

Monthly Water Monitoring Results Cabbage Tree Road Sand Quarry, NSW

December 2022 Monitoring Event

NCA22R148656
3 January 2023



Williamtown Sand Syndicate (WSS)
PO Box 898
Newcastle, NSW 2300

Attention: Darren Williams

Subject: Monthly Water Monitoring Results Cabbage Tree
Road Sand Quarry, NSW
December 2022 Monitoring Event

Please find enclosed the monthly water quality monitoring results for the December 2022 monitoring event undertaken by Kleinfelder at the Cabbage Tree Road Sand Quarry, NSW (herein referred to as the 'site').

1 SCOPE OF WORK

The scope of work presented in this report includes the results from the monthly surface and groundwater monitoring event undertaken in accordance with the NSW Environment Protection Authority (EPA) and Department of Planning and Environment (DPE) requirements for monthly water quality monitoring at the quarry.

Figure 1 (Attachment 1) presents the surface water and groundwater sampling locations.

The scheduled December 2022 monitoring event included gauging of nine (9) monitoring wells with the recording of field parameters for groundwater, and sampling from seven (7) of these monitoring wells. Furthermore, a wash plant water sample was taken as part of the water monitoring program outlined in the Soil and Water Management Plan (SWMP, 2021).

2 SITE WORK

The monitoring round was conducted on the 14th of December 2022 and comprised:

- Gauging of nine (9) monitoring wells (BH1A, BH2, BH4, BH6, BH7, BH9A, BH11, BH12A, & MW239S).
- Groundwater sampling from seven (7) monitoring wells (BH2, BH4, BH6, BH7, BH9A, BH11 & MW239S) as summarised in **Table 5** and detailed in **Attachment 2**.
- One (1) wash plant water sample (WPW) as summarised in **Table 6** and detailed in **Attachment 2**.

Each well location was gauged using a water level meter to determine groundwater depth (relative to the top of the well casing) and the total depth of the well in order to determine potential sand/silt inundation and potential maintenance requirements. Following gauging, a HydraSleeve was placed into the well, ensuring the top of the sleeve was located midway into the water column to be sampled, and suspended in place while all remaining wells were gauged. Each HydraSleeve was then removed from the well and representative groundwater samples taken.

The wash plant water samples were taken directly into laboratory supplied sample containers using a gloved hand. Where access was deemed unsafe, a telescopic sampling pole was used.



Table 1: Summary of Monthly Water Quality Analysis (December 2022)

Analysis	Number of Samples				
	Primary	Intra-lab (Duplicate)	Inter-lab (Triplicate)	Transport Blank	Rinsate Blank
Metals**	8	1	1	1	1
PFAS (28 analytes, standard level)	1	0	0	1	1

* TRH (C6 – C40) (Silica Gel Clean Up)

** Metals Suite (dissolved) – As, Fe, Mn

Table 2 provides a summary of the gauging data for December 2022. The full set of gauging data for each monitoring location is provided in **Table 5, Attachment 2**. Additionally, Watershed HydroGeo (2019) outlined a Trigger Action and Response Plan (TARP) to mitigate groundwater elevations that may potentially impact Cabbage Tree Road Sand Quarry operations (primarily sand excavation depths). Based on these recommendations, groundwater elevation has been shaded to correspond to triggers and actions outlined in **Table 3**.

As monitoring wells BH1A and BH11 have triggered the TARP rules outlined below in **Table 3**, weekly monitoring of groundwater levels is required at these locations until water levels decline to below inferred maximum historical levels listed in **Table 2**. WSS have taken over the weekly gauging of the affected wells as of 17 June 2022, therefore, groundwater elevation data is being collected by WSS directly following the June GME. It is also recommended that the Minimum Extraction Level (MEL) be re-analysed and reviewed for BH1A and BH11, in accordance with their respective TARP Level 1 and Level 3 trigger responses.

Table 2: Summary of Gauging Data for December 2022

Well ID	Top of Casing (mAHD)	Depth to Water (mBTOC)	Ground-water Elevation (mAHD)	Well Total Depth Current (mBTOC)	Well Total Depth 2014 (mBTOC)	Inferred Max GW Elevation (mAHD) ¹	Difference Between Inferred Max and Measured GW Elevation (mAHD)	Comment
BH1A	8.98	4.467	4.513	12.163	N/A	4.5 ²	-0.013	Gauge only
BH2	7.79	4.587	3.203	8.879	9.45	3.8	0.597	Very light brown, no odour / sheen, well in good condition
BH4	3.06	1.119	1.941	6.025	6.45	3.0 ³	1.059	Clear, no odour / sheen, well in good condition
BH5	7.36	-	-	-	9.28	4.0	-	N/A
BH6	3.62	1.024	2.596	4.53	4.95	4.4	1.804	Light yellow, slight Sulphur odour, no sheen, well in good condition
BH7	2.98	1.278	1.702	4.52	4.95	3.7	1.998	Light yellow, moderate Sulphur odour, no sheen, well



								in good condition
BH8	3.88	-	-	-	6.28	4.0	-	N/A
BH9	17.75	-	-	-	18.8	3.0 ³	-	N/A
BH9A	10.75	8.697	2.053	12.295	16.16	3.0 ³	0.947	Light yellow, No odour / sheen, well in good condition
BH10	6.69	-	-	-	5.45	4.9	-	N/A
BH11	6.63	1.456	5.174	5.302	5.95	5.5	0.326	Light yellow, strong Sulphur odour, no sheen, well in good condition
BH12A	5.62	2.587	3.033	7.37	NA	4.0 ⁵	0.967	Gauge Only
MW239S	3.04	0.911	2.129	3.81	4.0	3.9 ⁴	1.771	Light brown, strong Sulphur odour, no sheen, well in good condition
MW239D	3.04	-	-	-	20.49	3.9 ³	-	N/A
SW01*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SW02*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SW03*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SW04*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

* Surface water levels representing depth of water as read at time of sampling from an installed measuring tape (when dry number is ground elevation AHD).

¹ – Sourced from Watershed HydroGeo ,2019, *Maximum Extraction Depth Management Plan, Cabbage Tree Road Sand Quarry, May 2019.*

² – Inferred Max Groundwater level based on former adjacent well (BH1)

³ – Inferred Max Groundwater level based on adjacent wells (BH4 & BH9)

⁴ – Inferred Max Groundwater level based on adjacent well (MW239S)

⁵ – Inferred Max Groundwater level based on former adjacent well (BH12)

N/A – Not applicable/gauging not required



Table 3: Groundwater Level Monitoring TARP Rules (Watershed HydroGeo, 2019)

Level	Trigger	Action and Response	Report / Response Actions
0	Groundwater levels more than 0.5 m below <i>inferred</i> maximum historical level (Table 2).	Standard operations – monthly dipping of operational on-site monitoring bores.	N/A
1	Groundwater levels within 0.5 m below <i>inferred</i> maximum historical level (Table 2) at any on-site bore.	Weekly (or more frequent) monitoring (dipping) of groundwater levels until water level declines to below high frequency level bores listed in Table 2 .	Internal and environmental consultant. Include note in Annual Report.
2	Groundwater levels within 0.25 m of <i>inferred</i> maximum historical level (Table 2) at any on-site bore.	Weekly (or more frequent) monitoring (dipping) of groundwater levels. Re-analysis and review of Minimum Extraction Level (MEL).	WSS to issue letter to DPIE, documenting groundwater level and rainfall trends, review and make recommendations regarding MEL.
3	Groundwater levels within resource area rise above previously <i>inferred</i> maximum groundwater level (Table 2).	Analysis of recent data by hydrogeologist, including site data and data from local HWC wells and local Defence wells (if available). Revision of MEL. Remediation of earlier excavations to revised MEL if required by DPIE.	WSS to issue letter to DPIE, Dol Water and HWC, documenting groundwater level trends, and revision (if necessary) of MEL. Letter to outline remedial options, considering access, vegetation condition in previously rehabilitated areas. Re-grading of previously rehabilitated areas if required by DPIE.



Table 4 provides a summary of the field parameters taken during the December 2022 monitoring event. All field parameters for each monitoring location are detailed in the field sheets provided in **Attachment 2**. All values excluding BH6 were found to be within the trigger value range outlined in the SWMP (7 July 2021). The field pH for BH6 (4.11) was found to be slightly outside of the site-specific trigger value range (4.2-6.5) noting BH6 is considered upgradient from current site operations and therefore indicative of natural background fluctuations.

Table 4: Summary of Field Measurements

Borehole	Turbidity (NTU)	Temp (°C)	DO (mg/L)	EC (µc/cm)	TDS (mg/L)	pH	Redox (mV)
BH1A	ND	ND	ND	ND	ND	ND	ND
BH2	27.86	19.3	4.14	78.6	51	4.79	229.7
BH4	16.36	18.1	3.95	92.5	60	5.59	119.8
BH6	35	21.1	1.72	232.3	151	4.11	-45.6
BH7	35.8	21.6	3.82	70.1	46	4.74	-72.2
BH9A	61	18.7	2.32	107.7	70	4.75	166
BH11	73	19.1	3.19	130.2	85	4.48	-86
BH12A	ND	ND	ND	ND	ND	ND	ND
MW239S	239	21.5	3.05	115.4	75	4.62	-62
WPW	3055.6	22.1	8.64	267.8	174	4.97	189.5

ND: No Data – no sample taken

Table 5 below presents a summary of the water monitoring results for key analytes found to be elevated above the laboratory limit of reporting (LOR) for groundwater. **Table 6** presents a summary of the wash plant sampling results for PFAS analytes in water. The groundwater criteria outlined in the SWMP (7 July 2021) has been applied to this report including a comparison of results with previous data.

