EPL298-02 Monitoring Report

Katherine Waste Management Facility

Reporting period 1 August 2024 – 31 July 2025

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I _____ have reviewed this report and I confirm that to the best of my knowledge and ability all the information provided in the report is true and accurate.

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EcOz Pty Ltd.
ABN: 81 143 989 039
Level 1, 70 Cavenagh Street
DARWIN NT 0800
GPO Box 381, Darwin NT 0800

Telephone: +61 8 8981 1100
Email: ecoz@ecoz.com.au
Internet: www.ecoz.com.au

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ACRONYMS

Al	Aluminium
BOD	Biological Oxygen Demand
BoM	Bureau Of Meteorology
BTEXN	Benzene, Toluene, Ethylbenzene, Xylene, Naphthalene
Ca	Calcium
CaCO3	Alkalinity
Cd	Cadmium
Cl	Chloride
COD	Chemical Oxygen Demand
Cr III	Trivalent chromium
Cr VI	Hexavalent chromium
Cu	Copper
DO	Dissolved Oxygen
EC	Electrical Conductivity
EMP	Environmental Management Plan
EPL	Environment Protection Licence
Fe	Iron
GC-MS	Gas Chromatography-Mass Spectrometry
K	Potassium
KTC	Katherine Town Council
KWMF	Katherine Waste Management Facility
LOR	Limit of Reporting
mAHD	Metres with respect to the Australian Height Datum
mBGL	Metres Below Ground Level
Mg	Magnesium
Mn	Manganese
MTBE	Methyl Tert-Butyl Ether
NO_3	Nitrate (as N)
Na	Sodium
NATA	National Association of Testing Authorities
NEMP	National Environmental Management Plan (PFAS)
NH_4	Ammonium
Ni	Nickel
NT	Northern Territory
NT EPA	Northern Territory Environment Protection Authority
PAH	Polycyclic Aromatic Hydrocarbons
Pb	Lead
PCB	Polychlorinated Bi-Phenyls
PFAS	Per- And Polyfluoroalkyl Substances
PFOS	Perfluorooctanesulfonic acid

QA/QC	Quality Assurance and Quality Control
RAAF	Royal Australian Air Force
REDOX	Oxidation Reduction
RPD	Relative Percentage Difference
Se	Selenium
SO_4	Sulfate
SWL	Standing Water Level
TDS	Total Dissolved Solids
TN	Total Nitrogen
TOC	Total Organic Carbon / Top of Casing
TP	Total Phosphorus
TRH/TPH	Total Recoverable Hydrocarbons / Total Petroleum Hydrocarbons
VFA	Volatile Acids as Acetic Acid
VOC	Volatile Organic Compounds
WMPC Act	*Waste Management and Pollution Control Act*
Zn	Zinc

EXECUTIVE SUMMARY

The Katherine Waste Management Facility (KWMF) is a municipal waste resource recovery and disposal site operated by Katherine Town Council (KTC). Located approximately 7 km south of Katherine town centre on Novis Quarry Road, the facility serves both domestic and commercial customers in the region.

The storage, treatment and disposal of some listed waste is covered by the Environment Protection Licence 298 (EPL298-02). Under the licence, KTC is required to conduct surface and groundwater monitoring in accordance with Appendix 3 and Appendix 4 of the licence. An annual Monitoring Report is also required under the licence.

This Monitoring Report was prepared by EcOz Environmental Consultant (EcOz) on behalf of KWMF in accordance with EPL298-02 conditions 57 and 58 of the licence and covers the period starting 1 August 2024 and ending 31 July 2025.

Overall, the groundwater monitoring program was largely compliant with the licence requirements. Minor non-compliances were noted due to missing pH data due to equipment fault.

Surface water and leachate monitoring did not meet frequency requirements, primarily because of the absence of flow or leachate ponding during sampling attempts. Equipment calibration records not provided to EcOz until March 2025, resulting in uncertainty regarding the accuracy of field measurements. Despite these, most parameters were measured in line with licence requirement.

Quality Assurance/Quality Control (QA/QC) results generally met standards, although high Relative Percent Differences (RPDs) were observed for some duplicates indicating possible inconsistencies in sampling procedure or lab procedures.

Surface water quality at SWC and SWB was generally within trigger values, except for low dissolved oxygen (DO) and an exceedance of copper (Cu) at SWC. Elevated Electrical conductivity (EC) and nutrient levels indicate potential groundwater influence. Cu and DO results exceeded trigger values and were only non-compliance.

Groundwater monitoring results reflected seasonal fluctuations, with a notable wet season rise. Field parameters indicated generally alkaline pH, elevated EC at downgradient bores (especially GWB02), and consistently low DO levels. Elevated Sodium (Na), chloride (Cl), and potassium (K) at downgradient bores suggest possible leachate influence. Nutrient concentrations were higher at downgradient sites, particularly at GWB01, while upgradient bore GWE unexpectedly showed elevated nitrogen compounds, potentially indicating surface contamination. Dissolved metals were more frequently detected at downgradient bores, pointing to possible site-related impacts.

PFAS detections were higher and more diverse at downgradient bores (GWB01, GWB02), with no detections above limits of reporting (LOR) at the upgradient bore (GWB04), reinforcing the likely influence of site activities.

Overall, improvements are needed in documentation, sampling procedures, and monitoring practices to enhance compliance with EPL conditions for future rounds. Calibration activities should be consistently recorded, with faulty equipment promptly repaired or replaced to prevent data gaps. Field sheets must clearly document duplicate sample locations and associated metadata. Care should be taken to follow lab-specific sampling instructions. Staff training and updated SOPs for sample collection are recommended. Leachate flow inspection frequency should be increased after rainfall events.

1 INTRODUCTION

The KWMF is a municipal waste resource recovery and disposal site operated by KTC. The facility is located approximately 7 km south of Katherine town centre within NT Portion 5043, on Novis Quarry Road **(Figure 1-1).** KWMF provides services to domestic and commercial customers in the Katherine area.

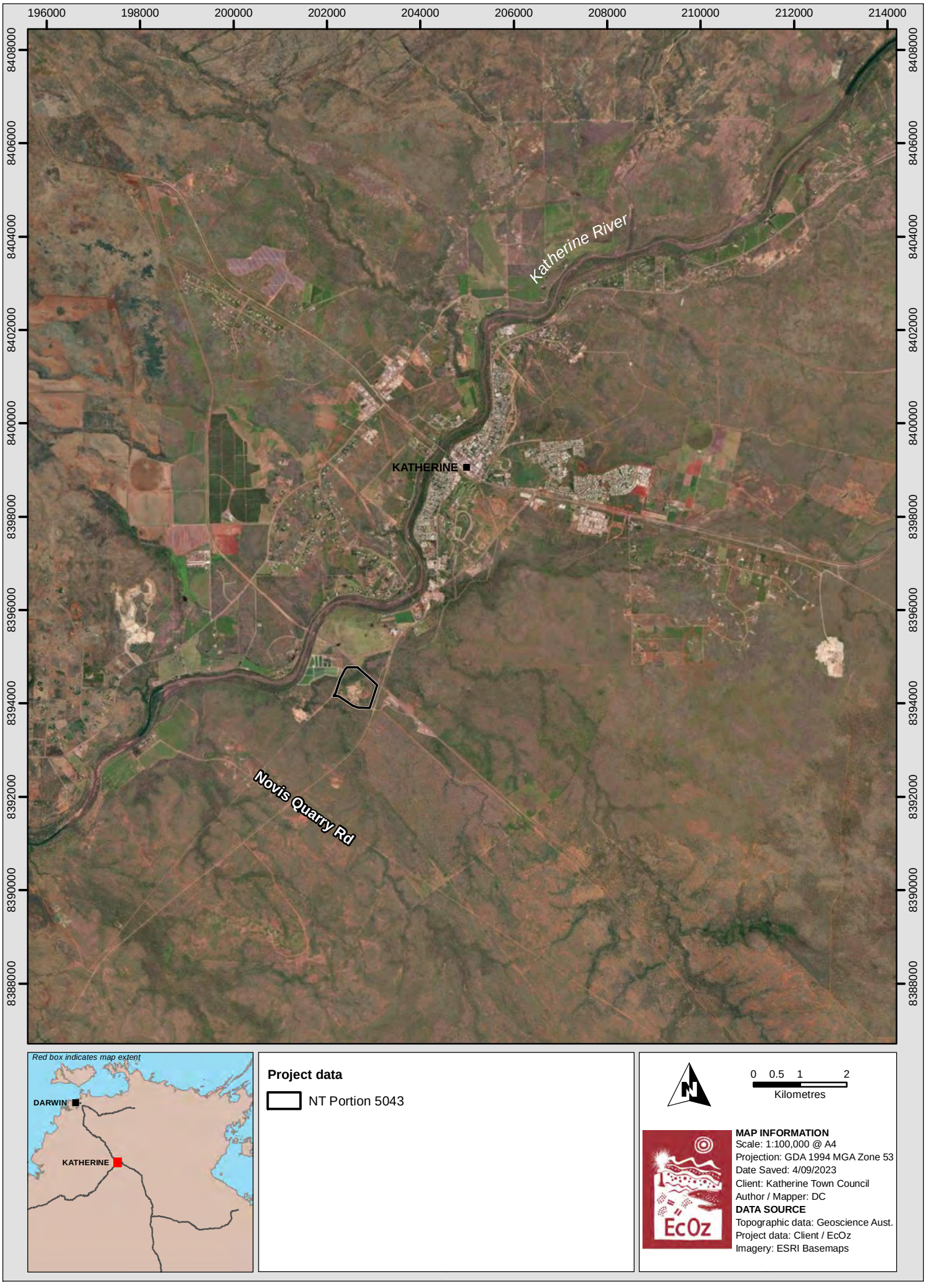
The current EPL covering the KWMF (i.e. EPL298 - 02), was issued by the Northern Territory Environment Protection Authority (NT EPA) to KTC on 4 August 2024 (expiry was on 3 August 2025). EPL298-02 licences KTC to collect, transport, store, re-cycle, treat or dispose of materials at the KWMF, which are classified as 'listed wastes' under the Northern Territory *Waste Management and Pollution Control Act*.

1.1 Purpose and scope

This Monitoring Report is required as per EPL298-02 conditions 57 and 58, as reproduced below:

> *57. The licensee must complete and provide to the NT EPA a Monitoring Report, as prescribed by this licence, within 10 business days after each anniversary date of this licence.*
>
> *58. The licensee must ensure that each Monitoring Report is prepared in consultation with a qualified professional and:*
>
> > *58.1 is prepared in accordance with the requirements of the NT EPA 'Guideline for Reporting on Environmental Monitoring'*
> >
> > *58.2 includes a tabulation of all monitoring data required as a condition of this licence;*
> >
> > *58.3 includes long term trend analysis of monitoring data to demonstrate any environmental impact associated with the activity, including potential impacts on beneficial uses of groundwater, over a minimum period of three years (where the data is available);*
> >
> > *58.4 includes an assessment of environmental impact from the activity;*
> >
> > *58.5 includes a review of performance against the measures specified in Document Number 1 of Table 2: and*
> >
> > *58.6 includes a copy of the qualified professional's endorsement.*

The Monitoring Report will cover the period starting 1 August 2024 and ending 31 July 2025. EcOz has prepared this report on behalf of KWMF.



Path: Z:\01 EcOz_Documents\04 EcOz Vantage GIS\EZ19181 - KTC EPL Update and EMP\01 Project Files\Figure 2-1 Map showing site layout and infrastructure.mxd

Figure 1-1. Figure of KWMF Location

2 OPERATIONS OVERVIEW

KTC manage operations at KWMF, and contractors manage kerbside collection.

The KWMF accepts and disposes of general waste from domestic and commercial users and is currently licenced to accept asbestos and tyres (listed wastes) for disposal.

The KWMF also accepts the following materials for landfill or subsequent resource recovery and disposal by contractors at external facilities:

- Chemical drums (only empty and triple washed containers accepted for Drum Muster)
- Tyres (whole or shredded)
- Metal
- Green waste
- Batteries
- Empty gas bottles
- Animal carcasses
- E-waste

The KWMF layout is shown in **Figure 2-1**. The area method of landfilling (as depicted in **Figure 2-2**) is used at KWMF whereby, waste is disposed of at an active tip face and is then compacted in a mound above ground (as opposed to trench filling below ground). All landfilling activities occur over the existing landfill that has been in operation since the 1980's.

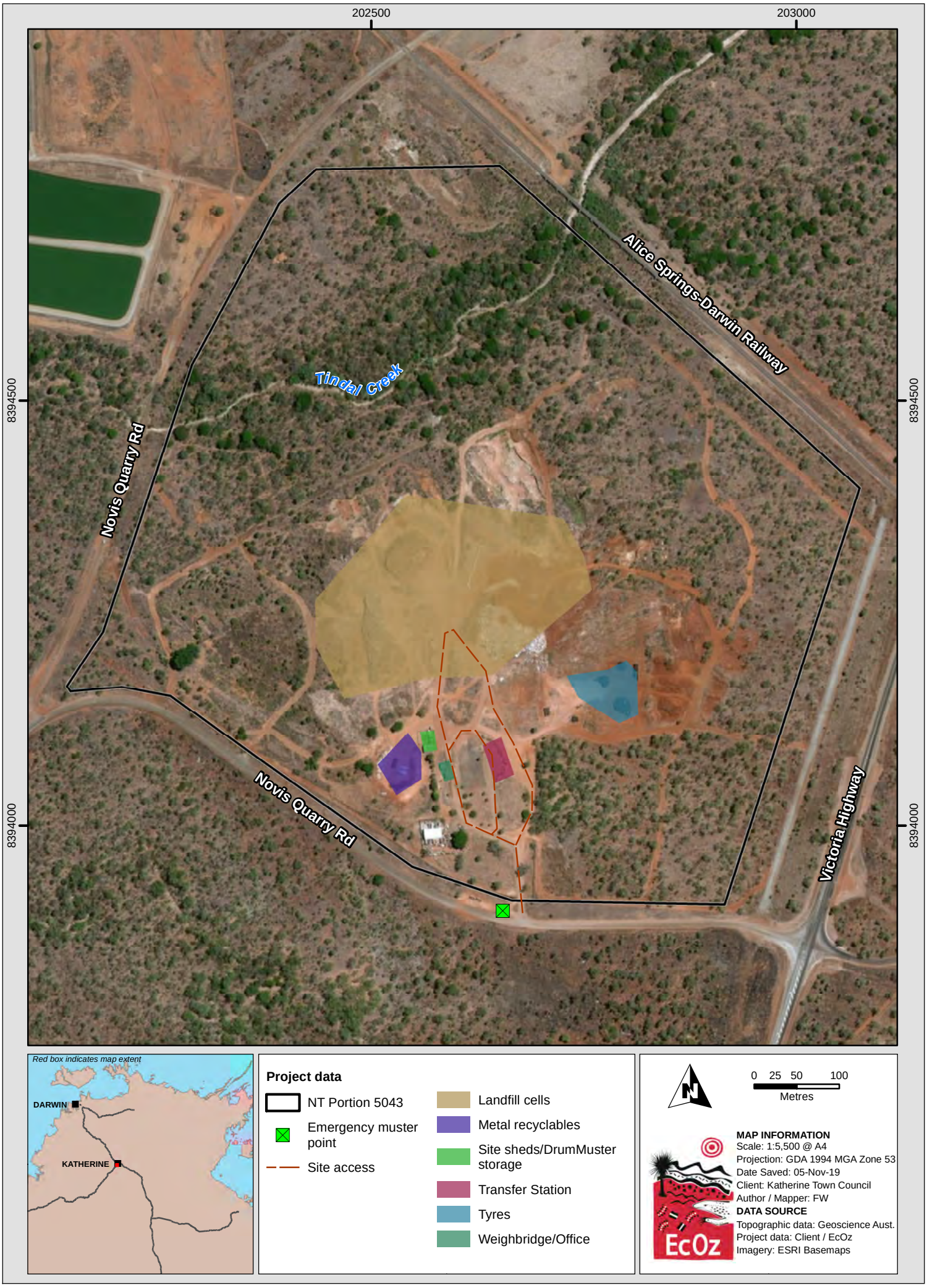
Each day, the waste is covered with daily cover, which is generally spoil material extracted from site or clean fill material accepted at the facility. Daily cover is applied at a minimum thickness of 150 mm, most of which can be retrieved on the following day prior to new waste disposal.

As the active tip area moves progressively along the existing landform (building up the height), the waste disposal areas are covered with a 300 mm intermediate layer of cover material to minimise rainfall infiltration. Final closure and rehabilitation are discussed in the TAFT (2022) IEMP report.

As landfill operations have been occurring on the site since the 1980's, it is unlikely an engineered liner has been installed beneath the landfill and there is currently no leachate recovery system.

In accordance with the *WMPC Act,* any lateral expansion of the landfill beyond the current footprint will require an Environment Protection Approval. The approval will factor in design considerations detailed in the *Guidelines for the Siting, Design and Management of Solid Waste Disposal Sites in the NT* (NT EPA 2013) and construction is required to undergo a rigorous quality assurance process. At the present time, there is no intention to expand the current landfill site, and the site has been earmarked for closure and rehabilitation after the site reaches its full capacity (expected 2037).

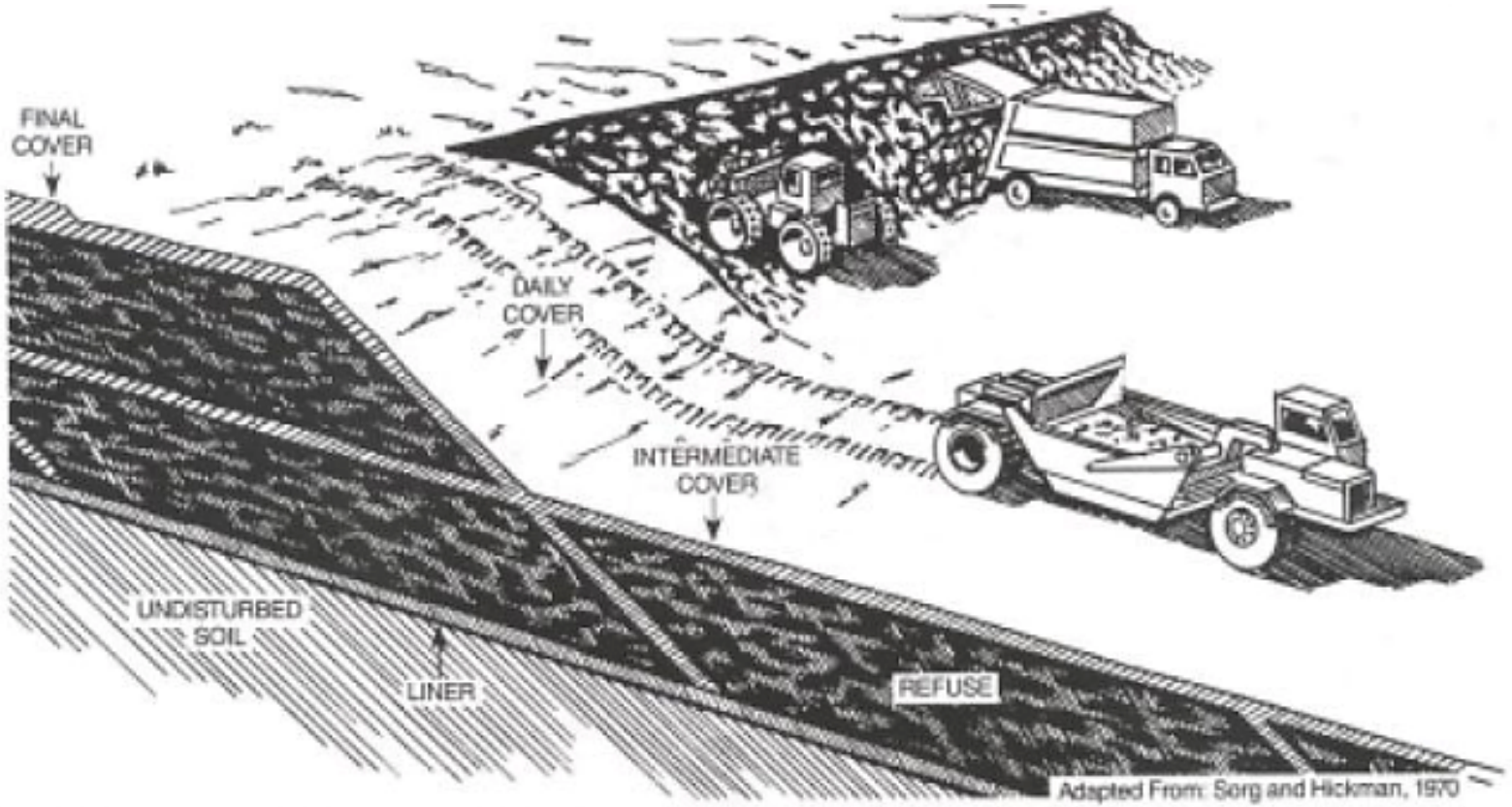
KTC is required to complete siting, approvals, design, and construction of a new landfill at an alternative site prior to closure of the existing KWMF, which is planned to take place in 2035.



Path: Z:\01 EcOz_Documents\04 EcOz Vantage GIS\EZ19181 - KTC EPL Update and EMP\01 Project Files\Figure 2-1 Map showing site layout and infrastructure.mxd

Figure 2-1. Figure of Layout KWMF

Figure 2-2: Figure of area Method of Landfilling (Taken from NT EPA 2013)



3 ENVIRONMENTAL SETTING

3.1 Climate

Katherine has a tropical savannah climate with distinct wet and dry seasons. The wet season typically occurs from November to April, and the dry season from May to October (see **Figure 3-1**). The average annual rainfall for Katherine is 967 mm (taken from BoM Katherine Council Station No. 014902). The driest months are June, July and August, which all have mean monthly rainfall totals of less than 2 mm. The wettest months are December, January and February, with mean monthly rainfall totals of between 200 mm - 240mm.

The hottest months are September, October, November and December, with mean maximum temperatures between 36°C and 39°C. The coolest months are June, July and August, with mean minimum temperatures between 14°C and 16°C (taken from BoM Katherine Tindal Base Station. 014932).

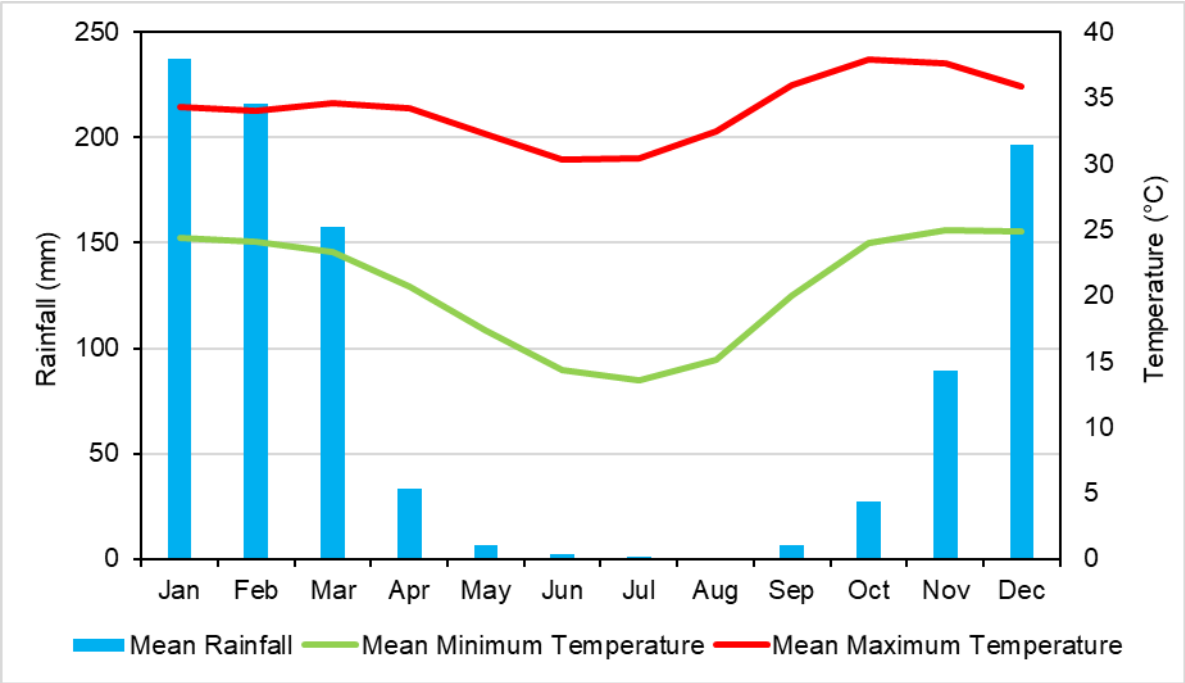


Figure 3-1: Graph of average climate data for Katherine (taken from BoM station ID 014932).

3.1.1 Rainfall during the reporting period

Table 3-1 presents the monthly rainfall totals recorded at the KTC station (No. 014902) for the 2024–2025 period, alongside the long-term monthly averages. Rainfall during the reporting period was below average in December, January, and February. However, rainfall was above average in most other months, particularly in May. The total rainfall for the reporting period (992.8 mm) was comparable to the long-term annual average (967.2 mm), indicating a broadly distributed rainfall pattern throughout the wet season (see Figure 3-2).

Katherine town experienced an unusual rainfall event in the month of May. The record-breaking rainfall event was more than 175mm, significantly higher than annual average of 5-6 mm.

Table 3-1. Average rainfall (taken from BoM Station No. 014932)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Rainfall (mm) Mean	237.2	216.2	157.6	33.2	6.5	2.0	0.9	0.5	6.5	27.2	89.2	196.8	967.2
Rainfall Reporting period (2024-2025)	111	156	191.6	33.6	184	-	-	0	26	59	120.6	111.0	992.8

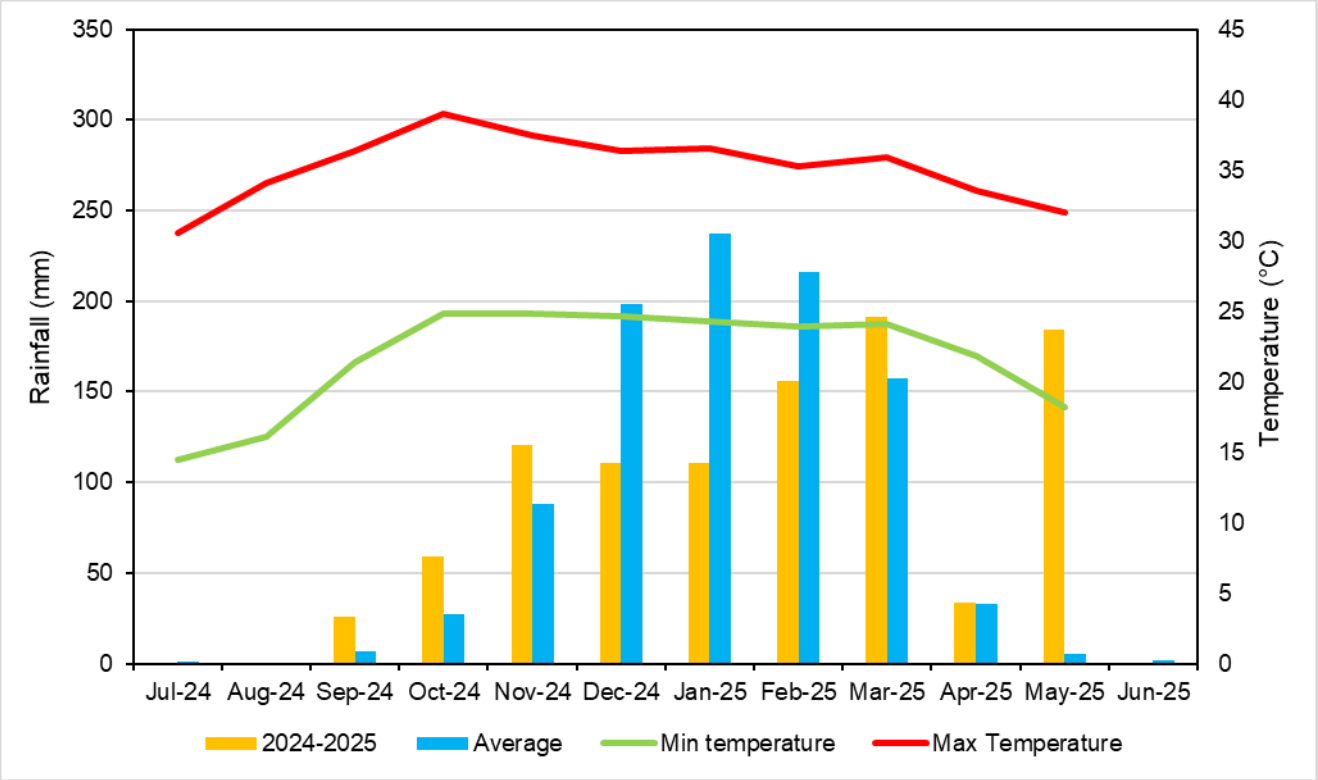


Figure 3-2: Graph of monthly and average rainfall during reporting period (taken from BoM station ID 014902 and 014932).

3.2 Topography and landform

The KWMF is on almost-level terrain; very gently sloping towards the northwest. The elevation change is only six metres (not including landfill mounds) starting at 108 metres with respect to the Australian Height Datum (mAHD) in the south-east, falling to 102 mAHD in the north-west.

Land unit mapping by Howe (2006) indicates that there are three land units within the site (3a, 3b and 7e), and two landforms. The landform is mostly plains, with a small area of drainage system.

Land unit 3b covers most of the site and is described as very gentle undulating terrain; slopes less than 2%; scattered limestone pavement or rock outcrop.

Land unit 3a is present on the eastern side of the site and is described as gentle slopes or undulating and dissected terrain; slopes to 2%; severe limestone and sandstone pavement and outcrop.

Land unit 7e is only present along the north-western side of the site associated with Tindal Creek and is described as major creeks and severely gullied tributaries; includes permanent and ephemeral waters, with poorly drained soils.

3.3 Surface water

The KWMF is approximately 1 km east of the Katherine River and lies within the Katherine River flood plain. Tindal Creek flows in a northeast to southwest direction across the northern part of the site (See Figure 3-3) and surface water runoff from most of the KWMF area flows in a north-westerly direction, towards this creek.

Tindal Creek has a catchment area of 173 km^2, most of which is upstream of the KWMF. This catchment includes most of the township of Katherine, as well as wide mix of industries, and areas used for horticulture and cattle grazing. The Royal Australian Air Force (RAAF) Base Tindal is also within the catchment and is a known contamination source of PFAS; see the *Department of Defence, RAAF Base Tindal, Supplementary Detailed Site Investigation Report* (Coffey, 2018).

Tindal Creek is ephemeral and typically only flows during the wet season. In its upper reaches, the creek is fed by surface water from bushland and scrubland but becomes groundwater-fed in the wet season from Uralla through to the southern edge of Katherine.

South of the KWMF, a tributary of Tindal Creek flows from east to west and joins Tindal Creek approximately 650 m south-west of the site, which then flows into the Katherine River approximately 2 km downstream from KWMF (following the bends of the creek channel).

Flood modelling of the Katherine region (see NRETA 2006a, NRETA 2006b & NRETA 2006c) indicates that during a 1 in 20-year flood event, the northern third of the KWMF, along Tindal Creek, would be flooded i.e. under at least 2 m of water. During a 1 in 50-year event, the northern half of the site would be flooded, and during a 1 in 100-year event, most of the site would be flooded.

3.4 Geology and groundwater

The KWMF is underlain by rocks of the Daly River Group; namely the middle Cambrian-age Jinduckin Formation, which is predominantly dolomitic siltstone, with interbeds of dolostone and sandstone. Simplified geological sequences recorded at or close to the site (GHD 2019) generally comprise:

- Clay materials to depths up to 3 m
- Limestone (dolomitic) from 3 to 30 m
- Mudstone (siltstone) from 30 to 60 m
- Fractured limestone from 60 to 80 m.

The Jinduckin Formation comprises the dolomitic limestone and mudstone/siltstone sequences to 60 m depth, and the fractured limestone at depths greater than 60 m is the Tindall Limestone.

The Tindall Limestone Aquifer is a highly productive and important water resource for the Katherine region (see the *Katherine Tindall Limestone Aquifer Water Allocation Plan 2019-2024*, DENR 2019). The Tindall Limestone Aquifer is used for the Katherine Township water supply, domestic supply for many rural properties, and supports the region's agricultural and other industries. The Tindall Limestone Aquifer also provides base flow to the Katherine River through springs and seepage along the riverbanks and is responsible for the river maintaining steady flow throughout the dry season.

In the area of KWMF, and elsewhere where the Jinduckin Formation occurs, this formation acts as a confining layer and prevents recharge to the Tindall Limestone Aquifer (see **Figure 3-3**). Recharge to the Tindall Aquifer only occurs in areas where it is in direct contact with the ground surface. These areas are described as 'unconfined' and do not include the KWMF. Similarly, discharge to the Katherine River through springs and seepage from the Tindall Aquifer only occur where the river crosses the unconfined Tindall Aquifer. These sections of river occur upstream of the KWMF, but do not occur at the section nearest the KWMF.

Groundwater bores drilled into the Tindall Limestone Aquifer have yields of typically 50 L/s or more and good water quality. Whereas bores drilled into the Jinduckin Formation have yields of typically less than 5 L/s, sometimes up 10 L/s, with poor water quality (excessive salinity).

Bore RN040476 located around 670 m north-east and up-gradient of the KWMF, was installed in 2017 as part of a network of bores to investigate the extent of PFAS contamination extending from RAAF Base Tindal (Coffey, 2018). This bore has a depth of 20 m and groundwater levels monitored in this bore vary seasonally by around 5.2 m, from 3.4 metres below ground level (mBGL) during the mid-wet season, to 8.6 mBGL at the end of the dry season.

PFAS concentrations measured by Coffey (2018) in this bore range from <0.01 µg/L up to 0.02 µg/L for PFOS+PFHxS. This is below the *PFAS National Environmental Management Plan* (NEMP) drinking water guideline of 0.07 µg/L (HEPA 2020). Given this shallow bore is in the Jinduckin Formation, and groundwater transport of PFAS from RAAF Base Tindal to the Katherine River is through the Tindall Aquifer, these PFAS concentrations are likely derived from surface water groundwater interaction, where the Katherine River is recharging the Jinduckin aquifer. Perfluorooctanesulfonic acid (PFOS) concentrations in the Katherine River can at times be above the PFAS NEMP freshwater ecosystem 95% species protection guideline value of 0.13 µg/L.

At a regional scale, groundwater hydraulic gradients fall towards the Katherine River. Standing water levels (SWLs) measured in bores within the KWMF are generally around 10 mBGL, and the differences in levels between these bores show that on-site groundwater gradients generally fall towards central landfilled areas from the northern, eastern and southern site boundaries, before discharging from the site in a northwest direction, towards Tindal Creek and the Katherine River (GHD 2019).

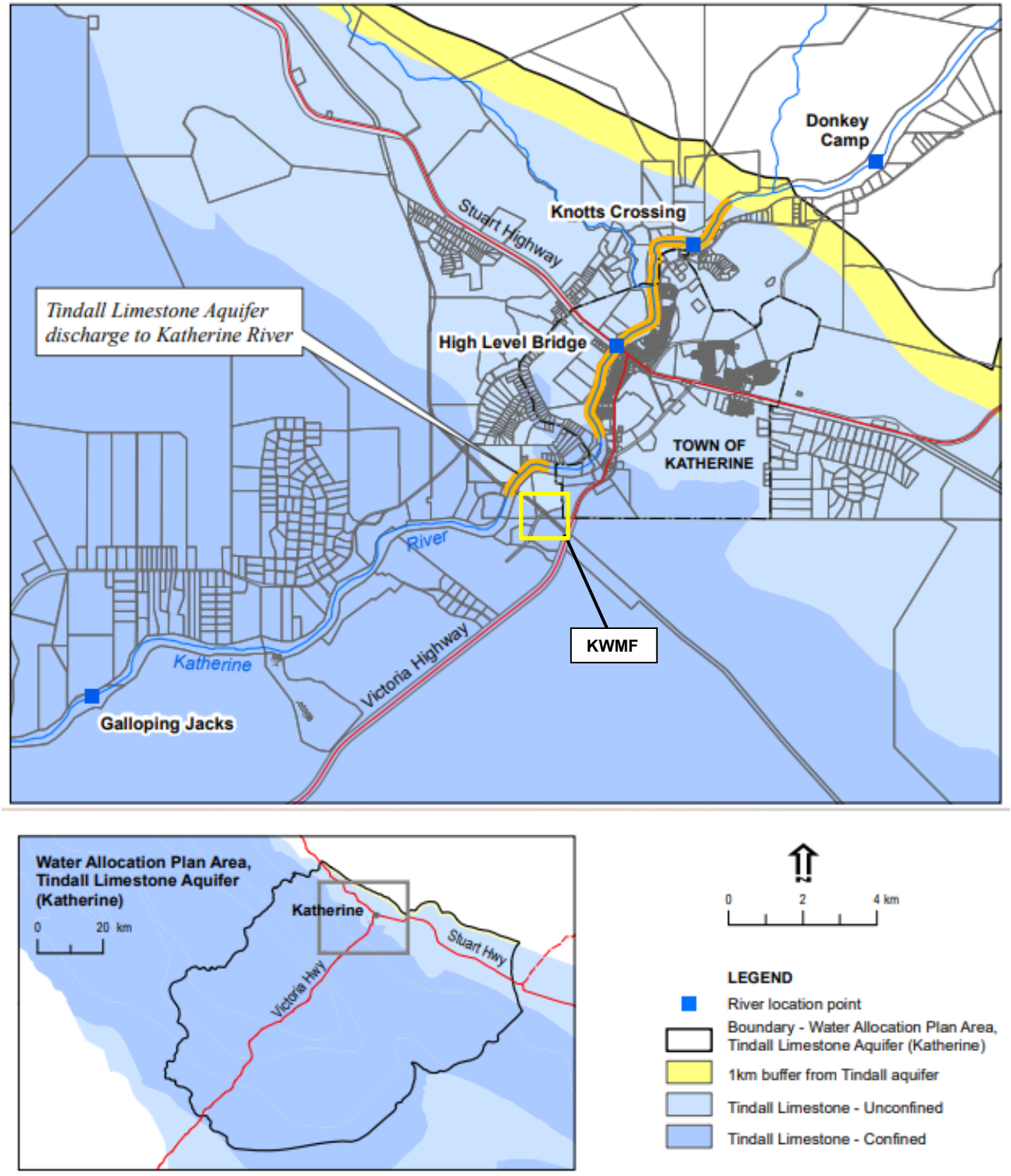


Figure 3-3: Figure of discharge zones into the Katherine River, taken from NRETAS (2009).

4 MONITORING UNDERTAKEN

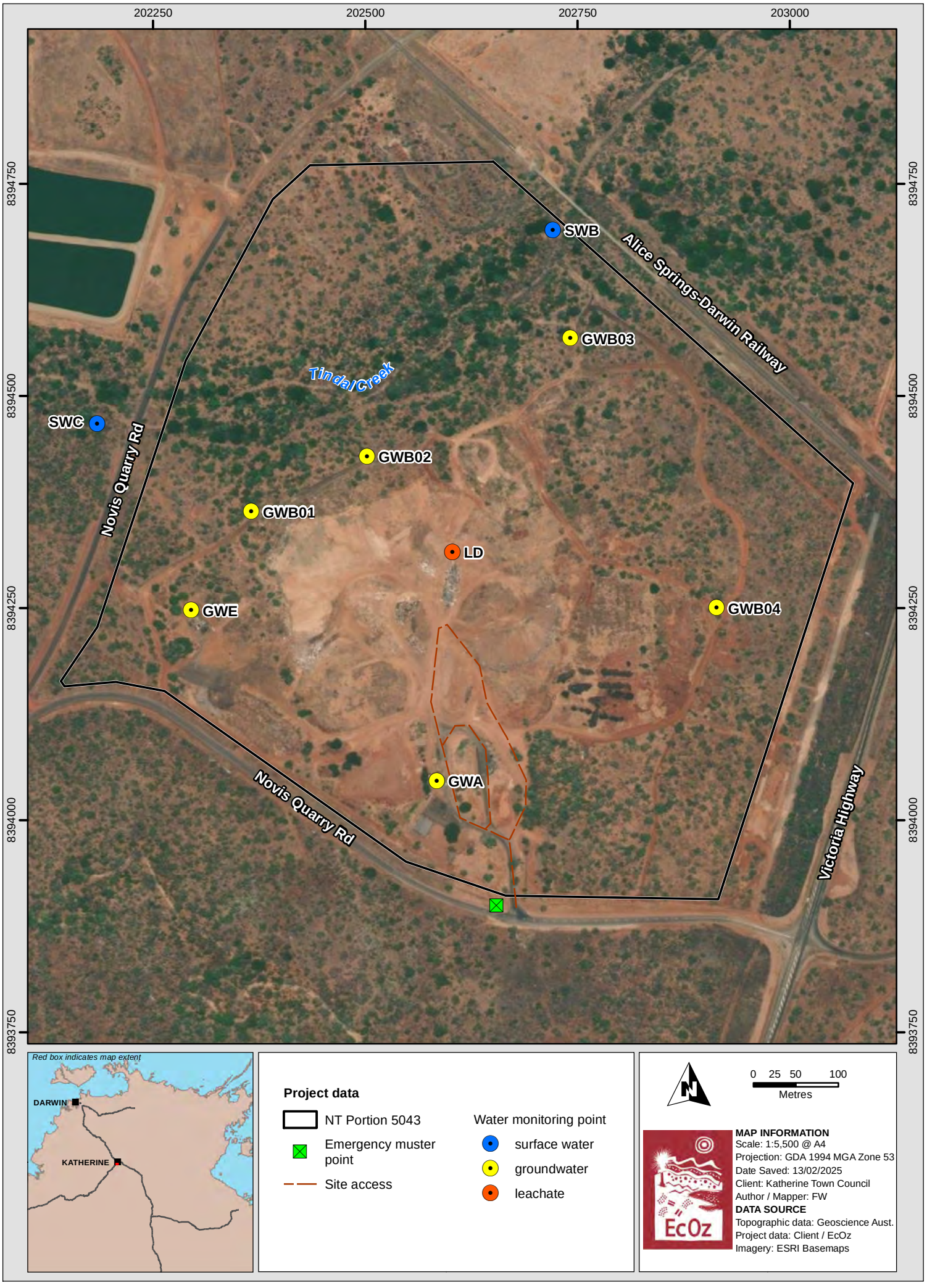
During the reporting period, monitoring was undertaken as per EPL298-02 requirements using the methods outlined in the section 4.3.

4.1 Monitoring sites

Details for surface water and groundwater monitoring sites as listed in EPL298-02 Appendix 2 are shown in **Figure 4-1** and detailed below in **Table 4-1.**

Table 4-1: Surface water and groundwater site details.

Site ID	Context and purpose	GPS Coordinates	
		Latitude	Longitude
Surface Water Sites			
SWB	Tindal Creek at railway crossing - upstream of the landfill and any leachate impacts	-14.5044°S	132.242°E
SWC	Tindal Creek - at Novis Quarry Rd bridge crossing – downstream of the landfill and any potential landfill impacts - this is the EPL298-02 compliance point where trigger values apply	-14.5064°S	132.237°E
LD	Determine quality of leachate source water	Active tip face	
Groundwater Bores			
GWA (RN031131)	- Water supply (and now also monitoring) installed in 1997 - located upgradient of the landfill. - Screen depth 26.3 – 33 mBGL in Jinduckin Formation. - Lithology: Clay, limestone	-14.5103°S	132.241°E
GWE (RN022487)	- Water supply (and now monitoring) bore installed in 1983 – located upgradient of the landfill. - Screened depth 16-23 m in Jinduckin Formation. Open hole 28-80 m in Tindall Limestone from 57 m+. - Lithology: Siltstone, limestone, mudstone, limestone and fractures.	-14.5084°S	132.238°E
GWB01	- Monitoring bores installed by GHD in 2018 – located downgradient of the landfill. - Screened depth 6.4-12.4 m in Jinduckin Formation. - Lithology: Clayey silt, silty clay, silty siltstone, silty sand, sand, sandy gravel	-14.5057°S	132.239°E
GWB02	- Monitoring bores installed by GHD in 2018 – located downgradient of the landfill. - Screened depth 8.0-17.0 m in Jinduckin Formation. - Lithology: Clay, clayey phyllite, sand, clayey phyllite, phyllite, siltstone	-14.5068°S	132.240°E
GWB03	- Monitoring bore installed by GHD in 2018 – located upgradient of the landfill. - Screened depth 5.6-10.1 m in Jinduckin Formation. - Lithology: Topsoil, silty clay, clay, clayey phyllite, phyllite, siltstone	-14.5055°S	132.242°E
GWB04	- Monitoring bore installed by GHD in 2018 – located upgradient of the landfill. - screened depth8.0-17.0 m in Jinduckin Formation. - Lithology: Silty clay, clayey phyllite, phyllite, siltstone, sandstone	-14.5084°S	132.244°E



Path: Z:\01 EcOz_Documents\04 EcOz Vantage GIS\EZ19181 - KTC EPL Update and EMP\01 Project Files\Figure 8-1 Map of KWMF water monitoring locations.mxd

Figure 4-1. Figure of Monitoring Locations at KWMF

4.2 Monitoring frequency, parameters and trigger values

Table 4-2 below list the parameters to be measured at each site, the sampling frequency and trigger values currently specified in EPL298-02 (Appendix 3) for Surface water sampling.

Table 4-2: Monitoring program and trigger values for Surface water.

			Surface water		Leachate
			SWB	SWC	
Parameter	**Unit**	**Trigger values (only apply to SWC)**	**Frequency**		
Field Measurements					
pH	-	6.0-8.0[2]	Quarterly		
Temperature	°C	-			
Electrical Conductivity (EC)	µS/cm	20-250[2]			
Dissolved Oxygen (DO)	% Sat	85-120[2]			
Major ions					
Potassium (K)	mg/L	400[3]	Quarterly		
Alkalinity ($CaCO_3$)		-			
Calcium (Ca)		500[3]			
Chloride (Cl)		-			
Sodium (Na)		300[3]			
Sulfate (SO_4)		400[3]			
Magnesium (Mg)		-			
Nutrients					
Total Nitrogen (TN)	µg/L	200-300[2]	Quarterly		
Total Phosphorus (TP)		-			
Nitrate (NO_3 as N)		-			
Ammonium (NH_4)		10[2]			
Metals					
Aluminium (Al)	µg/L	-	Quarterly		
Cadmium (Cd)		0.2[1]			
Chromium (CrIII)		3.3[4]			
Chromium (CrVI)		1.1[1]			
Copper (Cu)		1.4[1]			
Iron (Fe)	µg/L	300[3]			
Lead (Pb)		3.4[1]			
Manganese (Mn)		1900[1]			
Nickel (Ni)		11[1]			
Selenium (Se)		5[5]			
Zinc (Zn)		8.0[1]			
Other Leachate Indicators					
Total Organic Carbon (TOC)	mg/L	-	Quarterly		
Total Dissolved Solids (TDS)		-			

			Surface water		Leachate
			SWB	SWC	
Parameter	**Unit**	**Trigger values (only apply to SWC)**	**Frequency**		
Chemical Oxygen Demand (COD)		-			
Biological Oxygen Demand (BOD)		-			
Volatile acids as acetic acid (VFA)		-			
Other					
Total Recoverable Hydrocarbons (TRH)	µg/L	-	Annually		
Polycyclic Aromatic Hydrocarbons (PAHs)		16			
Benzene, toluene, ethylbenzene, xylene and naphthalene (BTEXN)		950			
Polychlorinated biphenyls (PCB)		-			
Perfluorooctanesulfonic acid (PFOS)/ Per- and polyfluoroalkyl substances (PFAS) (in any form)		-			

Key:
1 – ANZECC default guideline values for toxicants at 95% species protection applying to typical slightly- moderately disturbed systems.
2 – ANZECC default guideline values for physical and chemical stressors for tropical Australia for slightly disturbed ecosystems.
3 – ANZECC default guidelines for recreational purposes: general chemicals.
4 – ANZECC freshwater low reliability trigger value. These figures should only be used as an indicative interim working level.
5 – ANZECC default guidelines 99% species protection level recommended for slightly to moderately disturbed systems.
6 – Trigger Values to be applied at SWC only.
Quarterly – nominally January, April, July and October. If not flowing at the time of attempted sampling, further attempts should be made within that quarter to obtain a sample at the same location.
Annually – nominally February/March, towards the end of the wet season.

Similarly, **Table 4-3** below list the parameters to be measured at each site, the sampling frequency specified in EPL298-02 (Appendix 4) for groundwater sampling.

Table 4-3: Monitoring program and parameters to be measured for groundwater.

		Groundwater					
		GWA	GWE	GWB01	GWB02	GWB03	GWB04
Parameter	**Unit**	**Frequency**					
Field Measurements							
pH	-	Monthly					
Temperature	°C						
Electrical Conductivity (EC)	µS/cm						
Dissolved Oxygen (DO)	% Sat						
REDOX	mV						
Standing water level	mAHD						
Major ions							
Potassium (K)	mg/L	Monthly					
Alkalinity ($CaCO_3$)							
Calcium (Ca)							
Chloride (Cl)							
Sodium (Na)							
Sulfate (SO_4)							
Magnesium (Mg)							
Nutrients							
Total Nitrogen (TN)	µg/L	Quarterly					
Total Phosphorus (TP)							
Nitrate (NO_3 as N)							
Ammonium (NH_4)		Monthly					
Metals							
Aluminium (Al)	µg/L	Quarterly					
Cadmium (Cd)							
Chromium (CrIII)							
Metals continued							
Chromium (CrVI)	µg/L	Quarterly					
Copper (Cu)							

		Groundwater					
		GWA	GWE	GWB01	GWB02	GWB03	GWB04
Parameter	**Unit**	**Frequency**					
Iron (Fe)							
Lead (Pb)							
Manganese (Mn)							
Nickel (Ni)							
Selenium (Se)							
Zinc (Zn)							
Other Leachate Indicators							
Total Organic Carbon (TOC)	mg/L	Monthly					
Total Dissolved Solids (TDS)							
Chemical Oxygen Demand (COD)							
Biological Oxygen Demand (BOD)							
Volatile acids as acetic acid (VFA)		Quarterly					
Other							
Total Recoverable Hydrocarbons (TRH)	µg/L	Quarterly					
Polycyclic Aromatic Hydrocarbons (PAHs)							
Benzene, toluene, ethylbenzene, xylene and naphthalene (BTEXN)							
Polychlorinated biphenyls (PCB)							
Perfluorooctanesulfonic acid (PFOS)/ Per- and polyfluoroalkyl substances (PFAS) (in any form)							

4.3 Sampling procedures

All water sampling during the initial monitoring rounds (August 2024 – April 2025) was conducted by KTC staff. From April to July 2025, samples were collected by subcontractors. Field sheets for each monitoring round were provided to EcOz. Laboratory samples were analysed by a National Association of Testing Authorities (NATA) accredited laboratory.

Water quality meters are used for measuring in-situ surface water, leachate and groundwater physical parameters. These meters are required to be calibrated prior to each sampling round, however, it is uncertain whether the water quality meter was calibrated every monitoring round, as only the sub-contractor provided copies to EcOz (See **Table 4-4** below).

Table 4-4. Calibration records provided to EcOz

Month of sampling	Calibration records unavailable	Calibration records available
01/09/2024	X	
29/09/2024	X	
27/10/2024	X	
10/11/2024	X	
8/12/2024	X	
27/01/2025	X	
23/02/2024	X	
16/03/2025	X	
28/04/2025		✓
27/05/2025		✓
17/06/2025		✓
21/07/2025		✓

4.4 Monitoring undertaken during the reporting period

Table 4-5 lists the monitoring that was undertaken during the reporting period. Compliance against EPL298-02 monitoring requirements is shown. All monitoring including the collection of field measurements and physical grab samples was completed by KTC or the subcontractor, and data provided to EcOz to prepare this report. The monitoring locations are shown on **Figure 4-1**.

Table 4-5: Compliance with EPL298-02 monitoring requirements.

Type	Site ID	Frequency required	Dates sampled	Compliance with sampling frequency	Compliance with parameters measured
Surface water	SWB	Quarterly (field measurements, major ions, nutrients, metals and metalloids, other leachate indicators)	27/01/2025 17/06/2025	Non-compliant • Sites attended quarterly, but sites were not flowing on two attempts • Annual sample not collected	Non-compliant
		Annually (TRH, PAH, BTEXN, PCB and PFAS/PFOS)	-		
	SWC	Quarterly (field measurements, major ions, nutrients, metals	27/01/2025 17/06/2025		

Type	Site ID	Frequency required	Dates sampled	Compliance with sampling frequency	Compliance with parameters measured
		and metalloids, other leachate indicators)			
		Annually (TRH, PAH, BTEXN, PCB and PFAS/PFOS)	-		
Leachate		Quarterly (field measurements, major ions, nutrients, metals and metalloids, other leachate indicators)	-	Non-compliant • Sites attended quarterly but leachate was not ponding during when sampling was attempted.	
		Annually (TRH, PAH, BTEXN, PCB and PFAS/PFOS)	-		
Groundwater	GWA	Monthly (field measurements, major ions, NH_4, TOC. TDS, COD, BOD)	01/09/2024 29/09/2024 27/10/2024 10/11/2024 8/12/2024 27/01/2025 23/02/2025 16/03/2025 28/04/2025 27/05/2025 17/06/2025 21/07/2025	Compliant	Compliant except for: • pH measurement in first round of sampling in August as field equipment was not working. • SWL not measured in the reporting period given that the bore is equipped with a tap. Samples from this bore are collected from a tap.
		Quarterly (TN, TP, N, metals, VFA, TRH, PAH, BTEXN, PCB, PFOS/PFAS)	01/09/2024 10/11/2024 27/01/2025 28/04/2025 21/07/2025	Compliant	Compliant
	GWE	Monthly (field measurements, major ions, NH_4, TOC. TDS, COD, BOD)	01/09/2024 29/09/2024 27/10/2024 10/11/2024 8/12/2024 27/01/2025 23/02/2025 16/03/2025 07/05/2025 27/05/2025 17/06/2025 21/07/2025	Compliant .	Compliant except for: • pH measurement in first round of sampling in August as field equipment was not working.
		Quarterly (TN, TP, N, metals, VFA, TRH, PAH, BTEXN, PCB, PFOS/PFAS)	01/09/2024 10/11/2024 27/01/2025 28/04/2025 21/07/2025	Compliant	• Compliant
	GWB01	Monthly (field measurements, major ions, NH_4, TOC. TDS, COD, BOD)	01/09/2024 29/09/2024 27/10/2024 10/11/2024 8/12/2024	Compliant .	Compliant except for: • pH measurement in first round of sampling in August as field equipment was not working.

Type	Site ID	Frequency required	Dates sampled	Compliance with sampling frequency	Compliance with parameters measured
			27/01/2025 23/02/2025 16/03/2025 07/05/2025 27/05/2025 17/06/2025 21/07/2025		
		Quarterly (TN, TP, N, metals, VFA, TRH, PAH, BTEXN, PCB, PFOS/PFAS)	01/09/2024 10/11/2024 27/01/2025 28/04/2025 21/07/2025	Compliant	• Compliant
	GWB02	Monthly (field measurements, major ions, NH_4, TOC. TDS, COD, BOD)	01/09/2024 29/09/2024 27/10/2024 10/11/2024 8/12/2024 27/01/2025 23/02/2025 16/03/2025 07/05/2025 27/05/2025 17/06/2025 21/07/2025	Compliant	Compliant except for: • pH measurement in first round of sampling in August as field equipment was not working.
		Quarterly (TN, TP, N, metals, VFA, TRH, PAH, BTEXN, PCB, PFOS/PFAS)	01/09/2024 10/11/2024 27/01/2025 28/04/2025 21/07/2025	Compliant	• Compliant
	GWB03	Monthly (field measurements, major ions, NH_4, TOC. TDS, COD, BOD)	01/09/2024 29/09/2024 27/10/2024 10/11/2024 8/12/2024 27/01/2025 23/02/2025 16/03/2025 07/05/2025 27/05/2025 17/06/2025 21/07/2025	Compliant	Compliant except for: • pH measurement in first round of sampling in August as field equipment was not working. • EC measurement not collected in December 2024 – no explanation
		Quarterly (TN, TP, N, metals, VFA, TRH, PAH, BTEXN, PCB, PFOS/PFAS)	01/09/2024 10/11/2024 27/01/2025 28/04/2025 21/07/2025	Compliant	• Compliant
	GWB04	Monthly (field measurements, major ions, NH_4, TOC. TDS, COD, BOD)	01/09/2024 29/09/2024 27/10/2024 10/11/2024 8/12/2024	Compliant .	Compliant except for: • pH measurement in first round of sampling in August as field equipment was not working.

Type	Site ID	Frequency required	Dates sampled	Compliance with sampling frequency	Compliance with parameters measured
			27/01/2025 23/02/2025 16/03/2025 07/05/2025 27/05/2025 17/06/2025 21/07/2025		
		Quarterly (TN, TP, N, metals, VFA, TRH, PAH, BTEXN, PCB, PFOS/PFAS)	01/09/2024 10/11/2024 27/01/2025 28/04/2025 21/07/2025	Compliant	• Compliant

5 RESULTS AND DISCUSSION

5.1 Quality Assurance and Quality Control (QA/QC)

Multiple laboratory reports indicated that sampling bottles were received with headspace, which can impact on the analytical results. Details about the specific bottles affected were not provided. In addition to this, the outliers below were also identified in the reporting period.

5.1.1 Duplicates

Duplicates were collected during the reporting period to evaluate the precision of sampling methods. For this assessment, the RPD was estimated, when possible. As shown in **Table 5-1**, in most cases, differences between primary samples and duplicates did not exceed 20% (adopted criteria), when concentrations were at least ten times the LOR. Therefore, the results are acceptable. However, some PRDs were well above the adopted criteria even when at least one of the results was more than 10 times higher than the LOR. In such cases, RPDs of over 20%, and over 80% indicate problems with the sampling methodology and uncertainty of the representativeness of the results obtained. Therefore, these results are excluded from this report.

Table 5-1: RPD assessment

RPDs >20% and where at least one of the results was more than 10 times the LOR are indicated in Purple.

Date	Site	Parameter Measured In Primary Sample.	Parameter Measured In Duplicate Sample.	RPD Assessment
01/09/2024	GWB01	Total and dissolved metals, TDS, VFA, major ions, TOC, nutrients, BOD, COD and PFAS.	Total and dissolved metals, TDS, VFA, major ions, TOC, nutrients, BOD, COD and PFAS.	Compliant - results below detection limits or RPD <20%, except for: - VFAs 79% - Total Nitrogen 35% - BOD 120%
29/09/2024	GWA	TDS, major ions, TOC, Ammonium, BOD and COD.	TDS, major ions, TOC, Ammonium, BOD and COD.	Compliant - results below detection limits or RPD <20%, except for: - TDS 33% - Magnesium 47% - Potassium 47% - Sodium 28%
27/10/2024	GWA	TDS, major ions, TOC, Ammonium, BOD and COD.	TDS, major ions, TOC, Ammonium, BOD and COD.	Compliant - results below detection limits or RPD <20%.
10/11/2024	GWA	TDS, major ions, TOC, Ammonium, BOD and COD.	TDS, major ions, TOC, Ammonium, BOD and COD.	Compliant - results below detection limits or RPD <20%, except for: - VFAs 146%
8/12/2024	GWA	TDS, major ions, TOC, Ammonium, BOD and COD.	TDS, major ions, TOC, Ammonium, BOD and COD.	Compliant - results below detection limits or RPD <20%.
27/01/2025	GWA	Total and dissolved metals, TDS, VFA, major ions, TOC, nutrients, BOD, COD and PFAS.	Total and dissolved metals, TDS, VFA, major ions, TOC, nutrients, BOD, COD and PFAS.	Compliant - results below detection limits or RPD <20%, except for: - VFAs 61% - Potessium 32%

Date	Site	Parameter Measured In Primary Sample.	Parameter Measured In Duplicate Sample.	RPD Assessment
				- Sodium 23%
23/02/2025	GWA	TDS, major ions, TOC, Ammonium, BOD and COD.	TDS, major ions, TOC, Ammonium, BOD and COD.	Compliant - results below detection limits or RPD <20%.
16/03/2025	GWA	TDS, major ions, TOC, Ammonium, BOD and COD.	TDS, major ions, TOC, Ammonium, BOD and COD.	Compliant - results below detection limits or RPD <20%.
07/05/2025	GWB03	Total and dissolved metals, TDS, VFA, major ions, TOC, nutrients, BOD, COD and PFAS.	Dissolved metals, TRH & BTEXN, and PFAS.	Compliant - results below detection limits or RPD <20%.
27/05/2025	GWB02	TDS, major ions, TOC, Ammonium, BOD and COD.	TDS, TOC, Ammonium	Compliant - results below detection limits or RPD <20%.
17/06/2025	GWB01	TDS, major ions, TOC, Ammonium, BOD and COD.	TDS, TOC, Ammonium	Compliant - results below detection limits or RPD <20%.
21/07/2025	GWB01	Total and dissolved metals, TDS, VFA, major ions, TOC, nutrients, BOD, COD and PFAS.	TDS, TOC, Ammonium.	Compliant - results below detection limits or RPD <20%. except for: - TDS 34% - N and NH4+ 37.5%

5.1.2 Trip and field blanks

Field and trip blanks were also analysed alongside the primary samples to determine any potential cross-contamination during sample collection (field blank) and handling and transportation (trip blank). As shown in **Table 5-2**, multiple analytes were detected in the trip and field blank samples. Given the consistent detections of some analytes in the trip and field blanks, the laboratory was queried about their uncertainty levels for each sampling method. Envirolab advised EcOz that most of their methods yield approximately +/- 30% uncertainty, which increases significantly near detection limits up to >100% of the LOR.

The concentrations recorded in the trip and field blank samples were used to assess the integrity and accuracy of the results obtained. When analytes were at higher concentrations in the trip or field blanks than in the primary samples, it was concluded that the uncertainty regarding their accuracy is high due to a potential cross-contamination. As such, these results are not included in the tables in **Section 5.2** to **Section 5.4**. All laboratory reports are included in **Appendix D** for reference. All other results were deemed as accurate, under the assumption that if cross-contamination occurred, its impact on the primary sample results is minimal.

Table 5-2: Trip and field blank results summary.
Columns in red indicate analytes where the concentration in the trip or field blank was higher than in the primary sample, excepting those with results <LOR.

Date	Sample	Analyte	Units	LOR	Detections ± 30%	Primary samples where concentration below or equal to Trip/Field blank result	Primary samples concentration range
01/09/2024	Field Blank	TOC	mg/L	1	12.0 ± 3.6	All	1.40-6.90
		Ammonium	µg/L	10	13.0 ± 3.9	GWA, GWB02	8-1700
		TRH C10-C14 Fraction	µg/L	50	130.0 ± 39.0	All below LOR	<50
	Trip Blank	Ammonium	µg/L	10	16.0 ± 4.8	GWA, GWB02	8-1700
29/09/2024	Field Blank	BOD	mg/L	5	16.0 ± 4.8	All below LOR	<5
	Trip Blank	BOD	mg/L	5	16.0 ± 4.8	All below LOR	<5
10/11/2024	Field Blank	VFA	mg/L	5	6.90 ± 2.07	None	20-210
	Trip Blank	VFA	mg/L	5	12.0 ± 3.6	None	20-210
8/12/2024	Field Blank	BOD	mg/L	5	6.80 ± 2.04	GWA, GWE, GWB02	7.8-15
	Trip Blank	BOD	mg/L	5	7.00 ± 2.10	GWA, GWE, GWB02	7.8-15
27/01/2025	Field Blank	VFA	mg/L	5	11.0 ± 3.3	GWE	12-240
	Trip Blank	VFA	mg/L	5	6.40 ± 1.92	None	12-240
23/02/2024	Field Blank	BOD	mg/L	5	12.0 ± 3.6	GWE, GWB03	8.5-29
16/03/2025	Field Blank	BOD	mg/L	5	14.0 ± 4.2	All	11-17
	Trip Blank	BOD	mg/L	5	12.0 ± 3.6	GWA, GWE, GWB02, GWB03, GWB04	11-17

5.2 Leachate

Given that during all monitoring events, no leachate was observed to be ponding in the 2024/25 reporting period, therefore there are no new leachate results to present in this document.

Leachate results will not be presented in this document, with data assessment and historical trends from the last reporting period remaining the most relevant information. This information can be found in *EPL298-01 Monitoring report, Katherine Waste Management Facility – Reporting period 1 august 2023 – 31 July 2024* (NT EPA, 2024).

5.3 Surface water

Results for the reporting period and historic trends are provided in the sections below. An assessment of the concentrations recorded at SWC with respect to the EPL298-02 trigger values is also provided in Section 5.3.3.

Site SWC results are also compared against those from SWB as the latter is considered a background site.

5.3.1 Water quality in the reporting period

During the reporting period, field and laboratory parameters at both surface water sites were measured twice (January and June 2025).

pH values were consistent between both sites in both monitoring rounds, with elevated values in June exceeding the respective trigger value at SWC (8.43).

EC was elevated at both sites in both rounds, particularly in June. The higher EC in June may be influenced by reduced rainfall from March onwards, likely causing Tindal Creek's water quality to be dominated by groundwater discharge. DO levels were consistently low at both sites, further suggesting a strong influence of groundwater inputs.

All major ions were below respective trigger values, and concentrations were largely consistent between the two sites. Most major ions were lower in January, potentially due to dilution from wet season rainfall.

Nutrient levels at SWC were similar in both sampling rounds, with TN at the adopted trigger value. In contrast, SWB exhibited elevated nutrient levels compared to SWC, with notably higher nitrogen concentrations.

For total and dissolved metals, Cu was at the trigger value in SWC for January; otherwise, dissolved metals were generally below their respective trigger values and comparable to background levels at SWB.

Parameters such as TOC, TDS, COD, and BOD showed similar concentrations at both sites. VFA were slightly lower at SWB in January and higher at SWC in the June round.

Results for the reporting period are provided in **Table 5-3.**

Table 5-3: Surface water quality in the monitoring period.

Concentrations below the laboratory LOR are shown in **grey**. Hyphens (**-**) indicate that no trigger values, LOR or units are applicable, or no results available. Concentrations above the trigger value are shown **in red**.

PARAMETER	UNIT	LOR	TRIGGER VALUE	Jan 2025		Jun 2025	
				SWB	SWC	SWB	SWC
FIELD MEASUREMENTS							
pH	-	-	6-8	6.24	6.63	8.45	**8.43**
Temperature	°C	-	-	30.0	30.9	20.7	22.8
Electrical Conductivity (EC)	µs/cm	-	20-250	460	**470**	653	**557**
Dissolved Oxygen (DO)	% Sat	-	85-120	1.5	**5.8**	7.08	**10.05**
MAJOR IONS							
Potassium (K)		0.5	400	7.20	6.90	3.90	4.40
Alkalinity (CaCO3)		5	-	280	260	340	330
Calcium (Ca)		0.5	400	46	45	63	62
Chloride (Cl)	mg/L	1	-	9	9	10	10
Sodium (Na)		0.5	300	8.10	7.60	9.60	8.90
Sulfate (SO4)		1	500	2	2	3	3
Magnesium (Mg)		0.5	-	31	30	44	44
NUTRIENTS							
Total Nitrogen (TN)		100	200-300	200	**200**	270	**200**
Total Phosphorus (TP)		50/10	-	60	<50	<0.010	<50
Nitrate (as N)	µg/L	5	-	250	<5	13.0	<5
Ammonium (NH4)		7	10	43	<30	<0.0070	<7
Ammonia (as N)		5	10	-	-	7	<5
METALS (TOTAL)							
Cadmium (Cd)		0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001
Chromium (Cr(III))		0.005	0.0033	<0.0050	<0.0050	<0.005	<0.0050
Chromium (CrVI)		0.005	0.001	<0.0050	<0.0050	<0.005	<0.0050
Copper (Cu)		0.001	0.0014	0.002	**0.002**	<0.001	**0.0014**
Iron (Fe)		0.01	0.3	0.14	0.14	0.13	0.046
Lead (Pb)	mg/L	0.001	0.0034	<0.001	<0.010	<0.001	<0.010
Manganese (Mn)		0.005	1.9	0.028	0.013	0.0025	0.0027
Nickel (Ni)		0.001	0.013	<0.001	0.001	<0.001	<0.001
Zinc (Zn)		0.001	0.008	0.005	0.004	0.0041	0.0032
Aluminium (Al)		0.01	-	0.11	0.12	0.056	0.018
Selenium (Se)		0.001	-	<0.001	<0.001	<0.001	<0.001
METALS (DISSOLVED)							
Cadmium (Cd)		0.0001	0.0002	<0.001	<0.001	<0.0001	<0.001
Chromium (Cr(III))		0.005	0.0033	<0.0050	<0.0050	<0.005	<0.0050
Chromium (CrVI)		0.005	0.001	<0.0050	<0.0050	<0.005	<0.0050
Copper (Cu)		0.001	0.0014	0.001	0.001	<0.001	<0.001
Iron (Fe)		0.01	0.3	<0.010	<0.001	<0.01	<0.001
Lead (Pb)	mg/L	0.001	0.0034	<0.001	<0.001	<0.001	<0.001
Manganese (Mn)		0.005	1.9	0.006	<0.001	0.0010	0.0014
Nickel (Ni)		0.001	0.013	<0.001	<0.001	<0.001	<0.001
Zinc (Zn)		0.001	0.008	0.003	0.003	<0.001	<0.001
Aluminium (Al)		0.01	-	<0.001	<0.01	<0.001	<0.01
Selenium (Se)		0.001	-	<0.001	<0.001	<0.001	<0.001
OTHER LEACHATE INDICATORS							
Total Organic Carbon (TOC)		1	-	7	8	2.6	2
Total Dissolved Solids (TDS)		5	-	300	290	310	310
Chemical Oxygen Demand (COD)	mg/L	20	-	<50	<50	<20	<20
Biological Oxygen Demand (BOD)		5	-	<5	<5	6.7	6.7
Volatile acids as acetic acid (VFA)		5	-	95	17	14	100

5.3.2 Historical trend

All surface water quality data available since 2017 are included in **Appendix B.** Historic results and all surface water quality results for parameters with all data available are graphed in **Appendix C**.

No increasing, or decreasing, trends were observed in any of the parameters analysed at SWC and SWB. As observed in the graphs presented in **Appendix C**, when results for both surface water sites are available, concentrations tend to be similar at both sites.

The elevated TN recorded at SWC in November 2023 (860 µg/L), is the highest ever recorded since monitoring started. TN at the leachate site (1,600 µg/L), was above the trigger value at SWC the same month, potentially indicating an impact from the activities undertaken at the facility. However, in December 2020, elevated TN was also reported at SWB and SWC (600 and 700 µg/L, respectively), indicating that background conditions at the time were also above the guideline. During this reporting period, in 2024-2025, TN levels are at the trigger level for SWC (200 µg/L) but far less than historical values.

5.3.3 SWC trigger value compliance

Condition 64 of EPL298-02 defines the following as a non-compliance:

> *64.1 An exceedance of a trigger value, as specified in the Monitoring Plan on a single occasion where the parameter measured greater than or equal to three times the trigger value; or*
> *64.2 An exceedance of a trigger value, as specified in the Monitoring Plan on three consecutive occasions; or*
> *64.3 any subsequent consecutive exceedances of a trigger value, as specified in the Monitoring Plan.*

As per above conditions, DO was the only parameter that, in both sampling events, recorded a concentration more than three times (less than) the trigger value, representing a non-compliance. Non-compliances have always been reported in this parameter. However, the upstream site (SWB) has also recorded DO levels that are three times (less than) the trigger value. Therefore, it appears these trigger values need to be reviewed in respect to site-specific conditions.

Similarly, Cu (total) was the only parameter that recorded concentrations equal to or above the trigger value in three consecutive sampling events, indicating non-compliance. However, the concentration at the background site was at the trigger value, similar to the levels recorded at SWC in two of the three consecutive rounds.

Table 5-4. SWC trigger values compliance for 2024-25

Parameter	Unit	LOR	Trigger Value	Feb-24		Jan - 25		Jun - 25		Comment
				SWC	Exceedance	SWC	Exceedance	SWC	Exceedance	
Field Measurements										
DO	%	-	85-120	-	-	5.8	14.66	10.05	8.46	Recorded values are three times (less than) the trigger value
Metals (Total)										
Copper	mg/L	0.01	0.0014	0.0023	1.64	0.002	1.43	0.0014	1	Recorded values exceed the trigger value in three consecutive monitoring rounds

5.4 Groundwater

Groundwater levels, quality and historic trends are provided in the sections below.

5.4.1 Groundwater levels and flow

SWL data was available for the 2024–2025 monitoring period (see **Table 5-5** and **Figure 5-1**). The data shows the influence of seasonal rainfall, with SWLs beginning to decline after March (mid-wet season), when levels were likely at their highest for the season. A record-breaking rainfall event in May 2025 caused a noticeable rise in SWL, which is evident.

The groundwater elevation in the six on-site bores indicates that groundwater predominately flows in a north-west direction across the site towards Tindal Creek.

Table 5-5: SWLs from August 2024 to June 2025.

BORE ID	Aug-24		Sep-24		Oct-24		Nov-24		Dec-24		Jan-25		Feb-25		Mar-25		Apr-25		May-25		Jun-25		Jul-25	
	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD
GWA (RN031131)		102.6754		102.6754		102.6754		102.6754		102.6754		102.6754		102.6754		102.6754		102.6754		102.6754		102.6754		
GWE (RN022487)	10.87	91.2764	11.3	90.8464	11.2	90.9464	11.4	90.7464	10.4	91.7464	8.72	93.4264	7.9	94.2464	6.85	95.2964	10.66	91.4864	9.27	92.8764	8.76	93.3864	9.39	92.7564
GWB01	11.3	88.3214	11.5	88.1214	11.8	87.8214	11.9	87.7214	11.4	88.2214	8.81	90.8114	6.5	93.1214	7.51	92.1114	10.64	88.9814	9.9	89.7214	7.56	92.0614	10.22	89.4014
GWB02	7.4	92.3951	11.51	88.2851	11.7	88.0951	12	87.7951	11.1	88.6951	8.12	91.6751	6.5	93.2951	7.17	92.6251	7.99	91.8051	9.75	90.0451	7.41	92.3851	10.08	89.7151
GWB03	9.2	90.4793	9.71	89.9693	9.8	89.8793	10.3	89.3793	10.6	89.0793	8.2	91.4793	5.3	94.3793	4.97	94.7093	5.87	93.8093	7.89	91.7893	6.64	93.0393	7.98	91.6993
GWB04	12.4	90.463	12.92	89.943	13.2	89.663	13.3	89.563	11.8	91.063	11.4	91.463	8.56	94.303	8.46	94.403	9.11	93.753	10.98	91.883	9.55	93.313	11.12	91.743

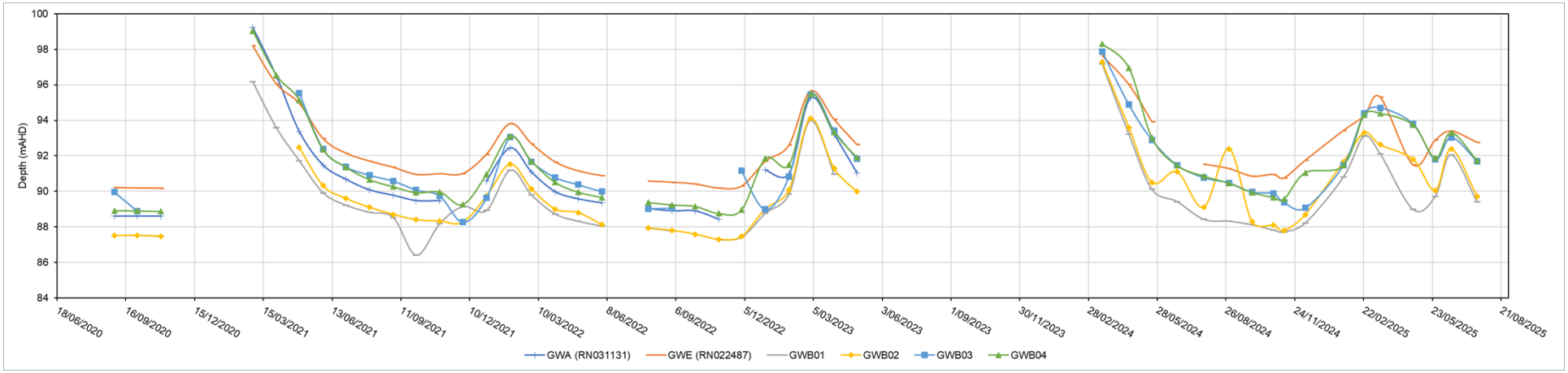


Figure 5-1: Graph of groundwater depths in mAHD at the monitoring bores since monitoring started in August 2020 at KWMF.

5.4.2 Water quality in the reporting period

Groundwater quality monitoring results for the reporting period are presented below. Analytes where all results were below the LOR for the reporting period will not be presented in this report. Trigger values are not defined for groundwater quality in EPL298-02, rather, concentrations in the two downgradient bores GWB01 and GWB02, are compared to the four upgradient bores.

Appendix B contains the tables with all the historic data available for the groundwater bores, including the results of single monitoring rounds undertaken in 2006, 2017 and 2018. Groundwater bores GWB01 to GWB04 were also only installed in 2018, and historic data for these bores is only available for a single monitoring round in 2018. A number of parameters were also not measured during the earlier monitoring rounds e.g., TN, VFA, and not all 28 PFAS that are currently analysed were analysed pre-2020.

Note that months when monitoring was not undertaken (variable for each parameter; see **Table 4-5**) were not included in the tables below. In addition, based on the data assessment (see **Section 5.1**) multiple data was not included in the sections below due to uncertainties regarding its representativeness.

Results tables are not provided below for parameters that recorded concentrations below the LOR for all bores, for all monitoring rounds.

Field parameters

From the reporting period, records of all the field parameters are presented in **Table 5-6** and **Figure 5-2** below.

August 2024 pH was not recorded as pH meter was not working. Results are generally neutral to alkaline with September and January results being slightly acidic.

EC measurement was not collected in December 2024 for GWB03, no explanation was given on the field sheet. EC ranged between 202 and 1130 µS/cm during the monitoring period. The highest EC levels were consistently recorded at the downgradient bores GWB02 peaking in April 2025, which potentially indicate an impact from leachate infiltration. GWB04 recorded most stable and consistent EC recordings.

DO was consistently low at all monitoring bores, with levels ranging from 0.7 to 25.1 % Saturation.

Table 5-6: Field Parameters in the monitoring bores during the reporting period

pH	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA		6.3	6.3	8.6	8.0	6.3	8.6	8.7	6.8	7.3	7.0	7.5
GWE		5.8	6.5	6.9	7.9	6.0	8.1	6.5	7.6	7.8	7.8	7.8
GWB01		5.9	6.3	6.8	8.0	5.7	7.0	8.5	6.7	6.8	6.9	7.1
GWB02		6.0	6.0	8.9	8.1	6.0	7.2	8.3	6.8	6.8	7.1	7.0
GWB03		6.1	6.4	8.2	8.4	5.6	7.8	7.1	6.8	6.9	7.3	7.1
GWB04		6.9	6.1	8.4	7.3	6.9	8.7	6.9	6.8	6.7	6.9	7.1

T (°C)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	30.0	35.1	35.2	32.3	31.3	42.6	29.8	38.0	31.2	31.7	31.5	27.1
GWE	34.5	30.8	33.5	31.2	37.0	33.6	29.1	32.0	32.0	31.5	28.1	23.0
GWB01	33.3	29.6	35.2	32.1	36.5	42.1	31.2	36.0	32.0	32.5	28.2	23.4
GWB02	33.0	32.5	38.0	33.2	39.0	42.7	32.6	38.0	32.1	31.8	30.0	23.7
GWB03	31.3	34.9	42.0	36.4	39.0	38.4	32.3	36.0	30.8	29.9	27.2	24.0
GWB04	29.2	32.7	39.4	34.6	37.0	39.7	32.0	36.0	31.0	32.1	28.4	25.0

EC (µS/cm)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	557	588	598	569	575	589	590	650	680	643	741	316
GWE	427	568	587	436	865	529	558	795	1060	585	601	533
GWB01	787	824	636	822	202	829	791	874	1130	781	562	780
GWB02	820	754	818	838	425	884	901	596	1070	868	874	785
GWB03	820	889	852	1000		902	297	604	1080	817	412	783
GWB04	820	792	963	806	825	791	732	874	1090	886	959	802

DO (%)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	3.9	4.1	13.1	0.8	3.5	6.3	5.1	4.5	14.2	3.7	1.9	4.9
GWE	2.1	4.7	20.1	6.3	5.5	25.1	7.3	11.5	17.2	0.7	2.1	5.5
GWB01	1.7	9.0	10.8	4.6	8.1	4.8	4.3	4.4	12.6	1.1	1.7	4.7
GWB02	1.3	8.6	4.3	8.1	9.0	2.3	3.2	6.5	16.9	0.9	4.4	4.1
GWB03	5.4	1.7	6.2	3.9	6.5	1.1	4.1	4.8	12.0	2.9	6.3	4.5
GWB04	8.5	10.1	3.5	7.2	12.4	4.9	2.2	2.2	23.9	3.1	2.2	4.2

Redox	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	244.0	234.0	180.0	254.0	221.0	219.0	131.0	305.0	159.7	110.5	94.6	115.3
GWE	150.0	72.0	222.0	195.0	234.0	237.0	225.0	212.0	202.1	63.6	74.7	150.0
GWB01	208.0	204.0	174.0	201.0	243.0	262.0	292.0	227.0	199.4	91.1	74.4	139.1
GWB02	222.0	231.0	209.0	242.0	235.0	253.0	303.0	214.0	200.2	64.7	87.0	134.9
GWB03	213.0	126.0	237.0	234.0	224.0	252.0	297.0	230.0	210.4	16.3	91.7	128.1
GWB04	244.0	234.0	243.0	255.0	239.0	291.0	329.0	226.0	203.1	71.9	75.5	125.1

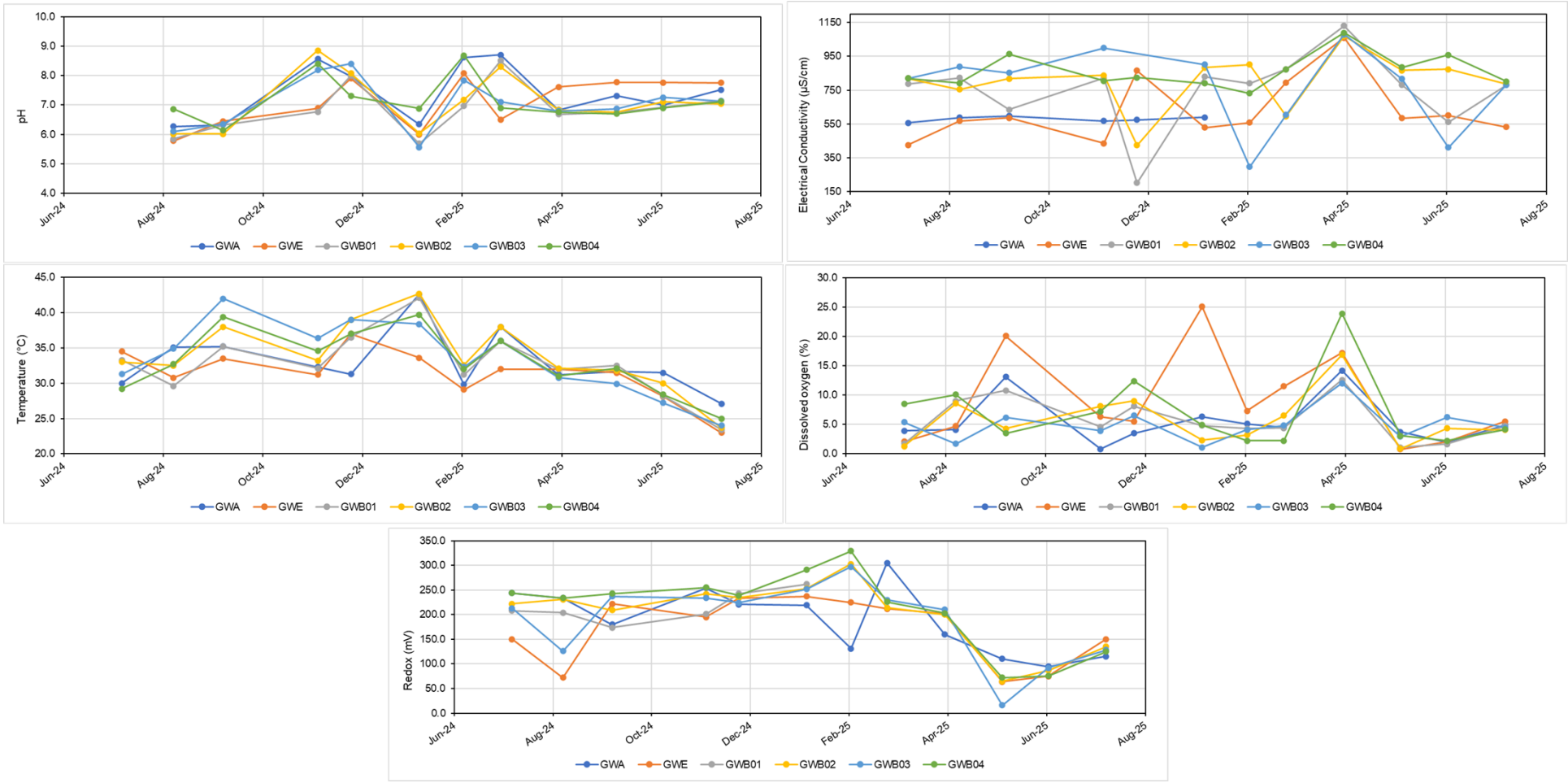


Figure 5-2: Graphs of field measurements in the monitoring bores during the reporting period

Major ions

From the reporting period, results of all the major ions are presented in **Table 5-7** and **Figure 5-3** below.

K concentrations were consistently higher at GWB01 (downgradient bore) and GWB04 (upgradient bore) than in the other bores. The elevated concentrations recorded at GWB01 are likely associated with an impact from the KWMF, however there is absence of leachate sampling during the reporting period to link the association.

The deeper bores GWA and GWE consistently recorded the lowest $CaCO_3$ and Mg concentrations. Given these bores are up the hydraulic gradient, the concentrations reported are potentially an indication of the natural characteristics of groundwater intercepted at deeper depths. Ca was also frequently lower at GWE than at any other bore.

Na and Cl were commonly elevated at the two downgradient bores GWB01 and GWB02. These results, and particularly Cl, may indicate a potential impact associated with leachate infiltration. However, historical data indicate that these major ions are commonly at lower concentrations in leachate than at these two bores, but leachate quality data is limited in reporting; therefore, a potential impact cannot be discarded.

In the reporting period, SO_4, Mg, Ca concentrations spiked at GWB03 in December 2024 and have since returned to levels consistent with historic data. The source of these spikes is yet unknown.

Table 5-7:Major Ions in the monitoring bores during the reporting period.

K (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	6.7	Redacted: See Table 5-1.	5.0	5.6	4.3	Redacted: See Table 5-1.	4.4	5.0	5.3	5.1	4.9	5.0
GWE	6.8		5.2	8.1	7.8		6.8	7.6	7.9	8.0	9.2	7.6
GWB01	15.0		13.0	15.0	12.0		11.0	12.0	11.0	13.0	12.0	11.0
GWB02	6.8		5.8	9.3	5.7		5.7	5.6	4.5	4.9	6.5	5.2
GWB03	5.0		6.0	5.9	6.8		3.6	3.8	3.2	3.9	4.1	4.0
GWB04	8.8		8.4	10.0	8.9		8.1	8.7	7.9	8.4	8.8	8.4

Alkalinity (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	270	290	310	340	350	290	300	330	340	340	350	350
GWE	250	240	280	220	230	280	280	300	270	270	250	310
GWB01	320	310	360	410	410	420	390	430	430	400	380	400
GWB02	320	320	430	430	440	460	440	450	450	420	430	460
GWB03	360	460	510	500	530	520	340	320	320	430	390	520
GWB04	370	390	430	440	490	520	430	500	490	480	500	540

Ca (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	76	49	75	72	71	50	72	77	78	71	81	66
GWE	39	43	60	25	29	60	48	54	53	48	53	46
GWB01	88	47	86	76	81	85	89	100	98	86	88	78
GWB02	100	51	96	96	95	95	110	110	110	93	100	88
GWB03	100	96	100	100	120	97	69	66	70	89	83	81
GWB04	87	47	84	82	79	82	83	92	91	83	92	77

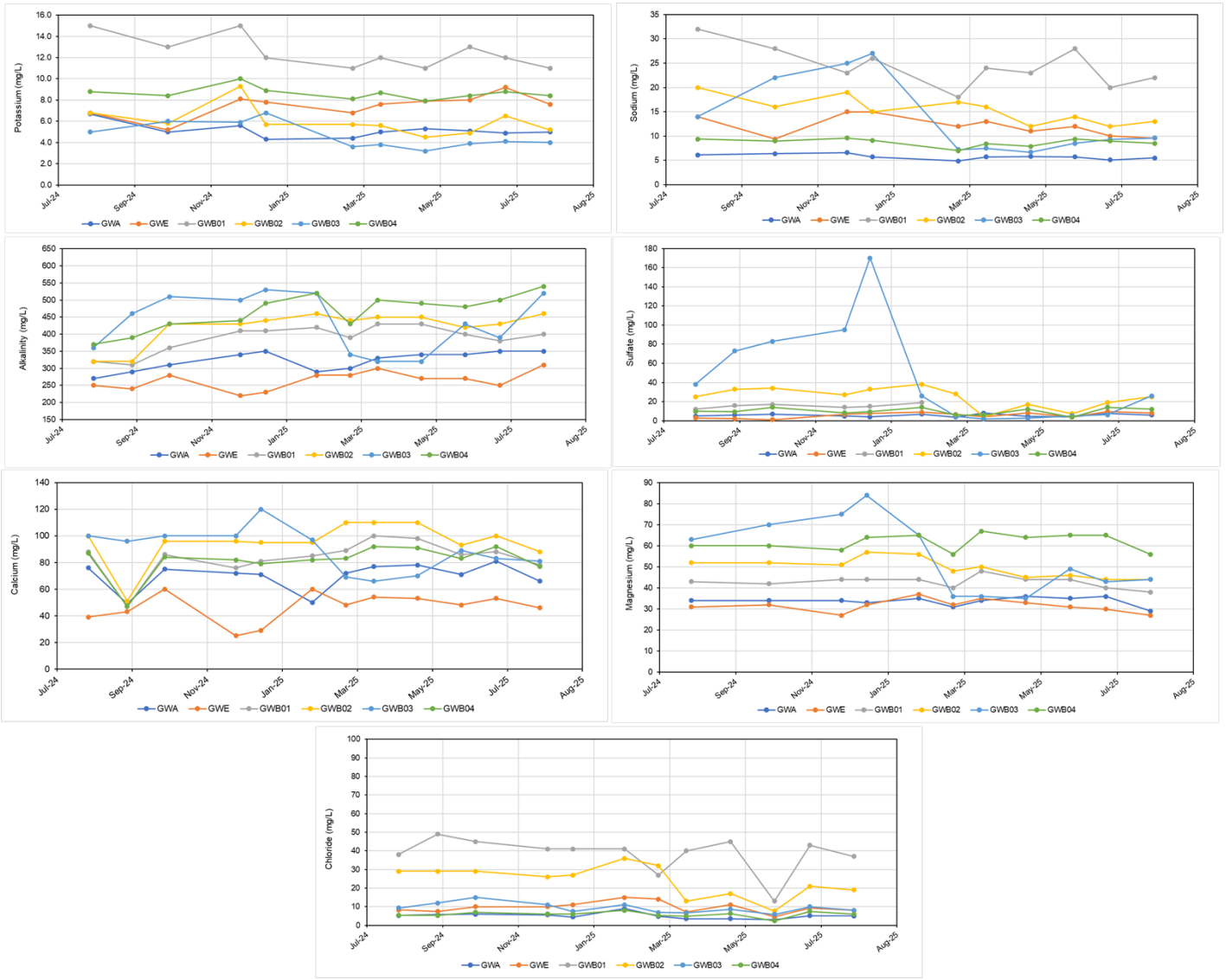
Cl (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	5	6	6	6	5	9	5	4	4	3	5	5
GWE	8	7	10	10	11	15	14	7	11	5	9	8
GWB01	38	49	45	41	41	41	27	40	45	13	43	37
GWB02	29	29	29	26	27	36	32	13	17	8	21	19
GWB03	9	12	15	11	8	11	7	7	9	6	10	8
GWB04	5	5	7	6	6	8	5	5	6	2	8	6

Na (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	6	Redacted: See Table 5-1.	6	7	6	Redacted: See Table 5-1.	5	6	6	6	5	6
GWE	14		9	15	15		12	13	11	12	10	10
GWB01	32		28	23	26		18	24	23	28	20	22
GWB02	20		16	19	15		17	16	12	14	12	13
GWB03	14		22	25	27		7	8	7	9	9	10
GWB04	9		9	10	9		7	8	8	9	9	9

SO4 (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	5	6	7	5	4	7	4	8	5	4	8	6
GWE	3	2	1	7	8	9	7	4	8	4	10	8
GWB01	12	16	17	14	15	19	11	19	16	4	19	14
GWB02	25	33	34	27	33	38	28	4	17	7	19	25
GWB03	38	73	83	95	170	26	4	2	3	5	6	26
GWB04	10	9	14	8	9	14	6	6	12	4	14	12

Mg (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	34	Redacted: See Table 5-1.	34	34	33	35	31	34	36	35	36	29
GWE	31		32	27	32	37	32	35	33	31	30	27
GWB01	43		42	44	44	44	40	48	44	44	40	38
GWB02	52		52	51	57	56	48	50	45	46	44	44
GWB03	63		70	75	84	65	36	36	35	49	43	44
GWB04	60		60	58	64	65	56	67	64	65	65	56

Figure 5-3: Graphs of Major Ions in the monitoring bores during the reporting period.



Nutrients

Results of all the major ions during the reporting period are presented in **Table 5-8** and **Figure 5-4** below.

All the nutrients in GWA represents stable upgradient background conditions with a peak in TN and NH4. However, GWE has unusual increase in TN, NH4, and NH3-N for an upgradient well. This could be due to impact from facility or contamination from surface.

Downgradient GWB01 shows constantly high TN (max 4300 µg/L) and extremely high NH4 and NH3-N in 2024 which has dropped later in reporting period. These results could be due to impact from the facility. GWB02 show relatively lower results and potentially less affected by the facility.

The results from GWB03 and GWB04 shows elevated NO3-N with high TP in GWB03 suggests influence from facility activities.

Table 5-8: Nutrients in the monitoring bores during the reporting period.

TN (µg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	Redacted: See Table 5-1.			280		400			540			<100
GWE				760		2400			8600			1400
GWB01				4200		1100			1500			2100
GWB02				410		100			2400			<100
GWB03				370		1800			780			1200
GWB04				4300		2400			3400			2900

TP (µg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	<10			<10		<50			<10			<50
GWE	<10			18		80			180			60
GWB01	25			32		<50			<10			<50
GWB02	<10			11		<50			17			<50
GWB03	58			360		<50			<10			<50
GWB04	<10			<10		<50			<10			<50

NO3-N (µg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	370			96		390			89			20
GWE	170			100		84			1200			30
GWB01	10			6		330			48			30
GWB02	120			39		87			1200			78
GWB03	1800			32		1500			83			1200
GWB04	1800			3800		3300			3000			2800

NH4 (µg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	8	20	130	<7	8	17	24	<7	12	<7	15	Redacted: See Table 5-1.
GWE	63	66	140	21	140	2200	1700	1600	1000	1800	2800	
GWB01	1700	2900	1100	2000	2000	730	320	220	840	910	840	
GWB02	120	17	920	14	8	11	22	10	510	26	17	
GWB03	<7	16	420	24	17	33	15	10	<7	<7	18	
GWB04	<7	10	1100	8	8	16	20	30	<7	<7	20	

NH3-N (µg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	Redacted: See Table 5-2.	20		<5	8		24	<5	12	6	15	<5
GWE		66		21	150		1700	2800	1100	1800	3000	1300
GWB01		2900		2000	2200		320	300	840	910	840	1900
GWB02		17		14	8		22	10	510	26	17	10
GWB03		16		24	17		15	10	<5	<5	18	<5
GWB04		14		8	8		29	30	<5	<5	20	<5

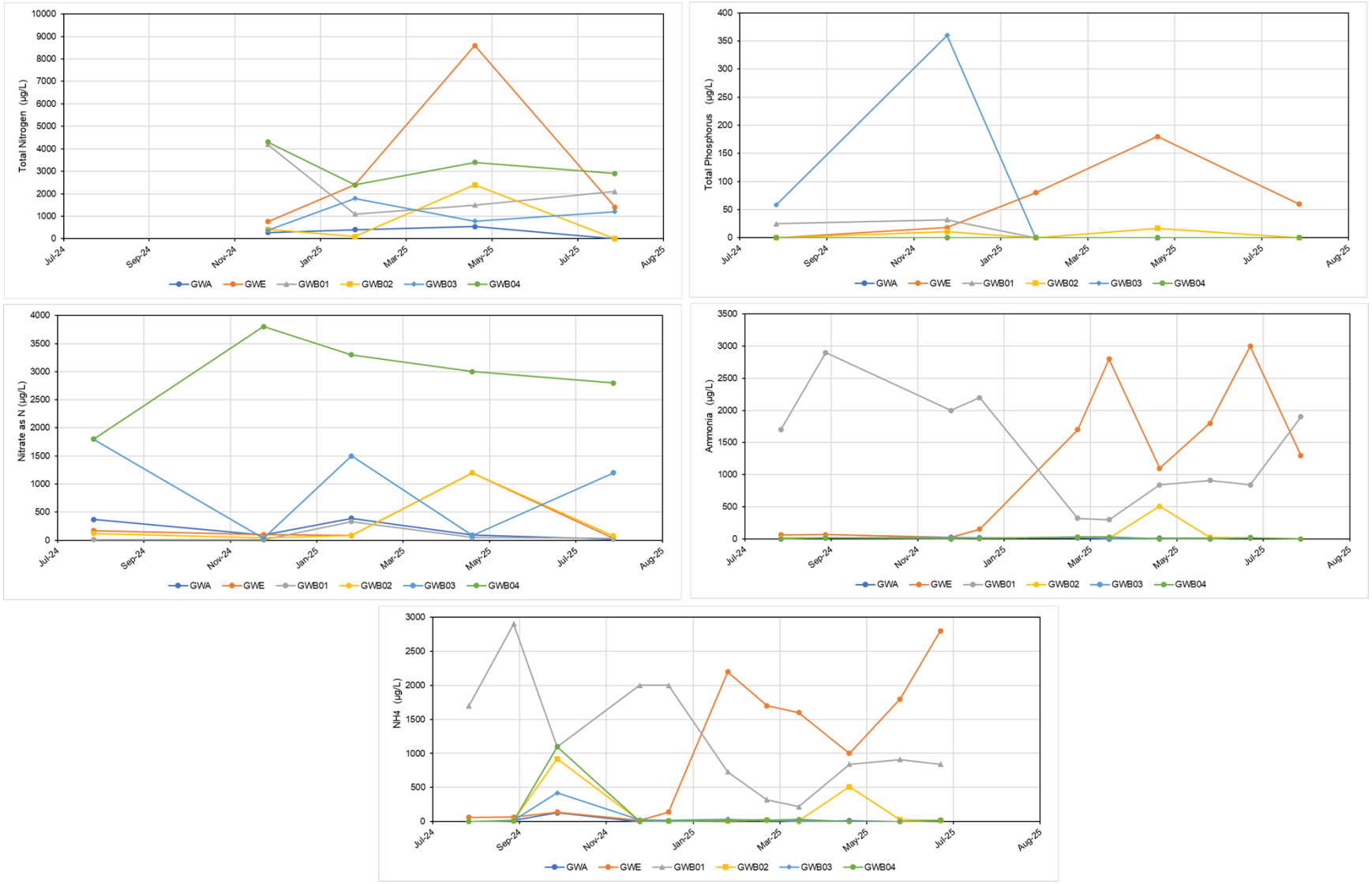


Figure 5-4: Graphs of Nutrients in the monitoring bores during the reporting period.

Dissolved metals

Results of all the major ions during the reporting period are presented in **Table 5-9** and **Figure 5-5** below.

Concentrations of CrIII, and CrVI were below their respective LOR in all sampling rounds when metals were analysed. Al was detected in at least one of the downgradient bores, while Pb was detected in both the downgradient bore GWB02 and the upgradient bore GWB04. However, the concentration of Pb at the downgradient bore was sixteen times higher than that at the upgradient bore.

During the reporting period, Cu, Mn, Ni, and Zn concentrations were higher and/or more frequently detected in the downgradient bores compared to the upgradient bores.

Spikes in Fe levels were reported in most bores in November, followed by a decrease in January. Cd results were not graphed, as concentrations above the LOR only once during the reporting period.

Table 5-9: Dissolved metals in the monitoring bores during the reporting period.

