Douglas PARTNERS | GROUNDED EXPERTISE

Lion-Beer, Spirits & Wine Pty Ltd
L 7 68 York St Sydney
Sydney, NSW 2000
Attention: Jason Lee
Email: jason.lee@lionco.com

Project 71021.19

22 December 2023

R.002.Rev0

KDP

Report on groundwater monitoring November 2023 Tooheys, 29 Nyrang Street, Lidcombe NSW

1. Introduction

This letter report by Douglas Partners Pty Ltd (DP) provides the laboratory results and a brief discussion of the November 2023 round of Groundwater Monitoring at the Tooheys Brewery Site at 29 Nyrang Street, Lidcombe.

The objectives of the groundwater monitoring programme are to assess whether any groundwater contamination identified on site in 2006 is migrating off site and to address the conditions of approval for groundwater monitoring set by the NSW Department of Planning as part of the approval for the upgrade and continued operation of the site under Part 3A of the Environmental Planning and Assessment Act 1979. It is understood that no further rounds of monitoring were required as of 2014. However, Tooheys has requested continued monitoring until such time as their licencing conditions are changed. The ongoing monitoring frequency is therefore biannual with rounds completed in May and November of each year, as instructed by the client.

As stated in DP's report First Round of 2011 Groundwater Monitoring, Tooheys Brewery - 29 Nyrang Street, Lidcombe, 7 June 2011, ref: 71021.03, a Phase 1 contamination assessment was conducted by DP in 2006. The results of the soil sampling and analysis conducted by DP in November and December 2006 indicated elevated total recoverable hydrocarbon (TRH) concentrations in samples collected from boreholes adjacent to the fuel underground storage tanks (USTs) for the former boiler (the former boiler USTs). Elevated TRH and toluene concentrations were detected in groundwater samples collected from the well adjacent to the former boiler USTs (BH6C). Elevated concentrations of TRH were also detected in the groundwater samples collected from the well adjacent to the refuelling USTs (BH1).

Four additional groundwater wells were installed at the boundary of the site in order to determine whether the identified contamination was migrating off-site (DP report on Field Investigation Phase 1 Contamination Assessment, 29 Nyrang Street, Lidcombe, March 2007, ref: 44359). Further rounds of groundwater monitoring have been undertaken by DP as listed in Section 8.

2. Site Information

The brewery is located at 29 Nyrang Street, Lidcombe, within the Local Government Area of Cumberland City Council and comprises a roughly rectangular area of approximately 6.2 hectares (ha). The site is contained within Lot 110, DP 1141813. It is Zoned 4(a) Industrial Enterprise and is surrounded by industrial sites to the north, west and south and a residential area to the east.

Haslams Creek is located to the immediate west of the site and flows in approximately a northerly direction. To the north of the site the creek bends to the east and flows to the northeast and discharges into Homebush Bay located approximately 3.5 km downstream from the brewery. The portion of Haslams Creek adjacent to the brewery is a concrete lined stormwater channel.

The site is used for the production and storage of Tooheys' beer, which is transported and distributed by trucks to various outlets. The majority of the site is occupied by large warehouse structures and large fermentation, maturation and storage tanks/silos. A site drawing and borehole location plan are presented in Drawing 1, attached.

Six decommissioned USTs were located along the northern boundary of the utility building. The USTs are reported to have been emptied in the late 1990s when the boilers were converted to natural gas. It was reported by ARUP that in September 2008, Tooheys decommissioned the six former boiler USTs in situ, which involved removal of the residual water / fuel mix inside the tanks and foam filling.

A further three USTs were located on the north-eastern boundary of the site which were formerly used for the storage of petrol or diesel for on-site vehicle refuelling. A concrete plinth and awning structure indicated that a bowser was also located nearby. Monitoring Wells BH1 and BH2 are located to the east and west of the UST and petrol bowser respectively. It was reported that the former refuelling USTs were decommissioned in situ by being sand filled and capped in the 1990s.

DP prepared a remediation action plan (RAP) for the removal and validation of the above three USTs on the north-east boundary. The RAP was entitled Remediation Action Plan, 29 Nyrang Street, Lidcombe, October 2011, ref 71021.02 Revision 2. The subsequent remediation and validation for the underground petroleum storage system (UPSS) in this area was undertaken shortly after the completion of the second round of groundwater monitoring carried out on 21 October 2011. The procedure and results of the remediation and validation of the UPSS at the north-eastern boundary area were reported in, UPSS Validation Assessment, Tooheys Brewery, 29 Nyrang Street, Lidcombe, project reference 71021.04, dated February 2012. The successful validation was subject to a Site Audit undertaken by ENVIRON Australia Pty Ltd.

3. Groundwater Default Guideline Values

Groundwater default guideline values (DGV) have been sourced from the ANZG Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2018) default guideline values for toxicants in fresh waters for the protection of 95% of species. It is noted that the groundwater investigation levels (GIL) for groundwater monitoring rounds prior to the August 2018 were sourced from the ANZECC Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000), trigger values for toxicants in fresh waters for the protection of 95% of species.

It is also noted that as of 29 August 2018, the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, 2018) revoked the documents listed below:

- The Australian Water Quality Guidelines for Fresh and Marine Waters (ANZECC, November 1992); and
- The Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ, October 2000).

Previously, in the absence of ANZECC (2000) criteria for TRH, the laboratory limits of reporting were adopted as the screening criteria as nominated for the auditor-approved RAP. In order to be consistent with the adopted modified values and with the EPL, the laboratory limits of reporting for TRH have continued to be used as screening levels. Furthermore, the purpose of the assessment is to assess the potential off-site migration of contaminants associated with the fuel tanks, not to assess potential vapour intrusion risks within the site. It is noted also that the DGV values for TRH are more stringent to those adopted in earlier groundwater monitoring rounds (pre-November 2011). Therefore, the laboratory limits of reporting are considered to be suitable as initial screening levels for TRH.

Table 1. Groundwater Default Guideline Values (DGV) and Rationale

Contaminant	Adopted Criteria (µg/L)	Contaminant
Metals Arsenic (V) Cadmium Chromium (III) Copper Lead Mercury Nickel Zinc	 13.0 2.4* (0.2) 33.1* (3.3) 1.4 121.1* (3.4) 0.6 120.2* (11) 87.4 (8)	ANZG (2018) Australian and New Zealand Guidelines for Fresh and Marine Water Quality for the protection of 95% of freshwater species. The threshold levels have been adjusted for extremely hard water (500 mg CaCO3 /L) in accordance with the guidelines which uses the algorithm available in ANZECC (2000).
TRH C6 – C9 >C9 >C10 – C16	 10 250 50	Screening DGV (at limit of reporting) - require further considerations if exceeded.
BTEX Benzene Toluene Ethylbenzene Xylene	 950 180 80 625	ANZG (2018) Australian Water Quality Guidelines for the protection of 95% of freshwater species.

Contaminant	Adopted Criteria (µg/L)	Contaminant
		Reliability of DGV for toluene and ethylbenzene is unknown. DGV for xylene is the sum of m-xylene, o-xylene and p-xylene default guideline values.

* Hardness modified trigger value (default trigger level)

4. Groundwater Monitoring Methodology and Field Observations

4.1 Identification of Wells

The locations of the six existing wells labelled BH1, BH2, BH7, BH8, BH9 and BH10 along the western and northern boundaries of the site are presented in the attached Drawing 1, attached.

4.2 Frequency of Sampling

The groundwater monitoring wells BH1, BH2, BH7, BH8, BH9 and BH10 are monitored on a bi-annual basis in May and November each year, until such time as the requirement for monitoring is terminated, in accordance with the environmental protection licence (EPL) pursuant to the site.

4.3 Well Development

Prior to collecting groundwater samples, each well was fully developed on 22 November 2023 using a submersible 12V pump in order to remove stagnant water and to provide good hydraulic connectivity to the local groundwater system. The exception was monitoring well BH7 that was developed with a peristaltic pump as the submersible 12V pump was unable to be lowered beyond a bend in the pipe.

Well development was achieved by the removal of a minimum of three well volumes of water or until the well was dry, whichever was the lesser. Monitoring wells BH7, BH9 and BH10 became dry during development. All wells were left to equilibrate prior to sampling.

4.4 Collection of Groundwater Samples

The collection of groundwater samples from each of the six monitoring wells was carried out in accordance with the methodology as set out in the DP Field Procedures Manual. Groundwater sampling was undertaken on 24 November 2023 by a DP Environmental Engineer using a low flow peristaltic pump. Samples were taken from near the middle of the screened section, being close to the middle of the water column. The sampling programme included 10% field replicates for QA / QC purposes. The replicate sample was identified as BD1/20231124was also collected on 24 November 2023 from BH8. A trip spike and blank were also taken to site and a rinsate sample collected.

The samples were collected after stable field readings were obtained for pH, conductivity, temperature and dissolved oxygen. Samples were carefully pumped into laboratory prepared sample containers including hydrochloric acid preserved BTEX vials. The groundwater samples collected for heavy metal testing were filtered in the field using a 45 µm filter. Completed field sheets are attached to this report.

No phase separated hydrocarbons (PSH) were noted in the groundwater collected from any of the wells sampled in this monitoring round.

Sample containers were labelled and stored in the field and transported in an esky cooled with ice and later stored in a fridge at the office or laboratory. The samples were delivered to a NATA accredited laboratory, Envirolab Services (ELS), together with chain-of-custody records.

4.5 Quality Assurance and Quality Control (QA / QC)

QA / QC sampling and analysis included the analysis of one replicate sample and one trip blank and trip spike and rinsate sample.

An intra-laboratory replicate analysis was conducted as a check of the reproducibility of results and as a measure of consistency of sampling techniques.

The comparative results of analysis between original and intra-laboratory replicate sample are summarised in Table 2.

Table 2. RPD Results - Intra-laboratory Results (µg/L)

Analyte	BH8	BD1/20231124	Difference	RPD (%)
As	<1	<1	0	0
Cd	0.3	0.4	0.1	29
Cr	<1	<1	0	0
Cu	2	6	4	**100**
Pb	<1	<1	0	0
Hg	<0.05	<0.05	0	0
Ni	3	3	0	0
Zn	18	20	2	11
C6-C9	<10	<10	0	0
C10-C36	<250	<250	0	0
>C10-C16	<50	<50	0	0
Benzene	<1	<1	0	0
Toluene	<1	<1	0	0
Ethyl-Benzene	<1	<1	0	0
Total Xylene	<3	<3	0	0

The calculated RPDs were all within the acceptable range of +/- 30 for inorganic analytes and +/- 50% for organics with the exception of copper. The exceedance was not considered significant due to the low overall concentrations detected. Therefore, the intra-laboratory replicate comparison indicates that the sampling technique was generally consistent and repeatable, and the laboratory sampling handling and analytical methods are comparable.

A trip spike and trip blank were also analysed. The trip spike recovery for BTEX was between 103% and 115% and the trip blank results for BTEX were below the laboratory level of reporting indicating that appropriate transport and handling techniques were adopted.

A rinsate sample was collected and analysed for TRH and BTEX. The concentrations of the analytes in the rinsate sample were below the laboratory detection limits indicating that adequate decontamination techniques had been employed.

4.6 Laboratory Results

The groundwater samples (including QA / QC samples) were sent for the following analysis at a NATA accredited laboratory:

- Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc); and
- TRH and BTEX.

Table 3 shows the analytical scheme for the groundwater samples.

Table 3. Analytical Scheme for Groundwater Samples

Sample ID	Heavy Metals	TRH	BTEX
BH1, 2, 7, 8, 9, 10	X	X	X
BD1/20231124*	X	X	X
Trip Spike			X
Trip Blank			X
Rinsate		X	X

* Blind duplicate sample of BH8

5. Results

5.1 Field Results

Piezometric levels were measured prior to development and prior to sampling from the groundwater wells. The measured levels are summarised in Table 4. It is noted that groundwater levels are transient and change over time due to climatic, anthropogenic and other influences.

Table 4. Piezometric Levels

Monitoring Well	m AHD (surface)	Date			
		22/11/23 (development)		24/11/23 (sampling)	
		m bgl	m AHD	m bgl	m AHD
1	6.46	2.42	4.04	2.36	4.1
2	6.25	2.52	3.73	2.62	3.63
7	6.38	1.92	4.46	2.05	4.33
8	6.50	4.13	2.37	4.16	2.34
9	6.00	3.82	2.18	3.86	2.14
10*	5.12	1.21	3.91	2.64	2.48

The water level appeared to have recovered to the equilibrium level or close to the equilibrium level after development in each of the wells.

Groundwater samples were noted to be mostly clear or slightly turbid. Samples were taken after stable readings were obtained for temperature, dissolved oxygen, conductivity, pH, and reduction potential as presented in Table 5.

Table 5. Groundwater Reading Upon Stablisation

Monitoring Well	Temperature (°C)	Dissolved Oxygen mg/L	Conductivity (µS/cm)	pH	Redox (mV)
1	20.9	0.27	3516	5.8	30.4
2	21.3	0.72	10312	6.1	138.0
7	20.3	0.55	1263	5.4	29.0
8	21.6	0.78	21444	5.7	55.0
9	21.3	3.14	7572	5.8	72.1
10	21.1	5.16	1288	6.7	21.3

5.2 Analytical Results

The attached Tables 6 to 23 provide the results of previous groundwater testing for reference purposes. The laboratory results of the current groundwater samples plus the QA / QC results are summarised in the attached Table 24. The laboratory test results certificates and chain-of-custody information for the current round of monitoring are also attached.

6. Discussion

Concentrations of TRH and BTEX were reported below the laboratory limits of reporting for all monitoring wells sampled during this round with the exception of the following:

TRH has periodically been detected in BH10 and on occasion in BH1 during the previous rounds of monitoring. Surface water impacts have been recorded at these locations due to localised minor flooding of the locations where the wells are positioned. Historically the TRH detections at these locations have not been persistent and have not been indicative of petroleum spills / leaks. Test locations BH1 and BH10 are located at the northern site boundary in a position that is hydraulically upgradient of the potential on-site source/s of petroleum hydrocarbons. The concentration of TRH in the three groundwater wells along Haslams Creek (the down-gradient site boundary, BH7 8 and 9) were all below the laboratory detection limit which indicates that there is not a significant risk of off-site migration of petroleum hydrocarbons.

Therefore, at this stage the TRH detections are not considered to be significant and do not warrant further action. If the TRH detections persist over multiple subsequent rounds of testing or if the concentrations then further actions may be recommended.

- BH1 – C15-C28 – 390 µg/L and >C16 -C34 – 420 µg/L
- BH10 – C10-C14 – 60 µg/L, C15-C28 – 210 µg/L, >C10-C16 and >C10-C16 less naphthalene (F2) – 71 µg/L and >C16-C34 – 240.

Concentrations of heavy metals were reported either below their respective laboratory limits of reporting or DGV for all monitoring wells sampled during this round of sampling with the following exceptions:

- Copper in excess of the DGV of 1.4 µg/L in samples:
  - BH 7 (4 µg/L);
  - BH 8 and its replicate sample BD1/20231124 (2 to 6 µg/L); and
  - BH 9 (2 µg/L).
- Zinc in excess of the DGV of 87.4 µg/L in sample
  - BH1 (960 µg/L).

Low levels of heavy metals, in particular copper have periodically been detected in groundwater and in that regard the results from the current round of testing are consistent with the previous rounds of testing at the site.

The elevated zinc concentration in BH1 was highly unusual. While slightly elevated zinc concentrations have been detected in some rounds, the concentration detected during the current round was higher than during any previous round (or other monitoring well locations). That notwithstanding the concentrations of zinc in the down-gradient wells (BH7, 8 and 9) were within the DGV which does not indicate that there is currently an off-site migration risk of zinc. If the elevated zinc concentration at this location persists and if an off-site migration risk is identified during future rounds of monitoring further action may be warranted but at this stage no further action is required.