Full results summary tables, including quality control sample analyses, are provided in **Tables 1 – 5, Attachment 2**. Based on a review of the QA/QC Compliance Assessment provided by ALS, the overall data quality is considered acceptable for interpretive use. Copies of the final NATA endorsed laboratory reports, including internal QA/QC results and chain-of-custody documentation for both laboratories are provided in **Attachment 3**.



Table 5: Groundwater Results and Screening Criteria for December 2022

Analyte	Metals			Discussion of results relative to previous monitoring (details on specific data trends provided in Section 4 below)
	Arsenic	Iron	Manganese	
LOR	0.001	0.05	0.001	
Units	mg/L	mg/L	mg/L	
Adopted Site Specific Trigger Values (SWMP 2021)	0.003	4.1 (8.84 for BH1)	0.136	
Samples				
BH1A	NS	NS	NS	Metals for BH1A were not analysed - no sample, gauge only.
BH2	<0.001	0.09	0.004	Metal concentrations were generally consistent with historical results and remain below the adopted criteria. BH2 is located marginally down hydraulic gradient from the current quarry operations footprint.
BH4	<0.001	0.14	0.015	Metal concentrations were generally consistent with historical variations and remain below the adopted criteria. BH4 is located down hydraulic gradient (approximately 700 m) from current quarry operations and on the southernmost boundary of the site adjacent to Cabbage Tree Road.
BH6	<0.001	3.23	0.012	Metal concentrations are generally consistent with historical results and remain below the adopted criteria. BH6 is considered up hydraulic gradient (approximately 860 m) from current quarry operations and the most north-eastern location at the Site.
BH7	<0.001	0.32	0.002	Metal concentrations were generally consistent with historical results and are below the adopted criteria. BH7 is located (approximately 960 m) east of the current quarry operations.
BH8	NS	NS	NS	Metals for BH8 were not analysed this round.
BH9	NS	NS	NS	Metals for BH9 were not analysed - no sample collected, gauge only.
BH9A	<0.001	0.18	0.023	Metal concentrations were generally consistent with historical results and below the adopted criteria. BH9A is down gradient (approximately 700m) from current quarry operations and is on the southernmost boundary of the Site adjacent to Cabbage Tree Road.
BH10	NS	NS	NS	Metals for BH10 were not analysed - no sample collected.



Analyte	Metals			
	Arsenic	Iron	Manganese	
LOR	0.001	0.05	0.001	
Units	mg/L	mg/L	mg/L	
Adopted Site Specific Trigger Values (SWMP 2021)	0.003	4.1 (8.84 for BH1)	0.136	
MW239S	<0.001	0.26	0.003	Metal concentrations were generally consistent with historical results and below the adopted criteria. MW239S is located approximately 800 m east of the current quarry operations.
BH11	<0.001	0.96	0.003	Metal concentrations were generally consistent with historical results and below the adopted criteria. BH11 is located approximately 460 m from current quarry operations and at the north-western most point of the Site.
BH12A	NS	NS	NS	Metals for BH12A were not analysed - no sample collected, gauge only

Notes:

< - Less than laboratory limit of reporting



Table 6: Wash Plant Water Sample Results and Screening Criteria

Analyte	PFAS				Discussion of results
	PFOA	PFOS	PFHxS	Sum of PFOS + PFHxS	
LOR	0.01	0.01	0.01	0.01	
Units	µg/L	µg/L	µg/L	µg/L	
Site Specific Trigger Values (SWMP 2021)	0.56	N/A	N/A	0.07	
Sample Name	Sand Wash Plant				
WPW	0.01	0.02	0.01	0.03	PFOA, PFOS and PFHxS were all detected at this location at concentrations below the adopted criteria during this reporting period. The findings are generally consistent with historical results.

Notes:

< - Less than laboratory limit of reporting



3 RAINWATER DATA

Table 7 presents the rainfall data from Williamtown RAAF base (Station Number: 061078, Latitude: 32.79°S; Longitude: 151.84°E; Elevation: 8 m) for the period 2021/22. The total monthly rainfall for December 2022 fell below the monthly mean, continuing the trend from the previous months data. Based on current rainfall data (mean and monthly totals) for December 2022, it is expected that surface and groundwater elevations will continue to decrease which is consistent with groundwater trend data.

Table 7: 2021-2022 Rainfall data (12-month period)

Date	Jan (22)	Feb (22)	Mar (22)	Apr (22)	May (22)	Jun (22)	Jul (22)	Aug (22)	Sep (22)	Oct (22)	Nov (22)	Dec (22)
1st	0	0	18.2	13.6	2.0	0	0	0	2.0	4.4	9	0
2nd	0	7.6	25.2	1.4	0	0	14.6	0.2	0	0	0	0
3rd	0	13.0	32.2	0	0	0	42.0	0	28.0	0	0	0
4th	1.0	32.8	55.4	ND	0	1.6	59.8	0	4.2	0	0.4	0
5th	7.6	7.2	0.2	0.2	4.0	0	49.8	12.0	0.4	0	0	0
6th	2.2	4.4	11.6	0.2	ND	0	36.6	0	0	23.4	0	0.4
7th	1.0	1.4	5.4	0	0	0	37.0	0	0.2	0.2	0	0
8th	10.4	2.0	11.8	36.2	0	0	0	0	0	6.6	0	0
9th	9.2	0.6	68.0	1.2	0	0	0	1.4	0.2	32.6	0	0
10th	0	0	0.6	2.0	1.8	0	3.2	18.4	2.2	0	0	0
11th	0	0	3.8	0.2	15.8	0	44.2	0.2	0	1.2	0	0
12th	0	39.4	0.6	8.4	8.8	0	0.2	0	0	0.2	0	0
13th	0.4	1.0	0.2	15.8	5.8	0	0	5.2	0	0	2.8	5.6
14th	0	0	0	10.8	4.0	0	12.4	0.2	0.6	0.2	24.2	0
15th	0	0	0.8	1.2	0	0	12.0	0	0.2	0.2	-	0
16th	5.4	0	0.8	0.2	0	0	0	0	5.4	0	-	0.2
17th	0.2	0	0.2	0	0	0	0	0	0	0.4	0	4.2
18th	0	8.6	0	0	0	1.0	0	0	0	0	0	2.8
19th	32.0	0.2	2.2	0	0	18.4	0.2	0	0	0	0	3
20th	13.2	0	0.4	0.2	2.6	7.4	7.8	0	0	1.6	0	0
21st	0.2	0	0	0	15.0	0.2	0.4	0	0	4	0	2
22nd	0	0	0	14.6	4.4	0	2.0	0	7.2	3.4	0	0
23rd	0	25.2	0	6.4	33.0	0	0	0	5.4	2.2	0	0.2
24th	6.8	3.2	35.6	10.0	8.0	0	1.8	0.6	0.4	3.4	0	0.8
25th	0	6.0	29.4	0.2	4.6	0	1.4	0	4.6	5.6	0	0



26th	0	6.0	14.4	0.2	0	0	1.2	0	0.2	0.4	1.6	0
27th	0	2.6	6.8	0.2	0	0	0.6	0	0	0	0	0
28th	0	0.2	0.8	0.6	0.2	0	0	0.2	0.2	0.8	12	0
29th	0	-	2.4	0.2	0	0	0	0	0	0	0	0
30th	0	-	12.2	0	0	0	0.2	0	13.0	0	0	0
31st	0	-	14.8	-	4.2	-	0	0	-	0	-	0
Total	89.6	161.4	354.0	124.0	114.2	28.6	327.4	38.4	74.4	90.8	50.0	19.2
Historical Mean	99.5	118.3	125.2	109.5	108.6	124.6	72.6	72.8	60.6	75.9	82.9	77.8

Notes:

ND – no data retrieved.

4 DATA TRENDS

Data trends, taken from analyses undertaken throughout the duration of the sampling program (January 2019 – current), are provided as **Attachment 4**. Generally, groundwater elevations have been steadily increasing over the last 3-4 years with a notable spike in elevation following the March 2021 water monitoring event. A general increase of groundwater elevations across the site during 2022 are predominantly due to the above average rainfalls recorded for most months this year. Since the October 2022 water monitoring event, a decreasing trend in ground water elevation has been observed likely attributed to below average rainfall recorded during most of the final months of this year.

Groundwater elevations have historically triggered the Groundwater Level Monitoring TARP Rules (**Table 3**) at BH1, BH2, BH9, BH9A, BH10 and BH11 between the months of April 2022 to August 2022. As a result, weekly gauging has been carried out at the affected locations to closely monitor elevation changes. During the current month, BH1A and BH11 have recorded groundwater elevations that trigger the Level 1 and Level 3 TARP Rules. It is recommended that the Minimum Extraction Level (MEL) be re-analysed and reviewed for these locations, in accordance with their respective TARP trigger response.

Overall, groundwater levels for the current month generally appear to be decreasing, in line with the recent below-average rainfall noted in **Section 3**. Based on these trends, groundwater elevations are likely to continue to decrease across the quarry.