CrIII (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	<0.0050			<0.0050		<0.0050			<0.0050			<0.0050
GWE	<0.0050			<0.0050		<0.0050			<0.0050			<0.0050
GWB01	<0.0050			0.0037		<0.0050			<0.0050			<0.0050
GWB02	<0.0050			<0.0050		<0.0050			<0.0050			<0.0050
GWB03	<0.0050			<0.0050		<0.0050			<0.0050			<0.0050
GWB04	<0.0050			<0.0050		<0.0050			<0.0050			<0.0050

Cu (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	0.002			<0.001		<0.001			0.026			<0.001
GWE	<0.001			<0.001		0.002			<0.001			<0.001
GWB01	0.005			0.210		0.005			0.002			0.005
GWB02	0.002			0.006		0.002			0.001			<0.001
GWB03	0.002			<0.001		0.002			<0.001			<0.001
GWB04	0.001			0.004		0.001			<0.001			0.002

Fe (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	<0.01			0.02		<0.01			<0.01			0.04
GWE	0.16			<0.010		<0.010			0.02			0.04
GWB01	0.01			2.30		<0.010			<0.01			<0.010
GWB02	<0.010			<0.010		<0.010			<0.01			<0.01
GWB03	<0.010			<0.010		<0.010			0.03			<0.01
GWB04	<0.010			<0.010		<0.010			<0.01			<0.01

Pb (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	<0.001			<0.001		<0.001			<0.001			<0.001
GWE	<0.001			<0.001		<0.001			<0.001			<0.001
GWB01	<1.0			0.016		<0.001			<0.001			<0.001
GWB02	<0.001			<0.001		<0.001			<0.001			<0.001
GWB03	<0.001			<0.001		<0.001			<0.001			<0.001
GWB04	0.001			0.001		0.001			0.004			0.003

Mn (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	0.001			0.002		<0.005			<0.001			<0.001
GWE	0.014			0.003		0.020			0.029			<0.001
GWB01	0.400			0.270		0.019			0.140			0.320
GWB02	0.034			0.100		0.009			0.005			0.058
GWB03	0.040			0.019		<0.001			0.027			<0.001
GWB04	<0.001			0.010		<0.001			<0.001			<0.005

Ni (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	<0.001			<0.001		<0.001			<0.001			<0.001
GWE	<0.001			<0.001		0.001			<0.001			<0.001
GWB01	0.003			0.010		0.002			0.003			0.003
GWB02	0.003			0.005		0.002			0.002			0.002
GWB03	0.002			0.002		0.002			<0.001			<0.001
GWB04	<0.001			0.003		<0.001			<0.001			<0.001

Zn (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	0.017			0.006		0.005			0.017			0.004
GWE	0.001			<0.001		<0.001			0.003			0.002
GWB01	0.004			0.047		0.005			0.004			0.003
GWB02	0.004			0.010		0.020			0.005			0.003
GWB03	0.007			0.003		0.024			0.003			0.009
GWB04	0.055			0.037		0.050			0.064			0.057

Al (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	<0.010			<0.010		<0.010			<0.010			<0.010
GWE	<0.010			<0.010		<0.010			<0.010			<0.010
GWB01	<0.010			3.500		<0.010			<0.010			<0.010
GWB02	<0.010			<0.010		<0.010			<0.010			<0.010
GWB03	<0.010			<0.010		<0.010			<0.010			<0.010
GWB04	<0.010			<0.010		<0.010			<0.010			<0.010

Se (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	<0.001			<0.001		<0.001			<0.001			<0.001
GWE	<0.001			<0.001		<0.001			<0.001			<0.001
GWB01	<0.001			<0.001		<0.001			<0.001			<0.001
GWB02	<0.001			<0.001		<0.001			<0.001			<0.001
GWB03	<0.001			<0.001		0.001			<0.001			<0.001
GWB04	0.002			0.002		<0.001			<0.001			0.001

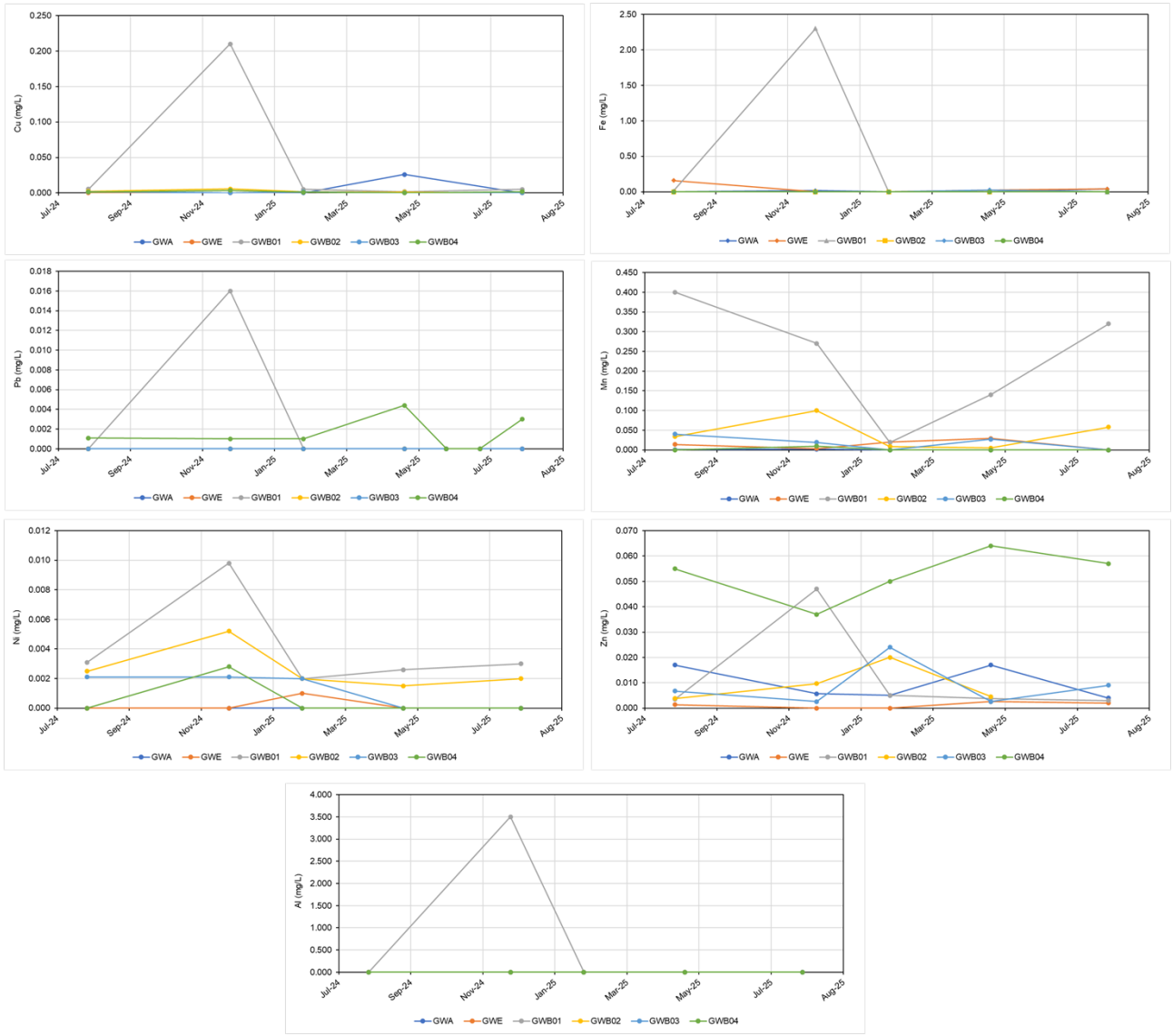


Figure 5-5: Graphs of dissolved metals in the monitoring bores during the reporting period.

Other leachate indicators

Results of all the other leachate indicators during the reporting period are presented in **Table 5-10** and **Figure 5-6** below.

TOC, TDS, BOD and VFA were variable during the reporting period, with no trends observed. Overall, concentrations in upgradient and downgradient bores do not appear to be significantly different, although slightly higher levels of TOC, BOD and TDS appear to be more commonly present in the downgradient bores.

Table 5-10: Leachate indicators in the monitoring bores during the reporting period.

TOC (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	Redacted: See Table 5-2.	1	2	1	<1.0	1	<1.0	<1.0	<1.0	<1.1	<1.0	<1
GWE		2	6	1	<1.0	3	1	<1.0	3	1	<1.0	2
GWB01		6	5	4	3	3	2	2	2	2	3	3
GWB02		5	7	3	1	1	2	<1.0	<1.0	2	2	<1
GWB03		14	4	3	6	1	1	<1.0	<1.0	1	1	<1
GWB04		1	2	3	1	4	<1.0	<1.0	<1.0	<1.1	<1.0	<1

TDS (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	280	Redacted: See Table 5-1.	360	330	350	290	350	350	330	350	360	Redacted: See Table 5-1.
GWE	260		270	230	280	300	320	320	330	320	340	
GWB01	390		460	510	540	500	450	550	520	450	480	
GWB02	360		600	500	560	540	530	530	470	530	470	
GWB03	410		660	570	760	550	340	320	500	340	420	
GWB04	360		480	490	570	510	470	490	520	470	520	

COD (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	<20	<20	<50	<20	<20	<50	<20	<20	<20	<20	<20	<50
GWE	<20	<20	<50	<20	<20	<50	<20	<20	<20	<20	<20	<50
GWB01	22	22	<50	220	<20	<50	<20	<20	<20	<20	<20	<50
GWB02	<20	<20	<50	<20	<20	<50	<20	<20	<20	<20	<20	<50
GWB03	33	24	<50	91	140	<50	<20	<20	<20	<20	<20	<50
GWB04	<20	<20	<50	<20	<20	<50	<20	<20	<20	<20	<20	<50

BOD (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	Redacted: See Table 5-1.	39	<5	11	Redacted: See Table 5-2.	<5	Redacted: See Table 5-2.	Redacted: See Table 5-2.	9	<5.0	12	14
GWE		19	<5	<5		<5			12	9	7	14
GWB01		38	<5	10		<5			12	29	12	12
GWB02		34	<5	24		<5			19	22	13	8
GWB03		39	<5	28		<5			14	10	11	6
GWB04		17	<5	<5		<5			16	17	21	10

VFA (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	Redacted: See Table 5-1.			Redacted: See Table 5-1.		Redacted: See Table 5-2.			31			24
GWE									7			93
GWB01									120			130
GWB02									120			190
GWB03									140			180
GWB04									130			190

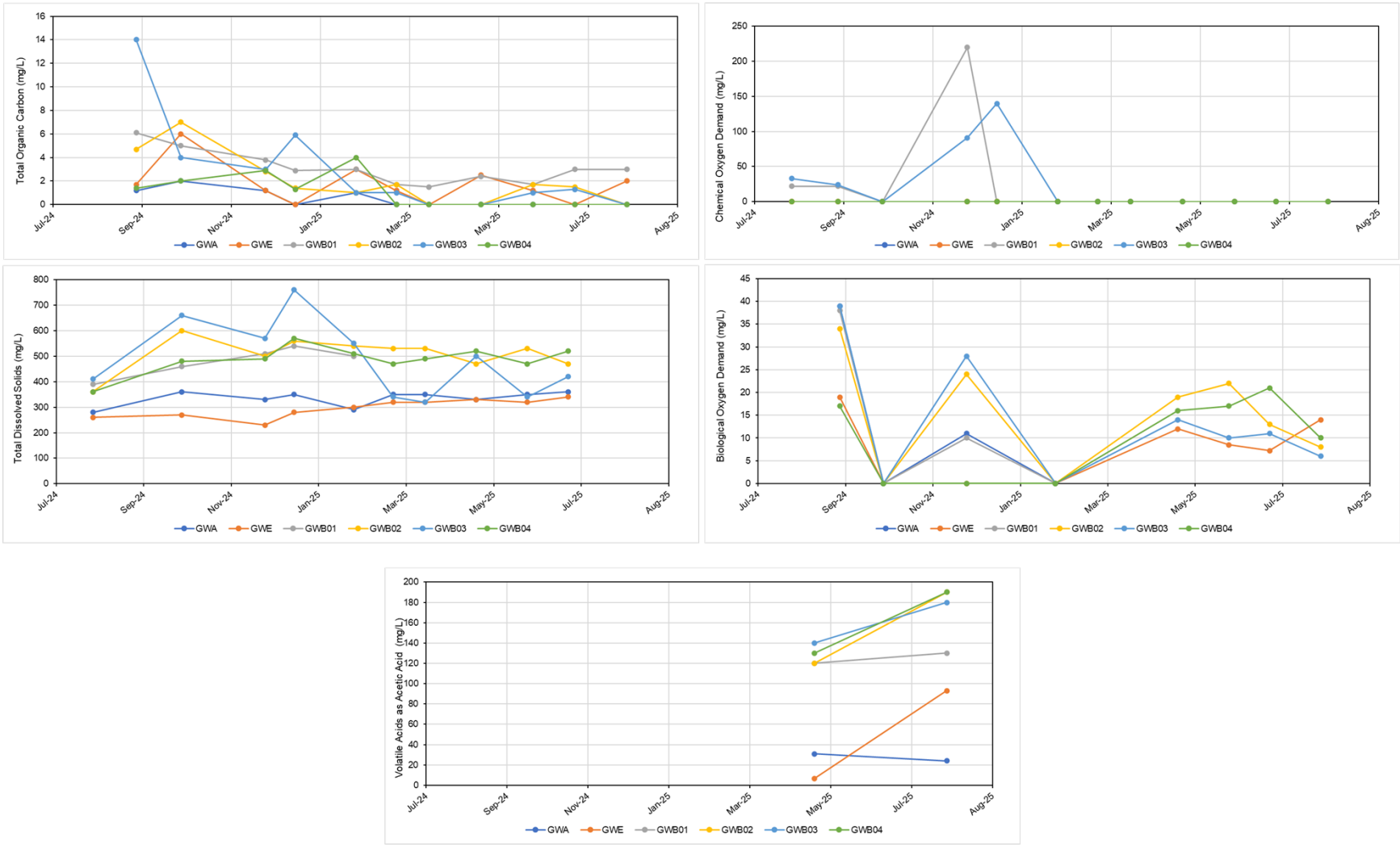


Figure 5-6: Graphs of other leachate indicators in the monitoring bores during the reporting period.

Total Recoverable Hydrocarbons

All the TRH results during the reporting period were below LOR except for TRH fraction C15-C28 in GWB01 in August 2024 (**Table 5-11**), with a detection of 120ug/L. GWB01 results were below LOR for rest of the reporting period.

Table 5-11. TRH C15-C28 fraction concentration in the monitoring bores during the reporting period.

TRH C15-C28 (µg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	21-Jan	18-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	<100			<100		-			<100			<100
GWE	<100			<100		<100			<100			<100
GWB01	120			<100		<100			<100			<100
GWB02	<100			<100		<100			<100			<100
GWB03	<100			<100		<100			<100			<100
GWB04	<100			<100		<100			<100			<100

PFAS

PFAS concentrations were higher and more frequently detected at the downgradient bores GWB01 and GWB02 compared to those upgradient; see **Table 5-12** and **Figure 5-7**. The wide mixture of different PFAS types detected in the downgradient bores is indicative of a landfill source. In the upgradient bore GWB04, all PFAS forms remained below the LOR. At GWA & GWE, PFAS were more frequently detected than at GWB03. Based on historical groundwater levels at this GWA, it appears that groundwater may also flow south of the site, although this is not the predominant direction.

Table 5-12: PFAS in the monitoring bores during the reporting period.

PFBS (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	<0.010			<0.010					<0.010			<0.01
GWE	<0.010			<0.010		0.02			<0.010			<0.01
GWB01	0.08			0.05		0.10			0.06			0.07
GWB02	0.13			0.07		0.11			0.06			0.06
GWB03	<0.010			0.02		<0.01			<0.010			<0.01
GWB04	<0.010			<0.010		<0.01			<0.010			<0.01

PFPeS (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	<0.010			<0.010					<0.010			<0.01
GWE	<0.010			<0.010		0.01			<0.010			<0.01
GWB01	0.05			0.03		0.06			0.04			0.04
GWB02	0.08			0.04		0.06			0.03			0.04
GWB03	<0.010			0.01		<0.01			<0.010			<0.01
GWB04	<0.010			<0.010		<0.01			<0.010			<0.01

PFHxS (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	0.02			<0.010					0.03			0.02
GWE	0.01			0.02		0.09			0.01			0.01
GWB01	0.59			0.27		0.43			0.41			0.34
GWB02	0.48			0.21		0.34			0.19			0.21
GWB03	<0.010			0.06		<0.01			<0.010			<0.01
GWB04	<0.010			<0.010		<0.01			<0.010			<0.01

PFHpS (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	<0.010			<0.010					<0.010			<0.01
GWE	<0.010			<0.010		<0.01			<0.010			<0.01
GWB01	0.05			0.03		0.03			0.03			0.03
GWB02	0.06			0.03		0.04			0.02			0.02
GWB03	<0.010			0.01		<0.01			<0.010			<0.01
GWB04	<0.010			<0.020		<0.01			<0.010			<0.01

PFOS (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	0.03			0.01					0.04			0.04
GWE	0.03			0.04		0.22			0.04			0.02
GWB01	1.70			0.70		1.00			1.30			1.10
GWB02	0.93			0.41		0.55			0.37			0.29
GWB03	<0.010			0.13		<0.01			0.02			<0.01
GWB04	<0.010			<0.020		<0.01			<0.010			<0.01

PFBA (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	0.11			0.03					0.16			0.10
GWE	<0.020			<0.020		<0.02			<0.020			<0.02
GWB01	0.08			0.06		0.05			0.06			0.06
GWB02	0.12			0.06		0.08			<0.020			0.04
GWB03	<0.020			<0.020		<0.02			<0.020			<0.02
GWB04	<0.020			<0.010		<0.02			<0.020			<0.02

PFPeA (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	0.20			0.06					0.24			0.21
GWE	<0.020			<0.020		<0.02			<0.020			<0.02
GWB01	0.10			0.07		0.05			0.07			0.10
GWB02	0.11			0.06		0.09			0.05			0.06
GWB03	<0.020			<0.020		<0.02			<0.020			<0.02
GWB04	<0.020			<0.010		<0.02			<0.020			<0.02

PFHxA (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	0.11			0.03					0.13			0.12
GWE	<0.010			<0.010		0.01			<0.010			<0.01
GWB01	0.15			0.10		0.07			0.10			0.12
GWB02	0.23			0.12		0.17			0.08			0.11
GWB03	<0.010			0.04		<0.01			<0.010			<0.01
GWB04	<0.010			<0.010		<0.01			<0.010			<0.01

PFHpA (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	0.09			0.02					0.11			0.10
GWE	<0.010			<0.010		<0.01			<0.010			<0.01
GWB01	0.07			0.04		0.03			0.04			0.04
GWB02	0.09			0.04		0.06			0.03			0.04
GWB03	<0.010			0.01		<0.01			<0.010			<0.01
GWB04	<0.010			<0.010		<0.01			<0.010			<0.01

PFOA (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	0.05			0.01					0.06			0.05
GWE	<0.010			<0.010		0.03			<0.010			<0.01
GWB01	0.15			0.09		0.09			0.10			0.10
GWB02	0.18			0.08		0.13			0.07			0.07
GWB03	<0.010			0.03		<0.01			<0.010			<0.01
GWB04	<0.010			<0.020		<0.01			<0.010			<0.01

TOTAL PFHxS + PFOS (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	0.05			0.01					0.06			0.05
GWE	0.05			0.06		0.31			0.05			0.04
GWB01	2.30			0.97		1.40			1.70			1.50
GWB02	1.40			0.62		0.90			0.56			0.50
GWB03	<0.010			0.19		<0.01			0.02			<0.01
GWB04	<0.010			<0.010		<0.01			<0.010			<0.01

TOTAL PFOS+PFOA (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	0.08			0.03					0.10			0.09
GWE	0.03			0.04		0.25			0.04			0.02
GWB01	1.80			0.79		1.10			1.40			1.20
GWB02	1.10			0.49		0.68			0.44			0.36
GWB03	<0.010			0.16		<0.01			0.02			<0.01
GWB04	<0.010			<0.010		<0.01			<0.010			<0.01

TOTAL PFAS (mg/L)	2024					2025						
	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	0.60			0.17					0.77			0.65
GWE	0.05			0.06		0.37			0.05			0.04
GWB01	3.00			1.40		1.90			2.20			2.00
GWB02	2.40			1.10		1.60			0.89			0.95
GWB03	<0.010			0.31		<0.01			0.02			<0.01
GWB04	<0.010			<0.010		<0.01			<0.010			<0.01

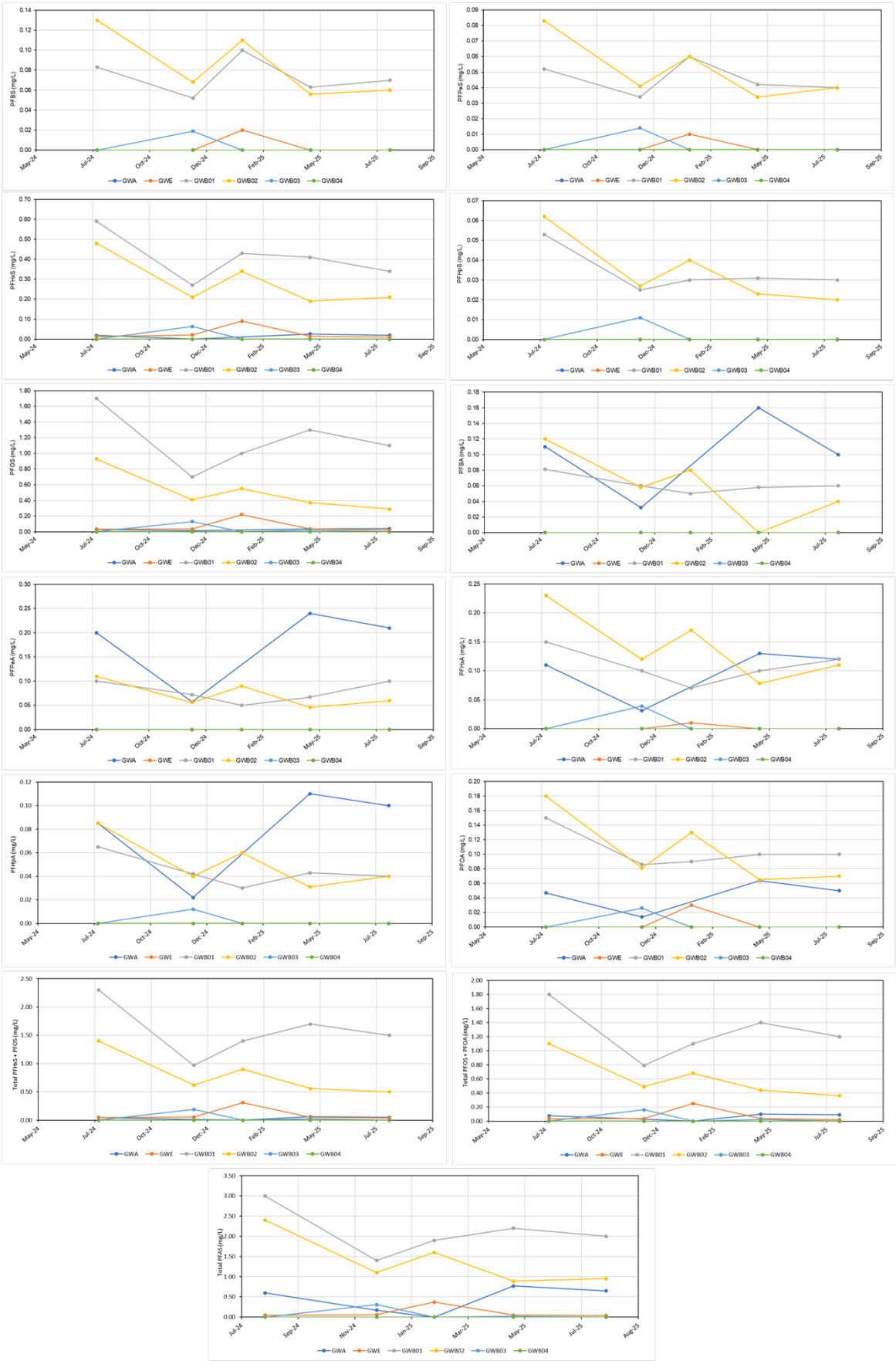


Figure 5-7: Graphs of PFAS in the monitoring bores during the reporting period.

Other parameters

PAH, BTEXN and PCBs were all below LOR in all bores during the reporting period.

5.4.3 Historical trends

All the historic data graphs are in **Appendix C**. Temperature and DO have been highly variable since monitoring began. Historical data indicates that EC is typically lower in GWA and GWE than in the other bores. Results for pH have been variable since monitoring began, although in the 2021-22 monitoring period, levels increased at all bores but then decreased in the following reporting period. In the current reporting period, pH is showing a narrower range (mostly between 6.5 and 8.5) compared to historical data.

Seasonal trends are not observed in major ions at the monitoring bores, but distinctive trends are seen when comparing results between monitoring bores. The deep bores GWA and GWE consistently have the lowest concentrations of $CaCO_3$, Ca and Mg. In contrast, the shallow and downgradient bores GWB01 and GWB02 commonly showed higher concentrations of Cl and Na than the other monitoring bores, with GWB01 often recording higher K concentrations as well. Major ion concentrations typically displayed less variability at GWA, GWE and GWB04, while greater variability was observed in the other three monitoring bores, particularly GWB03. Furthermore, SO_4, Mg, Ca concentrations spiked at GWB03 in December 2024 during this reporting period, which have been observed in historic data in 2022 & 2024 wet seasons.

TN and TP do not appear to follow seasonal trends, but they do exhibit a more stable concentration in the deep bores GWA and GWE. No seasonal trend is observed in NO3 levels at any bores, but it appears to be commonly higher at GWB03 and GWB04.

Data on NH_4 clearly shows that, historically, concentrations are higher at GWB01 than in any other monitoring bore. In addition, a seasonal trend is seen at GWB01 bore, with concentrations increasing from April to August/September, followed by a decrease, reaching the lowest levels in February/March. In the 2024/25 reporting period, TN, NH4, and NH3-N concentration at GWE has shown a significant increase compared to historical data, which is unusual for an upgradient well. This could be due to impact from facility or contamination from surface.

Since monitoring commenced, Cu, Fe, Mn, Ni, and Zn concentrations have displayed high variability at most monitoring bores, particularly at the shallow bores GWB01, GWB02, GWB03 and GWB04, except for Fe which is more variable at GWA and GWE. At the GWB02, Ni concentrations appear to increase early in the Wet season. Although no increasing trend is observed in the concentration of any of the monitored metals, it is evident that during the reporting period, the highest levels of Al, Zn, Pb, and Cu ever recorded were detected at the downgradient bores, particularly at GWB02. In this reporting period, nearly all metals except for Zn spiked in December 2024 sampling at GWB01.

TOC, COD and BOD have been highly variable since monitoring started at all bores, although spikes in concentration appear to be more frequently detected at all bores but GWA and GWE. At these two bores, TDS is usually the lowest.

The August 2024 isolated detection of TRH C15-C28 in GWB01 displays no historic trend, however similar detections have been noted in both January 2023 & May 2024 monitoring rounds.

As shown in **Appendix C**, VFAs shows increasing levels of detection compared to early historical monitoring rounds. Overall, VFA is the only analyte that appears to show an increasing level in concentration at all bores, however the trends displayed in the 2024/25 monitoring data indicate a more varied concentration between upgradient and downgradient bores.

PFAS concentrations in the downgradient bores GWB01 and GWB02 have always been higher than at the upgradient bores. The PFAS types detected at GWA and GWE have been commonly detected at these upgradient bores since monitoring started. Although the total PFAS concentration recorded at GWB01 is the highest recorded at this bore, and any other, no increasing trend is observed.

5.5 Discussion

Trigger value exceedances in pH, EC, DO, TN levels and Cu were reported in the monitoring period at downgradient surface water site SWC. However, a comparison between these results and those obtained in the upstream site SWB indicates that the operation of the KWMF is unlikely to be the cause of these results. Historical data available for these sites also supports this conclusion.

Groundwater monitoring results indicate a likely impact of landfill leachate on groundwater quality. Contaminants elevated in the two downgradient bores (GWB01 and GWB02), compared to the upgradient bores were some major ions (Na and Cl), NH_4, metals (Mn, Ni, Zn) TOC, BOD, COD, and a wide mixture of PFAS types. Of note is that the PFAS types detected in the upgradient bores GWA and GWE are likely derived from the regional-scale PFAS contamination from the RAAF Base Tindall.

The historical nitrate and Ni concentrations at GWB03 and 04, as well as those of Pb at GWB04, the increasing detections of ammonium at all upgradient bores (Particularly GWA & GWE) and the historic increasing VFA levels recorded at all bores, may also indicate that the impact on groundwater quality is not limited to those bores identified as downgradient bores. However, more leachate data is required to confirm any potential impact, as results from the leachate site are limited and, in many historical cases, concentrations at this site are lower than in the groundwater bores.

The isolated TRH results obtained in the reporting period in August 2024 at GWB01 are consistent with historic isolated detection. It is worth noting that in the 2023/24 reporting period, GC-MS run by the laboratory for the field blank samples indicated that the TRH fractions detected in GWA were non-petrogenic in nature. Such may also be the case of the TRH that have been detected at GWB01 in 2024/25.

6 POTENTIAL ENVIRONMENTAL IMPACTS

Based on the data available, it appears that landfill activities are impacting on groundwater quality, as more evidently seen in bores GWB01 and GWB02, where the highest concentrations of some dissolved metals, hydrocarbons, nitrogen species and PFAS were detected. However, the upgradient bores GWA, GWE, GWB03 and GWB04 may also be indicating impacts on groundwater quality, although at a lesser level.

Potential human receptors to contaminated groundwater downgradient of the KWMF appear limited. There are no known bores used for any purpose downgradient of the KWMF i.e. no bores to the northwest or west of the facility are used for groundwater extraction. The sewage ponds for Katherine are located in this area and as such, use of groundwater and/or surface water in this area would not generally be desirable. Groundwater used at the KWMF is sourced from a bore upgradient of the landfill and as such, on-site workers are not at risk.

It is possible that groundwater from beneath the KWMF discharges to the Katherine River, although the Jinduckin Formation is a relatively poor aquifer in the region, and the Katherine River receives its most important groundwater inputs from springs located upstream that discharge groundwater from the Tindall Limestone Aquifer. The Tindall Limestone Aquifer is not readily recharged by surface water from the KWMF, where the Jinduckin Formation occurs.

Over the monitoring period, exceedances and non-compliances were recorded in some field parameters, TN and Cu at SWC. However, data from the upgradient site SWB indicates that background concentrations are equal to those recorded at SWC, indicating non-significant impact from KWMF. On the other hand, limited surface water and leachate data are available for the monitoring sites, restricting the assessment of any potential impact of the facility on the water quality of Tindal Creek.

7 REVIEW OF PERFORMANCE AGAINST EMP MEASURES

As required by Condition 58.5 of EPL298-02, this section reviews the performance of KWMF against the environmental management measures outlined in the *Integrated Environmental Management Plan (IEMP) prepared by Taft Engineering (2022)*. Section 8 of the IEMP assesses each aspect of operational risks in the form of a risk register (See **Figure 7-1**). The risk register assigns a Site Operating Procedure (SOP) to each operational aspect as a control measure, which detail the control measures designed to manage environmental aspects and reduce the risk of potential environmental impacts. **Table 7-1** to **Table 7-10** below summarises KWMF's performance against the relevant SOPs.

Note: the SOP numbering listed in the IEMP Risk register don't align with the operational aspect of the SOP's listed in Appendix B of the IEMP, therefore the SOP's have been categorised in to this document based on their title and content.

Aspect	Impacts	Pre-control Risk			Control Measure	Residual Risk Level		
		Likelihood	Consequence	Risk Score		Likelihood	Consequence	Risk Score
Excessive noise	- Generation of nuisance noise	L	S	Medium	SOP-7	U	M	Low
Emission to air	- Greenhouse gas emissions from release of methane generated from decomposition of waste - Release of contaminates from fumes from plant and equipment	AC	S	High	SOP-16	U	MO	Low
Excessive dust	- Dust particulate generation from onsite operations - Windblown dust dispersion	AC	M	Medium	SOP-8	P	M	Low
Excessive odour	- Production of airborne odours	P	S	Medium	SOP-9	U	MO	Low
Windblown litter	- Visual pollution - Wildlife impact	AC	S	High	SOP-10	L	MO	Medium
Flora and Fauna	- Damage to protected species/habitat due to site works - Injury to fauna that may enter site - Declining habitat quality	P	MA	Medium	SOP-24	R	S	Low
Attraction of Pests and Vermin	- Infestation of vermin and insects - Spread of disease	L	MO	Medium	SOP-12 SOP-13	P	M	Low
Leachate generation	- Groundwater contamination - Surface water contamination	L	S	Medium	SOP-15	L	S	Medium
Discharge of water	- Contamination of surface water - Contamination of soil	L	S	Medium	SOP-17	P	M	Low
Oil/leachate spill	- Contamination of surface water - Contamination of soil	L	MA	High	SOP-26	U	M	Low
Mud Tracking	- Redeposition of soils/waste leading to nuisance	L	S	Medium	SOP-14	P	M	Low

Figure 7-1. Environmental Risk Register with control measures taken from the TAFT Engineering IEMP

Table 7-1: Environmental Management (SOP – 15) and review of KWMF performance.

EMP measure: SOP – 15 for Environmental Monitoring	
Objectives	- Meet the requirements of the EPL - Undertake monitoring of the site for assessment of potential impacts from the facility on the surrounding environment
performance criteria	- Completion of all environmental monitoring rounds required by the EPL.
Monitoring	- The Site Manager will maintain records of complaints as required by the EPL. - The Site Manager shall ensure a schedule of the environmental monitoring requirements for the site is maintained.
KWMF performance	- Discussed in this Monitoring report.

Table 7-2: Noise Management (SOP – 6) and review of KWMF performance.

EMP measure: SOP – 6 for Nosie management	
Objectives	- Meet the requirements of the EPL. - Minimise noise generated on site to the greatest possible extent - Protect the acoustic environment at surrounding residences and businesses - Minimise the likelihood of a complaint.
performance criteria	- No complaints received from KWMF users, employees and surrounding landowners/users relating to noise. - Compliance with EPL
Monitoring	- All staff are responsible for reporting mobile plant and equipment that is making excessive noise. - The Site Manager will compare noise monitoring results against relevant legislative requirements, licence conditions and nominated performance targets when they are received. - The Site Manager will initiate noise monitoring/surveys as often as is necessary to check compliance with the performance targets during activities. Noise monitoring locations will be determined as and when required. - All complaints received at the site will be recorded in the complaints register. - The Site Manager will maintain records as required by the EPL. - Where incidents may result in personal or environmental harm notification and reporting will be undertaken in accordance with the EPL.
KWMF performance	- SOP–6 was implemented during the reporting period. - No noise complaints were received from staff, contractors, or nearby landowners. - Routine inspections were carried out to identify excessive noise. - Noise monitoring was initiated when required and results reviewed for compliance. - All records of complaints were maintained by the Site Manager. - No incidents required reporting under the EPL.

Table 7-3: Air (Dust and Odour) quality Management (SOP – 7) and review of KWMF performance.

EMP measure: SOP – 7 for Air Quality Management	
Objectives	- Meet the requirements of the EPL - Minimise dust generated on site to the greatest possible extent - Minimise the transportation of dust which may be generated - Control dust so as to not impact workers, neighbours, or the environment - Minimise the likelihood of a complaint.
performance criteria	- No complaints received from KWMF users, employees and surrounding landowners/users relating to odour or dust - Compliance with EPL
Monitoring	- All staff are responsible for reporting dust and odour generating activities on site. - Monthly visual inspection will be carried out in and around the site. - All complaints received at the site will be recorded in the complaints register. - The Site Manager will maintain records as required by the Environmental Protection License - Where incidents may result in personal or environmental harm notification and reporting will be undertaken in accordance with the EPL.
KWMF performance	- SOP–7 was effectively implemented during the reporting period. - No complaints relating to dust or odour were received. - Monthly visual inspections were completed and documented. - Staff reported any dust-generating activities as required. - All records of complaints were maintained by the Site Manager. - No air quality-related incidents required formal notification.

Table 7-4: Litter Management (SOP – 8) and review of KWMF performance.

EMP measure: SOP – 8 for Litter Management	
Objectives	- Meet the requirements of the EPL - Minimise litter generation - Minimise the transportation of litter which may be generated - Control litter so as to not impact workers, neighbours, or the environment.
performance criteria	- No complaints received from KWMF users, employees and surrounding landowners/users relating to litter - Compliance with EPL
Monitoring	- All staff are responsible for reporting litter in managed areas on site. - Monthly visual inspection will be carried out in and around the site. - All complaints received at the site will be recorded in the complaints register. - The Site Manager will maintain records as required by the Environmental Protection License. - Where incidents may result in personal or environmental harm notification and reporting will be undertaken in accordance with the EPL.
KWMF performance	- SOP–8 was implemented effectively during the reporting period. - No complaints relating to litter were received. - Monthly site inspections were conducted to identify and manage litter. - Staff reported any observed litter issues as required. - All records of complaints were maintained by the Site Manager. - No incidents involving litter required formal notification or reporting.

Table 7-5: Flora and Fauna management (SOP – 20) and review of KWMF performance.

EMP measure: SOP – 20 for Flora and Fauna Management	
Objectives	- To minimise impacts on flora and fauna at the facility and in the surrounding environment
performance criteria	- No significant impacts to flora and fauna - No injured fauna as a result of KTC WMF activities - Disturbed areas progressively rehabilitated with local native species, and achieving a minimum 80% groundcover within the first year
Monitoring	- Monthly site inspections to check for signs of impacted flora and fauna - Monitoring of rehabilitation areas will be undertaken to ensure it is to an acceptable standard (i.e. a minimum 80% groundcover within the first year)
KWMF performance	- SOP–20 was implemented throughout the reporting period. - No incidents of fauna injury or significant flora disturbance were reported as a result of site activities. - Monthly inspections were carried out to monitor flora and fauna status. - Rehabilitation areas were monitored, and progress toward 80% groundcover was satisfactory, with local native species used.

Table 7-6: Pest, Vermin and Bird Management (SOP – 10) and review of KWMF performance.

EMP measure: SOP – 10 for Pest, Vermin and Bird Management	
Objectives	- Meet the requirements of the EPL - Minimise pest, vermin and birds present in and around the site - Prevent pests and vermin from accessing the waste - Reduce the likelihood of weed infestations at the site - Reduce the spread of weeds from the site.
performance criteria	- No declared weeds or introduction of noxious weeds at the Site - No spread of weeds from the site to the surrounding environment - No introduction of feral / pest species at the site - No feral / pest / vector infestations at the site - Reduced bird count at the site - No complaints from the community
Monitoring	- All staff are responsible for reporting pest and vermin at the site. - Monthly visual inspection will be carried out in and around the site. - All complaints received at the site will be recorded in the complaints register. - The Site Manager will maintain records as required by the Environmental Protection License.
KWMF performance	- SOP–10 was implemented during the reporting period. - No introduction or spread of weeds or feral/pest species was observed. - Monthly visual inspections were completed and did not identify any infestations. - No complaints were received from the community regarding pests, vermin, or birds. - Pest and bird management strategies remain effective, with a stable or reduced bird count observed. - All monitoring records and records of complaints were maintained by the Site Manager.

Table 7-7: Leachate management (SOP – 12) and review of KWMF performance.

EMP measure: SOP – 12 for Leachate Management	
Objectives	- Meet the requirements of the EPL - Minimise leachate generation - Minimise the potential for environmental harm and the potential impact on human health - To prevent impacts to the surface water, groundwater and surrounding environment due to leachate
performance criteria	- No impacts of groundwater or surface waters - No incidents or monitoring results in breach of the EPL - No detectable leachate flowing from operations area.
Monitoring	- All staff are responsible for reporting leachate presence at the site. - Monthly inspections - All complaints received at the site will be recorded in the complaints register. - The Site Manager will maintain records as required by the EPL. - Where incidents may result in personal or environmental harm notification and reporting will be undertaken in accordance with the EPL.
KWMF performance	- SOP–12 was effectively implemented during the reporting period. - No leachate-related complaints or incidents were reported. - Inspections confirmed no visible leachate flow from the operational areas. - Monitoring results discussed in this report. - The Site Manager maintained all required records.

Table 7-8: Surface Water Management (SOP – 14) and review of KWMF performance.

EMP measure: SOP – 14 for Surface Water Management	
Objectives	- Meet the requirements of the EPL - Prevent the release of sediment laden or contaminated water offsite - Divert clean water away from operational and disturbed areas - Minimise erosion and sediment transport at the facility - Minimise the generation of leachate
performance criteria	- No sedimentation of the surrounding environment - No impacts to surface water from the facility - Erosion and sediment control measures are implemented and maintained where necessary - Disturbed areas are rehabilitated as soon as possible.
Monitoring	- A monitoring program must be implemented to determine the quality of water released from the site. The monitoring program must include monitoring of the receiving waters. All monitoring must be undertaken by a suitably qualified person. - Monthly inspection will be carried out to ensure surface water management measures are working as planned. - The Site Manager will compare surface water monitoring results against relevant legislative requirements, licence conditions and nominated performance targets when they are received. - The Site Manager will initiate surface water monitoring/surveys as often as is necessary to check compliance with the performance targets during activities. Surface water monitoring locations will be determined as and when required. - Additional inspections will be carried out pre and post rainfall events. - All complaints received at the site will be recorded in the complaints register. - The Site Manager will maintain records as required by the EPL.
KWMF performance	- SOP–14 was effectively implemented throughout the reporting period. - No sedimentation or surface water impacts were recorded during the reporting period. - Surface water monitoring was undertaken and detailed in section 5.3 of this report. - Monthly and rainfall event-related inspections were conducted and recorded. - Erosion and sediment controls were in place and maintained as needed. - No complaints related to surface water management were received. - All monitoring data and records were maintained by the Site Manager.

Table 7-9: Mud and Debris Management (SOP – 11) and review of KWMF performance.

EMP measure: SOP – 11 for Mud and Debris Management	
Objectives	- Meet the requirements of the EPL; - Minimise mud and debris generation - Minimise the transportation of mud and debris which may be generated - Control mud and debris so as to not impact workers, neighbours, or the environment.
performance criteria	- Public access roads clear of mud and debris - No complaints from community
Monitoring	- All staff are responsible for reporting mud and debris generating activities at the site. - Monthly visual inspection will be carried out in and around the site. - All complaints received at the site will be recorded in the complaints register. - The Site Manager will maintain records as required by the Environmental Protection License. - Where incidents may result in personal or environmental harm notification and reporting will be undertaken in accordance with the EPL.
KWMF performance	- SOP–11 was implemented effectively during the reporting period. - No complaints were received from the community regarding mud or debris. - Public access roads remained clear of mud and debris. - Monthly inspections were conducted to identify and manage any potential mud or debris issues. - Staff adhered to reporting responsibilities. - All records of complaints were maintained by the Site Manager. - No incidents required formal reporting under the EPL.

Table 7-10: Landfill Gas Management (SOP – 13) and review of KWMF performance.

EMP measure: SOP – 13 for Landfill Gas Management	
Objectives	- Meet the requirements of the EPL - Prevent noticeable release of odorous landfill gas components which cause nuisance to sensitive receptors - Minimise adverse health, safety or environmental impacts due to landfill gas - Prevent explosion or fire hazards - Minimise the likelihood of a complaint about odours from landfill gas emissions - Minimise the potential for fires generated from Landfill Gas
performance criteria	- No complaints from users from the site, and the community. - No accumulation of landfill gas in structures
Monitoring	- All staff are responsible for reporting mud and debris generating activities at the site. - Monthly visual inspection will be carried out in and around the site. - All complaints received at the site will be recorded in the complaints register. - The Site Manager will maintain records as required by the EPL. - Where incidents may result in personal or environmental harm notification and reporting will be undertaken in accordance with the EPL.
KWMF performance	- SOP–13 was implemented effectively during the reporting period. - No complaints relating to landfill gas or odour were received from staff or the community. - Monthly inspections were conducted, and no accumulation of landfill gas in structures was observed. - No safety, health, or environmental risks associated with landfill gas were identified. - All inspection findings and records were maintained by the Site Manager.

8 CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Water sampling was largely compliant with EPL298-02 requirements across the reporting period. Groundwater monitoring at all bores (GWA, GWE, GWB01, GWB04) was conducted monthly and quarterly as required, with minor non-compliances due to pH not being recorded in the first sampling round (August 2024) due to faulty equipment. Surface water and leachate monitoring were non-compliant with frequency requirements due to sites not flowing or leachate not ponding at the time of sampling, which prevented sample collection. Calibration records for field equipment were incomplete, with records missing for multiple sampling rounds between August 2024 and March 2025, raising uncertainty about data accuracy during those periods. Despite these issues, the overall monitoring program was broadly implemented as planned, with most parameters measured in accordance with licence requirements.

Most QA/QC results were within acceptable limits, indicating generally reliable data. However, some duplicate samples showed high RPDs (e.g., BOD, VFAs, metals), suggesting inconsistencies in sampling or analysis. Similarly, Instances of headspace in sample bottles which were not specified in detail by lab, pose a potential risk to the reliability of analytical results, particularly for volatile compounds.

Leachate historical data shows variability in parameters such as nutrients and metals, with elevated TN, COD, and VFA levels indicating typical landfill leachate characteristics. However, absence of sampling in this reporting period restrict trend analysis.

Surface water quality at SWC and SWB during the reporting period showed generally similar patterns, with most parameters within trigger values. Elevated EC and low DO in both rounds suggest groundwater influence. Nutrients, TOC, TDS, COD, and BOD were comparable between sites. Cu exceeded the trigger value at SWC in January, while DO consistently exceeded trigger values at both sites. Historical data show no clear trends, but past exceedances of TN and Cu suggest periodic impacts potentially linked to site activity or background conditions. Under EPL298-02, non-compliances were identified for DO and Cu based on trigger exceedance criteria.

Groundwater levels during the 2024–2025 period followed seasonal trends, with declines after the wet season and a sharp rise in May 2025 following a record rainfall event. Groundwater flow direction remains consistent to the northwest towards Tindal Creek.

Field parameters showed that pH was mostly neutral to alkaline, with occasional acidic readings. EC was highest at downgradient bore GWB02, suggesting potential influence from leachate. GWB04 showed the most stable EC values. DO levels remained low across all bores.

Major ion results show elevated K concentrations at GWB01 (downgradient) suggest possible site-related impacts, though a link to leachate could not be confirmed due to a lack of leachate data. GWA and GWE, the deeper upgradient bores, consistently recorded the lowest concentrations of $CaCO_3$, Mg, and Ca, likely reflecting natural background groundwater characteristics at depth. Na and Cl levels were higher at GWB01 and GWB02, which may indicate leachate influence, though this remains inconclusive. Unexplained spikes in SO_4, Mg, and Ca were observed at GWB03 in December 2024.

Nutrient results show variation across the monitoring bores. GWA displayed stable background conditions with minor TN and NH_4 peaks, while GWE (upgradient) showed unexpectedly high TN, NH_4, and NH_3-N, potentially indicating surface contamination or facility impact. GWB01 (downgradient) recorded consistently elevated TN and very high NH_4 and NH_3-N in early 2024, which declined later - suggesting a potential facility-related influence. GWB02 showed comparatively lower nutrient levels, indicating it may be less impacted. Elevated NO_3-N and TP at GWB03 and GWB04 also suggest possible influence from site activities.

Dissolved metal results from the reporting period show that Cr, CrIII, and CrVI were consistently below LOR. Al and Pb were detected in downgradient bores, with Pb concentrations at GWB02 significantly higher than

those at the upgradient bore GWB04, suggesting possible site-related influence. Cu, Mn, Ni, and Zn were more frequently detected and at higher concentrations in downgradient bores compared to upgradient ones, supporting a potential facility impact. Fe levels spiked across most bores in November, possibly linked to seasonal changes or mobilisation during rainfall, before decreasing in January.

TOC, TDS, BOD, and VFA levels were variable in reporting period, with no clear trends. Slightly elevated concentrations of TOC, BOD, and TDS were more frequently observed in downgradient bores, which may suggest minor influence from site activities.

TRH results were mostly below LOR, except for a single isolated detection of TRH C15–C28 at GWB01 in August 2024, with no consistent pattern or recurrence observed. The cause of this outlier remains unidentified.

PFAS were more frequently detected and at higher concentrations in downgradient bores GWB01 and GWB02, with a broader range of PFAS compounds present. Upgradient bore GWB04 recorded no PFAS above LOR, supporting the likelihood of a landfill-related source impacting the downgradient bores.

Recommendations

- Improve documentation of calibration activities by ensuring calibration sheets are consistently completed and stored for each sampling round. Replace or repair faulty equipment promptly to avoid data gaps.
- Improve record keeping including clear documentation of duplicate sample locations and associated metadata on field sheets.
- Investigate sources of high RPD in duplicate samples and improve sampling and handling procedures. Minimise headspace in bottles, especially for volatile parameters, through staff training and quality control checks.
- Ensure bottles are filled according to laboratory instructions (e.g. no headspaces).
- Develop or revise SOPs for sample collection.
- Improve monitoring frequency and planning, especially after rainfall events, to ensure compliance with EPL298-02.
- Increase the frequency of site inspections following rainfall events to check for leachate ponding and enable timely sample collection.

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APPENDIX A FIELD SHEETS

	Bore Name	Groundwater						Surface Water		Leachate
		RN022487 (Car yard)	RNO31131 (near weighbridge)	GWB01	GWB02	GWB03	GWB04	SWB - highway	SWC	
Groundwater Level	GW to top of casing (m)									
	Top of casing to surface (m)	10.87		11.30	7.4	9.2	12.4			
	Standing water level (SWL) (m)									
	Bladder pump depth (m)									
	Pump time on	11.17		10-37	10.15	9.27	9.02			
	Pump time off	11.38		11.00	10.27	9.10	9.15			
Purging	Length water column (m)									
	Volume (L)									
	Purging Volume (L) Required									
	Purging Volume (L) Actual									
Field Measurements	Observations (Colour, Odour, etc.)	clear odorless	clear odorless slight	murky odorless	slightly murky odorless	mural odorless	clear odorless			
	Time	11.16	11.44	10.45	10.24	9.45	9.11			
	pH		meter	not	working					
	Temperature (°C)	34.5	30	33.3	33	31.3	29.2			
	Redox (Oxidation Reduction Potential) (mv)	150	244	208	29.2	213	244			
	Dissolved oxygen (%)	2.1	3.9.	1.7	1.3	5.4	8.5			
	Electric Conductivity (ms)	0.427	0.557	0.767	0.820	0.846	0.783			

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*DNP

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Company:	Katherine Town Council		
Contact Person:			
Project Mgr:	Brett Kimpton		
Sampler:	Jaidyn Easthaughffer		
Address:	24 Stuart Hwy Katherine NT 0850		
Phone:	08 89725500	Mob:	0448821745
Email Results to:	records@ktc.nt.gov.au		
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Sydney Lab. - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
02 9910 6200 | sydney@envirolab.com.au

Perth Lab. - NPL Laboratories
16-18 Hayden Crt, Myaree, WA 6154
08 6217 2500 | lab@npl.com.au

Melbourne Lab. - Envirolab Services
39 Reseach Drive, Croydon South, VIC 3136
03 9763 2500 | melbourne@envirolab.com.au

Adelaide Office - Envirolab Services
7a The Parade, Norwood, SA 5067
08 7067 6800 | adelaide@envirolab.com.au

Brisbane Office - Envirolab Services
20a, 10-20 Depot St, Banyo, QLD 4014
07 3268 9822 | brisbane@envirolab.com.au

Darwin Office - Envirolab Services
Unit 20/118 Railcheck Road, Winnellie, NT 0820
08 8967 1201 | darwin@envirolab.com.au

Sample Information

Tests Required

Envirolab Sample ID (Lab use only)	Client Sample ID or Information	Depth	Date Sampled	Type of Sample	Ionic Balance Ca, K, Mg, Na, Hardness - Calc., OH, CO3, HCO3, Total Alkalinity, Cl, SO4	TN, TP	Nitrate	Ammonium - Requires pH & Temp field measurements	Metals Total (Al, Cd, Cu, Fe, Pb, Mn, Ni, Zn, Se, Cr)	Metals Dissolved (Al, Cd, Cu, Fe, Pb, Mn, Ni, Zn, Se, Cr)	Total - Cr III and Cr VI	Dissolved - Cr III and Cr VI	TOC	TDS	COD	BOD	VFA	PAH	TRH & BTEXN	PCB	PFAS Expanded suite Routine Level	Field measurements pH, Temp, Redox, EC, DO	Provi inform sam
	SWB			GRAB WATER	x	x	x	x	x	x	x	x	x	x	x	x	x	x	Annually				
	SWC				x	x	x	x	x	x	x	x	x	x	x	x	x	x	Annually				
	Leachate	DRY			x	x	x	x	x	x	x	x	x	x	x	x	x	x	Annually				
	GWA (RN031131)	—		10.09.24 WATER	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
	GWE (RN022487)	10.87			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
	GWB01	11.3			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
	GWB02	7.4			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
	GWB03	9.2			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
	GWB04	12.4			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
	Field Blank																						
	Duplicate																						
	Trip blank																						

☐ Please tick the box if observed settled sediment present in water samples is to be included in the extraction and/or analysis

Relinquished by (Company): Katherine Town Council	Received by (Company):	Lab Use
Print Name:	Print Name:	Job number: / Cooling
Date & Time:	Date & Time:	Temperature: / Secure
Signature:	Signature:	TAT Req - SAME day / 1 / 2 / 3 / 4 / STD

Field Measurement Sheet – Waste Management Facility

Bore	Radius (m)	Total depth bore (m)
RN022487	0.076	33
RN031131	0.140	80
GWB01	0.0575	15.5
GWB02	0.0575	17.5
GWB03	0.0575	10.7
GWB04	0.0575	17.2

Date of Sampling: 29.09.2024

Staff Name: Jaidyn Eastaughffe

Bore Name	Groundwater						Surface Water		Leachate
	RN022487 (Car yard)	RNO31131 (near weighbridge)	GWB01	GWB02	GWB03	GWB04	SWB - highway	SWC	
Time of Arrival	8.03	9.55	8.28	8.42	9.12	9.35	no surface water		
Time of Departure	8.25	10.05	8.40	9.10	9.30	9.50			
Weather Condition	sunny slight wind								
Environment – Description									

	Bore Name		Groundwater						Surface Water		Leachate
			RN022487 (Car yard)	RNO31131 (near weighbridge)	GWB01	GWB02	GWB03	GWB04	SWB - highway	SWC	
Groundwater Level	GW to top of casing (m) A		.32	NO ACCESS TO GROUND WATER LEVEL	.66	.6	.67	.64	NO SURFACE WATER		
	Top of casing to surface (m) B		11.3m		11.5m	11.51m	9.71m	12.92m			
	Standing water level (SWL) (m) A-B		10.98m		10.84	10.9	9.04	12.28			
	Bladder pump depth (m) A+2m										
	Pump time on										
	Pump time off										
Purging	Length water column (m)										
	Volume (L)										
	Purging Volume (L)	Required									
		Actual									
Field Measurements	Observations (Colour, Odour, etc.)		clear odourless	clear odourless	slightly murky odourless	slightly murky odourless	very murky odourless	clear odourless			
	Time		8.10	10.00	6.37	6.55	9.20	9.44			
	pH		5.78	6.27	5.85	6.01	6.10	6.86			
	Temperature (°C)		30.8	35.1	29.6	32.5	34.9	32.7			
	Redox (Oxidation Reduction Potential) (mv)		72	234	204	231	126	234			
	Dissolved oxygen (%)		4.7	4.1	9.0	8.6	1.7	10.1			
	Electric Conductivity (ms)		0.568	0.588	0.624	0.754	0.889	0.792			

lots of sediment potentially almost out of water

Field Measurement Sheet – Waste Management Facility

Date of Sampling: 27th October 2024

Staff Name: Jaidyn Eastaughffe

Bore	Radius (m)	Total depth bore (m)
RN022487	0.076	33
RN031131	0.140	80
GWB01	0.0575	15.5
GWB02	0.0575	17.5
GWB03	0.0575	10.7
GWB04	0.0575	17.2

Bore Name		duplicate	Groundwater				Surface Water		Leachate
	RN022487 (Car yard) (GWE)	RNO31131 (near weighbridge) (GWA)	GWB01	GWB02	GWB03	GWB04	SWB - highway	SWC	
Time of Arrival	10.00	12.20	10.25	11.05	11.25	11.47			
Time of Departure	10.20	12.45	11.05	11.20	11.45	12.10			
Weather Condition	sunny, no wind	sunny, no wind	Sunny, no wind	Sunny, no wind	Sunny no wind	Sunny, no wind	NO surface water		
Environment – Description									

	Bore Name		Groundwater						Surface Water		Leachate
			RN022487 (Car yard)	RNO31131 (near weighbridge)	GWB01	GWB02	GWB03	GWB04	SWB - highway	SWC	
Groundwater Level	GW to top of casing (m) A		11.2m	NO	11.8m	11.7m	9.8m	13.2			
	Top of casing to surface (m) B		0.32m	access	0.66m	0.6m	.67m	.64			
	Standing water level (SWL) (m) A-B		10.88m		11.14m	11.1m	9.13m	12.56m			
	Bladder pump depth (m) A+2m										
	Pump time on										
	Pump time off										
Purging	Length water column (m)								NO SURFACE WATER		
	Volume (L)										
	Purging Volume (L)	Required									
		Actual		GWB01 GWA							
Field Measurements	Observations (Colour, Odour, etc.)		clear, odourless	murky, some sediment odourless	clear odourless	murky odourless	murky odourless	slightly murky odourless			
	Time		10.10am	10.50am	12.35	11.00	11.40	11.55			
	pH		6.52	6.32	6.45	6.01	6.35	6.14			
	Temperature (°C)		34.2	35.2	33.5	38	42	39.4			
	Redox (Oxidation Reduction Potential) (mv)		180	174	222	209	237	243			
	Dissolved oxygen (%)		20.1	10.8	13.1	4.3	6.2	3.5			
	Electric Conductivity (ms)		0.587	0.636	0.598	0.818	0.852	0.963			

Field Measurement Sheet – Waste Management Facility

Date of Sampling: 10th November 2024

Staff Name: Jaidyn Eastaughffe

Bore	Radius (m)	Total depth bore (m)
RN022487	0.076	33
RN031131	0.140	80
GWB01	0.0575	15.5
GWB02	0.0575	17.5
GWB03	0.0575	10.7
GWB04	0.0575	17.2

Bore Name	GWE / GWA		Groundwater				Surface Water		Leachate
	RN022487 (Car yard)	RNO31131 (near weighbridge)	GWB01	GWB02	GWB03	GWB04	SWB - highway	SWC	
Time of Arrival	8.20	12.40	9.00	9.40	10.20	11.10			
Time of Departure	8.55	1.00	9.35	10.15	11.00	12.30			
Weather Condition	Sunny, no wind	Sunny no wind	Sunny, slight wind	Sunny, no wind	Sunny, no wind	Sunny, slight wind	NO SURFACE WATER		
Environment – Description									

NO SURFACE WATE

	Bore Name		GWE RN022487 (Car yard)	GWA RNO31131 (near weighbridge)	Groundwater GWB01	GWB02	GWB03	GWB04	Surface Water SWB - highway	SWC	Leachate
Groundwater Level	GW to top of casing (m) A		11.4	No bore pump	11.9	12	10.3	13.3			
	Top of casing to surface (m) B		0.32		0.66	0.6	.67	.64			
	Standing water level (SWL) (m) A-B		11.1		11.23	11.4	9.8	12.64			
	Bladder pump depth (m) A+2m										
	Pump time on										
	Pump time off										
Purging	Length water column (m)										
	Volume (L)										
	Purging Volume (L)	Required									
		Actual									
Field Measurements	Observations (Colour, Odour, etc.)		clear, no odour	clear odourless	some * sediment, odourless	murky, no odour	murky no odour	clear, no odour			
	Time		8.30	12.45	9.18	9.50	11.00	12.30			
	pH		6.89	8.56	6.77	8.85	8.18	8.40			
	Temperature (°C)		31.2	32.3	32.1	33.2	36.4	34.6			
	Redox (Oxidation Reduction Potential) (mv)		195	254	201	242	234	255			
	Dissolved oxygen (%)		6.3	0.8	4.6	8.1	3.9	57.2			
	Electric Conductivity (ms)		0.436	0.569	0.822	0.838	1.0	.806			

* too much sediment to effectively field filter

Field Measurement Sheet – Waste Management Facility

Date of Sampling: 8th December 2024

Staff Name: Jaidyn Eastaughffe

Bore	Radius (m)	Total depth bore (m)
RN022487	0.076	33
RN031131	0.140	80
GWB01	0.0575	15.5
GWB02	0.0575	17.5
GWB03	0.0575	10.7
GWB04	0.0575	17.2

Bore Name	Groundwater						Surface Water		Leachate
	RN022487 (Car yard)	RNO31131 (near weighbridge)	GWB01	GWB02	GWB03	GWB04	SWB - highway	SWC	
Time of Arrival	1.00	1.30	12.40	12.19	11.52	11.30			
Time of Departure	1.25	1.45	1.00	1235	12.14	11.48	no sample		
Weather Condition	sunny, slight wind.	sunny, slight wind	sunny, slight wind	sunny, humid slight wind	sunny, humid,	sunny, humid, slight wind	collection (no bottles)		
Environment – Description									

	Bore Name		GWE RN022487 (Car yard)	GWA RNO31131 (near weighbridge)	Groundwater GWB01	GWB02	GWB03	GWB04	Surface Water SWB - highway	Surface Water SWC	Leachate
Groundwater Level	GW to top of casing (m) A		10.4	NO	11.4	11.1	10.6	11.8			
	Top of casing to surface (m) B		0.32	BORE	0.66	0.6	0.67	0.64	no sample		
	Standing water level (SWL) (m) A-B		10.08	PUMP	10.74	10.5	9.93	11.16	collection		
	Bladder pump depth (m) A+2m			X					(no bottles)		
	Pump time on	1.05	~~1.04~~		12.45	12.22	11.58	11.34			
	Pump time off	1.10	~~1.44~~		12.56	12.34	12.10	11.44			
Purging	Length water column (m)										
	Volume (L)										
	Purging Volume (L)	Required									
		Actual									
Field Measurements	Observations (Colour, Odour, etc.)		clear odourless	clear odourless	clear odourless	clear odourless	some sediment	clear odourless			
	Time		1.15	1.40	12.54	12.30	12	11.40			
	pH		7.9	7.98	8	8.07	8.4	7.3			
	Temperature (°C)		37	31.3	36.5	39	39	37			
	Redox (Oxidation Reduction Potential) (mv)		234	221	243	235	224	239			
	Dissolved oxygen (%)		5.5	3.5	8.1	9.0	6.5	12.4			
	Electric Conductivity (ms)		0.865	0.575	0.202	0.425	NA	0.825			

Field Measurement Sheet – Waste Management Facility

Date of Sampling: 27th January 2025

Staff Name: Jaidyn Eastaughffe

Bore	Radius (m)	Total depth bore (m)
RN022487	0.076	33
RN031131	0.140	80
GWB01	0.0575	15.5
GWB02	0.0575	17.5
GWB03	0.0575	10.7
GWB04	0.0575	17.2

Bore Name	GWA / GWE		Groundwater				Surface Water		Leachate
	RN022487 (Car yard)	RNO31131 (near weighbridge)	GWB01	GWB02	GWB03	GWB04	SWB - highway	SWC	
Time of Arrival	1.50	2.20	1.11	12.30	11.50	11.23	10.45	10.15	
Time of Departure	2.15	2.30	1.35	1.10	12.20	11.45	11.00	10.40	
Weather Condition	sunny, humid no wind	→	→	sunny, humid slight wind	humid, sunny no wind	→	→	humid, sunny slight wind	
Environment – Description							shallow shil water in shade	Shallow, flowing water in sun	

ran out of filters no field filter sorry for inconvenience

	Bore Name		Groundwater						Surface Water		Leachate
			RN022487 (Car yard)	RN031131 (near weighbridge)	GWB01	GWB02	GWB03	GWB04	SWB - highway	SWC	
Groundwater Level	GW to top of casing (m) A		8.72	NO BORE PUMP	8.81	8.12	8.2	11.4	NO BORE		
	Top of casing to surface (m) B		0.32		0.6	0.6	0.7	0.6			
	Standing water level (SWL) (m) A-B		8.42		8.21	8.6	7.5	10.8			
	Bladder pump depth (m) A+2m										
	Pump time on		1.57		1.12	12.40	11.55	11.26			
	Pump time off		2.10		1.25	1.03	12.10	11.34			
Purging	Length water column (m)										
	Volume (L)										
	Purging Volume (L)	Required									
		Actual									
Field Measurements	Observations (Colour, Odour, etc.)		clear odourless	slightly murky					lots of organic matter murky odourless	odourless, slightly murky	
	Time		2.05	2.25	1.30	12.45	11.58	11.30	10.55	10.20	
	pH		6.34	6.00	5.69	6.03	5.56	6.88	6.24	6.63	
	Temperature (°C)		42.6	33.6	42.1	42.7	38.4	39.7	30	30.9	
	Redox (Oxidation Reduction Potential) (mv)		219	237	262	253	252	291	254	252	
	Dissolved oxygen (%)		6.3	25.1	4.8	2.3	1.1	4.9	1.5	5.8	
	Electric Conductivity (ms)		0.589	0.529	0.829	0.884	0.902	0.791	0.460	0.470	

Field Measurement Sheet – Waste Management Facility

Date of Sampling: 23rd Feb 2025

Staff Name: Jaidyn Eastaughffe

Bore	Radius (m)	Total depth bore (m)
RN022487	0.076	33
RN031131	0.140	80
GWB01	0.0575	15.5
GWB02	0.0575	17.5
GWB03	0.0575	10.7
GWB04	0.0575	17.2

Bore Name	GWE	GWA	Groundwater				Surface Water		Leachate
	RN022487 (Car yard)	RNO31131 (near welghbridge)	GWB01	GWB02	GWB03	GWB04	SWB - highway	SWC	
Time of Arrival	8.24am	10.45	10.13	9.54	9.15	8.48			
Time of Departure	8.40am	11.05	10.27	10.12	9.50	9.14			
Weather Condition	Sunny, no wind, humid	sunny, no wind.	Sunny, no wind, humid	Sunny, no wind humid	Sunny, humid no wind	Sunny, humid, no wind			
Environment – Description									

	Bore Name	Groundwater						Surface Water		Leachate
		RN022487 (Car yard)	RNO31131 (near weighbridge)	GWB01	GWB02	GWB03	GWB04	SWB - highway	SWC	
Groundwater Level	GW to top of casing (m)	~~0.32~~	X	~~0.6~~	~~0.6~~	~~0.7~~	~~0.6~~			
	Top of casing to surface (m)	7.9		6.5	6.5	5.3	~~8.56~~			
	Standing water level (SWL) (m)	~~0.8~~		~~2.3~~	~~1.6~~	~~2.9~~	~~2.84~~			
	Bladder pump depth (m) [redacted]	7.58		5.9	5.9	4.6	7.96			
	Pump time on	8.28	X	10.13	9.57	9.16	8.58			
	Pump time off	8.37		10.25	10.07	9.30	9.03			
Purging	Length water column (m)									
	Volume (L)									
	Purging Volume (L) Required									
	Purging Volume (L) Actual									
Field Measurements	Observations (Colour, Odour, etc.)	clear odourless	clear odourless	clear odourless	clear odourless	clear odourless	clear, odourless			
	Time	8.37	10.47	10.19	10.04	9.30	9.05			
	pH	~~8.07~~	8.62	6.96	7.18	7.84	8.68			
	Temperature (°C)	29.1	29.8	31.2	32.6	32.3	32.0			
	Redox (Oxidation Reduction Potential) (mv)	225	131	292	303	297	329			
	Dissolved oxygen (%)	~~7.11~~ 7.3	5.1	4.3	3.2	4.1	2.2			
	Electric Conductivity (ms)	0.558	0.590	0.791	0.901	0.621	0.732			

* DUP.

calibration: DI Water

	1.	2.	3.	4.	5.	6.
Time:	745am	8.50am	9.15am	9.56am	10.14am	10.34am
pH:	7.03 pH	8.1 pH	~~7.205~~ pH	7.94 pH	7.76 pH	7.75
temp:	20.8 °C	24.2°C	27.2°C	28.6°C	29.1°C	29.4°
redox:	321 mV	270 mV	288 mV	314 mV	311 mV	308 mV
DO:	4.2%	4.6 %.	6.0%.	5.3%.	5.3%.	5.4%
EC:	0.54 us		6.3 µS	6.5 µS	6.08 µS	0.40 u
	office.					office

Field

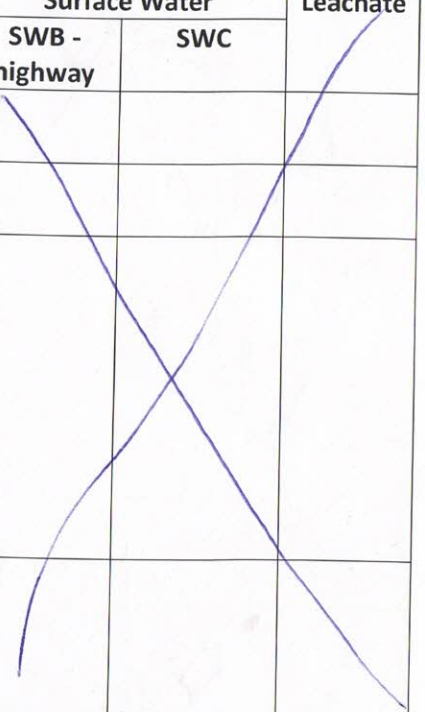
Field Measurement Sheet – Waste Management Facility

Date of Sampling: 16.03.25

Staff Name: Jaidyn Eastaughffe

Bore	Radius (m)	Total depth bore (m)
RN022487	0.076	33
RN031131	0.140	80
GWB01	0.0575	15.5
GWB02	0.0575	17.5
GWB03	0.0575	10.7
GWB04	0.0575	17.2

Bore Name	GWE / RN022487 (Car yard)	GWA / RNO31131 (near weighbridge)	Groundwater GWB01	GWB02	GWB03	GWB04	Surface Water SWB - highway	Surface Water SWC	Leachate
Time of Arrival	3.10	12.40	3.00	2.42	2.30	2.10			
Time of Departure	3.30	13.30	3.10	2.55	2.40	2.30			
Weather Condition	Sunny, ~~no wind~~ humid. windy	Sunny, Slight wind	Slightly overcast humid no wind	Sunny, no wind, humid	Sunny, humid, no wind	Slightly overcast, slight wind, humid			
Environment – Description									



*Duplicate

only sample field filtered

	Bore Name		RN022487 (Car yard)	RNO31131 (near weighbridge)	GWB01	GWB02	GWB03	GWB04	SWB - highway	SWC	~~Leachate~~
			Groundwater						Surface Water		~~Leachate~~
Groundwater Level	GW to top of casing (m) A		7.17		8.17	~~7.77~~	5.64	9.1			
	Top of casing to surface (m) B		0.32		0.66	0.6	0.67	0.64			
	Standing water level (SWL) (m) A-B		6.85		7.51	7.17	4.97	8.46			
	Bladder pump depth (m) A+2m										
	Pump time on										
	Pump time off										
Purging	Length water column (m)										
	Volume (L)										D.O
	Purging Volume (L)	Required									(TB)
		Actual									
Field Measurements	Observations (Colour, Odour, etc.)		clear odourless	clear odourless	clear odourless	clear odourless	clear odourless	clear odourless			
	Time		3.18	13.20	3.00	36.9	2.34	2.15			1300
	pH		8.70	6.48	8.54	8.34	~~7.18~~	6.9			6.82
	Temperature (°C)		37.6	31.5	35.8	38.1	35.6	36.2			25.5
	Redox (Oxidation Reduction Potential) (mv)		212	305 mV	~~227~~ ~~202~~	204	230	226mV			0.39US
	Dissolved oxygen (%)		~~12.5~~ 11.5	4.5	4.4	6.5	4.8	2.2			6.17.02
	Electric Conductivity (ms)		0.795	~~0.650~~ 0.650 mS	0.874	0.596	0.604	0.874			266 mV

AECOM

EQUIPMENT BUMP TEST FORM

Technician: Imogen

Date & Time: 10:47 / 28 April 2025

INSTRUMENT IDENTIFICATION

Model Number: 16102030

Serial Number: 18510431J

Instrument Type: YSI

INSPECTION RECORD (YES/NO):

Batteries Checked: Y

Membrane Cap/Electrolyte Replacement Required? N

Electrodes Cleaned/Checked: Y

BUMP TEST DETAILS:

Date & Time: 10:47 28/4/25

Parameter	pH		Conductivity	Redox	Dissolved Oxygen
Standard Concentration	4	~~8.587~~	12.88		
Temperature					
Reading	3.58	6.68			

Date & Time:

Parameter	pH		Conductivity	Redox	Dissolved Oxygen
Standard Concentration					
Temperature					
Reading					

Date & Time:

Parameter	pH		Conductivity	Redox	Dissolved Oxygen
Standard Concentration					
Temperature					
Reading					

Fieldwork Staff Signature

28/4/25
Date

Field Measurement Sheet – Waste Management Facility

Bore	Radius (m)	Total depth bore (m)
RN022487	0.076	33
RN031131	0.140	80
GWB01	0.0575	15.5
GWB02	0.0575	17.5
GWB03	0.0575	10.7
GWB04	0.0575	17.2

Date of Sampling: 28/4/25

Staff Name: Imogen

Bore Name	Groundwater						Surface Water		Leachate
	RN022487 (Car yard)	RNO31131 (near weighbridge)	GWB01	GWB02	GWB03	GWB04	SWB - highway	SWC	
Time of Arrival	12:30	12:10	1:30				–	–	–
Time of Departure	~~12:25~~ 1:25	12:25					–	–	–
Weather Condition	sunny, still	sunny, still	sunny, still				–	–	–
Environment – Description	missing a well lid						–	–	–

	Bore Name		Groundwater						Surface Water		Leachate
			RN022487 (Car yard)	RNO31131 (near weighbridge)	GWB01	GWB02	GWB03	GWB04	SWB - highway	SWC	
Groundwater Level	GW to top of casing (m) A		10.66	–	10.647	7.996	5.874	19.114	–	–	–
	Top of casing to surface (m) B		~~3.16~~ 0.316	–	0.668	0.703	0.670	0.664	–	–	–
	Standing water level (SWL) (m) A-B		~~7.50~~ 10.344	–	9.979	7.293	5.204	18.45	–	–	–
	Bladder pump depth (m) A+2m		~~9.50~~ 12.344	–					–	–	–
	Pump time on		12:30	[illegible]					–	–	–
	Pump time off		12:45	[illegible]					–	–	–
Purging	Length water column (m)		25.5	–							
	Volume (L)			–							
	Purging Volume (L)	Required	2	–	.40						
		Actual		–							
Field Measurements	Observations (Colour, Odour, etc.)		colourless no odour no sheen	colourless, no odour, no sheen	colourless no odour no sheen						
	Time		12:44	12:00							
	pH		6.07	6.83							
	Temperature (°C)			31.2							
	Redox (Oxidation Reduction Potential) (mv)			159.7							
	Dissolved oxygen (%)			14.2							
	Electric Conductivity (ms)			0.68							

AECOM

ANZ

FQM - Sample QAQC Tracking Sheet

Q4AN(EV)-011-FM1

Project Name:	RWMF	**Project Number:**	
Project Location:	Katherine Tip	**Client:**	Katherine Town Council
PM Name:	Matt Ryan	**Fieldwork Staff:**	LS

QAQC Information

QAQC ID	Primary Sample ID	Sample Type	Date
Duplicate	GWB03		7/5/25
Field Blank			7/5/25
Trip Blank			lab on 6/5/25

QAQC Project Requirements

QAQC	Required		Frequency		Method Used
Field Duplicates	Yes	No	1 in 10	1 in 20	
Field Triplicates	Yes	No	1 in 10	1 in 20	
Rinsate Blanks	Yes	No	1 per matrix/equipment/day		
Field Blanks	Yes	No	1 per day		
Trip Blanks	Yes	No	1 per ice chest		
Trip Spikes	Yes	No	1 per ice chest		

Approval and Distribution

Fieldwork Staff Signature	7/5/25 Date
Project Manager Signature	Date

Distribution: Project Central File

Field Measurement Sheet – Waste Management Facility

Bore	Radius (m)	Total depth bore (m)
RN022487	0.076	33
RN031131	0.140	80
GWB01	0.0575	15.5
GWB02	0.0575	17.5
GWB03	0.0575	10.7
GWB04	0.0575	17.2

Date of Sampling: 7/5/25

Staff Name: Imogen Smith

Bore Name	Groundwater						Surface Water		Leachate
	RN022487 (Car yard)	RNO31131 (near weighbridge)	GWB01	GWB02	GWB03	GWB04	SWB - highway	SWC	
Time of Arrival	11:40	-	12:25	1:03	1:50	2:30	3:05	3:10	-
Time of Departure	12:20	-	1:00	1:45	2:25	3:00	3:07	3:42	-
Weather Condition	windy, sunny, hot, dry	-	windy, sunny	windy, sunny	windy, sunny	windy, sunny	-	-	-
Environment – Description	No well cover	-	well in the shade	Frog in well well in the sun		well in the sun	Dry -	Dry -	-

	Bore Name		Groundwater						Surface Water		Leachate
			RN022487 (Car yard)	RNO31131 (near weighbridge)	GWB01	GWB02	GWB03	GWB04	SWB - highway	SWC	
Groundwater Level	GW to top of casing (m) A		8.170	–	8.872	8.630	6.653	9.778	–	–	–
	Top of casing to surface (m) B		0.316	–	0.668	0.703	0.670	0.664	–	–	–
	Standing water level (SWL) (m) A-B			–					–	–	–
	Bladder pump depth (m) A+2m		–	–					–	–	–
	Pump time on		–	–					–	–	–
	Pump time off		–	–					–	–	–
Purging	Length water column (m)		–	–					–		
	Volume (L)		–	–					–	–	–
	Purging Volume (L)	Required	–	–					–	–	–
		Actual	–	–					–	–	–
Field Measurements	Observations (Colour, Odour, etc.)		colourless no odour	–	colourless, no odour, suspended soil	colourless, no odour	colourless, no odour	colourless no odour	–	–	–
	Time		12:10	–	12:50	1:15	1:45	2:45	–	–	–
	pH		7.61	–	6.68	6.83	6.74	6.78	–	–	–
	Temperature (°C)		32.0	–	32.0	32.1	30.8	31.6	–	–	–
	Redox (Oxidation Reduction Potential) (mv)		202.1	–	199.4	200.2	210.4	203.1	–	–	–
	Dissolved oxygen (%)		17.2	–	12.6	16.9	12.02	23.9	–	–	–
	Electric Conductivity (ms)		1.06	–	1.13	1.07	1.08	1.09	–	–	–

AECOM

EQUIPMENT BUMP TEST FORM

Technician: Imogen

Date & Time: 26/5/25 10:08

INSTRUMENT IDENTIFICATION

Model Number:

Serial Number:

Instrument Type: YSI B

INSPECTION RECORD (YES/NO):

Batteries Checked: **Membrane Cap/Electrolyte Replacement Required?**

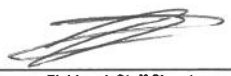
Electrodes Cleaned/Checked:

BUMP TEST DETAILS:

Date & Time: 10:08 20/5/25					
Parameter	pH		Conductivity	Redox	Dissolved Oxygen
Standard Concentration	4.0	7.0	1413		
Temperature					
Reading	4.00	7.28	1671		

Date & Time:					
Parameter	pH		Conductivity	Redox	Dissolved Oxygen
Standard Concentration					
Temperature					
Reading					

Date & Time:					
Parameter	pH		Conductivity	Redox	Dissolved Oxygen
Standard Concentration					
Temperature					
Reading					



Fieldwork Staff Signature

26/5/25

Date

AECOM

ANZ

FQM - Sample QAQC Tracking Sheet

Q4AN(EV)-011-FM1

Project Name:	IRWMF -WS	**Project Number:**	60754458
Project Location:	Katherine Tip	**Client:**	Katherine Town Council
PM Name:	MR	**Fieldwork Staff:**	IS

QAQC Information

QAQC ID	Primary Sample ID	Sample Type	Batch Number
QC 100		duplicate	
QC 300		rinsate	
QC 400		field blank	

QA\QC Project Requirements

QAQC	Required		Frequency		Method Used
Field Duplicates	☑ Yes	☐ No	☑ 1 in 10	☐ 1 in 20	
Field Triplicates	☐ Yes	☒ No	☐ 1 in 10	☐ 1 in 20	
Rinsate Blanks	☑ Yes	☐ No	☑ 1 per matrix/equipment/day		
Field Blanks	☑ Yes	☐ No	☑ 1 per day		
Trip Blanks	☐ Yes	☒ No	☐ 1 per ice chest		
Trip Spikes	☐ Yes	☒ No	☐ 1 per ice chest		

Approval and Distribution

27/5/25

Fieldwork Staff Signature — Date

Project Manager Signature — Date

Distribution: Project Central File

ANZ

FQM - Groundwater Sampling and Purging Record

AECOM

Q4AN(EV)-405-FM1

Project Name:	KWMF	Project Number:	60754458	PM Name:	Matt Ryan	Surface Water/Groundwater?	
Client:	Katherine town council	Project Location:	Katherine Tip	Fieldwork Staff:	Imogen	Well Development or Well Sampling Event? (circle)	
Date of GW Level:		Bore Radius (mm):		Chem Kit Serial No.:		☒ Decontaminated	☐ Low Flow Pump rate:
Depth to GW (m-pvc):		Screen Interval (m):		Chem Kit Model:		☒ Dedicated	Intake depth:
Bore Depth (m-pvc):		Casing Radius (mm):		Corrected Redox: Y (N)		☒ Disposable	☒ Bailer ☐ Hydrasleeve
Depth to Product (m-pvc):		Cover Type (gatic/stick up):		(The correction to apply is probe dependent)		☐ Other (specify)	☐ Peristaltic Pump ☐ Waterra
Product Thickness (m):		Bore Locked (YES/NO):		Parameter method: ☐ Downhole			☐ Other (specify)
		Key Type (if applicable):		☐ Retrieved			
Calculated bore volume (L):		Includes/ excludes bore annulus (circle)		# purge volumes removed:		Total purged volume (L):	

Hydrasleeve Size:	Monitoring sequence followed (number in order):
Hydrasleeve Type:	Gauging
Sampling Depth (m-pvc):	Hydrasleeve in
Hydrasleeve Install time:	Hydrasleeve out
Sampling Start Time:	Parameters

Date	Location ID	QA/QC	Turbidity (NTU)	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity	depth to water
10:15 27/5	GWA		-	3.72	643	7.31	110.5	31.7	bore was already on, colourless, no, nt	9.275
10:40 27/5	GWE		-	0.74	585	7.77	63.6	31.5	colourless, no, low turb	9.902
11:08 27/5	GWB01		-	1.08	781	6.76	91.1	32.5	"	9.736
11:20 27/5	GWB02	QC100	-	0.86	868	6.75	-64.7	31.8	"	7.890
11:45 27/5	GWB03		-	2.92	817	6.87	16.3	29.9	"	10.989
12:00 27/5	GWB04		-	3.09	886	6.70	71.9	32.1		
Acceptable Parameter Range:			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C		± 10% turbidity (if using a turbidity meter)	

Field Filtered:	Unfiltered:					
		x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO		Bore volume calculation, bore condition, fate of tubing, redox correction etc.
		x 40 mL Vial (H2SO4)	x 100 mL Amber	x 250 mL Plastic		

Approval and Distribution

Fieldwork Staff Signature _____ Date _____ Checker Name and Signature _____ Date _____

Project Manager Signature _____ Date _____ Distribution: Project Central File

AECOM

EQUIPMENT BUMP TEST FORM

Technician: J.b

Date & Time: 17/6/25 @ 09:30

INSTRUMENT IDENTIFICATION

Model Number: 605596

Serial Number: 19G10[illegible]36

Instrument Type: YSI Pro Plus

INSPECTION RECORD (YES/NO):

Batteries Checked: ✓ **Membrane Cap/Electrolyte Replacement Required?** N

Electrodes Cleaned/Checked: Y

BUMP TEST DETAILS:

Date & Time: 17/6/25 09:30 ~~Temp. 25.2~~

Parameter	pH		Conductivity	Redox	Dissolved Oxygen
Standard Concentration	4.00	7.00	1413 us/cm	230.8	100 %
Temperature				25.2	
Reading	4.03	7.01	1485	228.9	100%

Date & Time:

Parameter	pH		Conductivity	Redox	Dissolved Oxygen
Standard Concentration					
Temperature					
Reading					

Date & Time:

Parameter	pH		Conductivity	Redox	Dissolved Oxygen
Standard Concentration					
Temperature					
Reading					

Fieldwork Staff Signature

17/6/25
Date

AECOM

ANZ

FQM - Sample QAQC Tracking Sheet

Q4AN(EV)-011-FM1

Project Name:	Katherine wMP	**Project Number:**	60754458
Project Location:	Katherine	**Client:**	ITC
PM Name:	Matt Ryan	**Fieldwork Staff:**	S.B

QAQC Information

QAQC ID	Primary Sample ID	Sample Type	Batch Number
Field Duplicate	GWB01	intra-lab Dup	—
Rinsate		rinsate	—
Field Blank		field blank	—

QAQC Requirements

QAQC	Required		Frequency		Method Used
Field Duplicates	☑ Yes	☐ No	☑ 1 in 10	☐ 1 in 20	
Field Triplicates	☐ Yes	☐ No	☐ 1 in 10	☐ 1 in 20	
Rinsate Blanks	☑ Yes	☐ No	☑ 1 per matrix/equipment/day		
Field Blanks	☑ Yes	☐ No	☑ 1 per day		
Trip Blanks	Yes	☑ No	☐ 1 per ice chest		
Trip Spikes	☐ Yes	☑ No	☐ 1 per ice chest		

Approval and Distribution

Fieldwork Staff Signature — Date: 17/6/25

Project Manager Signature — Date:

Distribution: Project Central File

ANZ

FQM - NAPL and Groundwater Level Gauging Record

AECOM

Q4AN(EV)-414-FM1

Project Name:	Katherine vMP	**Project Location:**	Katherine	**PM Name:**	Matt Ryan
Project Number:	60754458	**Client:**	KTC	**Fieldwork Staff Name:**	S.B

Confirm NAPL and groundwater levels by repeat measurements. All columns must be completed. If NAPL is not present in a well write 'ND' (Not Detected) in the relevant column.

Field Data

Well ID	Date (dd/mm/yy)	Time (24hr:mm)	PID Reading (ppm)	Depth to LNAPL (mBTOC)	Depth to Groundwater (mBTOC)	LNAPL Thickness (m)	Depth to DNAPL (mBTOC)	Total Well Depth (mBTOC)	DNAPL Thickness (m)	Comments (well condition, odour, NAPL colour and viscosity)
GW E	17/6/25		—	—	8.764	—	—	—	—	Poor condition, missing gatic lid
GW A			—	—	—	—	—	—	—	Tap no gauging dated
GW B01			—	—	7.562	—	—	—	—	Good condition, No odour, no sheen, mod turbidity
GW B02			—	—	7.411	—	—	—	—	" "
GW B03			—	—	6.643	—	—	—	—	" "
GW B04	—		—	—	9.556	—	—	—	—	" "

Measurement Equipment

Make & Model:		**Supplier:**	
Serial No.:		**Calibration Report Provided?**	

Notes/Comments

(PID) - photo ionisation detector; (ppm) - parts per million; (LNAPL) - light non-aqueous phase liquids; (DNAPL) - dense light non-aqueous phase liquid; (mBTOC) - metres below top of casing

Approval and Distribution

17/6/25
Fieldwork Staff Signature — Date

Project Manager Signature — Date

Distribution: Project Central File

KTC - Tip GW 'monthly' sampling - June

ANZ

FQM - Groundwater Sampling and Purging Record

AECOM

Q4AN(EV)-405-FM1

Project Name: Katherine Tip	Project Number:		PM Name: Matt Ryan	Surface Water/Groundwater:	
Client: KTC	Project Location: Katherine		Fieldwork Staff: S.D	Well Development or Well Sampling Event? (circle)	
Date of GW Level:	Bore Radius (mm):	Chem Kit Serial No.:	☐ Decontaminated	☐ Low Flow Pump rate:	Hydrasleeve Size:
Depth to GW (m-pvc):	Screen Interval (m):	Chem Kit Model:	☐ Dedicated	Intake depth:	Hydrasleeve Type:
Bore Depth (m-pvc):	Casing Radius (mm):	Corrected Redox: Y / N	☐ Disposable	☐ Bailer ☐ Hydrasleeve	Sampling Depth (m-pvc):
Depth to Product (m-pvc):	Cover Type (gatic/stick up):	(The correction to apply is probe dependent)	☐ Other (specify)	☐ Peristaltic Pump ☐ Waterra	Hydrasleeve install time:
Product Thickness (m):	Bore Locked (YES/NO):	Parameter method: ☐ Downhole		☐ Other (specify):	Sampling Start Time:
	Key Type (if applicable):	☐ Retrieved			
Calculated bore volume (L):	Includes/ excludes bore annulus (circle)	# purge volumes removed:		Total purged volume (L):	

Monitoring sequence followed (number in order):
Gauging
Hydrasleeve in
Hydrasleeve out
Parameters

Date	Location ID	QAQC	Turbidity (NTU)	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity
17/6/25	GW E		—	2.08	601	7.76	74.7	28.1	Poor condition, No NS, mod turb
	GW A		—	1.92	741	6.99	94.6	31.5	GC, No NS low turb. Rore
	GW B01 intra		—	1.68	862	6.92	79.4	28.2	GC, No NS, mod turb
	GW B02		—	4.36	674	7.10	87.0	30.0	" " " "
	GW B03		—	6.25	418	7.25	91.7	27.2	" " " "
	GW B04		—	2.24	959	6.90	75.5	28.4	" " " "
	GW C		—	10.05	557	8.43	78.4	22.8	No NS algae, mod flow low turb
	GW B		—	7.06	653	8.45	77.9	20.7	Low flow, organic odour, fish, algae, mod turb.
Acceptable Parameter Range:			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C		± 10% turbidity (if using a turbidity meter)

Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO	Bore volume calculation, bore condition, fate of tubing, redox correction etc.
		x 40 mL Vial (H2SO4)	x 100 mL Amber	x 250 mL Plastic	

Approval and Distribution

Fieldwork Staff Signature	17/6/25 Date	Checker Name and Signature	Date
Project Manager Signature	Date	Distribution: Project Central File	

ANZ

FQM - Groundwater Sampling and Purging Record

AECOM

Q4AN(EV)-405-FM1

Project Name:	KTMMF GWM	Project Number:	60754458	PM Name:	Matt Ryan
Client:	KTC	Project Location:	KTMMF	Fieldwork Staff:	Imogen S

Surface Water/Groundwater:

Well Development or Well Sampling Event? (circle)

Sample Point Information		Calibration		Sampling Method		Purging Method	
Date of GW Level:	Bore Radius (mm):	Chem Kit Serial No.:	☒ Decontaminated	☐ Low Flow Pump rate:		Hydrasleeve Size:	Monitoring sequence followed (number in order):
Depth to GW (m-pvc):	Screen Interval (m):	Chem Kit Model:	☐ Dedicated	Intake depth:		Hydrasleeve Type:	Gauging
Bore Depth (m-pvc):	Casing Radius (mm):	Corrected Redox: Y / (N)	☒ Disposable	☒ Bailer	☐ Hydrasleeve	Sampling Depth (m-pvc):	Hydrasleeve in
Depth to Product (m-pvc):	Cover Type (gatic/stick up):	(The correction to apply is probe dependent)	☐ Other (specify)	☐ Peristaltic Pump	☐ Waterra	Hydrasleeve install time:	Hydrasleeve out
Product Thickness (m):	Bore Locked (YES/NO):	Parameter method: ☐ Downhole		☐ Other (specify)		Sampling Start Time:	Parameters
	Key Type (if applicable):	☐ Retrieved					
Calculated bore volume (L):	Includes/ excludes bore annulus (circle)	# purge volumes removed:		Total purged volume (L):			

Water Quality Parameters

	Date	Location ID	QA/QC	Turbidity (NTU) depth to H2O	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity
0850	21/7	GWE		9.397	5.54	533	7.75	150.0	23.0	colourless, clear, no, no sheen
0920	21/7	GWB01	duplicate	10.226	4.70	780	7.14	139.1	23.4	colourless, no, ns, suspended solids
1000	21/7	GWB02		10.064	4.66	785	7.04	134.9	23.7	colourless, no, ns
1040	21/7	GWB03		~~7~~.988	4.48	783	7.13	128.1	24.0	"
1110	21/7	GWB04	lab QC	11.120	4.17	802	7.11	125.1	25.0	"
1135	21/7	GWA		~	4.92	316.3	7.52	115.3	27.1	"
	Acceptable Parameter Range:			± 10%		± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)

Analytes Sampled for:		Bottles Collected						QA/QC Information
Field Filtered:	Unfiltered:		x 40 mL Vial (HCl)		x 60 mL Ferrous		x 60 mL metals (HNO_3)	
			x 40 mL Vial (H_2SO_4)		x 100 mL Amber		x 250 mL Plastic	

Field Comments

Bore volume calculation, bore condition, fate of tubing, redox correction etc.

Approval and Distribution

Fieldwork Staff Signature	21/7 Date	Checker Name and Signature	Date
Project Manager Signature	Date	Distribution: Project Central File	

APPENDIX B HISTORICAL DATA TABLES

All historical data for surface water, groundwater and leachate are presented in the tables below.

Surface water

Concentrations below the laboratory LOR are shown in grey. Hyphens (-) indicate that no trigger values, LOR or units are applicable, or no results available. Concentrations above the trigger value are shown in red.