Elevated heavy metals are also typical of diffuse urban pollution and generally cannot be attributed to any specific on or off-site source.

Mann-Kendall Trend Analysis was undertaken for heavy metals and TRH and no significant trends were identified. The trend analysis is attached to this report.

7. Conclusion

Based on the current round of groundwater monitoring at the site, the laboratory results indicate that the groundwater is not significantly impacted by petroleum hydrocarbon contamination at the monitored locations.

The results are generally consistent with the previous monitoring rounds. Based on the current results, it is considered that the concentration of TRH in groundwater is not increasing which was confirmed by the Mann-Kendall analysis.

8. List of Previous Report

The previous groundwater reports are listed below:

- Groundwater Monitoring Report, 29 Nyrang Street, Lidcombe, January 2010, ref: 71021.00;
- Groundwater Monitoring Report, 29 Nyrang Street, Lidcombe, January 2011 ref: 71021.01;
- First Round of Groundwater Monitoring Tooheys Brewery - 29 Nyrang Street, Lidcombe, June 2011 ref: 71021.03;
- Second Round of Groundwater Monitoring Tooheys Brewery - 29 Nyrang Street, Lidcombe, November 2011 ref: 71021.03;
- First Round of Groundwater Monitoring Tooheys Brewery - 29 Nyrang Street, Lidcombe, June 2012 ref: 71021.06;
- Second Round of Groundwater Monitoring Tooheys Brewery - 29 Nyrang Street, Lidcombe, October 2012 ref: 71021.06;
- First Round of Groundwater Monitoring Tooheys Brewery - 29 Nyrang Street, Lidcombe, May 2013 ref: 71021.07;
- Second Round of Groundwater Monitoring Tooheys Brewery - 29 Nyrang Street, Lidcombe, November 2013 ref: 71021.07;
- 2014 Groundwater Monitoring Tooheys Brewery - 29 Nyrang Street, Lidcombe, July 2014 ref: 71021.08;
- 2015 Groundwater Monitoring Tooheys Brewery - 29 Nyrang Street, Lidcombe, December 2015 ref: 71021.10;
- January 2016 Groundwater Monitoring Tooheys Brewery - 29 Nyrang Street, Lidcombe, February 2016 ref: 71021.10;
- January / February 2017 Groundwater Monitoring Tooheys Brewery - 29 Nyrang Street, Lidcombe, 6 March 2017 ref: 71021.11.R.001.Rev0;

- March 2017 Groundwater Monitoring Tooheys Brewery - 29 Nyrang Street, Lidcombe, 13 April 2017 ref: 71021.11.R.002.Rev;
- August 2017 Groundwater Monitoring Tooheys Brewery - 29 Nyrang Street, Lidcombe, 15 September 2017 ref: 71021.12.R001.Rev0;
- November 2017 Groundwater Monitoring, Tooheys Brewery - 29 Nyrang Street, Lidcombe, 1 December 2017 ref: 71021.12.R.002.Rev0;
- August 2018 Groundwater Monitoring Tooheys Brewery - 29 Nyrang Street, Lidcombe, 12 September 2018 ref: 71021.13.R.001.Rev0;
- Groundwater Monitoring - November 2018, 29 Nyrang Street, Lidcombe, 12 December 2018 ref: 71021.13.R.002.Rev0;
- August / September 2019 Groundwater Monitoring Round, 29 Nyrang Street, Lidcombe, 1 November 2019 ref: 71021.14.R.001.Rev0;
- November 2019 Groundwater Monitoring, Tooheys Brewery - 29 Nyrang Street, Lidcombe, 11 December 2019 ref: 71021.14.R.002.Rev0;
- May 2020 Groundwater Monitoring, Tooheys Brewery - 29 Nyrang Street, Lidcombe, 3 June 2020 ref: 71021.15.R.001.Rev0;
- November 2020 Groundwater Monitoring, Tooheys Brewery - 29 Nyrang Street, Lidcombe, November 2020 ref: 71021.15.R.002.Rev0;
- May 2021 Groundwater Monitoring, Tooheys Brewery - 29 Nyrang Street, Lidcombe, May 2021 ref: 71021.16.R.001.Rev0; and
- November 2021 Groundwater Monitoring, Tooheys Brewery - 29 Nyrang Street, Lidcombe, November 2021 ref: 71021.16.R.002.Rev0.
- May 2022 Groundwater Monitoring, Tooheys Brewery - 29 Nyrang Street, Lidcombe, November 2021 ref: 71021.18.R.001.Rev0.
- May 2022 Groundwater Monitoring, Tooheys Brewery - 29 Nyrang Street, Lidcombe, November 2021 ref: 71021.18.R.001.Rev0.
- ·December 2022 Groundwater Monitoring, Tooheys Brewery - 29 Nyrang Street, Lidcombe, February 2022 ref: 71021.18.R.002.Rev0.
- May 2023 Groundwater Monitoring, Tooheys Brewery - 29 Nyrang Street, Lidcombe, June 2023 ref: 71021.19.R.001.Rev0.

9. Limitations

Douglas Partners Pty Ltd (DP) has prepared this report for this project at 29 Nyrang Street, Lidcombe in accordance with DP's proposal (71028.19.P.001.rev0) dated 12 May 2023 and acceptance received from Mr Jason Lee of Lion-Beer, Spirits and Wine Pty Ltd. The work was

carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Lion-Beer, Spirits and Wine Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

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

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

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

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

The contents of this report do not constitute formal design components such as are required, by the Health and Safety Legislation and Regulations, to be included in a Safety Report specifying the hazards likely to be encountered during construction and the controls required to mitigate risk. This design process requires risk assessment to be undertaken, with such assessment being dependent upon factors relating to likelihood of occurrence and consequences of damage to property and to life. This, in turn, requires project data and analysis presently beyond the knowledge and project role respectively of DP. DP may be able, however, to assist the client in carrying out a risk assessment of potential hazards contained in the Comments section of this report, as an extension to the current scope of works, if so requested, and provided that suitable additional information is made available to DP. Any such risk assessment would, however, be necessarily restricted to the groundwater components set out in this report and to their application by the project designers to project design, construction, maintenance and demolition.

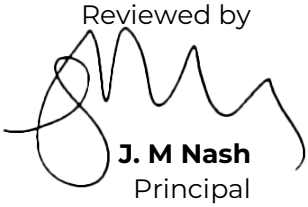
Please contact the undersigned if you have any questions on this matter.

Yours faithfully

Douglas Partners Pty Ltd

Kurt Plambeck
Senior Associate

Reviewed by



J. M Nash
Principal

Attachments:
About this Report
Drawing 1
Field Notes
Results Tables
Laboratory Certificates
Mann-Kendall Trend Analysis

Attachments

About this report

Drawing 1

Field Records

Results Tables – Table 6 to Table 24

Laboratory Certificates

Mann-Kendall Trend Analysis

About this Inspection Report

November 2023

Introduction

These notes are provided to amplify DP's inspection report in regard to the limitations of carrying out inspection work. Not all notes are necessarily relevant to this report.

Standards

This inspection report has been prepared by qualified personnel to current engineering standards of interpretation and analysis.

Copyright and Limits of Use

This inspection report is the property of DP and is provided for the exclusive use of the client for the specific project and purpose as described in the report. It should not be used by a third party for any purpose other than to confirm that the construction works addressed in the report have been inspected as described. Use of the inspection report is limited in accordance with the Conditions of Engagement for the commission.

DP does not undertake to guarantee the works of the contractors or relieve them of their responsibility to produce a completed product conforming to the design.

Reports

This inspection report may include advice or opinion that is based on engineering and/or geological interpretation, information provided by the client or the client's agent, and information gained from:

- an investigation report for the project (if available to DP);
- inspection of the work, exposed ground conditions, excavation spoil and performance of excavating equipment while DP was on site;
- investigation and testing that was carried out during the site inspection;
- anecdotal information provided by authoritative site personnel; and
- DP's experience and knowledge of local geology.

Such information may be limited by the frequency of any inspection or testing that was able to be practically carried out, including possible site or cost constraints imposed by the client/ contractor(s). For these reasons, the reliability of this inspection report is limited by the scope of information on which it relies.

Every care is taken with the inspection report as it relates to interpretation of subsurface conditions and any recommendations or suggestions for construction or design. However, DP cannot anticipate or assume responsibility for:

- unexpected variations in subsurface conditions that are not evident from the inspection; and
- the actions of contractors responding to commercial pressures.

Should these issues occur, then additional advice should be sought from DP and, if required, amendments made.

This inspection report must be read in conjunction with any attached information. This inspection report should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions from review by others of this inspection report or test data, which are not otherwise supported by an expressed statement, interpretation, outcome or conclusion stated in this inspection report.

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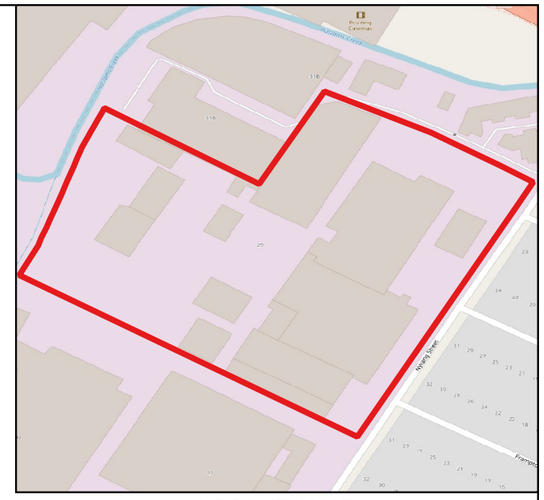

LOCALITY MAP

Notes:
1. Drawing projection GDA94
2. Latest available aerial imagery sourced from metromap.com accessed 14 June 2023
3. Test locations shown are approximate only

Legend

- Site Boundary
- Groundwater Monitoring Wells

0 25 50 75 100 m

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT:	Lion-Beer, Spirits and Wine Pty Ltd		
OFFICE:	Sydney	DRAWN BY:	KDP
SCALE:	1:1200 @ A3	DATE:	14.06.2023

TITLE: **Location of Groundwater Monitoring Wells**
Groundwater Monitoring
29 Nyrang Street, Lidcombe

N

PROJECT No:	71021.19
DRAWING No:	1
REVISION:	0

Douglas Partners
Geotechnics / Environment / Groundwater

Groundwater Field Sheet

Project and Bore Installation Details						
Bore / Standpipe ID:	**BH1**					
Project Name:	TooheysNovember 2023 Monitoring					
Project Number:	71021.19					
Site Location:	29 Nyrnag Street, Lidcombe					
Bore RL	6.5 m AHD					
Bore Easting:		Northing:				
Installation Date:	24-Oct-16					
GW Level (during drilling):	m bgl					
Well Depth:	14.2 m bgl					
Screened Interval:	2.0-14.2 m bgl					
Contaminants/Comments:						
Bore Development Details						
Date/Time:	22.11.2023					
Purged By:	Thomas Graham					
GW Level (pre-purge):	2.42 m bgl					
GW Level (post-purge):	3.6 m bgl					
PSH observed:	Yes / **No** (interface/visual).					
Observed Well Depth:	14.2 m bgl					
Estimated Bore Volume:	50 L					
Total Volume Purged:	150 L					
Equipment:	12 Volt pump					
Micropurge and Sampling Details						
Date/Time:	24.11.2023					
Sampled By:	Thomas Graham					
Weather Conditions:						
GW Level (pre-purge):	2.36 m bgl					
GW Level (post sample):	2.48 m bgl					
PSH observed:	Yes / **No** (interface/visual).					
Observed Well Depth:	14.3 m bgl					
Estimated Bore Volume:	L					
Total Volume Purged:	5 L					
Equipment:	peristaltic pump and TPS multimeter					

Water Quality Parameters

Time / Volume	Temp (°C)	DO (mg/L)	EC (µS or mS/cm)	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	***0.1° C***	**+/- 0.3 mg/L**	**+/- 3%**	**+/- 0.1**	**+/- 10%**	**+/- 10 mV**
0	20.8	0.52	3420	5.8	208	25.4
1	20.9	0.34	3489	5.8	154	32.8
2	20.9	0.33	3512	5.8	132	29.7
3	20.9	0.27	3516	5.8	136	30.4
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			

Sample Details

Sampling Depth (rationale):	m bgl,
Sample Appearance (e.g. colour, siltiness, odour)	clear, no colour
Sample ID:	
QA/QC Samples:	
Sampling Containers and filtration:	500mL glass, 2x 40mL glass vials (HCl) , 1x 100mL plastic (HNO3 (filtered)
Comments / Observations:	

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Groundwater Field Sheet

Project and Bore Installation Details						
Bore / Standpipe ID:	**BH2**					
Project Name:	TooheysNovember 2023 Monitoring					
Project Number:	71021.19					
Site Location:	29 Nyrnag Street, Lidcombe					
Bore RL	6.2 m AHD					
Bore Easting:		Northing:				
Installation Date:	20-Oct-16					
GW Level (during drilling):	m bgl					
Well Depth:	14.5 m bgl					
Screened Interval:	2.0-14.5 m bgl					
Contaminants/Comments:						
Bore Development Details						
Date/Time:	22.11.2023					
Purged By:	Thomas Graham					
GW Level (pre-purge):	2.52 m bgl					
GW Level (post-purge):	4.2 m bgl					
PSH observed:	Yes / **No** (interface/visual).					
Observed Well Depth:	14.5 m bgl					
Estimated Bore Volume:	30 L					
Total Volume Purged:	80 L					
Equipment:	12 Volt pump					
Micropurge and Sampling Details						
Date/Time:	24.11.2023					
Sampled By:	Thomas Graham					
Weather Conditions:						
GW Level (pre-purge):	2.62 m bgl					
GW Level (post sample):	m bgl					
PSH observed:	Yes / **No** (interface/visual).					
Observed Well Depth:	2.56 m bgl					
Estimated Bore Volume:	L					
Total Volume Purged:	5 L					
Equipment:	peristaltic pump and TPS multimeter					
Water Quality Parameters						
Time / Volume	Temp (°C)	DO (mg/L)	EC (µS or mS/cm)	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	***0.1° C***	**+/- 0.3 mg/L**	**+/- 3%**	**+/- 0.1**	**+/- 10%**	**+/- 10 mV**
0	21.5	1.58	9788	6.2	150	110
1	21.3	0.96	10305	6.1	162	136
2	21.3	0.85	10310	6.1	184	140
3	21.3	0.72	10312	6.1	179	138
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			
Sample Details						
Sampling Depth (rationale):	3.2 m bgl,					
Sample Appearance (e.g. colour, siltiness, odour)	clear					
Sample ID:						
QA/QC Samples:						
Sampling Containers and filtration:	500mL glass, 2x 40mL glass vials (HCl) , 1x 100mL plastic (HNO3 (filtered)					
Comments / Observations:						

