2-fluorophenol	%		Org-022	52	[NT]	[NT]	[NT]	[NT]	54	[NT]
Surrogate Phenol-d <sub>6</sub>	%		Org-022	34	[NT]	[NT]	[NT]	[NT]	36	[NT]
Surrogate 2-chlorophenol-d4	%		Org-022	54	[NT]	[NT]	[NT]	[NT]	66	[NT]
Surrogate Nitrobenzene-d <sub>5</sub>	%		Org-022	60	[NT]	[NT]	[NT]	[NT]	66	[NT]
Surrogate 2-fluorobiphenyl	%		Org-022	60	[NT]	[NT]	[NT]	[NT]	64	[NT]
Surrogate p-Terphenyl-d <sub>14</sub>	%		Org-022	82	[NT]	[NT]	[NT]	[NT]	82	[NT]

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QUALITY CONTROL: All metals in water-dissolved					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	34586-2
Date prepared	-			21/11/2022	1	21/11/2022	21/11/2022		21/11/2022	21/11/2022
Date analysed	-			21/11/2022	1	21/11/2022	21/11/2022		21/11/2022	21/11/2022
Aluminium-Dissolved	µg/L	10	Metals-022 ICP-MS	<10	1	35	26	30	105	90
Boron-Dissolved	µg/L	20	Metals-022 ICP-MS	<20	1	<20	<20	0	112	90
Cobalt-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	1	7	6	15	92	84
Iron-Dissolved	µg/L	10	Metals-022 ICP-MS	<10	1	31	18	53	97	#
Manganese-Dissolved	µg/L	5	Metals-022 ICP-MS	<5	1	170	170	0	97	#
Arsenic-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	1	<1	<1	0	100	96
Cadmium-Dissolved	µg/L	0.1	Metals-022 ICP-MS	<0.1	1	<0.1	<0.1	0	99	91
Chromium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	1	<1	<1	0	98	93
Copper-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	1	<1	<1	0	98	84
Lead-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	1	<1	<1	0	98	82
Mercury-Dissolved	µg/L	0.05	Metals-021 CV-AAS	<0.05	1	<0.05	<0.05	0	105	104
Molybdenum-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	1	2	2	0	97	100
Nickel-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	1	8	8	0	97	86
Tin-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	1	<1	<1	0	96	92
Selenium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	1	<1	<1	0	94	93
Silver-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	1	<1	<1	0	116	111
Zinc-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	1	4	4	0	98	89

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QUALITY CONTROL: Miscellaneous Inorganics					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			16/11/2022	[NT]	[NT]	[NT]	[NT]	16/11/2022	[NT]
Date analysed	-			16/11/2022	[NT]	[NT]	[NT]	[NT]	16/11/2022	[NT]
pH	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	100	[NT]
Total Cyanide	mg/L	0.004	Inorg-014	<0.004	[NT]	[NT]	[NT]	[NT]	95	[NT]
Fluoride, F	mg/L	0.1	Inorg-026	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Hexavalent Chromium, Cr <sup>6+</sup>	mg/L	0.005	INORG-118	<0.005	[NT]	[NT]	[NT]	[NT]	101	[NT]
Total Suspended Solids	mg/L	5	Inorg-019	<5	[NT]	[NT]	[NT]	[NT]	98	[NT]
Total Dissolved Solids (grav)	mg/L	5	Inorg-018	<5	[NT]	[NT]	[NT]	[NT]	82	[NT]
iTotal Dissolved Solids (grav)	mg/L	5	Inorg-018	<5	[NT]	[NT]	[NT]	[NT]	82	[NT]
Ammonia as N in water	mg/L	0.005	Inorg-057	<0.005	[NT]	[NT]	[NT]	[NT]	108	[NT]
Electrical Conductivity	µS/cm	1	Inorg-002	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Nitrate as N in water	mg/L	0.005	Inorg-055	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Nitrite as N in water	mg/L	0.005	Inorg-055	<0.005	[NT]	[NT]	[NT]	[NT]	82	[NT]
Phosphate as P in water	mg/L	0.005	Inorg-060	<0.005	[NT]	[NT]	[NT]	[NT]	99	[NT]
BOD	mg/L	5	Inorg-091	<5	[NT]	[NT]	[NT]	[NT]	82	[NT]
TKN in water	mg/L	0.1	Inorg-062	<0.1	[NT]	[NT]	[NT]	[NT]	72	[NT]
Sulphide	mg/L	0.5	Inorg-051	<0.5	[NT]	[NT]	[NT]	[NT]	89	[NT]
Silica (Reactive SiO <sub>2</sub> )	mg/L	0.1	Inorg-120	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]