Notable changes in data trends were observed for the following analytes:

- Iron – Concentrations of Iron at BH6 (3.23 mg/L) were found to have dropped back below the site-specific criteria (4.1 mg/L), after last months exceedance. Changes in analytical concentrations at BH6 are generally indicative of background natural fluctuations.
- pH – The pH of BH6 (4.11) was found to be marginally below the adopted site-specific range (4.2-6.5) for the third consecutive month. This is the second time this has occurred within the last 12 months with the first occurrence during the February and March GME's (3.68 & 3.49 pH units). Due to the location of this well 860 m upgradient of quarrying activities, this fluctuation is more indicative of natural environmental conditions rather than quarrying activities.
- PFAS – PFOA, PFOS and PFhXs were detected in the WPW sample during the current December 2022 sampling round. These analytes were within the range expected from historical results and all found below the site-specific trigger values.

5 CLOSING

Due to BH1A and BH11 exceeding their respective TARP Level 1 and Level 3 triggers, it is recommended that the Minimum Extraction Level (MEL) be re-analysed and reviewed by WSS, as they have taken over the weekly gauging activities, in accordance with the respective TARP response. BH1A has triggered a Level 3 TARP response in all four monitoring events since it was installed in August 2022. The former monitoring point BH1, which BH1A has taken its elevation data from, also exceeded the TARP level 3 value prior to decommissioning



in August. It is suggested that the inferred maximum groundwater elevation for BH1A be re-analysed to produce a unique value for this location in order to properly interpret the TARP trigger levels.

During the last three months, results for pH at BH6 outside the prescribed range are most likely related to background environmental conditions, not to quarrying activities. The distance (860 m) and upgradient location of this borehole means that the results are more indicative of natural background fluctuations resulting from a reducing environment that decreases pH and increases the available dissolved Iron concentrations. As stated in the SWMP below, it is suggested that the trigger value is not fully accounting for seasonal changes and should be reviewed when updating the management plan:

Where two consecutive samples are:

a. ABOVE the adopted trigger value, BUT LESS than previous data, this may suggest an incorrectly set trigger value that does not fully account for seasonal changes.

Consider updating trigger value at next management plan update.

Overall, the results suggest that since quarry operations began in August 2019, there has been negligible change in analytical results across the sampled locations. We trust that the above report meets with your requirements. If you have any questions, please do not hesitate to contact the undersigned.

Sincerely,

Kleinfelder Australia Pty Ltd

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Contaminated Land Management

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Attachments

Attachment 1: Figures

Attachment 2: Results tables and field records

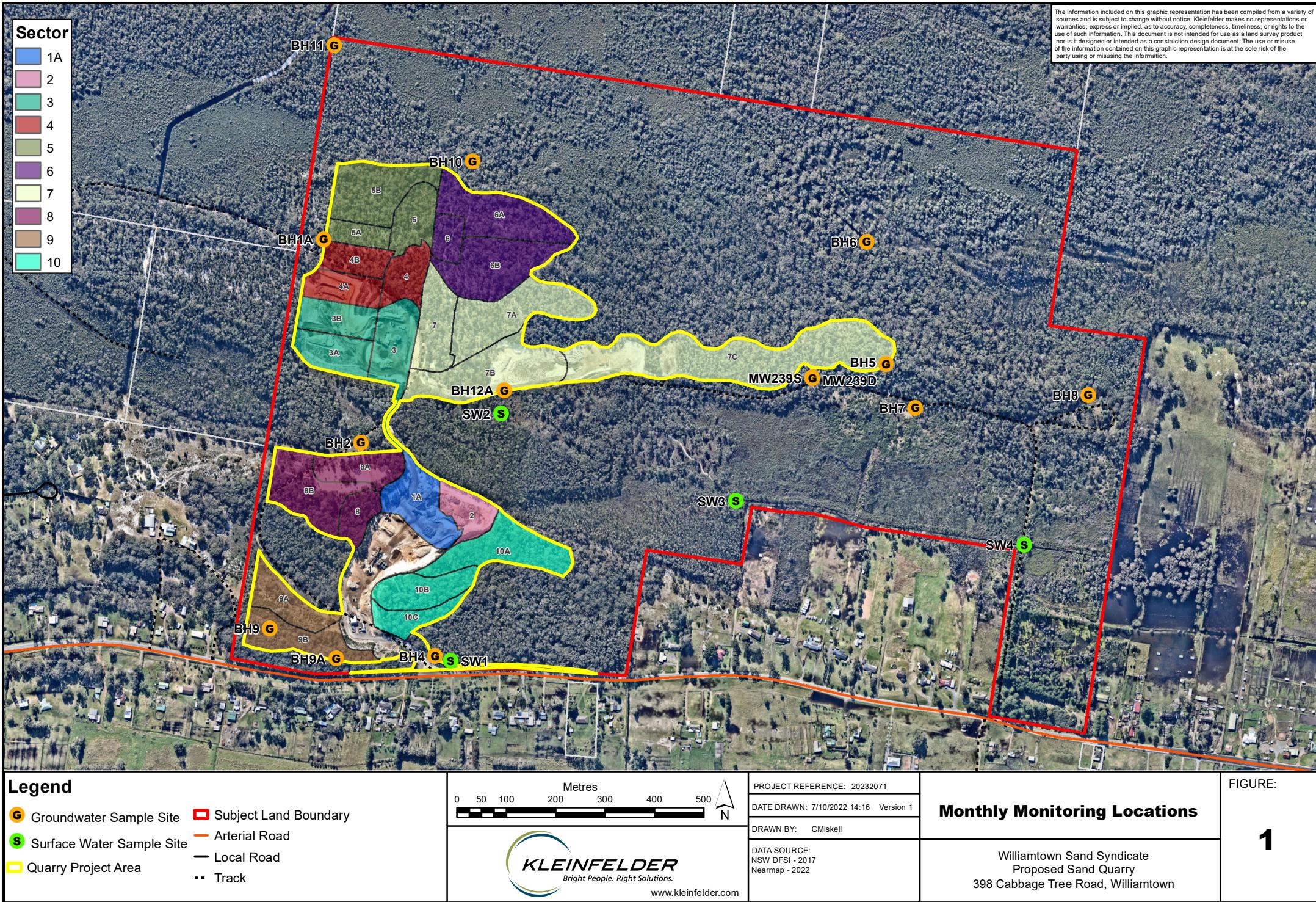
Attachment 3: Lab results

Attachment 4: Data Trends



ATTACHMENT 1: FIGURES







ATTACHMENT 2: RESULTS TABLES AND FIELD RECORDS



BH12	14-Jan-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50
	16-Feb-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50
	17-Mar-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50
	19-Aug-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50
	22-Sep-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50
	13-Oct-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50
	16-Nov-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50
	24-Feb-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50
	22-Feb-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50
MW239S	14-Mar-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50
	23-Apr-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	-
	16-May-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	-
	14-Jun-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50
	16-Jul-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50
	15-Aug-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	-
	16-Sep-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50
	15-Oct-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50
	18-Nov-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50
	16-Sep-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50
	16-Oct-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50
	16-Nov-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50
	16-Dec-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50
	14-Jan-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50
	16-Feb-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50
	17-Mar-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50
	19-Aug-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50
	16-Nov-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50
	24-Feb-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50
	27-May-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50
	12-Aug-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50
	18-Nov-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50

Notes:

-- Not analysed

< - Less than laboratory limit of reporting

µg/L - Micrograms per litre

BTEXN - Benzene, toluene, ethylbenzene, total xylenes, naphthalene

Bold indicates a detection above the laboratory limit of reporting

Highlighting indicates an exceedance of the corresponding criteria (highlighting corresponds to the guideline with the highest criteria value where analytical result exceeds more than one guideline)

Criteria:

SWMP 2021 - Soil and Water Management Plan, July 2021

Analyte		Anions and Cations												
		Sodium	Calcium	Magnesium	Potassium	Sulphate	Chloride	Fluoride	Reactive phosphorus as P	Total Phosphorus	Nitrite as N	Nitrate as N	Nitrite + Nitrate as N	Ammonia as N
Units		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Adopted Site Specific Trigger Values (SWMP 2021)		77	5.0	11	2.0	70	148	0.2	--	2.0	--	--	--	0.5
Sample Name	Sample Date													
BH1	15-Mar-19	11	2.0	1.0	< 1.0	< 1.0	25	< 0.1	-	-	-	-	-	-
	23-Apr-19	14	1.0	2.0	< 1.0	4.0	25	< 0.1	-	-	-	-	-	-
	16-May-19	12	< 1.0	2.0	< 1.0	5.0	25	< 0.1	0.03	< 0.01	< 0.01	< 0.01	< 0.01	0.11
	14-Jun-19	10	< 1.0	2.0	< 1.0	3.0	24	< 0.1	-	-	-	-	-	-
	16-Jul-19	15	< 1.0	2.0	< 1.0	4.0	23	< 0.1	-	-	-	-	-	-
	15-Aug-19	14	< 1.0	2.0	< 1.0	2.0	21	< 0.1	-	-	-	-	-	-
	16-Sep-19	13	< 1.0	2.0	< 1.0	2.0	20	< 0.1	< 0.01	0.06	< 0.01	< 0.01	< 0.01	0.12
	15-Oct-19	13	< 1.0	2.0	< 1.0	2.0	21	< 0.1	-	-	-	-	-	-
	18-Nov-19	16	< 1.0	2.0	< 1.0	3.0	23	0.1	< 0.01	< 0.01	< 0.01	-	0.01	0.13
	16-Sep-20	13	< 1.0	2.0	< 1.0	2.0	21	< 0.1	-	-	-	-	-	-
	16-Oct-20	14	< 1.0	2.0	< 1.0	4.0	21	< 0.1	-	-	-	-	-	-
	16-Nov-20	11	< 1.0	2.0	< 1.0	5.0	18	< 0.1	< 0.01	0.02	< 0.01	< 0.01	< 0.01	0.07
	16-Dec-20	13	< 1.0	2.0	1.0	6.0	22	< 0.1	-	-	-	-	-	-
	14-Jan-21	12	< 1.0	2.0	< 1.0	5.0	23	< 0.1	-	-	-	-	-	-
	16-Feb-21	14	< 1.0	2.0	1.0	5.0	25	< 0.1	< 0.01	< 0.01	< 0.01	0.02	0.02	0.05
	17-Mar-21	14	1.0	2.0	< 1.0	4.0	23	< 0.1	-	-	-	-	-	-
	13-Oct-21	-	-	-	-	-	-	-	-	-	-	-	-	-
	24-Feb-22	14	1.0	3.0	< 1.0	10	23	< 0.1	-	< 0.01	-	-	0.02	0.11
BH2	22-Feb-19	12	2.0	2.0	< 1.0	6.0	22	0.1	< 0.01	0.28	< 0.01	2.76	2.76	0.05
	15-Mar-19	10	3.0	2.0	< 1.0	7.0	23	< 0.1	-	-	-	-	-	-
	23-Apr-19	14	2.0	2.0	< 1.0	6.0	23	< 0.1	-	-	-	-	-	-
	16-May-19	12	2.0	2.0	< 1.0	21	22	< 0.1	< 0.01	0.26	< 0.01	0.38	0.38	0.01
	14-Jun-19	11	1.0	2.0	< 1.0	5.0	23	< 0.1	-	-	-	-	-	-
	16-Jul-19	13	2.0	2.0	< 1.0	9.0	20	< 0.1	-	-	-	-	-	-
	15-Aug-19	12	1.0	2.0	< 1.0	8.0	20	< 0.1	-	-	-	-	-	-
	16-Sep-19	11	2.0	2.0	< 1.0	8.0	18	< 0.1	< 0.01	0.28	< 0.01	1.07	1.07	0.04
	15-Oct-19	12	2.0	2.0	< 1.0	5.0	20	< 0.1	-	-	-	-	-	-
	18-Nov-19	14	2.0	1.0	< 1.0	7.0	19	< 0.1	< 0.01	0.21	< 0.01	-	1.01	0.05
	16-Sep-20	11	2.0	2.0	< 1.0	7.0	17	< 0.1	-	-	-	-	-	-
	16-Oct-20	11	2.0	2.0	< 1.0	6.0	16	< 0.1	-	-	-	-	-	-
	16-Nov-20	11	2.0	2.0	< 1.0	9.0	16	< 0.1	< 0.01	0.48	< 0.01	2.88	2.88	< 0.01
	16-Dec-20	11	2.0	2.0	< 1.0	7.0	15	< 0.1	-	-	-	-	-	-
	14-Jan-21	9.0	2.0	2.0	< 1.0	7.0	13	< 0.1	-	-	-	-	-	-
	16-Feb-21	12	1.0	1.0	< 1.0	8.0	12	< 0.1	< 0.01	0.15	< 0.01	2.58	2.58	< 0.01
	17-Mar-21	10	2.0	2.0	< 1.0	7.0	13	< 0.1	-	-	-	-	-	-
	19-Aug-21	-	-	2.0	-	-	-	-	-	-	-	-	-	-
	13-Oct-21	-	-	-	-	-	-	-	-	-	-	-	-	-
	16-Nov-21	-	-	2.0	-	-	-	-	-	-	-	-	-	-
	24-Feb-22	8.0	2.0	1.0	< 1.0	7.0	14	< 0.1	-	0.06	-	-	0.05	0.01
BH3	12-Apr-22	-	-	-	-	-	-	-	-	-	-	-	-	-
	27-May-22	-	-	1.0	-	-	-	-	-	-	-	-	-	-
	12-Aug-22	-	-	1.0	-	-	-	-	-	-	-	-	-	-
	18-Nov-22	-	-	1.0	-	-	-	-	-	-	-	-	-	-
	21-Feb-19	4.0	4.0	1.0	< 1.0	4.0	10	< 0.1	< 0.01	2.76	< 0.01	0.78	0.78	0.3
	21-Feb-19	8.0	2.0	1.0	1.0	5.0	17	< 0.1	< 0.01	0.19	< 0.01	0.35	0.35	0.04
	15-Mar-19	9.0	2.0	< 1.0	< 1.0	5.0	18	< 0.1	-	-	-	-	-	-
	23-Apr-19	10	2.0	1.0	1.0	3.0	19	< 0.1	-	-	-	-	-	-
	16-May-19	9.0	2.0	1.0	1.0	22	19	< 0.1	< 0.01	0.97	< 0.01	0.29	0.29	< 0.01
	14-Jun-19	6.0	1.0	1.0	< 1.0	4.0	18	< 0.1	-	-	-	-	-	-
	16-Jul-19	10	2.0	2.0	1.0	6.0	18	< 0.1	-	-	-	-	-	-
	15-Aug-19	8.0	2.0	1.0	1.0	5.0	16	< 0.1	-	-	-	-	-	-
	16-Sep-19	11	2.0	2.0	< 1.0	8.0	19	< 0.1	< 0.01	0.4	< 0.01	0.24	0.24	0.02
	15-Oct-19	10	1.0	1.0	< 1.0	4.0	18	< 0.1	-	-	-	-	-	-
	18-Nov-19	11	1.0	1.0	< 1.0	6.0	18	< 0.1	< 0.01	0.08	< 0.01	-	0.29	< 0.01
	16-Sep-20	20	< 1.0	2.0	< 1.0	11	31	< 0.1	-	-	-	-	-	-