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Groundwater Field Sheet

Project and Bore Installation Details						
Bore / Standpipe ID:	**BH7**					
Project Name:	TooheysNovember 2023 Monitoring					
Project Number:	71021.19					
Site Location:	29 Nyrnag Street, Lidcombe					
Bore RL	6.4 m AHD					
Bore Easting:		Northing:				
Installation Date:	7-Dec-16					
GW Level (during drilling):	m bgl					
Well Depth:	6.5 m bgl					
Screened Interval:	1.5-6.5 m bgl					
Contaminants/Comments:						
Bore Development Details Bend in pipe - development requires peristaltic pump						
Date/Time:	22.11.2023					
Purged By:	Thomas Graham					
GW Level (pre-purge):	1.92 m bgl			7 use		
GW Level (post-purge):	5.41 m bgl					
PSH observed:	Yes / **No** (interface/visual).					
Observed Well Depth:	5.41 m bgl					
Estimated Bore Volume:	10 L					
Total Volume Purged:	10 L			to dry		
Equipment:	12 Volt pump					
Micropurge and Sampling Details						
Date/Time:	24.11.2023					
Sampled By:	Thomas Graham					
Weather Conditions:						
GW Level (pre-purge):	2.05 m bgl					
GW Level (post sample):	m bgl					
PSH observed:	Yes / **No** (interface/visual).					
Observed Well Depth:	m bgl					
Estimated Bore Volume:	L					
Total Volume Purged:	3 L					
Equipment:	peristaltic pump and TPS multimeter					
Water Quality Parameters						
Time / Volume	Temp (°C)	DO (mg/L)	EC (µS or mS/cm)	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	***0.1° C***	**+/- 0.3 mg/L**	**+/- 3%**	**+/- 0.1**	**+/- 10%**	**+/- 10 mV**
0	20.5	1.35	1302	5.3	55.2	42
1	20.4	0.68	1258	5.3	60.8	26
2	20.4	0.53	1262	5.4	57.5	29
3	20.3	0.55	1263	5.4	54.1	29
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			
Sample Details						
Sampling Depth (rationale):	3 m bgl,					
Sample Appearance (e.g. colour, siltiness, odour)	clear brown, no odour					
Sample ID:						
QA/QC Samples:						
Sampling Containers and filtration:	500mL glass, 2x 40mL glass vials (HCl) , 1x 100mL plastic (HNO3 (filtered)					
Comments / Observations:						

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Groundwater Field Sheet

Project and Bore Installation Details						
Bore / Standpipe ID:	**BH8**					
Project Name:	TooheysNovember 2023 Monitoring					
Project Number:	71021.19					
Site Location:	29 Nyrnag Street, Lidcombe					
Bore RL	6.5 m AHD					
Bore Easting:		Northing:				
Installation Date:	7-Dec-06					
GW Level (during drilling):	m bgl					
Well Depth:	8.25 m bgl					
Screened Interval:	2.0-8.25 m bgl					
Contaminants/Comments:						
Bore Development Details						
Date/Time:	22.11.2023					
Purged By:	Thomas Graham					
GW Level (pre-purge):	4.13 m bgl					
GW Level (post-purge):	5.2 m bgl					
PSH observed:	Yes / **No** (interface/visual).					
Observed Well Depth:	8.25 m bgl					
Estimated Bore Volume:	L					
Total Volume Purged:	80 L					
Equipment:	12 Volt pump					
Micropurge and Sampling Details						
Date/Time:	24.11.2023					
Sampled By:	Thomas Graham					
Weather Conditions:						
GW Level (pre-purge):	4.16 m bgl					
GW Level (post sample):	4.2 m bgl					
PSH observed:	Yes / **No** (interface/visual).					
Observed Well Depth:	m bgl					
Estimated Bore Volume:	L					
Total Volume Purged:	5 L					
Equipment:	peristaltic pump and TPS multimeter					
Water Quality Parameters						
Time / Volume	Temp (°C)	DO (mg/L)	EC (µS or mS/cm)	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	***0.1° C***	**+/- 0.3 mg/L**	**+/- 3%**	**+/- 0.1**	**+/- 10%**	**+/- 10 mV**
0	23.2	2.34	21420	5.9	106	34.6
1	21.7	0.92	21434	5.7	130	45.2
2	21.6	0.84	21438	5.7	161	52
3	21.6	0.78	21444	5.7	168	55
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			
Sample Details						
Sampling Depth (rationale):	6 m bgl,					
Sample Appearance (e.g. colour, siltiness, odour)	clear, odourless					
Sample ID:						
QA/QC Samples:	BD1/20231124					
Sampling Containers and filtration:	500mL glass, 2x 40mL glass vials (HCl) , 1x 100mL plastic (HNO3 (filtered)					
Comments / Observations:						

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Groundwater Field Sheet

Project and Bore Installation Details						
Bore / Standpipe ID:	**BH9**					
Project Name:	TooheysNovember 2023 Monitoring					
Project Number:	71021.19					
Site Location:	29 Nyrnag Street, Lidcombe					
Bore RL	6.0 m AHD					
Bore Easting:		Northing:				
Installation Date:	7 December 20016					
GW Level (during drilling):	m bgl					
Well Depth:	6.5 m bgl					
Screened Interval:	1.5-6.5 m bgl					
Contaminants/Comments:						
Bore Development Details						
Date/Time:	22.11.2023					
Purged By:	Thomas Graham					
GW Level (pre-purge):	3.82 m bgl					
GW Level (post-purge):	6.04 m bgl					
PSH observed:	Yes / **No** (interface/visual).					
Observed Well Depth:	6.65 m bgl					
Estimated Bore Volume:	30 L					
Total Volume Purged:	30 L			dry		
Equipment:	12 Volt pump					
Micropurge and Sampling Details						
Date/Time:	24.11.2023					
Sampled By:	Thomas Graham					
Weather Conditions:						
GW Level (pre-purge):	3.86 m bgl					
GW Level (post sample):	m bgl					
PSH observed:	Yes / **No** (interface/visual).					
Observed Well Depth:	m bgl					
Estimated Bore Volume:	L					
Total Volume Purged:	3 L					
Equipment:	peristaltic pump and TPS multimeter					
Water Quality Parameters						
Time / Volume	Temp (°C)	DO (mg/L)	EC (µS or mS/cm)	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	***0.1° C***	**+/- 0.3 mg/L**	**+/- 3%**	**+/- 0.1**	**+/- 10%**	**+/- 10 mV**
0	20.8	3.84	7446	5.9	306	52.5
1	21.4	3.64	7520	5.8	275	65
2	21.3	3.22	7558	5.8	284	68.9
3	21.3	3.14	7572	5.8	292	72.1
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			
Sample Details						
Sampling Depth (rationale):	4.5 m bgl,					
Sample Appearance (e.g. colour, siltiness, odour)	yellow brown					
Sample ID:						
QA/QC Samples:						
Sampling Containers and filtration:	500mL glass, 2x 40mL glass vials (HCl) , 1x 100mL plastic (HNO3 (filtered)					
Comments / Observations:						

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Groundwater Field Sheet

Project and Bore Installation Details						
Bore / Standpipe ID:	**BH10**					
Project Name:	Tooheys November 2023 Monitoring					
Project Number:	71021.19					
Site Location:	29 Nyrnag Street, Lidcombe					
Bore RL	5.1 m AHD					
Bore Easting:		Northing:				
Installation Date:	7-Dec-06					
GW Level (during drilling):	m bgl					
Well Depth:	5 m bgl					
Screened Interval:	1.5-5.0 m bgl					
Contaminants/Comments:						
Bore Development Details - Develop using Bailer						
Date/Time:	22.11.2023					
Purged By:	Thomas Graham					
GW Level (pre-purge):	1.21 m bgl					
GW Level (post-purge):	4.96 m bgl					
PSH observed:	Yes / **No** (interface/visual).					
Observed Well Depth:	5.16 m bgl					
Estimated Bore Volume:	L					
Total Volume Purged:	40 L	dry				
Equipment:	12 Volt pump					
Micropurge and Sampling Details						
Date/Time:	24.11.2023					
Sampled By:	Thomas Graham					
Weather Conditions:						
GW Level (pre-purge):	2.64 m bgl					
GW Level (post sample):	2.84 m bgl					
PSH observed:	Yes / **No** (interface/visual).					
Observed Well Depth:	m bgl					
Estimated Bore Volume:	L					
Total Volume Purged:	3 L					
Equipment:	peristaltic pump and TPS multimeter					

Water Quality Parameters

Time / Volume	Temp (°C)	DO (mg/L)	EC (µS or mS/cm)	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	***0.1° C***	**+/- 0.3 mg/L**	**+/- 3%**	**+/- 0.1**	**+/- 10%**	**+/- 10 mV**
0	20.7	5.32	1260	6.6	245	20.6
1	21.2	5.08	1389.5	6.7	238	18.2
2	21.1	5.12	1296	6.7	264	19.6
3	21.1	5.16	1288	6.7	256	21.3
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			

Sample Details

Sampling Depth (rationale):	m bgl,
Sample Appearance (e.g. colour, siltiness, odour)	
Sample ID:	
QA/QC Samples:	
Sampling Containers and filtration:	500mL glass, 2x 40mL glass vials (HCl) , 1x 100mL plastic (HNO3 (filtered)
Comments / Observations:	

Table 6: Results of Laboratory Analysis in July 2014 (µg/L)

Well	Hardness (mg $CaCO_3$ /L)	Heavy Metals[1]								TRH		Benzene	Toluene	Ethyl-benzene	Total Xylene
		As	Cd	Cr^3	Cu	Pb	Hg	Ni	Zn	C_6-C_9	C_{10}-C_{36}				
1	130	<1	<0.1	<1	1	<1	<0.05	4	82	<10	<250	<1	<1	<1	<3
2BD1/ 180714		<1	<0.1	<1	<1	<1	<0.05	3	74	<10	<250	<1	<1	<1	<3
2	890	<1	0.2	<1	4	<1	<0.05	9	110	<10	<250	<1	<1	<1	<3
7	100	<1	<0.1	<1	3	<1	<0.05	6	28	<10	<250	<1	<1	<1	<3
8	1900	<1	0.2	<1	3	<1	<0.05	4	18	<10	<250	<1	<1	<1	<3
9	350	<1	<0.1	<1	1	<1	<0.05	2	18	<10	<250	<1	<1	<1	<3
10	380	<1	<0.1	<1	4	<1	<0.05	6	24	<10	<250	<1	<1	<1	<3
TS	-	-	-	-	-	-	-	-	-	-	-	101%	104%	102%	105%4
TB	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<3
DGV1		13	2.4[2]	33.1[2]	1.4[1]	121.1[2]	0.6	120.2[2]	87.4[2]	10	250	950	180	80	550

Notes:
1 DGV from the default guideline values provided in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, August 2018)
2 Heavy metal thresholds are adjusted for a hardness of 500 mg/L per ANZECC 2000
3 Field replicate of sample listed immediately above
4 All chromium are assumed to exist in the stable Cr (III) oxidation state, as Cr (VI) will be too reactive and unstable under the normal environment.
5 m+p+o xylene

bold exceeds DGV

Table 7: Results of Laboratory Analysis in October 2015 (µg/L)

Well	Hardness (mg $CaCO_3$ /L)	Heavy Metals[1]								TRH		Benzene	Toluene	Ethyl-benzene	Total Xylene
		As	Cd	Cr[3]	Cu	Pb	Hg	Ni	Zn	C_6-C_9	C_{10}-C_{36}				
1	670	2	<0.1	<1	4	<1	<0.05	7	55	<10	<250	<1	<1	<1	<3
2BD1/ 301015		2	<0.1	<1	<1	<1	<0.05	1	19	<10	<250	<1	<1	<1	<3
2	1000	<1	0.2	<1	2	<1	<0.05	10	50	<10	<250	<1	<1	<1	<3
7	180	3	<0.1	<1	<1	<1	<0.05	6	14	<10	<250	<1	<1	<1	<3
8	2300	<1	0.7	<1	4	<1	<0.05	4	17	<10	<250	<1	<1	<1	<3
9	420	<1	<0.1	<1	2	<1	<0.05	7	36	<10	<250	<1	<1	<1	<3
10	160	5	<0.1	<1	<1	<1	<0.05	9	8	<10	520	<1	<1	<1	<3
TS	-	-	-	-	-	-	-	-	-	-	-	81%	92%	98%	104%4
TB	-	-	-	-	-	-	-	-	-	<10	-	<1	<1	<1	<3
DGV1		13	2.4[2]	33.1[2]	1.4[1]	121.1[2]	0.6	120.2[2]	87.4[2]	10	250	950	180	80	550

Notes:

1 DGV from the default guideline values provided in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, August 2018)
2 Heavy metal thresholds are adjusted for a hardness of 500 mg/L per ANZECC 2000
3 Field replicate of sample listed immediately above
4 All chromium are assumed to exist in the stable Cr (III) oxidation state, as Cr (VI) will be too reactive and unstable under the normal environment.
5 m+p+o xylene

bold exceeds DGV

Table 8: Results of Laboratory Analysis in January 2016 (µg/L)

Well	Hardness (mg $CaCO_3$ /L)	Heavy Metals[1]								TRH			Benzene	Toluene	Ethyl-benzene	Total Xylene
		As	Cd	Cr^3	Cu	Pb	Hg	Ni	Zn	C_6-C_9	C_{10}-C_{36}	>C_{10}-C_{16}				
1	360	3	<0.1	<1	<1	<1	<0.05	<1	12	<10	<250	66	<1	<1	<1	<3
2BD1/ 180714		2	<0.1	<1	<1	<1	<0.05	<1	15	<10	<250	79	<1	<1	<1	<3
2	720	<1	0.2	<1	3	<1	<0.05	14	120	<10	<250	<50	<1	<1	<1	<3
7	110	3	<0.1	<1	<1	<1	<0.05	8	13	<10	<250	<50	<1	<1	<1	<3
8	1900	<1	0.3	<1	4	<1	<0.05	4	18	<10	<250	<50	<1	<1	<1	<3
9	480	<1	<0.1	<1	2	<1	<0.05	5	43	<10	<250	<50	<1	<1	<1	<3
10	170	4	<0.1	<1	<1	<1	<0.05	2	5	<10	<250	<50	<1	<1	<1	<3
TS	-	-	-	-	-	-	-	-	-	-	-	-	94%	95%	92%	93%4
TB	-	-	-	-	-	-	-	-	-	<10	-	-	<1	<1	<1	<3
DGV1		13	2.4[2]	33.1[2]	1.4[1]	121.1[2]	0.6	120.2[2]	87.4[2]	10	250	50	950	180	80	550

Notes:
1 DGV from the default guideline values provided in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, August 2018)
2 Heavy metal thresholds are adjusted for a hardness of 500 mg/L per ANZECC 2000
3 Field replicate of sample listed immediately above
4 All chromium are assumed to exist in the stable Cr (III) oxidation state, as Cr (VI) will be too reactive and unstable under the normal environment.
5 m+p+o xylene

bold exceeds DGV

Table 9: Results of Laboratory Analysis in January / February 2017 (µg/L)

Well	Heavy Metals[1]								TRH					Benzene	Toluene	Ethyl-benzene	Total Xylene
	As	Cd	Cr[3]	Cu	Pb	Hg	Ni	Zn	C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C36	>C_{10}-C_{16}				
1	1	<0.1	<1	1	<1	<0.05	4	28	<10	<50	<100	<100	<50	<1	<1	<1	<3
2	<1	0.2	<1	<1	<1	<0.05	5	20	<10	<50	<100	<100	<50	<1	<1	<1	<3
7	3	<0.1	<1	<1	<1	<0.05	6	1	<10	<50	<100	<100	<50	<1	<1	<1	<3
8	<1	0.5	<1	6	<1	<0.05	4	14	<10	<50	<100	<100	<50	<1	<1	<1	<3
9	<1	<0.1	<1	2	<1	<0.05	8	38	<10	<50	<100	<100	<50	<1	<1	<1	<3
BD1	<1	<0.1	<1	1	<1	<0.05	8	34	<10	<50	<100	<100	<50	<1	<1	<1	<3
10	3	<0.1	<1	7	<1	<0.05	50	150	<10	<50	220	<100	98	<1	<1	<1	<3
DGV1	13	2.4[2]	33.1[2]	1.4[1]	121.1[2]	0.6	120.2[2]	87.4[2]	10	250			50	950	180	80	550

Notes:

1 DGV from the default guideline values provided in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, August 2018)
2 Heavy metal thresholds are adjusted for a hardness of 500 mg/L per ANZECC 2000
3 Field replicate of sample listed immediately above
4 All chromium are assumed to exist in the stable Cr (III) oxidation state, as Cr (VI) will be too reactive and unstable under the normal environment.
5 m+p+o xylene

bold exceeds DGV

Table 10: Results of Laboratory Analysis in March 2017 (µg/L)