PARAMETER	UNIT	LOR	TRIGGER VALUE	May 2017		Dec 2020		Mar 2021		Apr 2021		Feb 2023		Mar 2023		Nov 2023		Feb 2024		Jan 2025		Jun 2025	
				SWB	SWC	SWB	SWC	SWB	SWC	SWB	SWC	SWB	SWC	SWB	SWC	SWB	SWC	SWB	SWC	SWB	SWC	SWB	SWC
FIELD MEASUREMENTS																							
pH	0	-	6-8	8.40	8.60	-	-	8.52	8.84	8.42	8.23	7.96	7.9	7.89	8.39	-	-	-	-	6.24	6.63	8.45	8.43
Temperature	-	-	-	-	-	-	-	28.7	28.2	26	26	27.8	29.1	34.1	29.2	-	-	-	-	30.0	30.9	20.7	22.8
Electrical Conductivity (EC)	°C	-	20-250	600	580	-	-	566	561	884	884	145.2	179.4	407	407	-	-	-	-	460	470	653	557
Dissolved Oxygen (DO)	% Sat	-	85-120	-	-	-	-	-	14.1	15.2	15.2	-	8.3	8.3	9.4	-	-	-	-	1.5	5.8	7.08	10.05
MAJOR IONS																							
Potassium (K)		0.5	400	-	-	4.2	5.1	5.7	5.5	3.8	2.9	4.8	4.2	4.6	4.7	-	6.3	8.4	5.6	7.20	6.90	3.90	4.40
Alkalinity (CaCO3)		5	-	-	-	77	81	280	280	370	350	68	74	220	200	-	86	210	230	280	260	340	330
Calcium (Ca)		0.5	400	-	-	19	18	54	53	55	39	16	18	36	35	-	19	43	47	46	45	63	62
Chloride (Cl)	mg/L	1	-	9	9	1	1	8	7	9	9	1.6	1.6	7.6	7.3	-	1.8	6.3	7.1	9	9	10	10
Sodium (Na)		0.5	300	-	-	1.7	1.3	9	8.4	9.4	7.6	0.95	1.2	7.2	6.6	-	1.1	5.00	5.40	8.10	7.60	9.60	8.90
Sulfate (SO4)		1	500	-	-	<1	<1	7	6	4	4	<1	<1	4.3	4.3	-	3.1	1.70	1.90	2	2	3	3
Magnesium (Mg)		0.5	-	-	-	5.5	5.8	31	30	40	30	5.3	5.5	24	23	-	5.8	18	20	31	30	44	44
NUTRIENTS																							
Total Nitrogen (TN)		100	200-300	-	-	600	700	-	-	400	300	-	-	-	-	-	860	440	-	200	200	270	200
Total Phosphorus (TP)		50/10	-	-	-	<50	60	-	-	<50	<50	-	-	-	-	-	41	16	10	60	<50	<0.010	<50
Nitrate (as N)	µg/L	5	-	-	-	<5	<5	-	-	<5	<5	-	-	-	-	-	<5	14	-	250	<5	13.0	<5
Ammonium (NH4)		7	10	-	-	38	82	-	-	-	-	<7	9.6	22	13	-	11	<7	<7	43	<30	<0.0070	<7
Ammonia (as N)		5	10	<5	<5	29	64	-	-	<5	<5	6.1	<5	22	13	-	11	<5	<5	-	-	7	<5
METALS (TOTAL)																							
Cadmium (Cd)		0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	-	-	<0.0001	<0.0001	-	-	-	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium (Cr(III))		0.005	0.0033	-	-	<0.005	<0.005	-	-	<0.005	<0.005	-	-	-	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.0050
Chromium (CrVI)		0.005	0.001	-	-	<0.005	<0.005	-	-	<0.005	<0.005	-	-	-	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.0050
Copper (Cu)		0.001	0.0014	<0.001	<0.001	0.003	0.003	-	-	<0.001	<0.001	-	-	-	-	-	0.0067	0.0023	0.0023	0.002	0.002	<0.001	0.0014
Iron (Fe)		0.01	0.3	-	-	1.9	2	-	-	0.05	0.04	-	-	-	-	-	3.8	1.6	1.6	0.14	0.14	0.13	0.046
Lead (Pb)	mg/L	0.001	0.0034	<0.001	<0.001	<0.001	<0.001	-	-	<0.001	<0.001	-	-	-	-	-	0.0027	<0.001	<0.010	<0.001	<0.010	<0.001	<0.010
Manganese (Mn)		0.005	1.9	-	-	0.025	0.029	-	-	<0.005	<0.005	-	-	-	-	-	0.047	0.027	0.026	0.028	0.013	0.0025	0.0027
Nickel (Ni)		0.001	0.013	<0.001	<0.001	0.001	0.002	-	-	<0.001	<0.001	-	-	-	-	-	0.0035	0.0014	0.014	<0.001	0.001	<0.001	<0.001
Zinc (Zn)		0.001	0.008	0.002	0.001	0.007	0.005	-	-	0.001	0.002	-	-	-	-	-	0.0067	0.0033	0.034	0.005	0.004	0.0041	0.0032
Aluminium (Al)		0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.9	1.0	0.97	0.11	0.12	0.056	0.018
Selenium (Se)		0.001	-	<0.001	<0.001	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
METALS (DISSOLVED)																							
Cadmium (Cd)		0.0001	0.0002	<0.0001	<0.0001	-	<0.0001	-	-	<0.0001	<0.0001	-	-	-	-	-	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.001
Chromium (Cr(III))		0.005	0.0033	-	-	-	<0.005	-	-	<0.005	<0.005	-	-	-	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.0050
Chromium (CrVI)		0.005	0.001	-	-	-	<0.005	-	-	<0.005	<0.005	-	-	-	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.0050
Copper (Cu)		0.001	0.0014	<0.001	<0.001	-	0.002	-	-	<0.001	<0.001	-	-	-	-	-	0.0031	0.0012	0.0011	0.001	0.001	<0.001	<0.001
Iron (Fe)		0.01	0.3	-	-	-	0.03	-	-	<0.01	<0.01	-	-	-	-	-	0.055	<0.010	<0.010	<0.010	<0.001	<0.01	<0.001
Lead (Pb)	mg/L	0.001	0.0034	<0.001	<0.001	-	<0.001	-	-	<0.001	<0.001	-	-	-	-	-	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese (Mn)		0.005	1.9	-	-	-	0.007	-	-	<0.005	<0.005	-	-	-	-	-	0.0022	0.0048	0.0041	0.006	<0.001	0.0010	0.0014
Nickel (Ni)		0.001	0.013	<0.001	<0.001	-	<0.001	-	-	<0.001	<0.001	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc (Zn)		0.001	0.008	0.005	0.006	-	0.002	-	-	0.001	0.001	-	-	-	-	-	<0.001	0.0013	0.0022	0.003	0.003	<0.001	<0.001
Aluminium (Al)		0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.028	<0.010	<0.01	<0.001	<0.01	<0.001	<0.01
Selenium (Se)		0.001	-	<0.001	<0.001	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
OTHER LEACHATE INDICATORS																							
Total Organic Carbon (TOC)		1	-	-	-	11	9	8	8	5	5	10	9.9	5.4	5.5	-	15	6.4	5.5	7	8	2.6	2
Total Dissolved Solids (TDS)		5	-	-	-	86	100	310	310	420	380	150	180	360	420	-	170	220	230	300	290	310	310
Chemical Oxygen Demand (COD)	mg/L	20	-	35	45	<20	<20	<40	<40	<20	<20	43	41	29	32	-	90	21	21	<50	<50	<20	<20
Biological Oxygen Demand (BOD)		5	-	-	-	28	28	20	26	<5	10	28	32	13	9.1	-	13	12.00	8.1	<5	<5	6.7	6.7
Volatile acids as acetic acid (VFA)		5	-	-	-	13	13	-	-	<5	<5	-	-	-	-	-	240	14	21	95	17	14	100
OTHER																							
TRH C6 - C9 Fraction		10	-	-	-	-	-	-	-	<10	<10	-	-	-	-	-	<10	-	-	-	-	-	-
TRH C10-C14 Fraction		50	-	-	-	-	-	-	-	<50	<50	-	-	-	-	-	<50	-	-	-	-	-	-
TRH C15-C28 Fraction		100	-	-	-	-	-	-	-	<100	<100	-	-	-	-	-	<100	-	-	-	-	-	-
TRH C29-C36		100	-	-	-	-	-	-	-	<100	<100	-	-	-	-	-	<100	-	-	-	-	-	-
MTBE		1	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	<1.0	-	-	-	-	-	-
Benzene		1	950	-	-	-	-	-	-	<1	<1	-	-	-	-	-	<1.0	-	-	-	-	-	-
Toluene		1	950	-	-	-	-	-	-	<1	<1	-	-	-	-	-	<1.0	-	-	-	-	-	-
Ethylbenzene		1	950	-	-	-	-	-	-	<1	<1	-	-	-	-	-	<1.0	-	-	-	-	-	-
Xylene (m&p)	µg/L	2	950	-	-	-	-	-	-	<2	<2	-	-	-	-	-	<2.0	-	-	-	-	-	-
Xylene (o)		1	950	-	-	-	-	-	-	<1	<1	-	-	-	-	-	<1.0	-	-	-	-	-	-
Naphthalene		1	950	-	-	-	-	-	-	<1	<1	-	-	-	-	-	<1.0	-	-	-	-	-	-
Aroclor 1016		2	-	-	-	-	-	-	-	<2	<2	-	-	-	-	-	<2.0	-	-	-	-	-	-
Aroclor 1221		2	-	-	-	-	-	-	-	<2	<2	-	-	-	-	-	<2.0	-	-	-	-	-	-
Aroclor 1232		2	-	-	-	-	-	-	-	<2	<2	-	-	-	-	-	<2.0	-	-	-	-	-	-
Aroclor 1242		2	-	-	-	-	-	-	-	<2	<2	-	-	-	-	-	<2.0	-	-	-	-	-	-
Aroclor 1248		2	-	-	-	-	-	-	-	<2	<2	-	-	-	-	-	<2.0	-	-	-	-	-	-
Aroclor 1254		2	-	-	-	-	-	-	-	<2	<2	-	-	-	-	-	<2.0	-	-	-	-	-	-
Aroclor 1260		2	-	-	-	-	-	-	-	<2	<2	-	-	-	-	-	<2.0	-	-	-	-	-	-
PFOS/PFAS (in any form)																							
Perfluorobutanesulfonic acid (PFBS)		0.01	-	-	-	-	-	-	-	<0.01	<0.01	-	-	-	-	-	<0.010	-	-	-	-	-	-
Perfluoropentanesulfonic acid (PFPeS)		0.01	-	-	-	-	-	-	-	<0.01	<0.01	-	-	-	-	-	<0.010	-	-	-	-	-	-
Perfluorohexanesulfonic acid (PFHxS)		0.01	-	-	-	-	-	-	-	<0.01	<0.01	-	-	-	-	-	0.013	-	-	-	-	-	-
Perfluoroheptanesulfonic acid (PFHpS)		0.01	-	-	-	-	-	-	-	<0.01	<0.01	-	-	-	-	-	<0.010	-	-	-	-	-	-
Perfluorooctanesulfonate (PFOS)		0.01	-	-	-	-	-	-	-	<0.01	<0.01	-	-	-	-	-	0.088	-	-	-	-	-	-
Perfluorodecanesulfonic acid (PFDS)		0.02	-	-	-	-	-	-	-	<0.02	<0.02	-	-	-	-	-	<0.020	-	-	-	-	-	-
Perfluorobutanoic acid (PFBA)		0.02	-	-	-	-	-	-	-	<0.02	<0.02	-	-	-	-	-	<0.020	-	-	-	-	-	-
Perfluoropentanoic acid (PFPeA)		0.02	-	-	-	-	-	-	-	<0.02	<0.02	-	-	-	-	-	<0.020	-	-	-	-	-	-
Perfluorohexanoic acid (PFHxA)		0.01	-	-	-	-	-	-	-	<0.01	<0.01	-	-	-	-	-	<0.010	-	-	-	-	-	-
Perfluoroheptanoic acid (PFHpA)		0.01	-	-	-	-	-	-	-	<0.01	<0.01	-	-	-	-	-	<0.010	-	-	-	-	-	-
Perfluorooctanoic acid PFOA		0.01	-	-	-	-	-	-	-	<0.01	<0.01	-	-	-	-	-	<0.010	-	-	-	-	-	-
Perfluorononanoic acid (PFNA)		0.01	-	-	-	-	-	-	-	<0.01	<0.01	-	-	-	-	-	<0.010	-	-	-	-	-	-
Perfluorodecanoic acid (PFDA)	µg/L	0.02	-	-	-	-	-	-	-	<0.02	<0.02	-	-	-	-	-	<0.020	-	-	-	-	-	-
Perfluoroundecanoic acid (PFUnDA)		0.02	-	-	-	-	-	-	-	<0.02	<0.02	-	-	-	-	-	<0.020	-	-	-	-	-	-
Perfluorododecanoic acid (PFDoDA)		0.05	-	-	-	-	-	-	-	<0.05	<0.05	-	-	-	-	-	<0.050	-	-	-	-	-	-
Perfluorotridecanoic acid (PFTrDA)		0.1	-	-	-	-	-	-	-	<0.1	<0.1	-	-	-	-	-	<0.10	-	-	-	-	-	-
Perfluorotetradecanoic acid (PFTeDA)		0.5	-	-	-	-	-	-	-	<0.5	<0.5	-	-	-	-	-	<0.50	-	-	-	-	-	-
4:2 FTS		0.01	-	-	-	-	-	-	-	<0.01	<0.01	-	-	-	-	-	<0.010	-	-	-	-	-	-
6:2 FTS		0.01	-	-	-	-	-	-	-	<0.01	<0.01	-	-	-	-	-	<0.010	-	-	-	-	-	-
8:2 FTS		0.02	-	-	-	-	-	-	-	<0.02	<0.02	-	-	-	-	-	<0.020	-	-	-	-	-	-
10:2 FTS		0.02	-	-	-	-	-	-	-	<0.02	<0.02	-	-	-	-	-	<0.020	-	-	-	-	-	-
Perfluorooctane sulfonamide (FOSA)		0.1	-	-	-	-	-	-	-	<0.1	<0.1	-	-	-	-	-	<0.10	-	-	-	-	-	-
Total Positive PFHxS & PFOS		0.01	-	-	-	-	-	-	-	<0.01	<0.01	-	-	-	-	-	0.01	-	-	-	-	-	-
Total Positive PFOS & PFOA		0.01	-	-	-	-	-	-	-	<0.01	<0.01	-	-	-	-	-	0.088	-	-	-	-	-	-
Total Positive PFAS		0.01	-	-	-	-	-	-	-	<0.01	<0.01	-	-	-	-	-	0.01	-	-	-	-	-	-
PAHs																							
Naphthalene		0.1	16	-	-	-	-	-	-	<0.1	<0.1	-	-	-	-	-	<0.10	-	-	-	-	-	-
Acenaphthylene		0.1	16	-	-	-	-	-	-	<0.1	<0.1	-	-	-	-	-	<0.10	-	-	-	-	-	-
Acenaphthene		0.1	16	-	-	-	-	-	-	<0.1	<0.1	-	-	-	-	-	<0.10	-	-	-	-	-	-
Fluorene		0.1	16	-	-	-	-	-	-	<0.1	<0.1	-	-	-	-	-	<0.10	-	-	-	-	-	-
Phenanthrene		0.1	16	-	-	-	-	-	-	<0.1	<0.1	-	-	-	-	-	<0.10	-	-	-	-	-	-
Anthracene		0.1	16	-	-	-	-	-	-	<0.1	<0.1	-	-	-	-	-	<0.10	-	-	-	-	-	-
Fluoranthene		0.1	16	-	-	-	-	-	-	<0.1	<0.1	-	-	-	-	-	<0.10	-	-	-	-	-	-
Pyrene		0.1	16	-	-	-	-	-	-	<0.1	<0.1	-	-	-	-	-	<0.10	-	-	-	-	-	-
Benzo(a)anthracene	µg/L	0.1	16	-	-	-	-	-	-	<0.1	<0.1	-	-	-	-	-	<0.10	-	-	-	-	-	-
Chrysene		0.1	16	-	-	-	-	-	-	<0.1	<0.1	-	-	-	-	-	<0.10	-	-	-	-	-	-
Benzo(b,j+k)fluoranthene		0.2	16	-	-	-	-	-	-	<0.2	<0.2	-	-	-	-	-	<0.20	-	-	-	-	-	-
Benzo(a)pyrene		0.1	16	-	-	-	-	-	-	<0.1	<0.1	-	-	-	-	-	<0.10	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene		0.1	16	-	-	-	-	-	-	<0.1	<0.1	-	-	-	-	-	<0.10	-	-	-	-	-	-
Dibenzo(a,h)anthracene		0.1	16	-	-	-	-	-	-	<0.1	<0.1	-	-	-	-	-	<0.10	-	-	-	-	-	-
Benzo(g,h,i)perylene		0.1	16	-	-	-	-	-	-	<0.1	<0.1	-	-	-	-	-	<0.10	-	-	-	-	-	-
Benzo(a)pyrene TEQ		0.5	16	-	-	-	-	-	-	<0.5	<0.5	-	-	-	-	-	<0.10	-	-	-	-	-	-
Total positive PAHs		0.1	16	-	-	-	-	-	-	<0.1	<0.1	-	-	-	-	-	<0.10	-	-	-	-	-	-

Groundwater

Standing Water Levels

BORE ID	EASTING	NORTHING	GROUND LEVEL	TOP OF CASING	REEN INTERV	AVERAGE	2018		2019		2020												2021														2022													
	MGA 1994		m AHD		m bgl	mAHD	Jul-18		May-19		Sep-20		Oct-20		Nov-20		Mar-21		Apr-21		May-21		Jun-21		Jul-21		Aug-21		Sep-21		Oct-21		Nov-21		Dec-21		Jan-22		Feb-22		Mar-22		Apr-22		May-22		Jun-22		Aug-22	
							mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD
GWA (RN031131)	202579.77	8394049.598	102.1758	102.6754	28-80	90.0544	-	-	12.621	90.0544	14.07	88.6054	14.072	88.6034	14.07	88.6054	3.45	99.2254	6.2	96.4754	9.32	93.3554	11.2	91.4754	12	90.6754	12.6	90.0754	12.9	89.7754	13.2	89.4754	13.2	89.4754	Not measured		12.1	90.5754	10.23	92.4454	11.6	91.0754	12.7	89.9754	13.1	89.5754	13.33	89.3454	13.65	89.0254
GWE (RN022487)	202293.293	8394238.216	101.7234	102.1464	26.3-33	91.7854	-	-	10.361	91.7854	11.944	90.2024	11.964	90.1824	11.976	90.1704	3.94	98.2064	6.1	96.0464	7.2	94.9464	9.18	92.9664	10	92.1464	10.45	91.6964	10.8	91.3464	11.2	90.9464	11.16	90.9864	11.15	90.9964	10.06	92.0864	8.33	93.8164	9.47	92.6764	10.5	91.6464	11	91.1464	11.27	90.8764	11.58	90.5664
GWB01	202365.993	8394363.648	98.9227	99.6214	6.5-12.5	89.1924	9.945	89.6764	10.913	88.7084	12.103	87.5184	12.106	87.5164	12.154	87.4674	3.45	96.1714	6.05	93.5714	7.9	91.7214	9.7	89.9214	10.4	89.2214	10.8	88.8214	11.1	88.5214	13.22	86.4014	11.43	88.1914	10.48	89.1414	10.7	88.9214	8.43	91.1914	9.83	89.7914	10.9	88.7214	11.3	88.3214	11.58	88.0414	11.69	87.9314
GWB02	202502.446	8394428.951	99.1063	99.7951	8.0-17.0	89.5051	9.727	90.0681	10.853	88.9421	12.287	87.5081	12.283	87.5121	12.332	87.4631	-	-	-	-	7.32	92.4751	9.48	90.3151	10.2	89.5951	10.7	89.0951	11.1	88.6951	11.4	88.3951	11.48	88.3151	11.54	88.2551	10.06	89.7351	8.27	91.5251	9.67	90.1251	10.8	88.9951	11	88.7951	11.68	88.1151	11.87	87.9251
GWB03	202741.518	8394567.78	99.0573	99.6793	5.1-10.1	91.9423	6.655	93.0243	8.819	90.8603	9.724	89.9553	10.795	88.8843	-	-	-	-	-	-	4.16	95.5193	7.3	92.3793	8.3	91.3793	8.77	90.9093	9.1	90.5793	9.6	90.0793	9.94	89.7393	11.41	88.2693	10.05	89.6293	6.63	93.0493	8.01	91.6693	8.9	90.7793	9.3	90.3793	9.7	89.9793	10.65	89.0293
GWB04	202913.846	8394250.261	102.2166	102.863	8.0-17.0	91.545	10.379	92.484	12.257	90.606	13.943	88.9200	13.957	88.906	13.99	88.873	3.82	99.043	6.32	96.543	7.71	95.153	10.5	92.363	11.5	91.363	12.2	90.663	12.6	90.263	12.93	89.933	12.9	89.963	13.6	89.263	11.9	90.963	9.74	93.123	11.17	91.693	12.35	90.513	12.9	89.963	13.2	89.663	13.48	89.383

BORE ID	EASTING	NORTHING	GROUND LEVEL	TOP OF CASING	REEN INTERV	AVERAGE	2023																																										
	MGA 1994		m AHD		m bgl	mAHD	Jan-23		Feb-23		Mar-23		Apr-23		May-23		Mar-24		Apr-24		May-24		Jun-24		Jul-24		Aug-24		Sep-24		Oct-24		Nov-24		Dec-24		Jan-25		Feb-25		Mar-25		Apr-25		May-25		Jun-25		Jul-25	
							mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD	mbTOC	mAHD
GWA (RN031131)	202579.77	8394049.598	102.1758	102.6754	28-80	90.0544	11.47	91.2054	11.69	90.9854	7.42	95.2554	9.47	93.2054	11.65	91.0254	-		-		-		-		-		102.6754		102.6754		102.6754		102.6754		102.6754		102.6754		102.6754		102.6754		102.6754		102.6754		102.6754		
GWE (RN022487)	202293.293	8394238.216	101.7234	102.1464	26.3-33	91.7854	10.46	91.6864	9.54	92.6064	6.5	95.6464	8.1	94.0464	9.52	92.6264	4.5	97.6464	6.13	96.0164	7.8	93.9234	-		10.2	91.5234	10.87	91.2764	11.3	90.8464	11.2	90.9464	11.4	90.7464	10.4	91.7464	8.72	93.4264	7.9	94.2464	6.85	95.2964	10.66	91.4864	9.27	92.8764	8.76	93.3864	9.39	92.7564
GWB01	202365.993	8394363.648	98.9227	99.6214	6.5-12.5	89.1924	10.86	88.7614	9.78	89.8414	5.63	93.9914	8.66	90.9614	Dry		2.45	97.1714	6.4	93.2214	**8.8**	90.1227	10.2	89.4214	11.2	88.4214	11.3	88.3214	11.5	88.1214	11.8	87.8214	11.9	87.7214	11.4	88.2214	8.81	90.8114	6.5	93.1214	7.51	92.1114	10.64	88.9814	9.9	89.7214	7.56	92.0614	10.22	89.4014
GWB02	202502.446	8394428.951	99.1063	99.7951	8.0-17.0	89.5051	10.78	89.0151	9.72	90.0751	5.69	94.1051	8.5	91.2951	9.81	89.9851	2.5	97.2951	6.2	93.5951	8.6	90.5063	8.7	91.0951	10.7	89.0951	7.4	92.3951	11.51	88.2851	11.7	88.0951	12	87.7951	11.1	88.6951	8.12	91.6751	6.5	93.2951	7.17	92.6251	7.99	91.8051	9.75	90.0451	7.41	92.3851	10.08	89.7151
GWB03	202741.518	8394567.78	99.0573	99.6793	5.1-10.1	91.9423	10.70	88.9793	8.84	90.8393	4.24	95.4393	6.26	93.4193	7.86	91.8193	1.82	97.8593	4.8	94.8793	6.16	92.8793	8.2	91.4793	8.9	90.7793	9.2	90.4793	9.71	89.9693	9.8	89.8793	10.3	89.3793	10.6	89.0793	8.2	91.4793	5.3	94.3793	4.97	94.7093	5.87	93.8093	7.89	91.7893	6.64	93.0393	7.98	91.6993
GWB04	202913.846	8394250.261	102.2166	102.863	8.0-17.0	91.545	11.00	91.863	11.37	91.493	7.39	95.473	9.53	93.333	10.94	91.923	4.56	98.303	5.9	96.963	9.18	93.0366	11.4	91.463	12	90.863	12.4	90.463	12.92	89.943	13.2	89.663	13.3	89.563	11.8	91.063	11.4	91.463	8.56	94.303	8.46	94.403	9.11	93.753	10.98	91.883	9.55	93.313	11.12	91.743

Field measurements

Redox only started to be measured in April 2022, as such, the table below only comprises the months since monitoring of this parameter started.

| pH | AVERAGE | 2006 | 2017 | 2018 | 2020 | | | | | 2021 | | | | | | | | | | | | | | | 2022 | | | | | | | | | | | | | | | | | | |

Major ions

| K (mg/L) | AVERAGE | 2006 | 2017 | 2018 | 2020 | | | | | 2021 | | | | |

Nutrients

TN (µg/L)	AVERAGE	2006	2017	2018	2020						2021												2022												2023												2024												2025						
		JUN	MAY	JUL	1-Aug	14-Sep	26-Oct	16-Nov	DEC	17-Mar	29-Apr	18-May	29-Jun	27-Jul	24-Aug	21-Sep	26-Oct	24-Nov	14-Dec	10-Jan	22-Feb	7-Mar	11-Apr	10-May	14-Jun	1-Jul	9-Aug	12-Sep	11-Oct	9-Nov	6-Dec	17-Jan	14-Feb	14-Mar	17-Apr	15-May	1-Jun	1-Jul	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	21-Jan	18-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	415				200		200				100			600			500			600			700					<100			200			680						270					510			780			280			400			540			<100
GWE	339				500		300				300			300			300			100			200					<100			200			420						140					970			280			760			2400			8600			1400
GWB01	2532					1900	2000				1700			4900						7500			1500								2100			920									1200		1600			4300			4200			1100			1500			2100
GWB02	957					<100	100					1100		600			600			600			1500					380			160			1600						1400			2600		840			240			410			100			2400			<100
GWB03	3440											1900		7100			4100			1000			5300											4200						3200					720			2200			370			1800			780			1200
GWB04	2569					200	300				4000			2800			2800			2300			1300					2800			2700			3200						3200			3900		3900			2300			4300			2400			3400			2900

TP (µg/L)	AVERAGE	2006	2017	2018	2020						2021												2022												2023												2024												2025						
		JUN	MAY	JUL	AUG	14-Sep	26-Oct	16-Nov	20-Dec	17-Mar	29-Apr	18-May	29-Jun	27-Jul	24-Aug	21-Sep	26-Oct	24-Nov	14-Dec	10-Jan	22-Feb	7-Mar	11-Apr	10-May	14-Jun	1-Jul	9-Aug	12-Sep	11-Oct	9-Nov	6-Dec	17-Jan	14-Feb	14-Mar	17-Apr	15-May	1-Jun	1-Jul	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	21-Jan	18-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	57			<50	<50		<50				<50			<50			<50			<50			<50					<10			<10			<10						<10			57		<10			<10			<10			<50			<0.010			<50
GWE	24			<50	<50		<50				<50			<50			<50			<50			<50					<10			<10			<10						<10			<10		24			<10			18			80			180			60
GWB01	60			<50		<50	<50				<50			<50						<50			110					20			<50			<10											49			25			32			<50			<0.010			<50
GWB02	50			<50		<50	<50					<50		<50			80			<50			<50					20			<10			<10						65			<10		33			<10			11			<50			17			<50
GWB03	317			60								<50		<50			140			750			370											33						810			<10		59			58			360			<50			<0.010			<50
GWB04	92			<50	<50		<50				<50			<50			<50			<50			<50					<10			<10			<10						23			<10		160			<10			<10			<50			<0.010			<50

NO3-N (µg/L)	AVERAGE	2006	2017	2018	2020						2021												2022												2023												2024												2025						
		JUN	MAY	JUL	AUG	14-Sep	26-Oct	16-Nov	20-Dec	17-Mar	29-Apr	18-May	29-Jun	27-Jul	24-Aug	21-Sep	26-Oct	24-Nov	14-Dec	10-Jan	22-Feb	7-Mar	11-Apr	10-May	14-Jun	1-Jul	9-Aug	12-Sep	11-Oct	9-Nov	6-Dec	17-Jan	14-Feb	14-Mar	17-Apr	15-May	1-Jun	1-Jul	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	21-Jan	18-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	293			270	130		100				8			450			340			470			540					37			190			720						<5					260			370			96			390			89			20
GWE	93			7			17				100			<5			9			9			77					32			7			77						31					640			170			100			84			1200			30
GWB01	917			220		18	13				1300			17						5400			12								620			780											790			10			6			330			48			30
GWB02	648			94		<5	<5					630		150			32			320			1200					200			20			1800						<5			2300		380			120			39			87			1200			78
GWB03	2514			47								1900		6400			3600			300			5100											1800						2800					680			1800			32			1500			83			1200
GWB04	2705			150		160	160				3800			2400			2600			2100			1200					10000			2500			3200						<5			3800		3100			1800			3800			3300			3000			2800

NH4 (µg/L)	AVERAGE	2006	2017	2018	2020						2021												2022												2023												2024												2025						
		JUN	MAY	JUL	1-Aug	14-Sep	26-Oct	16-Nov	1-Dec	17-Mar	29-Apr	18-May	29-Jun	27-Jul	24-Aug	21-Sep	26-Oct	24-Nov	14-Dec	10-Jan	22-Feb	7-Mar	11-Apr	10-May	14-Jun	1-Jul	9-Aug	12-Sep	11-Oct	9-Nov	6-Dec	17-Jan	14-Feb	14-Mar	17-Apr	15-May	1-Jun	1-Jul	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	21-Jan	18-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	25		<5	<5	<7			<7	<7				17			10		<7	63		55	17	<7	10	<7		9	45	11	<7	<7	<7		11	<7					31	<7	<7	<7	<7	<7	8	8	20	130	<7	8	17	24	<0.0070	12	<0.0070	15	<5
GWE	93				370			49					29			110		11	150		83	42	120	100	150		190	220	11	63		79	54	9	<7						22	58	110	<7	<7	<7	17	29	57	63	66	140	21	140	2200	1700	1600	1000	1800	2800	1300
GWB01	1870			2900									3500			6100		5400	4000		740	380	1100	1200	1900		2100	1600		2000		990	110	8	<7						1300	45	160		<7		2100	2700	1700	2900	1100	2000	2000	730	320	220	840	910	840	1900
GWB02	163			1000				<7				71	8			800		<7	51	<7	<7	<7	<7	<7	10		10	42	21	<7	<7	<7	<7	<7	<7	<7					29	24	<7	39	16	<7		<7	9	14	17	920	14	8	11	22	10	510	26	17	10
GWB03	59			360						<7	<7		<7			13		26	42		<7	<7	8	27	34		44				<7	<7	<7	<7	<7	<7					15	<7	18	<7	<7		21	7	<7	16	420	24	17	33	15	10	<0.0070	<0.0070	18	<5
GWB04	33			130				<7					<7			13		9	64		18	7	<7	9	13		13	37	9	<7	<7	<7	<7	<7	<7					100	<7	<7	<7	<7	<7	8	<7	7	<7	10	1100	8	8	16	20	30	<0.0070	<0.0070	20	<5

NH3-N (µg/L)	AVERAGE	2006	2017	2018	2020						2021												2022												2023												2024												2025						
		JUN	MAY	JUL	1-Aug	14-Sep	26-Oct	16-Nov	20-Dec	17-Mar	29-Apr	18-May	29-Jun	27-Jul	24-Aug	21-Sep	26-Oct	24-Nov	14-Dec	10-Jan	22-Feb	7-Mar	11-Apr	10-May	14-Jun	1-Jul	9-Aug	12-Sep	11-Oct	9-Nov	6-Dec	17-Jan	14-Feb	14-Mar	17-Apr	15-May	1-Jun	1-Jul	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	21-Jan	18-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	19			<0.005	<5	<5	<5	<5		<5	20		13	7		7	11	<5	49	11	42	24	<5	10	<5		9	45	11	<5	<5	<5		11	6	<5				31	<5	<5	<5	<5	<5	<5	8	8	20		<5	8		24	<0.0050	12	6	15	<5
GWE	79				340	49	38			<5	<5		23	53		83	44	9	110	35	65	81	90	120	120		190	220	11	63		79	79	9	<5	10				22	58	110	<5	<5	<5	17	29	57	63	66		21	150		1700	2800	1100	1800	3000	1300
GWB01	1470			0	1500	1700				<5	11		2700	3800		4700		4200	3100	1300	570	560	850	1200	1500		2100	1600		2000		990	130	8	<5						1300	45	160		<5	730	2100	2700	1700	2900		2000	2200		320	300	840	910	840	1900
GWB02	58			0	<5	<5	<5					55	6	9		620	35	<5	40	28	<5	<5	<5	5	7		10	42	21	<5	<5	<5	<5	<5	<5	<5				29	24	<5	39	16	<5	<5	<5	9	14	17		14	8		22	10	510	26	17	10
GWB03	20			0						<5	<5	<5	<5	7		10	16	20	33	49	<5	<5	6	35	26		44			<5	<5	<5	<5	<5	<5	<5				15	<5	18	<5	<5	7	21	7	<5	16		24	17		15	10	<0.0050	<0.0050	18	<5
GWB04	20			0	<5	<5	<5			<5	<5		<5	10		10	<5	7	50	7	14	8	<5	12	10		13	37	9	<5	<5	<5	<5	<5	<5	<5				100	<5	<5	<5	<5	<5	8	<5	7	<5	14		8	8		29	30	<0.0050	<0.0050	20	<5

Metals Dissolved

| Cd (mg/L) | AVERAGE | 2006 | 2017 | 2018 | 2020 | | | | | 2021 | | | | | | | | | | 2022 | | | | | | | | | |

Other leachate

| TOC (mg/L) | AVERAGE | 2006 | 2017 | 2018 | 2020 | | | | | | | 2021 | | | | | | | | | | | | | | | | | | | | | | | | | 2022 | | | | | | | | | | | | | | | | | | | | | | | | | 2023 | | | | | | | | | | | | | | | | | | | | | | | | | 2024 | | | | | | | | | | | | | | | | | | | | | | | | | 2025 | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---

TRH, PAH, BTEXN and PCB

| TRH C6-C9 (µg/L) | AVERAGE | 2006 | 2017 | 2018 | 2020 | | | | | 2021 | | | | | | | | | | | | | | | | 2022 | | | | | | | | | | | | | | | | | | | | | | | | 2023 | | | | | | | | | | | | | | | | | | | | | | | | 2024 | | | | | | | | | | | | | | | | | | | | | | | | 2025 | | | | | | |
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PFAS

PFBS (mg/L)	AVERAGE	2006	2017	2018	2020						2021												2022												2023												2024												2025						
		JUN	MAY	JUL	1-Aug	14-Sep	26-Oct	16-Nov	Dec-20	17-Mar	29-Apr	18-May	29-Jun	27-Jul	24-Aug	21-Sep	26-Oct	24-Nov	14-Dec	10-Jan	22-Feb	7-Mar	11-Apr	10-May	14-Jun	1-Jul	9-Aug	12-Sep	11-Oct	9-Nov	6-Dec	17-Jan	14-Feb	14-Mar	17-Apr	15-May	1-Jun	1-Jul	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	21-Jan	18-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	N/A				<0.01	<0.01	<0.01				<0.01			<0.01			<0.01			<0.01			<0.01					<0.01			<0.01			<0.01					<0.01			<0.010			<0.010					<0.010			<0.010			<0.01			<0.01			<0.01
GWE	0.03				<0.01		<0.01				<0.01			<0.01			0.03			<0.01			<0.01					<0.01			<0.01			<0.01					<0.01			<0.010			<0.010					<0.010			<0.010		0.02			<0.01			<0.01
GW001	0.09					0.05	0.04				0.10			0.10						0.10			0.15					0.09			0.10			0.15					0.09			0.10			0.06					0.07			0.10			0.06			0.07
GW002	0.10					<0.01	0.02					0.18		0.15			0.12			0.14			0.12					0.04			0.08			0.10					0.03			0.11			0.14					0.13			0.07			0.11			0.06			0.06
GW003	0.02					<0.01	<0.01				<0.01			<0.01			<0.01			<0.01			<0.01					<0.01			<0.01			<0.01					<0.01			<0.010			<0.010					<0.010			0.02			<0.01			<0.01
GW004	N/A					<0.01	<0.01				<0.01			<0.01			<0.01			<0.01			<0.01					<0.01			<0.01			<0.01					<0.01			<0.010			<0.010					<0.010			<0.010			<0.01			<0.01

PFPeS (mg/L)	AVERAGE	2006	2017	2018	2020						2021												2022												2023												2024												2025						
		JUN	MAY	JUL	1-Aug	14-Sep	26-Oct	16-Nov	Dec-20	17-Mar	29-Apr	18-May	29-Jun	27-Jul	24-Aug	21-Sep	26-Oct	24-Nov	14-Dec	10-Jan	22-Feb	7-Mar	11-Apr	10-May	14-Jun	1-Jul	9-Aug	12-Sep	11-Oct	9-Nov	6-Dec	17-Jan	14-Feb	14-Mar	17-Apr	15-May	1-Jun	1-Jul	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	21-Jan	18-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	N/A				<0.01	<0.01	<0.01				<0.01			<0.01			<0.01			<0.01			<0.01					<0.01			<0.01			<0.01					<0.01			<0.010			<0.010					<0.010			<0.010			<0.01			<0.01			<0.01
GWE	0.01				<0.01		<0.01				<0.01			<0.01			<0.01			<0.01			<0.01					<0.01			<0.01			<0.01					<0.01			<0.010			<0.010					<0.010			<0.010		0.01			<0.01			<0.01
GW001	0.06					0.04	0.03				0.07			0.08						0.08			0.08					0.09			0.05			0.14					0.08			0.09			0.05					0.03			0.04			0.06			0.04
GW002	0.06					<0.01	0.02					0.14		0.10			0.07			0.09			0.08					0.09			0.05			0.08					0.02			0.06			0.07					0.06			0.04			0.06			0.04
GW003	0.01					<0.01	<0.01				<0.01			<0.01			<0.01			<0.01			<0.01					<0.01			<0.01			<0.01					<0.01			<0.010			<0.010					<0.010			<0.010			<0.01			<0.01			<0.01
GW004	N/A					<0.01	<0.01				<0.01			<0.01			<0.01			<0.01			<0.01					<0.01			<0.01			<0.01					<0.01			<0.010			<0.010					<0.010			<0.010			<0.01			<0.01			<0.01

PFHxS (mg/L)	AVERAGE	2006	2017	2018	2020						2021												2022												2023												2024												2025						
		JUN	MAY	JUL	1-Aug	14-Sep	26-Oct	16-Nov	Dec-20	17-Mar	29-Apr	18-May	29-Jun	27-Jul	24-Aug	21-Sep	26-Oct	24-Nov	14-Dec	10-Jan	22-Feb	7-Mar	11-Apr	10-May	14-Jun	1-Jul	9-Aug	12-Sep	11-Oct	9-Nov	6-Dec	17-Jan	14-Feb	14-Mar	17-Apr	15-May	1-Jun	1-Jul	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	21-Jan	18-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	0.02		0.04		<0.01		<0.01				<0.01			0.03			<0.01			0.02			0.02					<0.01			0.03			0.04					0.03			0.03			0.02					0.02			0.02			0.02			0.03			0.02
GWE	0.03			0.03		0.04					<0.01			0.01			0.04			<0.01			0.03					<0.01			0.01			0.01					0.01			0.01			0.01					0.01			0.02			0.09			0.01			0.01
GW001	0.59				0.19	0.17				0.58			1.10						0.62			0.83					0.57			1.20			0.57					1.60			0.59			0.27					0.43			1.60			0.41			0.34
GW002	0.29				0.04	0.06						0.57		0.49			0.28			0.48			0.42					0.15			0.20			0.35					0.07			0.39			0.35					0.48			0.21			0.34			0.19			0.21
GW003	0.03											0.02		<0.01			<0.01			<0.01			<0.01					<0.01			0.01			<0.01					<0.01			<0.010			0.03					0.06			<0.01			<0.01			<0.01
GW004	0.01					<0.01	<0.01				<0.01			0.01			<0.01			<0.01			<0.01					<0.01			<0.01			<0.01					<0.01			<0.010			<0.010					<0.010			<0.010			<0.01			<0.01			<0.01

PFHpS (mg/L)	AVERAGE	2006	2017	2018	2020						2021												2022												2023												2024												2025						
		JUN	MAY	JUL	1-Aug	14-Sep	26-Oct	16-Nov	Dec-20	17-Mar	29-Apr	18-May	29-Jun	27-Jul	24-Aug	21-Sep	26-Oct	24-Nov	14-Dec	10-Jan	22-Feb	7-Mar	11-Apr	10-May	14-Jun	1-Jul	9-Aug	12-Sep	11-Oct	9-Nov	6-Dec	17-Jan	14-Feb	14-Mar	17-Apr	15-May	1-Jun	1-Jul	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	21-Jan	18-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	N/A				<0.01		<0.01				<0.01			<0.01			<0.01			<0.01			<0.01					<0.01			<0.01			<0.01					<0.01			<0.010			<0.010					<0.010			<0.010			<0.01			<0.01			<0.01
GWE	N/A				<0.01		<0.01				<0.01			<0.01			<0.01			<0.01			<0.01					<0.01			<0.01			<0.01					<0.01			<0.010			<0.010					<0.010			<0.010			<0.01			<0.01			<0.01
GW001	0.05				0.01	0.01				0.04			0.10						0.04			0.06					0.03			0.08			0.03					0.11			0.05			0.03					0.03			0.03			0.03			0.03
GW002	0.04										0.07		0.06			0.05			0.06			0.06					0.02			0.03			0.05					0.04			0.06			0.03					0.04			0.02			0.04			0.02			0.02
GW003	0.01					<0.01	<0.01				<0.01			<0.01			<0.01			<0.01			<0.01					<0.01			<0.01			<0.01					<0.01			<0.010			<0.010					<0.010			<0.010			<0.01			<0.01			<0.01
GW004	N/A					<0.01	<0.01				<0.01			<0.01			<0.01			<0.01			<0.01					<0.01			<0.01			<0.01					<0.01			<0.010			<0.010					<0.010			<0.010			<0.01			<0.01			<0.01

PFOS (mg/L)	AVERAGE	2006	2017	2018	2020						2021												2022												2023												2024												2025						
		JUN	MAY	JUL	1-Aug	14-Sep	26-Oct	16-Nov	Dec-20	17-Mar	29-Apr	18-May	29-Jun	27-Jul	24-Aug	21-Sep	26-Oct	24-Nov	14-Dec	10-Jan	22-Feb	7-Mar	11-Apr	10-May	14-Jun	1-Jul	9-Aug	12-Sep	11-Oct	9-Nov	6-Dec	17-Jan	14-Feb	14-Mar	17-Apr	15-May	1-Jun	1-Jul	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	21-Jan	18-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	0.04		0.09		<0.01		<0.01				<0.01			0.05			<0.01			<0.01			0.03					<0.01			0.01			0.05					0.01			0.03			0.01					0.04			0.04			0.04			0.04			0.04
GWE	0.05			0.06		0.06					<0.01			0.04			0.12			<0.01			0.02					0.02			0.08			0.01					0.01			0.02			0.03					0.04			0.02		0.22			0.04			0.02
GW001	1.22				0.24	0.23				1.20			2.30						0.90			1.40					0.48			1.60			1.20					1.60			1.70			1.00					0.70			1.10			1.10			1.10
GW002	0.42				0.04	0.04						0.69		0.45			0.51			0.69			0.59					0.18			0.22			0.37					0.08			0.67			0.45					0.93			0.41			0.55			0.37			0.29
GW003	0.04											0.03		0.01			<0.01			<0.01			<0.01					<0.01			<0.01			0.02					0.02			0.02			0.02					0.02			0.13			<0.01			0.02			<0.01
GW004	0.03					<0.01	<0.01				<0.01			0.04			<0.01			<0.01			<0.01					<0.01			<0.01			<0.01					<0.01			<0.010			<0.010					<0.010			<0.010			<0.01			<0.01			<0.01

PFDS (mg/L)	AVERAGE	2006	2017	2018	2020						2021												2022												2023												2024												2025						
		JUN	MAY	JUL	1-Aug	14-Sep	26-Oct	16-Nov	Dec-20	17-Mar	29-Apr	18-May	29-Jun	27-Jul	24-Aug	21-Sep	26-Oct	24-Nov	14-Dec	10-Jan	22-Feb	7-Mar	11-Apr	10-May	14-Jun	1-Jul	9-Aug	12-Sep	11-Oct	9-Nov	6-Dec	17-Jan	14-Feb	14-Mar	17-Apr	15-May	1-Jun	1-Jul	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	21-Jan	18-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	N/A				<0.02		<0.02				<0.02			<0.02			<0.02			<0.02			<0.02					<0.02			<0.02			<0.02					<0.02			<0.020			<0.020					<0.020			<0.020			<0.02			<0.02			<0.02
GWE	N/A				<0.02		<0.02				<0.02			<0.02			<0.02			<0.02			<0.02					<0.02			<0.02			<0.02					<0.02			<0.020			<0.020					<0.020			<0.020			<0.02			<0.02			<0.02
GW001	N/A					<0.02	<0.02				<0.02			<0.02						<0.02			<0.02					<0.02			<0.02			<0.02					<0.02			<0.020			<0.020					<0.020			<0.020			<0.02			<0.02			<0.02
GW002	N/A					<0.02	<0.02					<0.02		<0.02			<0.02			<0.02			<0.02					<0.02			<0.02			<0.02					<0.02			<0.020			<0.020					<0.020			<0.020			<0.02			<0.02			<0.02
GW003	N/A											<0.02		<0.02			<0.02			<0.02			<0.02					<0.02			<0.02			<0.02					<0.02			<0.020			<0.020					<0.020			<0.020			<0.02			<0.02			<0.02
GW004	N/A					<0.02	<0.02				<0.02			<0.02			<0.02			<0.02			<0.02					<0.02			<0.02			<0.02					<0.02			<0.020			<0.020					<0.020			<0.020			<0.02			<0.02			<0.02

PFBA (mg/L)	AVERAGE	2006	2017	2018	2020						2021												2022												2023												2024												2025						
		JUN	MAY	JUL	1-Aug	14-Sep	26-Oct	16-Nov	Dec-20	17-Mar	29-Apr	18-May	29-Jun	27-Jul	24-Aug	21-Sep	26-Oct	24-Nov	14-Dec	10-Jan	22-Feb	7-Mar	11-Apr	10-May	14-Jun	1-Jul	9-Aug	12-Sep	11-Oct	9-Nov	6-Dec	17-Jan	14-Feb	14-Mar	17-Apr	15-May	1-Jun	1-Jul	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	21-Jan	18-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	0.11			0.03		0.03					<0.02			0.20			<0.02			0.20			0.20					<0.02			0.10			<0.02					0.12			0.02			0.13			0.11			0.03			0.16			0.10
GWE	N/A			<0.02		<0.02					<0.02			<0.02			<0.02			<0.02			<0.02					<0.02			<0.02			<0.02					<0.02			<0.020			<0.020					<0.020			<0.020			<0.02			<0.02			<0.02
GW001	0.08				0.05	0.05				0.06			0.10						0.08			0.10					0.07			0.16			0.07					0.14			0.08			0.06					0.05			0.06			0.06			0.06
GW002	0.08					0.02						0.10		0.10			0.10			0.10			0.10					0.05			0.07			0.07					0.03			0.09			0.10					0.12			0.06			0.08			0.04			0.04
GW003	N/A											<0.02		<0.02			<0.02			<0.02			<0.02					<0.02			<0.02			<0.02					<0.02			<0.020			<0.020					<0.020			<0.020			<0.02			<0.02			<0.02
GW004	N/A					<0.02	<0.02				<0.02			<0.02			<0.02			<0.02			<0.02					<0.02			<0.02			<0.02					<0.02			<0.020			<0.020					<0.020			<0.020			<0.02			<0.02			<0.02

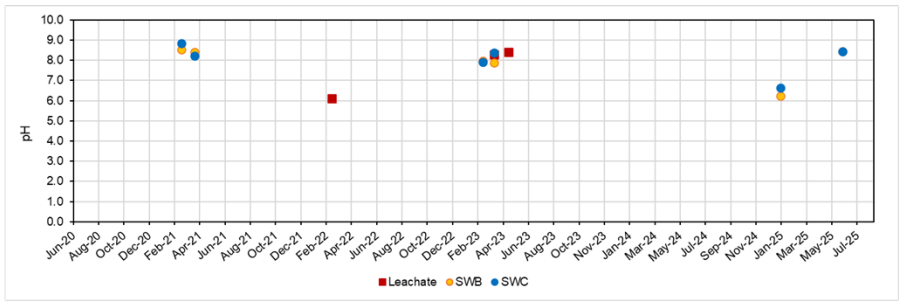
PFPeA (mg/L)	AVERAGE	2006	2017	2018	2020						2021												2022												2023												2024												2025						
		JUN	MAY	JUL	1-Aug	14-Sep	26-Oct	16-Nov	Dec-20	17-Mar	29-Apr	18-May	29-Jun	27-Jul	24-Aug	21-Sep	26-Oct	24-Nov	14-Dec	10-Jan	22-Feb	7-Mar	11-Apr	10-May	14-Jun	1-Jul	9-Aug	12-Sep	11-Oct	9-Nov	6-Dec	17-Jan	14-Feb	14-Mar	17-Apr	15-May	1-Jun	1-Jul	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	21-Jan	18-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	0.17			0.05		0.05					0.04			0.31			0.03			0.32			0.35					<0.02			0.20			<0.02					0.21			0.04			0.22			0.20			0.06			0.24			0.21
GWE	N/A			<0.02		<0.02					<0.02			<0.02			<0.02			<0.02			<0.02					<0.02			<0.02			<0.02					<0.02			<0.020			<0.020					<0.020			<0.020			<0.02			<0.02			<0.02
GW001	0.07				0.04	0.03				0.07			0.09						0.05			0.06					0.05			0.11			0.04					0.17			0.10			0.07					0.05			0.07			0.10			0.07
GW002	0.09					<0.02	<0.02					0.20		0.10			0.10			0.10			0.10					0.04			0.06			0.05					0.02			0.09			0.15					0.11			0.06			0.09			0.05			0.06
GW003	N/A											<0.02		<0.02			<0.02			<0.02			<0.02					<0.02			<0.02			<0.02					<0.02			<0.020			<0.020					<0.020			<0.020			<0.02			<0.02			<0.02
GW004	N/A					<0.02	<0.02				<0.02			<0.02			<0.02			<0.02			<0.02					<0.02			<0.02			<0.02					<0.02			<0.020			<0.020					<0.020			<0.020			<0.02			<0.02			<0.02

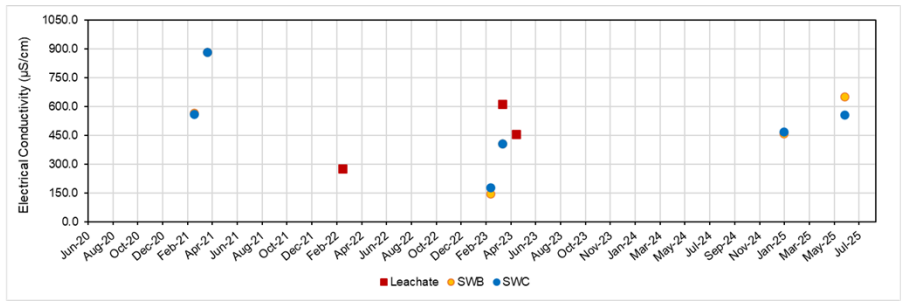
PFHxA (mg/L)	AVERAGE	2006	2017	2018	2020						2021												2022												2023												2024												2025						
		JUN	MAY	JUL	1-Aug	14-Sep	26-Oct	16-Nov	Dec-20	17-Mar	29-Apr	18-May	29-Jun	27-Jul	24-Aug	21-Sep	26-Oct	24-Nov	14-Dec	10-Jan	22-Feb	7-Mar	11-Apr	10-May	14-Jun	1-Jul	9-Aug	12-Sep	11-Oct	9-Nov	6-Dec	17-Jan	14-Feb	14-Mar	17-Apr	15-May	1-Jun	1-Jul	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	21-Jan	18-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	0.09			0.03		0.02					0.14			0.01			<0.02			0.15			0.16					<0.02			0.09			<0.02					0.11			0.02			0.10			0.11			0.03			0.13			0.12
GWE	0.02			<0.02		<0.02					<0.02			0.03			<0.02			<0.02			<0.02					<0.02			<0.02			<0.02					<0.02			<0.020			<0.020					<0.020			<0.020		0.01			<0.02			<0.02
GW001	0.12				0.06	0.06				0.14			0.23						0.11			0.14					0.09			0.17			0.07					0.26			0.15			0.10					0.07			0.10			0.12			0.10
GW002	0.17				0.02	0.04						0.36		0.34			0.25			0.29			0.26					0.09			0.13			0.10					0.05			0.17			0.24			0.23			0.12			0.17			0.08			0.11
GW003	0.04											<0.02		<0.02			<0.02			<0.02			<0.02					<0.02			<0.02			<0.02					<0.02			<0.020			<0.020					<0.020			<0.020			<0.02			<0.02			<0.02
GW004	N/A					<0.02	<0.02				<0.02			<0.02			<0.02			<0.02			<0.02					<0.02			<0.02			<0.02					<0.02			<0.020			<0.020					<0.020			<0.020			<0.02			<0.02			<0.02

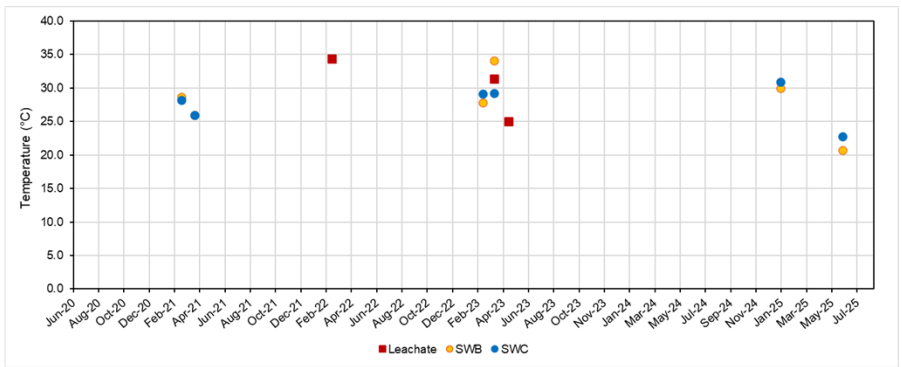
PFHpA (mg/L)	AVERAGE	2006	2017	2018	2020						2021												2022												2023												2024												2025						
		JUN	MAY	JUL	1-Aug	14-Sep	26-Oct	16-Nov	Dec-20	17-Mar	29-Apr	18-May	29-Jun	27-Jul	24-Aug	21-Sep	26-Oct	24-Nov	14-Dec	10-Jan	22-Feb	7-Mar	11-Apr	10-May	14-Jun	1-Jul	9-Aug	12-Sep	11-Oct	9-Nov	6-Dec	17-Jan	14-Feb	14-Mar	17-Apr	15-May	1-Jun	1-Jul	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	21-Jan	18-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul	1-Aug	1-Sep	1-Oct	27-Nov	17-Dec	27-Jan	23-Feb	17-Mar	21-Apr	26-May	23-Jun	28-Jul
GWA	0.07			0.01		0.01					0.09			0.08			<0.02			0.10			0.06					<0.02			0.08			<0.02					0.08			0.02			0.09			0.09			0.02			0.11			0.10
GWE	0.02			<0.02		<0.02					<0.02			0.01			<0.02			<0.02			<0.02					<0.02			<0.02			<0.02					<0.02			<0.020			<0.020					<0.020			<0.020			<0.02			<0.02			<0.02
GW001	0.06				0.03	0.03				0.07			0.09						0.05			0.05					0.04			0.11			0.03					0.11			0.07			0.04					0.03			0.04			0.03			0.04
GW002	0.06					0.01	0.01					0.13		0.11			0.09			0.09			0.09					0.03			0.04			0.02					0.09			0.07			0.08					0.09			0.04			0.06			0.03			0.04
GW003	0.01											<0.02		<0.02			<0.02			<0.02			<0.02					<0.02			<0.02			<0.02					<0.02			<0.020			<0.020					<0.020			<0.020			<0.02			<0.02			<0.02
GW004	N/A					<0.02	<0.02				<0.02			<0.02