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QUALITY CONTROL: Ion Balance						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			22/11/2022	[NT]	[NT]	[NT]	[NT]	22/11/2022	[NT]
Date analysed	-			22/11/2022	[NT]	[NT]	[NT]	[NT]	22/11/2022	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	[NT]	[NT]	95	[NT]
Potassium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	[NT]	[NT]	96	[NT]
Sodium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	[NT]	[NT]	92	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	[NT]	[NT]	95	[NT]
Hydroxide Alkalinity (OH <sup>-</sup> ) as CaCO <sub>3</sub>	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bicarbonate Alkalinity as CaCO <sub>3</sub>	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	100	[NT]
Carbonate Alkalinity as CaCO <sub>3</sub>	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Total Alkalinity as CaCO <sub>3</sub>	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	100	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Chloride, Cl	mg/L	1	Inorg-081	<1	[NT]	[NT]	[NT]	[NT]	91	[NT]

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QUALITY CONTROL: PFAS in Water Short						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Perfluorohexanesulfonic acid PFHxS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	104	[NT]
Perfluorooctanesulfonic acid PFOS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	105	[NT]
Perfluorooctanoic acid PFOA	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	112	[NT]
6:2 FTS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	110	[NT]
8:2 FTS	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	105	[NT]
Surrogate <sup>13</sup> C <sub>8</sub> PFOS	%		Org-029	100	[NT]	[NT]	[NT]	[NT]	98	[NT]
Surrogate <sup>13</sup> C <sub>2</sub> PFOA	%		Org-029	102	[NT]	[NT]	[NT]	[NT]	102	[NT]
Extracted ISTD <sup>18</sup> O <sub>2</sub> PFHxS	%		Org-029	96	[NT]	[NT]	[NT]	[NT]	99	[NT]
Extracted ISTD <sup>13</sup> C <sub>4</sub> PFOS	%		Org-029	96	[NT]	[NT]	[NT]	[NT]	98	[NT]
Extracted ISTD <sup>13</sup> C <sub>4</sub> PFOA	%		Org-029	116	[NT]	[NT]	[NT]	[NT]	107	[NT]
Extracted ISTD <sup>13</sup> C <sub>2</sub> 6:2FTS	%		Org-029	110	[NT]	[NT]	[NT]	[NT]	108	[NT]
Extracted ISTD <sup>13</sup> C <sub>2</sub> 8:2FTS	%		Org-029	88	[NT]	[NT]	[NT]	[NT]	98	[NT]

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**Result Definitions**

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

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## Quality Control Definitions

<b>Blank</b>	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.
<b>Duplicate</b>	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.
<b>Matrix Spike</b>	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.
<b>LCS (Laboratory Control Sample)</b>	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.
<b>Surrogate Spike</b>	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.

## Report Comments

% Inhibition analysed by ALS, report number 47976.

BOD, Sulphide and Reactive Silica analysed by Envirolab Sydney, report number 310884.

METALS: # Percent recovery is not possible to report due to the high concentration of Manganese and Iron in the sample/s. However an acceptable recovery was obtained for the LCS.

TRH: Surrogate recovery is low for 34586-1 due to interference caused by sample emulsification.

SVOC: Surrogate recovery is low for 34586-2 due to interference caused by sample emulsification.

# Surrogate recovery is not possible to report for Phenol-d6 due to interference caused by sample emulsification.

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## DATA QUALITY ASSESSMENT SUMMARY

Report Details	
Envirolab Report Reference	<b>34586</b>
Client ID	GeoPollution Management
Project Reference	GW3926 Glenbrae
Date Issued	24/11/2022

### QC DATA

All laboratory QC data was within the Envirolab Group's specifications except:

QC Specification Exceptions			
QC Type	Reference	Analysis	Comments
Spike Recovery %	34586-2	Iron-Dissolved	Fails internal acceptance criteria
Spike Recovery %	34586-2	Manganese-Dissolved	Fails internal acceptance criteria
Surrogate Recovery %	34586-1	Surrogate Phenol-d <sub>6</sub>	Fails internal acceptance criteria
Surrogate Recovery %	34586-1	Surrogate Phenol-d <sub>6</sub>	Fails internal acceptance criteria

QC Comments
METALS: # Percent recovery is not possible to report due to the high concentration of Manganese and Iron in the sample/s. However an acceptable recovery was obtained for the LCS.
TRH: Surrogate recovery is low for 34586-1 due to interference caused by sample emulsification.
SVOC: Surrogate recovery is low for 34586-2 due to interference caused by sample emulsification.
# Surrogate recovery is not possible to report for Phenol-d <sub>6</sub> due to interference caused by sample emulsification.

See Report 34586-[R00] for QA/QC details

### HOLDING TIME COMPLIANCE EVALUATION

All preservation / holding times (based on AS/ASPHA/ISO/NEPM/USEPA reference documents and standards) are compliant.

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Certain analyses have had their recommended technical holding times elongated by filtering and/or freezing on receipt at the laboratory (e.g. BOD, chlorophyll/Pheophytin, nutrients and acid sulphate soil tests).