Well	Heavy Metals[1]								TRH					Benzene	Toluene	Ethyl-benzene	Total Xylene
	As	Cd	Cr[3]	Cu	Pb	Hg	Ni	Zn	C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C36	>C_{10}-C_{16}				
1	2	<0.1	<1	1	<1	<0.05	10	90	<10	<50	<100	<100	<50	<1	<1	<1	<3
BD1	2	<0.1	<1	<1	<1	<0.05	11	92	<10	<50	<100	<100	<50	<1	<1	<1	<3
2	<1	<0.1	<1	3	<1	<0.05	5	38	<10	<50	<100	<100	<50	<1	<1	<1	<3
7	3	<0.1	<1	<1	<1	<0.05	8	2	<10	<50	<100	<100	<50	<1	<1	<1	<3
8	<1	<0.1	<1	4	<1	<0.05	4	16	<10	<50	<100	<100	<50	<1	<1	<1	<3
9	1	<0.1	<1	3	<1	<0.05	7	42	<10	<50	<100	<100	<50	<1	<1	<1	<3
10	2	<0.1	<1	2	<1	<0.05	4	33	<10	<50	<100	<100	<50	<1	<1	<1	<3
DGV1	13	2.4[2]	33.1[2]	1.4[1]	121.1[2]	0.6	120.2[2]	87.4[2]	10	250			50	950	180	80	550

Notes:

1 DGV from the default guideline values provided in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, August 2018)
2 Heavy metal thresholds are adjusted for a hardness of 500 mg/L per ANZECC 2000
3 Field replicate of sample listed immediately above
4 All chromium are assumed to exist in the stable Cr (III) oxidation state, as Cr (VI) will be too reactive and unstable under the normal environment.
5 m+p+o xylene

bold exceeds DGV

Table 11: Results of Laboratory Analysis in August 2017 (µg/L)

Well	Heavy Metals[1]								TRH					Benzene	Toluene	Ethyl-benzene	Total Xylene
	As	Cd	Cr[3]	Cu	Pb	Hg	Ni	Zn	C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C36	>C_{10}-C_{16}				
1	1	<0.1	<1	<1	<1	<0.05	5	19	<10	<50	<100	<100	<50	<1	<1	<1	<3
2	<1	<0.1	<1	<1	<1	<0.05	4	12	<10	<50	<100	<100	<50	<1	<1	<1	<3
BD1	<1	<0.1	<1	<1	<1	<0.05	4	13	<10	<50	<100	<100	<50	<1	<1	<1	<3
7	9	<0.1	<1	<1	<1	<0.05	17	19	<10	<50	<100	<100	<50	<1	<1	<1	<3
8	<1	1	<1	27	<1	<0.05	4	20	<10	<50	<100	<100	<50	<1	<1	<1	<3
9	5	<0.1	<1	4	<1	<0.05	30	420	<10	<50	<100	<100	<50	<1	<1	<1	<3
10	5	<0.1	<1	2	<1	<0.05	16	44	<10	<50	<100	<100	<50	<1	<1	<1	<3
DGV1	13	2.4[2]	33.1[2]	1.4[1]	121.1[2]	0.6	120.2[2]	87.4[2]	10	250			50	950	180	80	550

Notes:

1 DGV from the default guideline values provided in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, August 2018)
2 Heavy metal thresholds are adjusted for a hardness of 500 mg/L per ANZECC 2000
3 Field replicate of sample listed immediately above
4 All chromium are assumed to exist in the stable Cr (III) oxidation state, as Cr (VI) will be too reactive and unstable under the normal environment.
5 m+p+o xylene

bold exceeds DGV

Table 12: Results of Laboratory Analysis in November 2017 (µg/L)

Well	Heavy Metals[1]								TRH					Benzene	Toluene	Ethyl-benzene	Total Xylene
	As	Cd	Cr[3]	Cu	Pb	Hg	Ni	Zn	C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C36	>C_{10}-C_{16}				
1	<1	<0.1	<1	2	<1	<0.05	2	10	<10	<50	<100	<100	<50	<1	<1	<1	<3
2	<1	<0.1	<1	<1	<1	<0.05	3	6	<10	<50	<100	<100	<50	<1	<1	<1	<3
BD1/151120 17	<1	<0.1	<1	<1	<1	<0.05	3	5	<10	<50	<100	<100	<50	<1	<1	<1	<3
7	17	<0.1	<1	<1	<1	<0.05	24	69	<10	<50	<100	<100	<50	<1	<1	<1	<3
8	<1	0.4	<1	11	<1	<0.05	3	14	<10	<50	<100	<100	<50	<1	<1	<1	<3
9	1	<0.1	<1	<1	<1	<0.05	7	82	<10	<50	<100	<100	<50	<1	<1	<1	<3
10	3	<0.1	<1	<1	<1	<0.05	3	12	<10	<50	<100	<100	<50	<1	<1	<1	<3
DGV1	13	2.4[2]	33.1[2]	1.4[1]	121.1[2]	0.6	120.2[2]	87.4[2]	10	250			50	950	180	80	550

Notes:
1 DGV from the default guideline values provided in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, August 2018)
2 Heavy metal thresholds are adjusted for a hardness of 500 mg/L per ANZECC 2000
3 Field replicate of sample listed immediately above
4 All chromium are assumed to exist in the stable Cr (III) oxidation state, as Cr (VI) will be too reactive and unstable under the normal environment.
5 m+p+o xylene

bold exceeds DGV

Table 13: Results of Laboratory Analysis in August 2018 (µg/L)

Well	Heavy Metals[2]								TRH					Benzene	Toluene	Ethyl-benzene	Total Xylene[5]
	As	Cd	Cr[4]	Cu	Pb	Hg	Ni	Zn	C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	>C_{10}-C_{16}				
1	1	<0.1	<1	3	<1	<0.05	5	30	<10	<50	<100	<100	<50	<1	<1	<1	<3
2	<1	<0.1	<1	3	<1	<0.05	3	12	<10	<50	<100	<100	<50	<1	<1	<1	<3
BD1/ 20180828 3	<1	<0.1	<1	<1	<1	<0.05	3	9	<10	<50	<100	<100	<50	<1	<1	<1	<3
7	11	0.8	<1	4	1	<0.05	77	670	<10	<50	<100	<100	<50	<1	<1	<1	<3
8	<1	1.7	<1	10	<1	<0.05	3	21	<10	<50	<100	<100	<50	<1	<1	<1	<3
9	2	<0.1	<1	5	<1	<0.05	7	110	<10	<50	<100	<100	<50	<1	<1	<1	<3
10	4	<0.1	<1	3	<1	<0.05	8	59	22	190	610	<100	230	8	<1	<1	<3
DGV1	13	2.4[2]	33.1[2]	1.4[1]	121.1[2]	0.6	120.2[2]	87.4[2]	10	250			50	950	180	80	550[5]

Notes:
1 DGV from the default guideline values provided in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, August 2018)
2 Heavy metal thresholds are adjusted for a hardness of 500 mg/L per ANZECC 2000
3 Field replicate of sample listed immediately above
4 All chromium are assumed to exist in the stable Cr (III) oxidation state, as Cr (VI) will be too reactive and unstable under the normal environment.
5 m+p+o xylene

bold exceeds DGV

Table 14: Results of Laboratory Analysis in November 2018 (µg/L)

Well	Heavy Metals[2]								TRH					Benzene	Toluene	Ethyl-benzene	Total Xylene[5]
	As	Cd	Cr[4]	Cu	Pb	Hg	Ni	Zn	C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	>C_{10}-C_{16}				
1	<1	<0.1	<1	2	<1	<0.05	6	45	<10	<50	<100	<100	<50	<1	<1	<1	<3
2	<1	<0.1	<1	1	<1	<0.05	4	19	<10	<50	<100	<100	<50	<1	<1	<1	<3
BD1/20183	<1	<0.1	<1	<1	<1	<0.05	4	16	<10	<50	<100	<100	<50	<1	<1	<1	<3
7	15	<0.1	<1	1	<1	<0.05	9	10	<10	<50	<100	<100	<50	<1	<1	<1	<3
8	<1	0.7	<1	5	<1	<0.05	4	24	<10	<50	<100	<100	<50	<1	<1	<1	<3
9	3	<0.1	1	14	<1	<0.05	17	250	<10	<50	<100	<100	<50	<1	<1	<1	<3
10	4	<0.1	<1	6	<1	<0.05	6	30	<10	<50	<100	<100	<50	<1	<1	<1	<3
DGV1	13	2.4[2]	33.1[2]	1.4[1]	121.1[2]	0.6	120.2[2]	87.4[2]	10	250			50	950	180	80	550[5]

Notes:
1 DGV from the default guideline values provided in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, August 2018)
2 Heavy metal thresholds are adjusted for a hardness of 500 mg/L per ANZECC 2000
3 Field replicate of sample listed immediately above
4 All chromium are assumed to exist in the stable Cr (III) oxidation state, as Cr (VI) will be too reactive and unstable under the normal environment.
5 m+p+o xylene

bold exceeds DGV

Table 15: Results of Laboratory Analysis in August / September 2019 (µg/L)

Well	Heavy Metals[2]								TRH					Benzene	Toluene	Ethyl-benzene	Total Xylene[5]
	As	Cd	Cr[4]	Cu	Pb	Hg	Ni	Zn	C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	>C_{10}-C_{16}				
1	<1	<0.1	<1	2	<1	<0.05	3	69	<10	<50	<100	<100	<50	<1	<1	<1	<3
2	<1	0.2	<1	2	<1	<0.05	4	16	<10	<50	<100	<100	<50	<1	<1	<1	<3
BD1/ 201909023	<1	0.2	<1	2	<1	<0.05	4	19	<10	<50	<100	<100	<50	<1	<1	<1	<3
7	42	<0.1	<1	1	<1	<0.05	22	14	<10	<50	<100	<100	<50	<1	<1	<1	<3
8	<1	0.8	<1	8	<1	<0.05	4	16	<10	<50	<100	<100	<50	<1	<1	<1	<3
9	3	<0.1	<1	2	<1	<0.05	3	39	<10	<50	<100	<100	<50	<1	<1	<1	<3
10	3	<0.1	<1	2	<1	<0.05	22	34	<10	<50	<100	<100	<50	<1	<1	<1	<3
DGV1	13	2.4[2]	33.1[2]	1.4[1]	121.1[2]	0.6	120.2[2]	87.4[2]	10	250			50	950	180	80	550[5]

Notes:
1 DGV from the default guideline values provided in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, August 2018)
2 Heavy metal thresholds are adjusted for a hardness of 500 mg/L per ANZECC 2000
3 Field replicate of sample listed immediately above
4 All chromium are assumed to exist in the stable Cr (III) oxidation state, as Cr (VI) will be too reactive and unstable under the normal environment.
5 m+p+o xylene
bold exceeds DGV

Table 16: Results of Laboratory Analysis in November 2019 (µg/L)

Well	Heavy Metals[2]								TRH					Benzene	Toluene	Ethyl-benzene	Total Xylene[5]
	As	Cd	Cr[4]	Cu	Pb	Hg	Ni	Zn	C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	>C_{10}-C_{16}				
1	<1	<0.1	<1	<1	<1	<0.05	6	40	<10	<50	<100	<100	<50	<1	<1	<1	<3
BD1/ 201911253	<1	<0.1	<1	1	<1	<0.05	6	40	<10	<50	<100	<100	<50	<1	<1	<1	<3
2	<1	<0.1	<1	1	<1	<0.05	5	25	<10	<50	<100	<100	<50	<1	<1	<1	<3
7	8	<0.1	<1	1	<1	<0.05	22	39	<10	<50	<100	<100	<50	<1	<1	<1	<3
8	<1	0.3	<1	1	<1	<0.05	4	21	<10	<50	<100	<100	<50	<1	<1	<1	<3
9	3	<0.1	<1	2	<1	<0.05	3	42	<10	<50	<100	<100	<50	<1	<1	<1	<3
10	3	<0.1	<1	<1	<1	<0.05	5	24	<10	<50	<100	<100	<50	<1	<1	<1	<3
DGV1	13	2.4[2]	33.1[2]	1.4[1]	121.12	0.6	120.2[2]	87.4[2]	10	250			50	950	180	80	550[5]

Notes:
1 DGV from the default guideline values provided in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, August 2018)
2 Heavy metal thresholds are adjusted for a hardness of 500 mg/L per ANZECC 2000
3 Field replicate of sample listed immediately above
4 All chromium are assumed to exist in the stable Cr (III) oxidation state, as Cr (VI) will be too reactive and unstable under the normal environment.
5 m+p+o xylene
bold exceeds DGV

Table 17: Results of Laboratory Analysis in May 2020 (µg/L)

Well	Heavy Metals[2]								TRH					Benzene	Toluene	Ethyl-benzene	Total Xylene[5]
	As	Cd	Cr[4]	Cu	Pb	Hg	Ni	Zn	C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	>C_{10}-C_{16}				
1	<1	<0.1	<1	7	<1	<0.05	3	<1	<10	<50	<100	<100	<50	<1	<1	<1	<3
BD1/ 20200513[3]	2	<0.1	<1	<1	<1	<0.05	2	<1	<10	<50	<100	<100	<50	<1	<1	<1	<3
2	<1	<0.1	<1	17	<1	<0.05	5	3	<10	<50	<100	<100	<50	<1	<1	<1	<3
7	3	<0.1	<1	19	<1	<0.05	13	16	<10	<50	<100	<100	<50	<1	<1	<1	<3
8	<1	1.9	<1	26	<1	<0.05	11	68	<10	<50	<100	<100	<50	<1	<1	<1	<3
9	5	<0.1	<1	20	<1	<0.05	9	49	<10	<50	<100	<100	<50	<1	<1	<1	<3
10	2	<0.1	<1	9	<1	<0.05	6	14	<10	<50	110	<100	<50	<1	<1	<1	<3
DGV1	13	2.4[2]	33.1[2]	1.4[1]	121.1[2]	0.6	120.2[2]	87.4[2]	10	250			50	950	180	80	550[5]

Notes:
1 DGV from the default guideline values provided in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, August 2018)
2 Heavy metal thresholds are adjusted for a hardness of 500 mg/L per ANZECC 2000
3 Field replicate of sample listed immediately above
4 All chromium are assumed to exist in the stable Cr (III) oxidation state, as Cr (VI) will be too reactive and unstable under the normal environment.
5 m+p+o xylene

bold exceeds DGV

Table 18: Results of Laboratory Analysis in November 2020 (µg/L)

Well	Heavy Metals[2]								TRH					Benzene	Toluene	Ethyl-benzene	Total Xylene[5]
	As	Cd	Cr[4]	Cu	Pb	Hg	Ni	Zn	C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	>C_{10}-C_{16}				
1	2	<0.1	<1	<1	<1	<0.05	3	11	<10	<50	<100	<100	<50	<1	<1	<1	<3
2	<1	<0.1	<1	<1	<1	<0.05	4	17	<10	<50	<100	<100	<50	<1	<1	<1	<3
BD1 20201126	2	<0.1	<1	<1	<1	<0.05	3	15	<10	<50	<100	<100	<50	<1	<1	<1	<3
7	1	<0.1	<1	5	<1	<0.05	8	11	<10	<50	<100	<100	<50	<1	<1	<1	<3
8	<1	1.2	<1	21	<1	<0.05	5	31	<10	<50	<100	<100	<50	<1	<1	<1	<3
9	2	<0.1	<1	<1	<1	<0.05	3	12	<10	<50	<100	<100	<50	<1	<1	<1	<3
10	2	<0.1	<1	16	<1	<0.05	10	74	<10	<50	<100	<100	<50	<1	<1	<1	<3
DGV1	13	2.4[2]	33.1[2]	1.4[1]	121.1[2]	0.6	120.2[2]	87.4[2]	10	250			50	950	180	80	550[5]