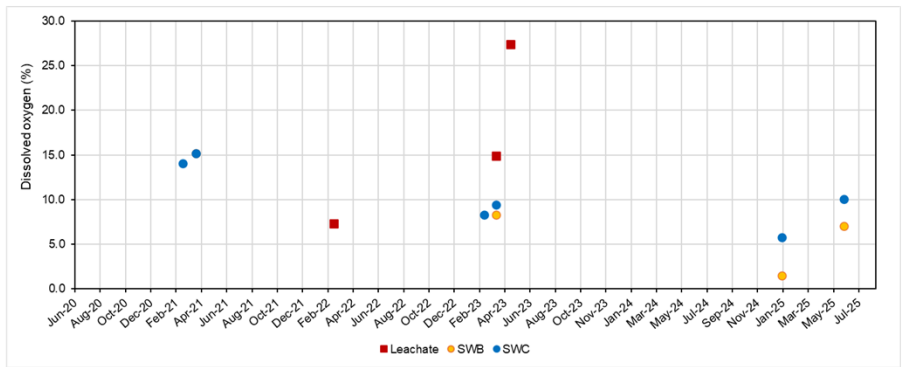
APPENDIX C HISTORICAL DATA GRAPHS

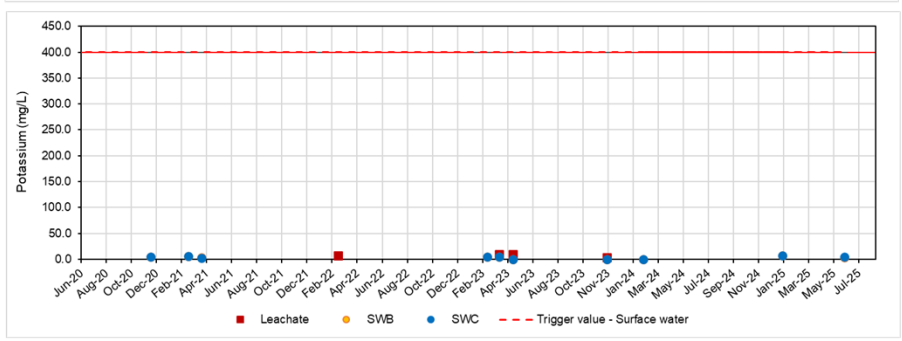
Surface water and leachate

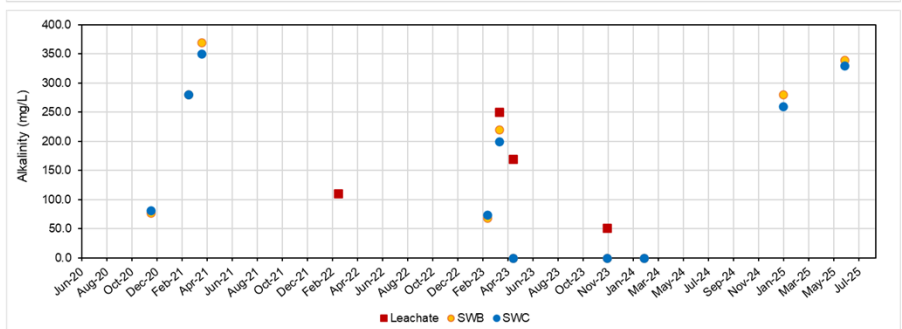


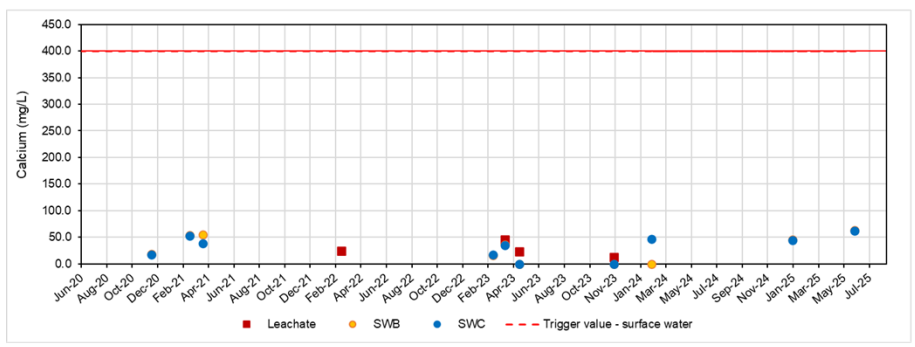


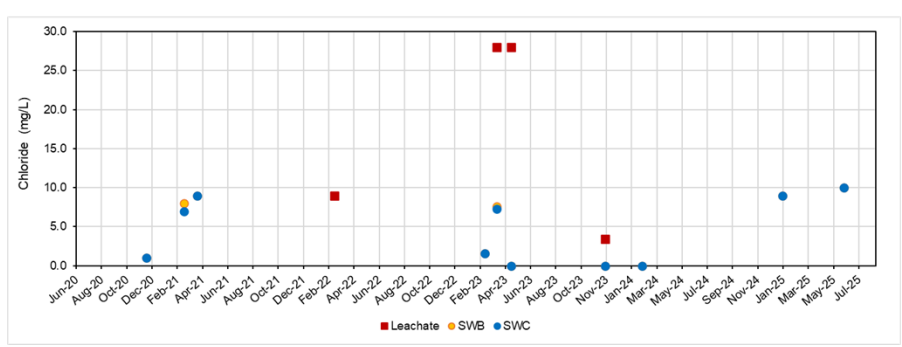


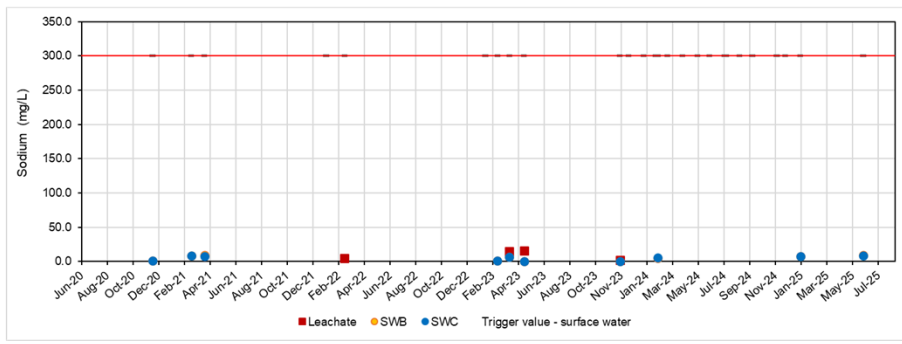


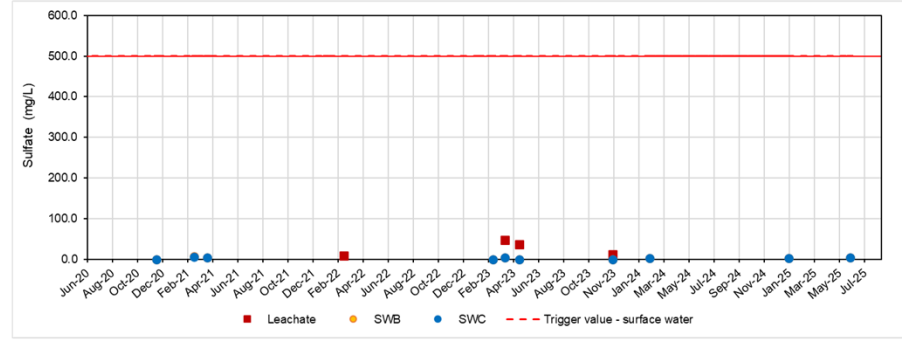


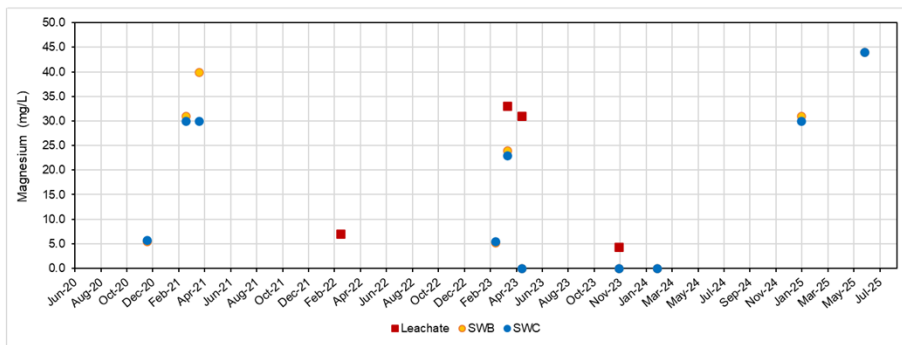


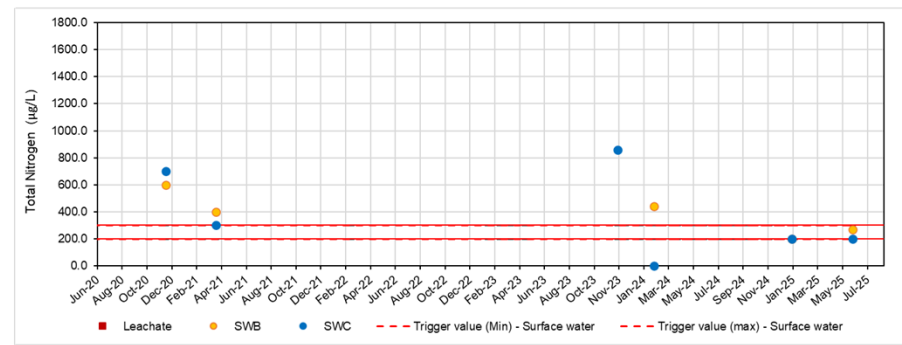


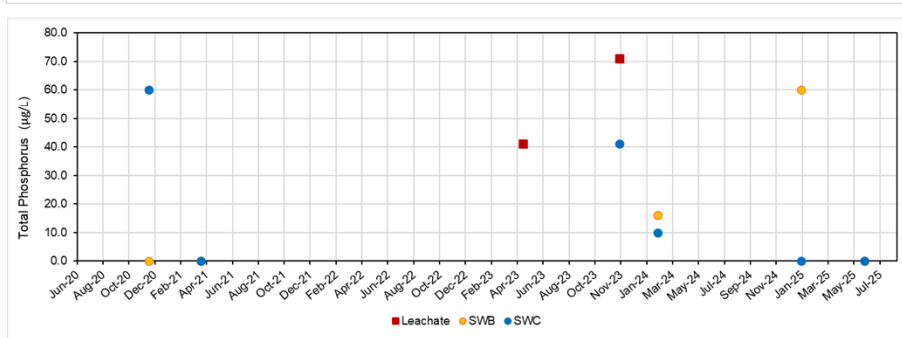


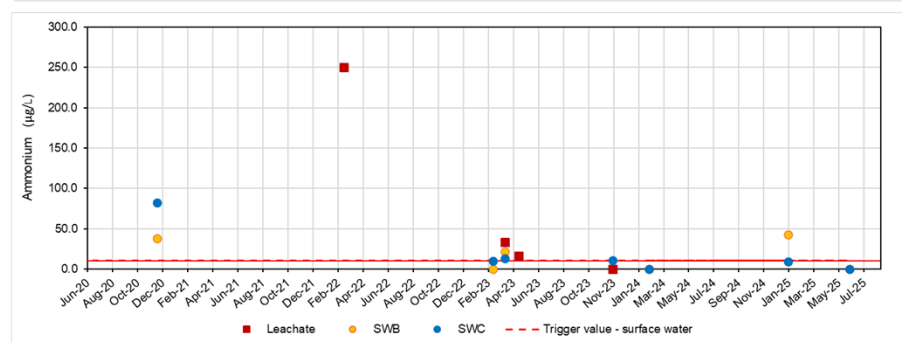


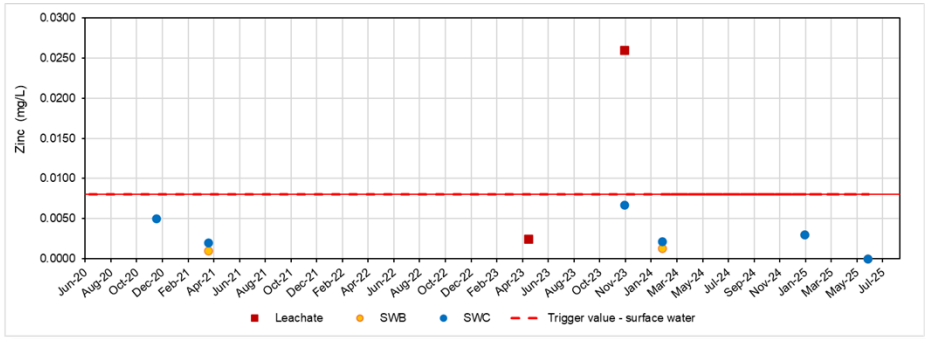


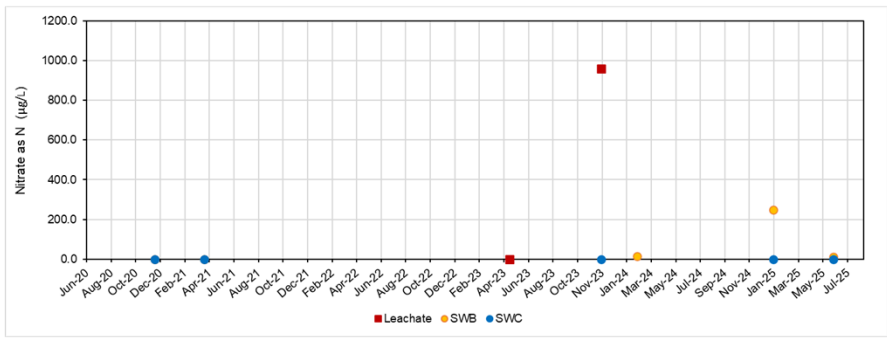


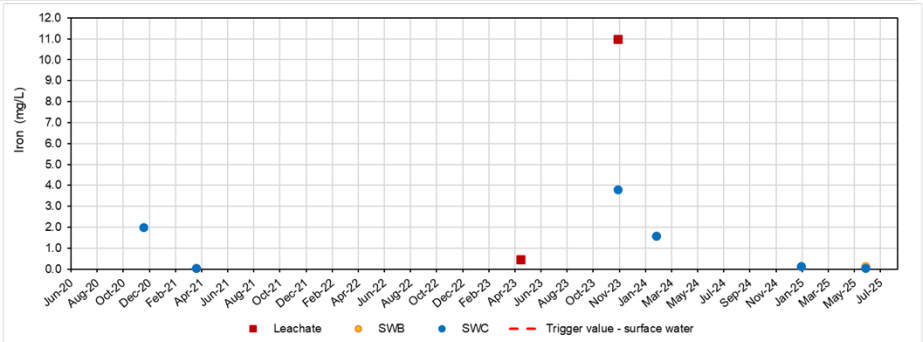


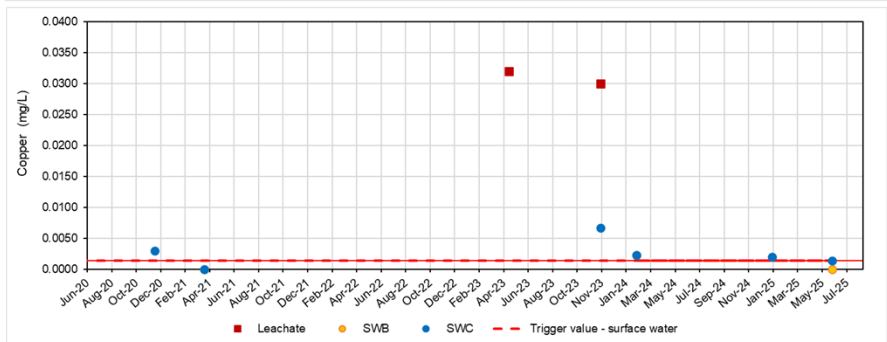


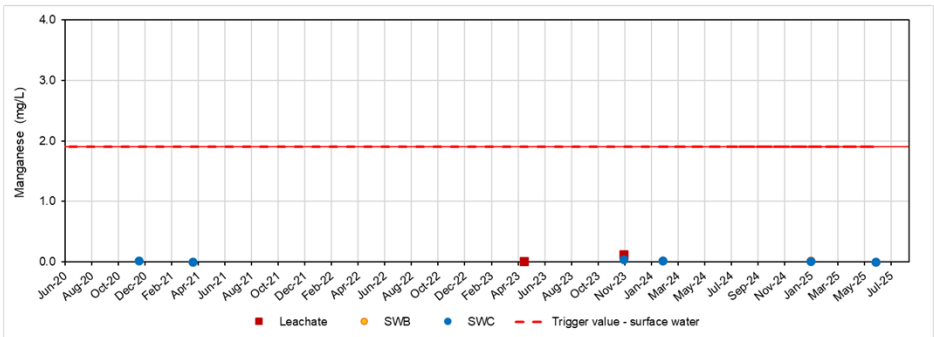


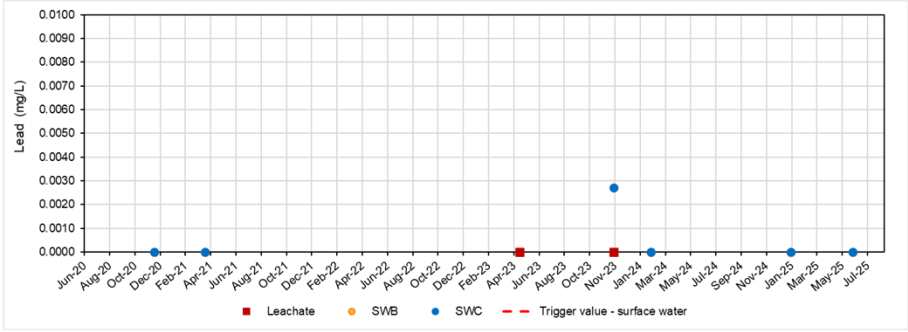

Zinc (mg/L)
Leachate
SWB
SWC
Trigger value - surface water

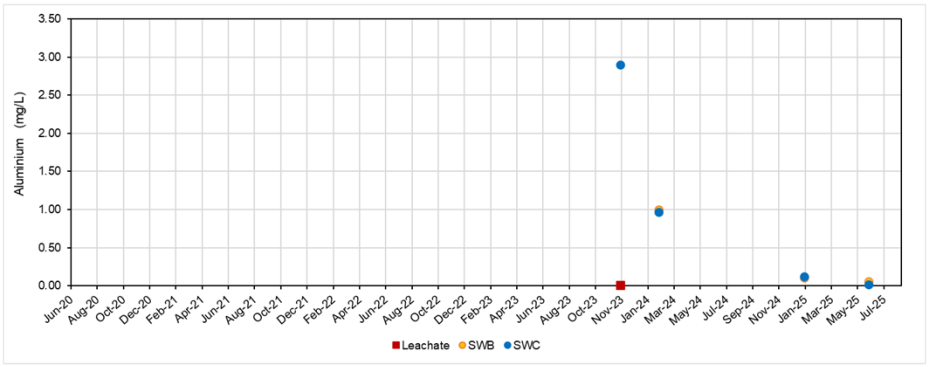

Nitrate as N (µg/L)
Leachate
SWB
SWC

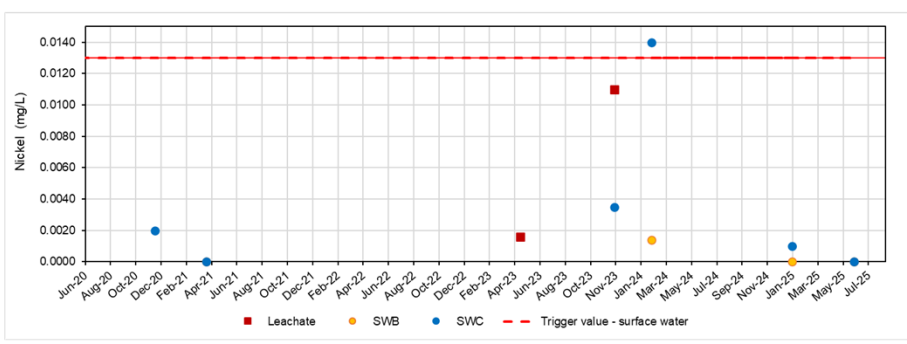

Iron (mg/L)
Leachate
SWB
SWC
Trigger value - surface water

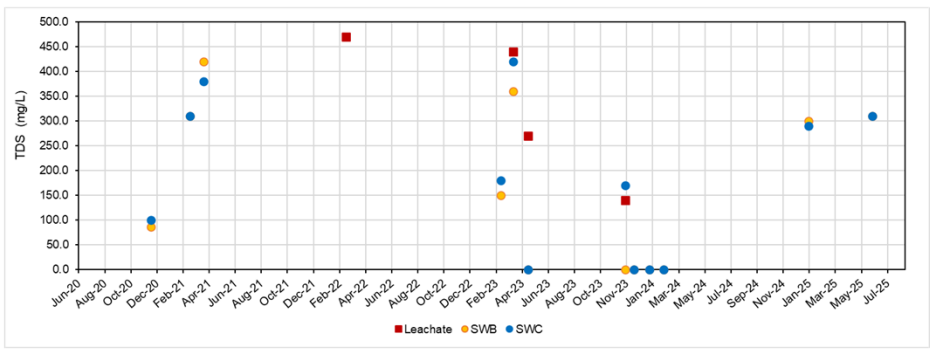

Copper (mg/L)
Leachate
SWB
SWC
Trigger value - surface water

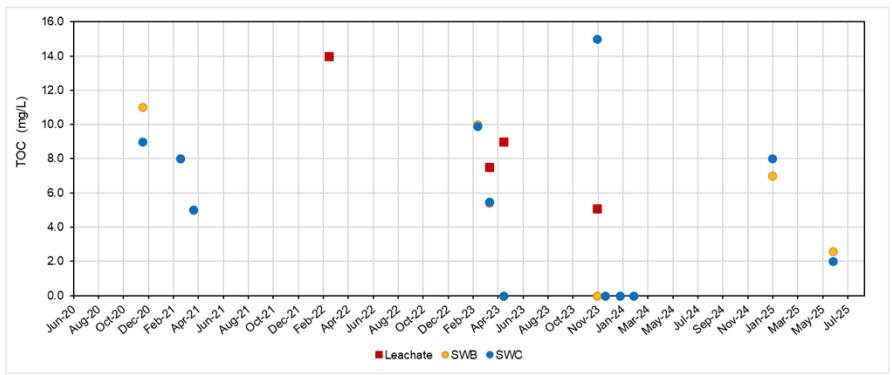

Manganese (mg/L)
Leachate
SWB
SWC
Trigger value - surface water

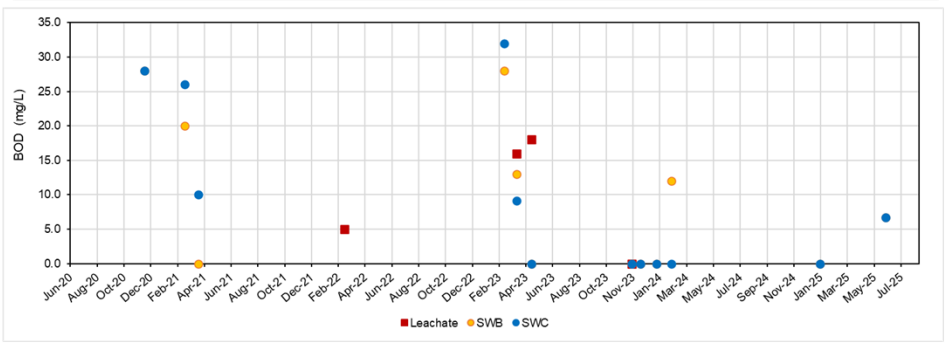

Lead (mg/L)
Leachate
SWB
SWC
Trigger value - surface water

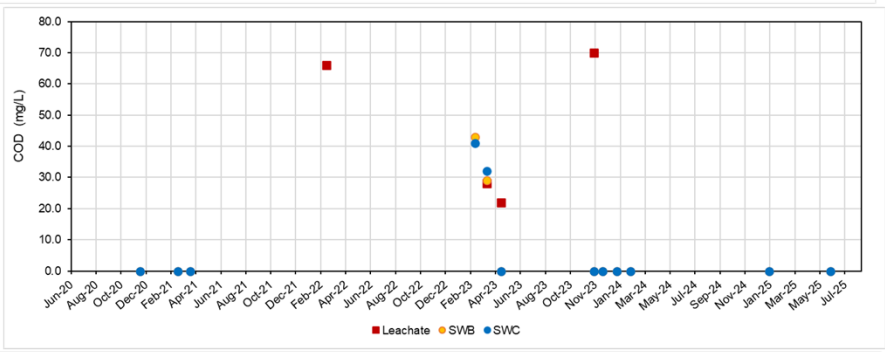

Aluminium (mg/L)
Leachate
SWB
SWC

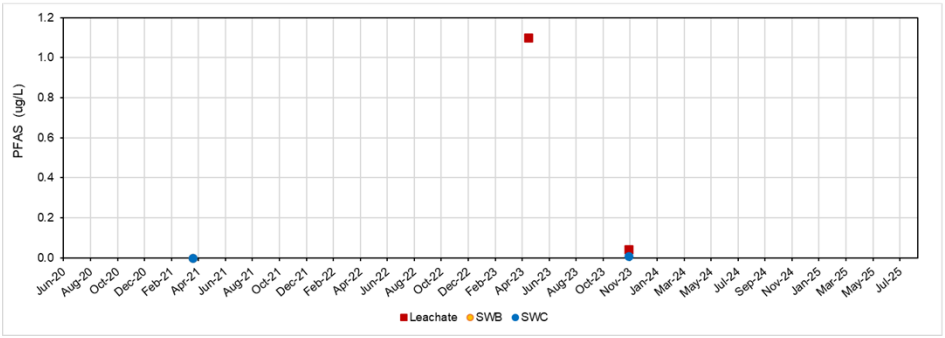

Nickel (mg/L)
Leachate
SWB
SWC
Trigger value - surface water

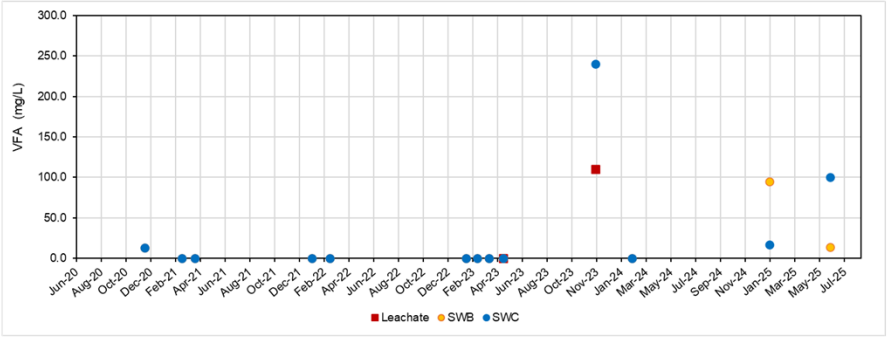

TDS (mg/L)
Leachate
SWB
SWC


TOC (mg/L)
Leachate
SWB
SWC


BOD (mg/L)
Leachate
SWB
SWC

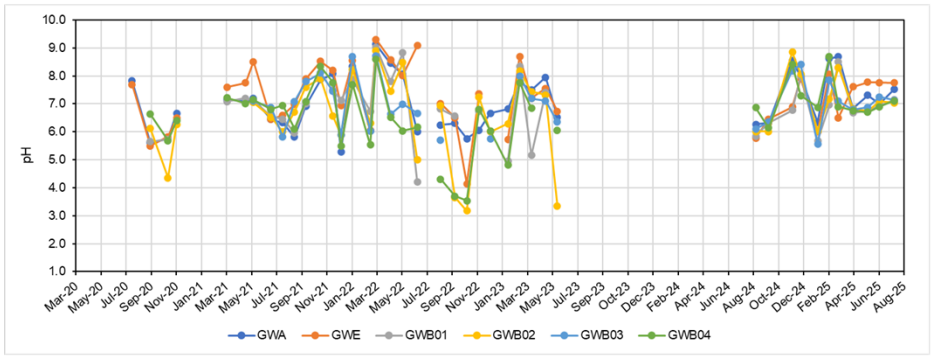

COD (mg/L)
Leachate
SWB
SWC

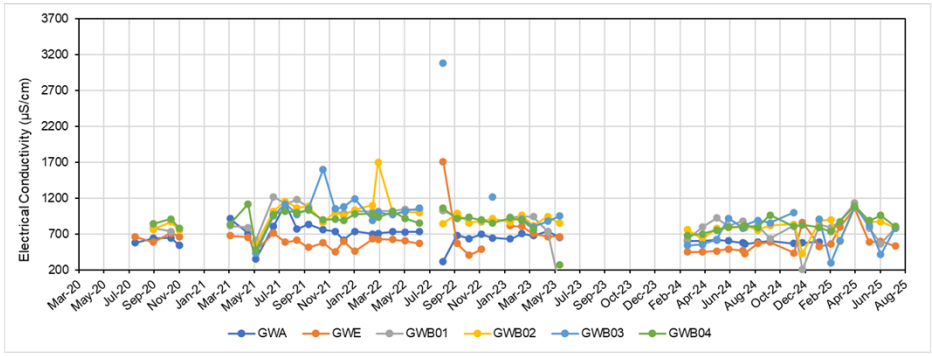

PFAS (ug/L)
Leachate
SWB
SWC

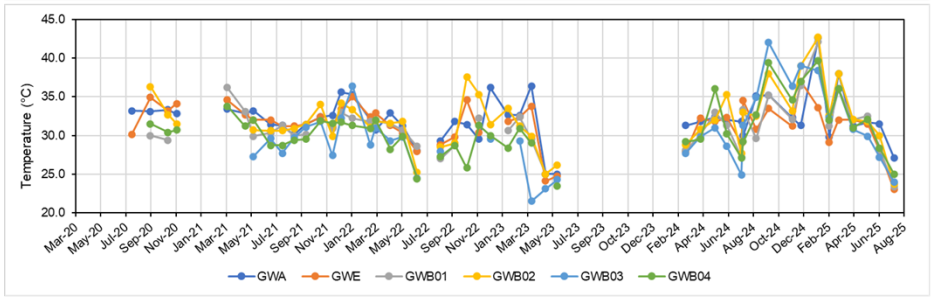

VFA (mg/L)
Leachate
SWB
SWC

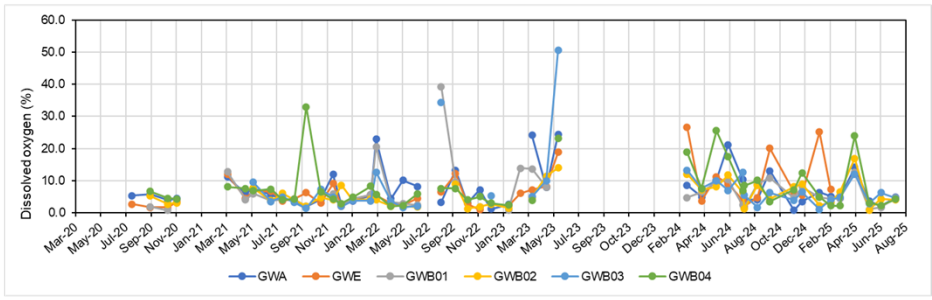
Groundwater

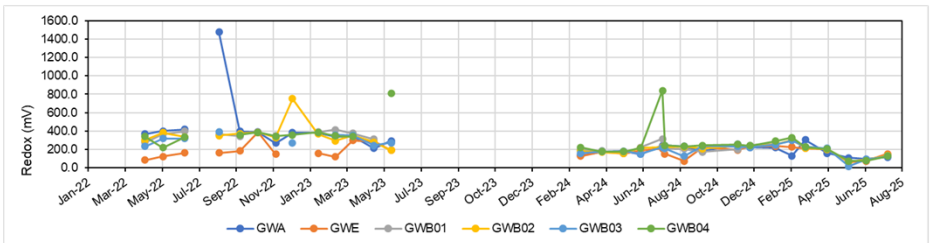
Field Measurements



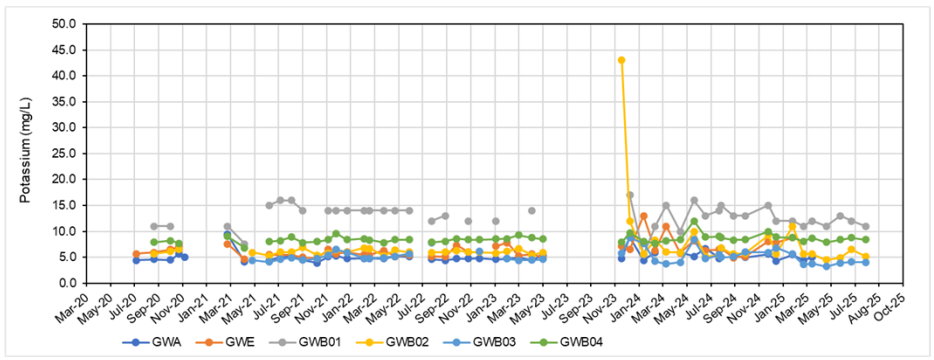


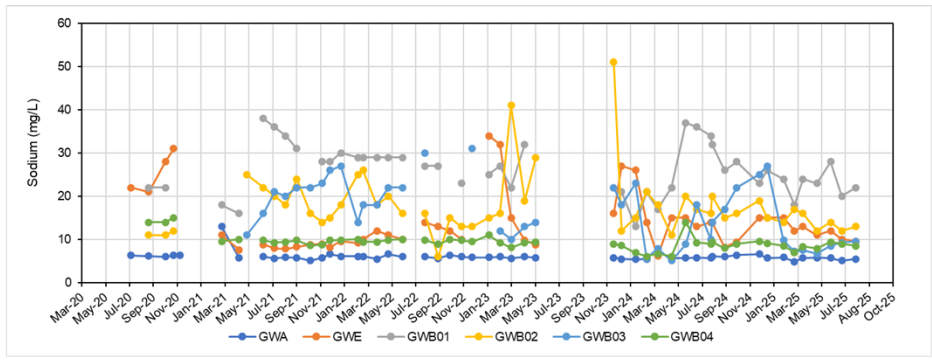


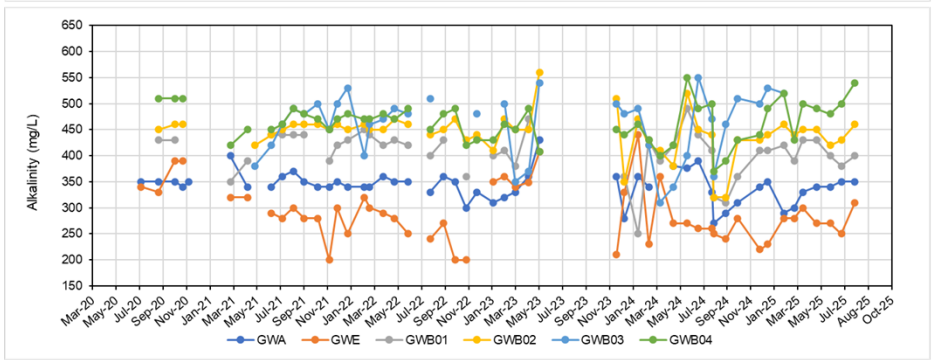


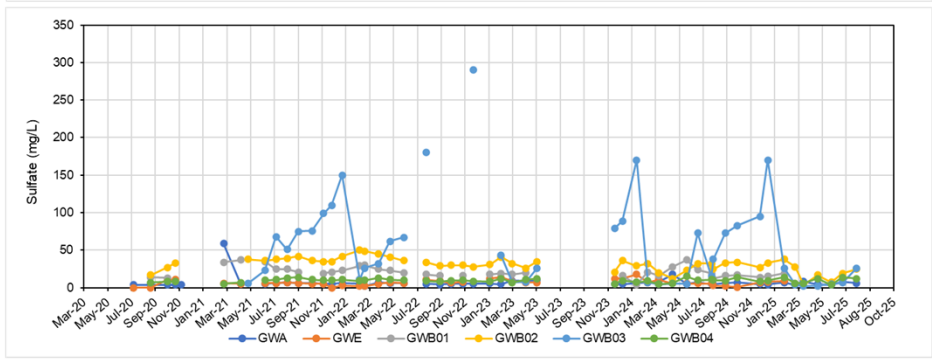


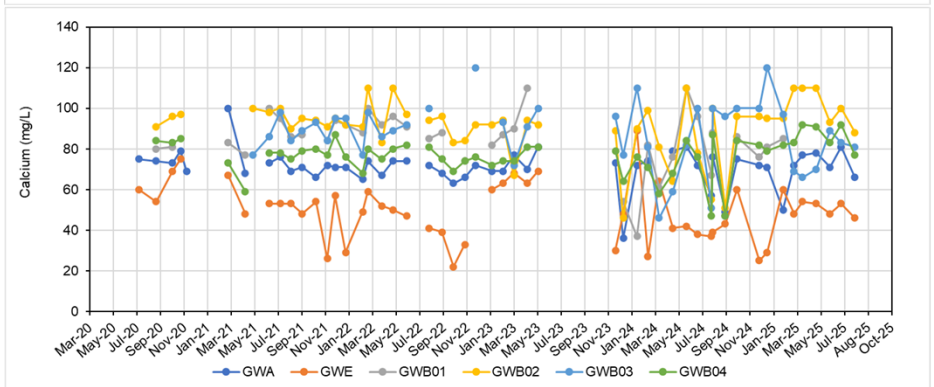
Major ions

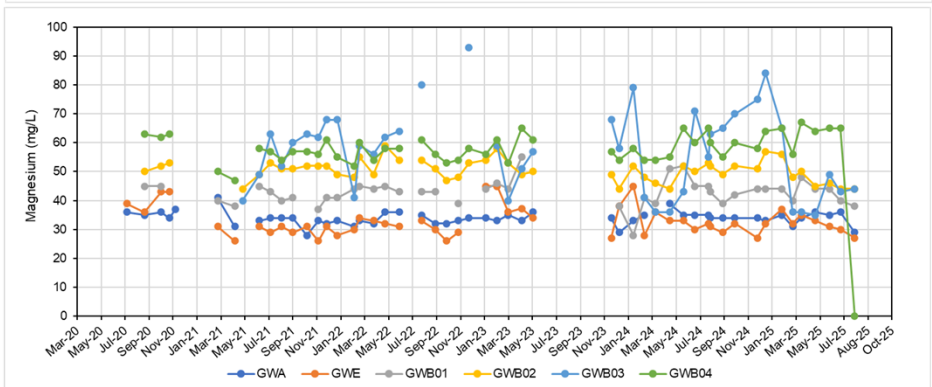


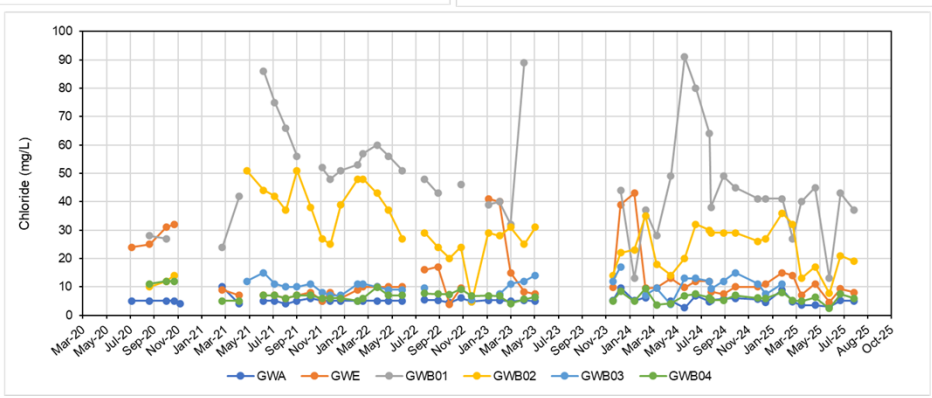




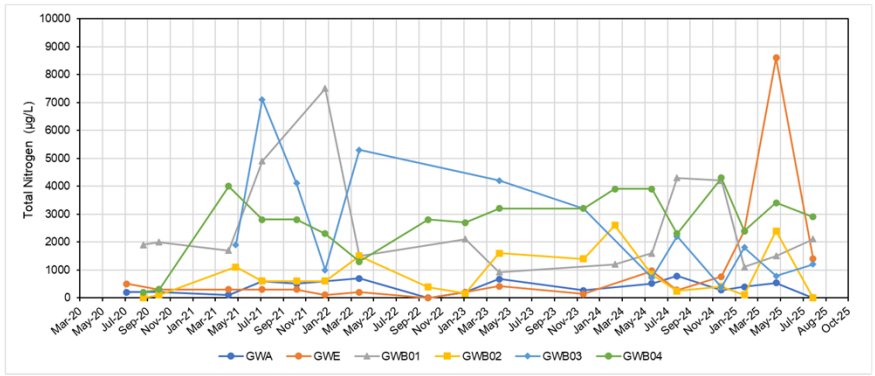


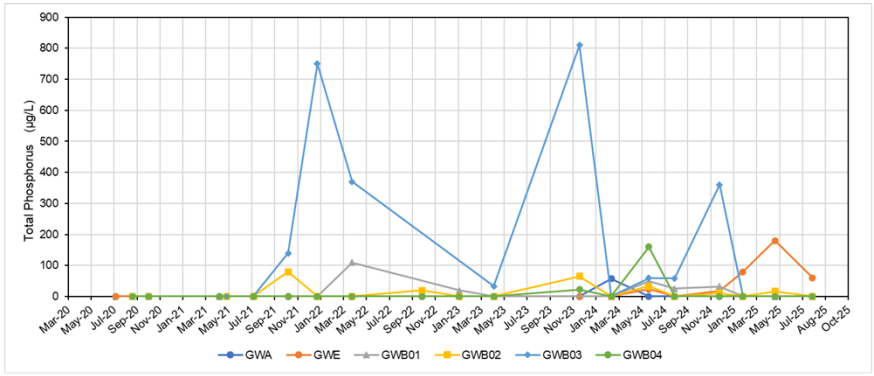


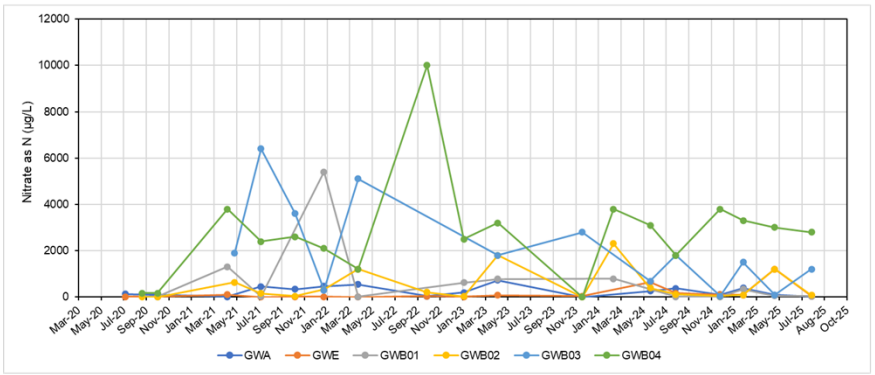


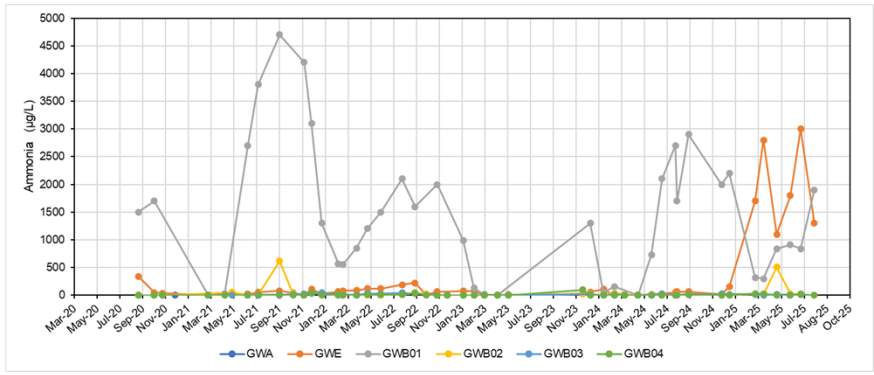


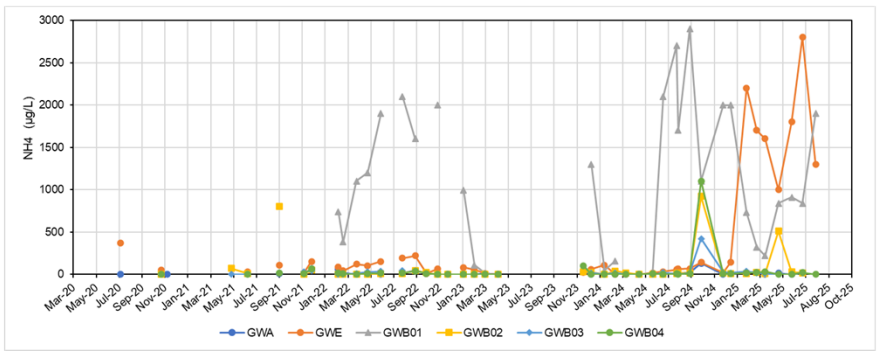
Nutrients



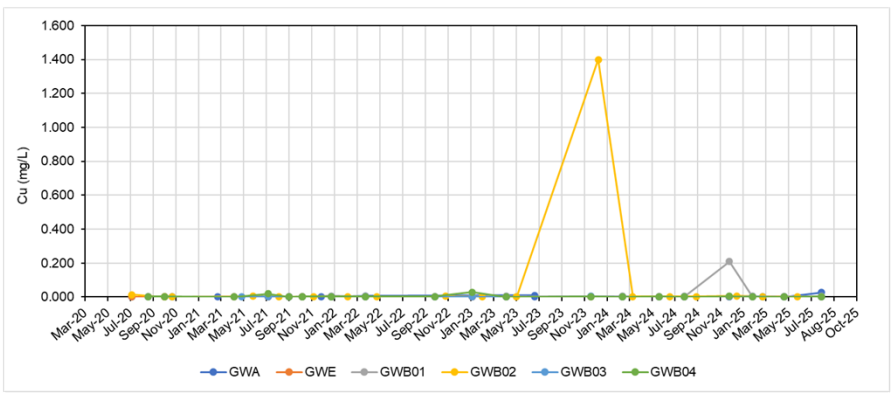


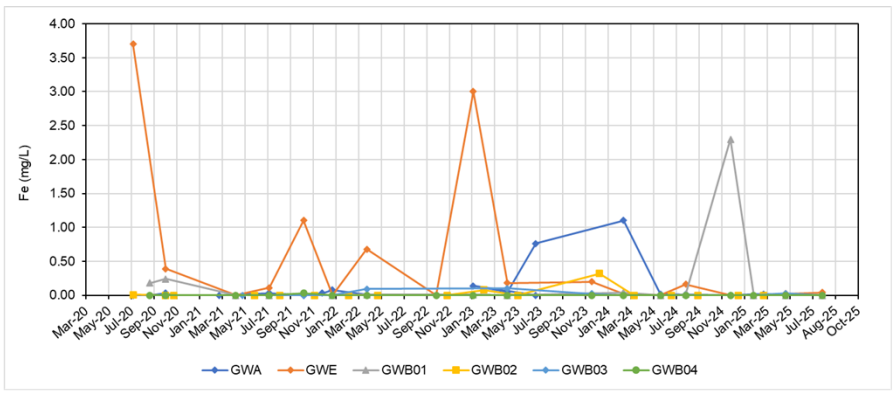


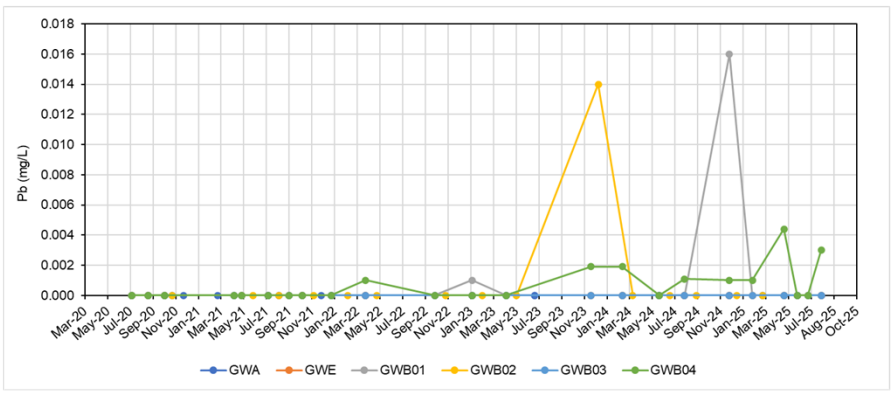


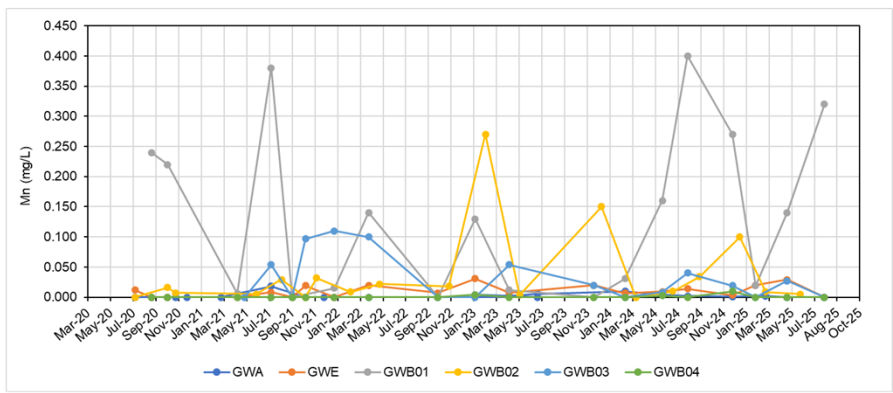


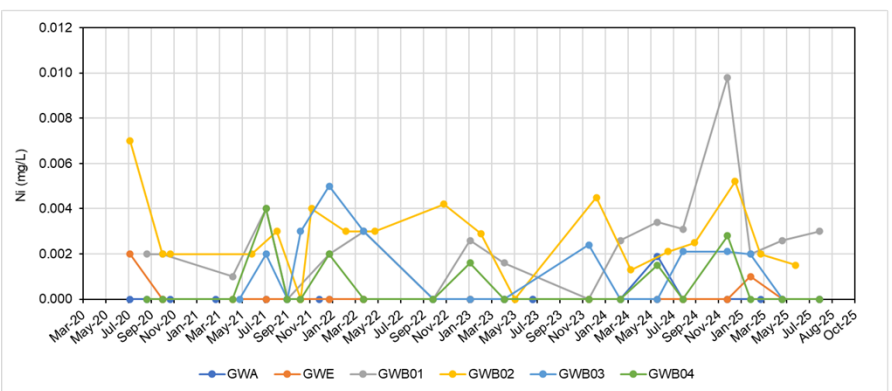
Metals Dissolved

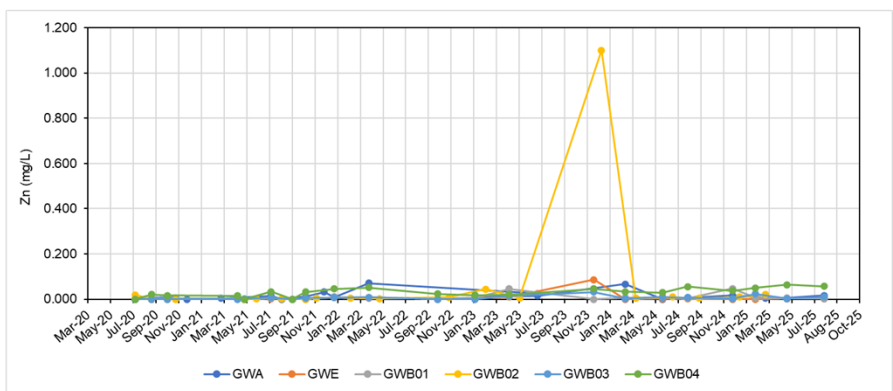


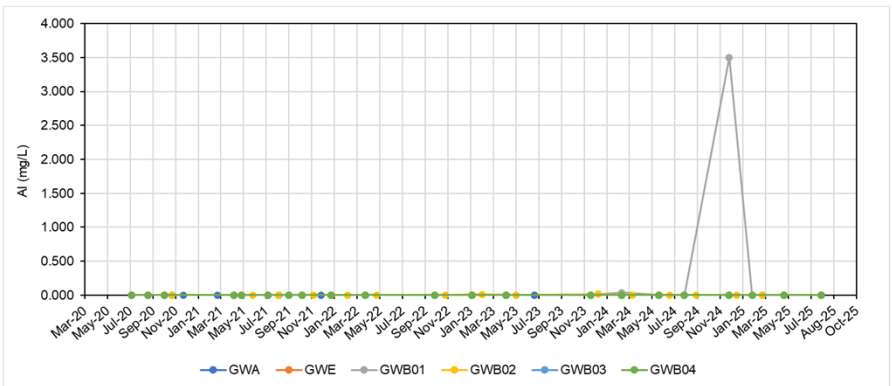




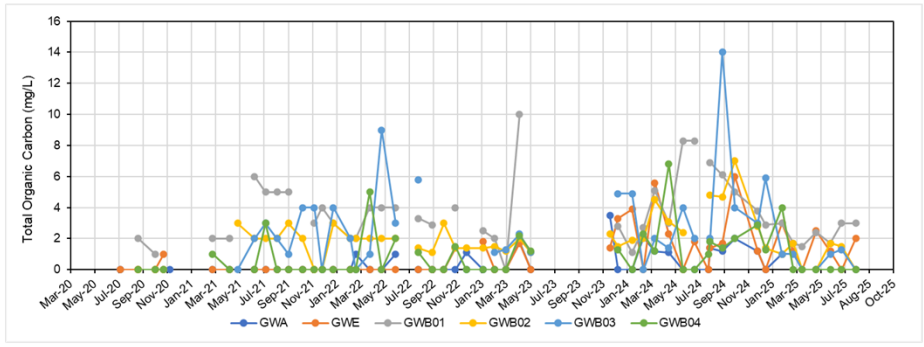


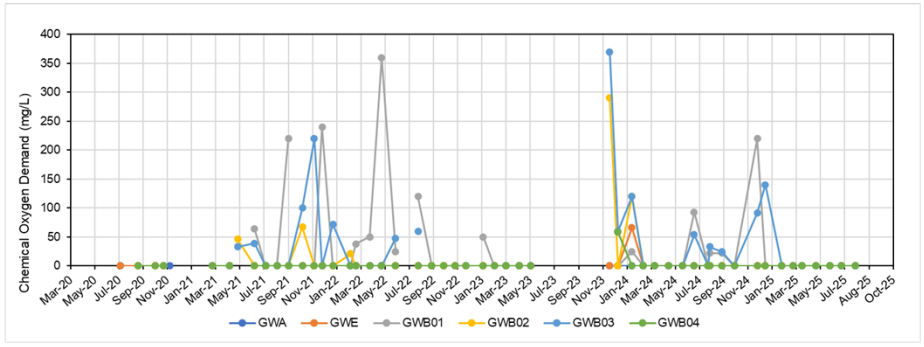


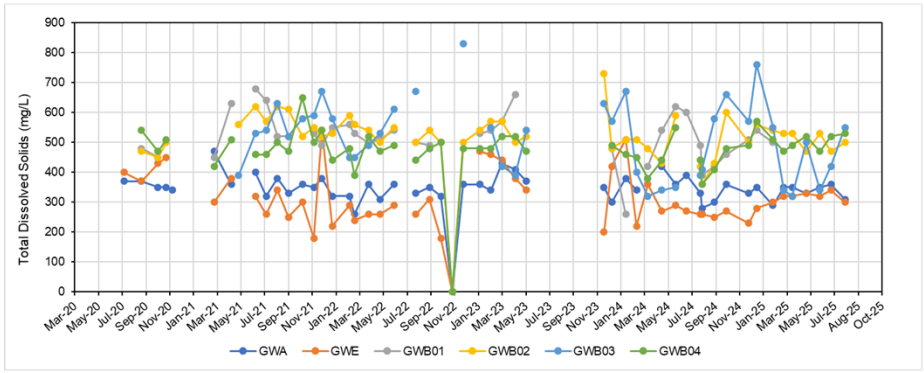


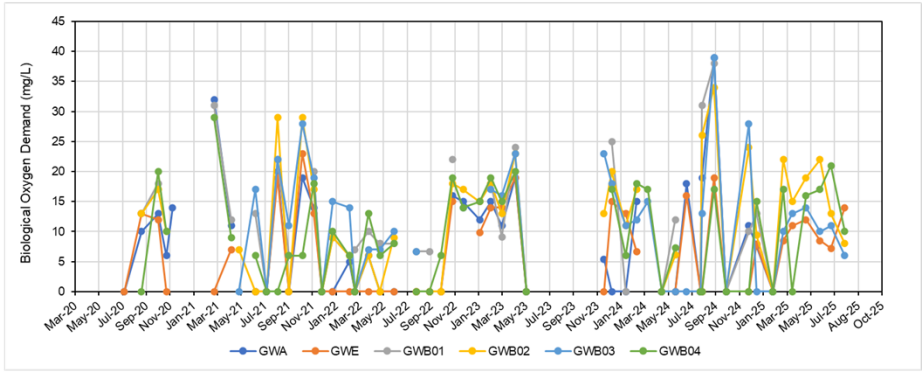


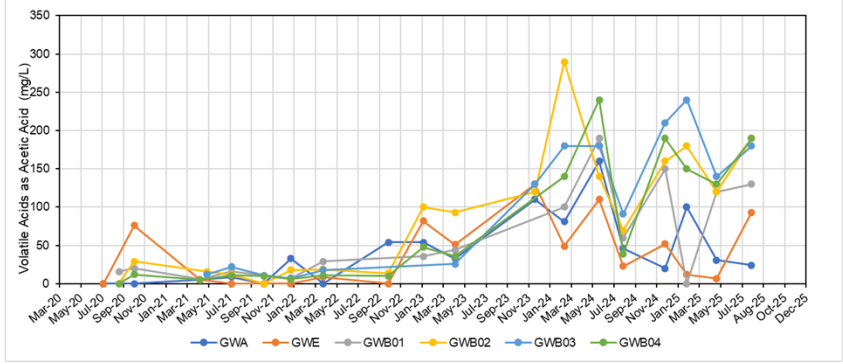
Other leachate Indicators



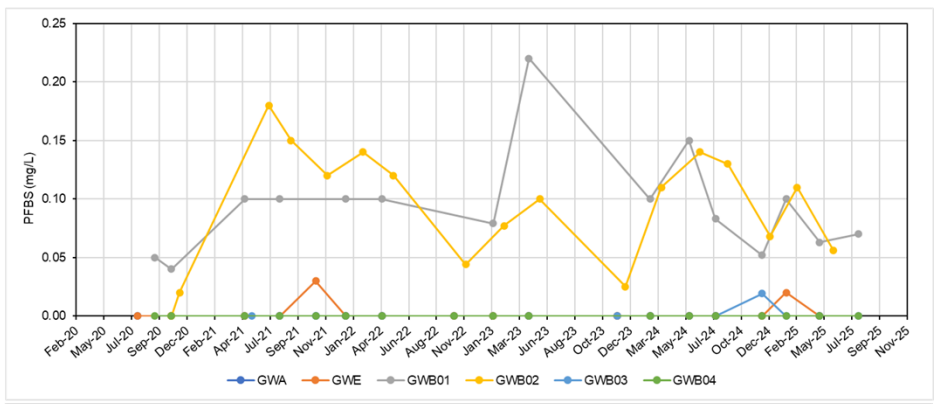


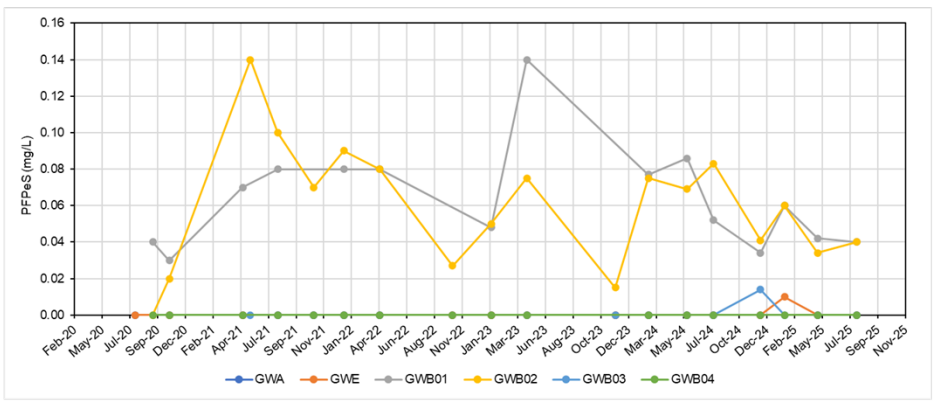


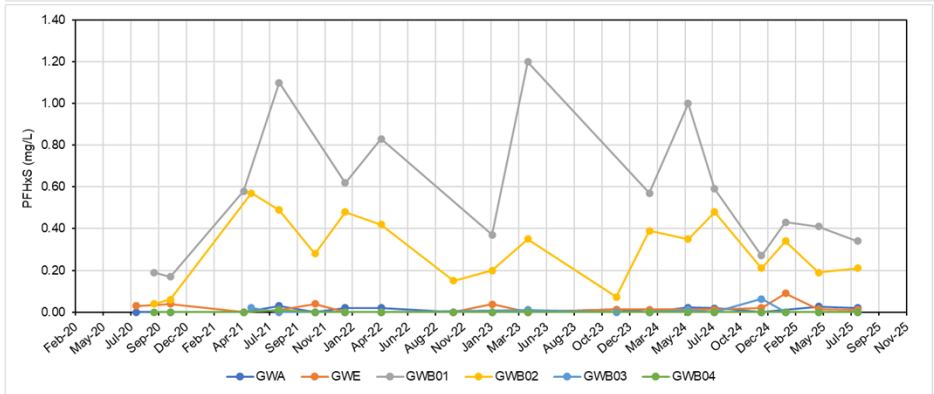


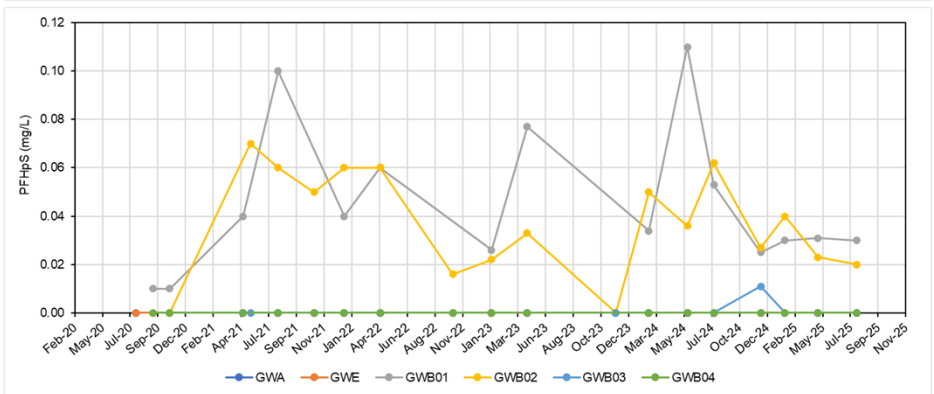


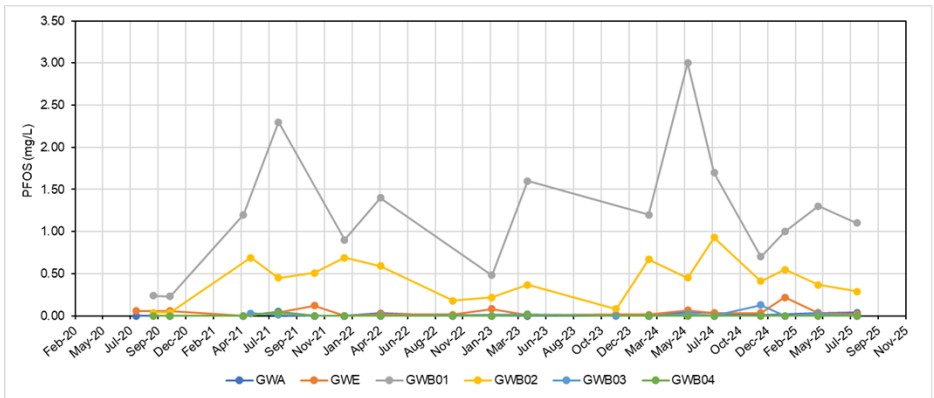
PFAS

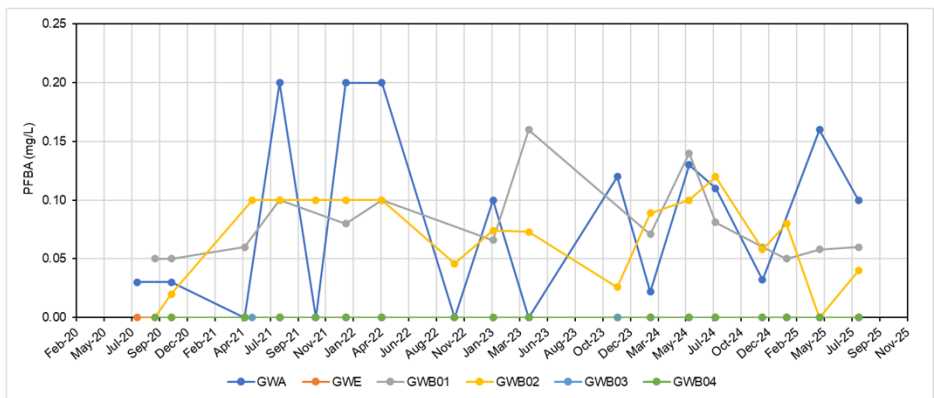


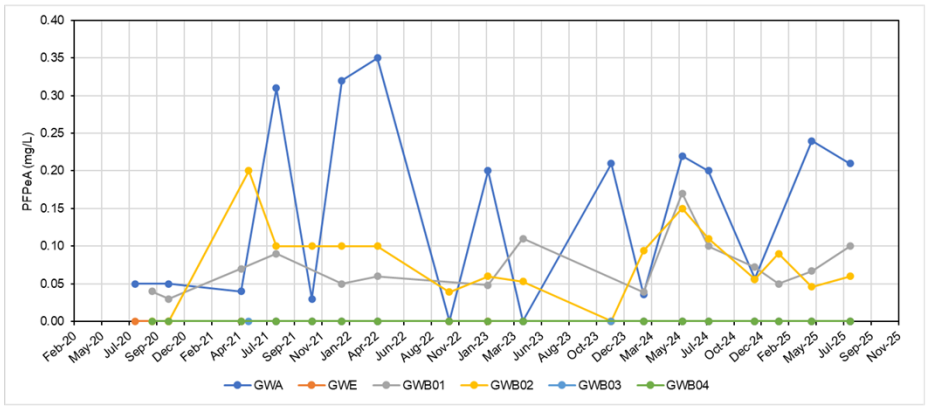


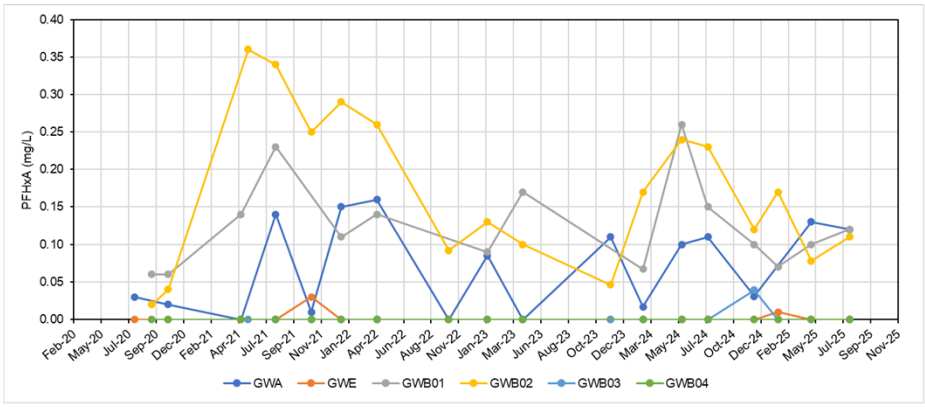


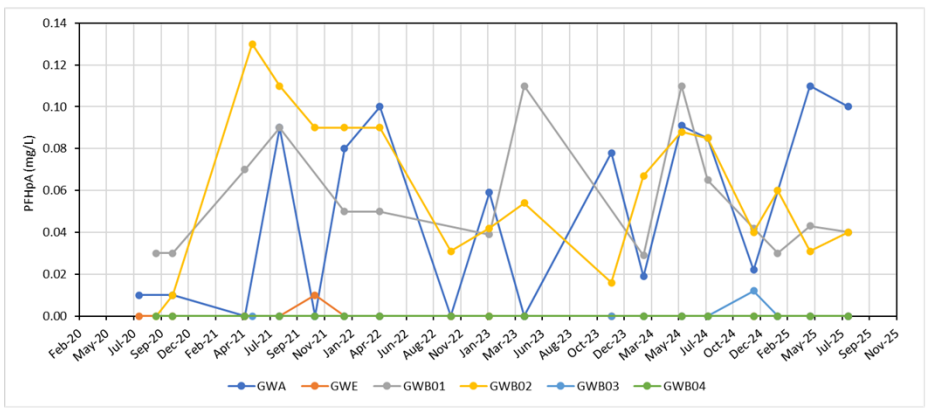


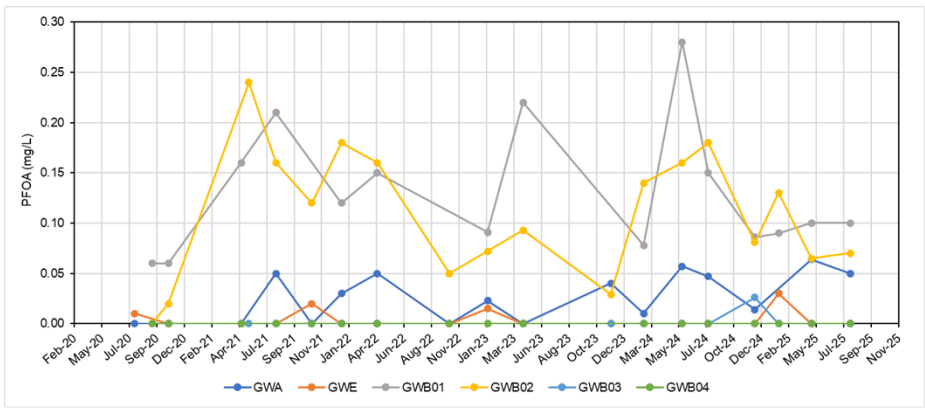


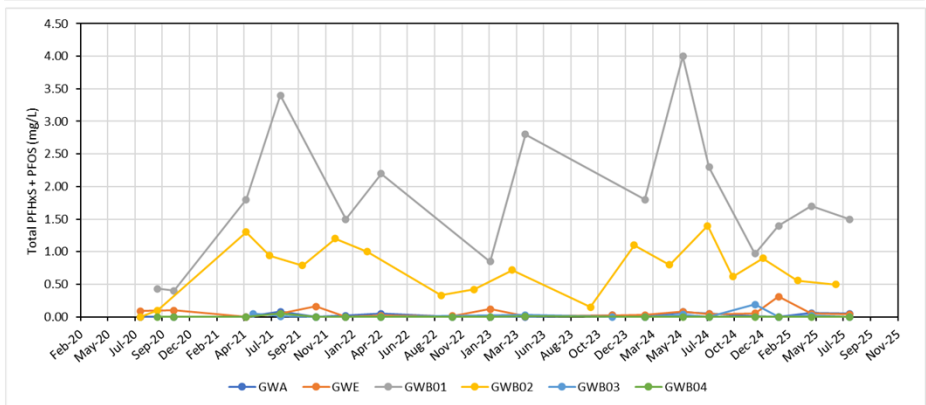


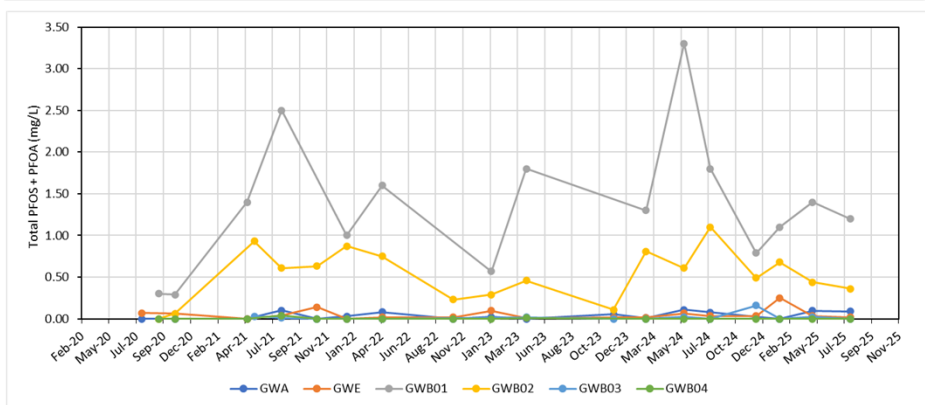

PFPeA (mg/L)
GWA GWE GWB01 GWB02 GWB03 GWB04

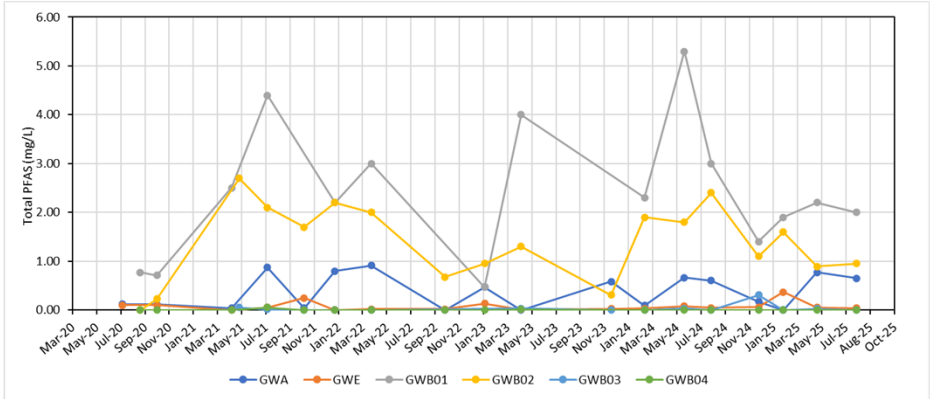

PFHxA (mg/L)
GWA GWE GWB01 GWB02 GWB03 GWB04


PFHpA (mg/L)
GWA GWE GWB01 GWB02 GWB03 GWB04


PFOA (mg/L)
GWA GWE GWB01 GWB02 GWB03 GWB04


Total PFHxS + PFOS (mg/L)
GWA GWE GWB01 GWB02 GWB03 GWB04


Total PFOS + PFOA (mg/L)
GWA GWE GWB01 GWB02 GWB03 GWB04


Total PFAS (mg/L)
GWA GWE GWB01 GWB02 GWB03 GWB04

APPENDIX D LABORATORY RESULTS

Envirolab Services (WA) Pty Ltd trading as MPL Laboratories
ABN 53 140 099 207
16-18 Hayden Court Myaree WA 6154
ph +61 8 9317 2505
lab@mpl.com.au
www.mpl.com.au

Certificate of Analysis PFI0123

Client Details

Client	Katherine Town Council - NT
Contact	Brett Kimpton
Address	PO Box 1071, KATHERINE, NT, 0851

Sample Details

Your Reference	Katherine Town Council - EPL298 - Quarterly
Number of Samples	9 Water
Date Samples Received	03/09/2024
Date Instructions Received	03/09/2024

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for soils and on an as received basis for other matrices.

Report Details

Date Results Requested by	17/09/2024
Date of Issue	18/09/2024

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

Authorisation Details

Results Approved By	Ben Carpenter, Metals Technician Diego Bigolin, Supervisor, Inorganics Lien Tang, Assistant Operations Manager Lucas Yii, Inorganics Team Leader Michael Mowle, Inorganics Supervisor Sean McAlary, Chemist Travis Carey, Organics Supervisor Varsha Ho Wing, Inorganics and Metals Supervisor
Laboratory Manager	Michael Kubiak

Certificate of Analysis PFI0123

Samples in this Report

Envirolab ID	Sample ID	Depth	Matrix	Date Sampled	Date Received
PFI0123-01	GWA (RN031131)		Water	01/09/2024	03/09/2024
PFI0123-02	GWE (RN022487)	10.87	Water	01/09/2024	03/09/2024
PFI0123-03	GWB01	11.30	Water	01/09/2024	03/09/2024
PFI0123-04	GWB02	7.40	Water	01/09/2024	03/09/2024
PFI0123-05	GWB03	9.20	Water	01/09/2024	03/09/2024
PFI0123-06	GWB04	12.40	Water	01/09/2024	03/09/2024
PFI0123-07	Field Blank		Water	01/09/2024	03/09/2024
PFI0123-08	Duplicate		Water	01/09/2024	03/09/2024
PFI0123-09	Trip Blank		Water	01/09/2024	03/09/2024

Sample Comments

GWA (RN031131)	Sample(s) was/were received with headspace, analytical results may be affected.
GWE (RN022487)	Sample(s) was/were received with headspace, analytical results may be affected.
GWB01	Sample(s) was/were received with headspace, analytical results may be affected.
GWB02	Sample(s) was/were received with headspace, analytical results may be affected.
GWB03	Sample(s) was/were received with headspace, analytical results may be affected.
GWB04	Sample(s) was/were received with headspace, analytical results may be affected.
Field Blank	Sample(s) was/were received with headspace, analytical results may be affected.
Duplicate	Sample(s) was/were received with headspace, analytical results may be affected.
Trip Blank	Sample(s) was/were received with headspace, analytical results may be affected.

Certificate of Analysis PFI0123

Volatile TRH and BTEX (Water)

Envirolab ID	Units	PQL	PFI0123-01	PFI0123-02	PFI0123-03	PFI0123-04	PFI0123-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			01/09/2024	01/09/2024	01/09/2024	01/09/2024	01/09/2024
Depth				10.87	11.30	7.40	9.20
TRH C6-C9	µg/L	10	<10	<10	<10	<10	<10
TRH C6-C10	µg/L	10	<10	<10	<10	<10	<10
TRH C6-C10 less BTEX (F1)	µg/L	10	<10	<10	<10	<10	<10
Methyl tert butyl ether (MTBE)	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzene	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
meta+para Xylene	µg/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0
ortho-Xylene	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total Xylene	µg/L	3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Naphthalene (value used in F2 calc)	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Surrogate Dibromofluoromethane	%		*94.7*	*97.3*	*98.2*	*97.3*	*90.7*
Surrogate Toluene-D8	%		*99.8*	*100*	*100*	*98.6*	*99.3*
Surrogate 4-Bromofluorobenzene	%		*95.0*	*95.7*	*94.3*	*93.0*	*90.9*

Envirolab ID	Units	PQL	PFI0123-06	PFI0123-07	PFI0123-08	PFI0123-09
Your Reference			GWB04	Field Blank	Duplicate	Trip Blank
Date Sampled			01/09/2024	01/09/2024	01/09/2024	01/09/2024
Depth			12.40			
TRH C6-C9	µg/L	10	<10	<10	<10	<10
TRH C6-C10	µg/L	10	<10	<10	<10	<10
TRH C6-C10 less BTEX (F1)	µg/L	10	<10	<10	<10	<10
Methyl tert butyl ether (MTBE)	µg/L	1.0	<1.0	<1.0	<1.0	<1.0
Benzene	µg/L	1.0	<1.0	<1.0	<1.0	<1.0
Toluene	µg/L	1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	µg/L	1.0	<1.0	<1.0	<1.0	<1.0
meta+para Xylene	µg/L	2.0	<2.0	<2.0	<2.0	<2.0
ortho-Xylene	µg/L	1.0	<1.0	<1.0	<1.0	<1.0
Total Xylene	µg/L	3.0	<3.0	<3.0	<3.0	<3.0
Naphthalene (value used in F2 calc)	µg/L	1.0	<1.0	<1.0	<1.0	<1.0
Surrogate Dibromofluoromethane	%		*90.8*	*93.6*	*90.6*	*92.4*
Surrogate Toluene-D8	%		*98.4*	*101*	*97.7*	*99.6*
Surrogate 4-Bromofluorobenzene	%		*93.2*	*93.0*	*92.7*	*93.2*

Certificate of Analysis PFI0123

Semi-volatile TRH (Water)

Envirolab ID	Units	PQL	PFI0123-01	PFI0123-02	PFI0123-03	PFI0123-04	PFI0123-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			01/09/2024	01/09/2024	01/09/2024	01/09/2024	01/09/2024
Depth				10.87	11.30	7.40	9.20
TRH C10-C14	µg/L	50	<50	<50	<50	<50	<50
TRH C15-C28	µg/L	100	<100	<100	120	<100	<100
TRH C29-C36	µg/L	100	<100	<100	<100	<100	<100
Total +ve TRH C10-C36	µg/L	50	<50	<50	120	<50	<50
TRH >C10-C16	µg/L	50	<50	<50	<50	<50	<50
TRH >C10-C16 less Naphthalene F2	µg/L	50	<50	<50	<50	<50	<50
TRH >C16-C34 (F3)	µg/L	100	<100	<100	110	<100	<100
TRH >C34-C40 (F4)	µg/L	100	<100	<100	<100	<100	<100
Total +ve TRH >C10-C40	µg/L	50	<50	<50	110	<50	<50
Surrogate o-Terphenyl	%		*92.4*	*91.2*	*90.9*	*98.9*	*97.6*

Envirolab ID	Units	PQL	PFI0123-06	PFI0123-07	PFI0123-08	PFI0123-09
Your Reference			GWB04	Field Blank	Duplicate	Trip Blank
Date Sampled			01/09/2024	01/09/2024	01/09/2024	01/09/2024
Depth			12.40			
TRH C10-C14	µg/L	50	<50	130	<50	<50
TRH C15-C28	µg/L	100	<100	<100	110	<100
TRH C29-C36	µg/L	100	<100	<100	<100	<100
Total +ve TRH C10-C36	µg/L	50	<50	130	110	<50
TRH >C10-C16	µg/L	50	<50	160	<50	<50
TRH >C10-C16 less Naphthalene F2	µg/L	50	<50	160	<50	<50
TRH >C16-C34 (F3)	µg/L	100	<100	<100	110	<100
TRH >C34-C40 (F4)	µg/L	100	<100	<100	<100	<100
Total +ve TRH >C10-C40	µg/L	50	<50	160	110	<50
Surrogate o-Terphenyl	%		*83.8*	*97.0*	*72.5*	*93.5*

Certificate of Analysis PFI0123

Polycyclic Aromatic Hydrocarbons (Water)

Envirolab ID	Units	PQL	PFI0123-01	PFI0123-02	PFI0123-03	PFI0123-04	PFI0123-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			01/09/2024	01/09/2024	01/09/2024	01/09/2024	01/09/2024
Depth				10.87	11.30	7.40	9.20
Naphthalene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthylene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Fluorene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Phenanthrene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Anthracene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Fluoranthene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Pyrene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo(a)anthracene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chrysene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo(b,j,k)fluoranthene	µg/L	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzo(a)pyrene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Indeno(1,2,3-c,d)pyrene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Dibenzo(a,h)anthracene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo(g,h,i)perylene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Total +ve PAH	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Surrogate p-Terphenyl-D14	%		*85.8*	*86.8*	*86.0*	*83.8*	*100*

Envirolab ID	Units	PQL	PFI0123-06	PFI0123-07	PFI0123-08	PFI0123-09
Your Reference			GWB04	Field Blank	Duplicate	Trip Blank
Date Sampled			01/09/2024	01/09/2024	01/09/2024	01/09/2024
Depth			12.40			
Naphthalene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthylene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Fluorene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Phenanthrene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Anthracene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Fluoranthene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Pyrene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Benzo(a)anthracene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Chrysene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Benzo(b,j,k)fluoranthene	µg/L	0.20	<0.20	<0.20	<0.20	<0.20
Benzo(a)pyrene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Indeno(1,2,3-c,d)pyrene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Dibenzo(a,h)anthracene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Benzo(g,h,i)perylene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Total +ve PAH	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Surrogate p-Terphenyl-D14	%		*78.8*	*93.7*	*79.8*	*93.0*

Certificate of Analysis PFI0123

Polychlorinated Biphenyls (Water)

Envirolab ID	Units	PQL	PFI0123-01	PFI0123-02	PFI0123-03	PFI0123-04	PFI0123-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			01/09/2024	01/09/2024	01/09/2024	01/09/2024	01/09/2024
Depth				10.87	11.30	7.40	9.20
Aroclor 1016	µg/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Aroclor 1221	µg/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Aroclor 1232	µg/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Aroclor 1242	µg/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Aroclor 1248	µg/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Aroclor 1254	µg/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Aroclor 1260	µg/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Total +ve PCB (1016-1260)	µg/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Surrogate 2-Fluorobiphenyl	%		*89.1*	*88.7*	*83.8*	*85.4*	*99.5*

Envirolab ID	Units	PQL	PFI0123-06	PFI0123-07	PFI0123-08	PFI0123-09
Your Reference			GWB04	Field Blank	Duplicate	Trip Blank
Date Sampled			01/09/2024	01/09/2024	01/09/2024	01/09/2024
Depth			12.40			
Aroclor 1016	µg/L	2.0	<2.0	<2.0	<2.0	<2.0
Aroclor 1221	µg/L	2.0	<2.0	<2.0	<2.0	<2.0
Aroclor 1232	µg/L	2.0	<2.0	<2.0	<2.0	<2.0
Aroclor 1242	µg/L	2.0	<2.0	<2.0	<2.0	<2.0
Aroclor 1248	µg/L	2.0	<2.0	<2.0	<2.0	<2.0
Aroclor 1254	µg/L	2.0	<2.0	<2.0	<2.0	<2.0
Aroclor 1260	µg/L	2.0	<2.0	<2.0	<2.0	<2.0
Total +ve PCB (1016-1260)	µg/L	2.0	<2.0	<2.0	<2.0	<2.0
Surrogate 2-Fluorobiphenyl	%		*83.9*	*89.5*	*71.6*	*93.9*

Certificate of Analysis PFI0123

Acid Extractable Low Level Metals (Water)

Envirolab ID	Units	PQL	PFI0123-01	PFI0123-02	PFI0123-03	PFI0123-04	PFI0123-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			01/09/2024	01/09/2024	01/09/2024	01/09/2024	01/09/2024
Depth				10.87	11.30	7.40	9.20
Aluminium	µg/L	10	12	<10	2300	200	1000
Cadmium	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chromium	µg/L	1.0	<1.0	<1.0	4.3	<1.0	2.6
Copper	µg/L	1.0	2.7	<1.0	63	4.1	15
Iron	µg/L	10	38	310	3400	440	1200
Manganese	µg/L	1.0	1.7	12	440	50	89
Nickel	µg/L	1.0	<1.0	<1.0	8.9	3.1	4.9
Lead	µg/L	1.0	<1.0	<1.0	4.4	2.3	3.6
Selenium	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Zinc	µg/L	1.0	18	3.7	26	5.8	29

Envirolab ID	Units	PQL	PFI0123-06	PFI0123-07	PFI0123-08	PFI0123-09
Your Reference			GWB04	Field Blank	Duplicate	Trip Blank
Date Sampled			01/09/2024	01/09/2024	01/09/2024	01/09/2024
Depth			12.40			
Aluminium	µg/L	10	130	<10	2000	<10
Cadmium	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Chromium	µg/L	1.0	<1.0	<1.0	3.7	<1.0
Copper	µg/L	1.0	3.9	<1.0	57	<1.0
Iron	µg/L	10	200	<10	3000	<10
Manganese	µg/L	1.0	9.4	<1.0	430	<1.0
Nickel	µg/L	1.0	1.8	<1.0	8.1	<1.0
Lead	µg/L	1.0	3.9	<1.0	3.9	<1.0
Selenium	µg/L	1.0	1.4	<1.0	<1.0	<1.0
Zinc	µg/L	1.0	50	<1.0	23	<1.0

Certificate of Analysis PFI0123

Dissolved Low Level Metals (Water)

Envirolab ID	Units	PQL	PFI0123-01	PFI0123-02	PFI0123-03	PFI0123-04	PFI0123-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			01/09/2024	01/09/2024	01/09/2024	01/09/2024	01/09/2024
Depth				10.87	11.30	7.40	9.20
Aluminium	µg/L	10	<10	<10	<10	<10	<10
Cadmium	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chromium	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Copper	µg/L	1.0	2.1	<1.0	5.3	2.3	1.5
Iron	µg/L	10	<10	160	11	<10	<10
Manganese	µg/L	1.0	1.1	14	400	34	40
Nickel	µg/L	1.0	<1.0	<1.0	3.1	2.5	2.1
Lead	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Selenium	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Zinc	µg/L	1.0	17	1.4	3.5	3.8	6.7

Envirolab ID	Units	PQL	PFI0123-06	PFI0123-07	PFI0123-08	PFI0123-09
Your Reference			GWB04	Field Blank	Duplicate	Trip Blank
Date Sampled			01/09/2024	01/09/2024	01/09/2024	01/09/2024
Depth			12.40			
Aluminium	µg/L	10	<10	<10	<10	<10
Cadmium	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Chromium	µg/L	1.0	<1.0	<1.0	<1.0	<1.0
Copper	µg/L	1.0	1.2	<1.0	5.0	<1.0
Iron	µg/L	10	<10	<10	12	<10
Manganese	µg/L	1.0	<1.0	<1.0	400	<1.0
Nickel	µg/L	1.0	<1.0	<1.0	3.1	<1.0
Lead	µg/L	1.0	1.1	<1.0	<1.0	<1.0
Selenium	µg/L	1.0	1.6	<1.0	<1.0	<1.0
Zinc	µg/L	1.0	55	<1.0	3.7	<1.0

Certificate of Analysis PFI0123

Inorganics - Physical Parameters (Water)

Envirolab ID	Units	PQL	PFI0123-01	PFI0123-02	PFI0123-03	PFI0123-04	PFI0123-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			01/09/2024	01/09/2024	01/09/2024	01/09/2024	01/09/2024
Depth				10.87	11.30	7.40	9.20
Total Dissolved Solids	mg/L	5.0	280	260	390	360	410

Envirolab ID	Units	PQL	PFI0123-06	PFI0123-07	PFI0123-08	PFI0123-09
Your Reference			GWB04	Field Blank	Duplicate	Trip Blank
Date Sampled			01/09/2024	01/09/2024	01/09/2024	01/09/2024
Depth			12.40			
Total Dissolved Solids	mg/L	5.0	360	<5.0	450	<5.0

Certificate of Analysis PFI0123

Inorganics - Physical Parameters (Water) - Analysed By Envirolab Services Sydney

Envirolab ID	Units	PQL	PFI0123-01	PFI0123-02	PFI0123-03	PFI0123-04	PFI0123-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			01/09/2024	01/09/2024	01/09/2024	01/09/2024	01/09/2024
Depth				10.87	11.30	7.40	9.20
Volatile Fatty Acids*	mg/L	5.0	46	23	60	70	91

Envirolab ID	Units	PQL	PFI0123-06	PFI0123-07	PFI0123-08	PFI0123-09
Your Reference			GWB04	Field Blank	Duplicate	Trip Blank
Date Sampled			01/09/2024	01/09/2024	01/09/2024	01/09/2024
Depth			12.40			
Volatile Fatty Acids*	mg/L	5.0	39	<5.0	26	<5.0

Certificate of Analysis PFI0123

Inorganics - Ionic Balance and Indexes (Water)

Envirolab ID	Units	PQL	PFI0123-01	PFI0123-02	PFI0123-03	PFI0123-04	PFI0123-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			01/09/2024	01/09/2024	01/09/2024	01/09/2024	01/09/2024
Depth				10.87	11.30	7.40	9.20
Bicarbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	270	250	320	320	360
Carbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Hydroxide OH- as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Total Alkalinity as CaCO3	mg/L as CaCO3	5.0	270	250	320	320	360
Chloride	mg/L	1.0	5.3	8.2	38	29	9.3
Sulfate	mg/L	1.0	4.8	2.9	12	25	38
Calcium	mg/L	0.50	76	39	88	100	100
Magnesium	mg/L	0.50	34	31	43	52	63
Potassium	mg/L	0.50	6.7	6.8	15	6.8	5.0
Sodium	mg/L	0.50	6.1	14	32	20	14
Hardness (calc) equivalent CaCO3	mg/L	3.0	330	220	400	470	520
Ionic Balance	%		11	-0.86	12	15	15
Total Anions	mg/L	7.0	280	260	370	380	410
Anions as meq	meq/L	0.59	4.7	4.3	6.5	6.7	7.0
Total Cations	mg/L	2.0	120	90	180	180	190
Cations as meq	meq/L	0.10	7.1	5.2	9.7	10	11

Envirolab ID	Units	PQL	PFI0123-06	PFI0123-07	PFI0123-08	PFI0123-09
Your Reference			GWB04	Field Blank	Duplicate	Trip Blank
Date Sampled			01/09/2024	01/09/2024	01/09/2024	01/09/2024
Depth			12.40			
Bicarbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	370	<5.0	330	<5.0
Carbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0	<5.0
Hydroxide OH- as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0	<5.0
Total Alkalinity as CaCO3	mg/L as CaCO3	5.0	370	<5.0	330	<5.0
Chloride	mg/L	1.0	5.4	<1.0	45	<1.0
Sulfate	mg/L	1.0	9.9	<1.0	13	<1.0
Calcium	mg/L	0.50	87	<0.50	88	<0.50
Magnesium	mg/L	0.50	60	<0.50	41	<0.50
Potassium	mg/L	0.50	8.8	<0.50	15	<0.50
Sodium	mg/L	0.50	9.4	<0.50	30	<0.50
Hardness (calc) equivalent CaCO3	mg/L	3.0	460	<3.0	390	<3.0
Ionic Balance	%		12	-82 [7]	8.2	-87 [7]
Total Anions	mg/L	7.0	390	<7.0	390	<7.0
Anions as meq	meq/L	0.59	6.5	<0.59	6.9	<0.59
Total Cations	mg/L	2.0	160	<2.0	170	<2.0
Cations as meq	meq/L	0.10	9.9	<0.10	9.5	<0.10

Certificate of Analysis PFI0123

Inorganics - Carbon, Nitrogen and Sulfur Species (Water)

Envirolab ID	Units	PQL	PFI0123-01	PFI0123-02	PFI0123-03	PFI0123-04	PFI0123-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			01/09/2024	01/09/2024	01/09/2024	01/09/2024	01/09/2024
Depth				10.87	11.30	7.40	9.20
Total Organic Carbon	mg/L	1.0	1.4	1.4	6.9	4.8	2.0

Envirolab ID	Units	PQL	PFI0123-06	PFI0123-07	PFI0123-08	PFI0123-09
Your Reference			GWB04	Field Blank	Duplicate	Trip Blank
Date Sampled			01/09/2024	01/09/2024	01/09/2024	01/09/2024
Depth			12.40			
Total Organic Carbon	mg/L	1.0	1.8	12 [9]	5.2	<1.0

Inorganics - Speciated Cr (III/VI) and Fe (II/III) (Water)

Envirolab ID	Units	PQL	PFI0123-01	PFI0123-02	PFI0123-03	PFI0123-04	PFI0123-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			01/09/2024	01/09/2024	01/09/2024	01/09/2024	01/09/2024
Depth				10.87	11.30	7.40	9.20
Hexavalent Chromium	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Hexavalent Chromium (Total)	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Trivalent Chromium	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Trivalent Chromium (Total)	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

Envirolab ID	Units	PQL	PFI0123-06	PFI0123-07	PFI0123-08	PFI0123-09
Your Reference			GWB04	Field Blank	Duplicate	Trip Blank
Date Sampled			01/09/2024	01/09/2024	01/09/2024	01/09/2024
Depth			12.40			
Hexavalent Chromium	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Hexavalent Chromium (Total)	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Trivalent Chromium	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Trivalent Chromium (Total)	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050

Certificate of Analysis PFI0123

Inorganics - Nutrients (Water)

Envirolab ID	Units	PQL	PFI0123-01	PFI0123-02	PFI0123-03	PFI0123-04	PFI0123-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			01/09/2024	01/09/2024	01/09/2024	01/09/2024	01/09/2024
Depth				10.87	11.30	7.40	9.20
Ammonia as N	mg/L	0.0050	0.0080	0.063	1.7	0.014	<0.0050
Free Ammonia (unionised) as N by calculation*	mg/L	0.0070	<0.0070	<0.0070	0.017	<0.0070	<0.0070
Ammonium (NH4+) as N by calculation	mg/L	0.0070	0.0080	0.063	1.7	0.014	<0.0070
Nitrate as N	mg/L	0.0050	0.37	0.17	0.0072	0.12	1.8
Nitrate as NO3 by calculation	mg/L	0.020	1.6	0.76	0.032	0.54	8.0
Total Nitrogen	mg/L	0.10	0.78	0.28	4.3	0.24	2.2
Total Phosphorus	mg/L	0.010	<0.010	<0.010	0.025	<0.010	0.058

Envirolab ID	Units	PQL	PFI0123-06	PFI0123-07	PFI0123-08	PFI0123-09
Your Reference			GWB04	Field Blank	Duplicate	Trip Blank
Date Sampled			01/09/2024	01/09/2024	01/09/2024	01/09/2024
Depth			12.40			
Ammonia as N	mg/L	0.0050	<0.0050	<0.0050	1.8	<0.0050
Free Ammonia (unionised) as N by calculation*	mg/L	0.0070	<0.0070	<0.0070	0.018	<0.0070
Ammonium (NH4+) as N by calculation	mg/L	0.0070	<0.0070	<0.0070	1.8	<0.0070
Nitrate as N	mg/L	0.0050	1.8	<0.0050	0.0079	<0.0050
Nitrate as NO3 by calculation	mg/L	0.020	8.1	<0.020	0.035	<0.020
Total Nitrogen	mg/L	0.10	2.3	<0.10	3.0	<0.10
Total Phosphorus	mg/L	0.010	<0.010	<0.010	0.022	<0.010

Certificate of Analysis PFI0123

Inorganics - Common Wastewater Parameters (Water)

Envirolab ID	Units	PQL	PFI0123-01	PFI0123-02	PFI0123-03	PFI0123-04	PFI0123-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			01/09/2024	01/09/2024	01/09/2024	01/09/2024	01/09/2024
Depth				10.87	11.30	7.40	9.20
BOD	mg/L	5.0	19	<5.0	31	26	13
COD	mg O2/L	20	<20	<20	22	<20	33

Envirolab ID	Units	PQL	PFI0123-06	PFI0123-07	PFI0123-08	PFI0123-09
Your Reference			GWB04	Field Blank	Duplicate	Trip Blank
Date Sampled			01/09/2024	01/09/2024	01/09/2024	01/09/2024
Depth			12.40			
BOD	mg/L	5.0	<5.0	11	7.8	6.7
COD	mg O2/L	20	<20	50 [8]	<20	<20

Certificate of Analysis PFI0123

PFAS Extended List (Water) - Analysed By Envirolab Services Sydney

Envirolab ID	Units	PQL	PFI0123-01	PFI0123-02	PFI0123-03	PFI0123-04	PFI0123-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			01/09/2024	01/09/2024	01/09/2024	01/09/2024	01/09/2024
Depth				10.87	11.30	7.40	9.20
Perfluorobutanesulfonic acid (PFBS)	µg/L	0.010	<0.010	<0.010	0.083	0.13	<0.010
Perfluoropentanesulfonic acid (PFPeS)	µg/L	0.010	<0.010	<0.010	0.052	0.083	<0.010
Perfluorohexanesulfonic acid (PFHxS)	µg/L	0.010	0.019	0.013	0.59	0.48	<0.010
Perfluoroheptanesulfonic acid (PFHpS)	µg/L	0.010	<0.010	<0.010	0.053	0.062	<0.010
Perfluorooctanesulfonic acid (PFOS)	µg/L	0.010	0.029	0.033	1.7	0.93	<0.010
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorobutanoic acid (PFBA)	µg/L	0.020	0.11	<0.020	0.081	0.12	<0.020
Perfluoropentanoic acid (PFPeA)	µg/L	0.020	0.20	<0.020	0.10	0.11	<0.020
Perfluorohexanoic acid (PFHxA)	µg/L	0.010	0.11	<0.010	0.15	0.23	<0.010
Perfluoroheptanoic acid (PFHpA)	µg/L	0.010	0.085	<0.010	0.065	0.085	<0.010
Perfluorooctanoic acid (PFOA)	µg/L	0.010	0.047	<0.010	0.15	0.18	<0.010
Perfluorononanoic acid (PFNA)	µg/L	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Perfluorodecanoic acid (PFDA)	µg/L	0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorododecanoic acid (PFDoDA)	µg/L	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.50	<0.50	<0.50	<0.50	<0.50	<0.50
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.020	<0.020	<0.020	<0.020	<0.020	<0.020
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorooctane sulfonamide (FOSA)	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-Methyl perfluorooctane sulfonamidoethanol	µg/L	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
N-Ethyl perfluorooctane sulfonamidoethanol	µg/L	0.50	<0.50	<0.50	<0.50	<0.50	<0.50
N-Methyl perfluorooctane sulfonamidoacetic acid	µg/L	0.020	<0.020	<0.020	<0.020	<0.020	<0.020
N-Ethyl perfluorooctane sulfonamidoacetic acid	µg/L	0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Surrogate 13C8 PFOS	%		*98.0*	*99.8*	*102*	*98.2*	*94.8*
Surrogate 13C2 PFOA	%		*99.0*	*102*	*101*	*101*	*99.8*
Total +ve PFHxS+PFOS	µg/L	0.010	0.048	0.046	2.3	1.4	<0.010
Total +ve PFOA+PFOS	µg/L	0.010	0.076	0.033	1.8	1.1	<0.010
Total +ve PFAS	µg/L	0.010	0.60	0.046	3.0	2.4	<0.010
Extraction Internal Standard 13C3 PFBS	%		*85.9*	*87.7*	*90.2*	*89.0*	*86.9*
Extraction Internal Standard 18O2 PFHxS	%		*84.5*	*90.1*	*83.1*	*86.9*	*81.9*
Extraction Internal Standard 13C4 PFOS	%		*82.4*	*82.2*	*78.2*	*83.2*	*87.3*
Extraction Internal Standard 13C4 PFBA	%		*101*	*104*	*98.5*	*103*	*103*
Extraction Internal Standard 13C3 PFPeA	%		*95.4*	*96.7*	*94.8*	*97.2*	*94.8*
Extraction Internal Standard 13C2 PFHxA	%		*88.1*	*88.5*	*93.0*	*90.9*	*87.0*
Extraction Internal Standard 13C4 PFHpA	%		*85.8*	*87.7*	*90.0*	*84.5*	*85.3*
Extraction Internal Standard 13C4 PFOA	%		*89.3*	*91.1*	*88.1*	*88.8*	*86.2*

PFAS Extended List (Water) - Analysed By Envirolab Services Sydney

Envirolab ID	Units	PQL	PFI0123-01	PFI0123-02	PFI0123-03	PFI0123-04	PFI0123-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			01/09/2024	01/09/2024	01/09/2024	01/09/2024	01/09/2024
Depth				10.87	11.30	7.40	9.20
Extraction Internal Standard 13C5 PFNA	%		*83.9*	*90.8*	*82.9*	*84.5*	*84.0*
Extraction Internal Standard 13C2 PFDA	%		*75.8*	*79.7*	*70.2*	*78.0*	*76.6*
Extraction Internal Standard 13C2 PFUnDA	%		*63.2*	*67.8*	*58.1*	*63.7*	*64.8*
Extraction Internal Standard 13C2 PFDoDA	%		*65.1*	*66.9*	*59.1*	*70.0*	*66.7*
Extraction Internal Standard 13C2 PFTeDA	%		*68.4*	*66.3*	*58.7*	*70.6*	*73.2*
Extraction Internal Standard 13C2 4:2FTS	%		*69.6*	*70.9*	*72.4*	*67.2*	*64.2*
Extraction Internal Standard 13C2 6:2FTS	%		*74.1*	*74.2*	*75.5*	*73.3*	*72.1*
Extraction Internal Standard 13C2 8:2FTS	%		*68.4*	*72.5*	*67.3*	*70.2*	*69.6*
Extraction Internal Standard 13C8 FOSA	%		*77.9*	*81.1*	*74.1*	*80.4*	*80.6*
Extraction Internal Standard d3 N MeFOSA	%		*82.0*	*80.5*	*77.6*	*86.7*	*83.9*
Extraction Internal Standard d5 N EtFOSA	%		*78.3*	*76.6*	*71.9*	*83.7*	*83.1*
Extraction Internal Standard d7 N MeFOSE	%		*68.1*	*65.0*	*64.4*	*69.9*	*67.6*
Extraction Internal Standard d9 N EtFOSE	%		*71.9*	*72.1*	*66.2*	*71.2*	*71.0*
Extraction Internal Standard d3 N MeFOSAA	%		*79.7*	*83.4*	*79.9*	*79.3*	*79.0*
Extraction Internal Standard d5 N EtFOSAA	%		*71.0*	*69.7*	*65.9*	*71.9*	*67.6*

Envirolab ID	Units	PQL	PFI0123-06	PFI0123-07	PFI0123-08	PFI0123-09
Your Reference			GWB04	Field Blank	Duplicate	Trip Blank
Date Sampled			01/09/2024	01/09/2024	01/09/2024	01/09/2024
Depth			12.40			
Perfluorobutanesulfonic acid (PFBS)	µg/L	0.010	<0.010	<0.010	0.078	<0.010
Perfluoropentanesulfonic acid (PFPeS)	µg/L	0.010	<0.010	<0.010	0.055	<0.010
Perfluorohexanesulfonic acid (PFHxS)	µg/L	0.010	<0.010	<0.010	0.52	<0.010
Perfluoroheptanesulfonic acid (PFHpS)	µg/L	0.010	<0.010	<0.010	0.048	<0.010
Perfluorooctanesulfonic acid (PFOS)	µg/L	0.010	<0.010	<0.010	1.7	<0.010
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.020	<0.020	<0.020	<0.020	<0.020
Perfluorobutanoic acid (PFBA)	µg/L	0.020	<0.020	<0.020	0.079	<0.020
Perfluoropentanoic acid (PFPeA)	µg/L	0.020	<0.020	<0.020	0.10	<0.020
Perfluorohexanoic acid (PFHxA)	µg/L	0.010	<0.010	<0.010	0.14	<0.010
Perfluoroheptanoic acid (PFHpA)	µg/L	0.010	<0.010	<0.010	0.053	<0.010
Perfluorooctanoic acid (PFOA)	µg/L	0.010	<0.010	<0.010	0.15	<0.010
Perfluorononanoic acid (PFNA)	µg/L	0.010	<0.010	<0.010	<0.010	<0.010
Perfluorodecanoic acid (PFDA)	µg/L	0.020	<0.020	<0.020	<0.020	<0.020
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.020	<0.020	<0.020	<0.020	<0.020
Perfluorododecanoic acid (PFDoDA)	µg/L	0.050	<0.050	<0.050	<0.050	<0.050
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.50	<0.50	<0.50	<0.50	<0.50
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.010	<0.010	<0.010	<0.010	<0.010
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.010	<0.010	<0.010	<0.010	<0.010
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.020	<0.020	<0.020	<0.020	<0.020
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.020	<0.020	<0.020	<0.020	<0.020
Perfluorooctane sulfonamide (FOSA)	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.050	<0.050	<0.050	<0.050	<0.050
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.10	<0.10	<0.10	<0.10	<0.10

Certificate of Analysis PFI0123

PFAS Extended List (Water) - Analysed By Envirolab Services Sydney

Envirolab ID	Units	PQL	PFI0123-06	PFI0123-07	PFI0123-08	PFI0123-09
Your Reference			GWB04	Field Blank	Duplicate	Trip Blank
Date Sampled			01/09/2024	01/09/2024	01/09/2024	01/09/2024
Depth			12.40			
N-Methyl perfluorooctane sulfonamidoethanol	µg/L	0.050	<0.050	<0.050	<0.050	<0.050
N-Ethyl perfluorooctane sulfonamidoethanol	µg/L	0.50	<0.50	<0.50	<0.50	<0.50
N-Methyl perfluorooctane sulfonamidoacetic acid	µg/L	0.020	<0.020	<0.020	<0.020	<0.020
N-Ethyl perfluorooctane sulfonamidoacetic acid	µg/L	0.020	<0.020	<0.020	<0.020	<0.020
Surrogate 13C8 PFOS	%		*103*	*95.6*	*106*	*105*
Surrogate 13C2 PFOA	%		*102*	*103*	*103*	*103*
Total +ve PFHxS+PFOS	µg/L	0.010	<0.010	<0.010	2.2	<0.010
Total +ve PFOA+PFOS	µg/L	0.010	<0.010	<0.010	1.8	<0.010
Total +ve PFAS	µg/L	0.010	<0.010	<0.010	2.9	<0.010
Extraction Internal Standard 13C3 PFBS	%		*85.0*	*85.8*	*87.0*	*85.4*
Extraction Internal Standard 18O2 PFHxS	%		*80.1*	*84.0*	*84.2*	*83.0*
Extraction Internal Standard 13C4 PFOS	%		*76.3*	*79.4*	*77.9*	*76.8*
Extraction Internal Standard 13C4 PFBA	%		*103*	*105*	*102*	*105*
Extraction Internal Standard 13C3 PFPeA	%		*95.5*	*95.6*	*95.3*	*94.9*
Extraction Internal Standard 13C2 PFHxA	%		*86.7*	*87.0*	*91.1*	*84.9*
Extraction Internal Standard 13C4 PFHpA	%		*85.5*	*83.4*	*89.5*	*85.8*
Extraction Internal Standard 13C4 PFOA	%		*84.2*	*83.5*	*88.0*	*85.8*
Extraction Internal Standard 13C5 PFNA	%		*81.8*	*81.2*	*85.6*	*84.6*
Extraction Internal Standard 13C2 PFDA	%		*74.0*	*73.3*	*73.7*	*76.1*
Extraction Internal Standard 13C2 PFUnDA	%		*60.1*	*59.8*	*62.1*	*63.8*
Extraction Internal Standard 13C2 PFDoDA	%		*63.1*	*62.8*	*62.6*	*65.3*
Extraction Internal Standard 13C2 PFTeDA	%		*60.4*	*63.1*	*61.8*	*65.4*
Extraction Internal Standard 13C2 4:2FTS	%		*66.8*	*68.2*	*71.7*	*68.5*
Extraction Internal Standard 13C2 6:2FTS	%		*72.9*	*74.8*	*73.3*	*72.7*
Extraction Internal Standard 13C2 8:2FTS	%		*68.7*	*68.6*	*69.4*	*69.2*
Extraction Internal Standard 13C8 FOSA	%		*75.0*	*75.4*	*76.6*	*80.3*
Extraction Internal Standard d3 N MeFOSA	%		*77.8*	*81.2*	*79.0*	*80.3*
Extraction Internal Standard d5 N EtFOSA	%		*75.6*	*75.8*	*74.4*	*77.6*
Extraction Internal Standard d7 N MeFOSE	%		*62.8*	*63.9*	*62.9*	*67.8*
Extraction Internal Standard d9 N EtFOSE	%		*66.0*	*69.5*	*69.0*	*68.9*
Extraction Internal Standard d3 N MeFOSAA	%		*80.4*	*78.1*	*80.6*	*81.2*
Extraction Internal Standard d5 N EtFOSAA	%		*65.6*	*67.2*	*69.1*	*74.8*

Certificate of Analysis PFI0123

General - Field Data (Water)

Envirolab ID	Units	PQL	PFI0123-01	PFI0123-02	PFI0123-03	PFI0123-04	PFI0123-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			01/09/2024	01/09/2024	01/09/2024	01/09/2024	01/09/2024
Depth				10.87	11.30	7.40	9.20
Temperature (Client Supplied)*	o C		30.0	34.5	33.3	33.0	31.3

Envirolab ID	Units	PQL	PFI0123-06	PFI0123-08
Your Reference			GWB04	Duplicate
Date Sampled			01/09/2024	01/09/2024
Depth			12.40	
Temperature (Client Supplied)*	o C		29.2	33.3

Result Comments

Identifier	Description
[7]	Ion Balance indicative only for samples with low Electrical Conductivity.
[8]	Reanalysis has been performed to confirm result.
[9]	Result has been confirmed through re-run

Method Summary

Method ID	Methodology Summary
Calc	Calculation
Calc - ION	Calculation
Field Data	Field Data supplied by client
INORG-006	Alkalinity - determined titrimetrically based on APHA latest edition 2320-B. Solids reported from a 1:5 water extract unless otherwise specified. Total Carbon Dioxide - determined by calculation in accordance with APHA latest edition,4500-CO2 D.
INORG-018	Total Dissolved Solids - determined gravimetrically. The solids are dried at 180±10°C. NOTE: Where the EC of the sample is <100µS/cm, the TDS will typically be below 70mg/L (as the sample is very likely to be at least drinking water quality). Therefore to ensure data quality for TDS, the TDS is typically calculated as per the equation: TDS = EC*0.6
INORG-040	The concentrations of the major ions (mg/L) are converted to milliequivalents and summed. The ionic balance should be within +/- 15% i.e. total anions = total cations +/-15%.
INORG-055	Nitrate/Nitrite/NOx/TKN - determined colourimetrically. Waters samples are filtered on receipt prior to analysis. Soils/solids are analysed following a water extraction.
INORG-057	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.
INORG-060_TP	Total Phosphorus - determined colourimetrically using APHA latest edition 4500-P J. Water samples are filtered on receipt prior to analysis. Soils are analysed from a water extract.
INORG-067	Samples are digested in acid with a known excess of potassium dichromate then the colour change is determined by discrete analyser or UV-VIS in accordance with APHA latest edition 5220 D.
INORG-079	Carbon forms (inorganic, organic, total) determined using a TOC/NDIR analyser via combustion. Dissolved aqueous\forms require filtering prior to determination.
INORG-081	Anions determined by Ion Chromatography. Waters samples are filtered on receipt prior to analysis. Solids are analysed from a water extract. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
INORG-091	BOD and/or cBOD - Analysed in accordance with APHA latest edition 5210 D.
INORG-111	Volatile Fatty Acids determined by distillation and titration.
INORG-118	Hexavalent Chromium by Ion Chromatographic separation and colourimetric determination. Waters samples are filtered prior to analysis. Solids are extracted with an alkaline buffered solution, for air sampling media the same alkali extraction can be used or alternatives from NIOSH/OSHA. For aqueous samples, Total Hexavalent Chromium includes the dissolved Hexavalent Chromium and any Hexavalent Chromium solubilised by the preservative i.e. Sodium Hydroxide from any particulate that may be present.
INORG-127	Total Nitrogen by high temperature catalytic combustion with chemiluminescence detection. Organic Carbon forms (inorganic, organic, total) determined using a TOC/NDIR analyser via combustion. Dissolved forms require filtering prior to determination.
METALS-020	Determination of various metals by ICP-OES.
METALS-022	Determination of various metals by ICP-MS.Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements.Salt forms and/or anion/cation forms (e.g. FeO, PbO, ZnO, BO3) are determined stoichiometrically from the base metal concentration.
ORG-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. 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 (>C10-C40).
ORG-021/022/025_PCB	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD and/or GC-MS/GC-MSMS.
ORG-022_PAH	Determination of semi-volatile organic compounds (SVOCs) by GC-MS. Water samples are extracted by LLE and solids using DCM/Acetone/Methanol. For PAHs:- Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. 1. 'TEQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'TEQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'TEQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, for Total +ve calculations, the PQL is reflective of the lowest individual PQL and therefore, for example, "Total +ve PAHs" is simply a sum of the positive individual PAHs.

Method Summary

Method ID	Methodology Summary
ORG-023_F1_TOT	Determination of volatile organic compounds (VOCs) by P&T-GC-MS. Water samples are analysed directly by purge and trap GC-MS. Solids are extracted with Methanol, diluted and analysed by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. 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.
ORG-029	Soil/solid and sorbent samples are extracted with basified Methanol. Waters and soil/sorbent 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. Analysis is undertaken with LC-MSMS. PFAS results include the sum of branched and linear isomers where applicable. 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. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

Result Definitions

Identifier	Description
NR	Not reported
NEPM	National Environment Protection Measure
NS	Not specified
LCS	Laboratory Control Sample
RPD	Relative Percent Difference
>	Greater than
<	Less than
PQL	Practical Quantitation Limit
INS	Insufficient sample for this test
NA	Test not required
NT	Not tested
DOL	Samples rejected due to particulate overload (air filters only)
RFD	Samples rejected due to filter damage (air filters only)
RUD	Samples rejected due to uneven deposition (air filters only)
##	Indicates a laboratory acceptance criteria outlier, for further details, see Result Comments and/or QC Comments

Quality Control Definitions

Blank

This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, and is determined by processing solvents and reagents in exactly the same manner as for samples.

Surrogate Spike

Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

LCS (Laboratory Control Sample)

This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Matrix Spike

A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

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.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

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 QAQC tables for details (available on request); <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; 60-140% for organics (+/-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 typically insufficient in order to satisfy laboratory QA/QC protocols.

Miscellaneous Information

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. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

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 or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volume measurements are not covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary PFI0123

Client Details

Client	Katherine Town Council - NT
Your Reference	Katherine Town Council - EPL298 - Quarterly
Date Issued	18/09/2024

Recommended Holding Time Compliance

No recommended holding time exceedances

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	Yes	No Outliers
Duplicates	No	Duplicate Outliers Exist - See detailed list below
Matrix Spike	No	Matrix Spike Outliers Exist - See detailed list below
Surrogates / Extracted Internal Standards	Yes	No Outliers
QC Frequency	No	QC Frequency Outliers Exist - See detailed list below

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Data Quality Assessment Summary PFI0123

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
vTRH&MBTEXN | Water	1-9	01/09/2024	04/09/2024	05/09/2024	Yes
sTRH | Water	1-9	01/09/2024	04/09/2024	05/09/2024	Yes
PAH | Water	1-9	01/09/2024	04/09/2024	05/09/2024	Yes
PCB | Water	1-9	01/09/2024	04/09/2024	05/09/2024	Yes
Total Metals (LL) | Water	1-9	01/09/2024	06/09/2024	07/09/2024	Yes
Dissolved Metals (LL) | Water	1-9	01/09/2024	05/09/2024	06/09/2024	Yes
TDS | Water	1-9	01/09/2024	04/09/2024	04/09/2024	Yes
VFA | Water	1-9	01/09/2024	04/09/2024	10/09/2024	Yes
Alkalinity Suite | Water	1-9	01/09/2024	04/09/2024	04/09/2024	Yes
Chloride | Water	1-9	01/09/2024	06/09/2024	06/09/2024	Yes
Dissolved Cations | Water	1-9	01/09/2024	05/09/2024	06/09/2024	Yes
Ion Balance | Water	1-9	01/09/2024	04/09/2024	11/09/2024	Yes
	1-9	01/09/2024	05/09/2024	06/09/2024	Yes
Sulfate | Water	1-9	01/09/2024	06/09/2024	06/09/2024	Yes
Total Organic Carbon | Water	1	01/09/2024	04/09/2024	06/09/2024	Yes
	2-9	01/09/2024	04/09/2024	09/09/2024	Yes
Cr6+ | Water	1-9	01/09/2024	06/09/2024	06/09/2024	Yes
Cr6+ - Total | Water	1-9	01/09/2024	06/09/2024	06/09/2024	Yes
Nitrogen - Ammonia | Water	1-9	01/09/2024	04/09/2024	04/09/2024	Yes
Nitrogen - Nitrate | Water	1-9	01/09/2024	04/09/2024	04/09/2024	Yes
Nitrogen - Total N | Water	1-9	01/09/2024	04/09/2024	06/09/2024	Yes
Total Phosphorus | Water	1-9	01/09/2024	05/09/2024	05/09/2024	Yes
BOD | Water	1-9	01/09/2024	04/09/2024	09/09/2024	Yes
COD | Water	1-9	01/09/2024	09/09/2024	09/09/2024	Yes
PFAS EXT-ISTD | Water	1-9	01/09/2024	05/09/2024	05/09/2024	Yes
PFAS-Extended | Water	1-9	01/09/2024	05/09/2024	05/09/2024	Yes

Outliers: Duplicates

METALS-022|Dissolved Low Level Metals (Water)| Batch BFI0824

Sample ID	Duplicate ID	Analyte	% Limits	RPD
BFI0824-DUP1#	DUP1	Zinc	20.00	31.6[4]

Data Quality Assessment Summary PFI0123

Outliers: Matrix Spike

INORG-055|Inorganics - Nutrients (Water)| Batch BFI0582

Sample ID	Analyte	% Limits	% Recovery
BFI0582-MS1#	Nitrate as N	70 - 130	##[1]

INORG-057|Inorganics - Nutrients (Water)| Batch BFI0582

Sample ID	Analyte	% Limits	% Recovery
BFI0582-MS1#	Ammonia as N	70 - 130	##[2]

Outliers: QC Frequency

INORG-091|Inorganics - Common Wastewater Parameters (Water)| Batch BFI0673

Analysis	QC Type	Expected	Reported
BOD	Duplicate	1	0

INORG-111|Inorganics - Physical Parameters (Water)| Batch BFI0742

Analysis	QC Type	Expected	Reported
VFA	Duplicate	1	0

Quality Control PFI0123

ORG-023_F1_TOT|Volatile TRH and BTEX (Water) | Batch BFI0717

Analyte	Units	PQL	Blank	DUP1 BFI0717-DUP1# Samp | QC | RPD %	DUP2 BFI0717-DUP2# Samp | QC | RPD %	LCS %	Spike % PFI0123-02
TRH C6-C9	µg/L	10	<10	<10 | <10 | [NA]	<10 | <10 | [NA]	82.4	80.9
TRH C6-C10	µg/L	10	<10	<10 | <10 | [NA]	<10 | <10 | [NA]	81.9	77.1
TRH C6-C10 less BTEX (F1)	µg/L	10	<10	<10 | <10 | [NA]	<10 | <10 | [NA]	[NA]	[NA]
Methyl tert butyl ether (MTBE)	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	[NA]	[NA]
Benzene	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	92.4	101
Toluene	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	89.5	97.9
Ethylbenzene	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	87.9	95.4
meta+para Xylene	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	<2.0 | <2.0 | [NA]	88.3	95.9
ortho-Xylene	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	87.7	95.1
Total Xylene	µg/L	3.0	<3.0	<3.0 | <3.0 | [NA]	<3.0 | <3.0 | [NA]	[NA]	[NA]
Naphthalene (value used in F2 calc)	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	[NA]	[NA]
Surrogate Dibromofluoromethane	*%*		*97.6*	*94.2 | 94.5*	*97.9 | 96.3*	*96.7*	*98.5*
Surrogate Toluene-D8	*%*		*100*	*97.4 | 97.5*	*97.6 | 95.1*	*103*	*103*
Surrogate 4-Bromofluorobenzene	*%*		*93.6*	*93.3 | 92.2*	*92.7 | 90.4*	*89.7*	*88.8*

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

ORG-020|Semi-volatile TRH (Water) | Batch BFI0635

Analyte	Units	PQL	Blank	DUP1 PFI0123-01 Samp | QC | RPD %	DUP2 PFI0123-02 Samp | QC | RPD %	LCS %	Spike % PFI0123-03
TRH C10-C14	µg/L	50	<50	<50 | <50 | [NA]	<50 | <50 | [NA]	117	123
TRH C15-C28	µg/L	100	<100	<100 | <100 | [NA]	<100 | <100 | [NA]	122	129
TRH C29-C36	µg/L	100	<100	<100 | <100 | [NA]	<100 | <100 | [NA]	115	120
TRH >C10-C16	µg/L	50	<50	<50 | <50 | [NA]	<50 | <50 | [NA]	119	124
TRH >C16-C34 (F3)	µg/L	100	<100	<100 | <100 | [NA]	<100 | <100 | [NA]	122	129
TRH >C34-C40 (F4)	µg/L	100	<100	<100 | <100 | [NA]	<100 | <100 | [NA]	113	119
Surrogate o-Terphenyl	*%*		*97.8*	*92.4 | 93.3*	*91.2 | 94.1*	*98.6*	*111*

ORG-022_PAH|Polycyclic Aromatic Hydrocarbons (Water) | Batch BFI0635

Analyte	Units	PQL	Blank	DUP1 PFI0123-01 Samp | QC | RPD %	DUP2 PFI0123-02 Samp | QC | RPD %	LCS %	Spike % PFI0123-04
Naphthalene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	88.2	74.5
Acenaphthylene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	[NA]	[NA]
Acenaphthene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	88.3	75.8
Fluorene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	92.3	78.5
Phenanthrene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	93.8	81.2
Anthracene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	[NA]	[NA]
Fluoranthene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	92.1	80.0
Pyrene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	89.7	78.1
Benzo(a)anthracene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	[NA]	[NA]
Chrysene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	75.1	63.6
Benzo(b,j,k)fluoranthene	µg/L	0.20	<0.20	<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	[NA]	[NA]
Benzo(a)pyrene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	68.3	61.7
Indeno(1,2,3-c,d)pyrene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	[NA]	[NA]
Dibenzo(a,h)anthracene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	[NA]	[NA]
Benzo(g,h,i)perylene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	[NA]	[NA]
Surrogate p-Terphenyl-D14	*%*		*99.2*	*85.8 | 98.6*	*86.8 | 84.9*	*76.3*	*73.1*

Quality Control PFI0123

ORG-021/022/025_PCB|Polychlorinated Biphenyls (Water) | Batch BFI0635

Analyte	Units	PQL	Blank	DUP1 PFI0123-01 Samp | QC | RPD %	DUP2 PFI0123-02 Samp | QC | RPD %	LCS %	Spike % PFI0123-04
Aroclor 1016	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	<2.0 | <2.0 | [NA]	[NA]	[NA]
Aroclor 1221	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	<2.0 | <2.0 | [NA]	[NA]	[NA]
Aroclor 1232	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	<2.0 | <2.0 | [NA]	[NA]	[NA]
Aroclor 1242	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	<2.0 | <2.0 | [NA]	[NA]	[NA]
Aroclor 1248	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	<2.0 | <2.0 | [NA]	[NA]	[NA]
Aroclor 1254	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	<2.0 | <2.0 | [NA]	[NA]	[NA]
Aroclor 1260	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	<2.0 | <2.0 | [NA]	[NA]	[NA]
PCB C103	µg/L			0.00 | 0.00 | [NA]	0.00 | 0.00 | [NA]	83.9	79.0
Surrogate 2-Fluorobiphenyl	*%*		*100*	*89.1 | 99.0*	*88.7 | 88.4*	*92.9*	*87.7*

METALS-022|Acid Extractable Low Level Metals (Water) | Batch BFI1097

Analyte	Units	PQL	Blank	DUP1 BFI1097-DUP1# Samp | QC | RPD %	DUP2 BFI1097-DUP2# Samp | QC | RPD %	LCS %	Spike % PFI0123-01
Aluminium	µg/L	10	<10	<10 | <10 | [NA]	<10 | <10 | [NA]	105	98.6
Cadmium	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	106	97.4
Chromium	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	110	104
Copper	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	110	98.5
Iron	µg/L	10	<10	31.0 | 32.1 | [NA]	<10 | <10 | [NA]	112	101
Lead	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	104	96.4
Manganese	µg/L	1.0	<1.0	10.9 | 11.2 | 3.09	<1.0 | <1.0 | [NA]	105	97.3
Nickel	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	110	99.6
Selenium	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	114	107
Zinc	µg/L	1.0	<1.0	1.97 | 2.14 | [NA]	1.11 | <1.0 | [NA] [3]	109	96.4

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-022|Dissolved Low Level Metals (Water) | Batch BFI0824

Analyte	Units	PQL	Blank	DUP1 BFI0824-DUP1# Samp | QC | RPD %	DUP2 PFI0123-07 Samp | QC | RPD %	LCS %	Spike % BFI0824-MS1#
Aluminium	µg/L	10	<10	<50 | <50 | [NA]	<10 | <10 | [NA]	107	113
Cadmium	µg/L	0.10	<0.10	<0.50 | <0.50 | [NA]	<0.10 | <0.10 | [NA]	97.2	96.1
Chromium	µg/L	1.0	<1.0	<5.0 | <5.0 | [NA]	<1.0 | <1.0 | [NA]	105	110
Copper	µg/L	1.0	<1.0	8.00 | 8.05 | [NA]	<1.0 | <1.0 | [NA]	107	100
Iron	µg/L	10	<10	<50 | <50 | [NA]	<10 | <10 | [NA]	108	86.6
Lead	µg/L	1.0	<1.0	<5.0 | <5.0 | [NA]	<1.0 | <1.0 | [NA]	100	94.3
Manganese	µg/L	1.0	<1.0	294 | 284 | 3.37	<1.0 | <1.0 | [NA]	105	108
Nickel	µg/L	1.0	<1.0	35.3 | 34.0 | 3.90	<1.0 | <1.0 | [NA]	104	101
Selenium	µg/L	1.0	<1.0	<5.0 | <5.0 | [NA]	<1.0 | <1.0 | [NA]	106	107
Zinc	µg/L	1.0	<1.0	60.4 | 83.1 | 31.6 [4]	<1.0 | <1.0 | [NA]	105	105

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-111|Inorganics - Physical Parameters (Water) | Batch BFI0742

Analyte	Units	PQL	Blank	LCS %
Volatile Fatty Acids	mg/L	5.0	<5.0	81.7

Batch QC Comments: [5]

INORG-018|Inorganics - Physical Parameters (Water) | Batch BFI0753

Analyte	Units	PQL	Blank	DUP1 PFI0123-01 Samp | QC | RPD %	DUP2 PFI0123-04 Samp | QC | RPD %	LCS %
Total Dissolved Solids	mg/L	5.0	<5.0	283 | 293 | 3.47	359 | 374 | 4.09	86.3

Quality Control PFI0123

INORG-006 | Inorganics - Ionic Balance and Indexes (Water) | Batch BFI0570

Analyte	Units	PQL	Blank	DUP1 BFI0570-DUP1# Samp | QC | RPD %	DUP2 BFI0570-DUP2# Samp | QC | RPD %	LCS %
Bicarbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	185 | 195 | 5.00	<5.0 | <5.0 | [NA]	[NA]
Carbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0 | <5.0 | [NA]	70.8 | 66.1 | 6.87	[NA]
Hydroxide OH- as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0 | <5.0 | [NA]	298 | 308 | 3.10	[NA]
Total Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	185 | 195 | 5.00	369 | 374 | 1.27	85.6

Analyte	Units	PQL	Blank	LCS %
Total Alkalinity as CaCO3	mg/L as CaCO3	5		87.7

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-020 | Inorganics - Ionic Balance and Indexes (Water) | Batch BFI0826

Analyte	Units	PQL	Blank	DUP1 BFI0826-DUP1# Samp | QC | RPD %	DUP2 PFI0123-07 Samp | QC | RPD %	LCS %	Spike % BFI0826-MS1#
Calcium	mg/L	0.50	<0.50	1520 | 1530 | 0.702	<0.50 | <0.50 | [NA]	96.9	99.1
Magnesium	mg/L	0.50	<0.50	189 | 190 | 0.379	<0.50 | <0.50 | [NA]	98.4	103
Potassium	mg/L	0.50	<0.50	374 | 372 | 0.485	<0.50 | <0.50 | [NA]	102	99.8
Sodium	mg/L	0.50	<0.50	19000 | 18900 | 0.364	<0.50 | <0.50 | [NA]	93.2	110
Hardness (calc) equivalent CaCO3	mg/L	3.0	<3.0	4570 | 4600 | 0.647	<3.0 | <3.0 | [NA]	[NA]	[NA]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-081 | Inorganics - Ionic Balance and Indexes (Water) | Batch BFI1101

Analyte	Units	PQL	Blank	DUP1 BFI1101-DUP1# Samp | QC | RPD %	DUP2 BFI1101-DUP2# Samp | QC | RPD %	LCS %	Spike % BFI1101-MS1#
Chloride	mg/L	1.0	<1.0	1.54 | 1.51 | [NA]	70.8 | 70.8 | 0.0496	93.2	97.6
Sulfate	mg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	10.4 | 10.3 | 0.543	91.8	95.4

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-079 | Inorganics - Carbon, Nitrogen and Sulfur Species (Water) | Batch BFI0682

Analyte	Units	PQL	Blank	DUP1 BFI0682-DUP1# Samp | QC | RPD %	DUP2 PFI0123-07 Samp | QC | RPD %	LCS %	Spike % PFI0123-01
Total Organic Carbon	mg/L	1.0	<1.0	9.78 | 9.64 | 1.45	11.7 | 12.4 | 5.92	97.7	105

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-118 | Inorganics - Speciated Cr (III/VI) and Fe (II/III) (Water) | Batch BFI1030

Analyte	Units	PQL	Blank	DUP1 BFI1030-DUP1# Samp | QC | RPD %	DUP2 PFI0123-05 Samp | QC | RPD %	LCS %	Spike % BFI1030-MS1#
Hexavalent Chromium	mg/L	0.0050	<0.0050	<0.0050 | <0.0050 | [NA]	<0.0050 | <0.0050 | [NA]	98.7	86.3

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-118 | Inorganics - Speciated Cr (III/VI) and Fe (II/III) (Water) | Batch BFI1031

Analyte	Units	PQL	Blank	DUP1 PFI0123-01 Samp | QC | RPD %	LCS %	Spike % PFI0123-02
Hexavalent Chromium (Total)	mg/L	0.0050	<0.0050	<0.0050 | <0.0050 | [NA]	97.6	95.9

Quality Control PFI0123

INORG-057 | Inorganics - Nutrients (Water) | Batch BFI0582

Analyte	Units	PQL	Blank	DUP1 BFI0582-DUP1# Samp | QC | RPD %	DUP2 PFI0123-02 Samp | QC | RPD %	LCS %	Spike % BFI0582-MS1#
Ammonia as N	mg/L	0.0050	<0.0050	0.328 | 0.300 | 9.05	0.0632 | 0.0612 | 3.21	93.8	##[2]
Nitrate as N	mg/L	0.0050	<0.0050	6.86 | 6.66 | 2.93	0.172 | 0.167 | 3.07	108	##[1]
Nitrate as NO3 by calculation	mg/L	0.020	<0.020			[NA]	[NA]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-127 | Inorganics - Nutrients (Water) | Batch BFI0679

Analyte	Units	PQL	Blank	DUP1 PFI0123-01 Samp | QC | RPD %	DUP2 BFI0679-DUP2# Samp | QC | RPD %	LCS %	Spike % PFI0123-02
Total Nitrogen	mg/L	0.10	<0.10	0.776 | 0.778 | 0.372	12.7 | 13.0 | 2.15	105	98.4

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-060_TP | Inorganics - Nutrients (Water) | Batch BFI0799

Analyte	Units	PQL	Blank	DUP1 BFI0799-DUP1# Samp | QC | RPD %	DUP2 PFI0123-01 Samp | QC | RPD %	LCS %	Spike % BFI0799-MS1#
Total Phosphorus	mg/L	0.010	<0.010	0.0484 | 0.0458 | [NA]	<0.010 | <0.010 | [NA]	104	100

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-067 | Inorganics - Common Wastewater Parameters (Water) | Batch BFI1493

Analyte	Units	PQL	Blank	DUP1 BFI1493-DUP1# Samp | QC | RPD %	DUP2 PFI0123-09 Samp | QC | RPD %	LCS %
COD	mg O2/L	20	<20	40.0 | 35.0 | [NA]	<20 | <20 | [NA]	94.0

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control PFI0123

ORG-029|PFAS Extended List (Water) | Batch BFI1688

Analyte	Units	PQL	Blank	DUP1 PFI0123-01 Samp | QC | RPD %	LCS %	Spike % PFI0123-02
Perfluorobutanesulfonic acid (PFBS)	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	104	94.3
Perfluoropentanesulfonic acid (PFPeS)	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	94.5	88.3
Perfluorohexanesulfonic acid (PFHxS)	µg/L	0.010	<0.010	0.0192 | 0.0202 | [NA]	95.6	90.0
Perfluoroheptanesulfonic acid (PFHpS)	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	101	90.5
Perfluorooctanesulfonic acid (PFOS)	µg/L	0.010	<0.010	0.0292 | 0.0288 | [NA]	103	91.7
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.020	<0.020	<0.020 | <0.020 | [NA]	88.6	72.9
Perfluorobutanoic acid (PFBA)	µg/L	0.020	<0.020	0.112 | 0.109 | 2.71	97.5	90.0
Perfluoropentanoic acid (PFPeA)	µg/L	0.020	<0.020	0.198 | 0.195 | 1.43	96.2	87.9
Perfluorohexanoic acid (PFHxA)	µg/L	0.010	<0.010	0.110 | 0.108 | 1.29	96.3	93.1
Perfluoroheptanoic acid (PFHpA)	µg/L	0.010	<0.010	0.0852 | 0.0812 | 4.81	97.8	92.9
Perfluorooctanoic acid (PFOA)	µg/L	0.010	<0.010	0.0466 | 0.0446 | [NA]	95.2	92.0
Perfluorononanoic acid (PFNA)	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	99.6	90.0
Perfluorodecanoic acid (PFDA)	µg/L	0.020	<0.020	<0.020 | <0.020 | [NA]	94.5	91.1
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.020	<0.020	<0.020 | <0.020 | [NA]	103	97.3
Perfluorododecanoic acid (PFDoDA)	µg/L	0.050	<0.050	<0.050 | <0.050 | [NA]	102	92.4
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	108	93.2
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	99.8	96.7
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	102	97.5
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	105	99.0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.020	<0.020	<0.020 | <0.020 | [NA]	107	99.9
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.020	<0.020	<0.020 | <0.020 | [NA]	130	116
Perfluorooctane sulfonamide (FOSA)	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	95.9	96.4
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.050	<0.050	<0.050 | <0.050 | [NA]	95.6	96.0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	94.9	93.8
N-Methyl perfluorooctane sulfonamidoethanol	µg/L	0.050	<0.050	<0.050 | <0.050 | [NA]	107	103
N-Ethyl perfluorooctane sulfonamidoethanol	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	106	106
N-Methyl perfluorooctane sulfonamidoacetic acid	µg/L	0.020	<0.020	<0.020 | <0.020 | [NA]	99.1	90.6
N-Ethyl perfluorooctane sulfonamidoacetic acid	µg/L	0.020	<0.020	<0.020 | <0.020 | [NA]	93.2	86.0
Surrogate 13C8 PFOS	%		*105*	*98.0 | 96.4*	*105*	*101*
Surrogate 13C2 PFOA	%		*101*	*99.0 | 98.5*	*102*	*98.6*
Extraction Internal Standard 13C3 PFBS	%		*91.2*	*85.9 | 86.2 | 0.360*	*[NA]*	*[NA]*
Extraction Internal Standard 18O2 PFHxS	%		*90.5*	*84.5 | 84.8 | 0.354*	*[NA]*	*[NA]*
Extraction Internal Standard 13C4 PFOS	%		*85.8*	*82.4 | 87.7 | 6.27*	*[NA]*	*[NA]*
Extraction Internal Standard 13C4 PFBA	%		*102*	*101 | 103 | 1.39*	*[NA]*	*[NA]*
Extraction Internal Standard 13C3 PFPeA	%		*98.0*	*95.4 | 98.4 | 3.08*	*[NA]*	*[NA]*
Extraction Internal Standard 13C2 PFHxA	%		*93.9*	*88.1 | 88.2 | 0.0454*	*[NA]*	*[NA]*
Extraction Internal Standard 13C4 PFHpA	%		*95.7*	*85.8 | 88.4 | 2.95*	*[NA]*	*[NA]*
Extraction Internal Standard 13C4 PFOA	%		*96.5*	*89.3 | 93.7 | 4.83*	*[NA]*	*[NA]*
Extraction Internal Standard 13C5 PFNA	%		*92.4*	*83.9 | 92.1 | 9.27*	*[NA]*	*[NA]*
Extraction Internal Standard 13C2 PFDA	%		*81.7*	*75.8 | 82.4 | 8.40*	*[NA]*	*[NA]*
Extraction Internal Standard 13C2 PFUnDA	%		*70.1*	*63.2 | 72.9 | 14.3*	*[NA]*	*[NA]*
Extraction Internal Standard 13C2 PFDoDA	%		*75.8*	*65.1 | 72.0 | 10.1*	*[NA]*	*[NA]*
Extraction Internal Standard 13C2 PFTeDA	%		*74.4*	*68.4 | 69.3 | 1.28*	*[NA]*	*[NA]*
Extraction Internal Standard 13C2 4:2FTS	%		*77.5*	*69.6 | 69.3 | 0.432*	*[NA]*	*[NA]*
Extraction Internal Standard 13C2 6:2FTS	%		*77.7*	*74.1 | 75.3 | 1.57*	*[NA]*	*[NA]*
Extraction Internal Standard 13C2 8:2FTS	%		*73.2*	*68.4 | 73.7 | 7.43*	*[NA]*	*[NA]*
Extraction Internal Standard 13C8 FOSA	%		*88.1*	*77.9 | 83.4 | 6.79*	*[NA]*	*[NA]*
Extraction Internal Standard d3 N MeFOSA	%		*87.8*	*82.0 | 86.0 | 4.75*	*[NA]*	*[NA]*
Extraction Internal Standard d5 N EtFOSA	%		*87.0*	*78.3 | 81.8 | 4.37*	*[NA]*	*[NA]*
Extraction Internal Standard d7 N MeFOSE	%		*79.5*	*68.1 | 75.6 | 10.5*	*[NA]*	*[NA]*
Extraction Internal Standard d9 N EtFOSE	%		*83.7*	*71.9 | 78.8 | 9.15*	*[NA]*	*[NA]*
Extraction Internal Standard d3 N MeFOSAA	%		*94.1*	*79.7 | 85.9 | 7.50*	*[NA]*	*[NA]*
Extraction Internal Standard d5 N EtFOSAA	%		*81.4*	*71.0 | 79.6 | 11.4*	*[NA]*	*[NA]*

Quality Control PFI0123

QC Comments

Identifier	Description
[1]	Spike recovery is not applicable due to the relatively high analyte background in the sample (>3* spike level). However, the LCS recovery is within acceptance criteria.
[2]	Spike recovery is outside routine acceptance criteria (70-130%), this may be due to suspected non-homogeneity and/or matrix interference effects. However, an acceptable recovery was achieved for the LCS.
[3]	Duplicate %RPD may be flagged as an outlier to routine laboratory acceptance, however, where one or both results are <10*PQL, the RPD acceptance criteria increases exponentially.
[4]	The laboratory duplicate RPD acceptance criteria has been exceeded. Results are accepted due to the inhomogeneous nature of the sample.
[5]	Unable to perform all QC according to our internal guidelines due to the limited amount of sample(s) available for testing.

Envirolab Services (WA) Pty Ltd trading as MPL Laboratories
ABN 53 140 099 207
16-18 Hayden Court Myaree WA 6154
ph +61 8 9317 2505
lab@mpl.com.au
www.mpl.com.au

Certificate of Analysis PFJ0089

Client Details

Client	Katherine Town Council - NT
Contact	Brett Kimpton
Address	PO Box 1071, KATHERINE, NT, 0851

Sample Details

Your Reference	Katherine Town Council - EPL298-01 - Monthly
Number of Samples	9 Water
Date Samples Received	01/10/2024
Date Instructions Received	01/10/2024

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for soils and on an as received basis for other matrices.

Report Details

Date Results Requested by	15/10/2024
Date of Issue	14/10/2024

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Authorisation Details

Results Approved By	Ben Carpenter, Metals Technician Lien Tang, Assistant Operations Manager Lucas Yii, Inorganics Team Leader Michael Mowle, Inorganics Supervisor
Laboratory Manager	Michael Kubiak

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Samples in this Report

Envirolab ID	Sample ID	Depth	Matrix	Date Sampled	Date Received
PFJ0089-01	GWA (RN031131)		Water	29/09/2024	01/10/2024
PFJ0089-02	GWE (RN022487)	11.30	Water	29/09/2024	01/10/2024
PFJ0089-03	GWB01	11.50	Water	29/09/2024	01/10/2024
PFJ0089-04	GWB02	11.50	Water	29/09/2024	01/10/2024
PFJ0089-05	GWB03	9.70	Water	29/09/2024	01/10/2024
PFJ0089-06	GWB04	12.90	Water	29/09/2024	01/10/2024
PFJ0089-07	Field Blank		Water	29/09/2024	01/10/2024
PFJ0089-08	Duplicate		Water	29/09/2024	01/10/2024
PFJ0089-09	Trip Blank		Water	29/09/2024	01/10/2024

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Inorganics - Physical Parameters (Water)

Envirolab ID	Units	PQL	PFJ0089-01	PFJ0089-02	PFJ0089-03	PFJ0089-04	PFJ0089-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			29/09/2024	29/09/2024	29/09/2024	29/09/2024	29/09/2024
Depth				11.30	11.50	11.50	9.70
Total Dissolved Solids	mg/L	5.0	300	250	420	430	580

Envirolab ID	Units	PQL	PFJ0089-06	PFJ0089-07	PFJ0089-08	PFJ0089-09
Your Reference			GWB04	Field Blank	Duplicate	Trip Blank
Date Sampled			29/09/2024	29/09/2024	29/09/2024	29/09/2024
Depth			12.90			
Total Dissolved Solids	mg/L	5.0	410	<5.0	420	<5.0

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Inorganics - Ionic Balance and Indexes (Water)

Envirolab ID	Units	PQL	PFJ0089-01	PFJ0089-02	PFJ0089-03	PFJ0089-04	PFJ0089-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			29/09/2024	29/09/2024	29/09/2024	29/09/2024	29/09/2024
Depth				11.30	11.50	11.50	9.70
Bicarbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	290	240	310	320	460
Carbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Hydroxide OH- as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Total Alkalinity as CaCO3	mg/L as CaCO3	5.0	290	240	310	320	460
Chloride	mg/L	1.0	5.7	7.4	49	29	12
Sulfate	mg/L	1.0	6.0	2.1	16	33	73
Calcium	mg/L	0.50	49	43	47	51	96
Magnesium	mg/L	0.50	34	29	39	49	65
Potassium	mg/L	0.50	5.2	4.9	13	5.6	5.1
Sodium	mg/L	0.50	6.0	8.2	26	15	17
Hardness (calc) equivalent CaCO3	mg/L	3.0	260	230	280	330	510
Ionic Balance	%		-4.6	-0.91	-3.9	-4.1	0.31
Total Anions	mg/L	7.0	300	250	370	390	540
Anions as meq	meq/L	0.59	5.1	4.2	6.7	6.8	9.3
Total Cations	mg/L	2.0	93	85	130	120	180
Cations as meq	meq/L	0.10	5.6	5.0	7.0	7.4	11

Envirolab ID	Units	PQL	PFJ0089-06	PFJ0089-07	PFJ0089-08	PFJ0089-09
Your Reference			GWB04	Field Blank	Duplicate	Trip Blank
Date Sampled			29/09/2024	29/09/2024	29/09/2024	29/09/2024
Depth			12.90			
Bicarbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	390	<5.0	350	<5.0
Carbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0	<5.0
Hydroxide OH- as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0	<5.0
Total Alkalinity as CaCO3	mg/L as CaCO3	5.0	390	<5.0	350	<5.0
Chloride	mg/L	1.0	5.3	<1.0	5.3	<1.0
Sulfate	mg/L	1.0	9.4	<1.0	9.5	<1.0
Calcium	mg/L	0.50	47	<0.50	49	<0.50
Magnesium	mg/L	0.50	55	<0.50	55	<0.50
Potassium	mg/L	0.50	8.3	<0.50	8.4	<0.50
Sodium	mg/L	0.50	8.0	<0.50	8.0	<0.50
Hardness (calc) equivalent CaCO3	mg/L	3.0	340	<3.0	350	<3.0
Ionic Balance	%		-4.5	-93 [1]	0.76	-92 [1]
Total Anions	mg/L	7.0	400	<7.0	370	<7.0
Anions as meq	meq/L	0.59	6.7	<0.59	6.1	<0.59
Total Cations	mg/L	2.0	120	<2.0	120	<2.0
Cations as meq	meq/L	0.10	7.4	<0.10	7.5	<0.10

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Inorganics - Carbon, Nitrogen and Sulfur Species (Water)

Envirolab ID	Units	PQL	PFJ0089-01	PFJ0089-02	PFJ0089-03	PFJ0089-04	PFJ0089-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			29/09/2024	29/09/2024	29/09/2024	29/09/2024	29/09/2024
Depth				11.30	11.50	11.50	9.70
Total Organic Carbon	mg/L	1.0	1.2	1.7	6.1	4.7	14

Envirolab ID	Units	PQL	PFJ0089-06	PFJ0089-07	PFJ0089-08	PFJ0089-09
Your Reference			GWB04	Field Blank	Duplicate	Trip Blank
Date Sampled			29/09/2024	29/09/2024	29/09/2024	29/09/2024
Depth			12.90			
Total Organic Carbon	mg/L	1.0	1.4	<1.0	2.7	<1.0

Certificate of Analysis PFJ0089

Inorganics - Nutrients (Water)

Envirolab ID	Units	PQL	PFJ0089-01	PFJ0089-02	PFJ0089-03	PFJ0089-04	PFJ0089-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			29/09/2024	29/09/2024	29/09/2024	29/09/2024	29/09/2024
Depth				11.30	11.50	11.50	9.70
Ammonia as N	mg/L	0.0050	0.020	0.066	2.9	0.017	0.016
Free Ammonia (unionised) as N by calculation*	mg/L	0.0070	<0.0070	<0.0070	<0.0070	<0.0070	<0.0070
Ammonium (NH4+) as N by calculation	mg/L	0.0070	0.020	0.066	2.9	0.017	0.016

Envirolab ID	Units	PQL	PFJ0089-06	PFJ0089-07	PFJ0089-08	PFJ0089-09
Your Reference			GWB04	Field Blank	Duplicate	Trip Blank
Date Sampled			29/09/2024	29/09/2024	29/09/2024	29/09/2024
Depth			12.90			
Ammonia as N	mg/L	0.0050	0.014	0.013	0.013	0.016
Free Ammonia (unionised) as N by calculation*	mg/L	0.0070	<0.0070	<0.0070	<0.0070	<0.0070
Ammonium (NH4+) as N by calculation	mg/L	0.0070	0.014	0.013	0.013	0.016

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Inorganics - Common Wastewater Parameters (Water)

Envirolab ID	Units	PQL	PFJ0089-01	PFJ0089-02	PFJ0089-03	PFJ0089-04	PFJ0089-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			29/09/2024	29/09/2024	29/09/2024	29/09/2024	29/09/2024
Depth				11.30	11.50	11.50	9.70
BOD	mg/L	5.0	39	19	38	34	39
COD	mg O2/L	20	<20	<20	22	<20	24

Envirolab ID	Units	PQL	PFJ0089-06	PFJ0089-07	PFJ0089-08	PFJ0089-09
Your Reference			GWB04	Field Blank	Duplicate	Trip Blank
Date Sampled			29/09/2024	29/09/2024	29/09/2024	29/09/2024
Depth			12.90			
BOD	mg/L	5.0	17	16	29	11
COD	mg O2/L	20	<20	<20	<20	<20

Certificate of Analysis PFJ0089

General - Field Data (Water)

Envirolab ID	Units	PQL	PFJ0089-01	PFJ0089-02	PFJ0089-03	PFJ0089-04	PFJ0089-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			29/09/2024	29/09/2024	29/09/2024	29/09/2024	29/09/2024
Depth				11.30	11.50	11.50	9.70
pH (Client Supplied)*	pH units		5.80	6.30	5.90	6.00	6.10
Temperature (Client Supplied)*	o C		30.8	35.0	30.0	33.0	35.0

Envirolab ID	Units	PQL	PFJ0089-06
Your Reference			GWB04
Date Sampled			29/09/2024
Depth			12.90
pH (Client Supplied)*	pH units		6.90
Temperature (Client Supplied)*	o C		33.0

Result Comments

Identifier	Description
[1]	Ion Balance indicative only for samples with low Electrical Conductivity.

Method Summary

Method ID	Methodology Summary
Calc	Calculation
Calc - ION	Calculation
Field Data	Field Data supplied by client
INORG-006	Alkalinity - determined titrimetrically based on APHA latest edition 2320-B. Solids reported from a 1:5 water extract unless otherwise specified. Total Carbon Dioxide - determined by calculation in accordance with APHA latest edition,4500-CO2 D.
INORG-018	Total Dissolved Solids - determined gravimetrically. The solids are dried at 180±10°C. NOTE: Where the EC of the sample is <100µS/cm, the TDS will typically be below 70mg/L (as the sample is very likely to be at least drinking water quality). Therefore to ensure data quality for TDS, the TDS is typically calculated as per the equation: TDS = EC*0.6
INORG-040	The concentrations of the major ions (mg/L) are converted to milliequivalents and summed. The ionic balance should be within +/- 15% i.e. total anions = total cations +/-15%.
INORG-057	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.
INORG-057_CALC	Calculation of Ammonium as N. Assumes all Ammonia is present as Ammonium unless samplpe pH and temperature provided.
INORG-067	Samples are digested in acid with a known excess of potassium dichromate then the colour change is determined by discrete analyser or UV-VIS in accordance with APHA latest edition 5220 D.
INORG-079	Carbon forms (inorganic, organic, total) determined using a TOC/NDIR analyser via combustion. Dissolved aqueous\forms require filtering prior to determination.
INORG-081	Anions determined by Ion Chromatography. Waters samples are filtered on receipt prior to analysis. Solids are analysed from a water extract. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
INORG-091	BOD and/or cBOD - Analysed in accordance with APHA latest edition 5210 D.
METALS-020	Determination of various metals by ICP-OES.

Result Definitions

Identifier	Description
NR	Not reported
NEPM	National Environment Protection Measure
NS	Not specified
LCS	Laboratory Control Sample
RPD	Relative Percent Difference
>	Greater than
<	Less than
PQL	Practical Quantitation Limit
INS	Insufficient sample for this test
NA	Test not required
NT	Not tested
DOL	Samples rejected due to particulate overload (air filters only)
RFD	Samples rejected due to filter damage (air filters only)
RUD	Samples rejected due to uneven deposition (air filters only)
##	Indicates a laboratory acceptance criteria outlier, for further details, see Result Comments and/or QC Comments

Quality Control Definitions

Blank

This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, and is determined by processing solvents and reagents in exactly the same manner as for samples.

Surrogate Spike

Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

LCS (Laboratory Control Sample)

This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Matrix Spike

A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

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.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

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 QAQC tables for details (available on request); <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; 60-140% for organics (+/-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 typically insufficient in order to satisfy laboratory QA/QC protocols.