### **COMPLIANCE TO QC FREQUENCY (NEPM)**

Internal laboratory QC rate complies with NEPM requirements (LCS/MB/MS 1 in 20, Duplicates 1 in 10 samples). Note, samples are batched together with other sample consignments in order to assign QC sample frequency.

QC Evaluation	
Duplicate(s) was performed as per NEPM frequency	✓
Laboratory Control Sample(s) were analysed with the samples received	✓
A Method Blank was performed with the samples received	✓
Matrix spike(s) was performed as per NEPM frequency (Not Applicable for Air samples)	✓

*Refer to Certificate of Analysis for all Quality Control data.*

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## **APPENDIX E:**

### **FIELD METHODS AND QA/QC**

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## FIELD METHODS AND QUALITY ASSURANCE / QUALITY CONTROL

### 1. Groundwater Monitoring Well Installation, Gauging and Sampling

Two groundwater monitoring wells were installed at the site using a GeoProbe 7822DT drilling rig. The wells were installed by a licensed driller in accordance with the Australian Government National Water Commission (2012).

The newly installed regional groundwater monitoring wells were “developed” (removal of disturbed or stagnant bore water to allow influx of fresh water), then gauged and sampled.

The presence or absence of water, and if water present, the static water level, SWL, was measured using an interface probe (Solinst model 122 Interface Meter), capable of identifying air-water and water-hydrocarbon product interface (separate phase petroleum hydrocarbons, SPH) and thickness, prior to well purging and again prior to sampling. The SPH (if any) and SWL levels were recorded as depths from the top of the 50mm diameter well casing (btoc). Visual and olfactory observations of sampled water were also recorded.

Groundwater sampling was carried out using disposable polyethylene bailers.

Samples were collected for chemical analysis in suitable containers (with or without preservatives according to analytical parameters). The groundwater samples to be analysed for the heavy metal lead were field filtered through a 0.45µm filter, prior to transfer into nitric acid preserved bottles.

### 2. Sample Dispatch and NATA Laboratory

Samples were cooled on ice following collection and during transport to our Ringwood office where they were refrigerated at 4 °C until dispatch on either the same or the next possible working day. Sample dispatch followed chain of custody procedures. A copy of the combined chain of custody and analysis request form is attached in Appendix D. Samples not chosen for individual analysis were placed in storage by the laboratory for possible future analysis.

Chemical analysis of samples) was carried out by the NATA accredited analytical laboratory of EnviroLab, Croydon South (refer to Appendix D). Laboratory-internal quality control data (duplicates, blanks and spike, recovery, analyses) are included in the laboratory reports.

#### 2.1 Internal Laboratory Quality Control

Internal laboratory quality control testing was performed as follows:

Duplicates	- 10% of all samples
Blanks	- 1 per batch of samples analysed
Spikes	- Duplicates with known spikes. Metals: Spike added to acid digest. Organic compounds: Spike added to soil prior to extraction.
Standards	- Instrument calibration standards as required by NATA.

Collection of field duplicate samples for external quality control checks was not conducted for the purpose of this initial investigation.

QA/QC procedures were adopted to ensure that the data, as far as possible, were accurate, precise (repeatable and reproducible) and representative. The methods employed were in compliance with the National Environment Protection (*Assessment of Site Contamination*) Measure 1999 Schedule B (3) *Guideline on Laboratory Analysis of Potentially Contaminated Soils* (NEPC 1999), as amended in 2013 (NEPM 2013).

#### **EnviroLab Report No. 34586-R00 & 34586-DQAS**

Most matrix spike recoveries performed by the laboratory (using laboratory control samples) were within the desirable range of 70-130% for inorganics (metals, TDS) or 60-140% for organics (hydrocarbons, phenols, PFAS, etc).

- Spike recoveries for iron and manganese failed then internal acceptance criteria. Acceptable recoveries were obtained for the Laboratory Control Samples (LCS).
- Two surrogate recoveries for phenol also failed acceptance criteria.

Given the small sample batch, only one duplicate pair analysis was conducted, namely for heavy metals. Most reported RPD variations were within the acceptable range, except for iron.

- Iron showed an elevated RPD variation of 67%.

All blank samples tested showed no detections.

### **3. Conclusions**

Most spike recoveries, duplicate variations and all blank analyses were in compliance with the QA/QC guidelines.

- ❖ The low recoveries of iron, manganese and phenol were considered of no concern for the quality of the results. Iron and manganese were detected at background levels and Phenols were not detected in the samples.
- ❖ The elevated duplicate variation for iron was not considered to be of concern for the overall data quality. It is noted that the duplicate test for iron in sample MWSY-1511 yielded the same concentration of iron as reported for MWBS, while the duplicate test for manganese resulted in an identical concentration (RPD of zero).

Subsequently, the reported QA/QC non-compliances were not considered to be of concern for the data set. In conclusion, the data quality results are considered to adequately validate the routine results as being representative of true sample concentrations. The data quality is deemed acceptable.

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