Notes:
1 DGV from the default guideline values provided in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, August 2018)
2 Heavy metal thresholds are adjusted for a hardness of 500 mg/L per ANZECC 2000
3 Field replicate of sample listed immediately above
4 All chromium are assumed to exist in the stable Cr (III) oxidation state, as Cr (VI) will be too reactive and unstable under the normal environment.
5 m+p+o xylene
bold exceeds DGV

Table 19: Results of Laboratory Analysis in May 2021 (µg/L)

Well	Heavy Metals[2]								TRH					Benzene	Toluene	Ethyl-benzene	Total Xylene[5]
	As	Cd	Cr[4]	Cu	Pb	Hg	Ni	Zn	C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	>C_{10}-C_{16}				
1	1	<0.1	<1	1	<1	<0.05	4	10	<10	<50	<100	<100	<50	<1	<1	<1	<3
BD1 20210528	1	<0.1	<1	<1	<1	<0.05	3	3	<10	<50	<100	<100	<50	<1	<1	<1	<3
2	<1	<0.1	<1	13	<1	<0.05	9	43	<10	<50	<100	<100	<50	<1	<1	<1	<3
7	<1	0.3	<1	12	<1	<0.05	35	220	<10	<50	<100	<100	<50	<1	<1	<1	<3
8	<1	2.6	<1	<1	<1	<0.05	7	82	<10	<50	<100	<100	<50	<1	<1	<1	<3
9	3	<0.1	<1	15	<1	<0.05	6	33	<10	<50	<100	<100	<50	<1	<1	<1	<3
10	4	<0.1	<1	<1	<1	<0.05	12	32	<10	<50	<100	<100	<50	<1	<1	<1	<3
DGV1	13	2.4[2]	33.1[2]	1.4[1]	121.1[2]	0.6	120.2[2]	87.4[2]	10	250			50	950	180	80	550[5]

Notes:
1 DGV from the default guideline values provided in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, August 2018)
2 Heavy metal thresholds are adjusted for a hardness of 500 mg/L per ANZECC 2000
3 Field replicate of sample listed immediately above
4 All chromium are assumed to exist in the stable Cr (III) oxidation state, as Cr (VI) will be too reactive and unstable under the normal environment.
5 m+p+o xylene
bold exceeds DGV

Table 20: Results of Laboratory Analysis in November 2021 (µg/L)

Well	Heavy Metals[2]								TRH					Benzene	Toluene	Ethyl-benzene	Total Xylene[5]
	As	Cd	Cr[4]	Cu	Pb	Hg	Ni	Zn	C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	>C_{10}-C_{16}				
1	<1	<0.1	<1	<1	<1	<0.05	5	33	<10	<50	<100	<100	<50	<1	<1	<1	<3
2	<1	<0.1	<1	<1	<1	<0.05	5	22	<10	<50	<100	<100	<50	<1	<1	<1	<3
7	4	0.1	<1	<1	<1	<0.05	17	10	<10	<50	<100	<100	<50	<1	<1	<1	<3
8	<1	1.4	<1	2	<1	<0.05	9	89	<10	<50	<100	<100	<50	<1	<1	<1	<3
BD1	<1	1.5	<1	2	<1	<0.05	10	97	<10	<50	<100	<100	<50	<1	<1	<1	<3
9	1	<0.1	<1	2	<1	<0.05	8	67	<10	<50	<100	<100	<50	<1	<1	<1	<3
10	5	<0.1	<1	<1	<1	<0.05	15	38	<10	<50	<100	<100	<50	<1	<1	<1	<3
DGV1	13	2.4[2]	33.1[2]	1.4[1]	121.1[2]	0.6	120.2[2]	87.4[2]	10	250			50	950	180	80	625[5]

Notes:
1 DGV from the default guideline values provided in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, August 2018)
2 Heavy metal thresholds are adjusted for a hardness of 500 mg/L per ANZECC 2000
3 Field replicate of sample listed immediately above
4 All chromium are assumed to exist in the stable Cr (III) oxidation state, as Cr (VI) will be too reactive and unstable under the normal environment.
5 m+p+o xylene

bold exceeds DGV

Table 21: Results of Laboratory Analysis in May 2022 (µg/L)

Well	Heavy Metals[2]								TRH					Benzene	Toluene	Ethyl-benzene	Total Xylene[5]
	As	Cd	Cr[4]	Cu	Pb	Hg	Ni	Zn	C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	>C_{10}-C_{16}				
1	<1	<0.1	<1	19	<1	<0.05	2	20	<10	<50	<100	<100	<50	<1	<1	<1	<3
2	<1	<0.1	<1	2	<1	<0.05	7	84	<10	<50	<100	<100	<50	<1	<1	<1	<3
7	<1	<0.1	<1	35	<1	<0.05	19	72	<10	<50	<100	<100	<50	<1	<1	<1	<3
8	<1	1.0	<1	<1	<1	<0.05	5	18	<10	<50	<100	<100	<50	<1	<1	<1	<3
BD1	<1	1.1	<1	2	<1	<0.05	4	19	<10	<50	<100	<100	<50	<1	<1	<1	<3
9	3	<0.1	<1	4	<1	<0.05	14	89	<10	<50	<100	<100	<50	<1	<1	<1	<3
10	2	<0.1	<1	2	<1	<0.05	13	43	<10	<50	<100	130	<50	<1	<1	<1	<3
DGV1	13	2.4[2]	33.1[2]	1.4[1]	121.1[2]	0.6	120.2[2]	87.4[2]	10	250			50	950	180	80	625[5]

Notes:
1 DGV from the default guideline values provided in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, August 2018)
2 Heavy metal thresholds are adjusted for a hardness of 500 mg/L per ANZECC 2000
3 Field replicate of sample listed immediately above
4 All chromium are assumed to exist in the stable Cr (III) oxidation state, as Cr (VI) will be too reactive and unstable under the normal environment.
5 m+p+o xylene

bold exceeds DGV

Table 22: Results of Laboratory Analysis in December 2022 (µg/L)

Well	Heavy Metals[2]								TRH					Benzene	Toluene	Ethyl-benzene	Total Xylene[5]
	As	Cd	Cr[4]	Cu	Pb	Hg	Ni	Zn	C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	>C_{10}-C_{16}				
1	2	<0.1	<1	<1	<1	<0.05	4	39	<10	<50	<100	<100	<50	<1	<1	<1	<3
BD1	2	<0.1	<1	<1	<1	<0.05	3	34	<10	<50	<100	<100	<50				
2	<1	0.1	<1	4	<1	<0.05	4	340	<10	<50	<100	<100	<50	<1	<1	<1	<3
7	2	<0.1	<1	4	<1	<0.05	12	37	<10	<50	<100	<100	<50	<1	<1	<1	<3
8	1	2.5	<1	3	<1	<0.05	9	56	<10	<50	<100	<100	<50	<1	<1	<1	<3
9	1	<0.1	<1	1	<1	<0.05	4	33	<10	<50	<100	<100	<50	<1	<1	<1	<3
10	7	<0.1	<1	<1	<1	<0.05	3	11	<10	78	570	610	100	<1	<1	<1	<3
10 – silica clean up	-	-	-	-	-	-	-	-	-	<50	160	300	59	-	-	-	-
DGV1	13	2.4[2]	33.1[2]	1.4[1]	121.1[2]	0.6	120.2[2]	87.4[2]	10	250			50	950	180	80	6255

Notes:
1 DGV from the default guideline values provided in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, August 2018)
2 Heavy metal thresholds are adjusted for a hardness of 500 mg/L per ANZECC 2000
3 Field replicate of sample listed immediately above
4 All chromium are assumed to exist in the stable Cr (III) oxidation state, as Cr (VI) will be too reactive and unstable under the normal environment.
5 m+p+o xylene
bold exceeds DGV

Table 23: Results of Laboratory Analysis in May 2023 (µg/L)

Well	Heavy Metals[2]								TRH								Benzene	Toluene	Ethyl-benzene	Total Xylene[5]
	As	Cd	Cr[4]	Cu	Pb	Hg	Ni	Zn	C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	>C_{10}-C_{16}	C6-C10	C6-C10-BTEX (f1)	F2				
1	<1	<0.1	<1	<1	<1	<0.05	4	9	<10	<50	<100	<100	<50	<10	<10	<50	<1	<1	<1	<3
2	<1	<0.1	<1	<1	<1	<0.05	3	5	<10	<50	<100	<100	<50	<10	<10	<50	<1	<1	<1	<3
7	4	<0.1	<1	4	<1	<0.05	10	38	<10	<50	<100	<100	<50	<10	<10	<50	<1	<1	<1	<3
8	<1	0.1	<1	3	<1	<0.05	5	16	<10	<50	<100	<100	<50	<10	<10	<50	<1	<1	<1	<3
BD1/20230530	<1	0.1	<1	<1	<1	<0.05	5	12	<10	<50	<100	<100	<50	<10	<10	<50	<1	<1	<1	<3
9	<1	<0.1	<1	2	<1	<0.05	3	22	<10	<50	<100	<100	<50	<10	<10	<50	<1	<1	<1	<3
10	3	<0.1	<1	<1	<1	<0.05	2	2	<10	<50	<100	<100	<50	<10	<10	<50	<1	<1	<1	<3
DGV1	13	2.4[2]	33.1[2]	1.4[1]	121.1[2]	0.6	120.2[2]	87.4[2]	10	250			50	-	-	-	950	180	80	625[5]

Notes:
1 DGV from the default guideline values provided in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, August 2018)
2 Heavy metal thresholds are adjusted for a hardness of 500 mg/L per ANZECC 2000
3 Field replicate of sample listed immediately above
4 All chromium are assumed to exist in the stable Cr (III) oxidation state, as Cr (VI) willd be too reactive and unstable under the normal environment.
5 m+p+o xylene

bold exceeds DGV

Table 24: Results of Laboratory Analysis in November 2023 (µg/L)

Well	Heavy Metals[2]								TRH										Benzene	Toluene	Ethyl-benzene	Total Xylene[5]
	As	Cd	Cr[4]	Cu	Pb	Hg	Ni	Zn	C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	>C_{10}-C_{16}	>C16-C34	>C34-C40	C6-C10	C6-C10-BTEX (f1)	F2				
1	<1	**0.1**	<1	**6**	<1	<0.05	10	**960**	<10	<50	**390**	<100	390	**420**	<100	<10	<10	<50	<1	<1	<1	<3
2	<1	<0.1	<1	<1	<1	<0.05	**2**	**30**	<10	<50	<100	<100	<50	<100	<100	<10	<10	<50	<1	<1	<1	<3
7	1	<0.1	<1	**4**	<1	<0.05	**6**	**25**	<10	<50	<100	<100	<50	<100	<100	<10	<10	<50	<1	<1	<1	<3
8	<1	**0.3**	<1	**2**	<1	<0.05	**3**	**18**	<10	<50	<100	<100	<50	<100	<100	<10	<10	<50	<1	<1	<1	<3
BD1/20231124	<1	**0.4**	<1	**6**	<1	<0.05	**3**	**20**	<10	<50	<100	<100	<50	<100	<100	<10	<10	<50	<1	<1	<1	<3
9	1	<0.1	<1	**6**	<1	<0.05	**6**	**62**	<10	<50	<100	<100	<50	<100	<100	<10	<10		<1	<1	<1	<3
10	<1	<0.1	1	2	<1	<0.05	<1	**10**	<10	**60**	**210**	<100	**71**	**240**	<100	<10	<10	**71**	<1	<1	<1	<3
Spike	-	-	-	-	-	-	-	-	-	-	-	-	-			-	-	-	106%	103%	112%	107-115%
Blank	-	-	-	-	-	-	-	-	<10	<10	-	-	-			-	-	-	<1	<1	<1	<3
Rinsate	-	-	-	-	-	-	-	-	<10	<10	<100	<100	<50	<100	<100	<10	<10	<50	<1	<1	<1	<3
DGV1	13	2.4[2]	33.1[2]	1.4[1]	121.1[2]	0.6	120.2[2]	87.4[2]	10	250			50	100	100	10	10	50	950	180	80	625[5]

Notes:
1 DGV from the default guideline values provided in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, August 2018)
2 Heavy metal thresholds are adjusted for a hardness of 500 mg/L per ANZECC 2000
3 Field replicate of sample listed immediately above
4 All chromium are assumed to exist in the stable Cr (III) oxidation state, as Cr (VI) will be too reactive and unstable under the normal environment.
5 m+p+o xylene

bold exceeds DGV

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 338881

Client Details

Client	Douglas Partners Pty Ltd
Attention	Kurt Plambeck
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**71021.19 Lidcombe**
Number of Samples	10 Water
Date samples received	28/11/2023
Date completed instructions received	28/11/2023

Analysis Details

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

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

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

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

Report Details

Date results requested by	05/12/2023
Date of Issue	05/12/2023

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Results Approved By
Hannah Nguyen, Metals Supervisor
Loren Bardwell, Development Chemist
Tim Toll, Chemist (FAS)

Authorised By
Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Water						
Our Reference		338881-1	338881-2	338881-3	338881-4	338881-5
Your Reference	UNITS	BH1	BH2	BH7	BH8	BH9
Date Sampled		30/05/2023	30/05/2023	30/05/2023	30/05/2023	30/05/2023
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	01/12/2023	01/12/2023	01/12/2023	01/12/2023	01/12/2023
Date analysed	-	04/12/2023	04/12/2023	04/12/2023	04/12/2023	04/12/2023
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	%	102	104	80	90	104
Surrogate Toluene-d8	%	100	101	101	103	103
Surrogate 4-Bromofluorobenzene	%	100	99	100	99	100

vTRH(C6-C10)/BTEXN in Water						
Our Reference		338881-6	338881-7	338881-8	338881-9	338881-10
Your Reference	UNITS	BH10	BD1/20230530	TS	TB	Rinsate
Date Sampled		30/05/2023	30/05/2023	30/05/2023	30/05/2023	30/05/2023
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	01/12/2023	01/12/2023	01/12/2023	01/12/2023	01/12/2023
Date analysed	-	04/12/2023	04/12/2023	04/12/2023	04/12/2023	04/12/2023
TRH C_6 - C_9	µg/L	<10	<10	[NA]	<10	<10
TRH C_6 - C_{10}	µg/L	<10	<10	[NA]	<10	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10	[NA]	<10	<10
Benzene	µg/L	<1	<1	106%	<1	<1
Toluene	µg/L	<1	<1	103%	<1	<1
Ethylbenzene	µg/L	<1	<1	112%	<1	<1
m+p-xylene	µg/L	<2	<2	107%	<2	<2
o-xylene	µg/L	<1	<1	115%	<1	<1
Naphthalene	µg/L	<1	<1	[NA]	<1	<1
Surrogate Dibromofluoromethane	%	108	102	102	101	100
Surrogate Toluene-d8	%	103	77	96	105	95
Surrogate 4-Bromofluorobenzene	%	99	89	96	99	104

svTRH (C10-C40) in Water						
Our Reference		338881-1	338881-2	338881-3	338881-4	338881-5
Your Reference	UNITS	BH1	BH2	BH7	BH8	BH9
Date Sampled		30/05/2023	30/05/2023	30/05/2023	30/05/2023	30/05/2023
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023
Date analysed	-	30/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023
TRH C_{10} - C_{14}	µg/L	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	µg/L	390	<100	<100	<100	<100
TRH C_{29} - C_{36}	µg/L	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	390	<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	420	<100	<100	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	420	<50	<50	<50	<50
Surrogate o-Terphenyl	%	80	78	76	87	88

svTRH (C10-C40) in Water				
Our Reference		338881-6	338881-7	338881-10
Your Reference	UNITS	BH10	BD1/20230530	Rinsate
Date Sampled		30/05/2023	30/05/2023	30/05/2023
Type of sample		Water	Water	Water
Date extracted	-	29/11/2023	29/11/2023	29/11/2023
Date analysed	-	30/11/2023	30/11/2023	30/11/2023
TRH C_{10} - C_{14}	µg/L	60	<50	<50
TRH C_{15} - C_{28}	µg/L	210	<100	<100
TRH C_{29} - C_{36}	µg/L	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	270	<50	<50
TRH >C_{10} - C_{16}	µg/L	71	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	71	<50	<50
TRH >C_{16} - C_{34}	µg/L	240	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	310	<50	<50
Surrogate o-Terphenyl	%	78	81	84