Miscellaneous Information

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. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

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 or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volume measurements are not covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary PFJ0089

Client Details

Client	Katherine Town Council - NT
Your Reference	Katherine Town Council - EPL298-01 - Monthly
Date Issued	14/10/2024

Recommended Holding Time Compliance

Recommended holding time exceedances exist - See detailed list below

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	Yes	No Outliers
Duplicates	Yes	No Outliers
Matrix Spike	Yes	No Outliers
Surrogates / Extracted Internal Standards	Yes	No Outliers
QC Frequency	No	QC Frequency Outliers Exist - See detailed list below

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Data Quality Assessment Summary PFJ0089

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
TDS | Water	1-9	29/09/2024	11/10/2024	11/10/2024	No
Alkalinity Suite | Water	1-9	29/09/2024	03/10/2024	03/10/2024	Yes
Chloride | Water	1-9	29/09/2024	03/10/2024	04/10/2024	Yes
Dissolved Cations | Water	1-9	29/09/2024	04/10/2024	07/10/2024	Yes
Ion Balance | Water	1-9	29/09/2024	03/10/2024	08/10/2024	Yes
	1-9	29/09/2024	04/10/2024	07/10/2024	Yes
Sulfate | Water	1-9	29/09/2024	03/10/2024	04/10/2024	Yes
Total Organic Carbon | Water	1-9	29/09/2024	04/10/2024	04/10/2024	Yes
Nitrogen - Ammonia | Water	1-9	29/09/2024	04/10/2024	04/10/2024	Yes
Nitrogen - Ammonium by calc | Water	1-9	29/09/2024	04/10/2024	08/10/2024	Yes
BOD | Water	1-9	29/09/2024	03/10/2024	07/10/2024	Yes
COD | Water	1-9	29/09/2024	04/10/2024	11/10/2024	Yes

Outliers: QC Frequency

INORG-091 | Inorganics - Common Wastewater Parameters (Water) | Batch BFJ0775

Analysis	QC Type	Expected	Reported
BOD	Duplicate	2	0

Quality Control PFJ0089

INORG-018 | Inorganics - Physical Parameters (Water) | Batch BFJ2218

Analyte	Units	PQL	Blank	DUP1 PFJ0089-01 Samp | QC | RPD %	DUP2 BFJ2218-DUP2# Samp | QC | RPD %	LCS %
Total Dissolved Solids	mg/L	5.0	<5.0	300 | 325 | 8.00	775 | 762 | 1.69	84.0

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-006 | Inorganics - Ionic Balance and Indexes (Water) | Batch BFJ0811

Analyte	Units	PQL	Blank	DUP1 PFJ0089-01 Samp | QC | RPD %	DUP2 BFJ0811-DUP2# Samp | QC | RPD %	LCS %
Bicarbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	292 | 285 | 2.32	<5.0 | <5.0 | [NA]	[NA]
Carbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0 | <5.0 | [NA]	<5.0 | <5.0 | [NA]	[NA]
Hydroxide OH- as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0 | <5.0 | [NA]	<5.0 | <5.0 | [NA]	[NA]
Total Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	292 | 285 | 2.32	<5.0 | <5.0 | [NA]	92.2

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-081 | Inorganics - Ionic Balance and Indexes (Water) | Batch BFJ0884

Analyte	Units	PQL	Blank	DUP1 BFJ0884-DUP1# Samp | QC | RPD %	DUP2 PFJ0089-05 Samp | QC | RPD %	LCS %	Spike % BFJ0884-MS1#
Chloride	mg/L	1.0	<1.0	109 | 108 | 0.212	12.4 | 12.4 | 0.342	89.3	85.6
Sulfate	mg/L	1.0	<1.0	165 | 164 | 0.244	73.0 | 72.9 | 0.153	96.5	97.3

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-020 | Inorganics - Ionic Balance and Indexes (Water) | Batch BFJ0998

Analyte	Units	PQL	Blank	DUP1 BFJ0998-DUP1# Samp | QC | RPD %	DUP2 PFJ0089-06 Samp | QC | RPD %	LCS %	Spike % BFJ0998-MS1#
Calcium	mg/L	0.50	<0.50	52.4 | 52.7 | 0.636	46.8 | 46.2 | 1.29	97.3	91.6
Magnesium	mg/L	0.50	<0.50	46.5 | 46.2 | 0.649	54.7 | 53.7 | 1.87	98.7	94.6
Potassium	mg/L	0.50	<0.50	14.5 | 14.7 | 1.10	8.34 | 8.37 | 0.312	97.5	93.6
Sodium	mg/L	0.50	<0.50	92.9 | 92.4 | 0.561	7.96 | 7.77 | 2.53	96.8	85.5
Hardness (calc) equivalent CaCO3	mg/L	3.0	<3.0	322 | 322 | 0.126	342 | 336 | 1.67	[NA]	[NA]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-079 | Inorganics - Carbon, Nitrogen and Sulfur Species (Water) | Batch BFJ1112

Analyte	Units	PQL	Blank	DUP1 PFJ0089-01 Samp | QC | RPD %	DUP2 PFJ0089-09 Samp | QC | RPD %	LCS %	Spike % PFJ0089-02
Total Organic Carbon	mg/L	1.0	<1.0	1.23 | 1.23 | [NA]	<1.0 | <1.0 | [NA]	100	97.6

INORG-057 | Inorganics - Nutrients (Water) | Batch BFJ1127

Analyte	Units	PQL	Blank	DUP1 PFJ0089-01 Samp | QC | RPD %	DUP2 BFJ1127-DUP2# Samp | QC | RPD %	LCS %	Spike % PFJ0089-02
Ammonia as N	mg/L	0.0050	<0.0050	0.0204 | 0.0189 | [NA]	10.0 | 10.2 | 1.98	87.6	79.2

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-091 | Inorganics - Common Wastewater Parameters (Water) | Batch BFJ0775

Analyte	Units	PQL	Blank	LCS %
BOD	mg/L	5.0	<5.0	83.3

Quality Control PFJ0089

INORG-067|Inorganics - Common Wastewater Parameters (Water) | Batch BFJ1161

Analyte	Units	PQL	Blank	DUP1 PFJ0089-01 Samp | QC | RPD %	DUP2 BFJ1161-DUP2# Samp | QC | RPD %	LCS %
COD	mg O2/L	20	<20	<20 | <20 | [NA]	<20 | <20 | [NA]	96.0

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

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

CERTIFICATE OF ANALYSIS 365036

Client Details

Client	Katherine Town Council - NT
Attention	Brett Kimpton
Address	PO Box 1071, KATHERINE, NT, 0851

Sample Details

Your Reference	**Katherine Town Council-EPL298-01 Monthly**
Number of Samples	9 Water
Date samples received	29/10/2024
Date completed instructions received	29/10/2024

Analysis Details

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

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

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

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

Report Details

Date results requested by	05/11/2024
Date of Issue	05/11/2024

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Results Approved By
Diego Bigolin, Inorganics Supervisor
Priya Samarawickrama, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

Ion Balance						
Our Reference		365036-1	365036-2	365036-3	365036-4	365036-5
Your Reference	UNITS	GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Depth		-	10.9	11.1	11.1	9.1
Date Sampled		27/10/2024	27/10/2024	27/10/2024	27/10/2024	27/10/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	29/10/2024	29/10/2024	29/10/2024	29/10/2024	29/10/2024
Date analysed	-	29/10/2024	29/10/2024	29/10/2024	29/10/2024	29/10/2024
Calcium - Dissolved	mg/L	75	60	86	96	100
Potassium - Dissolved	mg/L	5.0	5.2	13	5.8	6.0
Sodium - Dissolved	mg/L	6.4	9.4	28	16	22
Magnesium - Dissolved	mg/L	34	32	42	52	70
Hardness (calc) equivalent $CaCO_3$	mg/L	330	280	390	460	540
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	<5	<5	<5	<5	<5
Bicarbonate Alkalinity as $CaCO_3$	mg/L	310	280	360	430	510
Carbonate Alkalinity as $CaCO_3$	mg/L	<5	<5	<5	<5	<5
Total Alkalinity as $CaCO_3$	mg/L	310	280	360	430	510
Sulphate, SO4	mg/L	7	1	17	34	83
Chloride, Cl	mg/L	6	10	45	29	15
Ionic Balance	%	3.0	2.0	3.0	-1.0	-2.0

Ion Balance					
Our Reference		365036-6	365036-7	365036-8	365036-9
Your Reference	UNITS	GWB04	Field Blank	Duplicate (GWA)	Trip Blank
Depth		12.6	-	-	-
Date Sampled		27/10/2024	27/10/2024	27/10/2024	27/10/2024
Type of sample		Water	Water	Water	Water
Date prepared	-	29/10/2024	29/10/2024	29/10/2024	29/10/2024
Date analysed	-	29/10/2024	29/10/2024	29/10/2024	29/10/2024
Calcium - Dissolved	mg/L	84	<0.5	74	<0.5
Potassium - Dissolved	mg/L	8.4	<0.5	5	<0.5
Sodium - Dissolved	mg/L	9.0	<0.5	6.3	<0.5
Magnesium - Dissolved	mg/L	60	<0.5	34	<0.5
Hardness (calc) equivalent $CaCO_3$	mg/L	460	<3	320	<3
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	<5	<5	<5	<5
Bicarbonate Alkalinity as $CaCO_3$	mg/L	430	<5	360	<5
Carbonate Alkalinity as $CaCO_3$	mg/L	<5	<5	<5	<5
Total Alkalinity as $CaCO_3$	mg/L	430	<5	360	<5
Sulphate, SO4	mg/L	14	<1	7	<1
Chloride, Cl	mg/L	7	<1	6	<1
Ionic Balance	%	3.0	N/A	-4.0	N/A

Miscellaneous Inorganics						
Our Reference		365036-1	365036-2	365036-3	365036-4	365036-5
Your Reference	UNITS	GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Depth		-	10.9	11.1	11.1	9.1
Date Sampled		27/10/2024	27/10/2024	27/10/2024	27/10/2024	27/10/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	29/10/2024	29/10/2024	29/10/2024	29/10/2024	29/10/2024
Date analysed	-	29/10/2024	29/10/2024	29/10/2024	29/10/2024	29/10/2024
Ammonium as N form ONLY* (NH4+)	mg/L	0.13	0.14	1.1	0.92	0.42
Total Organic Carbon	mg/L	2	6	5	7	4
Total Dissolved Solids (grav)	mg/L	360	270	460	600	660
COD	mg O_2 /L	<50	<50	<50	<50	<50
BOD	mg/L	<5	<5	<5	<5	<5

Miscellaneous Inorganics					
Our Reference		365036-6	365036-7	365036-8	365036-9
Your Reference	UNITS	GWB04	Field Blank	Duplicate (GWA)	Trip Blank
Depth		12.6	-	-	-
Date Sampled		27/10/2024	27/10/2024	27/10/2024	27/10/2024
Type of sample		Water	Water	Water	Water
Date prepared	-	29/10/2024	29/10/2024	29/10/2024	29/10/2024
Date analysed	-	29/10/2024	29/10/2024	29/10/2024	29/10/2024
Ammonium as N form ONLY* (NH4+)	mg/L	1.1	[NA]	[NA]	[NA]
Total Organic Carbon	mg/L	2	<1	2	<1
Total Dissolved Solids (grav)	mg/L	480	<5	350	<5
COD	mg O_2 /L	<50	<50	<50	<50
BOD	mg/L	<5	<5	<5	<5

Method ID	Methodology Summary
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA latest edition, 2320-B.
Inorg-018	Total Dissolved Solids - determined gravimetrically. The solids are dried at 180+/-10°C. NOTE: Where the EC of the sample is <100µS/cm, the TDS will typically be below 70mg/L (as the sample is very likely to be at least drinking water quality). Therefore to ensure data quality for TDS, the TDS is typically calculated as per the equation below:- TDS = EC * 0.6
Inorg-040	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%.
Inorg-057	Ammonia - determined colourimetrically, based on APHA latest edition 4500-NH3 F. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a KCl extraction.
Inorg-067	Samples are digested in acid with a known excess of potassium dichromate then titrated against ammonium ferrous sulphate in accordance with APHA latest edition 5220 C.
Inorg-079	TOC determined using a TOC analyser using the combustion method. Dissolved requires filtering prior to determination. Analysis using APHA latest edition 5310B.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
Inorg-091	BOD - Analysed in accordance with APHA latest edition 5210 D and in house INORG-091.
Metals-020	Determination of various metals by ICP-AES.

QUALITY CONTROL: Ion Balance						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	365036-3
Date prepared	-			29/10/2024	1	29/10/2024	29/10/2024		29/10/2024	29/10/2024
Date analysed	-			29/10/2024	1	29/10/2024	29/10/2024		29/10/2024	29/10/2024
Calcium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	75	[NT]		99	#
Potassium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	5.0	[NT]		90	84
Sodium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	6.4	[NT]		104	93
Magnesium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	34	[NT]		96	96
Hardness (calc) equivalent $CaCO_3$	mg/L	3	Metals-020	[NT]	1	330	[NT]		[NT]	[NT]
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	5	Inorg-006	<5	1	<5	[NT]		[NT]	[NT]
Bicarbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	1	310	[NT]		[NT]	[NT]
Carbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	1	<5	[NT]		[NT]	[NT]
Total Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	1	310	[NT]		113	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	<1	1	7	7	0	106	[NT]
Chloride, Cl	mg/L	1	Inorg-081	<1	1	6	6	0	110	[NT]
Ionic Balance	%		Inorg-040	[NT]	1	3.0	[NT]		[NT]	[NT]

QUALITY CONTROL: Ion Balance						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	2	29/10/2024	29/10/2024		[NT]	[NT]
Date analysed	-			[NT]	2	29/10/2024	29/10/2024		[NT]	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020	[NT]	2	60	60	0	[NT]	[NT]
Potassium - Dissolved	mg/L	0.5	Metals-020	[NT]	2	5.2	5.2	0	[NT]	[NT]
Sodium - Dissolved	mg/L	0.5	Metals-020	[NT]	2	9.4	9.2	2	[NT]	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	[NT]	2	32	32	0	[NT]	[NT]
Hardness (calc) equivalent $CaCO_3$	mg/L	3	Metals-020	[NT]	2	280	280	0	[NT]	[NT]
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	5	Inorg-006	[NT]	2	<5	[NT]		[NT]	[NT]
Bicarbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	[NT]	2	280	[NT]		[NT]	[NT]
Carbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	[NT]	2	<5	[NT]		[NT]	[NT]
Total Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	[NT]	2	280	[NT]		[NT]	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	[NT]	2	1	[NT]		[NT]	[NT]
Chloride, Cl	mg/L	1	Inorg-081	[NT]	2	10	[NT]		[NT]	[NT]
Ionic Balance	%		Inorg-040	[NT]	2	2.0	[NT]		[NT]	[NT]

QUALITY CONTROL: Ion Balance						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	9	29/10/2024	29/10/2024		[NT]	[NT]
Date analysed	-			[NT]	9	29/10/2024	29/10/2024		[NT]	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020	[NT]	9	<0.5	[NT]		[NT]	[NT]
Potassium - Dissolved	mg/L	0.5	Metals-020	[NT]	9	<0.5	[NT]		[NT]	[NT]
Sodium - Dissolved	mg/L	0.5	Metals-020	[NT]	9	<0.5	[NT]		[NT]	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	[NT]	9	<0.5	[NT]		[NT]	[NT]
Hardness (calc) equivalent $CaCO_3$	mg/L	3	Metals-020	[NT]	9	<3	[NT]		[NT]	[NT]
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	5	Inorg-006	[NT]	9	<5	<5	0	[NT]	[NT]
Bicarbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	[NT]	9	<5	<5	0	[NT]	[NT]
Carbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	[NT]	9	<5	<5	0	[NT]	[NT]
Total Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	[NT]	9	<5	<5	0	[NT]	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	[NT]	9	<1	[NT]		[NT]	[NT]
Chloride, Cl	mg/L	1	Inorg-081	[NT]	9	<1	[NT]		[NT]	[NT]
Ionic Balance	%		Inorg-040	[NT]	9	N/A	N/A		[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	365036-2
Date prepared	-			29/10/2024	1	29/10/2024	29/10/2024		29/10/2024	29/10/2024
Date analysed	-			29/10/2024	1	29/10/2024	29/10/2024		29/10/2024	29/10/2024
Ammonium as N form ONLY* (NH4+)	mg/L	0.005	Inorg-057	<0.005	1	0.13	[NT]		[NT]	[NT]
Total Organic Carbon	mg/L	1	Inorg-079	<1	1	2	2	0	95	103
Total Dissolved Solids (grav)	mg/L	5	Inorg-018	<5	1	360	[NT]		86	[NT]
COD	mg O_2/L	50	Inorg-067	<50	1	<50	[NT]		102	[NT]
BOD	mg/L	5	Inorg-091	<5	1	<5	[NT]		83	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	9	29/10/2024	29/10/2024		[NT]	[NT]
Date analysed	-			[NT]	9	29/10/2024	29/10/2024		[NT]	[NT]
Total Organic Carbon	mg/L	1	Inorg-079	[NT]	9	<1	[NT]		[NT]	[NT]
Total Dissolved Solids (grav)	mg/L	5	Inorg-018	[NT]	9	<5	[NT]		[NT]	[NT]
COD	mg O_2/L	50	Inorg-067	[NT]	9	<50	<50	0	[NT]	[NT]
BOD	mg/L	5	Inorg-091	[NT]	9	<5	[NT]		[NT]	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Report Comments

Ion Balance - # Percent recovery is not applicable due to the high concentration of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

Ammonium NH4+as N does not cover under NATA scope. Ammonia as N in water" by convention comprises of both forms of Ammonium-N (NH4-N) and Ammonia (NH3-N) based on the colourimetric APHA method. In order to speciate the Ammonia form (NH3 as N), a calculation based on (ideally) the field pH and temperature can be used to determine the actual Ammonia (NH3 as N) species. If the field pH and temperature is not available otherwise determined in the laboratory.

Envirolab Services (WA) Pty Ltd trading as MPL Laboratories
ABN 53 140 099 207
16-18 Hayden Court Myaree WA 6154
ph +61 8 9317 2505
lab@mpl.com.au
www.mpl.com.au

Certificate of Analysis PFK0894

Client Details

Client	Katherine Town Council - NT
Contact	Brett Kimpton
Address	PO Box 1071, KATHERINE, NT, 0851

Sample Details

Your Reference	Katherine Town Council - EPL298 - Quarterly
Number of Samples	9 Water
Date Samples Received	13/11/2024
Date Instructions Received	14/11/2024

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for soils and on an as received basis for other matrices.

Report Details

Date Results Requested by	26/11/2024
Date of Issue	26/11/2024

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

Authorisation Details

Results Approved By	Amanda Chui, Senior Chemist Jenny Xin He, Chemist Lien Tang, Assistant Operations Manager Lucas Yii, Inorganics Team Leader Michael Mowle, Inorganics Supervisor Sean McAlary, Chemist Travis Carey, Organics Supervisor Varsha Ho Wing, Inorganics and Metals Supervisor
Laboratory Manager	Michael Kubiak

Certificate of Analysis PFK0894

Samples in this Report

Envirolab ID	Sample ID	Depth	Matrix	Date Sampled	Date Received
PFK0894-01	GWA (RN031131)	11.10	Water	10/11/2024	13/11/2024
PFK0894-02	GWE (RN022487)	11.40	Water	10/11/2024	13/11/2024
PFK0894-03	GWB01	11.40	Water	10/11/2024	13/11/2024
PFK0894-04	GWB02	9.80	Water	10/11/2024	13/11/2024
PFK0894-05	GWB03	12.60	Water	10/11/2024	13/11/2024
PFK0894-06	GWB04		Water	10/11/2024	13/11/2024
PFK0894-07	Field Blank		Water	10/11/2024	13/11/2024
PFK0894-08	Duplicate		Water	10/11/2024	13/11/2024
PFK0894-09	Trip blank		Water	10/11/2024	13/11/2024

Sample Comments

General Comment	Unfiltered NaOH bottle not received - Unable to test total CrIII & CrVI

Certificate of Analysis PFK0894

Volatile TRH and BTEX (Water)

Envirolab ID	Units	PQL	PFK0894-01	PFK0894-02	PFK0894-03	PFK0894-04	PFK0894-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			10/11/2024	10/11/2024	10/11/2024	10/11/2024	10/11/2024
Depth			11.10	11.40	11.40	9.80	12.60
TRH C6-C9	µg/L	10	<10	<10	<10	<10	<10
TRH C6-C10	µg/L	10	<10	<10	<10	<10	<10
TRH C6-C10 less BTEX (F1)	µg/L	10	<10	<10	<10	<10	<10
Methyl tert butyl ether (MTBE)	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzene	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
meta+para Xylene	µg/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0
ortho-Xylene	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total Xylene	µg/L	3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Naphthalene (value used in F2 calc)	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Surrogate Dibromofluoromethane	%		*99.0*	*98.5*	*97.1*	*96.9*	*95.9*
Surrogate Toluene-D8	%		*99.6*	*98.0*	*98.5*	*97.3*	*98.0*
Surrogate 4-Bromofluorobenzene	%		*97.5*	*97.6*	*98.4*	*98.4*	*97.1*

Envirolab ID	Units	PQL	PFK0894-06	PFK0894-07	PFK0894-08	PFK0894-09
Your Reference			GWB04	Field Blank	Duplicate	Trip blank
Date Sampled			10/11/2024	10/11/2024	10/11/2024	10/11/2024
TRH C6-C9	µg/L	10	<10	<10	<10	<10
TRH C6-C10	µg/L	10	<10	<10	<10	<10
TRH C6-C10 less BTEX (F1)	µg/L	10	<10	<10	<10	<10
Methyl tert butyl ether (MTBE)	µg/L	1.0	<1.0	<1.0	<1.0	<1.0
Benzene	µg/L	1.0	<1.0	<1.0	<1.0	<1.0
Toluene	µg/L	1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	µg/L	1.0	<1.0	<1.0	<1.0	<1.0
meta+para Xylene	µg/L	2.0	<2.0	<2.0	<2.0	<2.0
ortho-Xylene	µg/L	1.0	<1.0	<1.0	<1.0	<1.0
Total Xylene	µg/L	3.0	<3.0	<3.0	<3.0	<3.0
Naphthalene (value used in F2 calc)	µg/L	1.0	<1.0	<1.0	<1.0	<1.0
Surrogate Dibromofluoromethane	%		*96.6*	*98.2*	*98.1*	*99.8*
Surrogate Toluene-D8	%		*98.6*	*99.0*	*100*	*99.8*
Surrogate 4-Bromofluorobenzene	%		*99.8*	*97.1*	*98.8*	*99.4*

Semi-volatile TRH (Water)

Envirolab ID	Units	PQL	PFK0894-01	PFK0894-02	PFK0894-03	PFK0894-04	PFK0894-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			10/11/2024	10/11/2024	10/11/2024	10/11/2024	10/11/2024
Depth			11.10	11.40	11.40	9.80	12.60
TRH C10-C14	µg/L	50	<50	<50	<50	<50	<50
TRH C15-C28	µg/L	100	<100	<100	<100	<100	<100
TRH C29-C36	µg/L	100	<100	<100	<100	<100	<100
Total +ve TRH C10-C36	µg/L	50	<50	<50	<50	<50	<50
TRH >C10-C16	µg/L	50	<50	<50	<50	<50	<50
TRH >C10-C16 less Naphthalene F2	µg/L	50	<50	<50	<50	<50	<50
TRH >C16-C34 (F3)	µg/L	100	<100	<100	<100	<100	<100
TRH >C34-C40 (F4)	µg/L	100	<100	<100	<100	<100	<100
Total +ve TRH >C10-C40	µg/L	50	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%		*103*	*90.2*	*93.3*	*94.1*	*91.1*

Envirolab ID	Units	PQL	PFK0894-06	PFK0894-07	PFK0894-08	PFK0894-09
Your Reference			GWB04	Field Blank	Duplicate	Trip blank
Date Sampled			10/11/2024	10/11/2024	10/11/2024	10/11/2024
TRH C10-C14	µg/L	50	<50	<50	<50	<50
TRH C15-C28	µg/L	100	<100	<100	<100	<100
TRH C29-C36	µg/L	100	<100	<100	<100	<100
Total +ve TRH C10-C36	µg/L	50	<50	<50	<50	<50
TRH >C10-C16	µg/L	50	<50	<50	<50	<50
TRH >C10-C16 less Naphthalene F2	µg/L	50	<50	<50	<50	<50
TRH >C16-C34 (F3)	µg/L	100	<100	<100	<100	<100
TRH >C34-C40 (F4)	µg/L	100	<100	<100	<100	<100
Total +ve TRH >C10-C40	µg/L	50	<50	<50	<50	<50
Surrogate o-Terphenyl	%		*93.6*	*96.6*	*104*	*94.3*

Polycyclic Aromatic Hydrocarbons (Water)

Envirolab ID	Units	PQL	PFK0894-01	PFK0894-02	PFK0894-03	PFK0894-04	PFK0894-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			10/11/2024	10/11/2024	10/11/2024	10/11/2024	10/11/2024
Depth			11.10	11.40	11.40	9.80	12.60
Naphthalene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthylene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Fluorene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Phenanthrene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Anthracene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Fluoranthene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Pyrene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo(a)anthracene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chrysene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo(b,j,k)fluoranthene	µg/L	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzo(a)pyrene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Indeno(1,2,3-c,d)pyrene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Dibenzo(a,h)anthracene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo(g,h,i)perylene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Total +ve PAH	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Surrogate p-Terphenyl-D14	%		*93.8*	*89.4*	*93.8*	*95.0*	*93.5*

Envirolab ID	Units	PQL	PFK0894-06	PFK0894-07	PFK0894-08	PFK0894-09
Your Reference			GWB04	Field Blank	Duplicate	Trip blank
Date Sampled			10/11/2024	10/11/2024	10/11/2024	10/11/2024
Naphthalene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthylene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Fluorene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Phenanthrene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Anthracene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Fluoranthene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Pyrene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Benzo(a)anthracene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Chrysene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Benzo(b,j,k)fluoranthene	µg/L	0.20	<0.20	<0.20	<0.20	<0.20
Benzo(a)pyrene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Indeno(1,2,3-c,d)pyrene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Dibenzo(a,h)anthracene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Benzo(g,h,i)perylene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Total +ve PAH	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Surrogate p-Terphenyl-D14	%		*90.4*	*99.7*	*102*	*94.0*

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Polychlorinated Biphenyls (Water)

Envirolab ID	Units	PQL	PFK0894-01	PFK0894-02	PFK0894-03	PFK0894-04	PFK0894-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			10/11/2024	10/11/2024	10/11/2024	10/11/2024	10/11/2024
Depth			11.10	11.40	11.40	9.80	12.60
Aroclor 1016	µg/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Aroclor 1221	µg/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Aroclor 1232	µg/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Aroclor 1242	µg/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Aroclor 1248	µg/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Aroclor 1254	µg/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Aroclor 1260	µg/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Total +ve PCB (1016-1260)	µg/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Surrogate 2-Fluorobiphenyl	%		*84.7*	*81.8*	*87.2*	*92.2*	*95.5*

Envirolab ID	Units	PQL	PFK0894-06	PFK0894-07	PFK0894-08	PFK0894-09
Your Reference			GWB04	Field Blank	Duplicate	Trip blank
Date Sampled			10/11/2024	10/11/2024	10/11/2024	10/11/2024
Aroclor 1016	µg/L	2.0	<2.0	<2.0	<2.0	<2.0
Aroclor 1221	µg/L	2.0	<2.0	<2.0	<2.0	<2.0
Aroclor 1232	µg/L	2.0	<2.0	<2.0	<2.0	<2.0
Aroclor 1242	µg/L	2.0	<2.0	<2.0	<2.0	<2.0
Aroclor 1248	µg/L	2.0	<2.0	<2.0	<2.0	<2.0
Aroclor 1254	µg/L	2.0	<2.0	<2.0	<2.0	<2.0
Aroclor 1260	µg/L	2.0	<2.0	<2.0	<2.0	<2.0
Total +ve PCB (1016-1260)	µg/L	2.0	<2.0	<2.0	<2.0	<2.0
Surrogate 2-Fluorobiphenyl	%		*88.4*	*95.7*	*106*	*97.1*

Acid Extractable Low Level Metals (Water)

Envirolab ID	Units	PQL	PFK0894-01	PFK0894-02	PFK0894-03	PFK0894-04	PFK0894-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			10/11/2024	10/11/2024	10/11/2024	10/11/2024	10/11/2024
Depth			11.10	11.40	11.40	9.80	12.60
Aluminium	µg/L	10	<10	17	10000	770	6400
Cadmium	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chromium	µg/L	1.0	<1.0	<1.0	17	2.7	14
Copper	µg/L	1.0	<1.0	1.7	200	11	77
Iron	µg/L	10	140	110	14000	1300	9300
Manganese	µg/L	1.0	1.6	4.7	390	82	170
Nickel	µg/L	1.0	<1.0	1.3	27	4.7	14
Lead	µg/L	1.0	<1.0	<1.0	17	4.5	58
Selenium	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Zinc	µg/L	1.0	3.9	3.8	97	9.9	54

Envirolab ID	Units	PQL	PFK0894-06	PFK0894-07	PFK0894-08	PFK0894-09
Your Reference			GWB04	Field Blank	Duplicate	Trip blank
Date Sampled			10/11/2024	10/11/2024	10/11/2024	10/11/2024
Aluminium	µg/L	10	740	<10	<10	<10
Cadmium	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Chromium	µg/L	1.0	2.8	<1.0	<1.0	<1.0
Copper	µg/L	1.0	8.6	<1.0	<1.0	<1.0
Iron	µg/L	10	850	<10	130	<10
Manganese	µg/L	1.0	35	<1.0	1.5	<1.0
Nickel	µg/L	1.0	2.8	<1.0	<1.0	<1.0
Lead	µg/L	1.0	11	<1.0	<1.0	<1.0
Selenium	µg/L	1.0	1.4	<1.0	<1.0	<1.0
Zinc	µg/L	1.0	47	<1.0	4.0	<1.0

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Dissolved Low Level Metals (Water)

Envirolab ID	Units	PQL	PFK0894-01	PFK0894-02	PFK0894-03	PFK0894-04	PFK0894-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			10/11/2024	10/11/2024	10/11/2024	10/11/2024	10/11/2024
Depth			11.10	11.40	11.40	9.80	12.60
Aluminium	µg/L	10	<10	<10	3500	<10	<10
Cadmium	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chromium	µg/L	1.0	<1.0	<1.0	3.7	<1.0	<1.0
Copper	µg/L	1.0	<1.0	<1.0	210	5.5	<1.0
Iron	µg/L	10	16	<10	2300	<10	<10
Manganese	µg/L	1.0	1.8	3.4	270	100	19
Nickel	µg/L	1.0	<1.0	<1.0	9.8	5.2	2.1
Lead	µg/L	1.0	<1.0	<1.0	16	<1.0	<1.0
Selenium	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Zinc	µg/L	1.0	5.7	<1.0	47	9.7	2.6

Envirolab ID	Units	PQL	PFK0894-06	PFK0894-07	PFK0894-08	PFK0894-09
Your Reference			GWB04	Field Blank	Duplicate	Trip blank
Date Sampled			10/11/2024	10/11/2024	10/11/2024	10/11/2024
Aluminium	µg/L	10	<10	<10	<10	<10
Cadmium	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Chromium	µg/L	1.0	<1.0	<1.0	<1.0	<1.0
Copper	µg/L	1.0	3.6	<1.0	<1.0	<1.0
Iron	µg/L	10	<10	<10	13	<10
Manganese	µg/L	1.0	9.8	<1.0	1.3	<1.0
Nickel	µg/L	1.0	2.1	<1.0	<1.0	<1.0
Lead	µg/L	1.0	1.0	<1.0	<1.0	<1.0
Selenium	µg/L	1.0	1.5	<1.0	<1.0	<1.0
Zinc	µg/L	1.0	37	<1.0	2.9	<1.0

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Inorganics - Physical Parameters (Water)

Envirolab ID	Units	PQL	PFK0894-01	PFK0894-02	PFK0894-03	PFK0894-04	PFK0894-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			10/11/2024	10/11/2024	10/11/2024	10/11/2024	10/11/2024
Depth			11.10	11.40	11.40	9.80	12.60
Total Dissolved Solids	mg/L	5.0	330	230	510	500	570

Envirolab ID	Units	PQL	PFK0894-06	PFK0894-07	PFK0894-08	PFK0894-09
Your Reference			GWB04	Field Blank	Duplicate	Trip blank
Date Sampled			10/11/2024	10/11/2024	10/11/2024	10/11/2024
Total Dissolved Solids	mg/L	5.0	490	<5.0	320	<5.0

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Inorganics - Physical Parameters (Water) - Analysed By Envirolab Services Sydney

Envirolab ID	Units	PQL	PFK0894-01	PFK0894-02	PFK0894-03	PFK0894-04	PFK0894-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			10/11/2024	10/11/2024	10/11/2024	10/11/2024	10/11/2024
Depth			11.10	11.40	11.40	9.80	12.60
Volatile Fatty Acids*	mg/L	5.0	20	52	150	160	210

Envirolab ID	Units	PQL	PFK0894-06	PFK0894-07	PFK0894-08	PFK0894-09
Your Reference			GWB04	Field Blank	Duplicate	Trip blank
Date Sampled			10/11/2024	10/11/2024	10/11/2024	10/11/2024
Volatile Fatty Acids*	mg/L	5.0	190	6.9	130	12

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Inorganics - Ionic Balance and Indexes (Water)

Envirolab ID	Units	PQL	PFK0894-01	PFK0894-02	PFK0894-03	PFK0894-04	PFK0894-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			10/11/2024	10/11/2024	10/11/2024	10/11/2024	10/11/2024
Depth			11.10	11.40	11.40	9.80	12.60
Bicarbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	340	210	410	430	500
Carbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	7.4	<5.0	<5.0	<5.0
Hydroxide OH- as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Total Alkalinity as CaCO3	mg/L as CaCO3	5.0	340	220	410	430	500
Chloride	mg/L	1.0	5.6	10	41	26	11
Sulfate	mg/L	1.0	4.8	6.8	14	27	95
Calcium	mg/L	0.50	72	25	76	96	100
Magnesium	mg/L	0.50	34	27	44	51	75
Potassium	mg/L	0.50	5.6	8.1	15	9.3	5.9
Sodium	mg/L	0.50	6.6	15	23	19	25
Hardness (calc) equivalent CaCO3	mg/L	3.0	320	170	370	450	560
Ionic Balance	%		-1.2	-5.7	-3.1	0.65	1.3
Total Anions	mg/L	7.0	350	240	460	480	600
Anions as meq	meq/L	0.59	5.8	4.2	8.1	8.3	10
Total Cations	mg/L	2.0	120	75	160	170	210
Cations as meq	meq/L	0.10	6.8	4.3	8.8	10	13

Envirolab ID	Units	PQL	PFK0894-06	PFK0894-07	PFK0894-08	PFK0894-09
Your Reference			GWB04	Field Blank	Duplicate	Trip blank
Date Sampled			10/11/2024	10/11/2024	10/11/2024	10/11/2024
Bicarbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	440	<5.0	320	<5.0
Carbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0	<5.0
Hydroxide OH- as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0	<5.0
Total Alkalinity as CaCO3	mg/L as CaCO3	5.0	440	<5.0	320	<5.0
Chloride	mg/L	1.0	6.1	<1.0	4.9	<1.0
Sulfate	mg/L	1.0	8.3	<1.0	4.4	<1.0
Calcium	mg/L	0.50	82	<0.50	74	<0.50
Magnesium	mg/L	0.50	58	<0.50	34	<0.50
Potassium	mg/L	0.50	10	<0.50	4.9	<0.50
Sodium	mg/L	0.50	9.6	<0.50	6.5	<0.50
Hardness (calc) equivalent CaCO3	mg/L	3.0	440	<3.0	330	<3.0
Ionic Balance	%		2.2	-95 [5]	2.7	-98 [5]
Total Anions	mg/L	7.0	450	<7.0	330	<7.0
Anions as meq	meq/L	0.59	7.5	<0.59	5.4	<0.59
Total Cations	mg/L	2.0	160	<2.0	120	<2.0
Cations as meq	meq/L	0.10	9.6	<0.10	6.9	<0.10

Inorganics - Carbon, Nitrogen and Sulfur Species (Water)

Envirolab ID	Units	PQL	PFK0894-01	PFK0894-02	PFK0894-03	PFK0894-04	PFK0894-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			10/11/2024	10/11/2024	10/11/2024	10/11/2024	10/11/2024
Depth			11.10	11.40	11.40	9.80	12.60
Total Organic Carbon	mg/L	1.0	1.2	1.2	3.8	2.8	3.0

Envirolab ID	Units	PQL	PFK0894-06	PFK0894-07	PFK0894-08	PFK0894-09
Your Reference			GWB04	Field Blank	Duplicate	Trip blank
Date Sampled			10/11/2024	10/11/2024	10/11/2024	10/11/2024
Total Organic Carbon	mg/L	1.0	2.9	<1.0	1.6	<1.0

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Inorganics - Speciated Cr (III/VI) and Fe (II/III) (Water)

Envirolab ID	Units	PQL	PFK0894-01	PFK0894-02	PFK0894-03	PFK0894-04	PFK0894-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			10/11/2024	10/11/2024	10/11/2024	10/11/2024	10/11/2024
Depth			11.10	11.40	11.40	9.80	12.60
Hexavalent Chromium	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Trivalent Chromium	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

Envirolab ID	Units	PQL	PFK0894-06	PFK0894-07	PFK0894-08	PFK0894-09
Your Reference			GWB04	Field Blank	Duplicate	Trip blank
Date Sampled			10/11/2024	10/11/2024	10/11/2024	10/11/2024
Hexavalent Chromium	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Trivalent Chromium	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050

Inorganics - Nutrients (Water)

Envirolab ID	Units	PQL	PFK0894-01	PFK0894-02	PFK0894-03	PFK0894-04	PFK0894-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			10/11/2024	10/11/2024	10/11/2024	10/11/2024	10/11/2024
Depth			11.10	11.40	11.40	9.80	12.60
Ammonia as N	mg/L	0.0050	<0.0050	0.021	2.0	0.014	0.024
Free Ammonia (unionised) as N by calculation*	mg/L	0.0070	<0.0070	<0.0070	0.011	<0.0070	<0.0070
Ammonium (NH4+) as N by calculation	mg/L	0.0070	<0.0070	0.021	2.0	0.014	0.024
Nitrate as N	mg/L	0.0050	0.096	0.10	0.0064	0.039	0.032
Nitrate as NO3 by calculation	mg/L	0.020	0.42	0.46	0.028	0.17	0.14
Total Nitrogen	mg/L	0.10	0.28	0.76	4.2	0.41	0.37
Total Phosphorus	mg/L	0.010	<0.010	0.018	0.032	0.011	0.36

Envirolab ID	Units	PQL	PFK0894-06	PFK0894-07	PFK0894-08	PFK0894-09
Your Reference			GWB04	Field Blank	Duplicate	Trip blank
Date Sampled			10/11/2024	10/11/2024	10/11/2024	10/11/2024
Ammonia as N	mg/L	0.0050	0.0075	<0.0050	0.0062	<0.0050
Free Ammonia (unionised) as N by calculation*	mg/L	0.0070	<0.0070	<0.0070	<0.0070	<0.0070
Ammonium (NH4+) as N by calculation	mg/L	0.0070	0.0075	<0.0070	<0.0070	<0.0070
Nitrate as N	mg/L	0.0050	3.8	<0.0050	0.076	<0.0050
Nitrate as NO3 by calculation	mg/L	0.020	17	<0.020	0.34	<0.020
Total Nitrogen	mg/L	0.10	4.3	<0.10	0.13	<0.10
Total Phosphorus	mg/L	0.010	<0.010	<0.010	<0.010	<0.010

Inorganics - Common Wastewater Parameters (Water)

Envirolab ID	Units	PQL	PFK0894-01	PFK0894-02	PFK0894-03	PFK0894-04	PFK0894-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			10/11/2024	10/11/2024	10/11/2024	10/11/2024	10/11/2024
Depth			11.10	11.40	11.40	9.80	12.60
BOD	mg/L	5.0	11	9.1	10	24	28
COD	mg O2/L	20	<20	<20	220	<20	91

Envirolab ID	Units	PQL	PFK0894-06	PFK0894-07	PFK0894-08	PFK0894-09
Your Reference			GWB04	Field Blank	Duplicate	Trip blank
Date Sampled			10/11/2024	10/11/2024	10/11/2024	10/11/2024
BOD	mg/L	5.0	20	5.4	7.9	<5.0
COD	mg O2/L	20	<20	<20	<20	<20

PFAS Extended List (Water) - Analysed By Envirolab Services Sydney

Envirolab ID	Units	PQL	PFK0894-01	PFK0894-02	PFK0894-03	PFK0894-04	PFK0894-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			10/11/2024	10/11/2024	10/11/2024	10/11/2024	10/11/2024
Depth			11.10	11.40	11.40	9.80	12.60
Perfluorobutanesulfonic acid (PFBS)	µg/L	0.010	<0.010	<0.010	0.052	0.068	0.019
Perfluoropentanesulfonic acid (PFPeS)	µg/L	0.010	<0.010	<0.010	0.034	0.041	0.014
Perfluorohexanesulfonic acid (PFHxS)	µg/L	0.010	<0.010	0.021	0.27	0.21	0.063
Perfluoroheptanesulfonic acid (PFHpS)	µg/L	0.010	<0.010	<0.010	0.025	0.027	0.011
Perfluorooctanesulfonic acid (PFOS)	µg/L	0.010	0.012	0.035	0.70	0.41	0.13
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorobutanoic acid (PFBA)	µg/L	0.020	0.032	<0.020	0.060	0.058	<0.020
Perfluoropentanoic acid (PFPeA)	µg/L	0.020	0.057	<0.020	0.072	0.056	<0.020
Perfluorohexanoic acid (PFHxA)	µg/L	0.010	0.031	<0.010	0.10	0.12	0.039
Perfluoroheptanoic acid (PFHpA)	µg/L	0.010	0.022	<0.010	0.042	0.040	0.012
Perfluorooctanoic acid (PFOA)	µg/L	0.010	0.014	<0.010	0.086	0.081	0.026
Perfluorononanoic acid (PFNA)	µg/L	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Perfluorodecanoic acid (PFDA)	µg/L	0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorododecanoic acid (PFDoDA)	µg/L	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.50	<0.50	<0.50	<0.50	<0.50	<0.50
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.020	<0.020	<0.020	<0.020	<0.020	<0.020
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorooctane sulfonamide (FOSA)	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-Methyl perfluorooctane sulfonamidoethanol	µg/L	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
N-Ethyl perfluorooctane sulfonamidoethanol	µg/L	0.50	<0.50	<0.50	<0.50	<0.50	<0.50
N-Methyl perfluorooctane sulfonamidoacetic acid	µg/L	0.020	<0.020	<0.020	<0.020	<0.020	<0.020
N-Ethyl perfluorooctane sulfonamidoacetic acid	µg/L	0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Surrogate 13C8 PFOS	%		*97.0*	*96.9*	*98.3*	*98.7*	*98.5*
Surrogate 13C2 PFOA	%		*99.4*	*102*	*100*	*101*	*100*
Total +ve PFHxS+PFOS	µg/L	0.010	0.012	0.056	0.97	0.62	0.19
Total +ve PFOA+PFOS	µg/L	0.010	0.026	0.035	0.79	0.49	0.16
Total +ve PFAS	µg/L	0.010	0.17	0.056	1.4	1.1	0.31
Extraction Internal Standard 13C3 PFBS	%		*102*	*102*	*102*	*104*	*99.1*
Extraction Internal Standard 18O2 PFHxS	%		*95.3*	*97.3*	*102*	*104*	*100*
Extraction Internal Standard 13C4 PFOS	%		*102*	*102*	*104*	*106*	*103*
Extraction Internal Standard 13C4 PFBA	%		*103*	*104*	*103*	*104*	*102*
Extraction Internal Standard 13C3 PFPeA	%		*100*	*102*	*102*	*104*	*101*
Extraction Internal Standard 13C2 PFHxA	%		*97.2*	*100*	*107*	*104*	*97.8*
Extraction Internal Standard 13C4 PFHpA	%		*103*	*103*	*103*	*106*	*102*
Extraction Internal Standard 13C4 PFOA	%		*102*	*100*	*104*	*103*	*102*

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Envirolab ID	Units	PQL	PFK0894-01	PFK0894-02	PFK0894-03	PFK0894-04	PFK0894-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			10/11/2024	10/11/2024	10/11/2024	10/11/2024	10/11/2024
Depth			11.10	11.40	11.40	9.80	12.60
Extraction Internal Standard 13C5 PFNA	%		*101*	*103*	*105*	*106*	*102*
Extraction Internal Standard 13C2 PFDA	%		*102*	*101*	*102*	*107*	*101*
Extraction Internal Standard 13C2 PFUnDA	%		*102*	*103*	*105*	*108*	*104*
Extraction Internal Standard 13C2 PFDoDA	%		*100*	*102*	*100*	*105*	*101*
Extraction Internal Standard 13C2 PFTeDA	%		*89.7*	*95.1*	*94.1*	*96.0*	*91.4*
Extraction Internal Standard 13C2 4:2FTS	%		*103*	*106*	*102*	*104*	*102*
Extraction Internal Standard 13C2 6:2FTS	%		*103*	*102*	*101*	*103*	*102*
Extraction Internal Standard 13C2 8:2FTS	%		*99.9*	*105*	*98.4*	*109*	*100*
Extraction Internal Standard 13C8 FOSA	%		*105*	*107*	*105*	*109*	*106*
Extraction Internal Standard d3 N MeFOSA	%		*103*	*105*	*101*	*102*	*104*
Extraction Internal Standard d5 N EtFOSA	%		*103*	*104*	*99.1*	*103*	*102*
Extraction Internal Standard d7 N MeFOSE	%		*99.3*	*97.8*	*98.8*	*104*	*95.9*
Extraction Internal Standard d9 N EtFOSE	%		*99.4*	*99.2*	*98.4*	*102*	*97.9*
Extraction Internal Standard d3 N MeFOSAA	%		*103*	*102*	*105*	*102*	*104*
Extraction Internal Standard d5 N EtFOSAA	%		*104*	*105*	*102*	*102*	*102*

Envirolab ID	Units	PQL	PFK0894-06	PFK0894-07	PFK0894-08	PFK0894-09
Your Reference			GWB04	Field Blank	Duplicate	Trip blank
Date Sampled			10/11/2024	10/11/2024	10/11/2024	10/11/2024
Perfluorobutanesulfonic acid (PFBS)	µg/L	0.010	<0.010	<0.010	<0.010	<0.010
Perfluoropentanesulfonic acid (PFPeS)	µg/L	0.010	<0.010	<0.010	<0.010	<0.010
Perfluorohexanesulfonic acid (PFHxS)	µg/L	0.010	<0.010	<0.010	<0.010	<0.010
Perfluoroheptanesulfonic acid (PFHpS)	µg/L	0.010	<0.010	<0.010	<0.010	<0.010
Perfluorooctanesulfonic acid (PFOS)	µg/L	0.010	<0.010	<0.010	0.011	<0.010
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.020	<0.020	<0.020	<0.020	<0.020
Perfluorobutanoic acid (PFBA)	µg/L	0.020	<0.020	<0.020	0.035	<0.020
Perfluoropentanoic acid (PFPeA)	µg/L	0.020	<0.020	<0.020	0.056	<0.020
Perfluorohexanoic acid (PFHxA)	µg/L	0.010	<0.010	<0.010	0.029	<0.010
Perfluoroheptanoic acid (PFHpA)	µg/L	0.010	<0.010	<0.010	0.023	<0.010
Perfluorooctanoic acid (PFOA)	µg/L	0.010	<0.010	<0.010	0.014	<0.010
Perfluorononanoic acid (PFNA)	µg/L	0.010	<0.010	<0.010	<0.010	<0.010
Perfluorodecanoic acid (PFDA)	µg/L	0.020	<0.020	<0.020	<0.020	<0.020
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.020	<0.020	<0.020	<0.020	<0.020
Perfluorododecanoic acid (PFDoDA)	µg/L	0.050	<0.050	<0.050	<0.050	<0.050
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.50	<0.50	<0.50	<0.50	<0.50
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.010	<0.010	<0.010	<0.010	<0.010
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.010	<0.010	<0.010	<0.010	<0.010
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.020	<0.020	<0.020	<0.020	<0.020
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.020	<0.020	<0.020	<0.020	<0.020
Perfluorooctane sulfonamide (FOSA)	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.050	<0.050	<0.050	<0.050	<0.050
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.10	<0.10	<0.10	<0.10	<0.10

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PFAS Extended List (Water) - Analysed By Envirolab Services Sydney

Envirolab ID	Units	PQL	PFK0894-06	PFK0894-07	PFK0894-08	PFK0894-09
Your Reference			GWB04	Field Blank	Duplicate	Trip blank
Date Sampled			10/11/2024	10/11/2024	10/11/2024	10/11/2024
N-Methyl perfluorooctane sulfonamidoethanol	µg/L	0.050	<0.050	<0.050	<0.050	<0.050
N-Ethyl perfluorooctane sulfonamidoethanol	µg/L	0.50	<0.50	<0.50	<0.50	<0.50
N-Methyl perfluorooctane sulfonamidoacetic acid	µg/L	0.020	<0.020	<0.020	<0.020	<0.020
N-Ethyl perfluorooctane sulfonamidoacetic acid	µg/L	0.020	<0.020	<0.020	<0.020	<0.020
Surrogate 13C8 PFOS	%		*99.9*	*99.8*	*102*	*100*
Surrogate 13C2 PFOA	%		*99.6*	*101*	*99.8*	*99.8*
Total +ve PFHxS+PFOS	µg/L	0.010	<0.010	<0.010	0.011	<0.010
Total +ve PFOA+PFOS	µg/L	0.010	<0.010	<0.010	0.025	<0.010
Total +ve PFAS	µg/L	0.010	<0.010	<0.010	0.17	<0.010
Extraction Internal Standard 13C3 PFBS	%		*102*	*104*	*99.3*	*104*
Extraction Internal Standard 18O2 PFHxS	%		*99.1*	*104*	*102*	*101*
Extraction Internal Standard 13C4 PFOS	%		*102*	*102*	*99.6*	*101*
Extraction Internal Standard 13C4 PFBA	%		*102*	*105*	*101*	*104*
Extraction Internal Standard 13C3 PFPeA	%		*99.6*	*105*	*105*	*105*
Extraction Internal Standard 13C2 PFHxA	%		*100*	*101*	*100*	*99.8*
Extraction Internal Standard 13C4 PFHpA	%		*100*	*103*	*101*	*103*
Extraction Internal Standard 13C4 PFOA	%		*103*	*101*	*102*	*103*
Extraction Internal Standard 13C5 PFNA	%		*99.0*	*102*	*99.6*	*101*
Extraction Internal Standard 13C2 PFDA	%		*98.6*	*98.4*	*100*	*99.9*
Extraction Internal Standard 13C2 PFUnDA	%		*105*	*105*	*101*	*104*
Extraction Internal Standard 13C2 PFDoDA	%		*102*	*102*	*96.6*	*101*
Extraction Internal Standard 13C2 PFTeDA	%		*96.4*	*90.0*	*87.4*	*87.1*
Extraction Internal Standard 13C2 4:2FTS	%		*102*	*93.5*	*91.1*	*92.1*
Extraction Internal Standard 13C2 6:2FTS	%		*104*	*88.1*	*86.2*	*87.9*
Extraction Internal Standard 13C2 8:2FTS	%		*109*	*92.1*	*88.4*	*87.7*
Extraction Internal Standard 13C8 FOSA	%		*103*	*105*	*104*	*103*
Extraction Internal Standard d3 N MeFOSA	%		*102*	*102*	*100*	*99.5*
Extraction Internal Standard d5 N EtFOSA	%		*103*	*99.4*	*98.9*	*99.8*
Extraction Internal Standard d7 N MeFOSE	%		*96.2*	*98.0*	*97.5*	*95.5*
Extraction Internal Standard d9 N EtFOSE	%		*99.8*	*102*	*98.8*	*97.8*
Extraction Internal Standard d3 N MeFOSAA	%		*106*	*96.3*	*93.3*	*94.3*
Extraction Internal Standard d5 N EtFOSAA	%		*105*	*96.3*	*92.1*	*95.0*

Certificate of Analysis PFK0894

General - Field Data (Water)

Envirolab ID	Units	PQL	PFK0894-01	PFK0894-02	PFK0894-03	PFK0894-04	PFK0894-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			10/11/2024	10/11/2024	10/11/2024	10/11/2024	10/11/2024
Depth			11.10	11.40	11.40	9.80	12.60
pH (Client Supplied)*	pH units		8.56	6.89	6.77	8.85	8.18
Temperature (Client Supplied)*	o C		32.3	31.2	32.1	33.2	36.4

Envirolab ID	Units	PQL	PFK0894-06
Your Reference			GWB04
Date Sampled			10/11/2024
pH (Client Supplied)*	pH units		8.40
Temperature (Client Supplied)*	o C		34.6

Result Comments

Identifier	Description
[5]	Ion Balance indicative only for samples with low Electrical Conductivity.

Method Summary

Method ID	Methodology Summary
Calc	Calculation
Calc - ION	Calculation
Calc - Trivalent Cr	Calculation
Field Data	Field Data supplied by client
INORG-006	Alkalinity - determined titrimetrically based on APHA latest edition 2320-B. Solids reported from a 1:5 water extract unless otherwise specified. Total Carbon Dioxide - determined by calculation in accordance with APHA latest edition,4500-CO2 D.
INORG-018	Total Dissolved Solids - determined gravimetrically. The solids are dried at 180±10°C. NOTE: Where the EC of the sample is <100µS/cm, the TDS will typically be below 70mg/L (as the sample is very likely to be at least drinking water quality). Therefore to ensure data quality for TDS, the TDS is typically calculated as per the equation: TDS = EC*0.6
INORG-040	The concentrations of the major ions (mg/L) are converted to milliequivalents and summed. The ionic balance should be within +/- 15% i.e. total anions = total cations +/-15%.
INORG-055	Nitrate/Nitrite/NOx/TKN - determined colourimetrically. Waters samples are filtered on receipt prior to analysis. Soils/solids are analysed following a water extraction.
INORG-057	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.
INORG-057_CALC	Calculation of Ammonium as N. Assumes all Ammonia is present as Ammonium unless samplpe pH and temperature provided.
INORG-060_TP	Total Phosphorus - determined colourimetrically using APHA latest edition 4500-P J. Water samples are filtered on receipt prior to analysis. Soils are analysed from a water extract.
INORG-067	Samples are digested in acid with a known excess of potassium dichromate then the colour change is determined by discrete analyser or UV-VIS in accordance with APHA latest edition 5220 D.
INORG-079	Carbon forms (inorganic, organic, total) determined using a TOC/NDIR analyser via combustion. Dissolved aqueous\forms require filtering prior to determination.
INORG-081	Anions determined by Ion Chromatography. Waters samples are filtered on receipt prior to analysis. Solids are analysed from a water extract. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
INORG-091	BOD and/or cBOD - Analysed in accordance with APHA latest edition 5210 D.
INORG-111	Volatile Fatty Acids determined by distillation and titration.
INORG-118	Hexavalent Chromium by Ion Chromatographic separation and colourimetric determination. Waters samples are filtered prior to analysis. Solids are extracted with an alkaline buffered solution, for air sampling media the same alkali extraction can be used or alternatives from NIOSH/OSHA. For aqueous samples, Total Hexavalent Chromium includes the dissolved Hexavalent Chromium and any Hexavalent Chromium solubilised by the preservative i.e. Sodium Hydroxide from any particulate that may be present.
INORG-127	Total Nitrogen by high temperature catalytic combustion with chemiluminescence detection. Organic Carbon forms (inorganic, organic, total) determined using a TOC/NDIR analyser via combustion. Dissolved forms require filtering prior to determination.
METALS-020	Determination of various metals by ICP-OES.
METALS-022	Determination of various metals by ICP-MS.Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements.Salt forms and/or anion/cation forms (e.g. FeO, PbO, ZnO, BO3) are determined stoichiometrically from the base metal concentration.
ORG-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. 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 (>C10-C40).
ORG-021/022/025_PCB	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD and/or GC-MS/GC-MSMS.

Method Summary

Method ID	Methodology Summary
ORG-022_PAH	Determination of semi-volatile organic compounds (SVOCs) by GC-MS. Water samples are extracted by LLE and solids using DCM/Acetone/Methanol. For PAHs:- Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. 1. 'TEQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'TEQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'TEQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, for Total +ve calculations, the PQL is reflective of the lowest individual PQL and therefore, for example, "Total +ve PAHs" is simply a sum of the positive individual PAHs.
ORG-023_F1_TOT	Determination of volatile organic compounds (VOCs) by P&T-GC-MS. Water samples are analysed directly by purge and trap GC-MS. Solids are extracted with Methanol, diluted and analysed by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.
ORG-029	Soil/solid and sorbent samples are extracted with basified Methanol. Waters and soil/sorbent 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. Analysis is undertaken with LC-MSMS. PFAS results include the sum of branched and linear isomers where applicable. 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. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

Result Definitions

Identifier	Description
NR	Not reported
NEPM	National Environment Protection Measure
NS	Not specified
LCS	Laboratory Control Sample
RPD	Relative Percent Difference
>	Greater than
<	Less than
PQL	Practical Quantitation Limit
INS	Insufficient sample for this test
NA	Test not required
NT	Not tested
DOL	Samples rejected due to particulate overload (air filters only)
RFD	Samples rejected due to filter damage (air filters only)
RUD	Samples rejected due to uneven deposition (air filters only)
##	Indicates a laboratory acceptance criteria outlier, for further details, see Result Comments and/or QC Comments

Quality Control Definitions

Blank

This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, and is determined by processing solvents and reagents in exactly the same manner as for samples.

Surrogate Spike

Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

LCS (Laboratory Control Sample)

This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Matrix Spike

A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

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.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

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 QAQC tables for details (available on request); <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; 60-140% for organics (+/-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 typically insufficient in order to satisfy laboratory QA/QC protocols.

Miscellaneous Information

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. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

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 or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volume measurements are not covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary PFK0894

Client Details

Client	Katherine Town Council - NT
Your Reference	Katherine Town Council - EPL298 - Quarterly
Date Issued	26/11/2024

Recommended Holding Time Compliance

Recommended holding time exceedances exist - See detailed list below

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	Yes	No Outliers
Duplicates	Yes	No Outliers
Matrix Spike	No	Matrix Spike Outliers Exist - See detailed list below
Surrogates / Extracted Internal Standards	Yes	No Outliers
QC Frequency	No	QC Frequency Outliers Exist - See detailed list below

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Data Quality Assessment Summary PFK0894

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
vTRH&MBTEXN | Water	1-9	10/11/2024	15/11/2024	18/11/2024	Yes
sTRH | Water	1-2, 4-9	10/11/2024	15/11/2024	16/11/2024	Yes
	3	10/11/2024	15/11/2024	18/11/2024	Yes
PAH | Water	1-5	10/11/2024	15/11/2024	15/11/2024	Yes
	6-9	10/11/2024	15/11/2024	16/11/2024	Yes
PCB | Water	1-5	10/11/2024	15/11/2024	15/11/2024	Yes
	6-9	10/11/2024	15/11/2024	16/11/2024	Yes
Total Metals (LL) | Water	1-9	10/11/2024	25/11/2024	25/11/2024	Yes
Dissolved Metals (LL) | Water	1-9	10/11/2024	20/11/2024	22/11/2024	Yes
TDS | Water	1-9	10/11/2024	21/11/2024	22/11/2024	No
VFA | Water	1-9	10/11/2024	15/11/2024	21/11/2024	Yes
Alkalinity Suite | Water	1-9	10/11/2024	15/11/2024	15/11/2024	Yes
Chloride | Water	1-9	10/11/2024	20/11/2024	21/11/2024	Yes
Dissolved Cations | Water	1-9	10/11/2024	20/11/2024	22/11/2024	Yes
Ion Balance | Water	1-9	10/11/2024	15/11/2024	26/11/2024	Yes
	1-9	10/11/2024	20/11/2024	22/11/2024	Yes
Sulfate | Water	1-9	10/11/2024	20/11/2024	21/11/2024	Yes
Total Organic Carbon | Water	1-5, 7-9	10/11/2024	18/11/2024	18/11/2024	Yes
	6	10/11/2024	18/11/2024	19/11/2024	Yes
Cr3+ | Water	1-9	10/11/2024	20/11/2024	22/11/2024	Yes
Cr6+ | Water	1-9	10/11/2024	15/11/2024	18/11/2024	Yes
Nitrogen - Ammonia | Water	1-8	10/11/2024	15/11/2024	15/11/2024	Yes
	9	10/11/2024	18/11/2024	18/11/2024	Yes
Nitrogen - Ammonium by calc | Water	1-8	10/11/2024	15/11/2024	26/11/2024	Yes
	9	10/11/2024	18/11/2024	26/11/2024	Yes
Nitrogen - Nitrate | Water	1-8	10/11/2024	15/11/2024	15/11/2024	Yes
	9	10/11/2024	18/11/2024	18/11/2024	Yes
Nitrogen - Total N | Water	1-9	10/11/2024	15/11/2024	18/11/2024	Yes
Total Phosphorus | Water	1-9	10/11/2024	15/11/2024	15/11/2024	Yes
BOD | Water	1-9	10/11/2024	19/11/2024	25/11/2024	Yes
COD | Water	1-9	10/11/2024	25/11/2024	26/11/2024	Yes
PFAS EXT-ISTD | Water	1-9	10/11/2024	15/11/2024	16/11/2024	Yes
PFAS-Extended | Water	1-9	10/11/2024	15/11/2024	16/11/2024	Yes

Data Quality Assessment Summary PFK0894

Outliers: Matrix Spike

METALS-022|Acid Extractable Low Level Metals (Water)| Batch BFK4178

Sample ID	Analyte	% Limits	% Recovery
PFK0894-02	Iron	70 - 130	##[1]

Outliers: QC Frequency

INORG-091|Inorganics - Common Wastewater Parameters (Water)| Batch BFK3287

Analysis	QC Type	Expected	Reported
BOD	Duplicate	2	0

INORG-111|Inorganics - Physical Parameters (Water)| Batch BFK2696

Analysis	QC Type	Expected	Reported
VFA	Duplicate	1	0

Quality Control PFK0894

ORG-023_F1_TOT|Volatile TRH and BTEX (Water) | Batch BFK2714

Analyte	Units	PQL	Blank	DUP1 PFK0894-02 Samp | QC | RPD %	DUP2 BFK2714-DUP2# Samp | QC | RPD %	LCS %	Spike % BFK2714-MS1#
TRH C6-C9	µg/L	10	<10	<10 | <10 | [NA]	<10 | <10 | [NA]	94.3	89.2
TRH C6-C10	µg/L	10	<10	<10 | <10 | [NA]	<10 | <10 | [NA]	94.6	90.2
TRH C6-C10 less BTEX (F1)	µg/L	10	<10	<10 | <10 | [NA]	<10 | <10 | [NA]	[NA]	[NA]
Methyl tert butyl ether (MTBE)	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	[NA]	[NA]
Benzene	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	97.4	96.1
Toluene	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	101	101
Ethylbenzene	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	108	107
meta+para Xylene	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	<2.0 | <2.0 | [NA]	104	103
ortho-Xylene	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	110	109
Total Xylene	µg/L	3.0	<3.0	<3.0 | <3.0 | [NA]	<3.0 | <3.0 | [NA]	[NA]	[NA]
Naphthalene (value used in F2 calc)	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	[NA]	[NA]
Surrogate Dibromofluoromethane	*%*		*99.8*	*98.5 | 99.4*	*101 | 96.4*	*97.3*	*93.9*
Surrogate Toluene-D8	*%*		*99.3*	*98.0 | 98.8*	*98.3 | 99.2*	*101*	*102*
Surrogate 4-Bromofluorobenzene	*%*		*99.1*	*97.6 | 100*	*100 | 99.7*	*98.9*	*98.4*

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

ORG-020|Semi-volatile TRH (Water) | Batch BFK2631

Analyte	Units	PQL	Blank	DUP1 PFK0894-01 Samp | QC | RPD %	DUP2 PFK0894-02 Samp | QC | RPD %	LCS %	Spike % PFK0894-03
TRH C10-C14	µg/L	50	<50	<50 | <50 | [NA]	<50 | <50 | [NA]	108	96.5
TRH C15-C28	µg/L	100	<100	<100 | <100 | [NA]	<100 | <100 | [NA]	105	94.9
TRH C29-C36	µg/L	100	<100	<100 | <100 | [NA]	<100 | <100 | [NA]	106	95.0
TRH >C10-C16	µg/L	50	<50	<50 | <50 | [NA]	<50 | <50 | [NA]	108	97.1
TRH >C16-C34 (F3)	µg/L	100	<100	<100 | <100 | [NA]	<100 | <100 | [NA]	105	94.8
TRH >C34-C40 (F4)	µg/L	100	<100	<100 | <100 | [NA]	<100 | <100 | [NA]	105	92.9
Surrogate o-Terphenyl	*%*		*111*	*103 | 95.5*	*90.2 | 100*	*90.4*	*90.2*

ORG-022_PAH|Polycyclic Aromatic Hydrocarbons (Water) | Batch BFK2631

Analyte	Units	PQL	Blank	DUP1 PFK0894-01 Samp | QC | RPD %	DUP2 PFK0894-02 Samp | QC | RPD %	LCS %	Spike % PFK0894-04
Naphthalene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	97.0	86.7
Acenaphthylene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	[NA]	[NA]
Acenaphthene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	103	95.2
Fluorene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	102	96.4
Phenanthrene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	92.0	93.5
Anthracene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	[NA]	[NA]
Fluoranthene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	103	94.5
Pyrene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	100	93.6
Benzo(a)anthracene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	[NA]	[NA]
Chrysene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	88.2	81.3
Benzo(b,j,k)fluoranthene	µg/L	0.20	<0.20	<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	[NA]	[NA]
Benzo(a)pyrene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	89.2	75.6
Indeno(1,2,3-c,d)pyrene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	[NA]	[NA]
Dibenzo(a,h)anthracene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	[NA]	[NA]
Benzo(g,h,i)perylene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	[NA]	[NA]
Surrogate p-Terphenyl-D14	*%*		*102*	*93.8 | 105*	*89.4 | 98.4*	*92.5*	*86.7*

Quality Control PFK0894

ORG-021/022/025_PCB|Polychlorinated Biphenyls (Water) | Batch BFK2631

Analyte	Units	PQL	Blank	DUP1 PFK0894-01 Samp | QC | RPD %	DUP2 PFK0894-02 Samp | QC | RPD %	LCS %	Spike % PFK0894-04
Aroclor 1016	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	<2.0 | <2.0 | [NA]	[NA]	[NA]
Aroclor 1221	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	<2.0 | <2.0 | [NA]	[NA]	[NA]
Aroclor 1232	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	<2.0 | <2.0 | [NA]	[NA]	[NA]
Aroclor 1242	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	<2.0 | <2.0 | [NA]	[NA]	[NA]
Aroclor 1248	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	<2.0 | <2.0 | [NA]	[NA]	[NA]
Aroclor 1254	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	<2.0 | <2.0 | [NA]	[NA]	[NA]
Aroclor 1260	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	<2.0 | <2.0 | [NA]	[NA]	[NA]
PCB C103	µg/L			0.00 | 0.00 | [NA]	0.00 | 0.00 | [NA]	83.8	87.0
Surrogate 2-Fluorobiphenyl	*%*		*112*	*84.7 | 86.9*	*81.8 | 87.2*	*98.8*	*84.5*

METALS-022|Acid Extractable Low Level Metals (Water) | Batch BFK4178

Analyte	Units	PQL	Blank	DUP1 PFK0894-01 Samp | QC | RPD %	DUP2 BFK4178-DUP2# Samp | QC | RPD %	LCS %	Spike % PFK0894-02
Aluminium	µg/L	10	<10	<10 | <10 | [NA]	14.3 | 13.8 | [NA]	107	108
Cadmium	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	109	108
Chromium	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	101	107
Copper	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	95.3 | 91.6 | 3.99	98.1	99.4
Iron	µg/L	10	<10	139 | 132 | 5.37	58.2 | 60.8 | 4.33	118	##[1]
Lead	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	100	102
Manganese	µg/L	1.0	<1.0	1.57 | 1.40 | [NA]	1.48 | 1.58 | [NA]	100	103
Nickel	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	98.3	100
Selenium	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	114	111
Zinc	µg/L	1.0	<1.0	3.86 | 3.77 | [NA]	7.36 | 6.08 | 19.1	100	100

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-022|Dissolved Low Level Metals (Water) | Batch BFK3474

Analyte	Units	PQL	Blank	DUP1 PFK0894-01 Samp | QC | RPD %	DUP2 BFK3474-DUP2# Samp | QC | RPD %	LCS %	Spike % PFK0894-02
Aluminium	µg/L	10	<10	<10 | <10 | [NA]	<10 | <10 | [NA]	103	102
Cadmium	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	104	100
Chromium	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	104	103
Copper	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	2.93 | 2.84 | [NA]	105	100
Iron	µg/L	10	<10	15.6 | 15.5 | [NA]	<10 | <10 | [NA]	105	107
Lead	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	99.0	98.4
Manganese	µg/L	1.0	<1.0	1.82 | 1.67 | [NA]	<1.0 | <1.0 | [NA]	104	102
Nickel	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	1.76 | 1.70 | [NA]	105	102
Selenium	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	7.03 | 7.00 | 0.499	109	117
Zinc	µg/L	1.0	<1.0	5.68 | 5.05 | 11.8	7.74 | 7.55 | 2.55	103	99.6

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-111|Inorganics - Physical Parameters (Water) | Batch BFK2696

Analyte	Units	PQL	Blank	LCS %
Volatile Fatty Acids	mg/L	5.0	<5.0	97.1

Batch QC Comments: [4]

INORG-018|Inorganics - Physical Parameters (Water) | Batch BFK3823

Analyte	Units	PQL	Blank	DUP1 PFK0894-01 Samp | QC | RPD %	DUP2 BFK3823-DUP2# Samp | QC | RPD %	LCS %
Total Dissolved Solids	mg/L	5.0	<5.0	329 | 326 | 0.916	119 | 110 | 7.86	100

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control PFK0894

INORG-006 | Inorganics - Ionic Balance and Indexes (Water) | Batch BFK2589

Analyte	Units	PQL	Blank	DUP1 PFK0894-01 Samp | QC | RPD %	DUP2 BFK2589-DUP2# Samp | QC | RPD %	LCS %
Bicarbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	335 | 346 | 3.08	422 | 426 | 0.755	[NA]
Carbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0 | <5.0 | [NA]	<5.0 | <5.0 | [NA]	[NA]
Hydroxide OH- as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0 | <5.0 | [NA]	<5.0 | <5.0 | [NA]	[NA]
Total Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	335 | 346 | 3.08	422 | 426 | 0.755	101

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-081 | Inorganics - Ionic Balance and Indexes (Water) | Batch BFK3411

Analyte	Units	PQL	Blank	DUP1 BFK3411-DUP1# Samp | QC | RPD %	DUP2 PFK0894-01 Samp | QC | RPD %	LCS %	Spike % BFK3411-MS1#
Chloride	mg/L	1.0	<1.0	386 | 386 | 0.0973	5.59 | 5.39 | 3.80	92.6	83.5
Sulfate	mg/L	1.0	<1.0	318 | 318 | 0.131	4.80 | 4.67 | [NA]	89.2	96.1

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-020 | Inorganics - Ionic Balance and Indexes (Water) | Batch BFK3477

Analyte	Units	PQL	Blank	DUP1 PFK0894-01 Samp | QC | RPD %	DUP2 BFK3477-DUP2# Samp | QC | RPD %	LCS %	Spike % PFK0894-02
Calcium	mg/L	0.50	<0.50	72.2 | 69.6 | 3.68	66.4 | 66.2 | 0.244	106	103
Magnesium	mg/L	0.50	<0.50	33.5 | 31.4 | 6.66	125 | 124 | 0.322	107	92.7
Potassium	mg/L	0.50	<0.50	5.59 | 5.54 | 0.912	40.4 | 40.2 | 0.362	104	103
Sodium	mg/L	0.50	<0.50	6.59 | 6.23 | 5.60	360 | 356 | 1.06	106	98.9
Hardness (calc) equivalent CaCO3	mg/L	3.0	<3.0	318 | 303 | 4.96	679 | 677 | 0.303	[NA]	[NA]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-079 | Inorganics - Carbon, Nitrogen and Sulfur Species (Water) | Batch BFK2933

Analyte	Units	PQL	Blank	DUP1 BFK2933-DUP1# Samp | QC | RPD %	DUP2 PFK0894-02 Samp | QC | RPD %	LCS %	Spike % BFK2933-MS1#
Total Organic Carbon	mg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	1.24 | 1.24 | [NA]	103	106

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-118 | Inorganics - Speciated Cr (III/VI) and Fe (II/III) (Water) | Batch BFK2672

Analyte	Units	PQL	Blank	DUP1 PFK0894-01 Samp | QC | RPD %	DUP2 BFK2672-DUP2# Samp | QC | RPD %	LCS %	Spike % PFK0894-02
Hexavalent Chromium	mg/L	0.0050	<0.0050	<0.0050 | <0.0050 | [NA]	<0.0050 | <0.0050 | [NA]	92.4	103

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-060_TP | Inorganics - Nutrients (Water) | Batch BFK2494

Analyte	Units	PQL	Blank	DUP1 BFK2494-DUP1# Samp | QC | RPD %	DUP2 BFK2494-DUP2# Samp | QC | RPD %	LCS %	Spike % BFK2494-MS1#
Total Phosphorus	mg/L	0.010	<0.010	0.0140 | 0.0132 | [NA]	0.0267 | 0.0284 | [NA]	112	106

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control PFK0894

INORG-127 | Inorganics - Nutrients (Water) | Batch BFK2497

Analyte	Units	PQL	Blank	DUP1 BFK2497-DUP1# Samp | QC | RPD %	DUP2 PFK0894-09 Samp | QC | RPD %	LCS %	Spike % BFK2497-MS1#
Total Nitrogen	mg/L	0.10	<0.10	7.77 | 7.76 | 0.126	<0.10 | 0.131 | [NA] [3]	108	127

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-057 | Inorganics - Nutrients (Water) | Batch BFK2674

Analyte	Units	PQL	Blank	DUP1 BFK2674-DUP1# Samp | QC | RPD %	DUP2 BFK2674-DUP2# Samp | QC | RPD %	LCS %	Spike % BFK2674-MS1#
Ammonia as N	mg/L	0.0050	<0.0050	<0.0050 | <0.0050 | [NA]	0.0217 | 0.0233 | [NA]	119	72.3
Nitrate as N	mg/L	0.0050	<0.0050	<0.0050 | <0.0050 | [NA]	0.411 | 0.377 | 8.46	103	100
Nitrate as NO3 by calculation	mg/L	0.020	<0.020			[NA]	[NA]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-057 | Inorganics - Nutrients (Water) | Batch BFK2846

Analyte	Units	PQL	Blank	DUP1 BFK2846-DUP1# Samp | QC | RPD %	DUP2 BFK2846-DUP2# Samp | QC | RPD %	LCS %	Spike % BFK2846-MS1#
Ammonia as N	mg/L	0.0050	<0.0050	0.174 | 0.190 | 9.03	0.200 | 0.190 | 5.42	89.8	89.6
Nitrate as N	mg/L	0.0050	<0.0050	0.333 | 0.341 | 2.24	0.942 | 0.964 | 2.28	100	110
Nitrate as NO3 by calculation	mg/L	0.020	<0.020			[NA]	[NA]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-067 | Inorganics - Common Wastewater Parameters (Water) | Batch BFK4307

Analyte	Units	PQL	Blank	DUP1 PFK0894-01 Samp | QC | RPD %	DUP2 BFK4307-DUP2# Samp | QC | RPD %	LCS %
COD	mg O2/L	20	<20	<20 | <20 | [NA]	807 | 801 | 0.746	96.0

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control PFK0894

ORG-029|PFAS Extended List (Water) | Batch BFK2964

Analyte	Units	PQL	Blank	DUP1 BFK2964-DUP1# Samp | QC | RPD %	DUP2 BFK2964-DUP2# Samp | QC | RPD %	LCS %	Spike % BFK2964-MS1#
Perfluorobutanesulfonic acid (PFBS)	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	<0.010 | <0.010 | [NA]	97.7	99.4
Perfluoropentanesulfonic acid (PFPeS)	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	<0.010 | <0.010 | [NA]	98.4	97.2
Perfluorohexanesulfonic acid (PFHxS)	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	<0.010 | <0.010 | [NA]	98.1	96.2
Perfluoroheptanesulfonic acid (PFHpS)	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	<0.010 | <0.010 | [NA]	96.5	96.3
Perfluorooctanesulfonic acid (PFOS)	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	<0.010 | <0.010 | [NA]	97.6	95.3
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.020	<0.020	<0.020 | <0.020 | [NA]	<0.020 | <0.020 | [NA]	95.8	97.7
Perfluorobutanoic acid (PFBA)	µg/L	0.020	<0.020	<0.20 | <0.20 | [NA]	<0.020 | <0.020 | [NA]	96.6	91.3
Perfluoropentanoic acid (PFPeA)	µg/L	0.020	<0.020	<0.020 | <0.020 | [NA]	<0.020 | <0.020 | [NA]	93.9	92.0
Perfluorohexanoic acid (PFHxA)	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	<0.010 | <0.010 | [NA]	90.8	89.9
Perfluoroheptanoic acid (PFHpA)	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	<0.010 | <0.010 | [NA]	99.7	94.4
Perfluorooctanoic acid (PFOA)	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	<0.010 | <0.010 | [NA]	96.4	93.2
Perfluorononanoic acid (PFNA)	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	<0.010 | <0.010 | [NA]	98.1	98.1
Perfluorodecanoic acid (PFDA)	µg/L	0.020	<0.020	<0.020 | <0.020 | [NA]	<0.020 | <0.020 | [NA]	104	97.0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.020	<0.020	<0.020 | <0.020 | [NA]	<0.020 | <0.020 | [NA]	102	101
Perfluorododecanoic acid (PFDoDA)	µg/L	0.050	<0.050	<0.050 | <0.050 | [NA]	<0.050 | <0.050 | [NA]	95.5	91.6
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	82.0	88.4
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	88.5	91.0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.010	<0.010	<0.10 | <0.10 | [NA]	<0.010 | <0.010 | [NA]	96.8	90.1
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.010	<0.010	<0.10 | <0.10 | [NA]	<0.010 | <0.010 | [NA]	96.4	98.7
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.020	<0.020	<0.10 | <0.10 | [NA]	<0.020 | <0.020 | [NA]	93.1	91.9
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.020	<0.020	<0.10 | <0.10 | [NA]	<0.020 | <0.020 | [NA]	97.1	119
Perfluorooctane sulfonamide (FOSA)	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	99.5	98.7
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.050	<0.050	<0.050 | <0.050 | [NA]	<0.050 | <0.050 | [NA]	102	93.4
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	95.2	93.2
N-Methyl perfluorooctane sulfonamidoethanol	µg/L	0.050	<0.050	<0.050 | <0.050 | [NA]	<0.050 | <0.050 | [NA]	102	95.4
N-Ethyl perfluorooctane sulfonamidoethanol	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	101	98.6
N-Methyl perfluorooctane sulfonamidoacetic acid	µg/L	0.020	<0.020	<0.020 | <0.020 | [NA]	<0.020 | <0.020 | [NA]	107	101
N-Ethyl perfluorooctane sulfonamidoacetic acid	µg/L	0.020	<0.020	<0.020 | <0.020 | [NA]	<0.020 | <0.020 | [NA]	98.8	93.4
Surrogate 13C8 PFOS	%		*97.1*	*98.0 | 100*	*97.5 | 95.8*	*102*	*98.5*
Surrogate 13C2 PFOA	%		*103*	*104 | 104*	*102 | 102*	*102*	*101*
Extraction Internal Standard 13C3 PFBS	%		*103*	*92.2 | 87.3 | 5.53*	*105 | 102 | 3.15*	[NA]	[NA]
Extraction Internal Standard 18O2 PFHxS	%		*103*	*93.4 | 89.8 | 3.94*	*100 | 104 | 3.59*	[NA]	[NA]
Extraction Internal Standard 13C4 PFOS	%		*106*	*95.9 | 92.4 | 3.71*	*103 | 103 | 0.475*	[NA]	[NA]
Extraction Internal Standard 13C4 PFBA	%		*107*	*## | ## | [NA] [2]*	*106 | 105 | 0.522*	[NA]	*##[2]*
Extraction Internal Standard 13C3 PFPeA	%		*106*	*47.1 | 43.6 | 7.59 [2]*	*105 | 102 | 2.33*	[NA]	[NA]
Extraction Internal Standard 13C2 PFHxA	%		*102*	*60.3 | 60.0 | 0.366*	*108 | 103 | 4.48*	[NA]	[NA]
Extraction Internal Standard 13C4 PFHpA	%		*107*	*65.4 | 63.9 | 2.31*	*102 | 104 | 2.34*	[NA]	[NA]
Extraction Internal Standard 13C4 PFOA	%		*104*	*72.2 | 69.8 | 3.40*	*102 | 102 | 0.167*	[NA]	[NA]
Extraction Internal Standard 13C5 PFNA	%		*106*	*80.3 | 78.0 | 2.92*	*105 | 105 | 0.0763*	[NA]	[NA]
Extraction Internal Standard 13C2 PFDA	%		*103*	*82.7 | 77.3 | 6.77*	*104 | 102 | 1.84*	[NA]	[NA]
Extraction Internal Standard 13C2 PFUnDA	%		*101*	*90.1 | 83.0 | 8.17*	*105 | 101 | 4.11*	[NA]	[NA]
Extraction Internal Standard 13C2 PFDoDA	%		*104*	*86.8 | 81.5 | 6.37*	*108 | 105 | 3.11*	[NA]	[NA]
Extraction Internal Standard 13C2 PFTeDA	%		*86.3*	*76.5 | 68.7 | 10.7*	*95.6 | 90.1 | 5.97*	[NA]	[NA]
Extraction Internal Standard 13C2 4:2FTS	%		*110*	*## | ## | [NA] [2]*	*104 | 106 | 2.20*	[NA]	[NA]
Extraction Internal Standard 13C2 6:2FTS	%		*110*	*23.4 | 23.2 | 0.515 [2]*	*102 | 106 | 3.69*	[NA]	[NA]
Extraction Internal Standard 13C2 8:2FTS	%		*107*	*35.0 | 33.3 | 4.98 [2]*	*108 | 111 | 2.98*	[NA]	[NA]
Extraction Internal Standard 13C8 FOSA	%		*107*	*78.6 | 74.5 | 5.42*	*107 | 106 | 1.71*	[NA]	[NA]
Extraction Internal Standard d3 N MeFOSA	%		*103*	*102 | 98.3 | 3.97*	*103 | 105 | 1.55*	[NA]	[NA]
Extraction Internal Standard d5 N EtFOSA	%		*104*	*99.6 | 93.4 | 6.41*	*106 | 103 | 2.36*	[NA]	[NA]
Extraction Internal Standard d7 N MeFOSE	%		*108*	*94.2 | 90.8 | 3.63*	*98.3 | 102 | 3.17*	[NA]	[NA]
Extraction Internal Standard d9 N EtFOSE	%		*102*	*95.4 | 87.1 | 9.12*	*103 | 101 | 2.50*	[NA]	[NA]
Extraction Internal Standard d3 N MeFOSAA	%		*109*	*62.1 | 58.9 | 5.22*	*107 | 107 | 0.466*	[NA]	[NA]
Extraction Internal Standard d5 N EtFOSAA	%		*111*	*63.2 | 61.5 | 2.68*	*104 | 100 | 3.36*	[NA]	[NA]

Quality Control PFK0894

ORG-029|PFAS Extended List (Water) | Batch BFK2964

Analyte	Units	PQL	Blank	DUP3 BFK2964-DUP3# Samp | QC | RPD %	LCS %	Spike % BFK2964-MS2#
Perfluorobutanesulfonic acid (PFBS)	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	97.3	101
Perfluoropentanesulfonic acid (PFPeS)	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	95.3	102
Perfluorohexanesulfonic acid (PFHxS)	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	96.9	98.2
Perfluoroheptanesulfonic acid (PFHpS)	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	97.1	100
Perfluorooctanesulfonic acid (PFOS)	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	97.8	97.6
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.020	<0.020	<0.020 | <0.020 | [NA]	96.7	101
Perfluorobutanoic acid (PFBA)	µg/L	0.020	<0.020	<0.020 | <0.020 | [NA]	96.1	94.8
Perfluoropentanoic acid (PFPeA)	µg/L	0.020	<0.020	<0.020 | <0.020 | [NA]	95.7	95.8
Perfluorohexanoic acid (PFHxA)	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	97.5	98.9
Perfluoroheptanoic acid (PFHpA)	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	98.8	102
Perfluorooctanoic acid (PFOA)	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	95.1	95.6
Perfluorononanoic acid (PFNA)	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	99.8	102
Perfluorodecanoic acid (PFDA)	µg/L	0.020	<0.020	<0.020 | <0.020 | [NA]	97.5	104
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.020	<0.020	<0.020 | <0.020 | [NA]	99.1	96.2
Perfluorododecanoic acid (PFDoDA)	µg/L	0.050	<0.050	<0.050 | <0.050 | [NA]	107	102
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	91.2	90.0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	94.9	95.1
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	98.8	99.4
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	96.5	102
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.020	<0.020	<0.020 | <0.020 | [NA]	98.5	94.9
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.020	<0.020	<0.020 | <0.020 | [NA]	102	85.8
Perfluorooctane sulfonamide (FOSA)	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	97.7	100
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.050	<0.050	<0.050 | <0.050 | [NA]	101	104
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	96.8	98.4
N-Methyl perfluorooctane sulfonamidoethanol	µg/L	0.050	<0.050	<0.050 | <0.050 | [NA]	105	109
N-Ethyl perfluorooctane sulfonamidoethanol	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	101	102
N-Methyl perfluorooctane sulfonamidoacetic acid	µg/L	0.020	<0.020	<0.020 | <0.020 | [NA]	97.8	101
N-Ethyl perfluorooctane sulfonamidoacetic acid	µg/L	0.020	<0.020	<0.020 | <0.020 | [NA]	99.1	100
Surrogate 13C8 PFOS	%		*101*	*99.7 | 101*	*98.4*	*99.3*
Surrogate 13C2 PFOA	%		*102*	*102 | 104*	*100*	*103*
Extraction Internal Standard 13C3 PFBS	%		*105*	*104 | 102 | 2.12*	[NA]	[NA]
Extraction Internal Standard 18O2 PFHxS	%		*100*	*104 | 106 | 1.94*	[NA]	[NA]
Extraction Internal Standard 13C4 PFOS	%		*99.6*	*104 | 103 | 0.898*	[NA]	[NA]
Extraction Internal Standard 13C4 PFBA	%		*108*	*70.6 | 68.4 | 3.28*	[NA]	[NA]
Extraction Internal Standard 13C3 PFPeA	%		*104*	*102 | 98.9 | 2.80*	[NA]	[NA]
Extraction Internal Standard 13C2 PFHxA	%		*103*	*106 | 104 | 1.78*	[NA]	[NA]
Extraction Internal Standard 13C4 PFHpA	%		*105*	*109 | 109 | 0.0367*	[NA]	[NA]
Extraction Internal Standard 13C4 PFOA	%		*105*	*108 | 102 | 5.34*	[NA]	[NA]
Extraction Internal Standard 13C5 PFNA	%		*101*	*107 | 107 | 0.476*	[NA]	[NA]
Extraction Internal Standard 13C2 PFDA	%		*102*	*110 | 104 | 5.98*	[NA]	[NA]
Extraction Internal Standard 13C2 PFUnDA	%		*107*	*109 | 110 | 1.74*	[NA]	[NA]
Extraction Internal Standard 13C2 PFDoDA	%		*102*	*103 | 98.1 | 4.55*	[NA]	[NA]
Extraction Internal Standard 13C2 PFTeDA	%		*94.7*	*85.9 | 81.5 | 5.32*	[NA]	[NA]
Extraction Internal Standard 13C2 4:2FTS	%		*107*	*97.2 | 99.5 | 2.34*	[NA]	[NA]
Extraction Internal Standard 13C2 6:2FTS	%		*105*	*98.6 | 94.2 | 4.53*	[NA]	[NA]
Extraction Internal Standard 13C2 8:2FTS	%		*112*	*101 | 99.0 | 2.32*	[NA]	[NA]
Extraction Internal Standard 13C8 FOSA	%		*107*	*102 | 101 | 0.766*	[NA]	[NA]
Extraction Internal Standard d3 N MeFOSA	%		*105*	*100 | 98.1 | 1.99*	[NA]	[NA]
Extraction Internal Standard d5 N EtFOSA	%		*105*	*102 | 99.1 | 3.26*	[NA]	[NA]
Extraction Internal Standard d7 N MeFOSE	%		*106*	*102 | 105 | 2.37*	[NA]	[NA]
Extraction Internal Standard d9 N EtFOSE	%		*104*	*99.7 | 100 | 0.780*	[NA]	[NA]
Extraction Internal Standard d3 N MeFOSAA	%		*109*	*100 | 100 | 0.329*	[NA]	[NA]
Extraction Internal Standard d5 N EtFOSAA	%		*106*	*101 | 97.2 | 3.31*	[NA]	[NA]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control PFK0894

QC Comments

Identifier	Description
[1]	Spike recovery is outside routine acceptance criteria (70-130%), this may be due to suspected non-homogeneity and/or matrix interference effects. However, an acceptable recovery was achieved for the LCS.
[2]	For PFAS Extracted Internal Standards denoted with ## or being outside the 50-150% acceptance range, the respective target analyte results may be unaffected, in other circumstances the PQL has been raised to accommodate the outlier(s).
[3]	Duplicate %RPD may be flagged as an outlier to routine laboratory acceptance, however, where one or both results are <10*PQL, the RPD acceptance criteria increases exponentially.
[4]	Unable to perform all QC according to our internal guidelines due to the limited amount of sample(s) available for testing.

Envirolab Services (WA) Pty Ltd trading as MPL Laboratories
ABN 53 140 099 207
16-18 Hayden Court Myaree WA 6154
ph +61 8 9317 2505
lab@mpl.com.au
www.mpl.com.au

Certificate of Analysis PFL0771

Client Details

Client	Katherine Town Council - NT
Contact	Brett Kimpton
Address	PO Box 1071, KATHERINE, NT, 0851

Sample Details

Your Reference	Katherine Town Council - EPL298-01 - Monthly
Number of Samples	9 Water
Date Samples Received	10/12/2024
Date Instructions Received	10/12/2024

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for soils and on an as received basis for other matrices.

Report Details

Date Results Requested by	20/12/2024
Date of Issue	23/12/2024

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Authorisation Details

Results Approved By	Lien Tang, Assistant Operations Manager Lucas Yii, Inorganics Team Leader Michael Mowle, Inorganics Supervisor Varsha Ho Wing, Inorganics and Metals Supervisor
Laboratory Manager	Michael Kubiak

Certificate of Analysis PFL0771

Samples in this Report

Envirolab ID	Sample ID	Depth	Matrix	Date Sampled	Date Received
PFL0771-01	GWA (RN031131)		Water	08/12/2024	10/12/2024
PFL0771-02	GWE (RN022487)	10.08	Water	08/12/2024	10/12/2024
PFL0771-03	GWB01	10.74	Water	08/12/2024	10/12/2024
PFL0771-04	GWB02	10.50	Water	08/12/2024	10/12/2024
PFL0771-05	GWB03	9.93	Water	08/12/2024	10/12/2024
PFL0771-06	GWB04	11.16	Water	08/12/2024	10/12/2024
PFL0771-07	Field Blank		Water	08/12/2024	10/12/2024
PFL0771-08	Duplicate		Water	08/12/2024	10/12/2024
PFL0771-09	Trip Blank		Water	08/12/2024	10/12/2024

Certificate of Analysis PFL0771

Inorganics - Physical Parameters (Water)

Envirolab ID	Units	PQL	PFL0771-01	PFL0771-02	PFL0771-03	PFL0771-04	PFL0771-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			08/12/2024	08/12/2024	08/12/2024	08/12/2024	08/12/2024
Depth				10.08	10.74	10.50	9.93
Total Dissolved Solids	mg/L	5.0	350	280	540	560	760

Envirolab ID	Units	PQL	PFL0771-06	PFL0771-07	PFL0771-08	PFL0771-09
Your Reference			GWB04	Field Blank	Duplicate	Trip Blank
Date Sampled			08/12/2024	08/12/2024	08/12/2024	08/12/2024
Depth			11.16			
Total Dissolved Solids	mg/L	5.0	570	<5.0	350	<5.0

Inorganics - Ionic Balance and Indexes (Water)

Envirolab ID	Units	PQL	PFL0771-01	PFL0771-02	PFL0771-03	PFL0771-04	PFL0771-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			08/12/2024	08/12/2024	08/12/2024	08/12/2024	08/12/2024
Depth				10.08	10.74	10.50	9.93
Bicarbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	350	230	410	440	530
Carbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Hydroxide OH- as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Total Alkalinity as CaCO3	mg/L as CaCO3	5.0	350	230	410	440	530
Chloride	mg/L	1.0	4.5	11	41	27	7.5
Sulfate	mg/L	1.0	4.1	7.9	15	33	170
Calcium	mg/L	0.50	71	29	81	95	120
Magnesium	mg/L	0.50	33	32	44	57	84
Potassium	mg/L	0.50	4.3	7.8	12	5.7	6.8
Sodium	mg/L	0.50	5.7	15	26	15	27
Hardness (calc) equivalent CaCO3	mg/L	3.0	320	200	380	470	640
Ionic Balance	%		-3.4	-0.90	-1.8	-0.28	-1.3
Total Anions	mg/L	7.0	350	250	460	500	710
Anions as meq	meq/L	0.59	5.9	4.2	8.1	8.7	13
Total Cations	mg/L	2.0	110	84	160	170	230
Cations as meq	meq/L	0.10	6.7	4.9	9.1	10	14

Envirolab ID	Units	PQL	PFL0771-06	PFL0771-07	PFL0771-08	PFL0771-09
Your Reference			GWB04	Field Blank	Duplicate	Trip Blank
Date Sampled			08/12/2024	08/12/2024	08/12/2024	08/12/2024
Depth			11.16			
Bicarbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	490	<5.0	310	<5.0
Carbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0	<5.0
Hydroxide OH- as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0	<5.0
Total Alkalinity as CaCO3	mg/L as CaCO3	5.0	490	<5.0	310	<5.0
Chloride	mg/L	1.0	5.9	<1.0	4.4	<1.0
Sulfate	mg/L	1.0	9.4	<1.0	3.8	<1.0
Calcium	mg/L	0.50	79	<0.50	60	<0.50
Magnesium	mg/L	0.50	64	<0.50	33	<0.50
Potassium	mg/L	0.50	8.9	<0.50	4.3	<0.50
Sodium	mg/L	0.50	9.1	<0.50	5.7	<0.50
Hardness (calc) equivalent CaCO3	mg/L	3.0	460	<3.0	290	<3.0
Ionic Balance	%		-1.2	-90 [2]	-1.7	-95 [2]
Total Anions	mg/L	7.0	500	<7.0	310	<7.0
Anions as meq	meq/L	0.59	8.4	<0.59	5.2	<0.59
Total Cations	mg/L	2.0	160	<2.0	100	<2.0
Cations as meq	meq/L	0.10	9.9	<0.10	6.1	<0.10

Certificate of Analysis PFL0771

Inorganics - Carbon, Nitrogen and Sulfur Species (Water)

Envirolab ID	Units	PQL	PFL0771-01	PFL0771-02	PFL0771-03	PFL0771-04	PFL0771-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			08/12/2024	08/12/2024	08/12/2024	08/12/2024	08/12/2024
Depth				10.08	10.74	10.50	9.93
Total Organic Carbon	mg/L	1.0	<1.0	<1.0	2.9	1.4	5.9

Envirolab ID	Units	PQL	PFL0771-06	PFL0771-07	PFL0771-08	PFL0771-09
Your Reference			GWB04	Field Blank	Duplicate	Trip Blank
Date Sampled			08/12/2024	08/12/2024	08/12/2024	08/12/2024
Depth			11.16			
Total Organic Carbon	mg/L	1.0	1.3	<1.0	<1.0	<1.0

Inorganics - Nutrients (Water)

Envirolab ID	Units	PQL	PFL0771-01	PFL0771-02	PFL0771-03	PFL0771-04	PFL0771-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			08/12/2024	08/12/2024	08/12/2024	08/12/2024	08/12/2024
Depth				10.08	10.74	10.50	9.93
Ammonia as N	mg/L	0.0050	0.0075	0.15	2.2	0.0078	0.017
Free Ammonia (unionised) as N by calculation*	mg/L	0.0070	<0.0070	0.018	0.24	<0.0070	<0.0070
Ammonium (NH4+) as N by calculation	mg/L	0.0070	0.0075	0.14	2.0	0.0078	0.017

Envirolab ID	Units	PQL	PFL0771-06	PFL0771-07	PFL0771-08	PFL0771-09
Your Reference			GWB04	Field Blank	Duplicate	Trip Blank
Date Sampled			08/12/2024	08/12/2024	08/12/2024	08/12/2024
Depth			11.16			
Ammonia as N	mg/L	0.0050	0.0076	<0.0050	0.0069	<0.0050
Free Ammonia (unionised) as N by calculation*	mg/L	0.0070	<0.0070	<0.0070	<0.0070	<0.0070
Ammonium (NH4+) as N by calculation	mg/L	0.0070	0.0076	<0.0070	<0.0070	<0.0070

Certificate of Analysis PFL0771

Inorganics - Common Wastewater Parameters (Water)

Envirolab ID	Units	PQL	PFL0771-01	PFL0771-02	PFL0771-03	PFL0771-04	PFL0771-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			08/12/2024	08/12/2024	08/12/2024	08/12/2024	08/12/2024
Depth				10.08	10.74	10.50	9.93
BOD	mg/L	5.0	7.6	7.9	13	9.4	<5.0
COD	mg O2/L	20	<20	<20	<20	<20	140

Envirolab ID	Units	PQL	PFL0771-06	PFL0771-07	PFL0771-08	PFL0771-09
Your Reference			GWB04	Field Blank	Duplicate	Trip Blank
Date Sampled			08/12/2024	08/12/2024	08/12/2024	08/12/2024
Depth			11.16			
BOD	mg/L	5.0	15	6.8	8.8	7.0
COD	mg O2/L	20	<20	<20	<20	<20

Certificate of Analysis PFL0771

General - Field Data (Water)

Envirolab ID	Units	PQL	PFL0771-01	PFL0771-02	PFL0771-03	PFL0771-04	PFL0771-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			08/12/2024	08/12/2024	08/12/2024	08/12/2024	08/12/2024
Depth				10.08	10.74	10.50	9.93
pH (Client Supplied)*	pH units		8.00	8.00	8.00	8.00	8.40
Temperature (Client Supplied)*	o C		31.0	37.0	36.0	39.0	39.0

Envirolab ID	Units	PQL	PFL0771-06
Your Reference			GWB04
Date Sampled			08/12/2024
Depth			11.16
pH (Client Supplied)*	pH units		7.00
Temperature (Client Supplied)*	o C		37.0

Result Comments

Identifier	Description
[2]	Ion Balance indicative only for samples with low Electrical Conductivity.

Method Summary

Method ID	Methodology Summary
Calc	Calculation
Calc - ION	Calculation
Field Data	Field Data supplied by client
INORG-006	Alkalinity - determined titrimetrically based on APHA latest edition 2320-B. Solids reported from a 1:5 water extract unless otherwise specified. Total Carbon Dioxide - determined by calculation in accordance with APHA latest edition,4500-CO2 D.
INORG-018	Total Dissolved Solids - determined gravimetrically. The solids are dried at 180±10°C. NOTE: Where the EC of the sample is <100µS/cm, the TDS will typically be below 70mg/L (as the sample is very likely to be at least drinking water quality). Therefore to ensure data quality for TDS, the TDS is typically calculated as per the equation: TDS = EC*0.6
INORG-040	The concentrations of the major ions (mg/L) are converted to milliequivalents and summed. The ionic balance should be within +/- 15% i.e. total anions = total cations +/-15%.
INORG-057	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.
INORG-057_CALC	Calculation of Ammonium as N. Assumes all Ammonia is present as Ammonium unless samplpe pH and temperature provided.
INORG-067	Samples are digested in acid with a known excess of potassium dichromate then the colour change is determined by discrete analyser or UV-VIS in accordance with APHA latest edition 5220 D.
INORG-079	Carbon forms (inorganic, organic, total) determined using a TOC/NDIR analyser via combustion. Dissolved aqueous\forms require filtering prior to determination.
INORG-081	Anions determined by Ion Chromatography. Waters samples are filtered on receipt prior to analysis. Solids are analysed from a water extract. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
INORG-091	BOD and/or cBOD - Analysed in accordance with APHA latest edition 5210 D.
METALS-020	Determination of various metals by ICP-OES.

Result Definitions

Identifier	Description
NR	Not reported
NEPM	National Environment Protection Measure
NS	Not specified
LCS	Laboratory Control Sample
RPD	Relative Percent Difference
>	Greater than
<	Less than
PQL	Practical Quantitation Limit
INS	Insufficient sample for this test
NA	Test not required
NT	Not tested
DOL	Samples rejected due to particulate overload (air filters only)
RFD	Samples rejected due to filter damage (air filters only)
RUD	Samples rejected due to uneven deposition (air filters only)
##	Indicates a laboratory acceptance criteria outlier, for further details, see Result Comments and/or QC Comments

Quality Control Definitions

Blank

This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, and is determined by processing solvents and reagents in exactly the same manner as for samples.

Surrogate Spike

Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

LCS (Laboratory Control Sample)

This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Matrix Spike

A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

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.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

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 QAQC tables for details (available on request); <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; 60-140% for organics (+/-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 typically insufficient in order to satisfy laboratory QA/QC protocols.

Miscellaneous Information

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. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

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 or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volume measurements are not covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary PFL0771

Client Details

Client	Katherine Town Council - NT
Your Reference	Katherine Town Council - EPL298-01 - Monthly
Date Issued	23/12/2024

Recommended Holding Time Compliance

No recommended holding time exceedances

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	Yes	No Outliers
Duplicates	Yes	No Outliers
Matrix Spike	Yes	No Outliers
Surrogates / Extracted Internal Standards	Yes	No Outliers
QC Frequency	No	QC Frequency Outliers Exist - See detailed list below

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Data Quality Assessment Summary PFL0771

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
TDS | Water	1-9	08/12/2024	13/12/2024	13/12/2024	Yes
Alkalinity Suite | Water	1-9	08/12/2024	12/12/2024	12/12/2024	Yes
Chloride | Water	1-9	08/12/2024	12/12/2024	13/12/2024	Yes
Dissolved Cations | Water	1-9	08/12/2024	16/12/2024	16/12/2024	Yes
Ion Balance | Water	1-9	08/12/2024	16/12/2024	16/12/2024	Yes
	1-9	08/12/2024	16/12/2024	20/12/2024	Yes
Sulfate | Water	1-9	08/12/2024	12/12/2024	13/12/2024	Yes
Total Organic Carbon | Water	1-9	08/12/2024	13/12/2024	16/12/2024	Yes
Nitrogen - Ammonia | Water	1-9	08/12/2024	16/12/2024	16/12/2024	Yes
Nitrogen - Ammonium by calc | Water	1-9	08/12/2024	16/12/2024	20/12/2024	Yes
BOD | Water	1-9	08/12/2024	16/12/2024	23/12/2024	Yes
COD | Water	1-9	08/12/2024	12/12/2024	17/12/2024	Yes

Outliers: QC Frequency

INORG-091|Inorganics - Common Wastewater Parameters (Water)| Batch BFL3028

Analysis	QC Type	Expected	Reported
BOD	Duplicate	2	0

Quality Control PFL0771

INORG-018 | Inorganics - Physical Parameters (Water) | Batch BFL2402

Analyte	Units	PQL	Blank	DUP1 BFL2402-DUP1# Samp | QC | RPD %	DUP2 BFL2402-DUP2# Samp | QC | RPD %	LCS %
Total Dissolved Solids	mg/L	5.0	<5.0	5510 | 5280 | 4.26	974 | 987 | 1.33	103

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-018 | Inorganics - Physical Parameters (Water) | Batch BFL2412

Analyte	Units	PQL	Blank	DUP1 BFL2412-DUP1# Samp | QC | RPD %	DUP2 BFL2412-DUP2# Samp | QC | RPD %	LCS %
Total Dissolved Solids	mg/L	5.0	<5.0	565 | 564 | 0.177	934 | 927 | 0.752	103

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-006 | Inorganics - Ionic Balance and Indexes (Water) | Batch BFL2111

Analyte	Units	PQL	Blank	DUP1 PFL0771-01 Samp | QC | RPD %	DUP2 PFL0771-06 Samp | QC | RPD %	LCS %
Bicarbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	346 | 324 | 6.65	487 | 500 | 2.64	[NA]
Carbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0 | <5.0 | [NA]	<5.0 | <5.0 | [NA]	[NA]
Hydroxide OH- as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0 | <5.0 | [NA]	<5.0 | <5.0 | [NA]	[NA]
Total Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	346 | 324 | 6.65	487 | 500 | 2.64	96.1

INORG-081 | Inorganics - Ionic Balance and Indexes (Water) | Batch BFL2280

Analyte	Units	PQL	Blank	DUP1 BFL2280-DUP1# Samp | QC | RPD %	DUP2 PFL0771-01 Samp | QC | RPD %	LCS %	Spike % BFL2280-MS1#
Chloride	mg/L	1.0	<1.0	82.2 | 83.1 | 1.06	4.52 | 4.47 | [NA]	90.1	101
Sulfate	mg/L	1.0	<1.0	7.27 | 7.34 | 0.937	4.06 | 4.05 | [NA]	87.0	109

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-020 | Inorganics - Ionic Balance and Indexes (Water) | Batch BFL2817

Analyte	Units	PQL	Blank	DUP1 BFL2817-DUP1# Samp | QC | RPD %	DUP2 BFL2817-DUP2# Samp | QC | RPD %	LCS %	Spike % BFL2817-MS1#
Calcium	mg/L	0.50	<0.50	16.1 | 16.0 | 0.392	<0.50 | <0.50 | [NA]	102	103
Magnesium	mg/L	0.50	<0.50	2.41 | 2.38 | [NA]	<0.50 | <0.50 | [NA]	105	99.3
Potassium	mg/L	0.50	<0.50	1.47 | 1.47 | [NA]	<0.50 | <0.50 | [NA]	103	99.4
Sodium	mg/L	0.50	<0.50	35.2 | 34.4 | 2.17	4.69 | 4.89 | 4.11	102	93.7
Hardness (calc) equivalent CaCO3	mg/L	3.0	<3.0	50.1 | 49.8 | 0.524	<3.0 | <3.0 | [NA]	[NA]	[NA]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-020 | Inorganics - Ionic Balance and Indexes (Water) | Batch BFL2818

Analyte	Units	PQL	Blank	DUP1 PFL0771-09 Samp | QC | RPD %	DUP2 BFL2818-DUP2# Samp | QC | RPD %	LCS %	Spike % BFL2818-MS1#
Calcium	mg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	1.85 | 1.49 | [NA] [1]	104	105
Magnesium	mg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	3.23 | 2.55 | [NA] [1]	106	107
Potassium	mg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	55.9 | 55.8 | 0.143	102	106
Sodium	mg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	6040 | 5960 | 1.23	103	105
Hardness (calc) equivalent CaCO3	mg/L	3.0	<3.0	<3.0 | <3.0 | [NA]	17.9 | 14.2 | [NA] [1]	[NA]	[NA]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control PFL0771

INORG-079 | Inorganics - Carbon, Nitrogen and Sulfur Species (Water) | Batch BFL2392

Analyte	Units	PQL	Blank	DUP1 PFL0771-01 Samp | QC | RPD %	DUP2 BFL2392-DUP2# Samp | QC | RPD %	LCS %	Spike % PFL0771-02
Total Organic Carbon	mg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	1.69 | 1.43 | [NA]	101	105

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-057 | Inorganics - Nutrients (Water) | Batch BFL2668

Analyte	Units	PQL	Blank	DUP1 BFL2668-DUP1# Samp | QC | RPD %	DUP2 BFL2668-DUP2# Samp | QC | RPD %	LCS %	Spike % BFL2668-MS1#
Ammonia as N	mg/L	0.0050	<0.0050	0.00714 | 0.00780 | [NA]	<0.0050 | <0.0050 | [NA]	96.5	95.6

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-067 | Inorganics - Common Wastewater Parameters (Water) | Batch BFL2328

Analyte	Units	PQL	Blank	DUP1 PFL0771-01 Samp | QC | RPD %	DUP2 BFL2328-DUP2# Samp | QC | RPD %	LCS %
COD	mg O2/L	20	<20	<20 | <20 | [NA]	<20 | <20 | [NA]	98.5

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-091 | Inorganics - Common Wastewater Parameters (Water) | Batch BFL3028

Analyte	Units	PQL	Blank	LCS %
BOD	mg/L	5.0	<5.0	100

QC Comments

Identifier	Description
[1]	Duplicate %RPD may be flagged as an outlier to routine laboratory acceptance, however, where one or both results are <10*PQL, the RPD acceptance criteria increases exponentially.