BH4	16-Oct-20	19	1.0	3.0	< 1.0	10	34	< 0.1	-	-	-	-	-	-
	16-Nov-20	18	< 1.0	2.0	< 1.0	12	27	< 0.1	< 0.01	0.06	< 0.01	0.1	0.1	< 0.01
	16-Dec-20	25	1.0	4.0	< 1.0	15	43	< 0.1	-	-	-	-	-	-
	14-Jan-21	36	1.0	4.0	< 1.0	23	54	< 0.1	-	-	-	-	-	-
	16-Feb-21	69	2.0	9.0	1.0	32	111	< 0.1	< 0.01	0.11	< 0.01	< 0.01	< 0.01	0.03
	17-Mar-21	77	2.0	11	1.0	26	128	< 0.1	-	-	-	-	-	-
	19-Aug-21	-	-	3.0	-	-	-	-	-	-	-	-	-	-
	13-Oct-21	-	-	-	-	-	-	-	-	-	-	-	-	-
	24-Feb-22	7.0	1.0	2.0	< 1.0	7.0	15	< 0.1	-	0.3	-	-	0.21	0.01
	12-Apr-22	-	-	-	-	-	-	-	-	-	-	-	-	-
	27-May-22	-	-	2.0	-	-	-	-	-	-	-	-	-	-
	12-Aug-22	-	-	1.0	-	-	-	-	-	-	-	-	-	-
	18-Nov-22	-	-	2.0	-	-	-	-	-	-	-	-	-	-
BH5	22-Feb-19	42	< 1.0	6.0	1.0	19	69	0.2	< 0.01	0.34	< 0.01	< 0.01	< 0.01	0.09
	24-Feb-22	40	< 1.0	8.0	< 1.0	42	60	< 0.1	-	0.29	-	-	0.02	0.21
BH6	22-Feb-19	28	3.0	4.0	1.0	28	42	< 0.1	< 0.01	0.05	< 0.01	0.09	0.09	0.14
	14-Mar-19	23	2.0	4.0	1.0	17	37	< 0.1	-	-	-	-	-	-
	23-Apr-19	25	3.0	4.0	1.0	18	42	< 0.1	-	-	-	-	-	-
	16-May-19	23	3.0	4.0	1.0	18	45	< 0.1	< 0.01	0.13	< 0.01	< 0.01	< 0.01	0.14
	14-Jun-19	20	2.0	4.0	1.0	16	42	< 0.1	-	-	-	-	-	-
	16-Jul-19	23	2.0	4.0	1.0	20	35	< 0.1	-	-	-	-	-	-
	15-Aug-19	23	2.0	3.0	1.0	21	38	< 0.1	-	-	-	-	-	-
	16-Sep-19	25	3.0	3.0	1.0	21	38	< 0.1	< 0.01	0.15	< 0.01	0.07	0.07	0.19
	15-Oct-19	25	2.0	4.0	1.0	13	41	< 0.1	-	-	-	-	-	-
	18-Nov-19	27	3.0	3.0	1.0	18	45	< 0.1	< 0.01	0.06	< 0.01	-	< 0.01	0.23
	16-Sep-20	36	2.0	4.0	1.0	16	55	< 0.1	-	-	-	-	-	-
	16-Oct-20	36	2.0	5.0	1.0	12	64	< 0.1	-	-	-	-	-	-
	16-Nov-20	37	3.0	5.0	2.0	23	61	< 0.1	0.01	0.08	< 0.01	0.01	0.01	0.22
	16-Dec-20	46	3.0	6.0	2.0	15	75	< 0.1	-	-	-	-	-	-
	14-Jan-21	39	3.0	5.0	2.0	21	73	< 0.1	-	-	-	-	-	-
	16-Feb-21	43	3.0	6.0	2.0	18	72	< 0.1	< 0.01	0.1	< 0.01	< 0.01	< 0.01	0.25
	17-Mar-21	51	4.0	9.0	1.0	25	80	< 0.1	-	-	-	-	-	-
	19-Aug-21	-	-	5.0	-	-	-	-	-	-	-	-	-	-
	13-Oct-21	-	-	-	-	-	-	-	-	-	-	-	-	-
	24-Feb-22	30	< 1.0	4.0	< 1.0	10	61	< 0.1	-	0.11	-	-	0.02	0.04
	12-Apr-22	-	-	-	-	-	-	-	-	-	-	-	-	-
	27-May-22	-	-	4.0	-	-	-	-	-	-	-	-	-	-
	12-Aug-22	-	-	4.0	-	-	-	-	-	-	-	-	-	-
	18-Nov-22	-	-	3.0	-	-	-	-	-	-	-	-	-	-
BH7	22-Feb-19	34	< 1.0	5.0	2.0	12	64	0.2	< 0.01	0.13	< 0.01	0.02	0.02	0.34
	14-Mar-19	36	< 1.0	6.0	2.0	16	61	< 0.1	-	-	-	-	-	-
	23-Apr-19	38	< 1.0	6.0	2.0	17	62	< 0.1	-	-	-	-	-	-
	16-May-19	35	< 1.0	5.0	2.0	15	68	0.2	< 0.01	0.06	< 0.01	< 0.01	< 0.01	0.27
	14-Jun-19	31	< 1.0	4.0	2.0	11	56	0.1	-	-	-	-	-	-
	16-Jul-19	36	< 1.0	5.0	2.0	12	46	< 0.1	-	-	-	-	-	-
	15-Aug-19	32	< 1.0	4.0	2.0	15	49	0.1	-	-	-	-	-	-
	16-Sep-19	27	< 1.0	4.0	1.0	13	53	< 0.1	< 0.01	0.09	< 0.01	0.06	0.06	0.2
	15-Oct-19	34	< 1.0	5.0	2.0	12	53	< 0.1	-	-	-	-	-	-
	18-Nov-19	31	< 1.0	5.0	1.0	15	56	0.1	< 0.01	0.02	< 0.01	-	< 0.01	0.17
	16-Sep-20	33	< 1.0	5.0	2.0	12	62	0.1	-	-	-	-	-	-
	16-Oct-20	34	< 1.0	5.0	2.0	9.0	64	< 0.1	-	-	-	-	-	-
	16-Nov-20	30	< 1.0	5.0	2.0	9.0	54	0.1	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.3
	16-Dec-20	30	< 1.0	6.0	2.0	9.0	58	0.1	-	-	-	-	-	-
	14-Jan-21	31	< 1.0	5.0	2.0	10	63	0.1	-	-	-	-	-	-
	16-Feb-21													

BH8	21-Feb-19	52	< 1.0	6.0	< 1.0	11	90	< 0.1	< 0.01	1.97	< 0.01	< 0.01	< 0.01	0.5
	14-Mar-19	45	< 1.0	6.0	< 1.0	6.0	76	< 0.1	-	-	-	-	-	-
	23-Apr-19	53	< 1.0	7.0	< 1.0	8.0	89	< 0.1	-	-	-	-	-	-
	16-May-19	47	< 1.0	4.0	< 1.0	6.0	81	< 0.1	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.12
	14-Jun-19	47	< 1.0	5.0	< 1.0	4.0	89	< 0.1	-	-	-	-	-	-
	16-Jul-19	57	< 1.0	5.0	< 1.0	70	121	0.1	-	-	-	-	-	-
	15-Aug-19	42	< 1.0	3.0	< 1.0	4.0	63	< 0.1	-	-	-	-	-	-
	16-Sep-19	46	< 1.0	3.0	< 1.0	4.0	70	< 0.1	< 0.01	0.43	< 0.01	< 0.01	< 0.01	0.13
	15-Oct-19	45	< 1.0	4.0	< 1.0	4.0	70	< 0.1	-	-	-	-	-	-
	18-Nov-19	49	< 1.0	4.0	< 1.0	8.0	80	< 0.1	< 0.01	0.58	< 0.01	-	0.01	0.17
	16-Sep-20	58	< 1.0	4.0	< 1.0	9.0	109	< 0.1	-	-	-	-	-	-
	16-Oct-20	43	< 1.0	4.0	< 1.0	12	70	< 0.1	-	-	-	-	-	-
	16-Nov-20	48	< 1.0	6.0	< 1.0	10	76	< 0.1	< 0.01	0.14	< 0.01	< 0.01	< 0.01	0.13
	16-Dec-20	35	< 1.0	4.0	< 1.0	14	56	< 0.1	-	-	-	-	-	-
	14-Jan-21	44	< 1.0	5.0	< 1.0	13	77	< 0.1	-	-	-	-	-	-
	16-Feb-21	50	< 1.0	6.0	< 1.0	17	79	< 0.1	< 0.01	0.14	< 0.01	< 0.01	< 0.01	0.12
	17-Mar-21	50	< 1.0	6.0	< 1.0	19	75	< 0.1	-	-	-	-	-	-
	19-Aug-21	-	-	7.0	-	-	-	-	-	-	-	-	-	-
	16-Nov-21	-	-	8.0	-	-	-	-	-	-	-	-	-	-
	24-Feb-22	55	< 1.0	5.0	< 1.0	54	70	< 0.1	-	0.3	-	-	0.72	0.13
	27-May-22	-	-	2.0	-	-	-	-	-	-	-	-	-	-
	12-Aug-22	-	-	2.0	-	-	-	-	-	-	-	-	-	-
	18-Nov-22	-	-	1.0	-	-	-	-	-	-	-	-	-	-
BH9A	16-Sep-20	35	5.0	5.0	1.0	41	38	< 0.1	-	-	-	-	-	-
	16-Oct-20	32	3.0	6.0	1.0	33	48	< 0.1	-	-	-	-	-	-
	16-Nov-20	23	2.0	4.0	1.0	23	35	< 0.1	< 0.01	0.11	< 0.01	2.35	2.35	< 0.01
	16-Dec-20	23	1.0	3.0	1.0	9.0	37	< 0.1	-	-	-	-	-	-
	14-Jan-21	24	1.0	3.0	1.0	15	43	< 0.1	-	-	-	-	-	-
	16-Feb-21	25	1.0	3.0	1.0	12	40	< 0.1	< 0.01	1.74	< 0.01	< 0.01	< 0.01	0.15
	17-Mar-21	25	1.0	3.0	< 1.0	12	35	< 0.1	-	-	-	-	-	-
	19-Aug-21	25	1.0	3.0	1.0	14	37	< 0.1	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
	22-Sep-21	22	1.0	2.0	1.0	12	35	< 0.1	< 0.01	0.16	< 0.01	0.03	0.03	0.25
	13-Oct-21	24	< 1.0	2.0	1.0	11	38	< 0.1	< 0.01	0.13	< 0.01	< 0.01	< 0.01	0.31
	16-Nov-21	24	2.0	3.0	1.0	17	32	< 0.1	< 0.01	0.05	< 0.01	0.04	0.04	0.21
	24-Feb-22	21	2.0	4.0	1.0	17	32	< 0.1	-	0.19	-	-	< 0.01	0.25
	12-Apr-22	-	-	-	-	-	-	-	-	-	-	-	-	-
	27-May-22	-	-	3.0	-	-	-	-	-	-	-	-	-	-
	12-Aug-22	-	-	3.0	-	-	-	-	-	-	-	-	-	-
	18-Nov-22	-	-	2.0	-	-	-	-	-	-	-	-	-	-
BH11	21-Feb-19	48	< 1.0	10	< 1.0	24	80	0.1	< 0.01	0.03	< 0.01	0.04	0.04	0.06
	15-Mar-19	26	< 1.0	2.0	< 1.0	2.0	52	< 0.1	-	-	-	-	-	-
	23-Apr-19	32	< 1.0	5.0	< 1.0	2.0	57	< 0.1	-	-	-	-	-	-
	16-May-19	29	< 1.0	4.0	< 1.0	2.0	55	< 0.1	< 0.01	0.01	< 0.01	< 0.01	< 0.01	0.12
	14-Jun-19	26	< 1.0	3.0	< 1.0	< 1.0	53	< 0.1	-	-	-	-	-	-
	16-Jul-19	49	< 1.0	8.0	< 1.0	8.0	73	0.2	-	-	-	-	-	-
	15-Aug-19	28	< 1.0	3.0	< 1.0	4.0	47	< 0.1	-	-	-	-	-	-
	16-Sep-19	27	< 1.0	3.0	< 1.0	5.0	46	< 0.1	< 0.01	0.12	< 0.01	< 0.01	< 0.01	0.15
	15-Oct-19	28	< 1.0	3.0	< 1.0	3.0	44	< 0.1	-	-	-	-	-	-
	18-Nov-19	28	< 1.0	3.0	< 1.0	< 1.0	53	< 0.1	< 0.01	2.11	< 0.01	-	0.06	0.18
	16-Sep-20	29	< 1.0	5.0	< 1.0	6.0	48	< 0.1	-	-	-	-	-	-
	16-Oct-20	29	< 1.0	6.0	< 1.0	4.0	61	< 0.1	-	-	-	-	-	-
	16-Nov-20	27	< 1.0	5.0	< 1.0	5.0	50	< 0.1	< 0.01	0.06	< 0.01	< 0.01	< 0.01	0.08
	16-Dec-20	31	< 1.0											