HM in water - dissolved						
Our Reference		338881-1	338881-2	338881-3	338881-4	338881-5
Your Reference	UNITS	BH1	BH2	BH7	BH8	BH9
Date Sampled		30/05/2023	30/05/2023	30/05/2023	30/05/2023	30/05/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	30/11/2023	30/11/2023	30/11/2023	30/11/2023	30/11/2023
Date analysed	-	30/11/2023	30/11/2023	30/11/2023	30/11/2023	30/11/2023
Arsenic-Dissolved	µg/L	<1	<1	1	<1	1
Cadmium-Dissolved	µg/L	0.1	<0.1	<0.1	0.3	<0.1
Chromium-Dissolved	µg/L	<1	<1	<1	<1	<1
Copper-Dissolved	µg/L	6	<1	4	2	6
Lead-Dissolved	µg/L	<1	<1	<1	<1	<1
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel-Dissolved	µg/L	10	2	6	3	6
Zinc-Dissolved	µg/L	960	30	25	18	62

HM in water - dissolved			
Our Reference		338881-6	338881-7
Your Reference	UNITS	BH10	BD1/20230530
Date Sampled		30/05/2023	30/05/2023
Type of sample		Water	Water
Date prepared	-	30/11/2023	30/11/2023
Date analysed	-	30/11/2023	30/11/2023
Arsenic-Dissolved	µg/L	<1	<1
Cadmium-Dissolved	µg/L	<0.1	0.4
Chromium-Dissolved	µg/L	1	<1
Copper-Dissolved	µg/L	2	6
Lead-Dissolved	µg/L	<1	<1
Mercury-Dissolved	µg/L	<0.05	<0.05
Nickel-Dissolved	µg/L	<1	3
Zinc-Dissolved	µg/L	10	20

Cations in water Dissolved						
Our Reference		338881-1	338881-2	338881-3	338881-4	338881-5
Your Reference	UNITS	BH1	BH2	BH7	BH8	BH9
Date Sampled		30/05/2023	30/05/2023	30/05/2023	30/05/2023	30/05/2023
Type of sample		Water	Water	Water	Water	Water
Date digested	-	30/11/2023	30/11/2023	30/11/2023	30/11/2023	30/11/2023
Date analysed	-	30/11/2023	30/11/2023	30/11/2023	30/11/2023	30/11/2023
Calcium - Dissolved	mg/L	27	58	5.5	86	28
Magnesium - Dissolved	mg/L	96	20	14	350	150
Hardness	mgCaCO 3 /L	460	230	72	1,600	670

Cations in water Dissolved		
Our Reference		338881-6
Your Reference	UNITS	BH10
Date Sampled		30/05/2023
Type of sample		Water
Date digested	-	30/11/2023
Date analysed	-	30/11/2023
Calcium - Dissolved	mg/L	14
Magnesium - Dissolved	mg/L	73
Hardness	mgCaCO 3 /L	340

HM in water - total		
Our Reference	UNITS	338881-10
Your Reference		Rinsate
Date Sampled		30/05/2023
Type of sample		Water
Date prepared	-	30/11/2023
Date analysed	-	30/11/2023
Arsenic-Total	µg/L	<1
Cadmium-Total	µg/L	<0.1
Chromium-Total	µg/L	<1
Copper-Total	µg/L	<1
Lead-Total	µg/L	<1
Mercury-Total	µg/L	<0.05
Nickel-Total	µg/L	2
Zinc-Total	µg/L	3

Method ID	Methodology Summary
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements. Salt forms (e.g. FeO, PbO, ZnO) are determinined 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-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W5	[NT]
Date extracted	-			01/12/2023	1	01/12/2023	04/12/2023		01/12/2023	[NT]
Date analysed	-			04/12/2023	1	04/12/2023	05/12/2023		04/12/2023	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	1	<10	<10	0	116	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	1	<10	<10	0	116	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	109	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	114	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	120	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	118	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	120	[NT]
Naphthalene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	100	1	102	110	8	117	[NT]
Surrogate Toluene-d8	%		Org-023	105	1	100	95	5	99	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	100	1	100	98	2	101	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			29/11/2023	[NT]	[NT]	[NT]	[NT]	29/11/2023	[NT]
Date analysed	-			29/11/2023	[NT]	[NT]	[NT]	[NT]	29/11/2023	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	94	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	97	[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]	94	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	97	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate o-Terphenyl	%		Org-020	75	[NT]	[NT]	[NT]	[NT]	82	[NT]

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			30/11/2023	1	30/11/2023	30/11/2023		30/11/2023	[NT]
Date analysed	-			30/11/2023	1	30/11/2023	30/11/2023		30/11/2023	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	94	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	1	0.1	0.1	0	92	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	87	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	1	6	6	0	95	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	95	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	1	<0.05	[NT]		107	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	1	10	10	0	88	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	1	960	970	1	92	[NT]

QUALITY CONTROL: Cations in water Dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	338881-2
Date digested	-			30/11/2023	1	30/11/2023	30/11/2023		30/11/2023	30/11/2023
Date analysed	-			30/11/2023	1	30/11/2023	30/11/2023		30/11/2023	30/11/2023
Calcium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	27	27	0	94	127
Magnesium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	96	97	1	94	111
Hardness	mgCaCO 3 /L	3	Metals-020	[NT]	1	460	470	2	[NT]	[NT]

QUALITY CONTROL: HM in water - total						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date prepared	-			30/11/2023	[NT]	[NT]	[NT]	[NT]	30/11/2023	[NT]
Date analysed	-			30/11/2023	[NT]	[NT]	[NT]	[NT]	30/11/2023	[NT]
Arsenic-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Cadmium-Total	µg/L	0.1	Metals-022	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Chromium-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Copper-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Lead-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Mercury-Total	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	[NT]	[NT]	98	[NT]
Nickel-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Zinc-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	86	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Report Comments

Samples received in good order: Holding time exceedance

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	71021.19	**Suburb:**	Lidcombe	**To:**	Envirolab Services
Project Manager:	Kurt Plambeck	**Order Number:**		**Sampler:**	TG
					12 Ashley St, Chatswood NSW 2067
Email:	Kurt.Plambeck@douglaspartners.com.au			**Attn:**	Sample Receipt
Turnaround time:	☑ Standard ☐ 72 hour ☐ 48 hour ☐ 24 hour ☐ Same day				(02) 9910 6200 samplereceipt@envirolab.com.au
Prior Storage:	☐ Fridge ☐ Freezer ☑ Esky ☐ Shelf	**Do samples contain 'potential' HBM?**	☑ No ☐ Yes		(If YES, then handle, transport and store in accordance with FPM HAZID)

Lab ID	Sample ID: Location / Other ID	Depth From	Depth To	Date Sampled	Sample Type: S - soil W - water M - Material	Container Type: G - glass P - plastic	Analytes: Heavy Metals	TRH	BTEX	Hardness							Notes/ Preservation/ Additional Requirements
1	BH1			30/05/23	W	G + P	X	X	X	X							
2	BH2			30/05/23	W	G + P	X	X	X	X							
3	BH7			30/05/23	W	G + P	X	X	X	X							
4	BH8			30/05/23	W	G + P	X	X	X	X							
5	BH9			30/05/23	W	G + P	X	X	X	X							
6	BH10			30/05/23	W	G + P	X	X	X	X							
7	BD1/20230530			30/05/23	W	G + P	X	X	X								
8	Trip Spike				W	G			X								
9	Trip Blank				W	G			X								
10	Rinsate			30/05/23	W	G	X	X	X								

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

Job No: 338881
28/11/23
Date Received:
Time Received: 1410
Received By: DL
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Metals to analyse:

Number of samples in container:

Send results to: Douglas Partners Pty Ltd

Address: 96 Hermitage Road, West Ryde NSW 211

Relinquished by: TG

Transported to laboratory by: Courier

Phone: (02) 9809 0666

Date: ~~31/05/2023~~ 27.11.23

Signed: TG

LAB RECEIPT

Lab Ref. No: 338881

Received by: 28/11/23 1410

Date & Time: Dathyun Lee

Signed:

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

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd
Attention	Kurt Plambeck

Sample Login Details

Your reference	71021.19 Lidcombe
Envirolab Reference	338881
Date Sample Received	28/11/2023
Date Instructions Received	28/11/2023
Date Results Expected to be Reported	05/12/2023

Sample Condition

Samples received in appropriate condition for analysis	Holding time exceedance
No. of Samples Provided	10 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	4
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Please contact the laboratory within 24 hours if you wish to cancel the aformentioned testing. Otherwise testing will proceed as per the COC and hence invoiced accordingly.

Please direct any queries to:

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

Analysis Underway, details on the following page:

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

Sample ID	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	HM in water - dissolved	Cations in water Dissolved	HM in water - total
BH1	✓	✓	✓	✓	
BH2	✓	✓	✓	✓	
BH7	✓	✓	✓	✓	
BH8	✓	✓	✓	✓	
BH9	✓	✓	✓	✓	
BH10	✓	✓	✓	✓	
BD1/20230530	✓	✓	✓		
TS	✓				
TB	✓				
Rinsate	✓	✓			✓

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

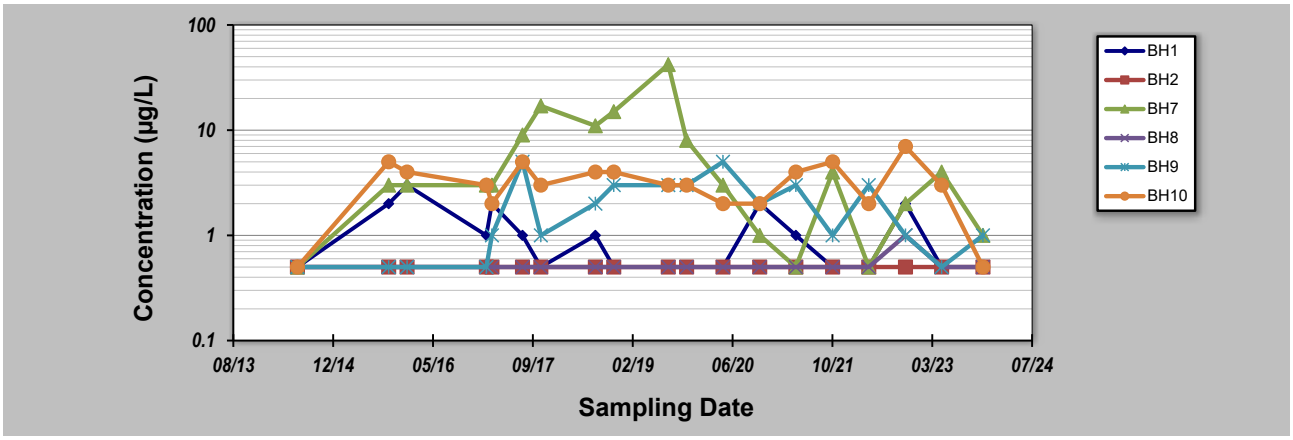
Additional Info

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

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	21-Dec-23	Job ID:	71021
Facility Name:	Tooheys	Constituent:	Arsenic
Conducted By:	KDP	Concentration Units:	µg/L

Sampling Point ID:	BH1	BH2	BH7	BH8	BH9	BH10
Sampling Event	Sampling Date	ARSENIC CONCENTRATION (µg/L)					
1	1-Jul-14	0.5	0.5	0.5	0.5	0.5	0.5
2	1-Oct-15	2	0.5	3	0.5	0.5	5
3	1-Jan-16	3	0.5	3	0.5	0.5	4
4	1-Feb-17	1	0.5	3	0.5	0.5	3
5	1-Mar-17	2	0.5	3	0.5	1	2
6	1-Aug-17	1	0.5	9	0.5	5	5
7	1-Nov-17	0.5	0.5	17	0.5	1	3
8	1-Aug-18	1	0.5	11	0.5	2	4
9	1-Nov-18	0.5	0.5	15	0.5	3	4
10	1-Aug-19	0.5	0.5	42	0.5	3	3
11	1-Nov-19	0.5	0.5	8	0.5	3	3
12	1-May-20	0.5	0.5	3	0.5	5	2
13	1-Nov-20	2	0.5	1	0.5	2	2
14	1-May-21	1	0.5	0.5	0.5	3	4
15	1-Nov-21	0.5	0.5	4	0.5	1	5
16	1-May-22	0.5	0.5	0.5	0.5	3	2
17	1-Nov-22	2	0.5	2	1	1	7
18	1-May-23	0.5	0.5	4	0.5	0.5	3
19	24-Nov-23	0.5	0.5	1	0.5	1	0.5
20							
Coefficient of Variation:		0.72	0.00	1.43	0.22	0.77	0.50
Mann-Kendall Statistic (S):		-42	0	-18	14	33	-13
Confidence Factor:		92.3%	48.6%	72.2%	67.4%	86.7%	66.1%
Concentration Trend:		Prob. Decreasing	Stable	No Trend	No Trend	No Trend	Stable



Notes:

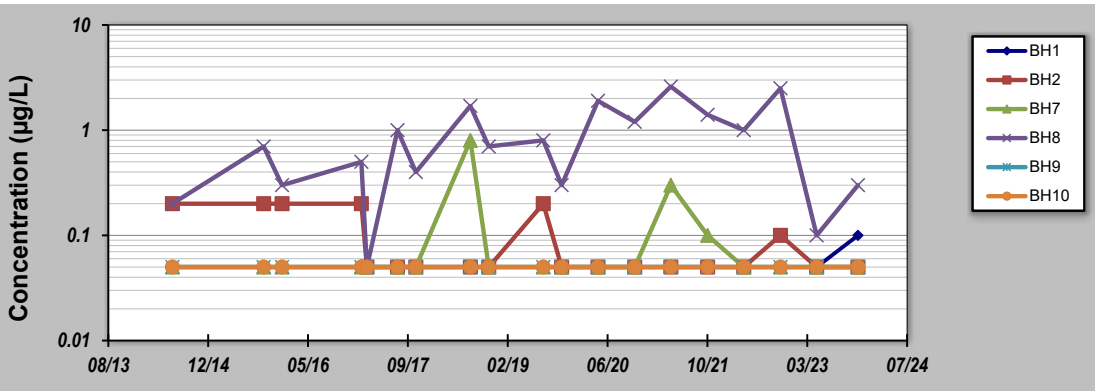
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

Result less than laboratory PQL. Half the PQL adopted as concentration

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	21-Dec-23	Job ID:	71021
Facility Name:	Tooheys	Constituent:	Cadmium
Conducted By:	KDP	Concentration Units:	µg/L