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

CERTIFICATE OF ANALYSIS 371540

Client Details

Client	Katherine Town Council - NT
Attention	Brett Kimpton
Address	PO Box 1071, KATHERINE, NT, 0851

Sample Details

Your Reference	**Katherine Town Council - EPL298 - Quarterly**
Number of Samples	11 Water
Date samples received	29/01/2025
Date completed instructions received	29/01/2025

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

Date results requested by	05/02/2025
Date of Issue	05/02/2025

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Results Approved By
Amanda Chui, LC/Air Toxics Supervisor
Diego Bigolin, Inorganics Supervisor
Dragana Tomas, Senior Chemist
Giovanni Agosti, Group Technical Manager
Jack Wallis, Senior Chemist
Timothy Toll, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Water						
Our Reference		371540-4	371540-5	371540-6	371540-7	371540-8
Your Reference	UNITS	GWE (RN031131)	GWB01	GWB02	GWB03	GWB04
Date Sampled		27/01/2025	27/01/2025	27/01/2025	27/01/2025	27/01/2025
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	01/02/2025	01/02/2025	01/02/2025	01/02/2025	01/02/2025
Date analysed	-	03/02/2025	03/02/2025	03/02/2025	03/02/2025	03/02/2025
TRH C_6 - C_9	µg/L	<10	<10	<10	<10	<10
TRH C_6 - C_{10}	µg/L	<10	<10	<10	<10	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10	<10	<10	<10
Benzene	µg/L	<1	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2	<2
o-xylene	µg/L	<1	<1	<1	<1	<1
Naphthalene	µg/L	<1	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	107	105	104	107	106
Surrogate Toluene-d8	%	100	100	99	101	100
Surrogate 4-Bromofluorobenzene	%	112	110	108	113	109

vTRH(C6-C10)/BTEXN in Water				
Our Reference		371540-9	371540-10	371540-11
Your Reference	UNITS	Field Blank	Duplicate	Trip Blank
Date Sampled		27/01/2025	27/01/2025	27/01/2025
Type of sample		Water	Water	Water
Date extracted	-	01/02/2025	01/02/2025	03/02/2025
Date analysed	-	03/02/2025	03/02/2025	04/02/2025
TRH C_6 - C_9	µg/L	<10	<10	<10
TRH C_6 - C_{10}	µg/L	<10	<10	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10	<10
Benzene	µg/L	<1	<1	<1
Toluene	µg/L	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2
o-xylene	µg/L	<1	<1	<1
Naphthalene	µg/L	<1	<1	<1
Surrogate Dibromofluoromethane	%	105	107	108
Surrogate Toluene-d8	%	99	100	100
Surrogate 4-Bromofluorobenzene	%	109	115	114

svTRH (C10-C40) in Water						
Our Reference		371540-4	371540-5	371540-6	371540-7	371540-8
Your Reference	UNITS	GWE (RN031131)	GWB01	GWB02	GWB03	GWB04
Date Sampled		27/01/2025	27/01/2025	27/01/2025	27/01/2025	27/01/2025
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	31/01/2025	31/01/2025	31/01/2025	31/01/2025	31/01/2025
Date analysed	-	01/02/2025	01/02/2025	01/02/2025	01/02/2025	01/02/2025
TRH C_{10} - C_{14}	µg/L	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	µg/L	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	µg/L	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16}	µg/L	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50	<50	<50	<50	<50
TRH >C_{16} - C_{34}	µg/L	<100	<100	<100	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	98	93	94	93	104

svTRH (C10-C40) in Water				
Our Reference		371540-9	371540-10	371540-11
Your Reference	UNITS	Field Blank	Duplicate	Trip Blank
Date Sampled		27/01/2025	27/01/2025	27/01/2025
Type of sample		Water	Water	Water
Date extracted	-	31/01/2025	31/01/2025	31/01/2025
Date analysed	-	01/02/2025	01/02/2025	01/02/2025
TRH C_{10} - C_{14}	µg/L	<50	<50	<50
TRH C_{15} - C_{28}	µg/L	<100	<100	<100
TRH C_{29} - C_{36}	µg/L	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50	<50
TRH >C_{10} - C_{16}	µg/L	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50	<50	<50
TRH >C_{16} - C_{34}	µg/L	<100	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50	<50
Surrogate o-Terphenyl	%	83	99	99

PAHs in Water						
Our Reference		371540-4	371540-5	371540-6	371540-7	371540-8
Your Reference	UNITS	GWE (RN031131)	GWB01	GWB02	GWB03	GWB04
Date Sampled		27/01/2025	27/01/2025	27/01/2025	27/01/2025	27/01/2025
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	31/01/2025	31/01/2025	31/01/2025	31/01/2025	31/01/2025
Date analysed	-	03/02/2025	03/02/2025	03/02/2025	03/02/2025	03/02/2025
Naphthalene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d14	%	91	90	89	75	101

PAHs in Water				
Our Reference	UNITS	371540-9	371540-10	371540-11
Your Reference		Field Blank	Duplicate	Trip Blank
Date Sampled		27/01/2025	27/01/2025	27/01/2025
Type of sample		Water	Water	Water
Date extracted	-	31/01/2025	31/01/2025	31/01/2025
Date analysed	-	03/02/2025	03/02/2025	03/02/2025
Naphthalene	µg/L	<0.1	<0.1	<0.1
Acenaphthylene	µg/L	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d14	%	89	101	84

PCBs in Water						
Our Reference		371540-4	371540-5	371540-6	371540-7	371540-8
Your Reference	UNITS	GWE (RN031131)	GWB01	GWB02	GWB03	GWB04
Date Sampled		27/01/2025	27/01/2025	27/01/2025	27/01/2025	27/01/2025
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	31/01/2025	31/01/2025	31/01/2025	31/01/2025	31/01/2025
Date analysed	-	03/02/2025	03/02/2025	03/02/2025	03/02/2025	03/02/2025
Aroclor 1016	µg/L	<2	<2	<2	<2	<2
Aroclor 1221	µg/L	<2	<2	<2	<2	<2
Aroclor 1232	µg/L	<2	<2	<2	<2	<2
Aroclor 1242	µg/L	<2	<2	<2	<2	<2
Aroclor 1248	µg/L	<2	<2	<2	<2	<2
Aroclor 1254	µg/L	<2	<2	<2	<2	<2
Aroclor 1260	µg/L	<2	<2	<2	<2	<2
Surrogate 2-Fluorobiphenyl	%	91	88	88	77	97

PCBs in Water				
Our Reference		371540-9	371540-10	371540-11
Your Reference	UNITS	Field Blank	Duplicate	Trip Blank
Date Sampled		27/01/2025	27/01/2025	27/01/2025
Type of sample		Water	Water	Water
Date extracted	-	31/01/2025	31/01/2025	31/01/2025
Date analysed	-	03/02/2025	03/02/2025	03/02/2025
Aroclor 1016	µg/L	<2	<2	<2
Aroclor 1221	µg/L	<2	<2	<2
Aroclor 1232	µg/L	<2	<2	<2
Aroclor 1242	µg/L	<2	<2	<2
Aroclor 1248	µg/L	<2	<2	<2
Aroclor 1254	µg/L	<2	<2	<2
Aroclor 1260	µg/L	<2	<2	<2
Surrogate 2-Fluorobiphenyl	%	87	97	83

PFAS in Waters Extended						
Our Reference		371540-4	371540-5	371540-6	371540-7	371540-8
Your Reference	UNITS	GWE (RN031131)	GWB01	GWB02	GWB03	GWB04
Date Sampled		27/01/2025	27/01/2025	27/01/2025	27/01/2025	27/01/2025
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	03/02/2025	03/02/2025	03/02/2025	03/02/2025	03/02/2025
Date analysed	-	03/02/2025	03/02/2025	03/02/2025	03/02/2025	03/02/2025
Perfluorobutanesulfonic acid	µg/L	0.02	0.1	0.11	<0.01	<0.01
Perfluoropentanesulfonic acid	µg/L	<0.01	0.06	0.06	<0.01	<0.01
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.09	0.43	0.34	<0.01	<0.01
Perfluoroheptanesulfonic acid	µg/L	<0.01	0.03	0.04	<0.01	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	0.22	1.0	0.55	<0.01	<0.01
Perfluorodecanesulfonic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorobutanoic acid	µg/L	<0.02	0.05	0.08	<0.02	<0.02
Perfluoropentanoic acid	µg/L	<0.02	0.05	0.09	<0.02	<0.02
Perfluorohexanoic acid	µg/L	0.01	0.07	0.17	<0.01	<0.01
Perfluoroheptanoic acid	µg/L	<0.01	0.03	0.06	<0.01	<0.01
Perfluorooctanoic acid PFOA	µg/L	0.03	0.09	0.13	<0.01	<0.01
Perfluorononanoic acid	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecanoic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorotridecanoic acid	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorotetradecanoic acid	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
4:2 FTS	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
6:2 FTS	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
8:2 FTS	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
10:2 FTS	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
N-Methyl perfluorooctane sulfonamide	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctanesulfon amide	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
N-Me perfluorooctanesulfonamid oethanol	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Et perfluorooctanesulfonamid oethanol	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
MePerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
EtPerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Surrogate $^{13}C_8$ *PFOS*	%	106	104	102	107	102
Surrogate $^{13}C_2$ *PFOA*	%	97	93	93	99	96
Extracted ISTD $^{13}C_3$ *PFBS*	%	95	92	91	93	96
Extracted ISTD $^{18}O_2$ *PFHxS*	%	106	112	109	110	112
Extracted ISTD $^{13}C_4$ *PFOS*	%	109	109	109	112	113
Extracted ISTD $^{13}C_4$ *PFBA*	%	107	106	107	111	110

PFAS in Waters Extended						
Our Reference		371540-4	371540-5	371540-6	371540-7	371540-8
Your Reference	UNITS	GWE (RN031131)	GWB01	GWB02	GWB03	GWB04
Date Sampled		27/01/2025	27/01/2025	27/01/2025	27/01/2025	27/01/2025
Type of sample		Water	Water	Water	Water	Water
Extracted ISTD $^{13}C_3$ *PFPeA*	%	94	96	93	97	97
Extracted ISTD $^{13}C_2$ *PFHxA*	%	104	106	105	104	108
Extracted ISTD $^{13}C_4$ *PFHpA*	%	105	103	106	105	109
Extracted ISTD $^{13}C_4$ *PFOA*	%	110	116	117	113	117
Extracted ISTD $^{13}C_5$ *PFNA*	%	119	123	122	127	124
Extracted ISTD $^{13}C_2$ *PFDA*	%	110	115	114	116	113
Extracted ISTD $^{13}C_2$ *PFUnDA*	%	110	119	114	117	116
Extracted ISTD $^{13}C_2$ *PFDoDA*	%	113	115	115	118	122
Extracted ISTD $^{13}C_2$ *PFTeDA*	%	88	95	86	95	96
Extracted ISTD $^{13}C_2$ *4:2FTS*	%	100	105	108	110	112
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	114	115	119	118	117
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	124	121	123	125	122
Extracted ISTD $^{13}C_8$ *FOSA*	%	105	110	107	110	111
Extracted ISTD d_3 *N MeFOSA*	%	101	106	103	106	109
Extracted ISTD d_5 *N EtFOSA*	%	100	99	104	102	108
Extracted ISTD d_7 *N MeFOSE*	%	130	129	127	131	130
Extracted ISTD d_9 *N EtFOSE*	%	135	138	140	138	147
Extracted ISTD d_3 *N MeFOSAA*	%	115	125	119	121	120
Extracted ISTD d_5 *N EtFOSAA*	%	115	117	115	114	114
Total Positive PFHxS & PFOS	µg/L	0.31	1.4	0.90	<0.01	<0.01
Total Positive PFOA & PFOS	µg/L	0.25	1.1	0.68	<0.01	<0.01
Total Positive PFAS	µg/L	0.37	1.9	1.6	<0.01	<0.01

PFAS in Waters Extended				
Our Reference	UNITS	371540-9	371540-10	371540-11
Your Reference		Field Blank	Duplicate	Trip Blank
Date Sampled		27/01/2025	27/01/2025	27/01/2025
Type of sample		Water	Water	Water
Date prepared	-	03/02/2025	03/02/2025	05/02/2025
Date analysed	-	03/02/2025	03/02/2025	05/02/2025
Perfluorobutanesulfonic acid	µg/L	<0.01	<0.01	<0.01
Perfluoropentanesulfonic acid	µg/L	<0.01	<0.01	<0.01
Perfluorohexanesulfonic acid - PFHxS	µg/L	<0.01	<0.01	<0.01
Perfluoroheptanesulfonic acid	µg/L	<0.01	<0.01	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	<0.01	<0.01	<0.01
Perfluorodecanesulfonic acid	µg/L	<0.02	<0.02	<0.02
Perfluorobutanoic acid	µg/L	<0.02	<0.02	<0.02
Perfluoropentanoic acid	µg/L	<0.02	<0.02	<0.02
Perfluorohexanoic acid	µg/L	<0.01	<0.01	<0.01
Perfluoroheptanoic acid	µg/L	<0.01	<0.01	<0.01
Perfluorooctanoic acid PFOA	µg/L	<0.01	<0.01	<0.01
Perfluorononanoic acid	µg/L	<0.01	<0.01	<0.01
Perfluorodecanoic acid	µg/L	<0.02	<0.02	<0.02
Perfluoroundecanoic acid	µg/L	<0.02	<0.02	<0.02
Perfluorododecanoic acid	µg/L	<0.05	<0.05	<0.05
Perfluorotridecanoic acid	µg/L	<0.1	<0.1	<0.1
Perfluorotetradecanoic acid	µg/L	<0.5	<0.5	<0.5
4:2 FTS	µg/L	<0.01	<0.01	<0.01
6:2 FTS	µg/L	<0.01	<0.01	<0.01
8:2 FTS	µg/L	<0.02	<0.02	<0.02
10:2 FTS	µg/L	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide	µg/L	<0.1	<0.1	<0.1
N-Methyl perfluorooctane sulfonamide	µg/L	<0.05	<0.05	<0.05
N-Ethyl perfluorooctanesulfon amide	µg/L	<0.1	<0.1	<0.1
N-Me perfluorooctanesulfonamid oethanol	µg/L	<0.05	<0.05	<0.05
N-Et perfluorooctanesulfonamid oethanol	µg/L	<0.5	<0.5	<0.5
MePerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02	<0.02
EtPerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02	<0.02
Surrogate $^{13}C_8$ *PFOS*	%	104	103	102
Surrogate $^{13}C_2$ *PFOA*	%	93	97	101
Extracted ISTD $^{13}C_3$ *PFBS*	%	88	89	102
Extracted ISTD $^{18}O_2$ *PFHxS*	%	108	108	101
Extracted ISTD $^{13}C_4$ *PFOS*	%	109	111	95
Extracted ISTD $^{13}C_4$ *PFBA*	%	111	105	103

PFAS in Waters Extended				
Our Reference	UNITS	371540-9	371540-10	371540-11
Your Reference		Field Blank	Duplicate	Trip Blank
Date Sampled		27/01/2025	27/01/2025	27/01/2025
Type of sample		Water	Water	Water
Extracted ISTD $^{13}C_3$ *PFPeA*	%	94	95	101
Extracted ISTD $^{13}C_2$ *PFHxA*	%	101	107	103
Extracted ISTD $^{13}C_4$ *PFHpA*	%	104	105	98
Extracted ISTD $^{13}C_4$ *PFOA*	%	114	117	101
Extracted ISTD $^{13}C_5$ *PFNA*	%	119	127	102
Extracted ISTD $^{13}C_2$ *PFDA*	%	115	114	100
Extracted ISTD $^{13}C_2$ *PFUnDA*	%	115	119	108
Extracted ISTD $^{13}C_2$ *PFDoDA*	%	116	117	114
Extracted ISTD $^{13}C_2$ *PFTeDA*	%	88	92	109
Extracted ISTD $^{13}C_2$ *4:2FTS*	%	110	106	82
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	119	120	83
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	119	130	92
Extracted ISTD $^{13}C_8$ *FOSA*	%	107	107	111
Extracted ISTD d_3 *N MeFOSA*	%	105	105	102
Extracted ISTD d_5 *N EtFOSA*	%	102	104	104
Extracted ISTD d_7 *N MeFOSE*	%	130	131	106
Extracted ISTD d_9 *N EtFOSE*	%	142	147	100
Extracted ISTD d_3 *N MeFOSAA*	%	113	119	102
Extracted ISTD d_5 *N EtFOSAA*	%	114	116	105
Total Positive PFHxS & PFOS	µg/L	<0.01	<0.01	<0.01
Total Positive PFOA & PFOS	µg/L	<0.01	<0.01	<0.01
Total Positive PFAS	µg/L	<0.01	<0.01	<0.01

Volatile Fatty Acids in Water						
Our Reference		371540-1	371540-2	371540-3	371540-4	371540-5
Your Reference	UNITS	SWB	SWC	GWA (RN031131)	GWE (RN031131)	GWB01
Date Sampled		27/01/2025	27/01/2025	27/01/2025	27/01/2025	27/01/2025
Type of sample		Water	Water	Water	Water	Water
Date Extracted	-	31/01/2025	31/01/2025	31/01/2025	31/01/2025	31/01/2025
Date analysed	-	31/01/2025	31/01/2025	31/01/2025	31/01/2025	31/01/2025
Volatile Fatty Acids*	mg/L	95	17	100	12	<5

Volatile Fatty Acids in Water						
Our Reference		371540-6	371540-7	371540-8	371540-9	371540-10
Your Reference	UNITS	GWB02	GWB03	GWB04	Field Blank	Duplicate
Date Sampled		27/01/2025	27/01/2025	27/01/2025	27/01/2025	27/01/2025
Type of sample		Water	Water	Water	Water	Water
Date Extracted	-	31/01/2025	31/01/2025	31/01/2025	31/01/2025	31/01/2025
Date analysed	-	31/01/2025	31/01/2025	31/01/2025	31/01/2025	31/01/2025
Volatile Fatty Acids*	mg/L	180	240	150	11	53

Volatile Fatty Acids in Water		
Our Reference		371540-11
Your Reference	UNITS	Trip Blank
Date Sampled		27/01/2025
Type of sample		Water
Date Extracted	-	31/01/2025
Date analysed	-	31/01/2025
Volatile Fatty Acids*	mg/L	6.4

All metals in water-dissolved						
Our Reference		371540-1	371540-2	371540-3	371540-4	371540-5
Your Reference	UNITS	SWB	SWC	GWA (RN031131)	GWE (RN031131)	GWB01
Date Sampled		27/01/2025	27/01/2025	27/01/2025	27/01/2025	27/01/2025
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	03/02/2025	03/02/2025	03/02/2025	03/02/2025	03/02/2025
Date analysed	-	03/02/2025	03/02/2025	03/02/2025	03/02/2025	03/02/2025
Aluminium-Dissolved	µg/L	<10	<10	<10	<10	<10
Cadmium-Dissolved	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Copper-Dissolved	µg/L	1	1	<1	2	5
Iron-Dissolved	µg/L	<10	<10	<10	<10	<10
Lead-Dissolved	µg/L	<1	<1	<1	<1	<1
Manganese-Dissolved	µg/L	6	<5	<5	20	19
Nickel-Dissolved	µg/L	<1	<1	<1	1	2
Zinc-Dissolved	µg/L	3	3	5	7	5
Selenium-Dissolved	µg/L	<1	<1	<1	<1	<1
Chromium-Dissolved	µg/L	<1	<1	<1	<1	<1

All metals in water-dissolved						
Our Reference		371540-6	371540-7	371540-8	371540-9	371540-10
Your Reference	UNITS	GWB02	GWB03	GWB04	Field Blank	Duplicate
Date Sampled		27/01/2025	27/01/2025	27/01/2025	27/01/2025	27/01/2025
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	03/02/2025	03/02/2025	03/02/2025	03/02/2025	03/02/2025
Date analysed	-	03/02/2025	03/02/2025	03/02/2025	03/02/2025	03/02/2025
Aluminium-Dissolved	µg/L	<10	<10	<10	<10	<10
Cadmium-Dissolved	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Copper-Dissolved	µg/L	2	2	1	<1	1
Iron-Dissolved	µg/L	<10	<10	<10	<10	<10
Lead-Dissolved	µg/L	<1	<1	1	<1	<1
Manganese-Dissolved	µg/L	9	<5	<5	<5	<5
Nickel-Dissolved	µg/L	2	2	<1	<1	<1
Zinc-Dissolved	µg/L	20	24	50	<1	2
Selenium-Dissolved	µg/L	<1	1	<1	<1	<1
Chromium-Dissolved	µg/L	<1	<1	<1	<1	<1

All metals in water-dissolved		
Our Reference		371540-11
Your Reference	UNITS	Trip Blank
Date Sampled		27/01/2025
Type of sample		Water
Date prepared	-	03/02/2025
Date analysed	-	03/02/2025
Aluminium-Dissolved	µg/L	<10
Cadmium-Dissolved	µg/L	<0.1
Copper-Dissolved	µg/L	<1
Iron-Dissolved	µg/L	<10
Lead-Dissolved	µg/L	<1
Manganese-Dissolved	µg/L	<5
Nickel-Dissolved	µg/L	<1
Zinc-Dissolved	µg/L	<1
Selenium-Dissolved	µg/L	<1
Chromium-Dissolved	µg/L	<1

All metals in water - total						
Our Reference		371540-1	371540-2	371540-3	371540-4	371540-5
Your Reference	UNITS	SWB	SWC	GWA (RN031131)	GWE (RN031131)	GWB01
Date Sampled		27/01/2025	27/01/2025	27/01/2025	27/01/2025	27/01/2025
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	31/01/2025	31/01/2025	31/01/2025	31/01/2025	31/01/2025
Date analysed	-	31/01/2025	31/01/2025	31/01/2025	31/01/2025	31/01/2025
Aluminium-Total	µg/L	110	120	<10	30	50
Cadmium-Total	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Copper-Total	µg/L	2	2	7	2	5
Iron-Total	µg/L	140	140	2,500	1,200	100
Lead-Total	µg/L	<1	<1	1	<1	<1
Manganese-Total	µg/L	28	13	<5	22	22
Nickel-Total	µg/L	<1	1	<1	1	2
Zinc-Total	µg/L	5	4	26	8	6
Selenium-Total	µg/L	<1	<1	<1	<1	<1
Chromium-Total	µg/L	<1	<1	<1	<1	<1

All metals in water - total						
Our Reference		371540-6	371540-7	371540-8	371540-9	371540-10
Your Reference	UNITS	GWB02	GWB03	GWB04	Field Blank	Duplicate
Date Sampled		27/01/2025	27/01/2025	27/01/2025	27/01/2025	27/01/2025
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	31/01/2025	31/01/2025	31/01/2025	31/01/2025	31/01/2025
Date analysed	-	31/01/2025	31/01/2025	31/01/2025	31/01/2025	31/01/2025
Aluminium-Total	µg/L	210	90	10	<10	180
Cadmium-Total	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Copper-Total	µg/L	3	3	2	<1	1
Iron-Total	µg/L	430	70	20	<10	150
Lead-Total	µg/L	2	<1	2	<1	<1
Manganese-Total	µg/L	31	5	<5	<5	12
Nickel-Total	µg/L	3	2	<1	<1	<1
Zinc-Total	µg/L	7	36	49	<1	3
Selenium-Total	µg/L	<1	1	<1	<1	<1
Chromium-Total	µg/L	<1	<1	<1	<1	<1

All metals in water - total		
Our Reference		371540-11
Your Reference	UNITS	Trip Blank
Date Sampled		27/01/2025
Type of sample		Water
Date prepared	-	31/01/2025
Date analysed	-	31/01/2025
Aluminium-Total	µg/L	<10
Cadmium-Total	µg/L	<0.1
Copper-Total	µg/L	<1
Iron-Total	µg/L	<10
Lead-Total	µg/L	<1
Manganese-Total	µg/L	<5
Nickel-Total	µg/L	<1
Zinc-Total	µg/L	<1
Selenium-Total	µg/L	<1
Chromium-Total	µg/L	<1

Ion Balance						
Our Reference		371540-1	371540-2	371540-3	371540-4	371540-5
Your Reference	UNITS	SWB	SWC	GWA (RN031131)	GWE (RN031131)	GWB01
Date Sampled		27/01/2025	27/01/2025	27/01/2025	27/01/2025	27/01/2025
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	29/01/2025	29/01/2025	29/01/2025	29/01/2025	29/01/2025
Date analysed	-	29/01/2025	29/01/2025	29/01/2025	29/01/2025	29/01/2025
Calcium - Dissolved	mg/L	46	45	50	60	85
Potassium - Dissolved	mg/L	7.2	6.9	5.5	8.8	12
Sodium - Dissolved	mg/L	8.1	7.6	5.9	15	24
Magnesium - Dissolved	mg/L	31	30	35	37	44
Hardness (calc) equivalent $CaCO_3$	mg/L	240	240	270	300	400
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	<5	<5	<5	<5	<5
Bicarbonate Alkalinity as $CaCO_3$	mg/L	280	260	290	280	420
Carbonate Alkalinity as $CaCO_3$	mg/L	<5	<5	<5	<5	<5
Total Alkalinity as $CaCO_3$	mg/L	280	260	290	280	420
Sulphate, SO4	mg/L	2	2	7	9	19
Chloride, Cl	mg/L	9	9	9	15	41
Ionic Balance	%	-4.0	-2.0	-4.0	6.0	-4.0

Ion Balance						
Our Reference		371540-6	371540-7	371540-8	371540-9	371540-10
Your Reference	UNITS	GWB02	GWB03	GWB04	Field Blank	Duplicate
Date Sampled		27/01/2025	27/01/2025	27/01/2025	27/01/2025	27/01/2025
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	29/01/2025	29/01/2025	29/01/2025	29/01/2025	29/01/2025
Date analysed	-	29/01/2025	29/01/2025	29/01/2025	29/01/2025	29/01/2025
Calcium - Dissolved	mg/L	95	97	82	<0.5	45
Potassium - Dissolved	mg/L	11	5.6	8.8	<0.5	4
Sodium - Dissolved	mg/L	14	9.8	8.5	<0.5	7.5
Magnesium - Dissolved	mg/L	56	65	65	<0.5	30
Hardness (calc) equivalent $CaCO_3$	mg/L	470	510	470	<3	240
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	<5	<5	<5	<5	<5
Bicarbonate Alkalinity as $CaCO_3$	mg/L	460	520	520	<5	260
Carbonate Alkalinity as $CaCO_3$	mg/L	<5	<5	<5	<5	<5
Total Alkalinity as $CaCO_3$	mg/L	460	520	520	<5	260
Sulphate, SO4	mg/L	38	26	14	<1	2
Chloride, Cl	mg/L	36	11	8	<1	9
Ionic Balance	%	-4.0	-2.0	-4.0	N/A	-4.0

Ion Balance		
Our Reference		371540-11
Your Reference	UNITS	Trip Blank
Date Sampled		27/01/2025
Type of sample		Water
Date prepared	-	29/01/2025
Date analysed	-	29/01/2025
Calcium - Dissolved	mg/L	<0.5
Potassium - Dissolved	mg/L	<0.5
Sodium - Dissolved	mg/L	<0.5
Magnesium - Dissolved	mg/L	<0.5
Hardness (calc) equivalent $CaCO_3$	mg/L	<3
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	<5
Bicarbonate Alkalinity as $CaCO_3$	mg/L	<5
Carbonate Alkalinity as $CaCO_3$	mg/L	<5
Total Alkalinity as $CaCO_3$	mg/L	<5
Sulphate, SO4	mg/L	<1
Chloride, Cl	mg/L	<1
Ionic Balance	%	N/A

Miscellaneous Inorganics						
Our Reference		371540-1	371540-2	371540-3	371540-4	371540-5
Your Reference	UNITS	SWB	SWC	GWA (RN031131)	GWE (RN031131)	GWB01
Date Sampled		27/01/2025	27/01/2025	27/01/2025	27/01/2025	27/01/2025
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	29/01/2025	29/01/2025	29/01/2025	29/01/2025	29/01/2025
Date analysed	-	29/01/2025	29/01/2025	29/01/2025	29/01/2025	29/01/2025
Total Nitrogen in water	mg/L	0.2	0.2	0.4	2.4	1.1
Nitrate as N in water	mg/L	0.25	<0.005	0.39	0.084	0.33
Hexavalent Chromium, Cr^{6+} (dissolved)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Hex Chromium, Cr^{6+} (total/unfiltered)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Trivalent Chromium, Cr^{3+}	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Triv Chromium, Cr^{3+} (total/unfiltered)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Total Organic Carbon	mg/L	7	8	1	3	3
Total Dissolved Solids (grav)	mg/L	300	290	290	300	500
COD	mg O_2/L	<50	<50	<50	<50	<50
BOD	mg/L	<5	<5	<5	<5	<5
Ammonium NH_4^+ as N	mg/L	0.04	<0.03	<0.03	2.2	0.7

Miscellaneous Inorganics						
Our Reference		371540-6	371540-7	371540-8	371540-9	371540-10
Your Reference	UNITS	GWB02	GWB03	GWB04	Field Blank	Duplicate
Date Sampled		27/01/2025	27/01/2025	27/01/2025	27/01/2025	27/01/2025
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	29/01/2025	29/01/2025	29/01/2025	29/01/2025	29/01/2025
Date analysed	-	29/01/2025	29/01/2025	29/01/2025	29/01/2025	29/01/2025
Total Nitrogen in water	mg/L	0.1	1.8	2.4	<0.1	0.2
Nitrate as N in water	mg/L	0.087	1.5	3.3	<0.005	<0.005
Hexavalent Chromium, Cr^{6+} (dissolved)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Hex Chromium, Cr^{6+} (total/unfiltered)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Trivalent Chromium, Cr^{3+}	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Triv Chromium, Cr^{3+} (total/unfiltered)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Total Organic Carbon	mg/L	1	1	4	<1	7
Total Dissolved Solids (grav)	mg/L	540	550	510	<5	270
COD	mg O_2/L	<50	<50	<50	<50	<50
BOD	mg/L	<5	<5	<5	<5	<5
Ammonium NH_4^+ as N	mg/L	<0.03	0.03	<0.03	<0.03	<0.03

Miscellaneous Inorganics		
Our Reference		371540-11
Your Reference	UNITS	Trip Blank
Date Sampled		27/01/2025
Type of sample		Water
Date prepared	-	29/01/2025
Date analysed	-	29/01/2025
Total Nitrogen in water	mg/L	<0.1
Nitrate as N in water	mg/L	<0.005
Hexavalent Chromium, Cr^{6+} (dissolved)	mg/L	<0.005
Hex Chromium, Cr^{6+} (total/unfiltered)	mg/L	<0.005
Trivalent Chromium, Cr^{3+}	mg/L	<0.005
Triv Chromium, Cr^{3+} (total/unfiltered)	mg/L	<0.005
Total Organic Carbon	mg/L	<1
Total Dissolved Solids (grav)	mg/L	<5
COD	mg O_2 /L	[NT]
BOD	mg/L	<5
Ammonium NH_4^+ as N	mg/L	<0.03

Metals in Waters - Acid extractable						
Our Reference		371540-1	371540-2	371540-3	371540-4	371540-5
Your Reference	UNITS	SWB	SWC	GWA (RN031131)	GWE (RN031131)	GWB01
Date Sampled		27/01/2025	27/01/2025	27/01/2025	27/01/2025	27/01/2025
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	31/01/2025	31/01/2025	31/01/2025	31/01/2025	31/01/2025
Date analysed	-	31/01/2025	31/01/2025	31/01/2025	31/01/2025	31/01/2025
Phosphorus - Total	mg/L	0.06	<0.05	<0.05	0.08	<0.05

Metals in Waters - Acid extractable						
Our Reference		371540-6	371540-7	371540-8	371540-9	371540-10
Your Reference	UNITS	GWB02	GWB03	GWB04	Field Blank	Duplicate
Date Sampled		27/01/2025	27/01/2025	27/01/2025	27/01/2025	27/01/2025
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	31/01/2025	31/01/2025	31/01/2025	31/01/2025	31/01/2025
Date analysed	-	31/01/2025	31/01/2025	31/01/2025	31/01/2025	31/01/2025
Phosphorus - Total	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05

Metals in Waters - Acid extractable		
Our Reference		371540-11
Your Reference	UNITS	Trip Blank
Date Sampled		27/01/2025
Type of sample		Water
Date prepared	-	31/01/2025
Date analysed	-	31/01/2025
Phosphorus - Total	mg/L	<0.05

Method ID	Methodology Summary
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA latest edition, 2320-B.
Inorg-018	Total Dissolved Solids - determined gravimetrically. The solids are dried at 180+/-10°C. NOTE: Where the EC of the sample is <100µS/cm, the TDS will typically be below 70mg/L (as the sample is very likely to be at least drinking water quality). Therefore to ensure data quality for TDS, the TDS is typically calculated as per the equation below:- TDS = EC * 0.6
Inorg-040	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%.
Inorg-055	Nitrate - determined colourimetrically. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
Inorg-055/062/127	Total Nitrogen - Calculation sum of TKN and oxidised Nitrogen. Alternatively analysed by combustion and chemiluminescence.
Inorg-067	Samples are digested in acid with a known excess of potassium dichromate then titrated against ammonium ferrous sulphate in accordance with APHA latest edition 5220 C.
Inorg-079	TOC determined using a TOC analyser using the combustion method. Dissolved requires filtering prior to determination. Analysis using APHA latest edition 5310B.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
Inorg-091	BOD - Analysed in accordance with APHA latest edition 5210 D and in house INORG-091.
Inorg-111	VFA determined by distillation and titration.

Method ID	Methodology Summary
Inorg-118	Hexavalent Chromium (Cr6+) - determined firstly by separation using ion chromatography followed by the colourimetric analytical finish. Water samples are ideally field filtered into alkali preserved containers prior to receipt for dissolved Cr6+ analysis. Unfiltered water samples into alkali preserved containers (or pH adjusted to pH 8-9 on receipt) can be classified as Total (unfiltered) Cr6+. Please note, for 'Total/Unfiltered' Trivalent Chromium in waters [calculated], these results may be exaggerated due to the digestive limitation of 'Total/Unfiltered' Hexavalent Chromium in NaOH at pH 8-9 compared to more comprehensive digestion for Total Chromium using the mineral acids HNO3 and HCl. Solid (includes soils, filters, paints, swabs for example) samples are extracted in a buffered catalysed solution prior to the analytical finish above. Water extractable options are available (e.g. as an option for filters) on request. Impingers may need pH adjusting to pH 8-9 prior to IC-colourimetric analytical finish.
Metals-020	Determination of various metals by ICP-AES.
Metals-022	Determination of various metals by ICP-MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements. Salt forms (e.g. FeO, PbO, ZnO) are determined stoichiometrically from the base metal concentration.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-021/022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD and/or GC-MS/GC-MSMS. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. 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. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

Method ID	Methodology Summary
SEI-036	Ammonia - determined by Ion Selective Electrode, in accordance with APHA 20th ED, 4500-NH_3-D.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Date extracted	-			01/02/2025	4	01/02/2025	03/02/2025		01/02/2025	[NT]
Date analysed	-			03/02/2025	4	03/02/2025	04/02/2025		03/02/2025	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	4	<10	<10	0	114	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	4	<10	<10	0	114	[NT]
Benzene	µg/L	1	Org-023	<1	4	<1	<1	0	104	[NT]
Toluene	µg/L	1	Org-023	<1	4	<1	<1	0	111	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	4	<1	<1	0	117	[NT]
m+p-xylene	µg/L	2	Org-023	<2	4	<2	<2	0	118	[NT]
o-xylene	µg/L	1	Org-023	<1	4	<1	<1	0	120	[NT]
Naphthalene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	108	4	107	107	0	108	[NT]
Surrogate Toluene-d8	%		Org-023	100	4	100	101	1	101	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	116	4	112	117	4	115	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Date extracted	-			31/01/2025	4	31/01/2025	31/01/2025		31/01/2025	[NT]
Date analysed	-			01/02/2025	4	01/02/2025	01/02/2025		01/02/2025	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	4	<50	<50	0	108	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	4	<100	<100	0	95	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	4	<100	<100	0	114	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	4	<50	<50	0	108	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	4	<100	<100	0	95	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	4	<100	<100	0	114	[NT]
Surrogate o-Terphenyl	%		Org-020	101	4	98	100	2	95	[NT]

QUALITY CONTROL: PAHs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			31/01/2025	4	31/01/2025	31/01/2025		31/01/2025	[NT]
Date analysed	-			03/02/2025	4	03/02/2025	03/02/2025		03/02/2025	[NT]
Naphthalene	µg/L	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	78	[NT]
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	87	[NT]
Fluorene	µg/L	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	79	[NT]
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	83	[NT]
Anthracene	µg/L	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	81	[NT]
Pyrene	µg/L	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	81	[NT]
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	80	[NT]
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	4	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	101	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	79	4	91	99	8	85	[NT]

QUALITY CONTROL: PCBs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			31/01/2025	4	31/01/2025	31/01/2025		31/01/2025	[NT]
Date analysed	-			03/02/2025	4	03/02/2025	03/02/2025		03/02/2025	[NT]
Aroclor 1016	µg/L	2	Org-021/022/025	<2	4	<2	<2	0	[NT]	[NT]
Aroclor 1221	µg/L	2	Org-021/022/025	<2	4	<2	<2	0	[NT]	[NT]
Aroclor 1232	µg/L	2	Org-021/022/025	<2	4	<2	<2	0	[NT]	[NT]
Aroclor 1242	µg/L	2	Org-021/022/025	<2	4	<2	<2	0	[NT]	[NT]
Aroclor 1248	µg/L	2	Org-021/022/025	<2	4	<2	<2	0	[NT]	[NT]
Aroclor 1254	µg/L	2	Org-021/022/025	<2	4	<2	<2	0	87	[NT]
Aroclor 1260	µg/L	2	Org-021/022/025	<2	4	<2	<2	0	[NT]	[NT]
Surrogate 2-Fluorobiphenyl	%		Org-021/022/025	76	4	91	95	4	84	[NT]

QUALITY CONTROL: PFAS in Waters Extended						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	371540-5
Date prepared	-			03/02/2025	4	03/02/2025	03/02/2025		03/02/2025	03/02/2025
Date analysed	-			03/02/2025	4	03/02/2025	03/02/2025		03/02/2025	03/02/2025
Perfluorobutanesulfonic acid	µg/L	0.01	Org-029	<0.01	4	0.02	0.02	0	127	121
Perfluoropentanesulfonic acid	µg/L	0.01	Org-029	<0.01	4	<0.01	0.01	0	115	106
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.01	Org-029	<0.01	4	0.09	0.09	0	124	116
Perfluoroheptanesulfonic acid	µg/L	0.01	Org-029	<0.01	4	<0.01	<0.01	0	131	120
Perfluorooctanesulfonic acid PFOS	µg/L	0.01	Org-029	<0.01	4	0.22	0.21	5	114	118
Perfluorodecanesulfonic acid	µg/L	0.02	Org-029	<0.02	4	<0.02	<0.02	0	117	107
Perfluorobutanoic acid	µg/L	0.02	Org-029	<0.02	4	<0.02	<0.02	0	114	110
Perfluoropentanoic acid	µg/L	0.02	Org-029	<0.02	4	<0.02	<0.02	0	119	116
Perfluorohexanoic acid	µg/L	0.01	Org-029	<0.01	4	0.01	0.01	0	113	105
Perfluoroheptanoic acid	µg/L	0.01	Org-029	<0.01	4	<0.01	<0.01	0	109	110
Perfluorooctanoic acid PFOA	µg/L	0.01	Org-029	<0.01	4	0.03	0.02	40	113	110
Perfluorononanoic acid	µg/L	0.01	Org-029	<0.01	4	<0.01	<0.01	0	100	95
Perfluorodecanoic acid	µg/L	0.02	Org-029	<0.02	4	<0.02	<0.02	0	118	110
Perfluoroundecanoic acid	µg/L	0.02	Org-029	<0.02	4	<0.02	<0.02	0	115	115
Perfluorododecanoic acid	µg/L	0.05	Org-029	<0.05	4	<0.05	<0.05	0	117	107
Perfluorotridecanoic acid	µg/L	0.1	Org-029	<0.1	4	<0.1	<0.1	0	131	132
Perfluorotetradecanoic acid	µg/L	0.5	Org-029	<0.5	4	<0.5	<0.5	0	116	111
4:2 FTS	µg/L	0.01	Org-029	<0.01	4	<0.01	<0.01	0	117	110
6:2 FTS	µg/L	0.01	Org-029	<0.01	4	<0.01	<0.01	0	119	111
8:2 FTS	µg/L	0.02	Org-029	<0.02	4	<0.02	<0.02	0	108	107
10:2 FTS	µg/L	0.02	Org-029	<0.02	4	<0.02	<0.02	0	115	98
Perfluorooctane sulfonamide	µg/L	0.1	Org-029	<0.1	4	<0.1	<0.1	0	118	110
N-Methyl perfluorooctane sulfonamide	µg/L	0.05	Org-029	<0.05	4	<0.05	<0.05	0	118	111
N-Ethyl perfluorooctanesulfon amide	µg/L	0.1	Org-029	<0.1	4	<0.1	<0.1	0	128	121
N-Me perfluorooctanesulfonamid oethanol	µg/L	0.05	Org-029	<0.05	4	<0.05	<0.05	0	112	106
N-Et perfluorooctanesulfonamid oethanol	µg/L	0.5	Org-029	<0.5	4	<0.5	<0.5	0	98	94
MePerfluorooctanesulf- amid oacetic acid	µg/L	0.02	Org-029	<0.02	4	<0.02	<0.02	0	109	109
EtPerfluorooctanesulf- amid oacetic acid	µg/L	0.02	Org-029	<0.02	4	<0.02	<0.02	0	100	101
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	105	4	106	99	7	102	99
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	97	4	97	95	2	94	93

QUALITY CONTROL: PFAS in Waters Extended						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	371540-5
Extracted ISTD $^{13}C_3$ *PFBS*	%		Org-029	92	4	95	89	7	89	91
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	107	4	106	111	5	97	105
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	107	4	109	114	4	102	108
Extracted ISTD $^{13}C_4$ *PFBA*	%		Org-029	109	4	107	107	0	102	102
Extracted ISTD $^{13}C_3$ *PFPeA*	%		Org-029	95	4	94	96	2	90	90
Extracted ISTD $^{13}C_2$ *PFHxA*	%		Org-029	104	4	104	103	1	96	102
Extracted ISTD $^{13}C_4$ *PFHpA*	%		Org-029	104	4	105	103	2	98	99
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	114	4	110	116	5	106	114
Extracted ISTD $^{13}C_5$ *PFNA*	%		Org-029	117	4	119	121	2	112	117
Extracted ISTD $^{13}C_2$ *PFDA*	%		Org-029	112	4	110	112	2	102	109
Extracted ISTD $^{13}C_2$ *PFUnDA*	%		Org-029	110	4	110	117	6	106	106
Extracted ISTD $^{13}C_2$ *PFDoDA*	%		Org-029	112	4	113	116	3	101	113
Extracted ISTD $^{13}C_2$ *PFTeDA*	%		Org-029	86	4	88	94	7	73	82
Extracted ISTD $^{13}C_2$ *4:2FTS*	%		Org-029	104	4	100	111	10	92	98
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-029	116	4	114	118	3	109	116
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	120	4	124	123	1	115	117
Extracted ISTD $^{13}C_8$ *FOSA*	%		Org-029	109	4	105	109	4	97	104
Extracted ISTD d_3 *N MeFOSA*	%		Org-029	104	4	101	104	3	94	101
Extracted ISTD d_5 *N EtFOSA*	%		Org-029	102	4	100	102	2	92	99
Extracted ISTD d_7 *N MeFOSE*	%		Org-029	129	4	130	128	2	117	125

QUALITY CONTROL: PFAS in Waters Extended						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	371540-5
Extracted ISTD d_9 *N EtFOSE*	%		Org-029	132	4	135	141	4	126	137
Extracted ISTD d_3 *N MeFOSAA*	%		Org-029	113	4	115	121	5	109	117
Extracted ISTD d_5 *N EtFOSAA*	%		Org-029	107	4	115	111	4	108	109

QUALITY CONTROL: Volatile Fatty Acids in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date Extracted	-			31/01/2025	[NT]	[NT]	[NT]	[NT]	31/01/2025	[NT]
Date analysed	-			31/01/2025	[NT]	[NT]	[NT]	[NT]	31/01/2025	[NT]
Volatile Fatty Acids*	mg/L	5	Inorg-111	<5	[NT]	[NT]	[NT]	[NT]	86	[NT]

QUALITY CONTROL: All metals in water-dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	371540-4
Date prepared	-			31/01/2025	3	03/02/2025	03/02/2025		31/01/2025	31/01/2025
Date analysed	-			31/01/2025	3	03/02/2025	03/02/2025		31/01/2025	31/01/2025
Aluminium-Dissolved	µg/L	10	Metals-022	<10	3	<10	<10	0	87	84
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	3	<0.1	<0.1	0	94	98
Copper-Dissolved	µg/L	1	Metals-022	<1	3	<1	<1	0	93	95
Iron-Dissolved	µg/L	10	Metals-022	<10	3	<10	<10	0	93	94
Lead-Dissolved	µg/L	1	Metals-022	<1	3	<1	<1	0	94	87
Manganese-Dissolved	µg/L	5	Metals-022	<5	3	<5	<5	0	93	95
Nickel-Dissolved	µg/L	1	Metals-022	<1	3	<1	<1	0	93	95
Zinc-Dissolved	µg/L	1	Metals-022	<1	3	5	5	0	94	94
Selenium-Dissolved	µg/L	1	Metals-022	<1	3	<1	<1	0	93	96
Chromium-Dissolved	µg/L	1	Metals-022	<1	3	<1	<1	0	93	98

QUALITY CONTROL: All metals in water - total						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	371540-6
Date prepared	-			31/01/2025	2	31/01/2025	31/01/2025		31/01/2025	31/01/2025
Date analysed	-			31/01/2025	2	31/01/2025	31/01/2025		31/01/2025	31/01/2025
Aluminium-Total	µg/L	10	Metals-022	<10	2	120	120	0	80	#
Cadmium-Total	µg/L	0.1	Metals-022	<0.1	2	<0.1	<0.1	0	92	94
Copper-Total	µg/L	1	Metals-022	<1	2	2	2	0	94	94
Iron-Total	µg/L	10	Metals-022	<10	2	140	150	7	91	#
Lead-Total	µg/L	1	Metals-022	<1	2	<1	<1	0	94	87
Manganese-Total	µg/L	5	Metals-022	<5	2	13	13	0	91	94
Nickel-Total	µg/L	1	Metals-022	<1	2	1	1	0	92	94
Zinc-Total	µg/L	1	Metals-022	<1	2	4	5	22	95	96
Selenium-Total	µg/L	1	Metals-022	<1	2	<1	<1	0	91	94
Chromium-Total	µg/L	1	Metals-022	<1	2	<1	<1	0	92	98

QUALITY CONTROL: Ion Balance						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	371540-2
Date prepared	-			29/01/2025	1	29/01/2025	29/01/2025		29/01/2025	29/01/2025
Date analysed	-			29/01/2025	1	29/01/2025	29/01/2025		29/01/2025	29/01/2025
Calcium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	46	46	0	98	88
Potassium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	7.2	7.2	0	90	82
Sodium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	8.1	7.9	2	86	78
Magnesium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	31	31	0	97	95
Hardness (calc) equivalent $CaCO_3$	mg/L	3	Metals-020	[NT]	1	240	240	0	[NT]	[NT]
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	5	Inorg-006	<5	1	<5	<5	0	[NT]	[NT]
Bicarbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	1	280	270	4	[NT]	[NT]
Carbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	1	<5	<5	0	[NT]	[NT]
Total Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	1	280	270	4	99	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	<1	1	2	[NT]		117	[NT]
Chloride, Cl	mg/L	1	Inorg-081	<1	1	9	[NT]		113	[NT]
Ionic Balance	%		Inorg-040	[NT]	1	-4.0	[NT]		[NT]	[NT]

QUALITY CONTROL: Ion Balance						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	371540-10
Date prepared	-			[NT]	9	29/01/2025	29/01/2025		[NT]	29/01/2025
Date analysed	-			[NT]	9	29/01/2025	29/01/2025		[NT]	29/01/2025
Calcium - Dissolved	mg/L	0.5	Metals-020	[NT]	9	<0.5	[NT]		[NT]	[NT]
Potassium - Dissolved	mg/L	0.5	Metals-020	[NT]	9	<0.5	[NT]		[NT]	[NT]
Sodium - Dissolved	mg/L	0.5	Metals-020	[NT]	9	<0.5	[NT]		[NT]	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	[NT]	9	<0.5	[NT]		[NT]	[NT]
Hardness (calc) equivalent $CaCO_3$	mg/L	3	Metals-020	[NT]	9	<3	[NT]		[NT]	[NT]
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	5	Inorg-006	[NT]	9	<5	[NT]		[NT]	[NT]
Bicarbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	[NT]	9	<5	[NT]		[NT]	[NT]
Carbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	[NT]	9	<5	[NT]		[NT]	[NT]
Total Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	[NT]	9	<5	[NT]		[NT]	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	[NT]	9	<1	<1	0	[NT]	110
Chloride, Cl	mg/L	1	Inorg-081	[NT]	9	<1	<1	0	[NT]	106
Ionic Balance	%		Inorg-040	[NT]	9	N/A	N/A		[NT]	[NT]

QUALITY CONTROL: Ion Balance						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	11	29/01/2025	29/01/2025		[NT]	[NT]
Date analysed	-			[NT]	11	29/01/2025	29/01/2025		[NT]	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020	[NT]	11	<0.5	[NT]		[NT]	[NT]
Potassium - Dissolved	mg/L	0.5	Metals-020	[NT]	11	<0.5	[NT]		[NT]	[NT]
Sodium - Dissolved	mg/L	0.5	Metals-020	[NT]	11	<0.5	[NT]		[NT]	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	[NT]	11	<0.5	[NT]		[NT]	[NT]
Hardness (calc) equivalent $CaCO_3$	mg/L	3	Metals-020	[NT]	11	<3	[NT]		[NT]	[NT]
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	5	Inorg-006	[NT]	11	<5	<5	0	[NT]	[NT]
Bicarbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	[NT]	11	<5	<5	0	[NT]	[NT]
Carbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	[NT]	11	<5	<5	0	[NT]	[NT]
Total Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	[NT]	11	<5	<5	0	[NT]	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	[NT]	11	<1	[NT]		[NT]	[NT]
Chloride, Cl	mg/L	1	Inorg-081	[NT]	11	<1	[NT]		[NT]	[NT]
Ionic Balance	%		Inorg-040	[NT]	11	N/A	N/A		[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	371540-2
Date prepared	-			29/01/2025	1	29/01/2025	29/01/2025		29/01/2025	29/01/2025
Date analysed	-			29/01/2025	1	29/01/2025	29/01/2025		29/01/2025	29/01/2025
Total Nitrogen in water	mg/L	0.1	Inorg-055/062/127	<0.1	1	0.2	[NT]		110	[NT]
Nitrate as N in water	mg/L	0.005	Inorg-055	<0.005	1	0.25	0.21	17	96	[NT]
Hexavalent Chromium, Cr^{6+} (dissolved)	mg/L	0.005	Inorg-118	<0.005	1	<0.005	[NT]		93	[NT]
Hex Chromium, Cr^{6+} (total/unfiltered)	mg/L	0.005	Inorg-118	<0.005	1	<0.005	<0.005	0	96	90
Trivalent Chromium, Cr^{3+}	mg/L	0.005	Inorg-118	<0.005	1	<0.005	<0.005	0	[NT]	[NT]
Triv Chromium, Cr^{3+} (total/unfiltered)	mg/L	0.005	Inorg-118	<0.005	1	<0.005	<0.005	0	[NT]	[NT]
Total Organic Carbon	mg/L	1	Inorg-079	<1	1	7	7	0	119	[NT]
Total Dissolved Solids (grav)	mg/L	5	Inorg-018	<5	1	300	260	14	105	[NT]
COD	mg O_2/L	50	Inorg-067	<50	1	<50	[NT]		91	[NT]
BOD	mg/L	5	Inorg-091	<5	1	<5	[NT]		96	[NT]
Ammonium NH_4^+ as N	mg/L	0.03	SEI-036	<0.03	1	0.04	0.04	0	107	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	371540-9
Date prepared	-			[NT]	2	29/01/2025	29/01/2025		[NT]	29/01/2025
Date analysed	-			[NT]	2	29/01/2025	29/01/2025		[NT]	29/01/2025
Total Nitrogen in water	mg/L	0.1	Inorg-055/062/127	[NT]	2	0.2	0.2	0	[NT]	105
Nitrate as N in water	mg/L	0.005	Inorg-055	[NT]	2	<0.005	[NT]		[NT]	[NT]
Hexavalent Chromium, Cr^{6+} (dissolved)	mg/L	0.005	Inorg-118	[NT]	2	<0.005	[NT]		[NT]	[NT]
Hex Chromium, Cr^{6+} (total/unfiltered)	mg/L	0.005	Inorg-118	[NT]	2	<0.005	[NT]		[NT]	[NT]
Trivalent Chromium, Cr^{3+}	mg/L	0.005	Inorg-118	[NT]	2	<0.005	[NT]		[NT]	[NT]
Triv Chromium, Cr^{3+} (total/unfiltered)	mg/L	0.005	Inorg-118	[NT]	2	<0.005	[NT]		[NT]	[NT]
Total Organic Carbon	mg/L	1	Inorg-079	[NT]	2	8	[NT]		[NT]	[NT]
Total Dissolved Solids (grav)	mg/L	5	Inorg-018	[NT]	2	290	[NT]		[NT]	[NT]
COD	mg O_2/L	50	Inorg-067	[NT]	2	<50	[NT]		[NT]	[NT]
BOD	mg/L	5	Inorg-091	[NT]	2	<5	[NT]		[NT]	[NT]
Ammonium NH_4^+ as N	mg/L	0.03	SEI-036	[NT]	2	<0.03	[NT]		[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	371540-10
Date prepared	-			[NT]	7	29/01/2025	29/01/2025		[NT]	29/01/2025
Date analysed	-			[NT]	7	29/01/2025	29/01/2025		[NT]	29/01/2025
Total Nitrogen in water	mg/L	0.1	Inorg-055/062/127	[NT]	7	1.8	[NT]		[NT]	[NT]
Nitrate as N in water	mg/L	0.005	Inorg-055	[NT]	7	1.5	[NT]		[NT]	96
Hexavalent Chromium, Cr^{6+} (dissolved)	mg/L	0.005	Inorg-118	[NT]	7	<0.005	[NT]		[NT]	94
Hex Chromium, Cr^{6+} (total/unfiltered)	mg/L	0.005	Inorg-118	[NT]	7	<0.005	[NT]		[NT]	[NT]
Trivalent Chromium, Cr^{3+}	mg/L	0.005	Inorg-118	[NT]	7	<0.005	[NT]		[NT]	[NT]
Triv Chromium, Cr^{3+} (total/unfiltered)	mg/L	0.005	Inorg-118	[NT]	7	<0.005	[NT]		[NT]	[NT]
Total Organic Carbon	mg/L	1	Inorg-079	[NT]	7	1	1	0	[NT]	123
Total Dissolved Solids (grav)	mg/L	5	Inorg-018	[NT]	7	550	[NT]		[NT]	[NT]
COD	mg O_2/L	50	Inorg-067	[NT]	7	<50	<50	0	[NT]	[NT]
BOD	mg/L	5	Inorg-091	[NT]	7	<5	<5	0	[NT]	[NT]
Ammonium NH_4^+ as N	mg/L	0.03	SEI-036	[NT]	7	0.03	[NT]		[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	8	29/01/2025	29/01/2025		[NT]	[NT]
Date analysed	-			[NT]	8	29/01/2025	29/01/2025		[NT]	[NT]
Total Nitrogen in water	mg/L	0.1	Inorg-055/062/127	[NT]	8	2.4	2.4	0	[NT]	[NT]
Nitrate as N in water	mg/L	0.005	Inorg-055	[NT]	8	3.3	[NT]		[NT]	[NT]
Hexavalent Chromium, Cr^{6+} (dissolved)	mg/L	0.005	Inorg-118	[NT]	8	<0.005	[NT]		[NT]	[NT]
Hex Chromium, Cr^{6+} (total/unfiltered)	mg/L	0.005	Inorg-118	[NT]	8	<0.005	[NT]		[NT]	[NT]
Trivalent Chromium, Cr^{3+}	mg/L	0.005	Inorg-118	[NT]	8	<0.005	[NT]		[NT]	[NT]
Triv Chromium, Cr^{3+} (total/unfiltered)	mg/L	0.005	Inorg-118	[NT]	8	<0.005	[NT]		[NT]	[NT]
Total Organic Carbon	mg/L	1	Inorg-079	[NT]	8	4	[NT]		[NT]	[NT]
Total Dissolved Solids (grav)	mg/L	5	Inorg-018	[NT]	8	510	[NT]		[NT]	[NT]
COD	mg O_2/L	50	Inorg-067	[NT]	8	<50	[NT]		[NT]	[NT]
BOD	mg/L	5	Inorg-091	[NT]	8	<5	[NT]		[NT]	[NT]
Ammonium NH_4^+ as N	mg/L	0.03	SEI-036	[NT]	8	<0.03	[NT]		[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	9	29/01/2025	29/01/2025		[NT]	[NT]
Date analysed	-			[NT]	9	29/01/2025	29/01/2025		[NT]	[NT]
Total Nitrogen in water	mg/L	0.1	Inorg-055/062/127	[NT]	9	<0.1	[NT]		[NT]	[NT]
Nitrate as N in water	mg/L	0.005	Inorg-055	[NT]	9	<0.005	<0.005	0	[NT]	[NT]
Hexavalent Chromium, Cr^{6+} (dissolved)	mg/L	0.005	Inorg-118	[NT]	9	<0.005	<0.005	0	[NT]	[NT]
Hex Chromium, Cr^{6+} (total/unfiltered)	mg/L	0.005	Inorg-118	[NT]	9	<0.005	[NT]		[NT]	[NT]
Trivalent Chromium, Cr^{3+}	mg/L	0.005	Inorg-118	[NT]	9	<0.005	[NT]		[NT]	[NT]
Triv Chromium, Cr^{3+} (total/unfiltered)	mg/L	0.005	Inorg-118	[NT]	9	<0.005	[NT]		[NT]	[NT]
Total Organic Carbon	mg/L	1	Inorg-079	[NT]	9	<1	[NT]		[NT]	[NT]
Total Dissolved Solids (grav)	mg/L	5	Inorg-018	[NT]	9	<5	[NT]		[NT]	[NT]
COD	mg O_2/L	50	Inorg-067	[NT]	9	<50	[NT]		[NT]	[NT]
BOD	mg/L	5	Inorg-091	[NT]	9	<5	[NT]		[NT]	[NT]
Ammonium NH_4^+ as N	mg/L	0.03	SEI-036	[NT]	9	<0.03	<0.03	0	[NT]	[NT]

QUALITY CONTROL: Metals in Waters - Acid extractable						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	371540-5
Date prepared	-			31/01/2025	2	31/01/2025	31/01/2025		31/01/2025	31/01/2025
Date analysed	-			31/01/2025	2	31/01/2025	31/01/2025		31/01/2025	31/01/2025
Phosphorus - Total	mg/L	0.05	Metals-020	<0.05	2	<0.05	0.06	18	119	100

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Report Comments

MISC_INORG: Ammonium NH4+ as N is not cover under NATA scope. Ammonia-N reported comprises of both forms of Ammonium-N (NH4-N) and Ammonia (NH3-N). The Ammonium (NH4+-N) is calculated based on the pH and temperature as stated by the client from the source of sampling otherwise determined in the lab.

Dissolved Metals: no filtered, preserved sample was received for #3, therefore the unpreserved sample was filtered through 0.45µm filter at the lab.
Note: there is a possibility some elements may be underestimated.

Total metals: no unfiltered, preserved sample was received, therefore analysis was conducted from the unpreserved sample bottle.
Note: there is a possibility some elements may be underestimated.

TRACE METALS: In theory the total metal content should be higher than the dissolved metal content. However, in some samples this is not the case. The sample has been re-analysed for both Total and Dissolved metals and results have been confirmed.

Percent recovery is not applicable due to the high concentration of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

Envirolab Services (WA) Pty Ltd trading as MPL Laboratories
ABN 53 140 099 207
16-18 Hayden Court Myaree WA 6154
ph +61 8 9317 2505
lab@mpl.com.au
www.mpl.com.au

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Client Details

Client	Katherine Town Council - NT
Contact	Brett Kimpton
Address	PO Box 1071, KATHERINE, NT, 0851

Sample Details

Your Reference	Katherine Twon Council - EPL298-01 - Monthly
Number of Samples	9 Water
Date Samples Received	26/02/2025
Date Instructions Received	26/02/2025

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 soils and on an as received basis for other matrices.

Report Details

Date Results Requested by	17/03/2025
Date of Issue	17/03/2025

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

Authorisation Details

Results Approved By	Lien Tang, Assistant Operations Manager Lucas Yii, Inorganics Team Leader Michael Mowle, Development Chemist - Inorganics and Metals Varsha Ho Wing, Inorganics and Metals Supervisor
Laboratory Manager	Michael Kubiak

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Samples in this Report

Envirolab ID	Sample ID	Depth	Matrix	Date Sampled	Date Received
PGB1721-01	GWA (RN031131)		Water	23/02/2025	26/02/2025
PGB1721-02	GWE (RN022487)	7.60Meters	Water	23/02/2025	26/02/2025
PGB1721-03	GWB01	6.00Meters	Water	23/02/2025	26/02/2025
PGB1721-04	GWB02	6.00Meters	Water	23/02/2025	26/02/2025
PGB1721-05	GWB03	5.00Meters	Water	23/02/2025	26/02/2025
PGB1721-06	GWB04	8.00Meters	Water	23/02/2025	26/02/2025
PGB1721-07	Field Blank		Water	23/02/2025	26/02/2025
PGB1721-08	Duplicate		Water	23/02/2025	26/02/2025
PGB1721-09	Trip Blank		Water	19/02/2025	26/02/2025

Sample Comments

Field Blank	No field data provided - Testing for ammonia instead of ammonium
Duplicate	No field data provided - Testing for ammonia instead of ammonium
Trip Blank	Analytes out of holding time not tested - Only ionic balance, TOC & COD tested

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Inorganics - Physical Parameters (Water)

Envirolab ID	Units	PQL	PGB1721-01	PGB1721-02	PGB1721-03	PGB1721-04	PGB1721-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			23/02/2025	23/02/2025	23/02/2025	23/02/2025	23/02/2025
Depth				7.60	6.00	6.00	5.00
Total Dissolved Solids	mg/L	5.0	350	320	450	530	340

Envirolab ID	Units	PQL	PGB1721-06	PGB1721-07	PGB1721-08
Your Reference			GWB04	Field Blank	Duplicate
Date Sampled			23/02/2025	23/02/2025	23/02/2025
Depth			8.00		
Total Dissolved Solids	mg/L	5.0	470	<5.0	330

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Inorganics - Ionic Balance and Indexes (Water)

Envirolab ID	Units	PQL	PGB1721-01	PGB1721-02	PGB1721-03	PGB1721-04	PGB1721-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			23/02/2025	23/02/2025	23/02/2025	23/02/2025	23/02/2025
Depth				7.60	6.00	6.00	5.00
Bicarbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	300	280	390	440	340
Carbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Hydroxide OH- as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Total Alkalinity as CaCO3	mg/L as CaCO3	5.0	300	280	390	440	340
Chloride	mg/L	1.0	4.8	14	27	32	6.9
Sulfate	mg/L	1.0	3.8	6.8	11	28	4.4
Calcium	mg/L	0.50	72	48	89	110	69
Magnesium	mg/L	0.50	31	32	40	48	36
Potassium	mg/L	0.50	4.4	6.8	11	5.7	3.6
Sodium	mg/L	0.50	4.9	12	18	17	7.2
Hardness (calc) equivalent CaCO3	mg/L	3.0	310	250	390	470	320
Ionic Balance	%		1.7	-1.3	-0.050	-0.18	-1.7
Total Anions	mg/L	7.0	310	300	430	500	350
Anions as meq	meq/L	0.59	5.1	5.1	7.4	8.7	5.8
Total Cations	mg/L	2.0	110	99	160	180	120
Cations as meq	meq/L	0.10	6.5	5.8	8.8	10	6.8

Envirolab ID	Units	PQL	PGB1721-06	PGB1721-07	PGB1721-08	PGB1721-09
Your Reference			GWB04	Field Blank	Duplicate	Trip Blank
Date Sampled			23/02/2025	23/02/2025	23/02/2025	19/02/2025
Depth			8.00			
Bicarbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	430	<5.0	320	<5.0
Carbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0	<5.0
Hydroxide OH- as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0	<5.0
Total Alkalinity as CaCO3	mg/L as CaCO3	5.0	430	<5.0	320	<5.0
Chloride	mg/L	1.0	5.3	<1.0	5.3	<1.0
Sulfate	mg/L	1.0	6.0	<1.0	3.8	<1.0
Calcium	mg/L	0.50	83	<0.50	70	<0.50
Magnesium	mg/L	0.50	56	<0.50	31	<0.50
Potassium	mg/L	0.50	8.1	<0.50	4.4	<0.50
Sodium	mg/L	0.50	7.0	<0.50	4.9	<0.50
Hardness (calc) equivalent CaCO3	mg/L	3.0	440	<3.0	300	<3.0
Ionic Balance	%		1.6	-93 [1]	-1.4	-98 [1]
Total Anions	mg/L	7.0	450	<7.0	330	<7.0
Anions as meq	meq/L	0.59	7.4	<0.59	5.4	<0.59
Total Cations	mg/L	2.0	150	<2.0	110	<2.0
Cations as meq	meq/L	0.10	9.3	<0.10	6.4	<0.10

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Inorganics - Carbon, Nitrogen and Sulfur Species (Water)

Envirolab ID	Units	PQL	PGB1721-01	PGB1721-02	PGB1721-03	PGB1721-04	PGB1721-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			23/02/2025	23/02/2025	23/02/2025	23/02/2025	23/02/2025
Depth				7.60	6.00	6.00	5.00
Total Organic Carbon	mg/L	1.0	<1.0	1.2	1.7	1.7	1.0

Envirolab ID	Units	PQL	PGB1721-06	PGB1721-07	PGB1721-08	PGB1721-09
Your Reference			GWB04	Field Blank	Duplicate	Trip Blank
Date Sampled			23/02/2025	23/02/2025	23/02/2025	19/02/2025
Depth			8.00			
Total Organic Carbon	mg/L	1.0	<1.0	<1.0	<1.0	<1.0

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Inorganics - Nutrients (Water)

Envirolab ID	Units	PQL	PGB1721-01	PGB1721-02	PGB1721-03	PGB1721-04	PGB1721-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			23/02/2025	23/02/2025	23/02/2025	23/02/2025	23/02/2025
Depth				7.60	6.00	6.00	5.00
Ammonia as N	mg/L	0.0050	0.024	1.8	0.32	0.022	0.015
Free Ammonia (unionised) as N by calculation*	mg/L	0.0070	<0.0070	0.16	<0.0070	<0.0070	<0.0070
Ammonium (NH4+) as N by calculation	mg/L	0.0070	0.024	1.7	0.32	0.022	0.015

Envirolab ID	Units	PQL	PGB1721-06	PGB1721-07	PGB1721-08
Your Reference			GWB04	Field Blank	Duplicate
Date Sampled			23/02/2025	23/02/2025	23/02/2025
Depth			8.00		
Ammonia as N	mg/L	0.0050	0.029	<0.0050	0.036
Free Ammonia (unionised) as N by calculation*	mg/L	0.0070	0.0090	[NA]	[NA]
Ammonium (NH4+) as N by calculation	mg/L	0.0070	0.020	[NA]	[NA]

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Inorganics - Common Wastewater Parameters (Water)

Envirolab ID	Units	PQL	PGB1721-01	PGB1721-02	PGB1721-03	PGB1721-04	PGB1721-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			23/02/2025	23/02/2025	23/02/2025	23/02/2025	23/02/2025
Depth				7.60	6.00	6.00	5.00
BOD	mg/L	5.0	<5.0	8.5	29	22	10
COD	mg O2/L	20	<20	<20	<20	<20	<20

Envirolab ID	Units	PQL	PGB1721-06	PGB1721-07	PGB1721-08	PGB1721-09
Your Reference			GWB04	Field Blank	Duplicate	Trip Blank
Date Sampled			23/02/2025	23/02/2025	23/02/2025	19/02/2025
Depth			8.00			
BOD	mg/L	5.0	17	12	12	[NA]
COD	mg O2/L	20	<20	<20	<20	<20

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General - Field Data (Water)

Envirolab ID	Units	PQL	PGB1721-01	PGB1721-02	PGB1721-03	PGB1721-04	PGB1721-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			23/02/2025	23/02/2025	23/02/2025	23/02/2025	23/02/2025
Depth				7.60	6.00	6.00	5.00
pH (Client Supplied)*	pH units		8.60	8.10	6.90	7.20	7.80
Temperature (Client Supplied)*	o C		29.8	29.1	31.0	33.0	32.0

Envirolab ID	Units	PQL	PGB1721-06
Your Reference			GWB04
Date Sampled			23/02/2025
Depth			8.00
pH (Client Supplied)*	pH units		8.70
Temperature (Client Supplied)*	o C		32.0

Result Comments

Identifier	Description
[1]	Ion balance is outside of acceptance criteria, however, the major cations/anions are near or below the PQL and hence the analytical error may be more significant resulting in a poor cation-anion balance.

Method Summary

Method ID	Methodology Summary
Calc	Calculation
Calc - ION	Calculation
Field Data	Field Data supplied by client
INORG-006	Alkalinity - determined titrimetrically based on APHA latest edition 2320-B. Solids reported from a 1:5 water extract unless otherwise specified. Total Carbon Dioxide - determined by calculation in accordance with APHA latest edition,4500-CO2 D.
INORG-018	Total Dissolved Solids - determined gravimetrically. The solids are dried at 180±10°C. NOTE: Where the EC of the sample is <100µS/cm, the TDS will typically be below 70mg/L (as the sample is very likely to be at least drinking water quality). Therefore to ensure data quality for TDS, the TDS is typically calculated as per the equation: TDS = EC*0.6
INORG-040	The concentrations of the major ions (mg/L) are converted to milliequivalents and summed. The ionic balance should be within +/- 15% i.e. total anions = total cations +/-15%.
INORG-057	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.
INORG-057_CALC	Calculation of Ammonium as N. Assumes all Ammonia is present as Ammonium unless samplpe pH and temperature provided.
INORG-067	Samples are digested in acid with a known excess of potassium dichromate then the colour change is determined by discrete analyser or UV-VIS in accordance with APHA latest edition 5220 D.
INORG-079	Carbon forms (inorganic, organic, total) determined using a TOC/NDIR analyser via combustion. Dissolved aqueous\forms require filtering prior to determination.
INORG-081	Anions determined by Ion Chromatography. Waters samples are filtered on receipt prior to analysis. Solids are analysed from a water extract. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
INORG-091	BOD and/or cBOD - Analysed in accordance with APHA latest edition 5210 D.
METALS-020	Determination of various metals by ICP-OES. Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation.

Result Definitions

Identifier	Description
NR	Not reported
NEPM	National Environment Protection Measure
NS	Not specified
LCS	Laboratory Control Sample
RPD	Relative Percent Difference
>	Greater than
<	Less than
PQL	Practical Quantitation Limit
INS	Insufficient sample for this test
NA	Test not required
NT	Not tested
DOL	Samples rejected due to particulate overload (air filters only)
RFD	Samples rejected due to filter damage (air filters only)
RUD	Samples rejected due to uneven deposition (air filters only)
##	Indicates a laboratory acceptance criteria outlier, for further details, see Result Comments and/or QC Comments

Quality Control Definitions

Blank

This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, and is determined by processing solvents and reagents in exactly the same manner as for samples.

Surrogate Spike

Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

LCS (Laboratory Control Sample)

This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Matrix Spike

A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

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.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

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 QAQC tables for details (available on request); <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; 60-140% for organics (+/-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 typically insufficient in order to satisfy laboratory QA/QC protocols.

Miscellaneous Information

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. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

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 or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volume measurements are not covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary PGB1721

Client Details

Client	Katherine Town Council - NT
Your Reference	Katherine Twon Council - EPL298-01 - Monthly
Date Issued	17/03/2025

Recommended Holding Time Compliance

No recommended holding time exceedances

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	Yes	No Outliers
Duplicates	Yes	No Outliers
Matrix Spike	No	Matrix Spike Outliers Exist - See detailed list below
Surrogates / Extracted Internal Standards	Yes	No Outliers
QC Frequency	No	QC Frequency Outliers Exist - See detailed list below

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Data Quality Assessment Summary PGB1721

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
TDS | Water	1-8	23/02/2025	28/02/2025	28/02/2025	Yes
Alkalinity Suite | Water	9	19/02/2025	28/02/2025	28/02/2025	Yes
	1-8	23/02/2025	28/02/2025	28/02/2025	Yes
Chloride | Water	9	19/02/2025	28/02/2025	04/03/2025	Yes
	1-8	23/02/2025	28/02/2025	04/03/2025	Yes
Dissolved Cations | Water	9	19/02/2025	04/03/2025	04/03/2025	Yes
	1-8	23/02/2025	28/02/2025	04/03/2025	Yes
Ion Balance | Water	9	19/02/2025	04/03/2025	04/03/2025	Yes
	9	19/02/2025	27/02/2025	14/03/2025	Yes
	1-8	23/02/2025	27/02/2025	14/03/2025	Yes
	1-8	23/02/2025	28/02/2025	04/03/2025	Yes
Sulfate | Water	9	19/02/2025	28/02/2025	04/03/2025	Yes
	1-8	23/02/2025	28/02/2025	04/03/2025	Yes
Total Organic Carbon | Water	9	19/02/2025	01/03/2025	03/05/2025	Yes
	1-8	23/02/2025	01/03/2025	03/05/2025	Yes
Nitrogen - Ammonia | Water	1-8	23/02/2025	28/02/2025	28/02/2025	Yes
Nitrogen - Ammonium by calc | Water	1-6	23/02/2025	28/02/2025	14/03/2025	Yes
BOD | Water	1-8	23/02/2025	10/03/2025	17/03/2025	Yes
COD | Water	9	19/02/2025	28/02/2025	06/03/2025	Yes
	1-8	23/02/2025	28/02/2025	06/03/2025	Yes

Outliers: Matrix Spike

METALS-020|Inorganics - Ionic Balance and Indexes (Water)| Batch BGB5019

Sample ID	Analyte	% Limits	% Recovery
BGB5019-MS1#	Calcium	70 - 130	##[2]
BGB5019-MS1#	Magnesium	70 - 130	##[2]
BGB5019-MS1#	Sodium	70 - 130	##[2]

Outliers: QC Frequency

INORG-091|Inorganics - Common Wastewater Parameters (Water)| Batch BGC1325

Analysis	QC Type	Expected	Reported
BOD	Duplicate	1	0

Quality Control PGB1721

INORG-018 | Inorganics - Physical Parameters (Water) | Batch BGB4873

Analyte	Units	PQL	Blank	DUP1 BGB4873-DUP1# Samp | QC | RPD %	DUP2 BGB4873-DUP2# Samp | QC | RPD %	LCS %
Total Dissolved Solids	mg/L	5.0	<5.0	93800 | 96300 | 2.63	113000 | 110000 | 2.60	101

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-006 | Inorganics - Ionic Balance and Indexes (Water) | Batch BGB5008

Analyte	Units	PQL	Blank	DUP1 PGB1721-01 Samp | QC | RPD %	DUP2 BGB5008-DUP2# Samp | QC | RPD %	LCS %
Bicarbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	301 | 307 | 2.04	591 | 600 | 1.56	[NA]
Carbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0 | <5.0 | [NA]	<5.0 | <5.0 | [NA]	[NA]
Hydroxide OH- as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0 | <5.0 | [NA]	<5.0 | <5.0 | [NA]	[NA]
Total Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	301 | 307 | 2.04	591 | 600 | 1.56	98.6

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-020 | Inorganics - Ionic Balance and Indexes (Water) | Batch BGB5019

Analyte	Units	PQL	Blank	DUP1 BGB5019-DUP1# Samp | QC | RPD %	DUP2 BGB5019-DUP2# Samp | QC | RPD %	LCS %	Spike % BGB5019-MS1#
Calcium	mg/L	0.50	<0.50	46.4 | 46.7 | 0.520	175 | 174 | 0.384	83.9	##[2]
Magnesium	mg/L	0.50	<0.50	56.4 | 57.0 | 1.20	239 | 237 | 0.702	89.2	##[2]
Potassium	mg/L	0.50	<0.50	9.64 | 9.68 | 0.466	33.9 | 34.5 | 1.63	90.4	84.3
Sodium	mg/L	0.50	<0.50	219 | 218 | 0.119	263 | 266 | 1.21	82.7	##[2]
Hardness (calc) equivalent CaCO3	mg/L	3.0	<3.0	348 | 351 | 0.973	1420 | 1410 | 0.604	[NA]	[NA]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-081 | Inorganics - Ionic Balance and Indexes (Water) | Batch BGB5039

Analyte	Units	PQL	Blank	DUP1 PGB1721-01 Samp | QC | RPD %	DUP2 BGB5039-DUP2# Samp | QC | RPD %	LCS %	Spike % PGB1721-02
Chloride	mg/L	1.0	<1.0	4.79 | 4.75 | [NA]	3520 | 3470 | 1.30	89.9	102
Sulfate	mg/L	1.0	<1.0	3.84 | 3.82 | [NA]	599 | 592 | 1.30	86.8	108

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-020 | Inorganics - Ionic Balance and Indexes (Water) | Batch BGC0185

Analyte	Units	PQL	Blank	DUP1 PGB1721-09 Samp | QC | RPD %	DUP2 BGC0185-DUP2# Samp | QC | RPD %	LCS %	Spike % BGC0185-MS1#
Calcium	mg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	18.3 | 18.6 | 1.37	86.6	86.3
Magnesium	mg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	4.83 | 4.91 | 1.69	91.0	90.9
Potassium	mg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	3.95 | 4.02 | 1.68	91.4	93.1
Sodium	mg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	83.6 | 84.6 | 1.22	85.8	87.0
Hardness (calc) equivalent CaCO3	mg/L	3.0	<3.0	<3.0 | <3.0 | [NA]	65.7 | 66.7 | 1.47	[NA]	[NA]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-079 | Inorganics - Carbon, Nitrogen and Sulfur Species (Water) | Batch BGC0028

Analyte	Units	PQL	Blank	DUP1 PGB1721-01 Samp | QC | RPD %	DUP2 BGC0028-DUP2# Samp | QC | RPD %	LCS %	Spike % PGB1721-02
Total Organic Carbon	mg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	108 | 106 | 1.99	102	95.8

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control PGB1721

INORG-057 | Inorganics - Nutrients (Water) | Batch BGB4871

Analyte	Units	PQL	Blank	DUP1 BGB4871-DUP1# Samp | QC | RPD %	DUP2 BGB4871-DUP2# Samp | QC | RPD %	LCS %	Spike % BGB4871-MS1#
Ammonia as N	mg/L	0.0050	<0.0050	0.245 | 0.251 | 2.34	0.550 | 0.557 | 1.20	101	96.2

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-067 | Inorganics - Common Wastewater Parameters (Water) | Batch BGB5027

Analyte	Units	PQL	Blank	DUP1 PGB1721-01 Samp | QC | RPD %	DUP2 BGB5027-DUP2# Samp | QC | RPD %	LCS %
COD	mg O2/L	20	<20	<20 | <20 | [NA]	<20 | <20 | [NA]	104

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

QC Comments

Identifier	Description
[2]	Spike recovery is not applicable due to the relatively high analyte background in the sample (>3* spike level). However, the LCS recovery is within acceptance criteria.

Envirolab Services (WA) Pty Ltd trading as MPL Laboratories
ABN 53 140 099 207
16-18 Hayden Court Myaree WA 6154
ph +61 8 9317 2505
lab@mpl.com.au
www.mpl.com.au

Certificate of Analysis PGC1080

Client Details

Client	Katherine Town Council - NT
Contact	Brett Kimpton
Address	PO Box 1071, KATHERINE, NT, 0851

Sample Details

Your Reference	Katherine Town Council - EPL298-01 - Monthly
Number of Samples	9 Water
Date Samples Received	18/03/2025
Date Instructions Received	18/03/2025

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 soils and on an as received basis for other matrices.

Report Details

Date Results Requested by	03/04/2025
Date of Issue	31/03/2025

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Authorisation Details

Results Approved By	Jessica Miller, Microbiological Supervisor Lien Tang, Assistant Operations Manager Lucas Yii, Inorganics Team Leader Varsha Ho Wing, Inorganics and Metals Supervisor
Laboratory Manager	Michael Kubiak

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Samples in this Report

Envirolab ID	Sample ID	Matrix	Date Sampled	Date Received
PGC1080-01	GWA (RN031131)	Water	16/03/2025	18/03/2025
PGC1080-02	GWE (RN022487)	Water	16/03/2025	18/03/2025
PGC1080-03	GWB01	Water	16/03/2025	18/03/2025
PGC1080-04	GWB02	Water	16/03/2025	18/03/2025
PGC1080-05	GWB03	Water	16/03/2025	18/03/2025
PGC1080-06	GWB04	Water	16/03/2025	18/03/2025
PGC1080-07	Field Blank	Water	16/03/2025	18/03/2025
PGC1080-08	Duplicate	Water	16/03/2025	18/03/2025
PGC1080-09	Trip Blank	Water	12/03/2025	18/03/2025

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Inorganics - Physical Parameters (Water)

Envirolab ID	Units	PQL	PGC1080-01	PGC1080-02	PGC1080-03	PGC1080-04	PGC1080-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			16/03/2025	16/03/2025	16/03/2025	16/03/2025	16/03/2025
Total Dissolved Solids	mg/L	5.0	350	320	550	530	320

Envirolab ID	Units	PQL	PGC1080-06	PGC1080-07	PGC1080-08	PGC1080-09
Your Reference			GWB04	Field Blank	Duplicate	Trip Blank
Date Sampled			16/03/2025	16/03/2025	16/03/2025	12/03/2025
Total Dissolved Solids	mg/L	5.0	490	<5.0	380	<5.0

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Inorganics - Ionic Balance and Indexes (Water)

Envirolab ID	Units	PQL	PGC1080-01	PGC1080-02	PGC1080-03	PGC1080-04	PGC1080-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			16/03/2025	16/03/2025	16/03/2025	16/03/2025	16/03/2025
Bicarbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	330	300	430	450	320
Carbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Hydroxide OH- as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Total Alkalinity as CaCO3	mg/L as CaCO3	5.0	330	300	430	450	320
Chloride	mg/L	1.0	3.5	7.1	40	13	6.6
Sulfate	mg/L	1.0	8.0	4.0	19	4.0	1.9
Calcium	mg/L	0.50	77	54	100	110	66
Magnesium	mg/L	0.50	34	35	48	50	36
Potassium	mg/L	0.50	5.0	7.6	12	5.6	3.8
Sodium	mg/L	0.50	5.7	13	24	16	7.5
Hardness (calc) equivalent CaCO3	mg/L	3.0	330	280	450	480	310
Ionic Balance	%		1.5	1.9	1.4	4.9	0.67
Total Anions	mg/L	7.0	340	310	480	470	330
Anions as meq	meq/L	0.59	5.6	5.2	8.5	7.9	5.5
Total Cations	mg/L	2.0	120	110	180	180	110
Cations as meq	meq/L	0.10	7.0	6.4	10	10	6.7

Envirolab ID	Units	PQL	PGC1080-06	PGC1080-07	PGC1080-08	PGC1080-09
Your Reference			GWB04	Field Blank	Duplicate	Trip Blank
Date Sampled			16/03/2025	16/03/2025	16/03/2025	12/03/2025
Bicarbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	500	<5.0	360	<5.0
Carbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0	<5.0
Hydroxide OH- as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0	<5.0
Total Alkalinity as CaCO3	mg/L as CaCO3	5.0	500	<5.0	360	<5.0
Chloride	mg/L	1.0	4.9	<1.0	4.5	<1.0
Sulfate	mg/L	1.0	6.0	<1.0	9.3	<1.0
Calcium	mg/L	0.50	92	<0.50	81	<0.50
Magnesium	mg/L	0.50	67	<0.50	36	<0.50
Potassium	mg/L	0.50	8.7	<0.50	4.9	<0.50
Sodium	mg/L	0.50	8.4	<0.50	5.6	<0.50
Hardness (calc) equivalent CaCO3	mg/L	3.0	510	<3.0	350	<3.0
Ionic Balance	%		2.1	-97 [1]	-0.46	-98 [1]
Total Anions	mg/L	7.0	510	<7.0	370	<7.0
Anions as meq	meq/L	0.59	8.5	<0.59	6.2	<0.59
Total Cations	mg/L	2.0	180	<2.0	130	<2.0
Cations as meq	meq/L	0.10	11	<0.10	7.4	<0.10

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Inorganics - Carbon, Nitrogen and Sulfur Species (Water)

Envirolab ID	Units	PQL	PGC1080-01	PGC1080-02	PGC1080-03	PGC1080-04	PGC1080-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			16/03/2025	16/03/2025	16/03/2025	16/03/2025	16/03/2025
Total Organic Carbon	mg/L	1.0	<1.0	<1.0	1.5	<1.0	<1.0

Envirolab ID	Units	PQL	PGC1080-06	PGC1080-07	PGC1080-08	PGC1080-09
Your Reference			GWB04	Field Blank	Duplicate	Trip Blank
Date Sampled			16/03/2025	16/03/2025	16/03/2025	12/03/2025
Total Organic Carbon	mg/L	1.0	<1.0	<1.0	<1.0	<1.0

Certificate of Analysis PGC1080

Inorganics - Nutrients (Water)

Envirolab ID	Units	PQL	PGC1080-01	PGC1080-02	PGC1080-03	PGC1080-04	PGC1080-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			16/03/2025	16/03/2025	16/03/2025	16/03/2025	16/03/2025
Ammonia as N	mg/L	0.0050	<0.0050	2.8	0.30	0.012	0.010
Free Ammonia (unionised) as N by calculation*	mg/L	0.0070	<0.0070	1.1	0.082	<0.0070	<0.0070
Ammonium (NH4+) as N by calculation	mg/L	0.0070	<0.0070	1.6	0.22	0.012	0.010

Envirolab ID	Units	PQL	PGC1080-06	PGC1080-07	PGC1080-08	PGC1080-09
Your Reference			GWB04	Field Blank	Duplicate	Trip Blank
Date Sampled			16/03/2025	16/03/2025	16/03/2025	12/03/2025
Ammonia as N	mg/L	0.0050	0.025	<0.0050	<0.0050	<0.0050
Free Ammonia (unionised) as N by calculation*	mg/L	0.0070	<0.0070	<0.0070	<0.0070	<0.0070
Ammonium (NH4+) as N by calculation	mg/L	0.0070	0.025	<0.0070	<0.0070	<0.0070

Certificate of Analysis PGC1080

Inorganics - Common Wastewater Parameters (Water)

Envirolab ID	Units	PQL	PGC1080-01	PGC1080-02	PGC1080-03	PGC1080-04	PGC1080-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			16/03/2025	16/03/2025	16/03/2025	16/03/2025	16/03/2025
BOD	mg/L	5.0	14	11	17	15	13
COD	mg O2/L	20	<20	<20	<20	<20	<20

Envirolab ID	Units	PQL	PGC1080-06	PGC1080-07	PGC1080-08	PGC1080-09
Your Reference			GWB04	Field Blank	Duplicate	Trip Blank
Date Sampled			16/03/2025	16/03/2025	16/03/2025	12/03/2025
BOD	mg/L	5.0	<5.0	14	17	12
COD	mg O2/L	20	<20	<20	<20	<20

Certificate of Analysis PGC1080

General - Field Data (Water)

Envirolab ID	Units	PQL	PGC1080-01	PGC1080-02	PGC1080-03	PGC1080-04	PGC1080-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			16/03/2025	16/03/2025	16/03/2025	16/03/2025	16/03/2025
pH (Client Supplied)*	pH units		6.50	8.70	8.50	8.30	7.10
Temperature (Client Supplied)*	o C		32.0	38.0	36.0	38.0	36.0

Envirolab ID	Units	PQL	PGC1080-06	PGC1080-07
Your Reference			GWB04	Field Blank
Date Sampled			16/03/2025	16/03/2025
pH (Client Supplied)*	pH units		6.90	6.80
Temperature (Client Supplied)*	o C		36.0	26.0

Result Comments

Identifier	Description
[1]	Ion balance is outside of acceptance criteria, however, the major cations/anions are near or below the PQL and hence the analytical error may be more significant resulting in a poor cation-anion balance.

Method Summary

Method ID	Methodology Summary
Calc	Calculation
Calc - ION	Calculation
Field Data	Field Data supplied by client
INORG-006	Alkalinity - determined titrimetrically based on APHA latest edition 2320-B. Solids reported from a 1:5 water extract unless otherwise specified. Total Carbon Dioxide - determined by calculation in accordance with APHA latest edition,4500-CO2 D.
INORG-018	Total Dissolved Solids - determined gravimetrically. The solids are dried at 180±10°C. NOTE: Where the EC of the sample is <100µS/cm, the TDS will typically be below 70mg/L (as the sample is very likely to be at least drinking water quality). Therefore to ensure data quality for TDS, the TDS is typically calculated as per the equation: TDS = EC*0.6
INORG-040	The concentrations of the major ions (mg/L) are converted to milliequivalents and summed. The ionic balance should be within +/- 15% i.e. total anions = total cations +/-15%.
INORG-057	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.
INORG-057_CALC	Calculation of Ammonium as N. Assumes all Ammonia is present as Ammonium unless samplpe pH and temperature provided.
INORG-067	Samples are digested in acid with a known excess of potassium dichromate then the colour change is determined by discrete analyser or UV-VIS in accordance with APHA latest edition 5220 D.
INORG-079	Carbon forms (inorganic, organic, total) determined using a TOC/NDIR analyser via combustion. Dissolved aqueous\forms require filtering prior to determination.
INORG-081	Anions determined by Ion Chromatography. Waters samples are filtered on receipt prior to analysis. Solids are analysed from a water extract. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
INORG-091	BOD and/or cBOD - Analysed in accordance with APHA latest edition 5210 D.
METALS-020	Determination of various metals by ICP-OES. Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation.

Result Definitions

Identifier	Description
NR	Not reported
NEPM	National Environment Protection Measure
NS	Not specified
LCS	Laboratory Control Sample
RPD	Relative Percent Difference
>	Greater than
<	Less than
PQL	Practical Quantitation Limit
INS	Insufficient sample for this test
NA	Test not required
NT	Not tested
DOL	Samples rejected due to particulate overload (air filters only)
RFD	Samples rejected due to filter damage (air filters only)
RUD	Samples rejected due to uneven deposition (air filters only)
##	Indicates a laboratory acceptance criteria outlier, for further details, see Result Comments and/or QC Comments

Quality Control Definitions

Blank

This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, and is determined by processing solvents and reagents in exactly the same manner as for samples.

Surrogate Spike

Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

LCS (Laboratory Control Sample)

This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Matrix Spike

A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

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.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

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 QAQC tables for details (available on request); <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; 60-140% for organics (+/-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 typically insufficient in order to satisfy laboratory QA/QC protocols.

Miscellaneous Information

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. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

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 or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volume measurements are not covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary PGC1080

Client Details

Client	Katherine Town Council - NT
Your Reference	Katherine Town Council - EPL298-01 - Monthly
Date Issued	31/03/2025

Recommended Holding Time Compliance

Recommended holding time exceedances exist - See detailed list below

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	Yes	No Outliers
Duplicates	Yes	No Outliers
Matrix Spike	No	Matrix Spike Outliers Exist - See detailed list below
Surrogates / Extracted Internal Standards	Yes	No Outliers
QC Frequency	No	QC Frequency Outliers Exist - See detailed list below

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Data Quality Assessment Summary PGC1080

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
TDS | Water	9	12/03/2025	20/03/2025	20/03/2025	No
	1-8	16/03/2025	20/03/2025	20/03/2025	Yes
Alkalinity Suite | Water	9	12/03/2025	19/03/2025	21/03/2025	Yes
	1-8	16/03/2025	19/03/2025	21/03/2025	Yes
Chloride | Water	9	12/03/2025	20/03/2025	21/03/2025	Yes
	1-8	16/03/2025	20/03/2025	21/03/2025	Yes
Dissolved Cations | Water	9	12/03/2025	21/03/2025	25/03/2025	Yes
	1-8	16/03/2025	21/03/2025	25/03/2025	Yes
Ion Balance | Water	9	12/03/2025	19/03/2025	27/03/2025	Yes
	9	12/03/2025	21/03/2025	25/03/2025	Yes
	1-8	16/03/2025	19/03/2025	27/03/2025	Yes
	1-8	16/03/2025	21/03/2025	25/03/2025	Yes
Sulfate | Water	9	12/03/2025	20/03/2025	21/03/2025	Yes
	1-8	16/03/2025	20/03/2025	21/03/2025	Yes
Total Organic Carbon | Water	9	12/03/2025	20/03/2025	20/03/2025	Yes
	1-8	16/03/2025	20/03/2025	20/03/2025	Yes
Nitrogen - Ammonia | Water	9	12/03/2025	20/03/2025	20/03/2025	Yes
	1-8	16/03/2025	20/03/2025	20/03/2025	Yes
Nitrogen - Ammonium by calc | Water	9	12/03/2025	20/03/2025	25/03/2025	Yes
	1-8	16/03/2025	20/03/2025	25/03/2025	Yes
BOD | Water	9	12/03/2025	24/03/2025	31/03/2025	Yes
	1-8	16/03/2025	24/03/2025	31/03/2025	Yes
COD | Water	9	12/03/2025	24/03/2025	27/03/2025	Yes
	1-8	16/03/2025	24/03/2025	27/03/2025	Yes

Outliers: Matrix Spike

METALS-020|Inorganics - Ionic Balance and Indexes (Water)| Batch BGC3632

Sample ID	Analyte	% Limits	% Recovery
BGC3632-MS1#	Calcium	70 - 130	##[2]
BGC3632-MS1#	Magnesium	70 - 130	##[2]
BGC3632-MS1#	Potassium	70 - 130	##[2]
BGC3632-MS1#	Sodium	70 - 130	##[2]

Data Quality Assessment Summary PGC1080

Outliers: QC Frequency

INORG-091 | Inorganics - Common Wastewater Parameters (Water) | Batch BGC4001

Analysis	QC Type	Expected	Reported
BOD	Blank	2	1
	Duplicate	3	0
	LCS	2	1

Quality Control PGC1080

INORG-018 | Inorganics - Physical Parameters (Water) | Batch BGC3411

Analyte	Units	PQL	Blank	DUP1 BGC3411-DUP1# Samp | QC | RPD %	DUP2 PGC1080-01 Samp | QC | RPD %	LCS %
Total Dissolved Solids	mg/L	5.0	<5.0	12500 | 14000 | 11.3	348 | 337 | 3.21	94.2

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-006 | Inorganics - Ionic Balance and Indexes (Water) | Batch BGC3095

Analyte	Units	PQL	Blank	DUP1 PGC1080-01 Samp | QC | RPD %	DUP2 BGC3095-DUP2# Samp | QC | RPD %	LCS %
Bicarbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	327 | 337 | 2.95	137 | 139 | 1.39	[NA]
Carbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0 | <5.0 | [NA]	<5.0 | <5.0 | [NA]	[NA]
Hydroxide OH- as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0 | <5.0 | [NA]	<5.0 | <5.0 | [NA]	[NA]
Total Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	327 | 337 | 2.95	137 | 139 | 1.39	98.8

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-081 | Inorganics - Ionic Balance and Indexes (Water) | Batch BGC3325

Analyte	Units	PQL	Blank	DUP1 BGC3325-DUP1# Samp | QC | RPD %	DUP2 PGC1080-06 Samp | QC | RPD %	LCS %	Spike % BGC3325-MS1#
Chloride	mg/L	1.0	<1.0	10.2 | 10.2 | 0.0354	4.89 | 4.89 | [NA]	99.6	97.3
Sulfate	mg/L	1.0	<1.0	1.03 | 1.02 | [NA]	6.00 | 5.99 | 0.0634	93.4	105

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-020 | Inorganics - Ionic Balance and Indexes (Water) | Batch BGC3632

Analyte	Units	PQL	Blank	DUP1 BGC3632-DUP1# Samp | QC | RPD %	DUP2 BGC3632-DUP2# Samp | QC | RPD %	LCS %	Spike % BGC3632-MS1#
Calcium	mg/L	0.50	<0.50	1.90 | 1.93 | [NA]	9.17 | 9.22 | 0.489	100	##[2]
Magnesium	mg/L	0.50	<0.50	10.4 | 10.5 | 0.661	5.31 | 5.30 | 0.228	100	##[2]
Potassium	mg/L	0.50	<0.50	7.16 | 7.17 | 0.169	0.571 | 0.570 | [NA]	99.2	##[2]
Sodium	mg/L	0.50	<0.50	149 | 151 | 1.01	2.83 | 2.90 | 2.63	99.7	##[2]
Hardness (calc) equivalent CaCO3	mg/L	3.0	<3.0	47.6 | 48.0 | 0.748	44.8 | 44.8 | 0.140	[NA]	[NA]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-079 | Inorganics - Carbon, Nitrogen and Sulfur Species (Water) | Batch BGC3263

Analyte	Units	PQL	Blank	DUP1 BGC3263-DUP1# Samp | QC | RPD %	DUP2 BGC3263-DUP2# Samp | QC | RPD %	LCS %	Spike % BGC3263-MS1#
Total Organic Carbon	mg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	33.4 | 35.6 | 6.41	101	106

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-057 | Inorganics - Nutrients (Water) | Batch BGC3221

Analyte	Units	PQL	Blank	DUP1 BGC3221-DUP1# Samp | QC | RPD %	DUP2 PGC1080-01 Samp | QC | RPD %	LCS %	Spike % BGC3221-MS1#
Ammonia as N	mg/L	0.0050	<0.0050	0.0446 | 0.0418 | 6.65	<0.0050 | <0.0050 | [NA]	90.8	93.7

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-067 | Inorganics - Common Wastewater Parameters (Water) | Batch BGC3975

Analyte	Units	PQL	Blank	DUP1 PGC1080-01 Samp | QC | RPD %	DUP2 PGC1080-09 Samp | QC | RPD %	LCS %
COD	mg O2/L	20	<20	<20 | <20 | [NA]	<20 | <20 | [NA]	105

Quality Control PGC1080

INORG-091 | Inorganics - Common Wastewater Parameters (Water) | Batch BGC4001

Analyte	Units	PQL	Blank	LCS %
BOD	mg/L	5.0	<5.0	72.5

QC Comments

Identifier	Description
[2]	Spike recovery is not applicable due to the relatively high analyte background in the sample (>3* spike level). However, the LCS recovery is within acceptance criteria.

Envirolab Services (WA) Pty Ltd trading as MPL Laboratories
ABN 53 140 099 207
16-18 Hayden Court Myaree WA 6154
ph +61 8 9317 2505
lab@mpl.com.au
www.mpl.com.au

Certificate of Analysis PGD1981

Client Details

Client	Katherine Town Council - NT
Contact	Brett Kimpton
Address	PO Box 1071, KATHERINE, NT, 0851

Sample Details

Your Reference	Katherine Town Council - EPL298 - Quarterly
Number of Samples	2 Water
Date Samples Received	30/04/2025
Date Instructions Received	30/04/2025

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 soils and on an as received basis for other matrices.

Report Details

Date Results Requested by	16/05/2025
Date of Reissue	26/05/2025 - This report supercedes previous report, see amendment history for details

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Authorisation Details

Results Approved By	Amanda Chui, Air & LC Supervisor Ben Carpenter, Metals Technician Diego Bigolin, Supervisor, Inorganics Hien Luong, Chemist - FAS Lien Tang, Assistant Operations Manager Lucas Yii, Inorganics Team Leader Michael Mowle, Development Chemist - Inorganics and Metals Paul Nottle, Operations Manager Travis Carey, Organics Supervisor
Laboratory Manager	Michael Kubiak

Report Amendment History

Revision	Reason for Amendment
R-01	Ammonium and Free Ammonia calculations added.