	18-Nov-22	-	-	2.0	-	-	-	-	-	-	-	-	-	-	-
BH12	16-Sep-20	24	< 1.0	7.0	1.0	22	38	< 0.1	-	-	-	-	-	-	-
	16-Nov-20	22	< 1.0	4.0	1.0	11	41	< 0.1	< 0.01	< 0.01	< 0.01	0.02	0.02	0.02	< 0.01
	13-Oct-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	24-Feb-22	20	< 1.0	4.0	2.0	18	28	< 0.1	-	0.12	-	-	0.01	0.01	-
	22-Feb-19	61	< 1.0	6.0	< 1.0	6.0	104	< 0.1	< 0.01	0.56	< 0.01	< 0.01	< 0.01	0.18	-
MW239S	14-Mar-19	64	< 1.0	6.0	< 1.0	2.0	126	< 0.1	-	-	-	-	-	-	-
	23-Apr-19	64	< 1.0	7.0	1.0	9.0	97	< 0.1	-	-	-	-	-	-	-
	16-May-19	52	< 1.0	6.0	< 1.0	13	88	< 0.1	< 0.01	0.43	< 0.01	< 0.01	< 0.01	< 0.01	0.09
	14-Jun-19	50	< 1.0	6.0	< 1.0	13	87	< 0.1	-	-	-	-	-	-	-
	16-Jul-19	52	< 1.0	7.0	1.0	16	73	< 0.1	-	-	-	-	-	-	-
	15-Aug-19	54	< 1.0	7.0	< 1.0	11	88	< 0.1	-	-	-	-	-	-	-
	16-Sep-19	55	< 1.0	6.0	1.0	14	85	< 0.1	< 0.01	0.32	< 0.01	< 0.01	< 0.01	< 0.01	0.1
	15-Oct-19	58	< 1.0	6.0	< 1.0	8.0	108	< 0.1	-	-	-	-	-	-	-
	18-Nov-19	63	< 1.0	6.0	1.0	8.0	118	< 0.1	< 0.01	0.23	< 0.01	-	< 0.01	0.17	-
	16-Sep-20	53	< 1.0	8.0	1.0	36	86	0.1	-	-	-	-	-	-	-
	16-Oct-20	76	< 1.0	9.0	1.0	17	148	< 0.1	-	-	-	-	-	-	-
	16-Nov-20	68	< 1.0	9.0	2.0	37	125	< 0.1	< 0.01	0.59	< 0.01	< 0.01	< 0.01	< 0.01	0.01
	16-Dec-20	68	< 1.0	10	1.0	24	126	< 0.1	-	-	-	-	-	-	-
	14-Jan-21	58	< 1.0	9.0	2.0	37	102	< 0.1	-	-	-	-	-	-	-
	16-Feb-21	66	< 1.0	11	2.0	38	124	< 0.1	< 0.01	0.58	< 0.01	< 0.01	< 0.01	< 0.01	0.06
	17-Mar-21	49	< 1.0	7.0	1.0	38	70	< 0.1	-	-	-	-	-	-	-
	13-Oct-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	24-Feb-22	24	< 1.0	3.0	< 1.0	15	33	< 0.1	-	0.33	-	-	0.16	0.04	-
	12-Apr-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	27-May-22	-	-	-	2.0	-	-	-	-	-	-	-	-	-	-
	12-Aug-22	-	-	-	2.0	-	-	-	-	-	-	-	-	-	-
	18-Nov-22	-	-	-	1.0	-	-	-	-	-	-	-	-	-	-

Notes:

-- Not analysed

< - Less than laboratory limit of reporting

LOR - Laboratory limit of reporting

mg/L - Milligrams per litre

µS/cm - Microsiemens per centimeter

Bold indicates a detection above the laboratory limit of reporting

Highlighting indicates an exceedance of the corresponding criteria (highlighting corresponds to the guideline with the highest criteria value where analytical result exceeds more than one guideline)

Criteria:

SWMP 2021 - Soil and Water Management Plan, July 2021

					Alkalinity					Inorganics				
Total Nitrogen as N	Total Kjeldahl Nitrogen as N	Total Cations	Total Anions	Sodium Adsorption Ratio	Bicarbonate Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Hydroxide Alkalinity as CaCO3	Total Alkalinity as CaCO3	Total Hardness as CaCO3	Electrical Conductivity @ 25°C	Total Dissolved Solids	Total suspended solids	pH	Turbidity
mg/L	mg/L	meq/L	meq/L	-	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	pH units	NTU
5.9	--	--	--	--	--	--	--	--	--	500	--	--	4.2-6.5	--
-	-	0.66	0.88	-	9.0	< 1.0	< 1.0	9.0	9.0	104	68	78	5.67	-
-	-	0.82	0.99	-	10	< 1.0	< 1.0	10	11	84	97	248	5.83	-
0.3	0.3	0.69	1.01	1.7	10	< 1.0	< 1.0	10	8.0	105	164	80	5.82	-
-	-	0.6	0.94	-	10	< 1.0	< 1.0	10	8.0	99	72	39	5.52	-
-	-	0.82	0.95	-	11	< 1.0	< 1.0	11	8.0	102	84	26	5.62	-
-	-	0.77	0.91	-	14	< 1.0	< 1.0	14	8.0	128	82	181	6.22	-
0.3	0.3	0.73	0.76	1.84	8.0	< 1.0	< 1.0	8.0	8.0	102	88	108	5.44	-
-	-	0.73	0.71	-	4.0	< 1.0	< 1.0	4.0	8.0	98	64	-	5.5	-
0.3	0.3	0.86	1.19	2.26	24	< 1.0	< 1.0	24	8.0	126	82	-	6.29	-
-	-	0.73	0.81	-	9.0	< 1.0	< 1.0	9.0	8.0	95	81	58	5.87	-
-	-	0.77	0.84	-	8.0	< 1.0	< 1.0	8.0	8.0	88	57	-	5.7	-
0.2	0.2	1.02	1.05	1.55	22	< 1.0	< 1.0	22	8.0	120	78	41	5.98	-
-	-	0.93	1.16	-	21	< 1.0	< 1.0	21	8.0	134	87	-	5.76	-
-	-	0.96	1.07	-	16	< 1.0	< 1.0	16	8.0	124	81	-	5.63	-
< 0.1	< 0.1	0.8	1.05	1.98	12	< 1.0	< 1.0	12	8.0	116	75	20	5.57	-
-	-	0.82	0.95	-	11	< 1.0	< 1.0	11	11	111	72	-	6.02	-
-	-	-	-	-	-	-	-	-	-	-	-	-	5.66	98
0.2	0.2	0.9	1.18	-	-	< 1.0	< 1.0	16	15	127	82	-	5.95	-
4.0	1.2	0.79	0.74	1.44	< 1.0	< 1.0	< 1.0	13	91	128	376	4.87	-	
-	-	0.75	0.79	-	< 1.0	< 1.0	< 1.0	16	101	66	352	4.71	-	
-	-	0.87	0.77	-	< 1.0	< 1.0	< 1.0	13	70	84	575	4.82	-	
1.3	0.9	0.79	1.06	1.44	< 1.0	< 1.0	< 1.0	13	94	144	111	4.85	-	
-	-	0.69	0.75	-	< 1.0	< 1.0	< 1.0	11	91	51	215	4.76	-	
-	-	0.83	0.75	-	< 1.0	< 1.0	< 1.0	13	90	63	92	4.84	-	
-	-	0.74	0.73	-	< 1.0	< 1.0	< 1.0	11	110	61	310	5.2	-	
2.7	1.6	0.74	0.67	1.32	< 1.0	< 1.0	< 1.0	13	96	60	216	4.72	-	
-	-	0.79	0.67	-	< 1.0	< 1.0	< 1.0	13	102	66	-	5.06	-	
2.1	1.1	0.79	0.68	2.02	< 1.0	< 1.0	< 1.0	9.0	102	66	-	5.47	-	
-	-	0.74	0.62	-	< 1.0	< 1.0	< 1.0	13	99	76	356	4.85	-	
-	-	0.74	0.58	-	< 1.0	< 1.0	< 1.0	13	90	58	-	5.07	-	
4.8	1.9	0.74	0.7	1.32	3.0	< 1.0	< 1.0	3.0	13	119	77	952	5.09	-
-	-	0.74	0.57	-	< 1.0	< 1.0	< 1.0	13	105	68	-	4.66	-	
-	-	0.66	0.57	-	3.0	< 1.0	< 1.0	3.0	13	93	60	-	5.04	-
3.5	0.9	0.65	0.5	2.03	< 1.0	< 1.0	< 1.0	< 1.0	7.0	89	58	86	4.84	-
-	-	0.7	0.53	-	1.0	< 1.0	< 1.0	1.0	13	88	57	-	5.28	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	5.09	101
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0.4	0.3	0.53	0.6	-	-	< 1.0	< 1.0	3.0	9.0	70	46	-	5.18	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	462
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5.9	5.1	0.46	0.54	0.46	9.0	< 1.0	< 1.0	9.0	14	60	438	3,800	5.55	-
0.6	0.3	0.56	0.7	1.15	6.0	< 1.0	< 1.0	6.0	9.0	73	96	122	5.4	-
-	-	0.49	0.61	-	< 1.0	< 1.0	< 1.0	< 1.0	5.0	77	50	45	5.12	-
-	-	0.64	0.6	-	< 1.0	< 1.0	< 1.0	< 1.0	9.0	54	61	147	5.05	-
1.0	0.7	0.6	0.99	1.3	< 1.0	< 1.0	< 1.0	< 1.0	9.0	73	100	44	4.	