Sampling Point ID:	BH1	BH2	BH7	BH8	BH9	BH10	
Sampling Event	Sampling Date	CADMIUM CONCENTRATION (µg/L)						
1	1-Jul-14	0.05	0.2	0.05	0.2	0.05	0.05	
2	1-Oct-15	0.05	0.2	0.05	0.7	0.05	0.05	
3	1-Jan-16	0.05	0.2	0.05	0.3	0.05	0.05	
4	1-Feb-17	0.05	0.2	0.05	0.5	0.05	0.05	
5	1-Mar-17	0.05	0.05	0.05	0.05	0.05	0.05	
6	1-Aug-17	0.05	0.05	0.05	1	0.05	0.05	
7	1-Nov-17	0.05	0.05	0.05	0.4	0.05	0.05	
8	1-Aug-18	0.05	0.05	0.8	1.7	0.05	0.05	
9	1-Nov-18	0.05	0.05	0.05	0.7	0.05	0.05	
10	1-Aug-19	0.05	0.2	0.05	0.8	0.05	0.05	
11	1-Nov-19	0.05	0.05	0.05	0.3	0.05	0.05	
12	1-May-20	0.05	0.05	0.05	1.9	0.05	0.05	
13	1-Nov-20	0.05	0.05	0.05	1.2	0.05	0.05	
14	1-May-21	0.05	0.05	0.3	2.6	0.05	0.05	
15	1-Nov-21	0.05	0.05	0.1	1.4	0.05	0.05	
16	1-May-22	0.05	0.05	0.05	1	0.05	0.05	
17	1-Nov-22	0.05	0.1	0.05	2.5	0.05	0.05	
18	1-May-23	0.05	0.05	0.05	0.1	0.05	0.05	
19	24-Nov-23	0.1	0.05	0.05	0.3	0.05	0.05	
20								
Coefficient of Variation:		0.22	0.73	1.69	0.84	0.00	0.00	
Mann-Kendall Statistic (S):		18	-51	11	46	0	0	
Confidence Factor:		72.2%	96.0%	63.5%	94.2%	48.6%	48.6%	
Concentration Trend:		No Trend	Decreasing	No Trend	Prob. Increasing	Stable	Stable	



Notes:

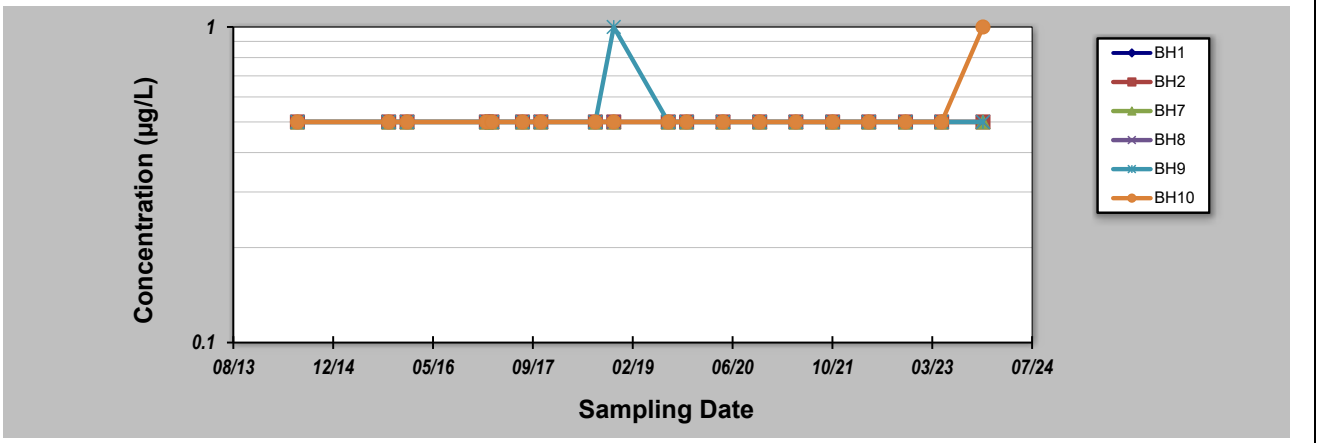
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

Result less than laboratory PQL. Half the PQL adopted as concentration

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	21-Dec-23	Job ID:	71021
Facility Name:	Tooheys	Constituent:	Chromium
Conducted By:	KDP	Concentration Units:	µg/L

Sampling Point ID:	BH1	BH2	BH7	BH8	BH9	BH10
Sampling Event	Sampling Date	CHROMIUM CONCENTRATION (µg/L)					
1	1-Jul-14	0.5	0.5	0.5	0.5	0.5	0.5
2	1-Oct-15	0.5	0.5	0.5	0.5	0.5	0.5
3	1-Jan-16	0.5	0.5	0.5	0.5	0.5	0.5
4	1-Feb-17	0.5	0.5	0.5	0.5	0.5	0.5
5	1-Mar-17	0.5	0.5	0.5	0.5	0.5	0.5
6	1-Aug-17	0.5	0.5	0.5	0.5	0.5	0.5
7	1-Nov-17	0.5	0.5	0.5	0.5	0.5	0.5
8	1-Aug-18	0.5	0.5	0.5	0.5	0.5	0.5
9	1-Nov-18	0.5	0.5	0.5	0.5	1	0.5
10	1-Aug-19	0.5	0.5	0.5	0.5	0.5	0.5
11	1-Nov-19	0.5	0.5	0.5	0.5	0.5	0.5
12	1-May-20	0.5	0.5	0.5	0.5	0.5	0.5
13	1-Nov-20	0.5	0.5	0.5	0.5	0.5	0.5
14	1-May-21	0.5	0.5	0.5	0.5	0.5	0.5
15	1-Nov-21	0.5	0.5	0.5	0.5	0.5	0.5
16	1-May-22	0.5	0.5	0.5	0.5	0.5	0.5
17	1-Nov-22	0.5	0.5	0.5	0.5	0.5	0.5
18	1-May-23	0.5	0.5	0.5	0.5	0.5	0.5
19	24-Nov-23	0.5	0.5	0.5	0.5	0.5	1
20							
Coefficient of Variation:		0.00	0.00	0.00	0.00	0.22	0.22
Mann-Kendall Statistic (S):		0	0	0	0	-2	18
Confidence Factor:		48.6%	48.6%	48.6%	48.6%	51.4%	72.2%
Concentration Trend:		Stable	Stable	Stable	Stable	Stable	No Trend



Notes:

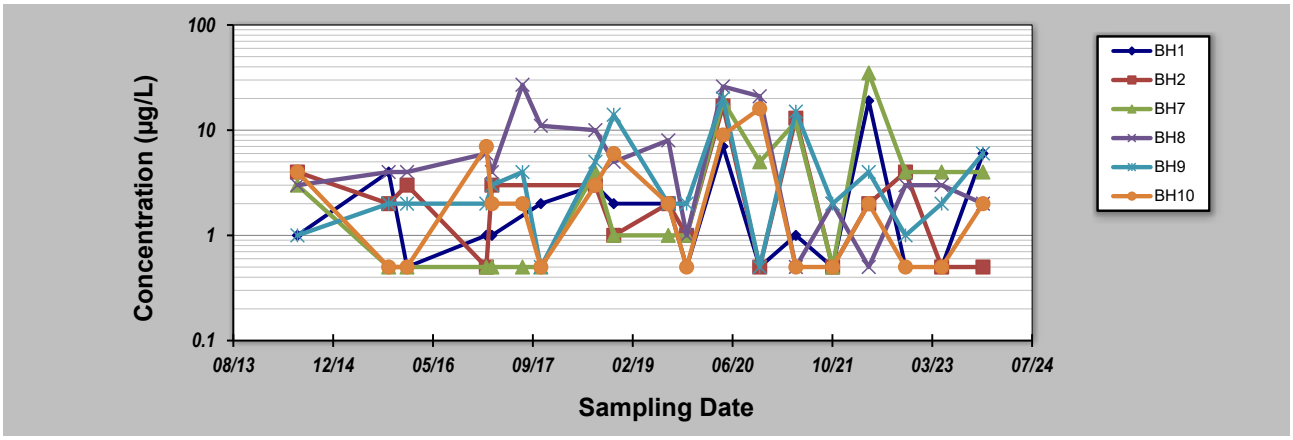
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

Result less than laboratory PQL. Half the PQL adopted as concentration

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	21-Dec-23	Job ID:	71021
Facility Name:	Tooheys	Constituent:	Chromium
Conducted By:	KDP	Concentration Units:	µg/L

Sampling Point ID:	BH1	BH2	BH7	BH8	BH9	BH10
Sampling Event	Sampling Date	CHROMIUM CONCENTRATION (µg/L)					
1	1-Jul-14	1	4	3	3	1	4
2	1-Oct-15	4	2	0.5	4	2	0.5
3	1-Jan-16	0.5	3	0.5	4	2	0.5
4	1-Feb-17	1	0.5	0.5	6	2	7
5	1-Mar-17	1	3	0.5	4	3	2
6	1-Aug-17	<1	<1	0.5	27	4	2
7	1-Nov-17	2	<1	0.5	11	0.5	0.5
8	1-Aug-18	3	3	4	10	5	3
9	1-Nov-18	2	1	1	5	14	6
10	1-Aug-19	2	2	1	8	2	2
11	1-Nov-19	0.5	1	1	1	2	0.5
12	1-May-20	7	17	19	26	20	9
13	1-Nov-20	0.5	0.5	5	21	0.5	16
14	1-May-21	1	13	12	0.5	15	0.5
15	1-Nov-21	0.5	0.5	0.5	2	2	0.5
16	1-May-22	19	2	35	0.5	4	2
17	1-Nov-22	0.5	4	4	3	1	0.5
18	1-May-23	0.5	0.5	4	3	2	0.5
19	24-Nov-23	6	0.5	4	2	6	2
20							
Coefficient of Variation:		1.54	1.36	1.70	1.11	1.19	1.28
Mann-Kendall Statistic (S):		-5	-30	73	-35	29	-15
Confidence Factor:		55.9%	88.2%	99.5%	88.1%	83.4%	68.6%
Concentration Trend:		No Trend	No Trend	Increasing	No Trend	No Trend	No Trend



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

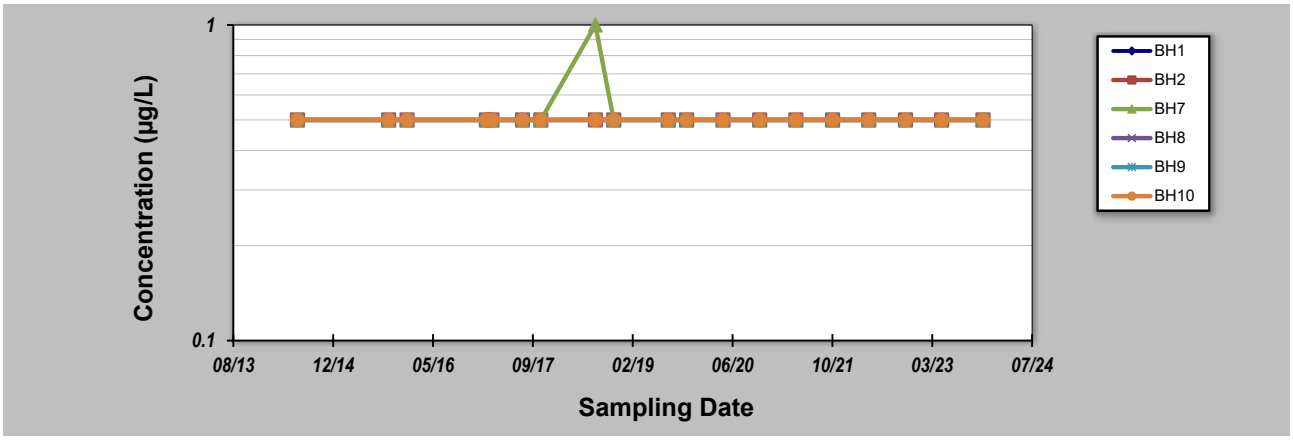
Result less than laboratory PQL. Half the PQL adopted as concentration

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	21-Dec-23	Job ID:	71021
Facility Name:	Tooheys	Constituent:	Lead
Conducted By:	KDP	Concentration Units:	µg/L

Sampling Point ID:	BH1	BH2	BH7	BH8	BH9	BH10

Sampling Event	Sampling Date	LEAD CONCENTRATION (µg/L)					
1	1-Jul-14	0.5	0.5	0.5	0.5	0.5	0.5
2	1-Oct-15	0.5	0.5	0.5	0.5	0.5	0.5
3	1-Jan-16	0.5	0.5	0.5	0.5	0.5	0.5
4	1-Feb-17	0.5	0.5	0.5	0.5	0.5	0.5
5	1-Mar-17	0.5	0.5	0.5	0.5	0.5	0.5
6	1-Aug-17	0.5	0.5	0.5	0.5	0.5	0.5
7	1-Nov-17	0.5	0.5	0.5	0.5	0.5	0.5
8	1-Aug-18	0.5	0.5	1	0.5	0.5	0.5
9	1-Nov-18	0.5	0.5	0.5	0.5	0.5	0.5
10	1-Aug-19	0.5	0.5	0.5	0.5	0.5	0.5
11	1-Nov-19	0.5	0.5	0.5	0.5	0.5	0.5
12	1-May-20	0.5	0.5	0.5	0.5	0.5	0.5
13	1-Nov-20	0.5	0.5	0.5	0.5	0.5	0.5
14	1-May-21	0.5	0.5	0.5	0.5	0.5	0.5
15	1-Nov-21	0.5	0.5	0.5	0.5	0.5	0.5
16	1-May-22	0.5	0.5	0.5	0.5	0.5	0.5
17	1-Nov-22	0.5	0.5	0.5	0.5	0.5	0.5
18	1-May-23	0.5	0.5	0.5	0.5	0.5	0.5
19	24-Nov-23	0.5	0.5	0.5	0.5	0.5	0.5
20							
Coefficient of Variation:		0.00	0.00	0.22	0.00	0.00	0.00
Mann-Kendall Statistic (S):		0	0	-4	0	0	0
Confidence Factor:		48.6%	48.6%	54.1%	48.6%	48.6%	48.6%
Concentration Trend:		Stable	Stable	Stable	Stable	Stable	Stable



Notes:

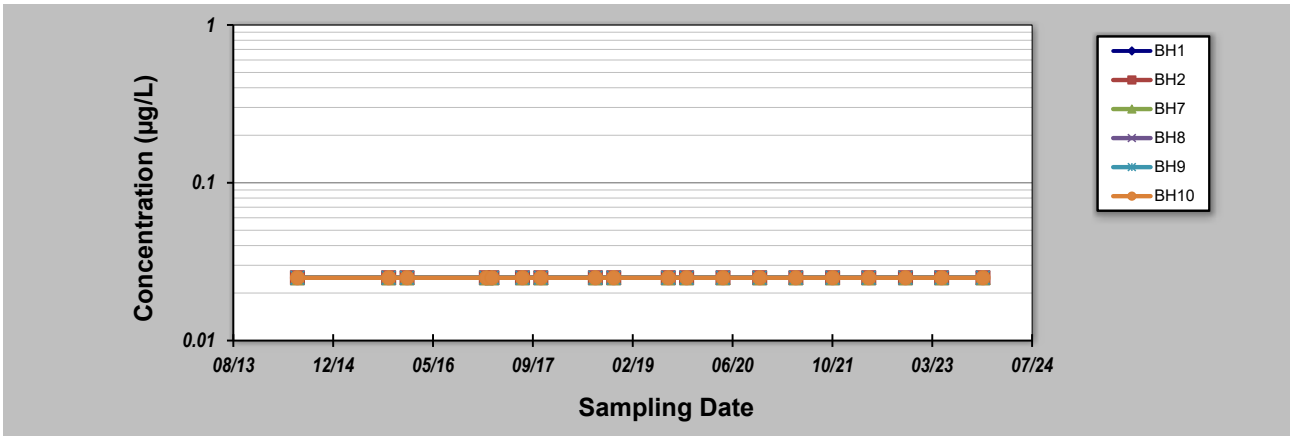
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

Result less than laboratory PQL. Half the PQL adopted as concentration

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	21-Dec-23	Job ID:	71021
Facility Name:	Tooheys	Constituent:	Mercury
Conducted By:	KDP	Concentration Units:	µg/L