Certificate of Analysis PGD1981

Samples in this Report

Envirolab ID	Sample ID	Matrix	Date Sampled	Date Received
PGD1981-01	GWA (RN031131)	Water	28/04/2025	30/04/2025
PGD1981-02	Trip blank	Water	23/04/2025	30/04/2025

Volatile TRH and BTEX (Water)

Envirolab ID	Units	PQL	PGD1981-01	PGD1981-02
Your Reference			GWA (RN031131)	Trip blank
Date Sampled			28/04/2025	23/04/2025
TRH C6-C9	µg/L	10	<10	<10
TRH C6-C10	µg/L	10	<10	<10
TRH C6-C10 less BTEX (F1)	µg/L	10	<10	<10
Methyl tert butyl ether (MTBE)	µg/L	1.0	<1.0	<1.0
Benzene	µg/L	1.0	<1.0	<1.0
Toluene	µg/L	1.0	<1.0	<1.0
Ethylbenzene	µg/L	1.0	<1.0	<1.0
meta+para Xylene	µg/L	2.0	<2.0	<2.0
ortho-Xylene	µg/L	1.0	<1.0	<1.0
Total +ve Xylenes	µg/L	1.0	<1.0	<1.0
Naphthalene (value used in F2 calc)	µg/L	1.0	<1.0	<1.0
Total +ve BTEX	µg/L	1.0	<1.0	<1.0
Surrogate Dibromofluoromethane	%		*99.9*	*102*
Surrogate Toluene-D8	%		*106*	*105*
Surrogate 4-Bromofluorobenzene	%		*88.0*	*90.4*

Semi-volatile TRH (Water)

Envirolab ID	Units	PQL	PGD1981-01	PGD1981-02
Your Reference			GWA (RN031131)	Trip blank
Date Sampled			28/04/2025	23/04/2025
TRH C10-C14	µg/L	50	<50	<50
TRH C15-C28	µg/L	100	<100	<100
TRH C29-C36	µg/L	100	<100	<100
Total +ve TRH C10-C36	µg/L	50	<50	<50
TRH >C10-C16	µg/L	50	<50	<50
TRH >C10-C16 less Naphthalene F2	µg/L	50	<50	<50
TRH >C16-C34 (F3)	µg/L	100	<100	<100
TRH >C34-C40 (F4)	µg/L	100	<100	<100
Total +ve TRH >C10-C40	µg/L	50	<50	<50
Surrogate o-Terphenyl	%		*84.1*	*92.1*

Polycyclic Aromatic Hydrocarbons (Water)

Envirolab ID	Units	PQL	PGD1981-01
Your Reference			GWA (RN031131)
Date Sampled			28/04/2025
Naphthalene	µg/L	0.10	<0.10
Acenaphthylene	µg/L	0.10	<0.10
Acenaphthene	µg/L	0.10	<0.10
Fluorene	µg/L	0.10	<0.10
Phenanthrene	µg/L	0.10	<0.10
Anthracene	µg/L	0.10	<0.10
Fluoranthene	µg/L	0.10	<0.10
Pyrene	µg/L	0.10	<0.10
Benzo(a)anthracene	µg/L	0.10	<0.10
Chrysene	µg/L	0.10	<0.10
Benzo(b,j,k)fluoranthene	µg/L	0.20	<0.20
Benzo(a)pyrene	µg/L	0.10	<0.10
Indeno(1,2,3-c,d)pyrene	µg/L	0.10	<0.10
Dibenzo(a,h)anthracene	µg/L	0.10	<0.10
Benzo(g,h,i)perylene	µg/L	0.10	<0.10
Total +ve PAH	µg/L	0.10	<0.10
Surrogate p-Terphenyl-D14	%		*76.6*

Polychlorinated Biphenyls (Water)

Envirolab ID	Units	PQL	PGD1981-01
Your Reference			GWA (RN031131)
Date Sampled			28/04/2025
Aroclor 1016	µg/L	2.0	<2.0
Aroclor 1221	µg/L	2.0	<2.0
Aroclor 1232	µg/L	2.0	<2.0
Aroclor 1242	µg/L	2.0	<2.0
Aroclor 1248	µg/L	2.0	<2.0
Aroclor 1254	µg/L	2.0	<2.0
Aroclor 1260	µg/L	2.0	<2.0
Total +ve PCB (1016-1260)	µg/L	2.0	<2.0
Surrogate 2-Fluorobiphenyl	%		*75.3*

Acid Extractable Low Level Metals (Water)

Envirolab ID	Units	PQL	PGD1981-01
Your Reference			GWA (RN031131)
Date Sampled			28/04/2025
Aluminium	µg/L	10	<10
Cadmium	µg/L	0.10	<0.10
Chromium	µg/L	1.0	<1.0
Copper	µg/L	1.0	19
Iron	µg/L	10	320
Manganese	µg/L	1.0	1.7
Nickel	µg/L	1.0	<1.0
Lead	µg/L	1.0	1.8
Selenium	µg/L	1.0	<1.0
Zinc	µg/L	1.0	35

Dissolved Low Level Metals (Water)

Envirolab ID	Units	PQL	PGD1981-01
Your Reference			GWA (RN031131)
Date Sampled			28/04/2025
Aluminium	µg/L	10	<10
Cadmium	µg/L	0.10	<0.10
Chromium	µg/L	1.0	<1.0
Copper	µg/L	1.0	2.6
Iron	µg/L	10	<10
Manganese	µg/L	1.0	<1.0
Nickel	µg/L	1.0	<1.0
Lead	µg/L	1.0	<1.0
Selenium	µg/L	1.0	<1.0
Zinc	µg/L	1.0	17

Certificate of Analysis PGD1981

Inorganics - Physical Parameters (Water)

Envirolab ID	Units	PQL	PGD1981-01
Your Reference			GWA (RN031131)
Date Sampled			28/04/2025
Total Dissolved Solids	mg/L	5.0	330

Certificate of Analysis PGD1981

Inorganics - Physical Parameters (Water) - Analysed By Envirolab Services Sydney

Envirolab ID	Units	PQL	PGD1981-01
Your Reference			GWA (RN031131)
Date Sampled			28/04/2025
Volatile Fatty Acids*	mg/L	5.0	31

Inorganics - Ionic Balance and Indexes (Water)

Envirolab ID	Units	PQL	PGD1981-01
Your Reference			GWA (RN031131)
Date Sampled			28/04/2025
Bicarbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	250
Carbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0
Hydroxide OH- as CaCO3	mg/L as CaCO3	5.0	<5.0
Total Alkalinity as CaCO3	mg/L as CaCO3	5.0	250
Chloride	mg/L	1.0	3.5
Sulfate	mg/L	1.0	4.6
Calcium	mg/L	0.50	78
Magnesium	mg/L	0.50	36
Potassium	mg/L	0.50	5.3
Sodium	mg/L	0.50	5.8
Hardness (calc) equivalent CaCO3	mg/L	3.0	340
Ionic Balance	%		17 [1]
Total Anions	mg/L	7.0	260
Anions as meq	meq/L	0.59	4.3
Total Cations	mg/L	2.0	130
Cations as meq	meq/L	0.10	7.3

Certificate of Analysis PGD1981

Inorganics - Carbon, Nitrogen and Sulfur Species (Water)

Envirolab ID	Units	PQL	PGD1981-01
Your Reference			GWA (RN031131)
Date Sampled			28/04/2025
Total Organic Carbon	mg/L	1.0	<1.0

Inorganics - Speciated Cr (III/VI) and Fe (II/III) (Water)

Envirolab ID	Units	PQL	PGD1981-01
Your Reference			GWA (RN031131)
Date Sampled			28/04/2025
Hexavalent Chromium	mg/L	0.0050	<0.0050
Hexavalent Chromium (Total)	mg/L	0.0050	<0.0050
Trivalent Chromium	mg/L	0.0050	<0.0050
Trivalent Chromium (Total)	mg/L	0.0050	<0.0050

Inorganics - Nutrients (Water)

Envirolab ID	Units	PQL	PGD1981-01
Your Reference			GWA (RN031131)
Date Sampled			28/04/2025
Ammonia as N	mg/L	0.0050	0.012
Free Ammonia (unionised) as N by calculation*	mg/L	0.0070	<0.0070
Ammonium (NH4+) as N by calculation	mg/L	0.0070	0.012
Nitrate as N	mg/L	0.0050	0.089
Nitrate as NO3 by calculation	mg/L	0.020	0.39
Total Nitrogen	mg/L	0.10	0.52
Total Phosphorus	mg/L	0.010	<0.010

Certificate of Analysis PGD1981

Inorganics - Common Wastewater Parameters (Water)

Envirolab ID	Units	PQL	PGD1981-01
Your Reference			GWA (RN031131)
Date Sampled			28/04/2025
BOD	mg/L	5.0	9.1
COD	mg O2/L	20	<20

PFAS Extended List (Water) - Analysed By Envirolab Services Sydney

Envirolab ID	Units	PQL	PGD1981-01	PGD1981-02
Your Reference			GWA (RN031131)	Trip blank
Date Sampled			28/04/2025	23/04/2025
Perfluorobutanesulfonic acid (PFBS)	µg/L	0.010	<0.010	<0.010
Perfluoropentanesulfonic acid (PFPeS)	µg/L	0.010	<0.010	<0.010
Perfluorohexanesulfonic acid (PFHxS)	µg/L	0.010	0.026	<0.010
Perfluoroheptanesulfonic acid (PFHpS)	µg/L	0.010	<0.010	<0.010
Perfluorooctanesulfonic acid (PFOS)	µg/L	0.010	0.035	<0.010
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.020	<0.020	<0.020
Perfluorobutanoic acid (PFBA)	µg/L	0.020	0.16	<0.020
Perfluoropentanoic acid (PFPeA)	µg/L	0.020	0.24	<0.020
Perfluorohexanoic acid (PFHxA)	µg/L	0.010	0.13	<0.010
Perfluoroheptanoic acid (PFHpA)	µg/L	0.010	0.11	<0.010
Perfluorooctanoic acid (PFOA)	µg/L	0.010	0.064	<0.010
Perfluorononanoic acid (PFNA)	µg/L	0.010	<0.010	<0.010
Perfluorodecanoic acid (PFDA)	µg/L	0.020	<0.020	<0.020
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.020	<0.020	<0.020
Perfluorododecanoic acid (PFDoDA)	µg/L	0.050	<0.050	<0.050
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.10	<0.10	<0.10
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.50	<0.50	<0.50
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.010	<0.010	<0.010
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.010	<0.010	<0.010
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.020	<0.020	<0.020
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.020	<0.020	<0.020
Perfluorooctane sulfonamide (FOSA)	µg/L	0.10	<0.10	<0.10
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.050	<0.050	<0.050
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.10	<0.10	<0.10
N-Methyl perfluorooctane sulfonamidoethanol	µg/L	0.050	<0.050	<0.050
N-Ethyl perfluorooctane sulfonamidoethanol	µg/L	0.50	<0.50	<0.50
N-Methyl perfluorooctane sulfonamidoacetic acid	µg/L	0.020	<0.020	<0.020
N-Ethyl perfluorooctane sulfonamidoacetic acid	µg/L	0.020	<0.020	<0.020
Surrogate 13C8 PFOS	%		*108*	*106*
Surrogate 13C2 PFOA	%		*98.6*	*97.8*
Total +ve PFHxS+PFOS	µg/L	0.010	0.061	<0.010
Total +ve PFOA+PFOS	µg/L	0.010	0.099	<0.010
Total +ve PFAS	µg/L	0.010	0.77	<0.010
Extraction Internal Standard 13C3 PFBS	%		*99.4*	*97.9*
Extraction Internal Standard 18O2 PFHxS	%		*106*	*104*
Extraction Internal Standard 13C4 PFOS	%		*105*	*100*
Extraction Internal Standard 13C4 PFBA	%		*97.7*	*101*
Extraction Internal Standard 13C3 PFPeA	%		*95.5*	*98.6*
Extraction Internal Standard 13C2 PFHxA	%		*94.8*	*96.7*
Extraction Internal Standard 13C4 PFHpA	%		*96.3*	*97.0*
Extraction Internal Standard 13C4 PFOA	%		*113*	*111*
Extraction Internal Standard 13C5 PFNA	%		*111*	*112*

PFAS Extended List (Water) - Analysed By Envirolab Services Sydney

Envirolab ID	Units	PQL	PGD1981-01	PGD1981-02
Your Reference			GWA (RN031131)	Trip blank
Date Sampled			28/04/2025	23/04/2025
Extraction Internal Standard 13C2 PFDA	%		*109*	*109*
Extraction Internal Standard 13C2 PFUnDA	%		*107*	*103*
Extraction Internal Standard 13C2 PFDoDA	%		*132*	*125*
Extraction Internal Standard 13C2 PFTeDA	%		*99.5*	*97.8*
Extraction Internal Standard 13C2 4:2FTS	%		*131*	*126*
Extraction Internal Standard 13C2 6:2FTS	%		*139*	*134*
Extraction Internal Standard 13C2 8:2FTS	%		*158 [6]*	*151 [6]*
Extraction Internal Standard 13C8 FOSA	%		*112*	*114*
Extraction Internal Standard d3 N MeFOSA	%		*103*	*102*
Extraction Internal Standard d5 N EtFOSA	%		*97.0*	*97.6*
Extraction Internal Standard d7 N MeFOSE	%		*114*	*108*
Extraction Internal Standard d9 N EtFOSE	%		*106*	*100*
Extraction Internal Standard d3 N MeFOSAA	%		*155 [6]*	*162 [6]*
Extraction Internal Standard d5 N EtFOSAA	%		*156 [6]*	*153 [6]*

Certificate of Analysis PGD1981

General - Field Data (Water)

Envirolab ID	Units	PQL	PGD1981-01
Your Reference			GWA (RN031131)
Date Sampled			28/04/2025
pH (Client Supplied)*	pH units		6.83
Temperature (Client Supplied)*	o C		31.2

Result Comments

Identifier	Description
[1]	The mass inbalance may be caused by other ions that have not been measured.
[6]	For PFAS Extracted Internal Standards denoted with ## or being outside the 50-150% acceptance range, the respective target analyte results may be unaffected, in other circumstances the PQL has been raised to accommodate the outlier(s).

Method Summary

Method ID	Methodology Summary
Calc	Calculation
Calc - ION	Calculation
Calc - Trivalent Cr	Calculation
Field Data	Field Data supplied by client
INORG-006	Alkalinity - determined titrimetrically based on APHA latest edition 2320-B. Solids reported from a 1:5 water extract unless otherwise specified. Total Carbon Dioxide - determined by calculation in accordance with APHA latest edition,4500-CO2 D.
INORG-018	Total Dissolved Solids - determined gravimetrically. The solids are dried at 180±10°C. NOTE: Where the EC of the sample is <100µS/cm, the TDS will typically be below 70mg/L (as the sample is very likely to be at least drinking water quality). Therefore to ensure data quality for TDS, the TDS is typically calculated as per the equation: TDS = EC*0.6
INORG-040	The concentrations of the major ions (mg/L) are converted to milliequivalents and summed. The ionic balance should be within +/- 15% i.e. total anions = total cations +/-15%.
INORG-055	Nitrate/Nitrite/NOx/TKN - determined colourimetrically. Waters samples are filtered on receipt prior to analysis. Soils/solids are analysed following a water extraction.
INORG-057	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.
INORG-057_CALC	Calculation of Ammonium as N. Assumes all Ammonia is present as Ammonium unless samplpe pH and temperature provided.
INORG-060_TP	Total Phosphorus - determined colourimetrically using APHA latest edition 4500-P J. Water samples are filtered on receipt prior to analysis. Soils are analysed from a water extract.
INORG-067	Samples are digested in acid with a known excess of potassium dichromate then the colour change is determined by discrete analyser or UV-VIS in accordance with APHA latest edition 5220 D.
INORG-079	Carbon forms (inorganic, organic, total) determined using a TOC/NDIR analyser via combustion. Dissolved aqueous\forms require filtering prior to determination.
INORG-081	Anions determined by Ion Chromatography. Waters samples are filtered on receipt prior to analysis. Solids are analysed from a water extract. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
INORG-091	BOD and/or cBOD - Analysed in accordance with APHA latest edition 5210 D.
INORG-111	Volatile Fatty Acids determined by distillation and titration.
INORG-118	Hexavalent Chromium by Ion Chromatographic separation and colourimetric determination. Waters samples are filtered prior to analysis. Solids are extracted with an alkaline buffered solution, for air sampling media the same alkali extraction can be used or alternatives from NIOSH/OSHA. For aqueous samples, Total Hexavalent Chromium includes the dissolved Hexavalent Chromium and any Hexavalent Chromium solubilised by the preservative i.e. Sodium Hydroxide from any particulate that may be present.
INORG-127	Total Nitrogen by high temperature catalytic combustion with chemiluminescence detection. Organic Carbon forms (inorganic, organic, total) determined using a TOC/NDIR analyser via combustion. Dissolved forms require filtering prior to determination.
METALS-020	Determination of various metals by ICP-OES. Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation.
METALS-022	Determination of various metals by ICP-MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements. Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation.
ORG-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. 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 (>C10-C40).
ORG-021/022/025_PCB	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD and/or GC-MS/GC-MSMS.

Method Summary

Method ID	Methodology Summary
ORG-022_PAH	Determination of semi-volatile organic compounds (SVOCs) by GC-MS. Water samples are extracted by LLE and solids using DCM/Acetone/Methanol. For PAHs:- Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. 1. 'TEQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'TEQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'TEQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, for Total +ve calculations, the PQL is reflective of the lowest individual PQL and therefore, for example, "Total +ve PAHs" is simply a sum of the positive individual PAHs.
ORG-023_F1_TOT	Determination of volatile organic compounds (VOCs) by P&T-GC-MS. Water samples are analysed directly by purge and trap GC-MS. Solids are extracted with Methanol, diluted and analysed by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.
ORG-029	Soil/solid and sorbent samples are extracted with basified Methanol. Waters and soil/sorbent 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. Analysis is undertaken with LC-MSMS. PFAS results include the sum of branched and linear isomers where applicable. 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. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

Result Definitions

Identifier	Description
NR	Not reported
NEPM	National Environment Protection Measure
NS	Not specified
LCS	Laboratory Control Sample
RPD	Relative Percent Difference
>	Greater than
<	Less than
PQL	Practical Quantitation Limit
INS	Insufficient sample for this test
NA	Test not required
NT	Not tested
DOL	Samples rejected due to particulate overload (air filters only)
RFD	Samples rejected due to filter damage (air filters only)
RUD	Samples rejected due to uneven deposition (air filters only)
##	Indicates a laboratory acceptance criteria outlier, for further details, see Result Comments and/or QC Comments

Quality Control Definitions

Blank

This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, and is determined by processing solvents and reagents in exactly the same manner as for samples.

Surrogate Spike

Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

LCS (Laboratory Control Sample)

This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Matrix Spike

A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

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.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

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 QAQC tables for details (available on request); <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; 60-140% for organics (+/-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 typically insufficient in order to satisfy laboratory QA/QC protocols.

Miscellaneous Information

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. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

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 or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volumes are typically provided by customers (often as flow rate(s) and sampling time(s) and/or simply volume(s) sampled or exposure times (determines 'volume' passive badges are exposed to)). Hence in such circumstances the volume measurement is inevitably not covered by Envirolab's NATA accreditation. An exception may occur where Envirolab Newcastle does the sampling where accreditation exists for certain types of sampling and hence volume determination(s). Note air volumes are often used to determine concentrations for dust and/or analyses on filters, sorbents and in impingers. For canister sampling, the air volume is covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary PGD1981

Client Details

Client	Katherine Town Council - NT
Your Reference	Katherine Town Council - EPL298 - Quarterly
Date Issued	26/05/2025

Recommended Holding Time Compliance

Recommended holding time exceedances exist - See detailed list below

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	No	LCS Outliers Exist - See detailed list below
Duplicates	No	Duplicate Outliers Exist - See detailed list below
Matrix Spike	No	Matrix Spike Outliers Exist - See detailed list below
Surrogates / Extracted Internal Standards	No	Surrogates / Extracted ISTD Outliers Exist - See detailed list below
QC Frequency	No	QC Frequency Outliers Exist - See detailed list below

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Data Quality Assessment Summary PGD1981

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
vTRH&MBTEXN | Water	2	23/04/2025	01/05/2025	02/05/2025	Yes
	1	28/04/2025	01/05/2025	02/05/2025	Yes
sTRH | Water	2	23/04/2025	02/05/2025	02/05/2025	No
	1	28/04/2025	02/05/2025	02/05/2025	Yes
PAH | Water	1	28/04/2025	02/05/2025	03/05/2025	Yes
PCB | Water	1	28/04/2025	02/05/2025	03/05/2025	Yes
Total Metals (LL) | Water	1	28/04/2025	02/05/2025	06/05/2025	Yes
Dissolved Metals (LL) | Water	1	28/04/2025	02/05/2025	05/05/2025	Yes
TDS | Water	1	28/04/2025	06/05/2025	06/05/2025	No
VFA | Water	1	28/04/2025	01/05/2025	07/05/2025	Yes
Alkalinity Suite | Water	1	28/04/2025	02/05/2025	02/05/2025	Yes
Chloride | Water	1	28/04/2025	01/05/2025	01/05/2025	Yes
Dissolved Cations | Water	1	28/04/2025	02/05/2025	05/05/2025	Yes
Ion Balance | Water	1	28/04/2025	02/05/2025	05/05/2025	Yes
	1	28/04/2025	02/05/2025	08/05/2025	Yes
Sulfate | Water	1	28/04/2025	01/05/2025	01/05/2025	Yes
Total Organic Carbon | Water	1	28/04/2025	06/05/2025	08/05/2025	Yes
Cr3+ | Water	1	28/04/2025	05/05/2025	05/05/2025	Yes
Cr3+ Total | Water	1	28/04/2025	05/05/2025	06/05/2025	Yes
Cr6+ | Water	1	28/04/2025	05/05/2025	05/05/2025	Yes
Cr6+ - Total | Water	1	28/04/2025	05/05/2025	05/05/2025	Yes
Nitrogen - Ammonia | Water	1	28/04/2025	01/05/2025	01/05/2025	Yes
Nitrogen - Ammonium by calc | Water	1	28/04/2025	26/05/2025	26/05/2025	Yes
Nitrogen - Nitrate | Water	1	28/04/2025	01/05/2025	01/05/2025	Yes
Nitrogen - Total N | Water	1	28/04/2025	07/05/2025	07/05/2025	Yes
Total Phosphorus | Water	1	28/04/2025	02/05/2025	02/05/2025	Yes
BOD | Water	1	28/04/2025	07/05/2025	13/05/2025	Yes
COD | Water	1	28/04/2025	05/05/2025	06/05/2025	Yes
PFAS EXT-ISTD | Water	2	23/04/2025	02/05/2025	03/05/2025	Yes
	1	28/04/2025	02/05/2025	03/05/2025	Yes
PFAS-Extended | Water	2	23/04/2025	02/05/2025	03/05/2025	Yes
	1	28/04/2025	02/05/2025	03/05/2025	Yes

Data Quality Assessment Summary PGD1981

Outliers: Laboratory Control Samples

ORG-020|Semi-volatile TRH (Water)| Batch BGE0350

Sample ID	Analyte	% Limits	% Recovery
BGE0350-BS1	o-Terphenyl	60 - 140	##[5]

Outliers: Duplicates

INORG-060_TP|Inorganics - Nutrients (Water)| Batch BGE0318

Sample ID	Duplicate ID	Analyte	% Limits	RPD
BGE0318-DUP1#	DUP1	Total Phosphorus	30.00	131

Outliers: Matrix Spike

INORG-060_TP|Inorganics - Nutrients (Water)| Batch BGE0318

Sample ID	Analyte	% Limits	% Recovery
BGE0318-MS1#	Total Phosphorus	70 - 130	##[3]

METALS-020|Inorganics - Ionic Balance and Indexes (Water)| Batch BGE0317

Sample ID	Analyte	% Limits	% Recovery
BGE0317-MS1#	Calcium	70 - 130	##[2]
BGE0317-MS1#	Magnesium	70 - 130	##[2]
BGE0317-MS1#	Potassium	70 - 130	##[2]
BGE0317-MS1#	Sodium	70 - 130	##[2]

METALS-022|Dissolved Low Level Metals (Water)| Batch BGE0314

Sample ID	Analyte	% Limits	% Recovery
BGE0314-MS1#	Aluminium	70 - 130	66.7[3]
BGE0314-MS1#	Copper	70 - 130	60.6[3]
BGE0314-MS1#	Iron	70 - 130	##[2]
BGE0314-MS1#	Manganese	70 - 130	##[2]
BGE0314-MS1#	Zinc	70 - 130	69.2[3]

ORG-020|Semi-volatile TRH (Water)| Batch BGE0350

Sample ID	Analyte	% Limits	% Recovery
BGE0350-MS1#	o-Terphenyl	60 - 140	##[5]

ORG-022_PAH|Polycyclic Aromatic Hydrocarbons (Water)| Batch BGE0350

Sample ID	Analyte	% Limits	% Recovery
BGE0350-MS2#	Benzo(a)pyrene	60 - 140	##[4]
BGE0350-MS2#	Chrysene	60 - 140	##[4]

Data Quality Assessment Summary PGD1981

Outliers: Surrogate / Extracted Internal Standards

ORG-029|PFAS Extended List (Matrix)| Batch BGE0671

Sample ID	Analyte	% Limits	% Recovery
PGD1981-01	Extraction Internal Standard d5 N EtFOSAA	50 - 150	156 [6]
	Extraction Internal Standard d3 N MeFOSAA	50 - 150	155 [6]
	Extraction Internal Standard 13C2 8:2FTS	50 - 150	158 [6]
PGD1981-02	Extraction Internal Standard d5 N EtFOSAA	50 - 150	153 [6]
	Extraction Internal Standard d3 N MeFOSAA	50 - 150	162 [6]
	Extraction Internal Standard 13C2 8:2FTS	50 - 150	151 [6]

Outliers: QC Frequency

INORG-091|Inorganics - Common Wastewater Parameters (Water)| Batch BGE1084

Analysis	QC Type	Expected	Reported
BOD	Duplicate	2	0

INORG-111|Inorganics - Physical Parameters (Water)| Batch BGE0228

Analysis	QC Type	Expected	Reported
VFA	Duplicate	1	0

ORG-023_F1_TOT|Volatile TRH and BTEX (Water)| Batch BGE0223

Analysis	QC Type	Expected	Reported
vTRH&MBTEXN	Duplicate	2	1
	Matrix Spike	1	0

Quality Control PGD1981

ORG-023_F1_TOT|Volatile TRH and BTEX (Water) | Batch BGE0223

Analyte	Units	PQL	Blank	DUP1 BGE0223-DUP1# Samp | QC | RPD %	LCS %
TRH C6-C9	µg/L	10	<10	<50 | <50 | [NA] [7]	88.9
TRH C6-C10	µg/L	10	<10	<50 | <50 | [NA] [7]	91.4
Methyl tert butyl ether (MTBE)	µg/L	1.0	<1.0	<5.0 | <5.0 | [NA] [7]	[NA]
Benzene	µg/L	1.0	<1.0	<5.0 | <5.0 | [NA] [7]	103
Toluene	µg/L	1.0	<1.0	<5.0 | <5.0 | [NA] [7]	104
Ethylbenzene	µg/L	1.0	<1.0	<5.0 | <5.0 | [NA] [7]	95.2
meta+para Xylene	µg/L	2.0	<2.0	<10 | <10 | [NA] [7]	94.7
ortho-Xylene	µg/L	1.0	<1.0	<5.0 | <5.0 | [NA] [7]	93.1
Naphthalene (value used in F2 calc)	µg/L	1.0	<1.0	<5.0 | <5.0 | [NA] [7]	[NA]
Surrogate Dibromofluoromethane	*%*		*104*	*101 / 101*	*104*
Surrogate Toluene-D8	*%*		*107*	*105 / 106*	*107*
Surrogate 4-Bromofluorobenzene	*%*		*89.1*	*88.0 / 91.1*	*90.5*

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

ORG-020|Semi-volatile TRH (Water) | Batch BGE0350

Analyte	Units	PQL	Blank	DUP1 BGE0350-DUP1# Samp | QC | RPD %	LCS %	Spike % BGE0350-MS1#
TRH C10-C14	µg/L	50	<50	<50 | <50 | [NA]	113	99.5
TRH C15-C28	µg/L	100	<100	<100 | <100 | [NA]	114	103
TRH C29-C36	µg/L	100	<100	<100 | <100 | [NA]	132	111
TRH >C10-C16	µg/L	50	<50	<50 | <50 | [NA]	113	100
TRH >C16-C34 (F3)	µg/L	100	<100	<100 | <100 | [NA]	117	105
TRH >C34-C40 (F4)	µg/L	100	<100	<100 | <100 | [NA]	109	87.8
Surrogate o-Terphenyl	*%*		*83.3*	*86.7 / 86.2*	*## [5]*	*##[5]*

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

ORG-022_PAH|Polycyclic Aromatic Hydrocarbons (Water) | Batch BGE0350

Analyte	Units	PQL	Blank	DUP1 BGE0350-DUP1# Samp | QC | RPD %	LCS %	Spike % BGE0350-MS2#
Naphthalene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	77.3	63.3
Acenaphthylene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	[NA]	[NA]
Acenaphthene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	82.5	63.3
Fluorene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	80.3	61.1
Phenanthrene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	83.9	66.2
Anthracene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	[NA]	[NA]
Fluoranthene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	83.8	65.9
Pyrene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	85.5	67.3
Benzo(a)anthracene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	[NA]	[NA]
Chrysene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	72.9	##[4]
Benzo(b,j,k)fluoranthene	µg/L	0.20	<0.20	<0.20 | <0.20 | [NA]	[NA]	[NA]
Benzo(a)pyrene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	73.4	##[4]
Indeno(1,2,3-c,d)pyrene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	[NA]	[NA]
Dibenzo(a,h)anthracene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	[NA]	[NA]
Benzo(g,h,i)perylene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	[NA]	[NA]
Surrogate p-Terphenyl-D14	*%*		*74.8*	*79.8 / 63.6*	*79.4*	*72.1*

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control PGD1981

ORG-021/022/025_PCB|Polychlorinated Biphenyls (Water) | Batch BGE0350

Analyte	Units	PQL	Blank	DUP1 BGE0350-DUP1# Samp | QC | RPD %	LCS %	Spike % BGE0350-MS2#
Aroclor 1016	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	[NA]	[NA]
Aroclor 1221	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	[NA]	[NA]
Aroclor 1232	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	[NA]	[NA]
Aroclor 1242	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	[NA]	[NA]
Aroclor 1248	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	[NA]	[NA]
Aroclor 1254	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	[NA]	[NA]
Aroclor 1260	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	[NA]	[NA]
PCB C103	µg/L			<2.0 | <2.0 | [NA]	84.6	66.5
Surrogate 2-Fluorobiphenyl	*%*		*76.9*	*82.3 | 71.5*	*75.2*	*75.2*

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-022|Acid Extractable Low Level Metals (Water) | Batch BGE0306

Analyte	Units	PQL	Blank	DUP1 BGE0306-DUP1# Samp | QC | RPD %	DUP2 PGD1981-01 Samp | QC | RPD %	LCS %	Spike % BGE0306-MS1#
Aluminium	µg/L	10	<10	<10 | <10 | [NA]	<10 | <10 | [NA]	94.8	97.4
Cadmium	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	101	103
Chromium	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	102	104
Copper	µg/L	1.0	<1.0	5.83 | 5.77 | 0.983	19.4 | 20.2 | 4.25	102	106
Iron	µg/L	10	<10	<10 | 16.9 | [NA] [8]	321 | 323 | 0.698	111	113
Lead	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	1.82 | 2.24 | [NA]	106	106
Manganese	µg/L	1.0	<1.0	1.94 | 2.65 | [NA] [8]	1.67 | 1.64 | [NA]	97.2	99.3
Nickel	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	102	106
Selenium	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	114	113
Zinc	µg/L	1.0	<1.0	12.4 | 11.8 | 4.93	35.4 | 35.0 | 1.08	101	105

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-022|Dissolved Low Level Metals (Water) | Batch BGE0314

Analyte	Units	PQL	Blank	DUP1 BGE0314-DUP1# Samp | QC | RPD %	DUP2 BGE0314-DUP2# Samp | QC | RPD %	LCS %	Spike % BGE0314-MS1#
Aluminium	µg/L	10	<10	<10 | <10 | [NA]	<10 | <10 | [NA]	95.8	66.7[3]
Cadmium	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	101	76.7
Chromium	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	2.72 | 2.66 | [NA]	102	76.3
Copper	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	100	60.6[3]
Iron	µg/L	10	<10	33.0 | 28.6 | [NA]	466 | 468 | 0.520	101	##[2]
Lead	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	102	75.8
Manganese	µg/L	1.0	<1.0	151 | 148 | 2.43	7930 | 8130 | 2.55	100	##[2]
Nickel	µg/L	1.0	<1.0	4.69 | 4.51 | [NA]	33.3 | 33.6 | 0.987	102	75.0
Selenium	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	1.23 | 1.29 | [NA]	107	86.8
Zinc	µg/L	1.0	<1.0	10.4 | 9.61 | 8.37	<1.0 | <1.0 | [NA]	105	69.2[3]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-111|Inorganics - Physical Parameters (Water) | Batch BGE0228

Analyte	Units	PQL	Blank	LCS %
Volatile Fatty Acids	mg/L	5.0	<5.0	86.0

INORG-018|Inorganics - Physical Parameters (Water) | Batch BGE1005

Analyte	Units	PQL	Blank	DUP1 PGD1981-01 Samp | QC | RPD %	DUP2 BGE1005-DUP2# Samp | QC | RPD %	LCS %
Total Dissolved Solids	mg/L	5.0	<5.0	329 | 317 | 3.72	1120 | 1120 | 0.358	105

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control PGD1981

INORG-081 | Inorganics - Ionic Balance and Indexes (Water) | Batch BGE0171

Analyte	Units	PQL	Blank	DUP1 BGE0171-DUP1# Samp | QC | RPD %	DUP2 BGE0171-DUP2# Samp | QC | RPD %	LCS %	Spike % BGE0171-MS1#
Chloride	mg/L	1.0	<1.0	1.28 | 1.28 | [NA]	<1.0 | <1.0 | [NA]	96.4	123
Sulfate	mg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	93.6	128

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-020 | Inorganics - Ionic Balance and Indexes (Water) | Batch BGE0317

Analyte	Units	PQL	Blank	DUP1 BGE0317-DUP1# Samp | QC | RPD %	DUP2 BGE0317-DUP2# Samp | QC | RPD %	LCS %	Spike % BGE0317-MS1#
Calcium	mg/L	0.50	<0.50	233 | 238 | 1.94	661 | 667 | 0.881	99.3	##[2]
Magnesium	mg/L	0.50	<0.50	695 | 709 | 1.95	1140 | 1150 | 0.914	99.2	##[2]
Potassium	mg/L	0.50	<0.50	336 | 342 | 1.80	105 | 106 | 0.933	100	##[2]
Sodium	mg/L	0.50	<0.50	9150 | 9310 | 1.74	7950 | 7910 | 0.530	96.1	##[2]
Hardness (calc) equivalent CaCO3	mg/L	3.0	<3.0	3450 | 3510 | 1.95	6360 | 6420 | 0.906	[NA]	[NA]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-006 | Inorganics - Ionic Balance and Indexes (Water) | Batch BGE0354

Analyte	Units	PQL	Blank	DUP1 PGD1981-01 Samp | QC | RPD %	DUP2 BGE0354-DUP2# Samp | QC | RPD %	LCS %
Bicarbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	248 | 253 | 1.72	<5.0 | <5.0 | [NA]	[NA]
Carbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0 | <5.0 | [NA]	<5.0 | <5.0 | [NA]	[NA]
Hydroxide OH- as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0 | <5.0 | [NA]	<5.0 | <5.0 | [NA]	[NA]
Total Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	248 | 253 | 1.72	<5.0 | <5.0 | [NA]	95.6

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-079 | Inorganics - Carbon, Nitrogen and Sulfur Species (Water) | Batch BGE0953

Analyte	Units	PQL	Blank	DUP1 BGE0953-DUP1# Samp | QC | RPD %	DUP2 BGE0953-DUP2# Samp | QC | RPD %	LCS %	Spike % BGE0953-MS1#
Total Organic Carbon	mg/L	1.0	<1.0	15.0 | 15.0 | 0.275	33.6 | 35.0 | 4.19	96.6	101

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-118 | Inorganics - Speciated Cr (III/VI) and Fe (II/III) (Water) | Batch BGE0735

Analyte	Units	PQL	Blank	DUP1 PGD1981-01 Samp | QC | RPD %	DUP2 BGE0735-DUP2# Samp | QC | RPD %	LCS %	Spike % BGE0735-MS1#
Hexavalent Chromium	mg/L	0.0050	<0.0050	<0.0050 | <0.0050 | [NA]	<0.025 | <0.025 | [NA]	94.5	##[3]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-118 | Inorganics - Speciated Cr (III/VI) and Fe (II/III) (Water) | Batch BGE0736

Analyte	Units	PQL	Blank	DUP1 BGE0736-DUP1# Samp | QC | RPD %	LCS %	Spike % BGE0736-MS1#
Hexavalent Chromium (Total)	mg/L	0.0050	<0.0050	<0.0050 | <0.0050 | [NA]	94.9	102

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control PGD1981

INORG-057 | Inorganics - Nutrients (Water) | Batch BGE0221

Analyte	Units	PQL	Blank	DUP1 PGD1981-01 Samp | QC | RPD %	DUP2 BGE0221-DUP2# Samp | QC | RPD %	LCS %	Spike % BGE0221-MS1#
Ammonia as N	mg/L	0.0050	<0.0050	0.0118 | 0.0104 | [NA]	0.503 | 0.447 | 11.6	104	92.7
Nitrate as N	mg/L	0.0050	<0.0050	0.0887 | 0.0906 | 2.20	<0.0050 | <0.0050 | [NA]	103	108
Nitrate as NO3 by calculation	mg/L	0.020	<0.020			[NA]	[NA]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-060_TP | Inorganics - Nutrients (Water) | Batch BGE0318

Analyte	Units	PQL	Blank	DUP1 BGE0318-DUP1# Samp | QC | RPD %	DUP2 BGE0318-DUP2# Samp | QC | RPD %	LCS %	Spike % BGE0318-MS1#
Total Phosphorus	mg/L	0.010	<0.010	0.230 | 0.0480 | 131	<0.010 | <0.010 | [NA]	109	##[3]

Analyte	Units	PQL	Blank	LCS %
Total Phosphorus	mg/L	0.010	<0.010	[NA]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-127 | Inorganics - Nutrients (Water) | Batch BGE1043

Analyte	Units	PQL	Blank	DUP1 BGE1043-DUP1# Samp | QC | RPD %	DUP2 BGE1043-DUP2# Samp | QC | RPD %	LCS %	Spike % BGE1043-MS1#
Total Nitrogen	mg/L	0.10	<0.10	0.399 | 0.395 | [NA]	11.9 | 10.3 | 13.9	101	111

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-067 | Inorganics - Common Wastewater Parameters (Water) | Batch BGE0664

Analyte	Units	PQL	Blank	DUP1 BGE0664-DUP1# Samp | QC | RPD %	DUP2 BGE0664-DUP2# Samp | QC | RPD %	LCS %
COD	mg O2/L	20	<20	395 | 390 | 1.27	51.0 | 50.0 | [NA]	106

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

ORG-029|PFAS Extended List (Water) | Batch BGE0671

Analyte	Units	PQL	Blank	DUP1 PGD1981-01 Samp | QC | RPD %	LCS %	Spike % PGD1981-02
Perfluorobutanesulfonic acid (PFBS)	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	118	110
Perfluoropentanesulfonic acid (PFPeS)	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	98.4	98.7
Perfluorohexanesulfonic acid (PFHxS)	µg/L	0.010	<0.010	0.0264 | 0.0222 | [NA]	105	108
Perfluoroheptanesulfonic acid (PFHpS)	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	109	108
Perfluorooctanesulfonic acid (PFOS)	µg/L	0.010	<0.010	0.0346 | 0.0354 | [NA]	112	110
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.020	<0.020	<0.020 | <0.020 | [NA]	103	97.5
Perfluorobutanoic acid (PFBA)	µg/L	0.020	<0.020	0.161 | 0.162 | 0.496	111	112
Perfluoropentanoic acid (PFPeA)	µg/L	0.020	<0.020	0.237 | 0.237 | 0.00	101	104
Perfluorohexanoic acid (PFHxA)	µg/L	0.010	<0.010	0.132 | 0.126 | 4.34	113	106
Perfluoroheptanoic acid (PFHpA)	µg/L	0.010	<0.010	0.110 | 0.112 | 1.80	107	109
Perfluorooctanoic acid (PFOA)	µg/L	0.010	<0.010	0.0636 | 0.0590 | 7.50	110	109
Perfluorononanoic acid (PFNA)	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	94.8	94.1
Perfluorodecanoic acid (PFDA)	µg/L	0.020	<0.020	<0.020 | <0.020 | [NA]	113	108
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.020	<0.020	<0.020 | <0.020 | [NA]	110	108
Perfluorododecanoic acid (PFDoDA)	µg/L	0.050	<0.050	<0.050 | <0.050 | [NA]	101	102
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	107	108
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	94.4	94.8
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	101	100
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	115	112
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.020	<0.020	<0.020 | <0.020 | [NA]	115	111
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.020	<0.020	<0.020 | <0.020 | [NA]	87.1	109
Perfluorooctane sulfonamide (FOSA)	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	108	108
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.050	<0.050	<0.050 | <0.050 | [NA]	112	110
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	108	114
N-Methyl perfluorooctane sulfonamidoethanol	µg/L	0.050	<0.050	<0.050 | <0.050 | [NA]	75.5	87.8
N-Ethyl perfluorooctane sulfonamidoethanol	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	110	110
N-Methyl perfluorooctane sulfonamidoacetic acid	µg/L	0.020	<0.020	<0.020 | <0.020 | [NA]	105	104
N-Ethyl perfluorooctane sulfonamidoacetic acid	µg/L	0.020	<0.020	<0.020 | <0.020 | [NA]	91.3	97.6
Surrogate 13C8 PFOS	%		*101*	*108 | 102*	*104*	*104*
Surrogate 13C2 PFOA	%		*99.2*	*98.6 | 99.0*	*101*	*102*
Extraction Internal Standard 13C3 PFBS	%		*96.4*	*99.4 | 99.0 | 0.383*	[NA]	[NA]
Extraction Internal Standard 18O2 PFHxS	%		*106*	*106 | 104 | 2.36*	[NA]	[NA]
Extraction Internal Standard 13C4 PFOS	%		*103*	*105 | 102 | 2.85*	[NA]	[NA]
Extraction Internal Standard 13C4 PFBA	%		*99.6*	*97.7 | 94.5 | 3.35*	[NA]	[NA]
Extraction Internal Standard 13C3 PFPeA	%		*96.4*	*95.5 | 94.6 | 1.01*	[NA]	[NA]
Extraction Internal Standard 13C2 PFHxA	%		*93.4*	*94.8 | 94.4 | 0.359*	[NA]	[NA]
Extraction Internal Standard 13C4 PFHpA	%		*97.5*	*96.3 | 95.7 | 0.583*	[NA]	[NA]
Extraction Internal Standard 13C4 PFOA	%		*110*	*113 | 110 | 2.70*	[NA]	[NA]
Extraction Internal Standard 13C5 PFNA	%		*111*	*111 | 109 | 2.24*	[NA]	[NA]
Extraction Internal Standard 13C2 PFDA	%		*106*	*109 | 108 | 1.13*	[NA]	[NA]
Extraction Internal Standard 13C2 PFUnDA	%		*107*	*107 | 105 | 2.25*	[NA]	[NA]
Extraction Internal Standard 13C2 PFDoDA	%		*122*	*132 | 119 | 10.3*	[NA]	[NA]
Extraction Internal Standard 13C2 PFTeDA	%		*98.0*	*99.5 | 99.2 | 0.322*	[NA]	[NA]
Extraction Internal Standard 13C2 4:2FTS	%		*129*	*131 | 123 | 5.77*	[NA]	[NA]
Extraction Internal Standard 13C2 6:2FTS	%		*138*	*139 | 135 | 2.70*	[NA]	[NA]
Extraction Internal Standard 13C2 8:2FTS	%		*160 [6]*	*158 | 148 | 6.53*	[NA]	[NA]
Extraction Internal Standard 13C8 FOSA	%		*113*	*112 | 114 | 1.61*	[NA]	[NA]
Extraction Internal Standard d3 N MeFOSA	%		*97.2*	*103 | 98.4 | 4.18*	[NA]	[NA]
Extraction Internal Standard d5 N EtFOSA	%		*94.6*	*97.0 | 97.8 | 0.883*	[NA]	[NA]
Extraction Internal Standard d7 N MeFOSE	%		*107*	*114 | 108 | 4.89*	[NA]	[NA]
Extraction Internal Standard d9 N EtFOSE	%		*105*	*106 | 103 | 3.00*	[NA]	[NA]
Extraction Internal Standard d3 N MeFOSAA	%		*163 [6]*	*155 | 159 | 2.30 [6]*	[NA] [6]	[NA]
Extraction Internal Standard d5 N EtFOSAA	%		*145*	*156 | 144 | 7.99*	[NA]	[NA]

QC Comments

Identifier	Description
[2]	Spike recovery is not applicable due to the relatively high analyte background in the sample (>3* spike level). However, the LCS recovery is within acceptance criteria.
[3]	Spike recovery is outside routine acceptance criteria (70-130%), this may be due to suspected non-homogeneity and/or matrix interference effects. However, an acceptable recovery was achieved for the LCS.
[4]	Spike recovery is outside routine acceptance criteria (60-140%). Where recoveries of <20% and >200% are attributable to matrix interference effects, there will be a high uncertainty associated with the parent result.
[5]	Surrogate recovery is outside routine acceptance criteria (60-140%) as a result of the high concentration of analyte(s) in the sample.
[6]	For PFAS Extracted Internal Standards denoted with ## or being outside the 50-150% acceptance range, the respective target analyte results may be unaffected, in other circumstances the PQL has been raised to accommodate the outlier(s).
[7]	PQL(s) has/have been raised as the sample(s) was/were foamy and therefore required dilution.
[8]	Duplicate %RPD may be flagged as an outlier to routine laboratory acceptance, however, where one or both results are <10*PQL, the RPD acceptance criteria increases exponentially.

Envirolab Services (WA) Pty Ltd trading as MPL Laboratories
ABN 53 140 099 207
16-18 Hayden Court Myaree WA 6154
ph +61 8 9317 2505
lab@mpl.com.au
www.mpl.com.au

Certificate of Analysis PGE0588

Client Details

Client	Katherine Town Council - NT
Contact	Brett Kimpton
Address	PO Box 1071, KATHERINE, NT, 0851

Sample Details

Your Reference	Katherine Town Council - EPL298 - Quarterly
Number of Samples	8 Water
Date Samples Received	09/05/2025
Date Instructions Received	12/05/2025

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 soils and on an as received basis for other matrices.

Report Details

Date Results Requested by	28/05/2025
Date of Issue	23/05/2025

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Authorisation Details

Results Approved By	Ben Carpenter, Metals Technician Jenny Xin He, Chemist Lien Tang, Assistant Operations Manager Lucas Yii, Inorganics Team Leader Michael Mowle, Development Chemist - Inorganics and Metals Sean McAlary, Senior Chemist Travis Carey, Organics Supervisor Varsha Ho Wing, Inorganics and Metals Supervisor
Laboratory Manager	Michael Kubiak

Certificate of Analysis PGE0588

Samples in this Report

Envirolab ID	Sample ID	Matrix	Date Sampled	Date Received
PGE0588-01	GWE (RN022487)	Water	07/05/2025	12/05/2025
PGE0588-02	GWB01	Water	07/05/2025	12/05/2025
PGE0588-03	GWB02	Water	07/05/2025	12/05/2025
PGE0588-04	GWB03	Water	07/05/2025	12/05/2025
PGE0588-05	GWB04	Water	07/05/2025	12/05/2025
PGE0588-06	Field Blank	Water	07/05/2025	12/05/2025
PGE0588-07	Duplicate	Water	07/05/2025	12/05/2025
PGE0588-08	Trip Blank	Water	07/05/2025	12/05/2025

Sample Comments

General Comment	Headspace in preserved vials of samples #1-7.
Field Blank	No amber bottle received - unable to analyse sTRH, only vTRH tested.

Volatile TRH and BTEX (Water)

Envirolab ID	Units	PQL	PGE0588-01	PGE0588-02	PGE0588-03	PGE0588-04	PGE0588-05
Your Reference			GWE (RN022487)	GWB01	GWB02	GWB03	GWB04
Date Sampled			07/05/2025	07/05/2025	07/05/2025	07/05/2025	07/05/2025
TRH C6-C9	µg/L	10	<10	<10	<10	<10	<10
TRH C6-C10	µg/L	10	<10	<10	<10	<10	<10
TRH C6-C10 less BTEX (F1)	µg/L	10	<10	<10	<10	<10	<10
Methyl tert butyl ether (MTBE)	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzene	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
meta+para Xylene	µg/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0
ortho-Xylene	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total +ve Xylenes	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene (value used in F2 calc)	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total +ve BTEX	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Surrogate Dibromofluoromethane	%		*82.7*	*104*	*106*	*107*	*105*
Surrogate Toluene-D8	%		*91.6*	*102*	*104*	*103*	*103*
Surrogate 4-Bromofluorobenzene	%		*96.1*	*97.3*	*99.7*	*96.4*	*98.7*

Envirolab ID	Units	PQL	PGE0588-06	PGE0588-07	PGE0588-08
Your Reference			Field Blank	Duplicate	Trip Blank
Date Sampled			07/05/2025	07/05/2025	07/05/2025
TRH C6-C9	µg/L	10	<10	<10	<10
TRH C6-C10	µg/L	10	<10	<10	<10
TRH C6-C10 less BTEX (F1)	µg/L	10	<10	<10	<10
Methyl tert butyl ether (MTBE)	µg/L	1.0	<1.0	<1.0	<1.0
Benzene	µg/L	1.0	<1.0	<1.0	<1.0
Toluene	µg/L	1.0	<1.0	<1.0	<1.0
Ethylbenzene	µg/L	1.0	<1.0	<1.0	<1.0
meta+para Xylene	µg/L	2.0	<2.0	<2.0	<2.0
ortho-Xylene	µg/L	1.0	<1.0	<1.0	<1.0
Total +ve Xylenes	µg/L	1.0	<1.0	<1.0	<1.0
Naphthalene (value used in F2 calc)	µg/L	1.0	<1.0	<1.0	<1.0
Total +ve BTEX	µg/L	1.0	<1.0	<1.0	<1.0
Surrogate Dibromofluoromethane	%		*110*	*105*	*108*
Surrogate Toluene-D8	%		*105*	*101*	*105*
Surrogate 4-Bromofluorobenzene	%		*98.4*	*101*	*98.7*

Semi-volatile TRH (Water)

Envirolab ID	Units	PQL	PGE0588-01	PGE0588-02	PGE0588-03	PGE0588-04	PGE0588-05
Your Reference			GWE (RN022487)	GWB01	GWB02	GWB03	GWB04
Date Sampled			07/05/2025	07/05/2025	07/05/2025	07/05/2025	07/05/2025
TRH C10-C14	µg/L	50	<50	<50	<50	<50	<50
TRH C15-C28	µg/L	100	<100	<100	<100	<100	<100
TRH C29-C36	µg/L	100	<100	<100	<100	<100	<100
Total +ve TRH C10-C36	µg/L	50	<50	<50	<50	<50	<50
TRH >C10-C16	µg/L	50	<50	<50	<50	<50	<50
TRH >C10-C16 less Naphthalene F2	µg/L	50	<50	<50	<50	<50	<50
TRH >C16-C34 (F3)	µg/L	100	<100	<100	<100	<100	<100
TRH >C34-C40 (F4)	µg/L	100	<100	<100	<100	<100	<100
Total +ve TRH >C10-C40	µg/L	50	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%		*87.1*	*89.9*	*80.7*	*80.9*	*82.8*

Envirolab ID	Units	PQL	PGE0588-07	PGE0588-08
Your Reference			Duplicate	Trip Blank
Date Sampled			07/05/2025	07/05/2025
TRH C10-C14	µg/L	50	<50	<50
TRH C15-C28	µg/L	100	<100	<100
TRH C29-C36	µg/L	100	<100	<100
Total +ve TRH C10-C36	µg/L	50	<50	<50
TRH >C10-C16	µg/L	50	<50	<50
TRH >C10-C16 less Naphthalene F2	µg/L	50	<50	<50
TRH >C16-C34 (F3)	µg/L	100	<100	<100
TRH >C34-C40 (F4)	µg/L	100	<100	<100
Total +ve TRH >C10-C40	µg/L	50	<50	<50
Surrogate o-Terphenyl	%		*90.2*	*105*

Polycyclic Aromatic Hydrocarbons (Water)

Envirolab ID	Units	PQL	PGE0588-01	PGE0588-02	PGE0588-03	PGE0588-04	PGE0588-05
Your Reference			GWE (RN022487)	GWB01	GWB02	GWB03	GWB04
Date Sampled			07/05/2025	07/05/2025	07/05/2025	07/05/2025	07/05/2025
Naphthalene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthylene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Fluorene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Phenanthrene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Anthracene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Fluoranthene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Pyrene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo(a)anthracene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chrysene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo(b,j,k)fluoranthene	µg/L	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzo(a)pyrene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Indeno(1,2,3-c,d)pyrene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Dibenzo(a,h)anthracene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo(g,h,i)perylene	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Total +ve PAH	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Surrogate p-Terphenyl-D14	%		*89.4*	*64.9*	*83.1*	*80.8*	*70.5*

Polychlorinated Biphenyls (Water)

Envirolab ID	Units	PQL	PGE0588-01	PGE0588-02	PGE0588-03	PGE0588-04	PGE0588-05
Your Reference			GWE (RN022487)	GWB01	GWB02	GWB03	GWB04
Date Sampled			07/05/2025	07/05/2025	07/05/2025	07/05/2025	07/05/2025
Aroclor 1016	µg/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Aroclor 1221	µg/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Aroclor 1232	µg/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Aroclor 1242	µg/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Aroclor 1248	µg/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Aroclor 1254	µg/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Aroclor 1260	µg/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Total +ve PCB (1016-1260)	µg/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Surrogate 2-Fluorobiphenyl	%		*99.5*	*67.0*	*84.2*	*110*	*87.7*

Acid Extractable Low Level Metals (Water)

Envirolab ID	Units	PQL	PGE0588-01	PGE0588-02	PGE0588-03	PGE0588-04	PGE0588-05
Your Reference			GWE (RN022487)	GWB01	GWB02	GWB03	GWB04
Date Sampled			07/05/2025	07/05/2025	07/05/2025	07/05/2025	07/05/2025
Aluminium	µg/L	10	19	580	640	210	90
Cadmium	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chromium	µg/L	1.0	<1.0	<1.0	2.0	<1.0	<1.0
Copper	µg/L	1.0	1.1	10	8.4	3.6	1.4
Iron	µg/L	10	340	890	810	280	130
Manganese	µg/L	1.0	29	180	82	39	6.0
Nickel	µg/L	1.0	1.1	3.4	3.1	1.0	1.0
Lead	µg/L	1.0	<1.0	2.1	3.9	1.0	6.7
Selenium	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Zinc	µg/L	1.0	17	9.9	14	11	63

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Dissolved Low Level Metals (Water)

Envirolab ID	Units	PQL	PGE0588-01	PGE0588-02	PGE0588-03	PGE0588-04	PGE0588-05
Your Reference			GWE (RN022487)	GWB01	GWB02	GWB03	GWB04
Date Sampled			07/05/2025	07/05/2025	07/05/2025	07/05/2025	07/05/2025
Aluminium	µg/L	10	<10	<10	<10	<10	<10
Cadmium	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chromium	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Copper	µg/L	1.0	<1.0	2.0	1.4	<1.0	<1.0
Iron	µg/L	10	21	<10	<10	25	<10
Manganese	µg/L	1.0	29	140	5.2	27	<1.0
Nickel	µg/L	1.0	<1.0	2.6	1.5	<1.0	<1.0
Lead	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	4.4
Selenium	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Zinc	µg/L	1.0	2.6	3.8	4.5	2.6	64

Envirolab ID	Units	PQL	PGE0588-06	PGE0588-07
Your Reference			Field Blank	Duplicate
Date Sampled			07/05/2025	07/05/2025
Aluminium	µg/L	10	<10	<10
Cadmium	µg/L	0.10	<0.10	<0.10
Chromium	µg/L	1.0	<1.0	<1.0
Copper	µg/L	1.0	<1.0	<1.0
Iron	µg/L	10	11	<10
Manganese	µg/L	1.0	<1.0	21
Nickel	µg/L	1.0	<1.0	<1.0
Lead	µg/L	1.0	<1.0	<1.0
Selenium	µg/L	1.0	<1.0	<1.0
Zinc	µg/L	1.0	<1.0	18

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Inorganics - Physical Parameters (Water)

Envirolab ID	Units	PQL	PGE0588-01	PGE0588-02	PGE0588-03	PGE0588-04	PGE0588-05
Your Reference			GWE (RN022487)	GWB01	GWB02	GWB03	GWB04
Date Sampled			07/05/2025	07/05/2025	07/05/2025	07/05/2025	07/05/2025
Total Dissolved Solids	mg/L	5.0	330	520	470	500	520

Inorganics - Physical Parameters (Water) - Analysed By Envirolab Services Sydney

Envirolab ID	Units	PQL	PGE0588-01	PGE0588-02	PGE0588-03	PGE0588-04	PGE0588-05
Your Reference			GWE (RN022487)	GWB01	GWB02	GWB03	GWB04
Date Sampled			07/05/2025	07/05/2025	07/05/2025	07/05/2025	07/05/2025
Volatile Fatty Acids*	mg/L	5.0	6.7	120	120	140	130

Inorganics - Ionic Balance and Indexes (Water)

Envirolab ID	Units	PQL	PGE0588-01	PGE0588-02	PGE0588-03	PGE0588-04	PGE0588-05
Your Reference			GWE (RN022487)	GWB01	GWB02	GWB03	GWB04
Date Sampled			07/05/2025	07/05/2025	07/05/2025	07/05/2025	07/05/2025
Bicarbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	290	450	460	470	510
Carbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Hydroxide OH- as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Total Alkalinity as CaCO3	mg/L as CaCO3	5.0	290	450	460	470	510
Chloride	mg/L	1.0	11	45	17	8.6	6.3
Sulfate	mg/L	1.0	8.3	16	17	2.6	12
Calcium	mg/L	0.50	53	98	110	70	91
Magnesium	mg/L	0.50	33	44	45	35	64
Potassium	mg/L	0.50	7.9	11	4.5	3.2	7.9
Sodium	mg/L	0.50	11	23	12	6.7	7.9
Hardness (calc) equivalent CaCO3	mg/L	3.0	270	430	450	320	490
Ionic Balance	%		-2.9	-3.3	-1.6	-18 [1]	-1.6
Total Anions	mg/L	7.0	310	510	490	480	530
Anions as meq	meq/L	0.59	5.3	8.9	8.3	8.0	8.8
Total Cations	mg/L	2.0	100	180	170	110	170
Cations as meq	meq/L	0.10	6.0	9.8	9.6	6.8	10

Inorganics - Carbon, Nitrogen and Sulfur Species (Water)

Envirolab ID	Units	PQL	PGE0588-01	PGE0588-02	PGE0588-03	PGE0588-04	PGE0588-05
Your Reference			GWE (RN022487)	GWB01	GWB02	GWB03	GWB04
Date Sampled			07/05/2025	07/05/2025	07/05/2025	07/05/2025	07/05/2025
Total Organic Carbon	mg/L	1.0	2.5	2.4	<1.0	<1.0	<1.0

Inorganics - Speciated Cr (III/VI) and Fe (II/III) (Water)

Envirolab ID	Units	PQL	PGE0588-01	PGE0588-02	PGE0588-03	PGE0588-04	PGE0588-05
Your Reference			GWE (RN022487)	GWB01	GWB02	GWB03	GWB04
Date Sampled			07/05/2025	07/05/2025	07/05/2025	07/05/2025	07/05/2025
Hexavalent Chromium	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Hexavalent Chromium (Total)	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Trivalent Chromium	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Trivalent Chromium (Total)	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

Inorganics - Nutrients (Water)

Envirolab ID	Units	PQL	PGE0588-01	PGE0588-02	PGE0588-03	PGE0588-04	PGE0588-05
Your Reference			GWE (RN022487)	GWB01	GWB02	GWB03	GWB04
Date Sampled			07/05/2025	07/05/2025	07/05/2025	07/05/2025	07/05/2025
Ammonia as N	mg/L	0.0050	1.1	0.84	0.51	<0.0050	<0.0050
Free Ammonia (unionised) as N by calculation*	mg/L	0.0070	0.065	<0.0070	<0.0070	<0.0070	<0.0070
Ammonium (NH4+) as N by calculation	mg/L	0.0070	1.0	0.84	0.51	<0.0070	<0.0070
Nitrate as N	mg/L	0.0050	1.2	0.048	1.2	0.083	3.0
Nitrate as NO3 by calculation	mg/L	0.020	5.4	0.21	5.2	0.37	13
Total Nitrogen	mg/L	0.10	8.6	1.5	2.4	0.78	3.4
Total Phosphorus	mg/L	0.010	0.18	<0.010	0.017	<0.010	<0.010

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Inorganics - Common Wastewater Parameters (Water)

Envirolab ID	Units	PQL	PGE0588-01	PGE0588-02	PGE0588-03	PGE0588-04	PGE0588-05
Your Reference			GWE (RN022487)	GWB01	GWB02	GWB03	GWB04
Date Sampled			07/05/2025	07/05/2025	07/05/2025	07/05/2025	07/05/2025
BOD	mg/L	5.0	12	12	19	14	16
COD	mg O2/L	20	<20	<20	<20	<20	<20

PFAS Extended List (Water) - Analysed By Envirolab Services Sydney

Envirolab ID	Units	PQL	PGE0588-01	PGE0588-02	PGE0588-03	PGE0588-04	PGE0588-05
Your Reference			GWE (RN022487)	GWB01	GWB02	GWB03	GWB04
Date Sampled			07/05/2025	07/05/2025	07/05/2025	07/05/2025	07/05/2025
Perfluorobutanesulfonic acid (PFBS)	µg/L	0.010	<0.010	0.063	0.056	<0.010	<0.010
Perfluoropentanesulfonic acid (PFPeS)	µg/L	0.010	<0.010	0.042	0.034	<0.010	<0.010
Perfluorohexanesulfonic acid (PFHxS)	µg/L	0.010	0.014	0.41	0.19	<0.010	<0.010
Perfluoroheptanesulfonic acid (PFHpS)	µg/L	0.010	<0.010	0.031	0.023	<0.010	<0.010
Perfluorooctanesulfonic acid (PFOS)	µg/L	0.010	0.035	1.3	0.37	0.022	<0.010
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorobutanoic acid (PFBA)	µg/L	0.020	<0.020	0.058	<0.020	<0.020	<0.020
Perfluoropentanoic acid (PFPeA)	µg/L	0.020	<0.020	0.067	0.046	<0.020	<0.020
Perfluorohexanoic acid (PFHxA)	µg/L	0.010	<0.010	0.10	0.078	<0.010	<0.010
Perfluoroheptanoic acid (PFHpA)	µg/L	0.010	<0.010	0.043	0.031	<0.010	<0.010
Perfluorooctanoic acid (PFOA)	µg/L	0.010	<0.010	0.10	0.065	<0.010	<0.010
Perfluorononanoic acid (PFNA)	µg/L	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Perfluorodecanoic acid (PFDA)	µg/L	0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorododecanoic acid (PFDoDA)	µg/L	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.50	<0.50	<0.50	<0.50	<0.50	<0.50
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.020	<0.020	<0.020	<0.020	<0.020	<0.020
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorooctane sulfonamide (FOSA)	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-Methyl perfluorooctane sulfonamidoethanol	µg/L	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
N-Ethyl perfluorooctane sulfonamidoethanol	µg/L	0.50	<0.50	<0.50	<0.50	<0.50	<0.50
N-Methyl perfluorooctane sulfonamidoacetic acid	µg/L	0.020	<0.020	<0.020	<0.020	<0.020	<0.020
N-Ethyl perfluorooctane sulfonamidoacetic acid	µg/L	0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Surrogate 13C8 PFOS	%		*97.6*	*101*	*99.8*	*106*	*101*
Surrogate 13C2 PFOA	%		*97.7*	*101*	*97.6*	*102*	*101*
Total +ve PFHxS+PFOS	µg/L	0.010	0.049	1.7	0.56	0.022	<0.010
Total +ve PFOA+PFOS	µg/L	0.010	0.035	1.4	0.44	0.022	<0.010
Total +ve PFAS	µg/L	0.010	0.049	2.2	0.89	0.022	<0.010
Extraction Internal Standard 13C3 PFBS	%		*95.2*	*94.8*	*94.7*	*98.6*	*101*
Extraction Internal Standard 18O2 PFHxS	%		*125*	*129*	*123*	*117*	*129*
Extraction Internal Standard 13C4 PFOS	%		*118*	*119*	*120*	*114*	*122*
Extraction Internal Standard 13C4 PFBA	%		*103*	*96.8*	*100*	*102*	*106*
Extraction Internal Standard 13C3 PFPeA	%		*103*	*99.6*	*101*	*103*	*104*
Extraction Internal Standard 13C2 PFHxA	%		*99.3*	*100*	*100*	*102*	*102*
Extraction Internal Standard 13C4 PFHpA	%		*106*	*108*	*108*	*108*	*110*
Extraction Internal Standard 13C4 PFOA	%		*126*	*127*	*126*	*125*	*125*
Extraction Internal Standard 13C5 PFNA	%		*125*	*130*	*129*	*131*	*134*

Certificate of Analysis PGE0588

PFAS Extended List (Water) - Analysed By Envirolab Services Sydney

Envirolab ID	Units	PQL	PGE0588-01	PGE0588-02	PGE0588-03	PGE0588-04	PGE0588-05
Your Reference			GWE (RN022487)	GWB01	GWB02	GWB03	GWB04
Date Sampled			07/05/2025	07/05/2025	07/05/2025	07/05/2025	07/05/2025
Extraction Internal Standard 13C2 PFDA	%		*121*	*129*	*123*	*126*	*134*
Extraction Internal Standard 13C2 PFUnDA	%		*121*	*127*	*125*	*122*	*134*
Extraction Internal Standard 13C2 PFDoDA	%		*129*	*135*	*136*	*135*	*144*
Extraction Internal Standard 13C2 PFTeDA	%		*134*	*144*	*141*	*141*	*122*
Extraction Internal Standard 13C2 4:2FTS	%		*115*	*124*	*115*	*116*	*118*
Extraction Internal Standard 13C2 6:2FTS	%		*124*	*136*	*135*	*130*	*129*
Extraction Internal Standard 13C2 8:2FTS	%		*126*	*146*	*135*	*136*	*165 [2]*
Extraction Internal Standard 13C8 FOSA	%		*110*	*117*	*114*	*116*	*123*
Extraction Internal Standard d3 N MeFOSA	%		*104*	*103*	*106*	*103*	*109*
Extraction Internal Standard d5 N EtFOSA	%		*99.7*	*107*	*105*	*104*	*101*
Extraction Internal Standard d7 N MeFOSE	%		*121*	*127*	*121*	*120*	*129*
Extraction Internal Standard d9 N EtFOSE	%		*120*	*123*	*121*	*119*	*127*
Extraction Internal Standard d3 N MeFOSAA	%		*126*	*130*	*137*	*135*	*166 [2]*
Extraction Internal Standard d5 N EtFOSAA	%		*117*	*116*	*118*	*118*	*144*

Envirolab ID	Units	PQL	PGE0588-06	PGE0588-07	PGE0588-08
Your Reference			Field Blank	Duplicate	Trip Blank
Date Sampled			07/05/2025	07/05/2025	07/05/2025
Perfluorobutanesulfonic acid (PFBS)	µg/L	0.010	<0.010	<0.010	<0.010
Perfluoropentanesulfonic acid (PFPeS)	µg/L	0.010	<0.010	<0.010	<0.010
Perfluorohexanesulfonic acid (PFHxS)	µg/L	0.010	<0.010	<0.010	<0.010
Perfluoroheptanesulfonic acid (PFHpS)	µg/L	0.010	<0.010	<0.010	<0.010
Perfluorooctanesulfonic acid (PFOS)	µg/L	0.010	<0.010	0.022	<0.010
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.020	<0.020	<0.020	<0.020
Perfluorobutanoic acid (PFBA)	µg/L	0.020	<0.020	<0.020	<0.020
Perfluoropentanoic acid (PFPeA)	µg/L	0.020	<0.020	<0.020	<0.020
Perfluorohexanoic acid (PFHxA)	µg/L	0.010	<0.010	<0.010	<0.010
Perfluoroheptanoic acid (PFHpA)	µg/L	0.010	<0.010	<0.010	<0.010
Perfluorooctanoic acid (PFOA)	µg/L	0.010	<0.010	<0.010	<0.010
Perfluorononanoic acid (PFNA)	µg/L	0.010	<0.010	<0.010	<0.010
Perfluorodecanoic acid (PFDA)	µg/L	0.020	<0.020	<0.020	<0.020
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.020	<0.020	<0.020	<0.020
Perfluorododecanoic acid (PFDoDA)	µg/L	0.050	<0.050	<0.050	<0.050
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.10	<0.10	<0.10	<0.10
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.50	<0.50	<0.50	<0.50
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.010	<0.010	<0.010	<0.010
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.010	<0.010	<0.010	<0.010
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.020	<0.020	<0.020	<0.020
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.020	<0.020	<0.020	<0.020
Perfluorooctane sulfonamide (FOSA)	µg/L	0.10	<0.10	<0.10	<0.10
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.050	<0.050	<0.050	<0.050
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.10	<0.10	<0.10	<0.10
N-Methyl perfluorooctane sulfonamidoethanol	µg/L	0.050	<0.050	<0.050	<0.050
N-Ethyl perfluorooctane sulfonamidoethanol	µg/L	0.50	<0.50	<0.50	<0.50

PFAS Extended List (Water) - Analysed By Envirolab Services Sydney

Envirolab ID	Units	PQL	PGE0588-06	PGE0588-07	PGE0588-08
Your Reference			Field Blank	Duplicate	Trip Blank
Date Sampled			07/05/2025	07/05/2025	07/05/2025
N-Methyl perfluorooctane sulfonamidoacetic acid	µg/L	0.020	<0.020	<0.020	<0.020
N-Ethyl perfluorooctane sulfonamidoacetic acid	µg/L	0.020	<0.020	<0.020	<0.020
Surrogate 13C8 PFOS	%		*103*	*104*	*99.4*
Surrogate 13C2 PFOA	%		*97.6*	*98.8*	*96.7*
Total +ve PFHxS+PFOS	µg/L	0.010	<0.010	0.022	<0.010
Total +ve PFOA+PFOS	µg/L	0.010	<0.010	0.022	<0.010
Total +ve PFAS	µg/L	0.010	<0.010	0.022	<0.010
Extraction Internal Standard 13C3 PFBS	%		*99.0*	*95.7*	*103*
Extraction Internal Standard 18O2 PFHxS	%		*130*	*125*	*118*
Extraction Internal Standard 13C4 PFOS	%		*117*	*113*	*116*
Extraction Internal Standard 13C4 PFBA	%		*108*	*101*	*108*
Extraction Internal Standard 13C3 PFPeA	%		*104*	*103*	*104*
Extraction Internal Standard 13C2 PFHxA	%		*104*	*103*	*102*
Extraction Internal Standard 13C4 PFHpA	%		*109*	*105*	*108*
Extraction Internal Standard 13C4 PFOA	%		*124*	*123*	*123*
Extraction Internal Standard 13C5 PFNA	%		*129*	*131*	*125*
Extraction Internal Standard 13C2 PFDA	%		*133*	*130*	*131*
Extraction Internal Standard 13C2 PFUnDA	%		*131*	*124*	*128*
Extraction Internal Standard 13C2 PFDoDA	%		*148*	*138*	*139*
Extraction Internal Standard 13C2 PFTeDA	%		*119*	*117*	*113*
Extraction Internal Standard 13C2 4:2FTS	%		*117*	*113*	*117*
Extraction Internal Standard 13C2 6:2FTS	%		*128*	*127*	*124*
Extraction Internal Standard 13C2 8:2FTS	%		*145*	*141*	*145*
Extraction Internal Standard 13C8 FOSA	%		*124*	*124*	*120*
Extraction Internal Standard d3 N MeFOSA	%		*110*	*108*	*104*
Extraction Internal Standard d5 N EtFOSA	%		*105*	*109*	*105*
Extraction Internal Standard d7 N MeFOSE	%		*124*	*121*	*119*
Extraction Internal Standard d9 N EtFOSE	%		*123*	*120*	*121*
Extraction Internal Standard d3 N MeFOSAA	%		*148*	*147*	*144*
Extraction Internal Standard d5 N EtFOSAA	%		*124*	*130*	*122*

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General - Field Data (Water)

Envirolab ID	Units	PQL	PGE0588-01	PGE0588-02	PGE0588-03	PGE0588-04	PGE0588-05
Your Reference			GWE (RN022487)	GWB01	GWB02	GWB03	GWB04
Date Sampled			07/05/2025	07/05/2025	07/05/2025	07/05/2025	07/05/2025
pH (Client Supplied)*	pH units		7.61	6.08	6.83	6.74	6.76
Temperature (Client Supplied)*	o C		32.0	32.0	32.1	30.8	31.0

Result Comments

Identifier	Description
[1]	The mass inbalance may be caused by other ions that have not been measured.
[2]	For PFAS Extracted Internal Standards denoted with ## or being outside the 50-150% acceptance range, the respective target analyte results may be unaffected, in other circumstances the PQL has been raised to accommodate the outlier(s).

Method Summary

Method ID	Methodology Summary
Calc	Calculation
Calc - ION	Calculation
Calc - Trivalent Cr	Calculation
Field Data	Field Data supplied by client
INORG-006	Alkalinity - determined titrimetrically based on APHA latest edition 2320-B. Solids reported from a 1:5 water extract unless otherwise specified. Total Carbon Dioxide - determined by calculation in accordance with APHA latest edition,4500-CO2 D.
INORG-018	Total Dissolved Solids - determined gravimetrically. The solids are dried at 180±10°C. NOTE: Where the EC of the sample is <100µS/cm, the TDS will typically be below 70mg/L (as the sample is very likely to be at least drinking water quality). Therefore to ensure data quality for TDS, the TDS is typically calculated as per the equation: TDS = EC*0.6
INORG-040	The concentrations of the major ions (mg/L) are converted to milliequivalents and summed. The ionic balance should be within +/- 15% i.e. total anions = total cations +/-15%.
INORG-055	Nitrate/Nitrite/NOx/TKN - determined colourimetrically. Waters samples are filtered on receipt prior to analysis. Soils/solids are analysed following a water extraction.
INORG-057	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.
INORG-057_CALC	Calculation of Ammonium as N. Assumes all Ammonia is present as Ammonium unless samplpe pH and temperature provided.
INORG-060_TP	Total Phosphorus - determined colourimetrically using APHA latest edition 4500-P J. Water samples are filtered on receipt prior to analysis. Soils are analysed from a water extract.
INORG-067	Samples are digested in acid with a known excess of potassium dichromate then the colour change is determined by discrete analyser or UV-VIS in accordance with APHA latest edition 5220 D.
INORG-079	Carbon forms (inorganic, organic, total) determined using a TOC/NDIR analyser via combustion. Dissolved aqueous\forms require filtering prior to determination.
INORG-081	Anions determined by Ion Chromatography. Waters samples are filtered on receipt prior to analysis. Solids are analysed from a water extract. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
INORG-091	BOD and/or cBOD - Analysed in accordance with APHA latest edition 5210 D.
INORG-111	Volatile Fatty Acids determined by distillation and titration.
INORG-118	Hexavalent Chromium by Ion Chromatographic separation and colourimetric determination. Waters samples are filtered prior to analysis. Solids are extracted with an alkaline buffered solution, for air sampling media the same alkali extraction can be used or alternatives from NIOSH/OSHA. For aqueous samples, Total Hexavalent Chromium includes the dissolved Hexavalent Chromium and any Hexavalent Chromium solubilised by the preservative i.e. Sodium Hydroxide from any particulate that may be present.
INORG-127	Total Nitrogen by high temperature catalytic combustion with chemiluminescence detection. Organic Carbon forms (inorganic, organic, total) determined using a TOC/NDIR analyser via combustion. Dissolved forms require filtering prior to determination.
METALS-020	Determination of various metals by ICP-OES. Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation.
METALS-022	Determination of various metals by ICP-MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements. Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation.
ORG-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. 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 (>C10-C40).
ORG-021/022/025_PCB	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD and/or GC-MS/GC-MSMS.

Method Summary

Method ID	Methodology Summary
ORG-022_PAH	Determination of semi-volatile organic compounds (SVOCs) by GC-MS. Water samples are extracted by LLE and solids using DCM/Acetone/Methanol. For PAHs:- Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. 1. 'TEQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'TEQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'TEQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, for Total +ve calculations, the PQL is reflective of the lowest individual PQL and therefore, for example, "Total +ve PAHs" is simply a sum of the positive individual PAHs.
ORG-023_F1_TOT	Determination of volatile organic compounds (VOCs) by P&T-GC-MS. Water samples are analysed directly by purge and trap GC-MS. Solids are extracted with Methanol, diluted and analysed by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.
ORG-029	Soil/solid and sorbent samples are extracted with basified Methanol. Waters and soil/sorbent 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. Analysis is undertaken with LC-MSMS. PFAS results include the sum of branched and linear isomers where applicable. 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. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

Result Definitions

Identifier	Description
NR	Not reported
NEPM	National Environment Protection Measure
NS	Not specified
LCS	Laboratory Control Sample
RPD	Relative Percent Difference
>	Greater than
<	Less than
PQL	Practical Quantitation Limit
INS	Insufficient sample for this test
NA	Test not required
NT	Not tested
DOL	Samples rejected due to particulate overload (air filters only)
RFD	Samples rejected due to filter damage (air filters only)
RUD	Samples rejected due to uneven deposition (air filters only)
##	Indicates a laboratory acceptance criteria outlier, for further details, see Result Comments and/or QC Comments

Quality Control Definitions

Blank

This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, and is determined by processing solvents and reagents in exactly the same manner as for samples.

Surrogate Spike

Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

LCS (Laboratory Control Sample)

This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Matrix Spike

A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

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.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

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 QAQC tables for details (available on request); <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; 60-140% for organics (+/-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 typically insufficient in order to satisfy laboratory QA/QC protocols.

Miscellaneous Information

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. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

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 or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volumes are typically provided by customers (often as flow rate(s) and sampling time(s) and/or simply volume(s) sampled or exposure times (determines 'volume' passive badges are exposed to)). Hence in such circumstances the volume measurement is inevitably not covered by Envirolab's NATA accreditation. An exception may occur where Envirolab Newcastle does the sampling where accreditation exists for certain types of sampling and hence volume determination(s). Note air volumes are often used to determine concentrations for dust and/or analyses on filters, sorbents and in impingers. For canister sampling, the air volume is covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary PGE0588

Client Details

Client	Katherine Town Council - NT
Your Reference	Katherine Town Council - EPL298 - Quarterly
Date Issued	23/05/2025

Recommended Holding Time Compliance

No recommended holding time exceedances

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	No	LCS Outliers Exist - See detailed list below
Duplicates	Yes	No Outliers
Matrix Spike	Yes	No Outliers
Surrogates / Extracted Internal Standards	No	Surrogates / Extracted ISTD Outliers Exist - See detailed list below
QC Frequency	No	QC Frequency Outliers Exist - See detailed list below

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Data Quality Assessment Summary PGE0588

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
vTRH&MBTEXN | Water	6, 8	07/05/2025	12/05/2025	13/05/2025	Yes
	1-5, 7	07/05/2025	12/05/2025	14/05/2025	Yes
sTRH | Water	1-5, 7-8	07/05/2025	13/05/2025	15/05/2025	Yes
PAH | Water	1-5	07/05/2025	13/05/2025	15/05/2025	Yes
PCB | Water	1-5	07/05/2025	13/05/2025	15/05/2025	Yes
Total Metals (LL) | Water	1-5	07/05/2025	15/05/2025	17/05/2025	Yes
Dissolved Metals (LL) | Water	1-5	07/05/2025	14/05/2025	15/05/2025	Yes
	6-7	07/05/2025	15/05/2025	15/05/2025	Yes
TDS | Water	1-5	07/05/2025	13/05/2025	13/05/2025	Yes
VFA | Water	1-5	07/05/2025	15/05/2025	15/05/2025	Yes
Alkalinity Suite | Water	1-5	07/05/2025	12/05/2025	13/05/2025	Yes
Chloride | Water	1-5	07/05/2025	12/05/2025	13/05/2025	Yes
Dissolved Cations | Water	1-5	07/05/2025	14/05/2025	15/05/2025	Yes
Ion Balance | Water	1-5	07/05/2025	13/05/2025	22/05/2025	Yes
	1-5	07/05/2025	14/05/2025	15/05/2025	Yes
Sulfate | Water	1-5	07/05/2025	12/05/2025	13/05/2025	Yes
Total Organic Carbon | Water	1-5	07/05/2025	13/05/2025	13/05/2025	Yes
Cr3+ | Water	1-5	07/05/2025	14/05/2025	15/05/2025	Yes
Cr3+ Total | Water	1-5	07/05/2025	15/05/2025	17/05/2025	Yes
Cr6+ | Water	1-5	07/05/2025	12/05/2025	12/05/2025	Yes
Cr6+ - Total | Water	1-5	07/05/2025	12/05/2025	12/05/2025	Yes
Nitrogen - Ammonia | Water	1-5	07/05/2025	13/05/2025	13/05/2025	Yes
Nitrogen - Ammonium by calc | Water	1-5	07/05/2025	13/05/2025	22/05/2025	Yes
Nitrogen - Nitrate | Water	1-5	07/05/2025	13/05/2025	13/05/2025	Yes
Nitrogen - Total N | Water	1-2	07/05/2025	19/05/2025	19/05/2025	Yes
	3-5	07/05/2025	19/05/2025	20/05/2025	Yes
Total Phosphorus | Water	1-5	07/05/2025	13/05/2025	14/05/2025	Yes
BOD | Water	1-5	07/05/2025	16/05/2025	21/05/2025	Yes
COD | Water	1-5	07/05/2025	12/05/2025	15/05/2025	Yes
PFAS EXT-ISTD | Water	1-8	07/05/2025	14/05/2025	15/05/2025	Yes
PFAS-Extended | Water	1-8	07/05/2025	14/05/2025	15/05/2025	Yes

Data Quality Assessment Summary PGE0588

Outliers: Laboratory Control Samples

ORG-029|PFAS Extended List (Water)| Batch BGE2639

Sample ID	Analyte	% Limits	% Recovery
BGE2639-BS1	N-Methyl perfluorooctane sulfonamidoethanol	60 - 140	49.5

Outliers: Surrogate / Extracted Internal Standards

ORG-029|PFAS Extended List (Matrix)| Batch BGE2639

Sample ID	Analyte	% Limits	% Recovery
PGE0588-05	Extraction Internal Standard d3 N MeFOSAA	50 - 150	166 [2]
	Extraction Internal Standard 13C2 8:2FTS	50 - 150	165 [2]

Outliers: QC Frequency

INORG-091|Inorganics - Common Wastewater Parameters (Water)| Batch BGE2740

Analysis	QC Type	Expected	Reported
BOD	Duplicate	2	0

INORG-111|Inorganics - Physical Parameters (Water)| Batch BGE2699

Analysis	QC Type	Expected	Reported
VFA	Duplicate	1	0

ORG-023_F1_TOT|Volatile TRH and BTEX (Water)| Batch BGE1915

Analysis	QC Type	Expected	Reported
vTRH&MBTEXN	Matrix Spike	1	0

ORG-029|PFAS Extended List (Water)| Batch BGE2639

Analysis	QC Type	Expected	Reported
PFAS EXT-ISTD	Duplicate	1	0
	Matrix Spike	1	0
PFAS-Extended	Duplicate	1	0
	Matrix Spike	1	0

Quality Control PGE0588

ORG-023_F1_TOT|Volatile TRH and BTEX (Water) | Batch BGE1915

Analyte	Units	PQL	Blank	DUP1 PGE0588-04 Samp | QC | RPD %	LCS %
TRH C6-C9	µg/L	10	<10	<10 | <10 | [NA]	97.5
TRH C6-C10	µg/L	10	<10	<10 | <10 | [NA]	104
Methyl tert butyl ether (MTBE)	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	[NA]
Benzene	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	98.3
Toluene	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	106
Ethylbenzene	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	98.1
meta+para Xylene	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	104
ortho-Xylene	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	98.6
Naphthalene (value used in F2 calc)	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	[NA]
Surrogate Dibromofluoromethane	*%*		*108*	*107 | 106*	*106*
Surrogate Toluene-D8	*%*		*104*	*103 | 104*	*107*
Surrogate 4-Bromofluorobenzene	*%*		*99.2*	*96.4 | 99.9*	*96.4*

ORG-020|Semi-volatile TRH (Water) | Batch BGE1979

Analyte	Units	PQL	Blank	DUP1 BGE1979-DUP1# Samp | QC | RPD %	DUP2 PGE0588-05 Samp | QC | RPD %	LCS %	Spike % BGE1979-MS1#
TRH C10-C14	µg/L	50	<50	<50 | <50 | [NA]	<50 | <50 | [NA]	103	95.4
TRH C15-C28	µg/L	100	<100	<100 | <100 | [NA]	<100 | <100 | [NA]	104	96.6
TRH C29-C36	µg/L	100	<100	<100 | <100 | [NA]	<100 | <100 | [NA]	119	107
TRH >C10-C16	µg/L	50	<50	<50 | <50 | [NA]	<50 | <50 | [NA]	107	98.9
TRH >C16-C34 (F3)	µg/L	100	<100	<100 | <100 | [NA]	<100 | <100 | [NA]	105	97.7
TRH >C34-C40 (F4)	µg/L	100	<100	<100 | <100 | [NA]	<100 | <100 | [NA]	100	92.1
Surrogate o-Terphenyl	*%*		*95.4*	*94.2 | 101*	*82.8 | 83.4*	*84.7*	*76.1*

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

ORG-022_PAH|Polycyclic Aromatic Hydrocarbons (Water) | Batch BGE1979

Analyte	Units	PQL	Blank	DUP1 BGE1979-DUP1# Samp | QC | RPD %	DUP2 PGE0588-05 Samp | QC | RPD %	LCS %	Spike % BGE1979-MS2#
Naphthalene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	78.2	96.5
Acenaphthylene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	[NA]	[NA]
Acenaphthene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	80.8	100
Fluorene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	78.7	96.4
Phenanthrene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	89.7	101
Anthracene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	[NA]	[NA]
Fluoranthene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	84.9	96.5
Pyrene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	82.9	95.2
Benzo(a)anthracene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	[NA]	[NA]
Chrysene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	70.5	86.0
Benzo(b,j,k)fluoranthene	µg/L	0.20	<0.20	<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	[NA]	[NA]
Benzo(a)pyrene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	67.2	81.2
Indeno(1,2,3-c,d)pyrene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	[NA]	[NA]
Dibenzo(a,h)anthracene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	[NA]	[NA]
Benzo(g,h,i)perylene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	[NA]	[NA]
Surrogate p-Terphenyl-D14	*%*		*96.8*	*97.3 | 99.3*	*70.5 | 80.5*	*73.6*	*79.5*

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control PGE0588

ORG-021/022/025_PCB|Polychlorinated Biphenyls (Water) | Batch BGE1979

Analyte	Units	PQL	Blank	DUP1 BGE1979-DUP1# Samp | QC | RPD %	DUP2 PGE0588-05 Samp | QC | RPD %	LCS %	Spike % BGE1979-MS2#
Aroclor 1016	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	<2.0 | <2.0 | [NA]	[NA]	[NA]
Aroclor 1221	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	<2.0 | <2.0 | [NA]	[NA]	[NA]
Aroclor 1232	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	<2.0 | <2.0 | [NA]	[NA]	[NA]
Aroclor 1242	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	<2.0 | <2.0 | [NA]	[NA]	[NA]
Aroclor 1248	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	<2.0 | <2.0 | [NA]	[NA]	[NA]
Aroclor 1254	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	<2.0 | <2.0 | [NA]	[NA]	[NA]
Aroclor 1260	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	<2.0 | <2.0 | [NA]	[NA]	[NA]
PCB C103	µg/L			0.00 | 0.00 | [NA]	0.00 | 0.00 | [NA]	80.2	87.4
Surrogate 2-Fluorobiphenyl	*%*		*95.2*	*96.3 | 96.8*	*87.7 | 97.2*	*71.1*	*84.6*

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-022|Acid Extractable Low Level Metals (Water) | Batch BGE2506

Analyte	Units	PQL	Blank	DUP1 BGE2506-DUP1# Samp | QC | RPD %	DUP2 PGE0588-03 Samp | QC | RPD %	LCS %	Spike % BGE2506-MS1#
Aluminium	µg/L	10	<10	<100 | <100 | [NA]	642 | 630 | 1.94	101	105
Cadmium	µg/L	0.10	<0.10	5.95 | 5.71 | 4.12	<0.10 | <0.10 | [NA]	105	94.8
Chromium	µg/L	1.0	<1.0	<10 | <10 | [NA]	2.03 | 2.03 | [NA]	109	109
Copper	µg/L	1.0	<1.0	<10 | <10 | [NA]	8.37 | 8.03 | 4.12	109	107
Iron	µg/L	10	<10	<100 | 124 | [NA] [3]	810 | 793 | 2.17	116	108
Lead	µg/L	1.0	<1.0	<10 | <10 | [NA]	3.85 | 3.83 | [NA]	104	101
Manganese	µg/L	1.0	<1.0	20300 | 20200 | 0.596	82.3 | 78.0 | 5.36	103	90.5
Nickel	µg/L	1.0	<1.0	<10 | <10 | [NA]	3.10 | 2.95 | [NA]	108	108
Selenium	µg/L	1.0	<1.0	<10 | <10 | [NA]	<1.0 | <1.0 | [NA]	112	113
Zinc	µg/L	1.0	<1.0	32.2 | 25.8 | [NA]	14.3 | 12.5 | 13.8	108	102

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-022|Dissolved Low Level Metals (Water) | Batch BGE2404

Analyte	Units	PQL	Blank	DUP1 PGE0588-01 Samp | QC | RPD %	DUP2 BGE2404-DUP2# Samp | QC | RPD %	LCS %	Spike % PGE0588-02
Aluminium	µg/L	10	<10	<10 | <10 | [NA]	<10 | <10 | [NA]	107	109
Cadmium	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	104	106
Chromium	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	105	105
Copper	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	10.7 | 10.8 | 1.09	104	100
Iron	µg/L	10	<10	20.6 | 20.8 | [NA]	<10 | <10 | [NA]	104	104
Lead	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	103	99.6
Manganese	µg/L	1.0	<1.0	29.0 | 28.0 | 3.39	38.2 | 38.9 | 1.63	105	95.1
Nickel	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	16.1 | 16.4 | 1.29	105	100
Selenium	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	1.18 | 1.20 | [NA]	105	115
Zinc	µg/L	1.0	<1.0	2.56 | 2.70 | [NA]	44.3 | 44.8 | 1.17	107	106

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control PGE0588

METALS-022|Dissolved Low Level Metals (Water) | Batch BGE2505

Analyte	Units	PQL	Blank	DUP1 PGE0588-06 Samp | QC | RPD %	LCS %	Spike % PGE0588-07
Aluminium	µg/L	10	<10	<10 | <10 | [NA]	105	111
Cadmium	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	104	103
Chromium	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	106	103
Copper	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	105	102
Iron	µg/L	10	<10	11.4 | 13.6 | [NA]	107	117
Lead	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	102	99.3
Manganese	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	105	101
Nickel	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	105	101
Selenium	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	105	103
Zinc	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	106	102

INORG-018|Inorganics - Physical Parameters (Water) | Batch BGE2173

Analyte	Units	PQL	Blank	DUP1 BGE2173-DUP1# Samp | QC | RPD %	DUP2 BGE2173-DUP2# Samp | QC | RPD %	LCS %
Total Dissolved Solids	mg/L	5.0	<5.0	170 | 162 | 4.82	305 | 287 | 6.08	100

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-111|Inorganics - Physical Parameters (Water) | Batch BGE2699

Analyte	Units	PQL	Blank	LCS %
Volatile Fatty Acids	mg/L	5.0	<5.0	84.0

INORG-006|Inorganics - Ionic Balance and Indexes (Water) | Batch BGE1948

Analyte	Units	PQL	Blank	DUP1 PGE0588-01 Samp | QC | RPD %	DUP2 BGE1948-DUP2# Samp | QC | RPD %	LCS %
Bicarbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	295 | 300 | 1.70	120 | 116 | 3.15	[NA]
Carbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0 | <5.0 | [NA]	6.33 | 6.96 | [NA]	[NA]
Hydroxide OH- as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0 | <5.0 | [NA]	<5.0 | <5.0 | [NA]	[NA]
Total Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	295 | 300 | 1.70	126 | 123 | 2.47	88.7

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-081|Inorganics - Ionic Balance and Indexes (Water) | Batch BGE1953

Analyte	Units	PQL	Blank	DUP1 PGE0588-01 Samp | QC | RPD %	DUP2 BGE1953-DUP2# Samp | QC | RPD %	LCS %	Spike % PGE0588-02
Chloride	mg/L	1.0	<1.0	11.2 | 10.7 | 4.17	302 | 303 | 0.330	87.5	99.4
Sulfate	mg/L	1.0	<1.0	8.29 | 8.36 | 0.819	<1.0 | <1.0 | [NA]	85.7	102

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-020|Inorganics - Ionic Balance and Indexes (Water) | Batch BGE2408

Analyte	Units	PQL	Blank	DUP1 PGE0588-01 Samp | QC | RPD %	DUP2 BGE2408-DUP2# Samp | QC | RPD %	LCS %	Spike % PGE0588-02
Calcium	mg/L	0.50	<0.50	53.0 | 53.1 | 0.232	8.19 | 8.14 | 0.677	88.5	78.2
Magnesium	mg/L	0.50	<0.50	32.8 | 32.5 | 0.867	45.2 | 44.9 | 0.571	90.6	92.6
Potassium	mg/L	0.50	<0.50	7.94 | 8.01 | 0.982	11.1 | 11.1 | 0.00	91.0	93.8
Sodium	mg/L	0.50	<0.50	11.2 | 11.0 | 0.901	212 | 213 | 0.324	83.5	92.8
Hardness (calc) equivalent CaCO3	mg/L	3.0	<3.0	267 | 266 | 0.322	206 | 205 | 0.581	[NA]	[NA]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control PGE0588

INORG-079 | Inorganics - Carbon, Nitrogen and Sulfur Species (Water) | Batch BGE1978

Analyte	Units	PQL	Blank	DUP1 PGE0588-01 Samp | QC | RPD %	DUP2 BGE1978-DUP2# Samp | QC | RPD %	LCS %	Spike % PGE0588-02
Total Organic Carbon	mg/L	1.0	<1.0	2.46 | 2.41 | [NA]	13.3 | 14.0 | 4.95	101	111

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-118 | Inorganics - Speciated Cr (III/VI) and Fe (II/III) (Water) | Batch BGE1892

Analyte	Units	PQL	Blank	DUP1 BGE1892-DUP1# Samp | QC | RPD %	LCS %	Spike % BGE1892-MS1#
Hexavalent Chromium	mg/L	0.0050	<0.0050	<0.0050 | <0.0050 | [NA]	110	108

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-118 | Inorganics - Speciated Cr (III/VI) and Fe (II/III) (Water) | Batch BGE1893

Analyte	Units	PQL	Blank	DUP1 BGE1893-DUP1# Samp | QC | RPD %	LCS %	Spike % BGE1893-MS1#
Hexavalent Chromium (Total)	mg/L	0.0050	<0.0050	<0.0050 | <0.0050 | [NA]	108	107

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-057 | Inorganics - Nutrients (Water) | Batch BGE1970

Analyte	Units	PQL	Blank	DUP1 PGE0588-01 Samp | QC | RPD %	DUP2 BGE1970-DUP2# Samp | QC | RPD %	LCS %	Spike % PGE0588-02
Ammonia as N	mg/L	0.0050	<0.0050	1.06 | 1.05 | 1.30	<0.0050 | <0.0050 | [NA]	96.8	84.8
Nitrate as N	mg/L	0.0050	<0.0050	1.21 | 1.23 | 1.33	<0.0050 | <0.0050 | [NA]	96.8	96.9
Nitrate as NO3 by calculation	mg/L	0.020	<0.020			[NA]	[NA]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-060_TP | Inorganics - Nutrients (Water) | Batch BGE2177

Analyte	Units	PQL	Blank	DUP1 BGE2177-DUP1# Samp | QC | RPD %	DUP2 PGE0588-05 Samp | QC | RPD %	LCS %	Spike % BGE2177-MS1#
Total Phosphorus	mg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	<0.010 | <0.010 | [NA]	105	83.3

Analyte	Units	PQL	Blank	LCS %
Total Phosphorus	mg/L	0.010	<0.010	[NA]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-127 | Inorganics - Nutrients (Water) | Batch BGE3078

Analyte	Units	PQL	Blank	DUP1 BGE3078-DUP1# Samp | QC | RPD %	LCS %	Spike % BGE3078-MS1#
Total Nitrogen	mg/L	0.10	<0.10	0.315 | 0.259 | [NA]	113	111

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-067 | Inorganics - Common Wastewater Parameters (Water) | Batch BGE1918

Analyte	Units	PQL	Blank	DUP1 BGE1918-DUP1# Samp | QC | RPD %	DUP2 BGE1918-DUP2# Samp | QC | RPD %	LCS %
COD	mg O2/L	20	<20	<20 | <20 | [NA]	5450 | 5410 | 0.737	105

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control PGE0588

INORG-091 | Inorganics - Common Wastewater Parameters (Water) | Batch BGE2740

Analyte	Units	PQL	Blank	LCS %
BOD	mg/L	5.0	<5.0	87.2

Quality Control PGE0588

ORG-029|PFAS Extended List (Water) | Batch BGE2639

Analyte	Units	PQL	Blank	LCS %
Perfluorobutanesulfonic acid (PFBS)	µg/L	0.010	<0.010	98.3
Perfluoropentanesulfonic acid (PFPeS)	µg/L	0.010	<0.010	83.9
Perfluorohexanesulfonic acid (PFHxS)	µg/L	0.010	<0.010	88.2
Perfluoroheptanesulfonic acid (PFHpS)	µg/L	0.010	<0.010	91.1
Perfluorooctanesulfonic acid (PFOS)	µg/L	0.010	<0.010	92.9
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.020	<0.020	111
Perfluorobutanoic acid (PFBA)	µg/L	0.020	<0.020	93.3
Perfluoropentanoic acid (PFPeA)	µg/L	0.020	<0.020	85.1
Perfluorohexanoic acid (PFHxA)	µg/L	0.010	<0.010	90.9
Perfluoroheptanoic acid (PFHpA)	µg/L	0.010	<0.010	91.5
Perfluorooctanoic acid (PFOA)	µg/L	0.010	<0.010	90.1
Perfluorononanoic acid (PFNA)	µg/L	0.010	<0.010	71.4
Perfluorodecanoic acid (PFDA)	µg/L	0.020	<0.020	88.1
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.020	<0.020	89.6
Perfluorododecanoic acid (PFDoDA)	µg/L	0.050	<0.050	91.6
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.10	<0.10	99.4
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.50	<0.50	86.8
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.010	<0.010	92.9
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.010	<0.010	98.2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.020	<0.020	101
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.020	<0.020	87.2
Perfluorooctane sulfonamide (FOSA)	µg/L	0.10	<0.10	98.0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.050	<0.050	87.2
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.10	<0.10	102
N-Methyl perfluorooctane sulfonamidoethanol	µg/L	0.050	<0.050	49.5
N-Ethyl perfluorooctane sulfonamidoethanol	µg/L	0.50	<0.50	89.4
N-Methyl perfluorooctane sulfonamidoacetic acid	µg/L	0.020	<0.020	86.0
N-Ethyl perfluorooctane sulfonamidoacetic acid	µg/L	0.020	<0.020	85.0
Surrogate 13C8 PFOS	*%*		*103*	*104*
Surrogate 13C2 PFOA	*%*		*99.6*	*102*
Extraction Internal Standard 13C3 PFBS	*%*		*92.5*	*[NA]*
Extraction Internal Standard 18O2 PFHxS	*%*		*134*	*[NA]*
Extraction Internal Standard 13C4 PFOS	*%*		*122*	*[NA]*
Extraction Internal Standard 13C4 PFBA	*%*		*115*	*[NA]*
Extraction Internal Standard 13C3 PFPeA	*%*		*101*	*[NA]*
Extraction Internal Standard 13C2 PFHxA	*%*		*109*	*[NA]*
Extraction Internal Standard 13C4 PFHpA	*%*		*111*	*[NA]*
Extraction Internal Standard 13C4 PFOA	*%*		*136*	*[NA]*
Extraction Internal Standard 13C5 PFNA	*%*		*136*	*[NA]*
Extraction Internal Standard 13C2 PFDA	*%*		*138*	*[NA]*
Extraction Internal Standard 13C2 PFUnDA	*%*		*136*	*[NA]*
Extraction Internal Standard 13C2 PFDoDA	*%*		*142*	*[NA]*
Extraction Internal Standard 13C2 PFTeDA	*%*		*144*	*[NA]*
Extraction Internal Standard 13C2 4:2FTS	*%*		*122*	*[NA]*
Extraction Internal Standard 13C2 6:2FTS	*%*		*136*	*[NA]*
Extraction Internal Standard 13C2 8:2FTS	*%*		*158 [2]*	*[NA]*
Extraction Internal Standard 13C8 FOSA	*%*		*129*	*[NA]*
Extraction Internal Standard d3 N MeFOSA	*%*		*114*	*[NA]*
Extraction Internal Standard d5 N EtFOSA	*%*		*115*	*[NA]*
Extraction Internal Standard d7 N MeFOSE	*%*		*127*	*[NA]*
Extraction Internal Standard d9 N EtFOSE	*%*		*121*	*[NA]*
Extraction Internal Standard d3 N MeFOSAA	*%*		*144*	*[NA]*
Extraction Internal Standard d5 N EtFOSAA	*%*		*135*	*[NA]*

QC Comments

Identifier	Description
[2]	For PFAS Extracted Internal Standards denoted with ## or being outside the 50-150% acceptance range, the respective target analyte results may be unaffected, in other circumstances the PQL has been raised to accommodate the outlier(s).
[3]	Duplicate %RPD may be flagged as an outlier to routine laboratory acceptance, however, where one or both results are <10*PQL, the RPD acceptance criteria increases exponentially.

Envirolab Services (WA) Pty Ltd trading as MPL Laboratories
ABN 53 140 099 207
16-18 Hayden Court Myaree WA 6154
ph +61 8 9317 2505
lab@mpl.com.au
www.mpl.com.au

Certificate of Analysis PGE1955

Client Details

Client	Katherine Town Council - NT
Contact	Brett Kimpton
Address	PO Box 1071, KATHERINE, NT, 0851

Sample Details

Your Reference	Katherine Town Council - EPL296-Monthly
Number of Samples	9 Water
Date Samples Received	29/05/2025
Date Instructions Received	29/05/2025

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 soils and on an as received basis for other matrices.