2.4	2.4	2.76	2.77	4.44	< 1.0	< 1.0	< 1.0	< 1.0	25	352	258	438	4.46	-
-	-	2.45	2.27	-	< 1.0	< 1.0	< 1.0	< 1.0	25	319	207	138	4.77	-
-	-	2.88	2.68	-	< 1.0	< 1.0	< 1.0	< 1.0	29	264	223	121	4.76	-
0.4	0.4	2.37	2.43	4.86	1.0	< 1.0	< 1.0	1.0	16	302	354	312	4.9	-
-	-	2.46	2.59	-	< 1.0	< 1.0	< 1.0	< 1.0	20	315	194	83	4.82	-
-	-	2.89	4.87	-	< 1.0	< 1.0	< 1.0	< 1.0	20	353	226	145	4.78	-
-	-	2.07	1.86	-	< 1.0	< 1.0	< 1.0	< 1.0	12	260	140	98	5.0	-
1.1	1.1	2.25	2.06	5.43	< 1.0	< 1.0	< 1.0	< 1.0	12	293	206	79	4.85	-
-	-	2.29	2.06	-	< 1.0	< 1.0	< 1.0	< 1.0	16	303	197	-	5.02	-
1.3	1.3	2.46	2.42	5.06	< 1.0	< 1.0	< 1.0	< 1.0	16	316	205	-	5.12	-
-	-	3.1	3.26	-	< 1.0	< 1.0	< 1.0	< 1.0	16	391	216	34	4.79	-
-	-	2.2	2.22	-	< 1.0	< 1.0	< 1.0	< 1.0	16	268	174	-	5.01	-
0.6	0.6	2.58	2.35	4.1	< 1.0	< 1.0	< 1.0	< 1.0	25	341	222	14	4.75	-
-	-	1.85	1.87	-	< 1.0	< 1.0	< 1.0	< 1.0	16	256	166	-	4.82	-
-	-	2.32	2.44	-	< 1.0	< 1.0	< 1.0	< 1.0	20	317	206	-	4.76	-
< 0.1	< 0.1	2.67	2.58	4.27	< 1.0	< 1.0	< 1.0	< 1.0	25	335	218	63	4.68	-
-	-	2.67	2.51	-	< 1.0	< 1.0	< 1.0	< 1.0	25	329	214	-	4.57	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.7	1.0	2.8	3.2	-	-	< 1.0	< 1.0	5.0	20	329	214	-	4.67	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	2.21	2.06	-	7.0	< 1.0	< 1.0	7.0	33	276	310	1,060	5.78	-
-	-	2.06	2.06	-	1.0	< 1.0	< 1.0	1.0	32	237	154	-	5.15	-
2.8	0.5	1.46	1.51	2.16	2.0	< 1.0	< 1.0	2.0	21	195	127	2,220	4.93	-
-	-	1.32	1.23	-	< 1.0	< 1.0	< 1.0	< 1.0	15	175	114	-	4.83	-
-	-	1.37	1.52	-	< 1.0	< 1.0	< 1.0	< 1.0	15	196	127	-	4.96	-
5.1	5.1	1.41	1.42	2.82	2.0	< 1.0	< 1.0	2.0	15	181	118	2,030	4.72	-
-	-	1.38	1.32	-	4.0	< 1.0	< 1.0	4.0	15	164	107	-	5.23	-
0.8	0.8	1.41	1.42	2.82	4.0	< 1.0	< 1.0	4.0	15	180	117	-	5.03	-
1.0	1.0	1.2	1.36	2.92	6.0	< 1.0	< 1.0	6.0	11	172	112	-	4.99	-
0.9	0.9	1.23	1.46	3.39	8.0	< 1.0	< 1.0	8.0	8.0	156	101	-	5.21	105
1.1	1.1	1.42	1.36	2.51	5.0	< 1.0	< 1.0	5.0	-	163	106	-	5.51	-
1.0	1.0	1.37	1.26	-	-	< 1.0	< 1.0	1.0	21	164	107	-	4.85	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	289
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.8	1.8	2.91	2.76	3.21	< 1.0	< 1.0	< 1.0	< 1.0	41	346	278	144	4.67	-
-	-	1.3	1.51	-	< 1.0	< 1.0	< 1.0	< 1.0	8.0	186	121	152	4.82	-
-	-	1.8	1.65	-	< 1.0	< 1.0	< 1.0	< 1.0	20	150	135	112	4.99	-
0.4	0.4	1.59	1.59	3.0	< 1.0	< 1.0	< 1.0	< 1.0	16	188	216	156	4.91	-
-	-	1.38	1.5	-	< 1.0	< 1.0	< 1.0	< 1.0	12	175	107	136	4.84	-
-	-	2.79	2.22	-	< 1.0	< 1.0	< 1.0	< 1.0	33	318	192	223	4.68	-
-	-	1.46	1.41	-	< 1.0	< 1.0	< 1.0	< 1.0	12	197	135	303	4.88	-
0.7	0.7	1.42	1.4	3.18	< 1.0	< 1.0	< 1.0	< 1.0	12	195	140	533	4.66	-
-	-	1.46	1.3	-	< 1.0	< 1.0	< 1.0	< 1.0	12	194	126	-	4.92	-
5.9	5.8	1.46	1.5	3.3	< 1.0	< 1.0	< 1.0	< 1.0	12	193	125	-	5.12	-
-	-	1.67	1.48	-	< 1.0	< 1.0	< 1.0	< 1.0	20	223	111	136	4.61	-
-	-	1.76	1.8	-	< 1.0	< 1.0	< 1.0	< 1.0	25	218	142	-	4.8	-
0.5	0.5	1.58	1.5											

Analyte		Metals																
		Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Vanadium	Zinc	
Units		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Adopted Site Specific Trigger Values (SWMP 2021)		0.003	0.07	0.002	0.1	0.0002	0.004	0.006	0.083	4.1 (8.84 for BH1)	0.001	0.136	0.0001	0.02	0.01	0.01	0.01	0.085 (0.1 for BH1)
Sample Name	Sample Date																	
BH1	15-Mar-19	< 0.001	0.003	< 0.001	< 0.05	< 0.0001	0.004	< 0.001	< 0.001	13	< 0.001	0.014	< 0.0001	< 0.001	< 0.01	< 0.01	1.27	
	23-Apr-19	< 0.001	0.003	< 0.001	< 0.05	< 0.0001	0.004	< 0.001	0.002	10	0.001	0.015	< 0.0001	0.002	< 0.01	< 0.01	0.363	
	16-May-19	< 0.001	0.002	< 0.001	< 0.05	< 0.0001	0.003	< 0.001	< 0.001	8.33	< 0.001	0.009	< 0.0001	0.002	< 0.01	< 0.01	0.132	
	14-Jun-19	< 0.001	0.001	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	0.001	6.31	< 0.001	0.009	< 0.0001	< 0.001	< 0.01	< 0.01	0.074	
	16-Jul-19	< 0.001	0.002	< 0.001	< 0.05	< 0.0001	0.003	< 0.001	0.002	7.35	< 0.001	0.01	< 0.0001	0.001	< 0.01	< 0.01	0.116	
	15-Aug-19	< 0.001	0.002	< 0.001	< 0.05	< 0.0001	0.003	< 0.001	0.002	7.96	< 0.001	0.008	< 0.0001	< 0.001	< 0.01	< 0.01	0.023	
	16-Sep-19	< 0.001	0.002	< 0.001	< 0.05	< 0.0001	0.004	< 0.001	0.001	8.84	< 0.001	0.009	< 0.0001	< 0.001	< 0.01	< 0.01	0.034	
	15-Oct-19	< 0.001	0.005	< 0.001	< 0.05	< 0.0001	0.003	< 0.001	0.006	-	< 0.001	0.007	< 0.0001	< 0.001	< 0.01	< 0.01	0.037	
	18-Nov-19	< 0.001	0.001	< 0.001	< 0.05	< 0.0001	0.004	< 0.001	< 0.001	11	< 0.001	0.008	< 0.0001	0.001	< 0.01	< 0.01	0.012	
	16-Sep-20	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	0.005	5.48	< 0.001	0.01	< 0.0001	< 0.001	< 0.01	< 0.01	0.016	
	16-Oct-20	< 0.001	0.006	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	0.001	5.55	< 0.001	0.009	< 0.0001	< 0.001	< 0.01	< 0.01	0.017	
	16-Nov-20	< 0.001	0.002	< 0.001	< 0.05	< 0.0001	0.003	< 0.001	0.001	7.05	< 0.001	0.012	< 0.0001	< 0.001	< 0.01	< 0.01	0.045	
	16-Dec-20	< 0.001	0.006	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	0.008	3.21	< 0.001	0.011	< 0.0001	0.001	< 0.01	< 0.01	0.077	
	14-Jan-21	< 0.001	0.002	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	0.001	5.21	< 0.001	0.013	< 0.0001	< 0.001	< 0.01	< 0.01	0.032	
	16-Feb-21	< 0.001	0.003	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	0.001	3.24	< 0.001	0.015	< 0.0001	< 0.001	< 0.01	< 0.01	0.652	
	17-Mar-21	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	< 0.001	4.0	< 0.001	0.027	< 0.0001	< 0.001	< 0.01	< 0.01	0.596	
	24-Feb-22	< 0.001	0.003	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	< 0.001	7.7	< 0.001	0.018	< 0.0001	< 0.001	< 0.01	< 0.01	0.106	
BH2	22-Feb-19	< 0.001	0.005	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.002	0.14	< 0.001	0.021	< 0.0001	0.015	< 0.01	< 0.01	0.006	
	15-Mar-19	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.003	< 0.05	< 0.001	0.02	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005	
	23-Apr-19	< 0.001	0.005	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.004	0.19	< 0.001	0.018	< 0.0001	0.001	< 0.01	< 0.01	0.008	
	16-May-19	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.001	0.06	< 0.001	0.014	< 0.0001	0.001	< 0.01	< 0.01	< 0.005	
	14-Jun-19	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.004	0.08	< 0.001	0.009	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005	
	16-Jul-19	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.008	0.05	< 0.001	0.013	< 0.0001	0.001	< 0.01	< 0.01	0.006	
	15-Aug-19	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.012	0.08	< 0.001	0.011	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005	
	16-Sep-19	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.008	0.26	< 0.001	0.014	< 0.0001	0.001	< 0.01	< 0.01	0.007	
	15-Oct-19	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.006	-	< 0.001	0.011	< 0.0001	< 0.001	< 0.01	< 0.01	0.007	
	18-Nov-19	< 0.001	0.007	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.013	0.08	< 0.001	0.011	< 0.0001	< 0.001	< 0.01	< 0.01	0.028	
	16-Sep-20	< 0.001	0.012	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.026	0.07	< 0.001	0.016	< 0.0001	< 0.001	< 0.01	< 0.01</		