Sampling Point ID:	BH1	BH2	BH7	BH8	BH9	BH10	
Sampling Event	Sampling Date	MERCURY CONCENTRATION (µg/L)						
1	1-Jul-14	0.025	0.025	0.025	0.025	0.025	0.025	
2	1-Oct-15	0.025	0.025	0.025	0.025	0.025	0.025	
3	1-Jan-16	0.025	0.025	0.025	0.025	0.025	0.025	
4	1-Feb-17	0.025	0.025	0.025	0.025	0.025	0.025	
5	1-Mar-17	0.025	0.025	0.025	0.025	0.025	0.025	
6	1-Aug-17	0.025	0.025	0.025	0.025	0.025	0.025	
7	1-Nov-17	0.025	0.025	0.025	0.025	0.025	0.025	
8	1-Aug-18	0.025	0.025	0.025	0.025	0.025	0.025	
9	1-Nov-18	0.025	0.025	0.025	0.025	0.025	0.025	
10	1-Aug-19	0.025	0.025	0.025	0.025	0.025	0.025	
11	1-Nov-19	0.025	0.025	0.025	0.025	0.025	0.025	
12	1-May-20	0.025	0.025	0.025	0.025	0.025	0.025	
13	1-Nov-20	0.025	0.025	0.025	0.025	0.025	0.025	
14	1-May-21	0.025	0.025	0.025	0.025	0.025	0.025	
15	1-Nov-21	0.025	0.025	0.025	0.025	0.025	0.025	
16	1-May-22	0.025	0.025	0.025	0.025	0.025	0.025	
17	1-Nov-22	0.025	0.025	0.025	0.025	0.025	0.025	
18	1-May-23	0.025	0.025	0.025	0.025	0.025	0.025	
19	24-Nov-23	0.025	0.025	0.025	0.025	0.025	0.025	
20								
Coefficient of Variation:		0.00	0.00	0.00	0.00	0.00	0.00	
Mann-Kendall Statistic (S):		0	0	0	0	0	0	
Confidence Factor:		48.6%	48.6%	48.6%	48.6%	48.6%	48.6%	
Concentration Trend:		Stable	Stable	Stable	Stable	Stable	Stable	



Notes:

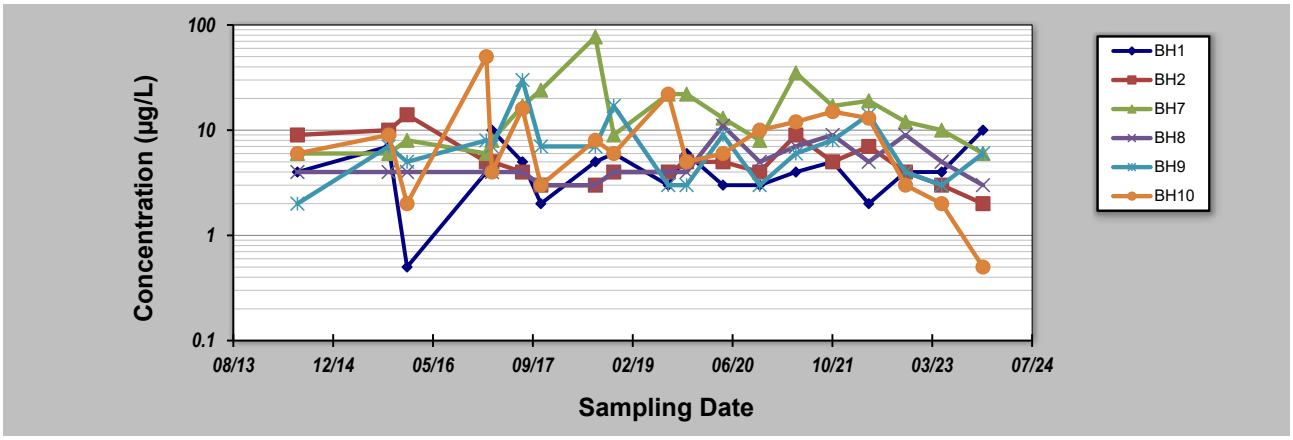
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

Result less than laboratory PQL. Half the PQL adopted as concentration

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	21-Dec-23	Job ID:	71021
Facility Name:	Tooheys	Constituent:	Nickel
Conducted By:	KDP	Concentration Units:	µg/L

Sampling Point ID:	BH1	BH2	BH7	BH8	BH9	BH10
Sampling Event	Sampling Date	NICKEL CONCENTRATION (µg/L)					
1	1-Jul-14	4	9	6	4	2	6
2	1-Oct-15	7	10	6	4	7	9
3	1-Jan-16	0.5	14	8	4	5	2
4	1-Feb-17	4	5	6	4	8	50
5	1-Mar-17	10	5	8	4	7	4
6	1-Aug-17	5	4	17	4	30	16
7	1-Nov-17	2	3	24	3	7	3
8	1-Aug-18	5	3	77	3	7	8
9	1-Nov-18	6	4	9	4	17	6
10	1-Aug-19	3	4	22	4	3	22
11	1-Nov-19	6	5	22	4	3	5
12	1-May-20	3	5	13	11	9	6
13	1-Nov-20	3	4	8	5	3	10
14	1-May-21	4	9	35	7	6	12
15	1-Nov-21	5	5	17	9	8	15
16	1-May-22	2	7	19	5	14	13
17	1-Nov-22	4	4	12	9	4	3
18	1-May-23	4	3	10	5	3	2
19	24-Nov-23	10	2	6	3	6	0.5
20							
Coefficient of Variation:		0.53	0.54	0.97	0.45	0.84	1.10
Mann-Kendall Statistic (S):		0	-51	30	50	-7	-18
Confidence Factor:		48.6%	96.0%	84.3%	95.7%	58.2%	72.2%
Concentration Trend:		Stable	Decreasing	No Trend	Increasing	Stable	No Trend



Notes:

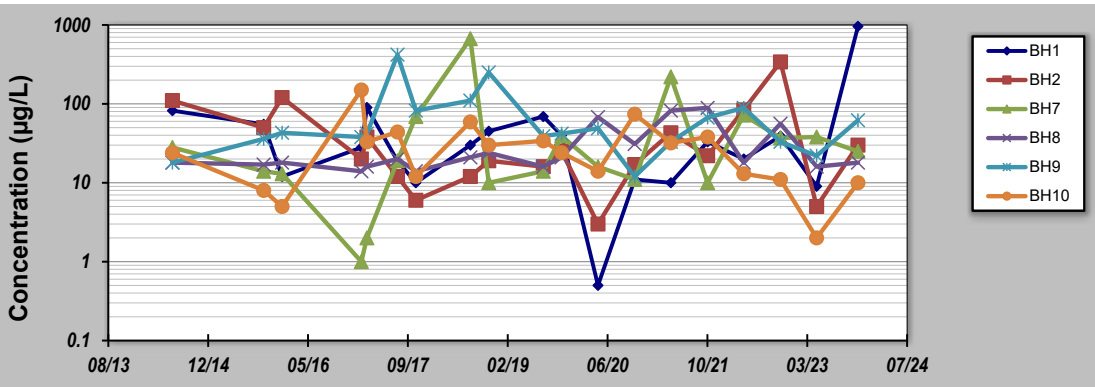
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

Result less than laboratory PQL. Half the PQL adopted as concentration

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	21-Dec-23	Job ID:	71021
Facility Name:	Tooheys	Constituent:	Nickel
Conducted By:	KDP	Concentration Units:	µg/L

Sampling Point ID:	BH1	BH2	BH7	BH8	BH9	BH10	
Sampling Event	Sampling Date	NICKEL CONCENTRATION (µg/L)						
1	1-Jul-14	82	110	28	18	18	24	
2	1-Oct-15	55	50	14	17	36	8	
3	1-Jan-16	12	120	13	18	43	5	
4	1-Feb-17	28	20	1	14	38	150	
5	1-Mar-17	90	38	2	16	42	33	
6	1-Aug-17	19	12	19	20	420	44	
7	1-Nov-17	10	6	69	14	82	12	
8	1-Aug-18	30	12	670	21	110	59	
9	1-Nov-18	45	19	10	24	250	30	
10	1-Aug-19	69	16	14	16	39	34	
11	1-Nov-19	40	25	39	21	42	24	
12	1-May-20	0.5	3	16	68	49	14	
13	1-Nov-20	11	17	11	31	12	74	
14	1-May-21	10	43	220	82	33	32	
15	1-Nov-21	33	22	10	89	67	38	
16	1-May-22	20	84	72	18	89	13	
17	1-Nov-22	39	340	37	56	33	11	
18	1-May-23	9	5	38	16	22	2	
19	24-Nov-23	960	30	25	18	62	10	
20								
Coefficient of Variation:		2.60	1.52	2.23	0.79	1.25	1.05	
Mann-Kendall Statistic (S):		-24	-10	33	54	1	-30	
Confidence Factor:		78.7%	62.2%	86.7%	96.9%	50.0%	84.3%	
Concentration Trend:		No Trend	No Trend	No Trend	Increasing	No Trend	No Trend	



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
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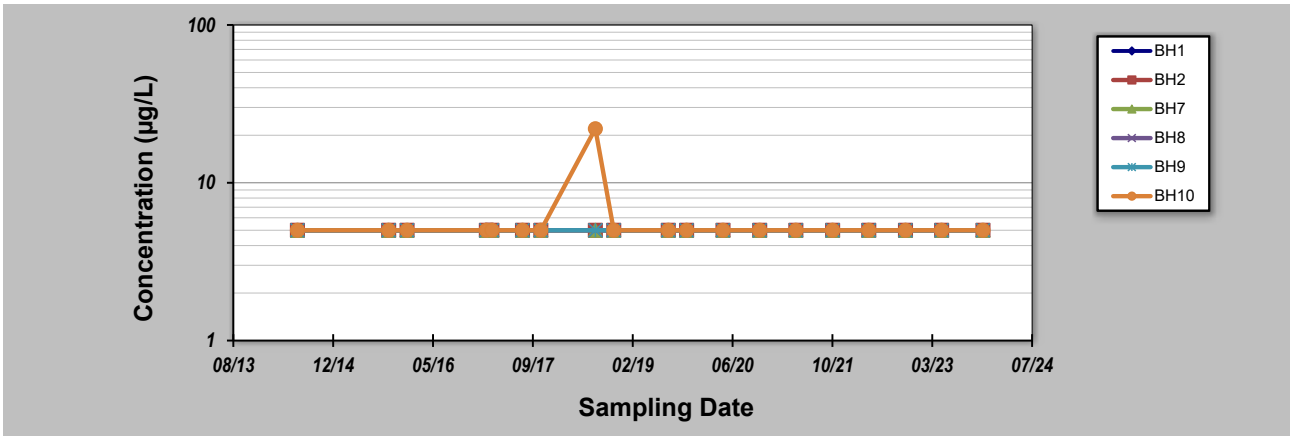
Result less than laboratory PQL. Half the PQL adopted as concentration

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	21-Dec-23	Job ID:	71021
Facility Name:	Tooheys	Constituent:	C6-C9
Conducted By:	KDP	Concentration Units:	µg/L

Sampling Point ID:	BH1	BH2	BH7	BH8	BH9	BH10
Sampling Event	Sampling Date	C6-C9 CONCENTRATION (µg/L)					
1	1-Jul-14	5	5	5	5	5	5
2	1-Oct-15	5	5	5	5	5	5
3	1-Jan-16	5	5	5	5	5	5
4	1-Feb-17	5	5	5	5	5	5
5	1-Mar-17	5	5	5	5	5	5
6	1-Aug-17	5	5	5	5	5	5
7	1-Nov-17	5	5	5	5	5	5
8	1-Aug-18	5	5	5	5	5	22
9	1-Nov-18	5	5	5	5	5	5
10	1-Aug-19	5	5	5	5	5	5
11	1-Nov-19	5	5	5	5	5	5
12	1-May-20	5	5	5	5	5	5
13	1-Nov-20	5	5	5	5	5	5
14	1-May-21	5	5	5	5	5	5
15	1-Nov-21	5	5	5	5	5	5
16	1-May-22	5	5	5	5	5	5
17	1-Nov-22	5	5	5	5	5	5
18	1-May-23	5	5	5	5	5	5
19	24-Nov-23	5	5	5	5	5	5
20							
Coefficient of Variation:		0.00	0.00	0.00	0.00	0.00	0.66
Mann-Kendall Statistic (S):		0	0	0	0	0	-4
Confidence Factor:		48.6%	48.6%	48.6%	48.6%	48.6%	54.1%
Concentration Trend:		Stable	Stable	Stable	Stable	Stable	Stable



Notes:

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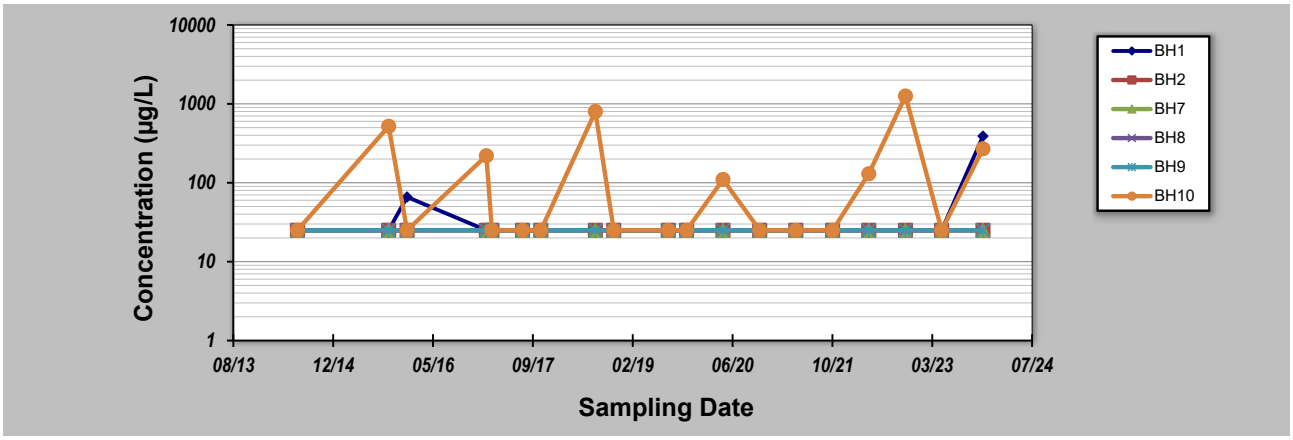
Result less than laboratory PQL. Half the PQL adopted as concentration

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	21-Dec-23	Job ID:	71021
Facility Name:	Tooheys	Constituent:	C10-C36
Conducted By:	KDP	Concentration Units:	µg/L

Sampling Point ID:	BH1	BH2	BH7	BH8	BH9	BH10
Sampling Event	Sampling Date	C10-C36 CONCENTRATION (µg/L)					
1	1-Jul-14	25	25	25	25	25	25
2	1-Oct-15	25	25	25	25	25	520
3	1-Jan-16	66	25	25	25	25	25
4	1-Feb-17	25	25	25	25	25	220
5	1-Mar-17	25	25	25	25	25	25
6	1-Aug-17	25	25	25	25	25	25
7	1-Nov-17	25	25	25	25	25	25
8	1-Aug-18	25	25	25	25	25	800
9	1-Nov-18	25	25	25	25	25	25
10	1-Aug-19	25	25	25	25	25	25
11	1-Nov-19	25	25	25	25	25	25
12	1-May-20	25	25	25	25	25	110
13	1-Nov-20	25	25	25	25	25	25
14	1-May-21	25	25	25	25	25	25
15	1-Nov-21	25	25	25	25	25	25
16	1-May-22	25	25	25	25	25	130
17	1-Nov-22	25	25	25	25	25	1258
18	1-May-23	25	25	25	25	25	25
19	24-Nov-23	390	25	25	25	25	270
20							
Coefficient of Variation:		1.81	0.00	0.00	0.00	0.00	1.74
Mann-Kendall Statistic (S):		5	0	0	0	0	17
Confidence Factor:		55.5%	48.6%	48.6%	48.6%	48.6%	71.0%
Concentration Trend:		No Trend	Stable	Stable	Stable	Stable	No Trend



Notes:

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2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

Result less than laboratory PQL. Half the PQL adopted as concentration