Report Details

Date Final Results Expected	17/06/2025
Date of Issue	09/06/2025

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Authorisation Details

Results Approved By	Lien Tang, Assistant Operations Manager Lucas Yii, Inorganics Team Leader Michael Mowle, Development Chemist - Inorganics and Metals Varsha Ho Wing, Inorganics and Metals Supervisor
Laboratory Manager	Michael Kubiak

Certificate of Analysis PGE1955

Samples in this Report

Envirolab ID	Sample ID	Matrix	Date Sampled	Date Received
PGE1955-01	GWA	Water	27/05/2025	29/05/2025
PGE1955-02	GWE	Water	27/05/2025	29/05/2025
PGE1955-03	GWB01	Water	27/05/2025	29/05/2025
PGE1955-04	GWB02	Water	27/05/2025	29/05/2025
PGE1955-05	GWB03	Water	27/05/2025	29/05/2025
PGE1955-06	GWB04	Water	27/05/2025	29/05/2025
PGE1955-07	QC100	Water	27/05/2025	29/05/2025
PGE1955-08	Rinsate	Water	27/05/2025	29/05/2025
PGE1955-09	Trip Blank	Water	26/05/2025	29/05/2025

Certificate of Analysis PGE1955

Inorganics - Physical Parameters (Water)

Envirolab ID	Units	PQL	PGE1955-01	PGE1955-02	PGE1955-03	PGE1955-04	PGE1955-05
Your Reference			GWA	GWE	GWB01	GWB02	GWB03
Date Sampled			27/05/2025	27/05/2025	27/05/2025	27/05/2025	27/05/2025
Total Dissolved Solids	mg/L	5.0	340	310	540	480	460

Envirolab ID	Units	PQL	PGE1955-06	PGE1955-07	PGE1955-08	PGE1955-09
Your Reference			GWB04	QC100	Rinsate	Trip Blank
Date Sampled			27/05/2025	27/05/2025	27/05/2025	26/05/2025
Total Dissolved Solids	mg/L	5.0	470	470	<5.0	<5.0

Inorganics - Ionic Balance and Indexes (Water)

Envirolab ID	Units	PQL	PGE1955-01	PGE1955-02	PGE1955-03	PGE1955-04	PGE1955-05
Your Reference			GWA	GWE	GWB01	GWB02	GWB03
Date Sampled			27/05/2025	27/05/2025	27/05/2025	27/05/2025	27/05/2025
Bicarbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	340	270	400	420	430
Carbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Hydroxide OH- as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Total Alkalinity as CaCO3	mg/L as CaCO3	5.0	340	270	400	420	430
Chloride	mg/L	1.0	3.1	4.6	13	7.7	5.8
Sulfate	mg/L	1.0	3.9	4.1	4.0	7.3	5.1
Calcium	mg/L	0.50	71	48	86	93	89
Magnesium	mg/L	0.50	35	31	44	46	49
Potassium	mg/L	0.50	5.1	8.0	13	4.9	3.9
Sodium	mg/L	0.50	5.7	12	28	14	8.5
Hardness (calc) equivalent CaCO3	mg/L	3.0	320	250	400	420	420
Ionic Balance	%		-0.41	1.8	6.4	1.6	0.71
Total Anions	mg/L	7.0	340	280	410	440	440
Anions as meq	meq/L	0.59	5.7	4.7	6.9	7.3	7.2
Total Cations	mg/L	2.0	120	100	170	160	150
Cations as meq	meq/L	0.10	6.8	5.7	9.5	9.2	8.9

Envirolab ID	Units	PQL	PGE1955-06
Your Reference			GWB04
Date Sampled			27/05/2025
Bicarbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	480
Carbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0
Hydroxide OH- as CaCO3	mg/L as CaCO3	5.0	<5.0
Total Alkalinity as CaCO3	mg/L as CaCO3	5.0	480
Chloride	mg/L	1.0	2.4
Sulfate	mg/L	1.0	3.7
Calcium	mg/L	0.50	83
Magnesium	mg/L	0.50	65
Potassium	mg/L	0.50	8.4
Sodium	mg/L	0.50	9.4
Hardness (calc) equivalent CaCO3	mg/L	3.0	480
Ionic Balance	%		2.5
Total Anions	mg/L	7.0	480
Anions as meq	meq/L	0.59	7.9
Total Cations	mg/L	2.0	170
Cations as meq	meq/L	0.10	10

Certificate of Analysis PGE1955

Inorganics - Carbon, Nitrogen and Sulfur Species (Water)

Envirolab ID	Units	PQL	PGE1955-01	PGE1955-02	PGE1955-03	PGE1955-04	PGE1955-05
Your Reference			GWA	GWE	GWB01	GWB02	GWB03
Date Sampled			27/05/2025	27/05/2025	27/05/2025	27/05/2025	27/05/2025
Total Organic Carbon	mg/L	1.0	<1.0	1.8	3.5	1.1	<1.0

Envirolab ID	Units	PQL	PGE1955-06	PGE1955-07	PGE1955-08	PGE1955-09
Your Reference			GWB04	QC100	Rinsate	Trip Blank
Date Sampled			27/05/2025	27/05/2025	27/05/2025	26/05/2025
Total Organic Carbon	mg/L	1.0	<1.0	<1.0	<1.0	<1.0

Certificate of Analysis PGE1955

Inorganics - Nutrients (Water)

Envirolab ID	Units	PQL	PGE1955-01	PGE1955-02	PGE1955-03	PGE1955-04	PGE1955-05
Your Reference			GWA	GWE	GWB01	GWB02	GWB03
Date Sampled			27/05/2025	27/05/2025	27/05/2025	27/05/2025	27/05/2025
Ammonia as N	mg/L	0.0050	0.0064	1.8	0.91	0.026	<0.0050
Free Ammonia (unionised) as N by calculation*	mg/L	0.0070	<0.0070	0.092	<0.0070	<0.0070	<0.0070
Ammonium (NH4+) as N by calculation	mg/L	0.0070	<0.0070	1.8	0.91	0.026	<0.0070

Envirolab ID	Units	PQL	PGE1955-06	PGE1955-07	PGE1955-08	PGE1955-09
Your Reference			GWB04	QC100	Rinsate	Trip Blank
Date Sampled			27/05/2025	27/05/2025	27/05/2025	26/05/2025
Ammonia as N	mg/L	0.0050	<0.0050	0.024	<0.0050	<0.0050
Free Ammonia (unionised) as N by calculation*	mg/L	0.0070	<0.0070	[NA]	[NA]	[NA]
Ammonium (NH4+) as N by calculation	mg/L	0.0070	<0.0070	[NA]	[NA]	[NA]

Certificate of Analysis PGE1955

Inorganics - Common Wastewater Parameters (Water)

Envirolab ID	Units	PQL	PGE1955-01	PGE1955-02	PGE1955-03	PGE1955-04	PGE1955-05
Your Reference			GWA	GWE	GWB01	GWB02	GWB03
Date Sampled			27/05/2025	27/05/2025	27/05/2025	27/05/2025	27/05/2025
BOD	mg/L	5.0	6.8	13	9.7	14	17
COD	mg O2/L	20	<20	<20	<20	<20	<20

Envirolab ID	Units	PQL	PGE1955-06
Your Reference			GWB04
Date Sampled			27/05/2025
BOD	mg/L	5.0	<5.0
COD	mg O2/L	20	<20

Certificate of Analysis PGE1955

General - Field Data (Water)

Envirolab ID	Units	PQL	PGE1955-01	PGE1955-02	PGE1955-03	PGE1955-04	PGE1955-05
Your Reference			GWA	GWE	GWB01	GWB02	GWB03
Date Sampled			27/05/2025	27/05/2025	27/05/2025	27/05/2025	27/05/2025
pH (Client Supplied)*	pH units		7.31	7.77	6.76	6.75	6.87
Temperature (Client Supplied)*	o C		31.7	31.5	32.5	31.8	29.9

Envirolab ID	Units	PQL	PGE1955-06
Your Reference			GWB04
Date Sampled			27/05/2025
pH (Client Supplied)*	pH units		6.70
Temperature (Client Supplied)*	o C		32.1

Method Summary

Method ID	Methodology Summary
Calc	Calculation
Calc - ION	Calculation
Field Data	Field Data supplied by client
INORG-006	Alkalinity - determined titrimetrically based on APHA latest edition 2320-B. Solids reported from a 1:5 water extract unless otherwise specified. Total Carbon Dioxide - determined by calculation in accordance with APHA latest edition,4500-CO2 D.
INORG-018	Total Dissolved Solids - determined gravimetrically. The solids are dried at 180±10°C. NOTE: Where the EC of the sample is <100µS/cm, the TDS will typically be below 70mg/L (as the sample is very likely to be at least drinking water quality). Therefore to ensure data quality for TDS, the TDS is typically calculated as per the equation: TDS = EC*0.6
INORG-040	The concentrations of the major ions (mg/L) are converted to milliequivalents and summed. The ionic balance should be within +/- 15% i.e. total anions = total cations +/-15%.
INORG-057	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.
INORG-057_CALC	Calculation of Ammonium as N. Assumes all Ammonia is present as Ammonium unless samplpe pH and temperature provided.
INORG-067	Samples are digested in acid with a known excess of potassium dichromate then the colour change is determined by discrete analyser or UV-VIS in accordance with APHA latest edition 5220 D.
INORG-079	Carbon forms (inorganic, organic, total) determined using a TOC/NDIR analyser via combustion. Dissolved aqueous\forms require filtering prior to determination.
INORG-081	Anions determined by Ion Chromatography. Waters samples are filtered on receipt prior to analysis. Solids are analysed from a water extract. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
INORG-091	BOD and/or cBOD - Analysed in accordance with APHA latest edition 5210 D.
METALS-020	Determination of various metals by ICP-OES. Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation.

Result Definitions

Identifier	Description
NR	Not reported
NEPM	National Environment Protection Measure
NS	Not specified
LCS	Laboratory Control Sample
RPD	Relative Percent Difference
>	Greater than
<	Less than
PQL	Practical Quantitation Limit
INS	Insufficient sample for this test
NA	Test not required
NT	Not tested
DOL	Samples rejected due to particulate overload (air filters only)
RFD	Samples rejected due to filter damage (air filters only)
RUD	Samples rejected due to uneven deposition (air filters only)
##	Indicates a laboratory acceptance criteria outlier, for further details, see Result Comments and/or QC Comments

Quality Control Definitions

Blank

This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, and is determined by processing solvents and reagents in exactly the same manner as for samples.

Surrogate Spike

Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

LCS (Laboratory Control Sample)

This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Matrix Spike

A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

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.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

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 QAQC tables for details (available on request); <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; 60-140% for organics (+/-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 typically insufficient in order to satisfy laboratory QA/QC protocols.

Miscellaneous Information

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. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

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 or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volumes are typically provided by customers (often as flow rate(s) and sampling time(s) and/or simply volume(s) sampled or exposure times (determines 'volume' passive badges are exposed to)). Hence in such circumstances the volume measurement is inevitably not covered by Envirolab's NATA accreditation. An exception may occur where Envirolab Newcastle does the sampling where accreditation exists for certain types of sampling and hence volume determination(s). Note air volumes are often used to determine concentrations for dust and/or analyses on filters, sorbents and in impingers. For canister sampling, the air volume is covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary PGE1955

Client Details

Client	Katherine Town Council - NT
Your Reference	Katherine Town Council - EPL296-Monthly
Date Issued	09/06/2025

Recommended Holding Time Compliance

Recommended holding time exceedances exist - See detailed list below

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	Yes	No Outliers
Duplicates	Yes	No Outliers
Matrix Spike	Yes	No Outliers
Surrogates / Extracted Internal Standards	Yes	No Outliers
QC Frequency	No	QC Frequency Outliers Exist - See detailed list below

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Data Quality Assessment Summary PGE1955

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
TDS | Water	9	26/05/2025	06/06/2025	06/06/2025	No
	1-8	27/05/2025	06/06/2025	06/06/2025	No
Alkalinity Suite | Water	1-6	27/05/2025	30/05/2025	30/05/2025	Yes
Chloride | Water	1-6	27/05/2025	30/05/2025	30/05/2025	Yes
Dissolved Cations | Water	1-6	27/05/2025	03/06/2025	05/06/2025	Yes
Ion Balance | Water	1-6	27/05/2025	03/06/2025	05/06/2025	Yes
	1-6	27/05/2025	03/06/2025	06/06/2025	Yes
Sulfate | Water	1-6	27/05/2025	30/05/2025	30/05/2025	Yes
Total Organic Carbon | Water	9	26/05/2025	04/06/2025	04/06/2025	Yes
	1-8	27/05/2025	04/06/2025	04/06/2025	Yes
Nitrogen - Ammonia | Water	9	26/05/2025	30/05/2025	30/05/2025	Yes
	1-8	27/05/2025	30/05/2025	30/05/2025	Yes
Nitrogen - Ammonium by calc | Water	1-6	27/05/2025	03/06/2025	06/06/2025	Yes
BOD | Water	1-6	27/05/2025	30/05/2025	04/06/2025	Yes
COD | Water	1-6	27/05/2025	29/05/2025	04/06/2025	Yes

Outliers: QC Frequency

INORG-091 | Inorganics - Common Wastewater Parameters (Water) | Batch BGE5471

Analysis	QC Type	Expected	Reported
BOD	Duplicate	2	0

Quality Control PGE1955

INORG-018 | Inorganics - Physical Parameters (Water) | Batch BGF0963

Analyte	Units	PQL	Blank	DUP1 PGE1955-01 Samp | QC | RPD %	DUP2 BGF0963-DUP2# Samp | QC | RPD %	LCS %
Total Dissolved Solids	mg/L	5.0	<5.0	344 | 355 | 3.15	135 | 138 | 2.20	101

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-006 | Inorganics - Ionic Balance and Indexes (Water) | Batch BGE5366

Analyte	Units	PQL	Blank	DUP1 BGE5366-DUP1# Samp | QC | RPD %	DUP2 BGE5366-DUP2# Samp | QC | RPD %	LCS %
Bicarbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	20.1 | 20.2 | [NA]	80.6 | 82.5 | 2.28	[NA]
Carbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0 | <5.0 | [NA]	<5.0 | <5.0 | [NA]	[NA]
Hydroxide OH- as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0 | <5.0 | [NA]	<5.0 | <5.0 | [NA]	[NA]
Total Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	20.1 | 20.2 | [NA]	80.6 | 82.5 | 2.29	94.7

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-081 | Inorganics - Ionic Balance and Indexes (Water) | Batch BGE5409

Analyte	Units	PQL	Blank	DUP1 BGE5409-DUP1# Samp | QC | RPD %	DUP2 BGE5409-DUP2# Samp | QC | RPD %	LCS %	Spike % BGE5409-MS1#
Chloride	mg/L	1.0	<1.0	245 | 245 | 0.0426	66.0 | 68.0 | [NA]	100	93.1
Sulfate	mg/L	1.0	<1.0	29.4 | 29.3 | 0.368	24.0 | 22.0 | [NA]	95.4	101

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-020 | Inorganics - Ionic Balance and Indexes (Water) | Batch BGF0166

Analyte	Units	PQL	Blank	DUP1 BGF0166-DUP1# Samp | QC | RPD %	DUP2 BGF0166-DUP2# Samp | QC | RPD %	LCS %	Spike % BGF0166-MS1#
Calcium	mg/L	0.50	<0.50	14.7 | 14.8 | 0.725	29.3 | 28.9 | 1.29	92.6	104
Magnesium	mg/L	0.50	<0.50	13.2 | 13.3 | 0.257	75.2 | 74.5 | 0.855	97.1	98.1
Potassium	mg/L	0.50	<0.50	14.7 | 14.9 | 1.39	30.2 | 30.3 | 0.363	96.6	99.2
Sodium	mg/L	0.50	<0.50	62.9 | 63.3 | 0.634	918 | 920 | 0.222	98.9	96.3
Hardness (calc) equivalent CaCO3	mg/L	3.0	<3.0	91.2 | 91.6 | 0.445	383 | 379 | 0.939	[NA]	[NA]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-079 | Inorganics - Carbon, Nitrogen and Sulfur Species (Water) | Batch BGF0382

Analyte	Units	PQL	Blank	DUP1 PGE1955-01 Samp | QC | RPD %	DUP2 BGF0382-DUP2# Samp | QC | RPD %	LCS %	Spike % PGE1955-02
Total Organic Carbon	mg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	104	91.2

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-057 | Inorganics - Nutrients (Water) | Batch BGE5373

Analyte	Units	PQL	Blank	DUP1 BGE5373-DUP1# Samp | QC | RPD %	DUP2 BGE5373-DUP2# Samp | QC | RPD %	LCS %	Spike % BGE5373-MS1#
Ammonia as N	mg/L	0.0050	<0.0050	0.420 | 0.428 | 1.92	0.0996 | 0.0958 | [NA]	104	101

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-067 | Inorganics - Common Wastewater Parameters (Water) | Batch BGE5301

Analyte	Units	PQL	Blank	DUP1 BGE5301-DUP1# Samp | QC | RPD %	DUP2 BGE5301-DUP2# Samp | QC | RPD %	LCS %
COD	mg O2/L	20	<20	914 | 910 | 0.439	435 | 430 | [NA]	104

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control PGE1955

INORG-091 | Inorganics - Common Wastewater Parameters (Water) | Batch BGE5471

Analyte	Units	PQL	Blank	LCS %
BOD	mg/L	5.0	<5.0	82.8

Envirolab Services (WA) Pty Ltd trading as MPL Laboratories
ABN 53 140 099 207
16-18 Hayden Court Myaree WA 6154
ph +61 8 9317 2505
lab@mpl.com.au
www.mpl.com.au

Certificate of Analysis PGF1282

Client Details

Client	Katherine Town Council - NT
Contact	Brett Kimpton
Address	PO Box 1071, KATHERINE, NT, 0851

Sample Details

Your Reference	Katherine Town Council - EPL298 - Monthly - June
Number of Samples	11 Water
Date Samples Received	19/06/2025
Date Instructions Received	19/06/2025

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 soils and on an as received basis for other matrices.

Report Details

Date Final Results Expected	03/07/2025
Date of Issue	30/06/2025

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Authorisation Details

Results Approved By	Lien Tang, Assistant Operations Manager Lucas Yii, Inorganics Team Leader Michael Mowle, Development Chemist - Inorganics and Metals Priya Samarawickrama, Senior Chemist, Inorganics Varsha Ho Wing, Inorganics and Metals Supervisor
Laboratory Manager	Michael Kubiak

Certificate of Analysis PGF1282

Samples in this Report

Envirolab ID	Sample ID	Matrix	Date Sampled	Date Received
PGF1282-01	GWA (RN031131)	Water	17/06/2025	19/06/2025
PGF1282-02	GWE (RN022487)	Water	17/06/2025	19/06/2025
PGF1282-03	GWB01	Water	17/06/2025	19/06/2025
PGF1282-04	GWB02	Water	17/06/2025	19/06/2025
PGF1282-05	GWB03	Water	17/06/2025	19/06/2025
PGF1282-06	GWB04	Water	17/06/2025	19/06/2025
PGF1282-07	Field Duplicate	Water	17/06/2025	19/06/2025
PGF1282-08	Rinsate Blank	Water	17/06/2025	19/06/2025
PGF1282-09	Field Blank	Water	17/06/2025	19/06/2025
PGF1282-10	SWB	Water	17/06/2025	19/06/2025
PGF1282-11	SWC	Water	17/06/2025	19/06/2025

Certificate of Analysis PGF1282

Acid Extractable Low Level Metals (Water)

Envirolab ID	Units	PQL	PGF1282-10	PGF1282-11
Your Reference			SWB	SWC
Date Sampled			17/06/2025	17/06/2025
Aluminium	µg/L	10	56	18
Cadmium	µg/L	0.10	<0.10	<0.10
Chromium	µg/L	1.0	<1.0	<1.0
Copper	µg/L	1.0	<1.0	1.4
Iron	µg/L	10	130	46
Manganese	µg/L	1.0	2.5	2.7
Nickel	µg/L	1.0	<1.0	<1.0
Lead	µg/L	1.0	<1.0	<1.0
Selenium	µg/L	1.0	<1.0	<1.0
Zinc	µg/L	1.0	4.1	3.2

Certificate of Analysis PGF1282

Dissolved Low Level Metals (Water)

Envirolab ID	Units	PQL	PGF1282-08	PGF1282-09	PGF1282-10	PGF1282-11
Your Reference			Rinsate Blank	Field Blank	SWB	SWC
Date Sampled			17/06/2025	17/06/2025	17/06/2025	17/06/2025
Aluminium	µg/L	10	<10	<10	<10	<10
Cadmium	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Chromium	µg/L	1.0	<1.0	<1.0	<1.0	<1.0
Copper	µg/L	1.0	<1.0	<1.0	<1.0	<1.0
Iron	µg/L	10	<10	<10	<10	<10
Manganese	µg/L	1.0	<1.0	<1.0	1.0	1.4
Nickel	µg/L	1.0	<1.0	<1.0	<1.0	<1.0
Lead	µg/L	1.0	<1.0	<1.0	<1.0	<1.0
Selenium	µg/L	1.0	<1.0	<1.0	<1.0	<1.0
Zinc	µg/L	1.0	<1.0	<1.0	<1.0	<1.0

Certificate of Analysis PGF1282

Inorganics - Physical Parameters (Water)

Envirolab ID	Units	PQL	PGF1282-01	PGF1282-02	PGF1282-03	PGF1282-04	PGF1282-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			17/06/2025	17/06/2025	17/06/2025	17/06/2025	17/06/2025
Total Dissolved Solids	mg/L	5.0	360	340	480	470	420

Envirolab ID	Units	PQL	PGF1282-06	PGF1282-07	PGF1282-08	PGF1282-09	PGF1282-10
Your Reference			GWB04	Field Duplicate	Rinsate Blank	Field Blank	SWB
Date Sampled			17/06/2025	17/06/2025	17/06/2025	17/06/2025	17/06/2025
Total Dissolved Solids	mg/L	5.0	520	510	<5.0	<5.0	310

Envirolab ID	Units	PQL	PGF1282-11
Your Reference			SWC
Date Sampled			17/06/2025
Total Dissolved Solids	mg/L	5.0	310

Certificate of Analysis PGF1282

Inorganics - Physical Parameters (Water) - Analysed By Envirolab Services Sydney

Envirolab ID	Units	PQL	PGF1282-10	PGF1282-11
Your Reference			SWB	SWC
Date Sampled			17/06/2025	17/06/2025
Volatile Fatty Acids*	mg/L	5.0	14	100

Inorganics - Ionic Balance and Indexes (Water)

Envirolab ID	Units	PQL	PGF1282-01	PGF1282-02	PGF1282-03	PGF1282-04	PGF1282-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			17/06/2025	17/06/2025	17/06/2025	17/06/2025	17/06/2025
Bicarbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	270	300	380	300	380
Carbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Hydroxide OH- as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Total Alkalinity as CaCO3	mg/L as CaCO3	5.0	270	300	380	300	380
Chloride	mg/L	1.0	5.1	9.3	43	21	10
Sulfate	mg/L	1.0	7.7	9.6	19	19	6.3
Calcium	mg/L	0.50	81	53	88	100	83
Magnesium	mg/L	0.50	36	30	40	44	43
Potassium	mg/L	0.50	4.9	9.2	12	6.5	4.1
Sodium	mg/L	0.50	5.1	10	20	12	9.3
Hardness (calc) equivalent CaCO3	mg/L	3.0	350	250	380	430	390
Calcium Hardness	mg/L	1.0	200	130	220	250	210
Magnesium Hardness	mg/L	1.0	150	120	170	180	180
Ionic Balance	%		13	-4.5	-1.8	14	1.7
Total Anions	mg/L	7.0	280	320	440	340	390
Anions as meq	meq/L	0.59	4.7	5.4	7.9	5.9	6.6
Total Cations	mg/L	2.0	130	100	160	160	140
Cations as meq	meq/L	0.10	7.3	5.8	8.9	9.3	8.2

Envirolab ID	Units	PQL	PGF1282-06	PGF1282-10	PGF1282-11
Your Reference			GWB04	SWB	SWC
Date Sampled			17/06/2025	17/06/2025	17/06/2025
Bicarbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	510	310	320
Carbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	17
Hydroxide OH- as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0
Total Alkalinity as CaCO3	mg/L as CaCO3	5.0	510	310	330
Chloride	mg/L	1.0	7.5	10	10
Sulfate	mg/L	1.0	14	3.3	3.3
Calcium	mg/L	0.50	92	63	62
Magnesium	mg/L	0.50	65	44	44
Potassium	mg/L	0.50	8.8	3.9	4.4
Sodium	mg/L	0.50	9.0	9.6	8.9
Hardness (calc) equivalent CaCO3	mg/L	3.0	500	340	330
Calcium Hardness	mg/L	1.0	230	160	160
Magnesium Hardness	mg/L	1.0	270	180	180
Ionic Balance	%		-0.095	6.2	1.3
Total Anions	mg/L	7.0	530	320	350
Anions as meq	meq/L	0.59	8.8	5.4	6.1
Total Cations	mg/L	2.0	180	120	120
Cations as meq	meq/L	0.10	11	7.3	7.2

Certificate of Analysis PGF1282

Inorganics - Carbon, Nitrogen and Sulfur Species (Water)

Envirolab ID	Units	PQL	PGF1282-01	PGF1282-02	PGF1282-03	PGF1282-04	PGF1282-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			17/06/2025	17/06/2025	17/06/2025	17/06/2025	17/06/2025
Total Organic Carbon	mg/L	1.0	<1.0	<1.0	3.0	1.5	1.3

Envirolab ID	Units	PQL	PGF1282-06	PGF1282-07	PGF1282-08	PGF1282-09	PGF1282-10
Your Reference			GWB04	Field Duplicate	Rinsate Blank	Field Blank	SWB
Date Sampled			17/06/2025	17/06/2025	17/06/2025	17/06/2025	17/06/2025
Total Organic Carbon	mg/L	1.0	<1.0	3.2	<1.0	<1.0	2.6

Envirolab ID	Units	PQL	PGF1282-11
Your Reference			SWC
Date Sampled			17/06/2025
Total Organic Carbon	mg/L	1.0	2.0

Inorganics - Speciated Cr (III/VI) and Fe (II/III) (Water)

Envirolab ID	Units	PQL	PGF1282-10	PGF1282-11
Your Reference			SWB	SWC
Date Sampled			17/06/2025	17/06/2025
Hexavalent Chromium	mg/L	0.0050	<0.0050	<0.0050
Hexavalent Chromium (Total)	mg/L	0.0050	<0.0050	<0.0050

Inorganics - Nutrients (Water)

Envirolab ID	Units	PQL	PGF1282-01	PGF1282-02	PGF1282-03	PGF1282-04	PGF1282-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			17/06/2025	17/06/2025	17/06/2025	17/06/2025	17/06/2025
Ammonia as N	mg/L	0.0050	0.015	3.0	0.84	0.017	0.018
Free Ammonia (unionised) as N by calculation*	mg/L	0.0070	<0.0070	0.12	<0.0070	<0.0070	<0.0070
Ammonium (NH4+) as N by calculation	mg/L	0.0070	0.015	2.8	0.84	0.017	0.018
Nitrate as N	mg/L	0.0050	[NA]	[NA]	[NA]	[NA]	[NA]
Nitrate as NO3 by calculation	mg/L	0.020	[NA]	[NA]	[NA]	[NA]	[NA]
Total Nitrogen	mg/L	0.10	[NA]	[NA]	[NA]	[NA]	[NA]
Total Phosphorus	mg/L	0.010	[NA]	[NA]	[NA]	[NA]	[NA]

Envirolab ID	Units	PQL	PGF1282-06	PGF1282-07	PGF1282-08	PGF1282-09	PGF1282-10
Your Reference			GWB04	Field Duplicate	Rinsate Blank	Field Blank	SWB
Date Sampled			17/06/2025	17/06/2025	17/06/2025	17/06/2025	17/06/2025
Ammonia as N	mg/L	0.0050	0.020	0.96	<0.0050	<0.0050	0.0067
Free Ammonia (unionised) as N by calculation*	mg/L	0.0070	<0.0070	<0.0070	<0.0070	<0.0070	<0.0070
Ammonium (NH4+) as N by calculation	mg/L	0.0070	0.020	0.96	<0.0070	<0.0070	<0.0070
Nitrate as N	mg/L	0.0050	[NA]	[NA]	[NA]	[NA]	0.013
Nitrate as NO3 by calculation	mg/L	0.020	[NA]	[NA]	[NA]	[NA]	0.056
Total Nitrogen	mg/L	0.10	[NA]	[NA]	[NA]	[NA]	0.27
Total Phosphorus	mg/L	0.010	[NA]	[NA]	[NA]	[NA]	<0.010

Envirolab ID	Units	PQL	PGF1282-11
Your Reference			SWC
Date Sampled			17/06/2025
Ammonia as N	mg/L	0.0050	<0.0050
Free Ammonia (unionised) as N by calculation*	mg/L	0.0070	<0.0070
Ammonium (NH4+) as N by calculation	mg/L	0.0070	<0.0070
Nitrate as N	mg/L	0.0050	<0.0050
Nitrate as NO3 by calculation	mg/L	0.020	0.020
Total Nitrogen	mg/L	0.10	0.20
Total Phosphorus	mg/L	0.010	<0.010

Certificate of Analysis PGF1282

Inorganics - Common Wastewater Parameters (Water)

Envirolab ID	Units	PQL	PGF1282-01	PGF1282-02	PGF1282-03	PGF1282-04	PGF1282-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			17/06/2025	17/06/2025	17/06/2025	17/06/2025	17/06/2025
BOD	mg/L	5.0	12	7.2	12	13	11
COD	mg O2/L	20	<20	<20	<20	<20	<20

Envirolab ID	Units	PQL	PGF1282-06	PGF1282-10	PGF1282-11
Your Reference			GWB04	SWB	SWC
Date Sampled			17/06/2025	17/06/2025	17/06/2025
BOD	mg/L	5.0	21	6.7	6.7
COD	mg O2/L	20	<20	<20	<20

Certificate of Analysis PGF1282

General - Field Data (Water)

Envirolab ID	Units	PQL	PGF1282-01	PGF1282-02	PGF1282-03	PGF1282-04	PGF1282-05
Your Reference			GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Date Sampled			17/06/2025	17/06/2025	17/06/2025	17/06/2025	17/06/2025
pH (Client Supplied)*	pH units		6.99	7.76	6.92	7.10	7.25
Temperature (Client Supplied)*	o C		31.5	28.1	28.2	30.0	27.2

Envirolab ID	Units	PQL	PGF1282-06	PGF1282-07	PGF1282-10	PGF1282-11
Your Reference			GWB04	Field Duplicate	SWB	SWC
Date Sampled			17/06/2025	17/06/2025	17/06/2025	17/06/2025
pH (Client Supplied)*	pH units		6.90	6.92	8.45	8.43
Temperature (Client Supplied)*	o C		27.2	28.2	20.7	22.8

Method Summary

Method ID	Methodology Summary
Calc	Calculation
Calc - ION	Calculation
Field Data	Field Data supplied by client
INORG-006	Alkalinity - determined titrimetrically based on APHA latest edition 2320-B. Solids reported from a 1:5 water extract unless otherwise specified. Total Carbon Dioxide - determined by calculation in accordance with APHA latest edition,4500-CO2 D.
INORG-018	Total Dissolved Solids - determined gravimetrically. The solids are dried at 180±10°C. NOTE: Where the EC of the sample is <100µS/cm, the TDS will typically be below 70mg/L (as the sample is very likely to be at least drinking water quality). Therefore to ensure data quality for TDS, the TDS is typically calculated as per the equation: TDS = EC*0.6
INORG-040	The concentrations of the major ions (mg/L) are converted to milliequivalents and summed. The ionic balance should be within +/- 15% i.e. total anions = total cations +/-15%.
INORG-055	Nitrate/Nitrite/NOx/TKN - determined colourimetrically. Waters samples are filtered on receipt prior to analysis. Soils/solids are analysed following a water extraction.
INORG-057	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.
INORG-057_CALC	Calculation of Ammonium as N. Assumes all Ammonia is present as Ammonium unless samplpe pH and temperature provided.
INORG-060_TP	Total Phosphorus - determined colourimetrically using APHA latest edition 4500-P J. Water samples are filtered on receipt prior to analysis. Soils are analysed from a water extract.
INORG-067	Samples are digested in acid with a known excess of potassium dichromate then the colour change is determined by discrete analyser or UV-VIS in accordance with APHA latest edition 5220 D.
INORG-079	Carbon forms (inorganic, organic, total) determined using a TOC/NDIR analyser via combustion. Dissolved aqueous\forms require filtering prior to determination.
INORG-081	Anions determined by Ion Chromatography. Waters samples are filtered on receipt prior to analysis. Solids are analysed from a water extract. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
INORG-091	BOD and/or cBOD - Analysed in accordance with APHA latest edition 5210 D.
INORG-111	Volatile Fatty Acids determined by distillation and titration.
INORG-118	Hexavalent Chromium by Ion Chromatographic separation and colourimetric determination. Waters samples are filtered prior to analysis. Solids are extracted with an alkaline buffered solution, for air sampling media the same alkali extraction can be used or alternatives from NIOSH/OSHA. For aqueous samples, Total Hexavalent Chromium includes the dissolved Hexavalent Chromium and any Hexavalent Chromium solubilised by the preservative i.e. Sodium Hydroxide from any particulate that may be present.
INORG-127	Total Nitrogen by high temperature catalytic combustion with chemiluminescence detection. Organic Carbon forms (inorganic, organic, total) determined using a TOC/NDIR analyser via combustion. Dissolved forms require filtering prior to determination.
METALS-020	Determination of various metals by ICP-OES. Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation.
METALS-022	Determination of various metals by ICP-MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements. Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation.

Result Definitions

Identifier	Description
NR	Not reported
NEPM	National Environment Protection Measure
NS	Not specified
LCS	Laboratory Control Sample
RPD	Relative Percent Difference
>	Greater than
<	Less than
PQL	Practical Quantitation Limit
INS	Insufficient sample for this test
NA	Test not required
NT	Not tested
DOL	Samples rejected due to particulate overload (air filters only)
RFD	Samples rejected due to filter damage (air filters only)
RUD	Samples rejected due to uneven deposition (air filters only)
##	Indicates a laboratory acceptance criteria outlier, for further details, see Result Comments and/or QC Comments

Quality Control Definitions

Blank

This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, and is determined by processing solvents and reagents in exactly the same manner as for samples.

Surrogate Spike

Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

LCS (Laboratory Control Sample)

This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Matrix Spike

A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

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.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

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 QAQC tables for details (available on request); <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; 60-140% for organics (+/-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 typically insufficient in order to satisfy laboratory QA/QC protocols.

Miscellaneous Information

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. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

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 or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volumes are typically provided by customers (often as flow rate(s) and sampling time(s) and/or simply volume(s) sampled or exposure times (determines 'volume' passive badges are exposed to)). Hence in such circumstances the volume measurement is inevitably not covered by Envirolab's NATA accreditation. An exception may occur where Envirolab Newcastle does the sampling where accreditation exists for certain types of sampling and hence volume determination(s). Note air volumes are often used to determine concentrations for dust and/or analyses on filters, sorbents and in impingers. For canister sampling, the air volume is covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary PGF1282

Client Details

Client	Katherine Town Council - NT
Your Reference	Katherine Town Council - EPL298 - Monthly - June
Date Issued	30/06/2025

Recommended Holding Time Compliance

Recommended holding time exceedances exist - See detailed list below

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	No	LCS Outliers Exist - See detailed list below
Duplicates	No	Duplicate Outliers Exist - See detailed list below
Matrix Spike	No	Matrix Spike Outliers Exist - See detailed list below
Surrogates / Extracted Internal Standards	Yes	No Outliers
QC Frequency	No	QC Frequency Outliers Exist - See detailed list below

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Data Quality Assessment Summary PGF1282

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
Total Metals (LL) | Water	10-11	17/06/2025	20/06/2025	23/06/2025	Yes
Dissolved Metals (LL) | Water	8-10	17/06/2025	20/06/2025	24/06/2025	Yes
	11	17/06/2025	20/06/2025	25/06/2025	Yes
TDS | Water	1-11	17/06/2025	27/06/2025	30/06/2025	No
VFA | Water	10-11	17/06/2025	20/06/2025	26/06/2025	Yes
Alkalinity Suite | Water	1-4	17/06/2025	19/06/2025	19/06/2025	Yes
	5-6, 10-11	17/06/2025	19/06/2025	20/06/2025	Yes
Chloride | Water	1-6, 10-11	17/06/2025	20/06/2025	21/06/2025	Yes
Dissolved Cations | Water	1-6, 10-11	17/06/2025	20/06/2025	20/06/2025	Yes
Ion Balance | Water	1-6, 10-11	17/06/2025	20/06/2025	21/06/2025	Yes
	1-6, 10-11	17/06/2025	24/06/2025	26/06/2025	Yes
Sulfate | Water	1-6, 10-11	17/06/2025	20/06/2025	21/06/2025	Yes
Total Organic Carbon | Water	1-7, 10-11	17/06/2025	20/06/2025	20/06/2025	Yes
	8-9	17/06/2025	20/06/2025	21/06/2025	Yes
Cr6+ | Water	10-11	17/06/2025	23/06/2025	25/06/2025	Yes
Cr6+ - Total | Water	10-11	17/06/2025	23/06/2025	25/06/2025	Yes
Nitrogen - Ammonia | Water	1-9	17/06/2025	20/06/2025	20/06/2025	Yes
	10-11	17/06/2025	20/06/2025	21/06/2025	Yes
Nitrogen - Ammonium by calc | Water	1-11	17/06/2025	24/06/2025	26/06/2025	Yes
Nitrogen - Nitrate | Water	10-11	17/06/2025	20/06/2025	21/06/2025	Yes
Nitrogen - Total N | Water	10-11	17/06/2025	25/06/2025	25/06/2025	Yes
Total Phosphorus | Water	10-11	17/06/2025	25/06/2025	25/06/2025	Yes
BOD | Water	1-6, 10-11	17/06/2025	20/06/2025	25/06/2025	Yes
COD | Water	1-6, 10-11	17/06/2025	20/06/2025	23/06/2025	Yes

Outliers: Laboratory Control Samples

INORG-091 \| Inorganics - Common Wastewater Parameters (Water) \| Batch BGF3331

Sample ID	Analyte	% Limits	% Recovery
BGF3331-BS1	BOD	70 - 130	806

Data Quality Assessment Summary PGF1282

Outliers: Duplicates

METALS-020|Inorganics - Ionic Balance and Indexes (Water)| Batch BGF3234

Sample ID	Duplicate ID	Analyte	% Limits	RPD
BGF3234-DUP1#	DUP1	Calcium	20.00	22.4[5]
BGF3234-DUP1#	DUP1	Calcium Hardness	20.00	22.4[5]

METALS-022|Acid Extractable Low Level Metals (Water)| Batch BGF3201

Sample ID	Duplicate ID	Analyte	% Limits	RPD
BGF3201-DUP2#	DUP2	Copper	30.00	32.4[4]

Data Quality Assessment Summary PGF1282

Outliers: Matrix Spike

INORG-055|Inorganics - Nutrients (Water)| Batch BGF3358

Sample ID	Analyte	% Limits	% Recovery
BGF3358-MS1#	Nitrate as N	70 - 130	##[2]

METALS-020|Inorganics - Ionic Balance and Indexes (Water)| Batch BGF3233

Sample ID	Analyte	% Limits	% Recovery
BGF3233-MS1#	Sodium	70 - 130	##[1]

METALS-020|Inorganics - Ionic Balance and Indexes (Water)| Batch BGF3234

Sample ID	Analyte	% Limits	% Recovery
BGF3234-MS1#	Calcium	70 - 130	##[1]
BGF3234-MS1#	Magnesium	70 - 130	##[1]
BGF3234-MS1#	Potassium	70 - 130	##[1]
BGF3234-MS1#	Sodium	70 - 130	##[1]

METALS-020|Inorganics - Ionic Balance and Indexes (Water)| Batch BGF3236

Sample ID	Analyte	% Limits	% Recovery
BGF3236-MS1#	Magnesium	70 - 130	66.2

METALS-020|Inorganics - Ionic Balance and Indexes (Water)| Batch BGF3237

Sample ID	Analyte	% Limits	% Recovery
BGF3237-MS1#	Magnesium	70 - 130	##[1]
BGF3237-MS1#	Potassium	70 - 130	##[1]
BGF3237-MS1#	Sodium	70 - 130	##[1]

METALS-022|Dissolved Low Level Metals (Water)| Batch BGF3231

Sample ID	Analyte	% Limits	% Recovery
BGF3231-MS1#	Iron	70 - 130	##[2]

METALS-022|Dissolved Low Level Metals (Water)| Batch BGF3232

Sample ID	Analyte	% Limits	% Recovery
BGF3232-MS1#	Iron	70 - 130	##[1]
BGF3232-MS1#	Manganese	70 - 130	##[1]

Data Quality Assessment Summary PGF1282

Outliers: QC Frequency

INORG-091 | Inorganics - Common Wastewater Parameters (Water) | Batch BGF3331

Analysis	QC Type	Expected	Reported
BOD	Duplicate	2	0

INORG-111 | Inorganics - Physical Parameters (Water) | Batch BGF3389

Analysis	QC Type	Expected	Reported
VFA	Duplicate	1	0

Quality Control PGF1282

METALS-022|Acid Extractable Low Level Metals (Water) | Batch BGF3201

Analyte	Units	PQL	Blank	DUP1 BGF3201-DUP1# Samp | QC | RPD %	DUP2 BGF3201-DUP2# Samp | QC | RPD %	LCS %	Spike % BGF3201-MS1#
Aluminium	µg/L	10	<10	<10 | <10 | [NA]	142 | 144 | 1.31	96.1	98.4
Cadmium	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	8.63 | 8.57 | 0.698	91.5	93.3
Chromium	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	1.89 | 1.89 | [NA]	95.5	96.8
Copper	µg/L	1.0	<1.0	2.26 | 2.16 | [NA]	8.74 | 6.30 | 32.4 [4]	99.9	107
Iron	µg/L	10	<10	<10 | <10 | [NA]	644 | 624 | 3.15	98.7	102
Lead	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	94.1	93.3
Manganese	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	20.4 | 19.8 | 3.38	91.5	91.6
Nickel	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	2.16 | 2.12 | [NA]	97.1	98.2
Selenium	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	1.09 | 1.27 | [NA]	105	107
Zinc	µg/L	1.0	<1.0	12.8 | 12.2 | 4.76	23.6 | 19.5 | 19.3	97.4	97.4

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-022|Dissolved Low Level Metals (Water) | Batch BGF3231

Analyte	Units	PQL	Blank	DUP1 BGF3231-DUP1# Samp | QC | RPD %	DUP2 BGF3231-DUP2# Samp | QC | RPD %	LCS %	Spike % BGF3231-MS1#
Aluminium	µg/L	10	<10	<10 | <10 | [NA]	64.2 | 57.9 | 10.2	92.1	99.3
Cadmium	µg/L	0.10	<0.10	0.485 | 0.440 | [NA]	<0.10 | <0.10 | [NA]	90.5	91.3
Chromium	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	93.3	96.7
Copper	µg/L	1.0	<1.0	6.23 | 6.08 | 2.44	<1.0 | <1.0 | [NA]	95.6	91.1
Iron	µg/L	10	<10	9290 | 9260 | 0.321	33.1 | 33.3 | [NA]	93.7	##[2]
Lead	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	93.4	87.8
Manganese	µg/L	1.0	<1.0	2660 | 2660 | 0.311	1.38 | 1.39 | [NA]	90.4	83.7
Nickel	µg/L	1.0	<1.0	68.8 | 68.3 | 0.707	<1.0 | <1.0 | [NA]	94.5	92.0
Selenium	µg/L	1.0	<1.0	5.46 | 5.08 | 7.21	<1.0 | <1.0 | [NA]	99.9	90.9
Zinc	µg/L	1.0	<1.0	367 | 365 | 0.565	3.66 | 3.70 | [NA]	97.1	93.8

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-022|Dissolved Low Level Metals (Water) | Batch BGF3232

Analyte	Units	PQL	Blank	DUP1 BGF3232-DUP1# Samp | QC | RPD %	DUP2 BGF3232-DUP2# Samp | QC | RPD %	LCS %	Spike % BGF3232-MS1#
Aluminium	µg/L	10	<10	<20 | <20 | [NA]	18.2 | 18.8 | [NA]	94.9	117
Cadmium	µg/L	0.10	<0.10	<0.20 | <0.20 | [NA]	0.125 | 0.110 | [NA]	104	116
Chromium	µg/L	1.0	<1.0	<2.0 | <2.0 | [NA]	<1.0 | <1.0 | [NA]	97.9	110
Copper	µg/L	1.0	<1.0	<2.0 | <2.0 | [NA]	1.40 | 1.52 | [NA]	95.8	102
Iron	µg/L	10	<10	576 | 571 | 0.927	123 | 121 | 1.49	94.1	##[1]
Lead	µg/L	1.0	<1.0	<2.0 | <2.0 | [NA]	17.1 | 17.3 | 1.08	99.4	93.4
Manganese	µg/L	1.0	<1.0	215 | 212 | 1.27	2.74 | 2.66 | [NA]	94.7	##[1]
Nickel	µg/L	1.0	<1.0	6.80 | 6.54 | [NA]	<1.0 | <1.0 | [NA]	98.3	107
Selenium	µg/L	1.0	<1.0	<2.0 | <2.0 | [NA]	<1.0 | <1.0 | [NA]	105	104
Zinc	µg/L	1.0	<1.0	2.42 | 2.28 | [NA]	95.7 | 94.9 | 0.771	96.9	109

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control PGF1282

METALS-022|Dissolved Low Level Metals (Water) | Batch BGF3271

Analyte	Units	PQL	Blank	DUP1 BGF3271-DUP1# Samp | QC | RPD %	DUP2 BGF3271-DUP2# Samp | QC | RPD %	LCS %	Spike % BGF3271-MS1#
Aluminium	µg/L	10	<10	<10 | <10 | [NA]	<10 | <10 | [NA]	92.5	94.9
Cadmium	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	94.1	96.0
Chromium	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	94.2	92.1
Copper	µg/L	1.0	<1.0	2.88 | 2.81 | [NA]	<1.0 | <1.0 | [NA]	97.4	84.2
Iron	µg/L	10	<10	<10 | <10 | [NA]	116 | 117 | 0.398	94.9	94.7
Lead	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	97.5	89.4
Manganese	µg/L	1.0	<1.0	1.56 | 1.53 | [NA]	32.0 | 32.5 | 1.60	90.4	85.8
Nickel	µg/L	1.0	<1.0	1.83 | 1.79 | [NA]	6.24 | 6.25 | 0.128	101	85.6
Selenium	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	101	101
Zinc	µg/L	1.0	<1.0	43.0 | 42.0 | 2.26	1.64 | 1.64 | [NA]	98.1	85.6

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-111|Inorganics - Physical Parameters (Water) | Batch BGF3389

Analyte	Units	PQL	Blank	LCS %
Volatile Fatty Acids	mg/L	5.0	<5.0	84.0

INORG-018|Inorganics - Physical Parameters (Water) | Batch BGF4255

Analyte	Units	PQL	Blank	DUP1 PGF1282-01 Samp | QC | RPD %	DUP2 PGF1282-11 Samp | QC | RPD %	LCS %
Total Dissolved Solids	mg/L	5.0	<5.0	361 | 389 | 7.47	313 | 339 | 7.98	102

INORG-006|Inorganics - Ionic Balance and Indexes (Water) | Batch BGF3163

Analyte	Units	PQL	Blank	DUP1 BGF3163-DUP1# Samp | QC | RPD %	DUP2 BGF3163-DUP2# Samp | QC | RPD %	LCS %
Bicarbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	322 | 333 | 3.18	30.0 | 30.9 | 2.99	[NA]
Carbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0 | <5.0 | [NA]	<5.0 | <5.0 | [NA]	[NA]
Hydroxide OH- as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0 | <5.0 | [NA]	<5.0 | <5.0 | [NA]	[NA]
Total Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	322 | 333 | 3.18	30.0 | 30.9 | 3.00	88.6

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-020|Inorganics - Ionic Balance and Indexes (Water) | Batch BGF3233

Analyte	Units	PQL	Blank	DUP1 BGF3233-DUP1# Samp | QC | RPD %	DUP2 BGF3233-DUP2# Samp | QC | RPD %	LCS %	Spike % BGF3233-MS1#
Calcium	mg/L	0.50	<0.50	61.6 | 61.6 | 0.0958	6.95 | 7.05 | 1.43	102	76.6
Magnesium	mg/L	0.50	<0.50	72.1 | 72.3 | 0.222	4.25 | 4.29 | 0.855	105	81.7
Potassium	mg/L	0.50	<0.50	16.6 | 16.4 | 0.959	4.63 | 4.74 | 2.33	103	98.3
Sodium	mg/L	0.50	<0.50	170 | 169 | 0.789	15.9 | 16.1 | 1.33	94.8	##[1]
Hardness (calc) equivalent CaCO3	mg/L	3.0	<3.0	451 | 452 | 0.179	34.9 | 35.3 | 1.14	[NA]	[NA]
Calcium Hardness	mg/L	1.0	<1.0	154 | 154 | 0.0958	17.4 | 17.6 | 1.43	[NA]	[NA]
Magnesium Hardness	mg/L	1.0	<1.0	297 | 298 | 0.222	17.5 | 17.6 | 0.855	[NA]	[NA]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control PGF1282

METALS-020|Inorganics - Ionic Balance and Indexes (Water) | Batch BGF3234

Analyte	Units	PQL	Blank	DUP1 BGF3234-DUP1# Samp | QC | RPD %	DUP2 BGF3234-DUP2# Samp | QC | RPD %	LCS %	Spike % BGF3234-MS1#
Calcium	mg/L	0.50	<0.50	346 | 277 | 22.4 [5]	22.2 | 22.1 | 0.379	98.2	##[1]
Magnesium	mg/L	0.50	<0.50	827 | 829 | 0.326	34.5 | 36.1 | 4.59	100	##[1]
Potassium	mg/L	0.50	<0.50	332 | 332 | 0.0150	6.81 | 7.33 | 7.38	99.0	##[1]
Sodium	mg/L	0.50	<0.50	9620 | 9660 | 0.415	199 | 207 | 3.93	94.2	##[1]
Hardness (calc) equivalent CaCO3	mg/L	3.0	<3.0	4270 | 4110 | 3.89	197 | 204 | 3.22	[NA]	[NA]
Calcium Hardness	mg/L	1.0	<1.0	865 | 691 | 22.4 [5]	55.5 | 55.3 | 0.379	[NA]	[NA]
Magnesium Hardness	mg/L	1.0	<1.0	3400 | 3410 | 0.326	142 | 149 | 4.59	[NA]	[NA]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-020|Inorganics - Ionic Balance and Indexes (Water) | Batch BGF3236

Analyte	Units	PQL	Blank	DUP1 BGF3236-DUP1# Samp | QC | RPD %	DUP2 BGF3236-DUP2# Samp | QC | RPD %	LCS %	Spike % BGF3236-MS1#
Calcium	mg/L	0.50	<0.50	33.4 | 33.1 | 0.887	52.8 | 52.7 | 0.258	102	86.4
Magnesium	mg/L	0.50	<0.50	188 | 186 | 1.09	50.3 | 49.8 | 0.905	105	66.2
Potassium	mg/L	0.50	<0.50	108 | 107 | 1.27	12.8 | 12.9 | 0.132	103	77.1
Sodium	mg/L	0.50	<0.50	1400 | 1390 | 1.05	80.2 | 79.9 | 0.362	94.8	80.7
Hardness (calc) equivalent CaCO3	mg/L	3.0	<3.0	859 | 850 | 1.07	339 | 337 | 0.653	[NA]	[NA]
Calcium Hardness	mg/L	1.0	<1.0	83.4 | 82.7 | 0.887	132 | 131 | 0.258	[NA]	[NA]
Magnesium Hardness	mg/L	1.0	<1.0	775 | 766 | 1.09	207 | 205 | 0.905	[NA]	[NA]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-020|Inorganics - Ionic Balance and Indexes (Water) | Batch BGF3237

Analyte	Units	PQL	Blank	DUP1 BGF3237-DUP1# Samp | QC | RPD %	DUP2 BGF3237-DUP2# Samp | QC | RPD %	LCS %	Spike % BGF3237-MS1#
Calcium	mg/L	0.50	<0.50	363 | 330 | 9.60	20.2 | 19.8 | 1.68	103	74.5
Magnesium	mg/L	0.50	<0.50	322 | 306 | 5.19	4.44 | 4.40 | 0.871	104	##[1]
Potassium	mg/L	0.50	<0.50	43.9 | 51.4 | 15.8	3.27 | 3.23 | 1.14	104	##[1]
Sodium	mg/L	0.50	<0.50	2070 | 1960 | 5.39	65.7 | 64.8 | 1.43	98.1	##[1]
Hardness (calc) equivalent CaCO3	mg/L	3.0	<3.0	2220 | 2080 | 6.10	68.6 | 67.6 | 1.47	[NA]	[NA]
Calcium Hardness	mg/L	1.0	<1.0	899 | 824 | 8.68	50.4 | 49.5 | 1.68	[NA]	[NA]
Magnesium Hardness	mg/L	1.0	<1.0	1320 | 1260 | 4.42	18.3 | 18.1 | 0.871	[NA]	[NA]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-081|Inorganics - Ionic Balance and Indexes (Water) | Batch BGF3337

Analyte	Units	PQL	Blank	DUP1 BGF3337-DUP1# Samp | QC | RPD %	DUP2 BGF3337-DUP2# Samp | QC | RPD %	LCS %	Spike % BGF3337-MS1#
Chloride	mg/L	1.0	<1.0	5590 | 5600 | 0.133	137 | 137 | 0.0489	102	81.7
Sulfate	mg/L	1.0	<1.0	603 | 603 | 0.0159	74.8 | 74.1 | 0.906	101	115

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-079|Inorganics - Carbon, Nitrogen and Sulfur Species (Water) | Batch BGF3186

Analyte	Units	PQL	Blank	DUP1 BGF3186-DUP1# Samp | QC | RPD %	DUP2 BGF3186-DUP2# Samp | QC | RPD %	LCS %	Spike % BGF3186-MS1#
Total Organic Carbon	mg/L	1.0	<1.0	31.6 | 30.9 | 2.27	45.3 | 43.8 | 3.26	108	97.4

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control PGF1282

INORG-079 | Inorganics - Carbon, Nitrogen and Sulfur Species (Water) | Batch BGF3187

Analyte	Units	PQL	Blank	DUP1 PGF1282-10 Samp | QC | RPD %	LCS %	Spike % PGF1282-11
Total Organic Carbon	mg/L	1.0	<1.0	2.56 | 2.20 | [NA]	107	111

INORG-118 | Inorganics - Speciated Cr (III/VI) and Fe (II/III) (Water) | Batch BGF3601

Analyte	Units	PQL	Blank	DUP1 BGF3601-DUP1# Samp | QC | RPD %	DUP2 BGF3601-DUP2# Samp | QC | RPD %	LCS %	Spike % BGF3601-MS1#
Hexavalent Chromium	mg/L	0.0050	<0.0050	<0.050 | <0.050 | [NA] [3]	<0.050 | <0.050 | [NA] [3]	96.4	99.8

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-118 | Inorganics - Speciated Cr (III/VI) and Fe (II/III) (Water) | Batch BGF3602

Analyte	Units	PQL	Blank	DUP1 BGF3602-DUP1# Samp | QC | RPD %	LCS %	Spike % BGF3602-MS1#
Hexavalent Chromium (Total)	mg/L	0.0050	<0.0050	<0.0050 | <0.0050 | [NA]	96.7	101

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-057 | Inorganics - Nutrients (Water) | Batch BGF3357

Analyte	Units	PQL	Blank	DUP1 BGF3357-DUP1# Samp | QC | RPD %	DUP2 PGF1282-09 Samp | QC | RPD %	LCS %	Spike % PGF1282-01
Ammonia as N	mg/L	0.0050	<0.0050	<0.0050 | <0.0050 | [NA]	<0.0050 | 0.00731 | [NA] [4]	96.3	78.2

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-057 | Inorganics - Nutrients (Water) | Batch BGF3358

Analyte	Units	PQL	Blank	DUP1 BGF3358-DUP1# Samp | QC | RPD %	DUP2 BGF3358-DUP2# Samp | QC | RPD %	LCS %	Spike % BGF3358-MS1#
Ammonia as N	mg/L	0.0050	<0.0050	0.00874 | 0.00812 | [NA]	0.0161 | 0.0135 | [NA]	93.3	92.7
Nitrate as N	mg/L	0.0050	<0.0050	0.946 | 0.904 | 4.46	0.133 | 0.125 | 6.40	110	##[2]
Nitrate as NO3 by calculation	mg/L	0.020	<0.020			[NA]	[NA]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-127 | Inorganics - Nutrients (Water) | Batch BGF3851

Analyte	Units	PQL	Blank	DUP1 BGF3851-DUP1# Samp | QC | RPD %	DUP2 BGF3851-DUP2# Samp | QC | RPD %	LCS %	Spike % BGF3851-MS1#
Total Nitrogen	mg/L	0.10	<0.10	7.69 | 7.62 | 0.964	0.219 | 0.224 | [NA]	104	100

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-060_TP | Inorganics - Nutrients (Water) | Batch BGF3942

Analyte	Units	PQL	Blank	DUP1 BGF3942-DUP1# Samp | QC | RPD %	LCS %	Spike % PGF1282-10
Total Phosphorus	mg/L	0.010	<0.010	0.111 | 0.103 | 7.63	105	109

Analyte	Units	PQL	Blank	LCS %
Total Phosphorus	mg/L	0.010	<0.010	[NA]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control PGF1282

INORG-067 | Inorganics - Common Wastewater Parameters (Water) | Batch BGF3217

Analyte	Units	PQL	Blank	DUP1 BGF3217-DUP1# Samp | QC | RPD %	DUP2 PGF1282-01 Samp | QC | RPD %	LCS %
COD	mg O2/L	20	<20	1390 | 1400 | 1.07	<20 | <20 | [NA]	99.5

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-091 | Inorganics - Common Wastewater Parameters (Water) | Batch BGF3331

Analyte	Units	PQL	Blank	LCS %
BOD	mg/L	5.0	<5.0	806

QC Comments

Identifier	Description
[1]	Spike recovery is not applicable due to the relatively high analyte background in the sample (>3* spike level). However, the LCS recovery is within acceptance criteria.
[2]	Spike recovery is outside routine acceptance criteria (70-130%), this may be due to suspected non-homogeneity and/or matrix interference effects. However, an acceptable recovery was achieved for the LCS.
[3]	PQL(s) has/have been raised due to matrix interference.
[4]	Duplicate %RPD may be flagged as an outlier to routine laboratory acceptance, however, where one or both results are <10*PQL, the RPD acceptance criteria increases exponentially.
[5]	The laboratory duplicate RPD acceptance criteria has been exceeded. Results are accepted due to the inhomogeneous nature of the sample.

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

CERTIFICATE OF ANALYSIS 386599

Client Details

Client	Katherine Town Council - NT
Attention	Brett Kimpton
Address	PO Box 1071, KATHERINE, NT, 0851

Sample Details

Your Reference	**Katherine Town Council - EPL298 - Quarterly July**
Number of Samples	10 Water
Date samples received	23/07/2025
Date completed instructions received	24/07/2025

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

Date results requested by	30/07/2025
Date of Issue	30/07/2025

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Results Approved By
Amanda Chui, LC/Air Toxics Supervisor
Dragana Tomas, Senior Chemist
Giovanni Agosti, Group Technical Manager
Nick Sarlamis, Assistant Operation Manager
Priya Samarawickrama, Senior Chemist
Tabitha Roberts, Senior Chemist
Timothy Toll, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Water						
Our Reference		386599-1	386599-2	386599-3	386599-4	386599-5
Your Reference	UNITS	GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	25/07/2025	25/07/2025	25/07/2025	25/07/2025	25/07/2025
Date analysed	-	28/07/2025	28/07/2025	28/07/2025	28/07/2025	28/07/2025
TRH C_6 - C_9	µg/L	<10	<10	<10	<10	<10
TRH C_6 - C_{10}	µg/L	<10	<10	<10	<10	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10	<10	<10	<10
Benzene	µg/L	<1	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2	<2
o-xylene	µg/L	<1	<1	<1	<1	<1
Naphthalene	µg/L	<1	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	93	93	91	95	94
Surrogate Toluene-d8	%	99	99	98	98	98
Surrogate 4-Bromofluorobenzene	%	98	98	98	98	98

vTRH(C6-C10)/BTEXN in Water						
Our Reference		386599-6	386599-7	386599-8	386599-9	386599-10
Your Reference	UNITS	GWB04	Duplicate	Rinsate Blank	Field Blank	Trip Blank
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	25/07/2025	25/07/2025	25/07/2025	25/07/2025	25/07/2025
Date analysed	-	28/07/2025	28/07/2025	28/07/2025	28/07/2025	28/07/2025
TRH C_6 - C_9	µg/L	<10	<10	<10	<10	<10
TRH C_6 - C_{10}	µg/L	<10	<10	<10	<10	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10	<10	<10	<10
Benzene	µg/L	<1	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2	<2
o-xylene	µg/L	<1	<1	<1	<1	<1
Naphthalene	µg/L	<1	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	93	94	91	94	93
Surrogate Toluene-d8	%	99	98	98	99	98
Surrogate 4-Bromofluorobenzene	%	99	98	99	98	99

svTRH (C10-C40) in Water						
Our Reference		386599-1	386599-2	386599-3	386599-4	386599-5
Your Reference	UNITS	GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	24/07/2025	24/07/2025	24/07/2025	24/07/2025	24/07/2025
Date analysed	-	25/07/2025	25/07/2025	25/07/2025	25/07/2025	25/07/2025
TRH C_{10} - C_{14}	µg/L	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	µg/L	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	µg/L	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16}	µg/L	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50	<50	<50	<50	<50
TRH >C_{16} - C_{34}	µg/L	<100	<100	<100	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	103	100	103	104	119

svTRH (C10-C40) in Water						
Our Reference		386599-6	386599-7	386599-8	386599-9	386599-10
Your Reference	UNITS	GWB04	Duplicate	Rinsate Blank	Field Blank	Trip Blank
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	24/07/2025	24/07/2025	24/07/2025	24/07/2025	24/07/2025
Date analysed	-	25/07/2025	25/07/2025	25/07/2025	25/07/2025	25/07/2025
TRH C_{10} - C_{14}	µg/L	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	µg/L	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	µg/L	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16}	µg/L	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50	<50	<50	<50	<50
TRH >C_{16} - C_{34}	µg/L	<100	<100	<100	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	99	102	94	103	109

PAHs in Water						
Our Reference		386599-1	386599-2	386599-3	386599-4	386599-5
Your Reference	UNITS	GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	24/07/2025	24/07/2025	24/07/2025	24/07/2025	24/07/2025
Date analysed	-	25/07/2025	25/07/2025	25/07/2025	25/07/2025	25/07/2025
Naphthalene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d14	%	85	86	95	94	109

PAHs in Water		
Our Reference		386599-6
Your Reference	UNITS	GWB04
Type of sample		Water
Date extracted	-	24/07/2025
Date analysed	-	25/07/2025
Naphthalene	µg/L	<0.1
Acenaphthylene	µg/L	<0.1
Acenaphthene	µg/L	<0.1
Fluorene	µg/L	<0.1
Phenanthrene	µg/L	<0.1
Anthracene	µg/L	<0.1
Fluoranthene	µg/L	<0.1
Pyrene	µg/L	<0.1
Benzo(a)anthracene	µg/L	<0.1
Chrysene	µg/L	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2
Benzo(a)pyrene	µg/L	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5
Total +ve PAH's	µg/L	<0.1
Surrogate p-Terphenyl-d14	%	84

PCBs in Water						
Our Reference		386599-1	386599-2	386599-3	386599-4	386599-5
Your Reference	UNITS	GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	24/07/2025	24/07/2025	24/07/2025	24/07/2025	24/07/2025
Date analysed	-	25/07/2025	25/07/2025	25/07/2025	25/07/2025	25/07/2025
Aroclor 1016	µg/L	<2	<2	<2	<2	<2
Aroclor 1221	µg/L	<2	<2	<2	<2	<2
Aroclor 1232	µg/L	<2	<2	<2	<2	<2
Aroclor 1242	µg/L	<2	<2	<2	<2	<2
Aroclor 1248	µg/L	<2	<2	<2	<2	<2
Aroclor 1254	µg/L	<2	<2	<2	<2	<2
Aroclor 1260	µg/L	<2	<2	<2	<2	<2
Surrogate 2-Fluorobiphenyl	%	81	79	85	88	86

PCBs in Water		
Our Reference		386599-6
Your Reference	UNITS	GWB04
Type of sample		Water
Date extracted	-	24/07/2025
Date analysed	-	25/07/2025
Aroclor 1016	µg/L	<2
Aroclor 1221	µg/L	<2
Aroclor 1232	µg/L	<2
Aroclor 1242	µg/L	<2
Aroclor 1248	µg/L	<2
Aroclor 1254	µg/L	<2
Aroclor 1260	µg/L	<2
Surrogate 2-Fluorobiphenyl	%	80

PFAS in Waters Extended						
Our Reference		386599-1	386599-2	386599-3	386599-4	386599-5
Your Reference	UNITS	GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	23/07/2025	23/07/2025	23/07/2025	23/07/2025	23/07/2025
Date analysed	-	23/07/2025	23/07/2025	23/07/2025	23/07/2025	23/07/2025
Perfluorobutanesulfonic acid	µg/L	<0.01	<0.01	0.07	0.06	<0.01
Perfluoropentanesulfonic acid	µg/L	<0.01	<0.01	0.04	0.04	<0.01
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.02	0.01	0.34	0.21	<0.01
Perfluoroheptanesulfonic acid	µg/L	<0.01	<0.01	0.03	0.02	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	0.04	0.02	1.1	0.29	<0.01
Perfluorodecanesulfonic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorobutanoic acid	µg/L	0.1	<0.02	0.06	0.04	<0.02
Perfluoropentanoic acid	µg/L	0.21	<0.02	0.1	0.06	<0.02
Perfluorohexanoic acid	µg/L	0.12	<0.01	0.12	0.11	<0.01
Perfluoroheptanoic acid	µg/L	0.10	<0.01	0.04	0.04	<0.01
Perfluorooctanoic acid PFOA	µg/L	0.05	<0.01	0.1	0.07	<0.01
Perfluorononanoic acid	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecanoic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorotridecanoic acid	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorotetradecanoic acid	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
4:2 FTS	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
6:2 FTS	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
8:2 FTS	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
10:2 FTS	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
N-Methyl perfluorooctane sulfonamide	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctanesulfon amide	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
N-Me perfluorooctanesulfonamid oethanol	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Et perfluorooctanesulfonamid oethanol	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
MePerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
EtPerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Surrogate $^{13}C_8$ *PFOS*	%	99	99	95	96	93
Surrogate $^{13}C_2$ *PFOA*	%	103	103	102	100	102
Extracted ISTD $^{13}C_3$ *PFBS*	%	96	95	100	103	103
Extracted ISTD $^{18}O_2$ *PFHxS*	%	99	101	100	101	98
Extracted ISTD $^{13}C_4$ *PFOS*	%	103	100	104	107	108
Extracted ISTD $^{13}C_4$ *PFBA*	%	99	100	100	102	102
Extracted ISTD $^{13}C_3$ *PFPeA*	%	100	100	101	99	100

PFAS in Waters Extended						
Our Reference		386599-1	386599-2	386599-3	386599-4	386599-5
Your Reference	UNITS	GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Type of sample		Water	Water	Water	Water	Water
Extracted ISTD $^{13}C_2$ *PFHxA*	%	98	100	98	99	99
Extracted ISTD $^{13}C_4$ *PFHpA*	%	101	100	95	96	96
Extracted ISTD $^{13}C_4$ *PFOA*	%	103	105	104	104	104
Extracted ISTD $^{13}C_5$ *PFNA*	%	99	100	102	100	99
Extracted ISTD $^{13}C_2$ *PFDA*	%	97	101	103	99	100
Extracted ISTD $^{13}C_2$ *PFUnDA*	%	95	101	103	96	93
Extracted ISTD $^{13}C_2$ *PFDoDA*	%	104	104	106	103	101
Extracted ISTD $^{13}C_2$ *PFTeDA*	%	93	96	97	96	91
Extracted ISTD $^{13}C_2$ *4:2FTS*	%	96	105	114	104	98
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	107	111	109	107	98
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	106	115	109	104	100
Extracted ISTD $^{13}C_8$ *FOSA*	%	110	114	107	107	107
Extracted ISTD d_3 *N MeFOSA*	%	101	102	100	102	105
Extracted ISTD d_5 *N EtFOSA*	%	98	103	98	100	102
Extracted ISTD d_7 *N MeFOSE*	%	102	100	100	100	97
Extracted ISTD d_9 *N EtFOSE*	%	96	97	95	96	95
Extracted ISTD d_3 *N MeFOSAA*	%	109	112	107	101	103
Extracted ISTD d_5 *N EtFOSAA*	%	101	111	102	108	106
Total Positive PFHxS & PFOS	µg/L	0.05	0.04	1.5	0.50	<0.01
Total Positive PFOA & PFOS	µg/L	0.09	0.02	1.2	0.36	<0.01
Total Positive PFAS	µg/L	0.65	0.04	2.0	0.95	<0.01

PFAS in Waters Extended			
Our Reference		386599-6	386599-10
Your Reference	UNITS	GWB04	Trip Blank
Type of sample		Water	Water
Date prepared	-	23/07/2025	23/07/2025
Date analysed	-	23/07/2025	23/07/2025
Perfluorobutanesulfonic acid	µg/L	<0.01	<0.01
Perfluoropentanesulfonic acid	µg/L	<0.01	<0.01
Perfluorohexanesulfonic acid - PFHxS	µg/L	<0.01	<0.01
Perfluoroheptanesulfonic acid	µg/L	<0.01	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	<0.01	<0.01
Perfluorodecanesulfonic acid	µg/L	<0.02	<0.02
Perfluorobutanoic acid	µg/L	<0.02	<0.02
Perfluoropentanoic acid	µg/L	<0.02	<0.02
Perfluorohexanoic acid	µg/L	<0.01	<0.01
Perfluoroheptanoic acid	µg/L	<0.01	<0.01
Perfluorooctanoic acid PFOA	µg/L	<0.01	<0.01
Perfluorononanoic acid	µg/L	<0.01	<0.01
Perfluorodecanoic acid	µg/L	<0.02	<0.02
Perfluoroundecanoic acid	µg/L	<0.02	<0.02
Perfluorododecanoic acid	µg/L	<0.05	<0.05
Perfluorotridecanoic acid	µg/L	<0.1	<0.1
Perfluorotetradecanoic acid	µg/L	<0.5	<0.5
4:2 FTS	µg/L	<0.01	<0.01
6:2 FTS	µg/L	<0.01	<0.01
8:2 FTS	µg/L	<0.02	<0.02
10:2 FTS	µg/L	<0.02	<0.02
Perfluorooctane sulfonamide	µg/L	<0.1	<0.1
N-Methyl perfluorooctane sulfonamide	µg/L	<0.05	<0.05
N-Ethyl perfluorooctanesulfon amide	µg/L	<0.1	<0.1
N-Me perfluorooctanesulfonamid oethanol	µg/L	<0.05	<0.05
N-Et perfluorooctanesulfonamid oethanol	µg/L	<0.5	<0.5
MePerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02
EtPerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02
Surrogate $^{13}C_8$ *PFOS*	%	95	93
Surrogate $^{13}C_2$ *PFOA*	%	101	99
Extracted ISTD $^{13}C_3$ *PFBS*	%	100	104
Extracted ISTD $^{18}O_2$ *PFHxS*	%	99	101
Extracted ISTD $^{13}C_4$ *PFOS*	%	104	107
Extracted ISTD $^{13}C_4$ *PFBA*	%	104	103
Extracted ISTD $^{13}C_3$ *PFPeA*	%	102	104

PFAS in Waters Extended			
Our Reference		386599-6	386599-10
Your Reference	UNITS	GWB04	Trip Blank
Type of sample		Water	Water
Extracted ISTD $^{13}C_2$ *PFHxA*	%	100	100
Extracted ISTD $^{13}C_4$ *PFHpA*	%	97	101
Extracted ISTD $^{13}C_4$ *PFOA*	%	103	104
Extracted ISTD $^{13}C_5$ *PFNA*	%	100	102
Extracted ISTD $^{13}C_2$ *PFDA*	%	97	100
Extracted ISTD $^{13}C_2$ *PFUnDA*	%	97	99
Extracted ISTD $^{13}C_2$ *PFDoDA*	%	102	107
Extracted ISTD $^{13}C_2$ *PFTeDA*	%	93	99
Extracted ISTD $^{13}C_2$ *4:2FTS*	%	101	108
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	103	105
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	95	105
Extracted ISTD $^{13}C_8$ *FOSA*	%	105	107
Extracted ISTD d_3 *N MeFOSA*	%	103	102
Extracted ISTD d_5 *N EtFOSA*	%	101	98
Extracted ISTD d_7 *N MeFOSE*	%	102	98
Extracted ISTD d_9 *N EtFOSE*	%	97	95
Extracted ISTD d_3 *N MeFOSAA*	%	104	104
Extracted ISTD d_5 *N EtFOSAA*	%	98	101
Total Positive PFHxS & PFOS	µg/L	<0.01	<0.01
Total Positive PFOA & PFOS	µg/L	<0.01	<0.01
Total Positive PFAS	µg/L	<0.01	<0.01

Volatile Fatty Acids in Water						
Our Reference		386599-1	386599-2	386599-3	386599-4	386599-5
Your Reference	UNITS	GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Type of sample		Water	Water	Water	Water	Water
Date Extracted	-	30/07/2025	30/07/2025	30/07/2025	30/07/2025	30/07/2025
Date analysed	-	30/07/2025	30/07/2025	30/07/2025	30/07/2025	30/07/2025
Volatile Fatty Acids*	mg/L	24	93	130	190	180

Volatile Fatty Acids in Water		
Our Reference		386599-6
Your Reference	UNITS	GWB04
Type of sample		Water
Date Extracted	-	30/07/2025
Date analysed	-	30/07/2025
Volatile Fatty Acids*	mg/L	190

All metals in water-dissolved						
Our Reference		386599-1	386599-2	386599-3	386599-4	386599-5
Your Reference	UNITS	GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	25/07/2025	25/07/2025	25/07/2025	25/07/2025	25/07/2025
Date analysed	-	25/07/2025	25/07/2025	25/07/2025	25/07/2025	25/07/2025
Aluminium-Dissolved	µg/L	<10	<10	<10	<10	<10
Cadmium-Dissolved	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Copper-Dissolved	µg/L	<1	<1	5	<1	<1
Iron-Dissolved	µg/L	40	50	<10	<10	<10
Lead-Dissolved	µg/L	<1	<1	<1	<1	<1
Manganese-Dissolved	µg/L	<5	21	320	58	<5
Nickel-Dissolved	µg/L	<1	<1	3	2	<1
Zinc-Dissolved	µg/L	4	2	3	3	9
Selenium-Dissolved	µg/L	<1	<1	<1	<1	<1
Chromium-Dissolved	µg/L	<1	<1	<1	<1	<1

All metals in water-dissolved					
Our Reference		386599-6	386599-7	386599-8	386599-9
Your Reference	UNITS	GWB04	Duplicate	Rinsate Blank	Field Blank
Type of sample		Water	Water	Water	Water
Date prepared	-	25/07/2025	25/07/2025	25/07/2025	25/07/2025
Date analysed	-	25/07/2025	25/07/2025	25/07/2025	25/07/2025
Aluminium-Dissolved	µg/L	<10	<10	<10	<10
Cadmium-Dissolved	µg/L	<0.1	<0.1	<0.1	<0.1
Copper-Dissolved	µg/L	2	4	<1	<1
Iron-Dissolved	µg/L	<10	<10	<10	<10
Lead-Dissolved	µg/L	3	<1	<1	<1
Manganese-Dissolved	µg/L	<5	330	<5	<5
Nickel-Dissolved	µg/L	<1	3	<1	<1
Zinc-Dissolved	µg/L	57	4	<1	<1
Selenium-Dissolved	µg/L	1	<1	<1	<1
Chromium-Dissolved	µg/L	<1	<1	<1	<1

All metals in water - total						
Our Reference		386599-1	386599-2	386599-3	386599-4	386599-5
Your Reference	UNITS	GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	24/07/2025	24/07/2025	24/07/2025	24/07/2025	24/07/2025
Date analysed	-	24/07/2025	24/07/2025	24/07/2025	24/07/2025	24/07/2025
Aluminium-Total	µg/L	<10	<10	630	290	250
Cadmium-Total	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Copper-Total	µg/L	1	<1	31	3	3
Iron-Total	µg/L	50	960	810	660	330
Lead-Total	µg/L	<1	<1	3	3	<1
Manganese-Total	µg/L	<5	19	270	79	18
Nickel-Total	µg/L	<1	<1	4	2	1
Zinc-Total	µg/L	5	1	8	4	16
Selenium-Total	µg/L	<1	<1	<1	<1	<1
Chromium-Total	µg/L	<1	<1	<1	<1	<1

All metals in water - total		
Our Reference		386599-6
Your Reference	UNITS	GWB04
Type of sample		Water
Date prepared	-	24/07/2025
Date analysed	-	24/07/2025
Aluminium-Total	µg/L	530
Cadmium-Total	µg/L	<0.1
Copper-Total	µg/L	2
Iron-Total	µg/L	70
Lead-Total	µg/L	4
Manganese-Total	µg/L	<5
Nickel-Total	µg/L	<1
Zinc-Total	µg/L	57
Selenium-Total	µg/L	<1
Chromium-Total	µg/L	<1

Ion Balance						
Our Reference		386599-1	386599-2	386599-3	386599-4	386599-5
Your Reference	UNITS	GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	23/07/2025	23/07/2025	23/07/2025	23/07/2025	23/07/2025
Date analysed	-	23/07/2025	23/07/2025	23/07/2025	23/07/2025	23/07/2025
Calcium - Dissolved	mg/L	66	46	78	88	81
Potassium - Dissolved	mg/L	5	7.6	11	5.2	4
Sodium - Dissolved	mg/L	5.5	9.6	22	13	9.6
Magnesium - Dissolved	mg/L	29	27	38	44	44
Hardness (calc) equivalent $CaCO_3$	mg/L	280	230	350	400	380
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	<5	<5	<5	<5	<5
Bicarbonate Alkalinity as $CaCO_3$	mg/L	350	310	400	460	520
Carbonate Alkalinity as $CaCO_3$	mg/L	<5	<5	<5	<5	<5
Total Alkalinity as $CaCO_3$	mg/L	350	310	400	460	520
Sulphate, SO4	mg/L	6	8	14	25	26
Chloride, Cl	mg/L	5	8	37	19	8
Ionic Balance	%	-8.0	-12	-6.0	-8.0	-15

Ion Balance		
Our Reference		386599-6
Your Reference	UNITS	GWB04
Type of sample		Water
Date prepared	-	23/07/2025
Date analysed	-	23/07/2025
Calcium - Dissolved	mg/L	77
Potassium - Dissolved	mg/L	8.4
Sodium - Dissolved	mg/L	8.5
Magnesium - Dissolved	mg/L	56
Hardness (calc) equivalent $CaCO_3$	mg/L	420
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	<5
Bicarbonate Alkalinity as $CaCO_3$	mg/L	540
Carbonate Alkalinity as $CaCO_3$	mg/L	<5
Total Alkalinity as $CaCO_3$	mg/L	540
Sulphate, SO4	mg/L	12
Chloride, Cl	mg/L	6
Ionic Balance	%	-10

Miscellaneous Inorganics						
Our Reference		386599-1	386599-2	386599-3	386599-4	386599-5
Your Reference	UNITS	GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	23/07/2025	23/07/2025	23/07/2025	23/07/2025	23/07/2025
Date analysed	-	23/07/2025	23/07/2025	23/07/2025	23/07/2025	23/07/2025
Total Nitrogen in water	mg/L	<0.1	1.4	2.1	<0.1	1.2
Nitrate as N in water	mg/L	0.02	0.03	0.03	0.078	1.2
Hexavalent Chromium, Cr^{6+} (dissolved)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Hex Chromium, Cr^{6+} (total/unfiltered)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Trivalent Chromium, Cr^{3+}	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Triv Chromium, Cr^{3+} (total/unfiltered)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Total Organic Carbon	mg/L	<1	2	3	<1	<1
Total Dissolved Solids (grav)	mg/L	310	300	520	500	550
COD	mg O_2 /L	<50	<50	<50	<50	<50
BOD	mg/L	14	14	12	8	6
Ammonia as N in water	mg/L	<0.005	1.3	1.9	0.01	<0.005
Ammonium as N form ONLY* (NH4+)	mg/L	<0.005	1.3	1.9	0.01	<0.005

Miscellaneous Inorganics					
Our Reference		386599-6	386599-7	386599-8	386599-9
Your Reference	UNITS	GWB04	Duplicate	Rinsate Blank	Field Blank
Type of sample		Water	Water	Water	Water
Date prepared	-	23/07/2025	23/07/2025	23/07/2025	23/07/2025
Date analysed	-	23/07/2025	23/07/2025	23/07/2025	23/07/2025
Total Nitrogen in water	mg/L	2.9	[NA]	[NA]	[NA]
Nitrate as N in water	mg/L	2.8	[NA]	[NA]	[NA]
Hexavalent Chromium, Cr^{6+} (dissolved)	mg/L	<0.005	[NA]	[NA]	[NA]
Hex Chromium, Cr^{6+} (total/unfiltered)	mg/L	<0.005	[NA]	[NA]	[NA]
Trivalent Chromium, Cr^{3+}	mg/L	<0.005	[NA]	[NA]	[NA]
Triv Chromium, Cr^{3+} (total/unfiltered)	mg/L	<0.005	[NA]	[NA]	[NA]
Total Organic Carbon	mg/L	<1	4	<1	<1
Total Dissolved Solids (grav)	mg/L	530	370	<5	<5
COD	mg O_2 /L	<50	[NA]	[NA]	[NA]
BOD	mg/L	10	[NA]	[NA]	[NA]
Ammonia as N in water	mg/L	<0.005	1.3	<0.005	<0.005
Ammonium as N form ONLY* (NH4+)	mg/L	<0.005	1.3	[NA]	[NA]

Metals in Waters - Acid extractable						
Our Reference		386599-1	386599-2	386599-3	386599-4	386599-5
Your Reference	UNITS	GWA (RN031131)	GWE (RN022487)	GWB01	GWB02	GWB03
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	29/07/2025	29/07/2025	29/07/2025	29/07/2025	29/07/2025
Date analysed	-	29/07/2025	29/07/2025	29/07/2025	29/07/2025	29/07/2025
Phosphorus - Total	mg/L	<0.05	0.06	<0.05	<0.05	<0.05

Metals in Waters - Acid extractable		
Our Reference		386599-6
Your Reference	UNITS	GWB04
Type of sample		Water
Date prepared	-	29/07/2025
Date analysed	-	29/07/2025
Phosphorus - Total	mg/L	<0.05

Method ID	Methodology Summary
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA latest edition, 2320-B.
Inorg-018	Total Dissolved Solids - determined gravimetrically. The solids are dried at 180+/-10°C. NOTE: Where the EC of the sample is <100µS/cm, the TDS will typically be below 70mg/L (as the sample is very likely to be at least drinking water quality). Therefore to ensure data quality for TDS, the TDS is typically calculated as per the equation below:- TDS = EC * 0.6
Inorg-040	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%.
Inorg-055	Nitrate - determined colourimetrically. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
Inorg-055/062/127	Total Nitrogen - Calculation sum of TKN and oxidised Nitrogen. Alternatively analysed by combustion and chemiluminescence.
Inorg-057	Ammonia - determined colourimetrically, based on APHA latest edition 4500-NH3 F. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a KCl extraction.
Inorg-067	Samples are digested in acid with a known excess of potassium dichromate then titrated against ammonium ferrous sulphate in accordance with APHA latest edition 5220 C.
Inorg-079	TOC determined using a TOC analyser using the combustion method. Dissolved requires filtering prior to determination. Analysis using APHA latest edition 5310B.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
Inorg-091	BOD - Analysed in accordance with APHA latest edition 5210 D and in house INORG-091.
Inorg-111	VFA determined by distillation and titration.

Method ID	Methodology Summary
Inorg-118	Hexavalent Chromium (Cr6+) - determined firstly by separation using ion chromatography followed by the colourimetric analytical finish. Water samples are ideally field filtered into alkali preserved containers prior to receipt for dissolved Cr6+ analysis. Unfiltered water samples into alkali preserved containers (or pH adjusted to pH 8-9 on receipt) can be classified as Total (unfiltered) Cr6+. Please note, for 'Total/Unfiltered' Trivalent Chromium in waters [calculated], these results may be exaggerated due to the digestive limitation of 'Total/Unfiltered' Hexavalent Chromium in NaOH at pH 8-9 compared to more comprehensive digestion for Total Chromium using the mineral acids HNO3 and HCl. Solid (includes soils, filters, paints, swabs for example) samples are extracted in a buffered catalysed solution prior to the analytical finish above. Water extractable options are available (e.g. as an option for filters) on request. Impingers may need pH adjusting to pH 8-9 prior to IC-colourimetric analytical finish.
Metals-020	Determination of various metals by ICP-AES. Total Phosphate determined stochiometrically from Phosphorus (assumed to be present as Phosphate). Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation. Submission of low masses of sample e.g. for dust samples, may result in raised PQLs.
Metals-022	Determination of various metals by ICP-MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements. Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-021/022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD and/or GC-MS/GC-MSMS. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

Method ID	Methodology Summary
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 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. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			25/07/2025	1	25/07/2025	28/07/2025		25/07/2025	[NT]
Date analysed	-			28/07/2025	1	28/07/2025	29/07/2025		28/07/2025	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	1	<10	<10	0	100	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	1	<10	<10	0	100	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	99	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	99	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	100	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	101	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	100	[NT]
Naphthalene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	94	1	93	89	4	100	[NT]
Surrogate Toluene-d8	%		Org-023	98	1	99	98	1	100	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	98	1	98	98	0	102	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			24/07/2025	[NT]	[NT]	[NT]	[NT]	24/07/2025	[NT]
Date analysed	-			25/07/2025	[NT]	[NT]	[NT]	[NT]	25/07/2025	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	93	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	91	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	100	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	93	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	91	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate o-Terphenyl	%		Org-020	100	[NT]	[NT]	[NT]	[NT]	131	[NT]

QUALITY CONTROL: PAHs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	386599-3
Date extracted	-			24/07/2025	1	24/07/2025	24/07/2025		24/07/2025	24/07/2025
Date analysed	-			25/07/2025	1	25/07/2025	25/07/2025		25/07/2025	25/07/2025
Naphthalene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	72	87
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	64	74
Fluorene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	73	87
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	83	91
Anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	82	92
Pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	82	89
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	69	70
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	72	83
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	88	1	85	97	13	73	80

QUALITY CONTROL: PCBs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	386599-3
Date extracted	-			24/07/2025	1	24/07/2025	24/07/2025		24/07/2025	24/07/2025
Date analysed	-			25/07/2025	1	25/07/2025	25/07/2025		25/07/2025	25/07/2025
Aroclor 1016	µg/L	2	Org-021/022/025	<2	1	<2	<2	0	[NT]	[NT]
Aroclor 1221	µg/L	2	Org-021/022/025	<2	1	<2	<2	0	[NT]	[NT]
Aroclor 1232	µg/L	2	Org-021/022/025	<2	1	<2	<2	0	[NT]	[NT]
Aroclor 1242	µg/L	2	Org-021/022/025	<2	1	<2	<2	0	[NT]	[NT]
Aroclor 1248	µg/L	2	Org-021/022/025	<2	1	<2	<2	0	[NT]	[NT]
Aroclor 1254	µg/L	2	Org-021/022/025	<2	1	<2	<2	0	71	84
Aroclor 1260	µg/L	2	Org-021/022/025	<2	1	<2	<2	0	[NT]	[NT]
Surrogate 2-Fluorobiphenyl	%		Org-021/022/025	78	1	81	83	2	72	84

QUALITY CONTROL: PFAS in Waters Extended						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	386599-2
Date prepared	-			23/07/2025	1	23/07/2025	23/07/2025		23/07/2025	23/07/2025
Date analysed	-			23/07/2025	1	23/07/2025	23/07/2025		23/07/2025	23/07/2025
Perfluorobutanesulfonic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	105	104
Perfluoropentanesulfonic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	98	108
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.01	Org-029	<0.01	1	0.02	0.02	0	92	96
Perfluoroheptanesulfonic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	98	102
Perfluorooctanesulfonic acid PFOS	µg/L	0.01	Org-029	<0.01	1	0.04	0.03	29	99	100
Perfluorodecanesulfonic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	94	98
Perfluorobutanoic acid	µg/L	0.02	Org-029	<0.02	1	0.1	0.1	0	98	100
Perfluoropentanoic acid	µg/L	0.02	Org-029	<0.02	1	0.21	0.21	0	104	106
Perfluorohexanoic acid	µg/L	0.01	Org-029	<0.01	1	0.12	0.11	9	96	96
Perfluoroheptanoic acid	µg/L	0.01	Org-029	<0.01	1	0.10	0.10	0	107	108
Perfluorooctanoic acid PFOA	µg/L	0.01	Org-029	<0.01	1	0.05	0.05	0	99	102
Perfluorononanoic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	103	102
Perfluorodecanoic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	101	102
Perfluoroundecanoic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	105	106
Perfluorododecanoic acid	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.05	0	99	100
Perfluorotridecanoic acid	µg/L	0.1	Org-029	<0.1	1	<0.1	<0.1	0	95	98
Perfluorotetradecanoic acid	µg/L	0.5	Org-029	<0.5	1	<0.5	<0.5	0	98	100
4:2 FTS	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	116	108
6:2 FTS	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	106	114
8:2 FTS	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	112	106
10:2 FTS	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	108	124
Perfluorooctane sulfonamide	µg/L	0.1	Org-029	<0.1	1	<0.1	<0.1	0	99	100
N-Methyl perfluorooctane sulfonamide	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.05	0	104	108
N-Ethyl perfluorooctanesulfon amide	µg/L	0.1	Org-029	<0.1	1	<0.1	<0.1	0	93	100
N-Me perfluorooctanesulfonamid oethanol	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.05	0	110	96
N-Et perfluorooctanesulfonamid oethanol	µg/L	0.5	Org-029	<0.5	1	<0.5	<0.5	0	107	106
MePerfluorooctanesulf- amid oacetic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	113	102
EtPerfluorooctanesulf- amid oacetic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	103	102
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	95	1	99	94	5	96	98
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	101	1	103	100	3	103	100

QUALITY CONTROL: PFAS in Waters Extended						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	386599-2
Extracted ISTD $^{13}C_3$ *PFBS*	%		Org-029	92	1	96	98	2	97	97
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	97	1	99	102	3	100	100
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	92	1	103	107	4	98	102
Extracted ISTD $^{13}C_4$ *PFBA*	%		Org-029	107	1	99	102	3	100	98
Extracted ISTD $^{13}C_3$ *PFPeA*	%		Org-029	91	1	100	101	1	97	98
Extracted ISTD $^{13}C_2$ *PFHxA*	%		Org-029	101	1	98	98	0	94	101
Extracted ISTD $^{13}C_4$ *PFHpA*	%		Org-029	85	1	101	100	1	89	96
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	103	1	103	108	5	99	104
Extracted ISTD $^{13}C_5$ *PFNA*	%		Org-029	96	1	99	103	4	95	100
Extracted ISTD $^{13}C_2$ *PFDA*	%		Org-029	93	1	97	100	3	96	100
Extracted ISTD $^{13}C_2$ *PFUnDA*	%		Org-029	95	1	95	97	2	97	97
Extracted ISTD $^{13}C_2$ *PFDoDA*	%		Org-029	92	1	104	101	3	93	98
Extracted ISTD $^{13}C_2$ *PFTeDA*	%		Org-029	87	1	93	98	5	92	96
Extracted ISTD $^{13}C_2$ *4:2FTS*	%		Org-029	85	1	96	107	11	88	107
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-029	105	1	107	109	2	106	105
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	105	1	106	107	1	97	114
Extracted ISTD $^{13}C_8$ *FOSA*	%		Org-029	111	1	110	111	1	99	106
Extracted ISTD d_3 *N MeFOSA*	%		Org-029	98	1	101	106	5	99	100
Extracted ISTD d_5 *N EtFOSA*	%		Org-029	97	1	98	102	4	101	99
Extracted ISTD d_7 *N MeFOSE*	%		Org-029	94	1	102	100	2	90	99

QUALITY CONTROL: PFAS in Waters Extended						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	386599-2
Extracted ISTD d_9 *N EtFOSE*	%		Org-029	91	1	96	98	2	91	95
Extracted ISTD d_3 *N MeFOSAA*	%		Org-029	100	1	109	115	5	95	105
Extracted ISTD d_5 *N EtFOSAA*	%		Org-029	103	1	101	102	1	96	98

QUALITY CONTROL: Volatile Fatty Acids in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date Extracted	-			30/07/2025	[NT]	[NT]	[NT]	[NT]	30/07/2025	[NT]
Date analysed	-			30/07/2025	[NT]	[NT]	[NT]	[NT]	30/07/2025	[NT]
Volatile Fatty Acids*	mg/L	5	Inorg-111	<5	[NT]	[NT]	[NT]	[NT]	87	[NT]

QUALITY CONTROL: All metals in water-dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	386599-3
Date prepared	-			25/07/2025	2	25/07/2025	25/07/2025		25/07/2025	25/07/2025
Date analysed	-			25/07/2025	2	25/07/2025	25/07/2025		25/07/2025	25/07/2025
Aluminium-Dissolved	µg/L	10	Metals-022	<10	2	<10	<10	0	95	102
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	2	<0.1	<0.1	0	89	103
Copper-Dissolved	µg/L	1	Metals-022	<1	2	<1	<1	0	90	99
Iron-Dissolved	µg/L	10	Metals-022	<10	2	50	60	18	87	101
Lead-Dissolved	µg/L	1	Metals-022	<1	2	<1	<1	0	102	104
Manganese-Dissolved	µg/L	5	Metals-022	<5	2	21	23	9	86	#
Nickel-Dissolved	µg/L	1	Metals-022	<1	2	<1	<1	0	89	100
Zinc-Dissolved	µg/L	1	Metals-022	<1	2	2	1	67	87	101
Selenium-Dissolved	µg/L	1	Metals-022	<1	2	<1	<1	0	82	115
Chromium-Dissolved	µg/L	1	Metals-022	<1	2	<1	<1	0	87	102

QUALITY CONTROL: All metals in water - total						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	386599-2
Date prepared	-			24/07/2025	1	24/07/2025	24/07/2025		24/07/2025	24/07/2025
Date analysed	-			24/07/2025	1	24/07/2025	24/07/2025		24/07/2025	24/07/2025
Aluminium-Total	µg/L	10	Metals-022	<10	1	<10	<10	0	91	87
Cadmium-Total	µg/L	0.1	Metals-022	<0.1	1	<0.1	<0.1	0	88	87
Copper-Total	µg/L	1	Metals-022	<1	1	1	1	0	89	86
Iron-Total	µg/L	10	Metals-022	<10	1	50	40	22	92	#
Lead-Total	µg/L	1	Metals-022	<1	1	<1	<1	0	95	89
Manganese-Total	µg/L	5	Metals-022	<5	1	<5	<5	0	83	82
Nickel-Total	µg/L	1	Metals-022	<1	1	<1	<1	0	86	83
Zinc-Total	µg/L	1	Metals-022	<1	1	5	5	0	87	86
Selenium-Total	µg/L	1	Metals-022	<1	1	<1	<1	0	90	89
Chromium-Total	µg/L	1	Metals-022	<1	1	<1	<1	0	84	84

QUALITY CONTROL: Ion Balance						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	386599-2
Date prepared	-			23/07/2025	1	23/07/2025	23/07/2025		23/07/2025	23/07/2025
Date analysed	-			23/07/2025	1	23/07/2025	23/07/2025		23/07/2025	23/07/2025
Calcium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	66	67	2	88	80
Potassium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	5	5	0	91	81
Sodium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	5.5	5.5	0	87	80
Magnesium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	29	29	0	86	82
Hardness (calc) equivalent $CaCO_3$	mg/L	3	Metals-020	[NT]	1	280	290	4	[NT]	[NT]
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	5	Inorg-006	<5	1	<5	[NT]		[NT]	[NT]
Bicarbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	1	350	[NT]		[NT]	[NT]
Carbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	1	<5	[NT]		[NT]	[NT]
Total Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	1	350	[NT]		100	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	<1	1	6	[NT]		120	[NT]
Chloride, Cl	mg/L	1	Inorg-081	<1	1	5	[NT]		102	[NT]
Ionic Balance	%		Inorg-040	[NT]	1	-8.0	[NT]		[NT]	[NT]

QUALITY CONTROL: Ion Balance						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	3	23/07/2025	23/07/2025		[NT]	[NT]
Date analysed	-			[NT]	3	23/07/2025	23/07/2025		[NT]	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020	[NT]	3	78	[NT]		[NT]	[NT]
Potassium - Dissolved	mg/L	0.5	Metals-020	[NT]	3	11	[NT]		[NT]	[NT]
Sodium - Dissolved	mg/L	0.5	Metals-020	[NT]	3	22	[NT]		[NT]	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	[NT]	3	38	[NT]		[NT]	[NT]
Hardness (calc) equivalent $CaCO_3$	mg/L	3	Metals-020	[NT]	3	350	[NT]		[NT]	[NT]
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	5	Inorg-006	[NT]	3	<5	<5	0	[NT]	[NT]
Bicarbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	[NT]	3	400	440	10	[NT]	[NT]
Carbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	[NT]	3	<5	<5	0	[NT]	[NT]
Total Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	[NT]	3	400	440	10	[NT]	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	[NT]	3	14	[NT]		[NT]	[NT]
Chloride, Cl	mg/L	1	Inorg-081	[NT]	3	37	[NT]		[NT]	[NT]
Ionic Balance	%		Inorg-040	[NT]	3	-6.0	[NT]		[NT]	[NT]

QUALITY CONTROL: Ion Balance						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	6	23/07/2025	23/07/2025		[NT]	[NT]
Date analysed	-			[NT]	6	23/07/2025	23/07/2025		[NT]	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020	[NT]	6	77	78	1	[NT]	[NT]
Potassium - Dissolved	mg/L	0.5	Metals-020	[NT]	6	8.4	8.6	2	[NT]	[NT]
Sodium - Dissolved	mg/L	0.5	Metals-020	[NT]	6	8.5	8.7	2	[NT]	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	[NT]	6	56	57	2	[NT]	[NT]
Hardness (calc) equivalent $CaCO_3$	mg/L	3	Metals-020	[NT]	6	420	430	2	[NT]	[NT]
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	5	Inorg-006	[NT]	6	<5	[NT]		[NT]	[NT]
Bicarbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	[NT]	6	540	[NT]		[NT]	[NT]
Carbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	[NT]	6	<5	[NT]		[NT]	[NT]
Total Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	[NT]	6	540	[NT]		[NT]	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	[NT]	6	12	[NT]		[NT]	[NT]
Chloride, Cl	mg/L	1	Inorg-081	[NT]	6	6	[NT]		[NT]	[NT]
Ionic Balance	%		Inorg-040	[NT]	6	-10	[NT]		[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	386599-1
Date prepared	-			23/07/2025	1	23/07/2025	23/07/2025		23/07/2025	23/07/2025
Date analysed	-			23/07/2025	1	23/07/2025	23/07/2025		23/07/2025	23/07/2025
Total Nitrogen in water	mg/L	0.1	Inorg-055/062/127	<0.1	1	<0.1	[NT]		90	106
Nitrate as N in water	mg/L	0.005	Inorg-055	<0.005	1	0.02	0.007	96	106	[NT]
Hexavalent Chromium, Cr^{6+} (dissolved)	mg/L	0.005	Inorg-118	<0.005	1	<0.005	<0.005	0	107	[NT]
Hex Chromium, Cr^{6+} (total/unfiltered)	mg/L	0.005	Inorg-118	<0.005	1	<0.005	<0.005	0	91	[NT]
Trivalent Chromium, Cr^{3+}	mg/L	0.005	Inorg-118	<0.005	1	<0.005	[NT]		[NT]	[NT]
Triv Chromium, Cr^{3+} (total/unfiltered)	mg/L	0.005	Inorg-118	<0.005	1	<0.005	<0.005	0	[NT]	[NT]
Total Organic Carbon	mg/L	1	Inorg-079	<1	1	<1	<1	0	95	[NT]
Total Dissolved Solids (grav)	mg/L	5	Inorg-018	<5	1	310	[NT]		87	[NT]
COD	mg O_2/L	50	Inorg-067	<50	1	<50	[NT]		96	[NT]
BOD	mg/L	5	Inorg-091	<5	1	14	[NT]		86	[NT]
Ammonia as N in water	mg/L	0.005	Inorg-057	<0.005	1	<0.005	<0.005	0	101	[NT]
Ammonium as N form ONLY* (NH4+)	mg/L	0.005	Inorg-057	<0.005	1	<0.005	<0.005	0	[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	386599-2
Date prepared	-			[NT]	[NT]	[NT]	[NT]	[NT]	[NT]	23/07/2025
Date analysed	-			[NT]	[NT]	[NT]	[NT]	[NT]	[NT]	23/07/2025
Nitrate as N in water	mg/L	0.005	Inorg-055	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]	106
Hex Chromium, Cr^{6+} (total/unfiltered)	mg/L	0.005	Inorg-118	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]	80
Ammonia as N in water	mg/L	0.005	Inorg-057	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]	100

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	386599-6
Date prepared	-			[NT]	[NT]	[NT]	[NT]	[NT]	[NT]	23/07/2025
Date analysed	-			[NT]	[NT]	[NT]	[NT]	[NT]	[NT]	23/07/2025
Hexavalent Chromium, Cr^{6+} (dissolved)	mg/L	0.005	Inorg-118	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]	100
Hex Chromium, Cr^{6+} (total/unfiltered)	mg/L	0.005	Inorg-118	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]	100

QUALITY CONTROL: Metals in Waters - Acid extractable						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	386599-3
Date prepared	-			29/07/2025	1	29/07/2025	29/07/2025		29/07/2025	29/07/2025
Date analysed	-			29/07/2025	1	29/07/2025	29/07/2025		29/07/2025	29/07/2025
Phosphorus - Total	mg/L	0.05	Metals-020	<0.05	1	<0.05	<0.05	0	102	109

Result Definitions

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

Quality Control Definitions

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

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.

Air volumes are typically provided by customers (often as flow rate(s) and sampling time(s) and/or simply volumes) sampled or exposure times (determines 'volume' passive badges are exposed to)). Hence in such circumstances the volume measurement is inevitably not covered by Envirolab's NATA accreditation. An exception may occur where Envirolab Newcastle does the sampling where accreditation exists for certain types of sampling and hence volume determination(s). Note air volumes are often used to determine concentrations for dust and/or analyses on filters, sorbents and in impingers. For canister sampling, the air volume is covered by Envirolab's NATA accreditation.

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.

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.

For Dust Deposit Gauge (DDG) analysis the sampling, sampling period and funnel exposure area do not fall under Envirolab's NATA accreditation (unless the Newcastle laboratory where responsible for the sampling), hence the annotation on the DDG units of reporting.

Urine Analysis - The BEI values listed are taken from the 2022 edition of "TLVs and BEIs Threshold Limits" by ACGIH.

Report Comments

MISC_INORG: Ammonium NH4+ as N is not covered under NATA scope. Ammonia as N in water by convention comprises of both forms of Ammonium-N (NH4-N) and Ammonia (NH3-N) based on the colourimetric APHA method. In order to speciate the Ammonia form (NH3 as N), a calculation based on the field pH (ideally) and temperature can be used to determine the actual Ammonia (NH3 as N) species. If the field pH and temperature are not available, the pH determined in the laboratory and the laboratory temperature are used for the calculation.

All metals in water-dissolved - # Percent recovery is not applicable due to the high concentration of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

All metals in water - total - # Percent recovery is not applicable due to the high concentration of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

EcOz Environmental Consultants

EcOz Pty Ltd.
ABN 81 143 989 039

Level 1, 70 Cavenagh St,
GPO Box 381,
Darwin NT 0801

T: +61 8 8981 1100
E: ecoz@ecoz.com.au

www.ecoz.com.au