BH4	16-Oct-20	< 0.001	0.01	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.003	0.25	< 0.001	0.021	< 0.0001	0.001	< 0.01	< 0.01	0.018	
	16-Nov-20	< 0.001	0.008	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.005	0.18	< 0.001	0.008	< 0.0001	0.001	< 0.01	< 0.01	0.005	
	16-Dec-20	< 0.001	0.011	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.002	0.46	< 0.001	0.027	< 0.0001	0.003	< 0.01	< 0.01	< 0.005	
	14-Jan-21	< 0.001	0.01	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.012	0.27	< 0.001	0.012	< 0.0001	0.002	< 0.01	< 0.01	0.006	
	16-Feb-21	< 0.001	0.02	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.002	0.94	< 0.001	0.023	< 0.0001	0.003	< 0.01	< 0.01	0.008	
	17-Mar-21	< 0.001	0.027	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.006	1.39	< 0.001	0.029	< 0.0001	0.002	< 0.01	< 0.01	0.019	
	19-Aug-21	< 0.001	0.011	< 0.001	< 0.05	< 0.0001	< 0.001	0.001	0.198	0.14	< 0.001	0.022	< 0.0001	0.001	< 0.01	< 0.01	0.013	
	22-Sep-21	< 0.001	0.009	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.022	0.172	0.1	< 0.001	0.02	< 0.0001	< 0.001	< 0.01	< 0.01	0.006
	13-Oct-21	< 0.001	0.009	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.026	1.65	< 0.001	0.019	< 0.0001	0.001	< 0.01	< 0.01	< 0.005	
	16-Nov-21	< 0.001	0.009	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.012	0.38	< 0.001	0.021	< 0.0001	0.001	< 0.01	< 0.01	0.006	
	15-Dec-21	< 0.001	-	-	-	-	-	-	-	0.69	-	0.016	-	-	-	-		
	18-Jan-22	< 0.001	-	-	-	-	-	-	-	0.52	-	0.018	-	-	-	-		
	24-Feb-22	< 0.001	0.009	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	0.62	< 0.001	0.017	< 0.0001	< 0.001	< 0.01	< 0.01	0.008	
	12-Apr-22	< 0.001	-	-	-	-	-	-	-	0.27	-	0.017	-	-	-	-		
	27-May-22	< 0.001	0.011	-	-	-	< 0.001	-	0.097	< 0.05	-	-	-	< 0.001	-	< 0.005		
	17-Jun-22	< 0.001	-	-	-	-	-	-	0.082	< 0.05	-	0.014	-	-	-	-		
	27-Jul-22	< 0.001	-	-	-	-	-	-	-	0.09	-	0.014	-	-	-	-		
	12-Aug-22	< 0.001	0.013	-	-	-	-	< 0.001	-	0.05	< 0.05	-	0.013	-	< 0.001	-	0.013	
	16-Sep-22	< 0.001	-	-	-	-	-	-	-	0.11	-	0.014	-	-	-	-		
	24-Oct-22	< 0.001	-	-	-	-	-	-	-	0.19	-	0.016	-	-	-	-		
	18-Nov-22	< 0.001	0.012	-	-	-	< 0.001	< 0.001	0.006	0.13	-	0.016	-	< 0.001	-	0.011		
	14-Dec-22	< 0.001	-	-	-	-	-	-	-	0.14	-	0.015	-	-	-	-		
BH5	22-Feb-19	< 0.001	0.01	< 0.001	< 0.05	< 0.0001	0.001	< 0.001	< 0.001	1.4	< 0.001	0.005	< 0.0001	0.003	< 0.01	< 0.01	0.008	
	24-Feb-22	< 0.001	0.024	< 0.001	< 0.05	< 0.0001	0.001	< 0.001	< 0.001	1.64	< 0.001	0.005	< 0.0001	0.002	< 0.01	< 0.01	< 0.005	
	22-Feb-19	< 0.001	0.03	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	1.03	< 0.001	0.014	< 0.0001	0.001	< 0.01	< 0.01	0.019	
	14-Mar-19	< 0.001	0.027	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	1.9	< 0.001	0.01	< 0.0001	< 0.001	< 0.01	< 0.01	0.012	
	23-Apr-19	< 0.001	0.03	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.001	0.96	< 0.001	0.01	< 0.0001	< 0.001	< 0.01	< 0.01	0.022	
	16-May-19	< 0.001	0.029	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	2.57	< 0.001	0.009	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005	
	14-Jun-19	< 0.001	0.027	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.001	2.86	< 0.001	0.008	< 0.0001	< 0.001	< 0.01	< 0.01	0.008	
	16-Jul-19	< 0.001	0.026	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.002	2.41	< 0.001	0.008	< 0.0001	< 0.001	< 0.01	< 0.01	0.005	
	15-Aug-19	< 0.001	0.026	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.001	2.19	< 0.001	0.008	< 0.0001	< 0.001	< 0.01	< 0.01	0.007	
	16-Sep-19	< 0.001	0.034	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.008	2.08	< 0.001	0.012	< 0.0001	0.007	< 0.01	< 0.01	0.035	
	15-Oct-19	< 0.001	0.026	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	-	< 0.001	0.009	< 0.0001	< 0.001	< 0.01	< 0.01	0.006	
	18-Nov-19	< 0.001	0.03	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	1.58	< 0.001	0.009	< 0.0001	0.008	< 0.01	< 0.01	0.073	
	16-Sep-20	< 0.001	0.047	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.002	1.78	< 0.001	0.01	< 0.0001	< 0.001	< 0.01	< 0.01	0.006	
	16-Oct-20	< 0.001	0.04	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	1.84	< 0.001	0.011	< 0.0001	< 0.001	< 0.01	<		

BH7	14-Jan-21	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	0.002	0.002	0.004	1.65	< 0.001	0.025	< 0.0001	0.004	< 0.01	< 0.01	0.017	
	16-Feb-21	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	0.002	0.002	0.002	1.74	< 0.001	0.025	< 0.0001	0.004	< 0.01	< 0.01	0.013	
	17-Mar-21	< 0.001	0.009	< 0.001	< 0.05	< 0.0001	0.002	0.003	0.001	< 0.001	2.28	< 0.001	0.028	< 0.0001	0.005	< 0.01	< 0.01	< 0.005
	19-Aug-21	0.003	0.004	< 0.001	< 0.05	< 0.0001	0.003	0.001	0.001	0.79	< 0.001	0.006	< 0.0001	0.002	< 0.01	< 0.01	0.006	
	22-Sep-21	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	0.003	< 0.001	< 0.001	0.62	< 0.001	0.005	< 0.0001	0.002	< 0.01	< 0.01	< 0.005	
	13-Oct-21	< 0.001	0.006	< 0.001	< 0.05	< 0.0001	0.003	< 0.001	< 0.001	0.69	0.002	0.005	< 0.0001	0.002	< 0.01	< 0.01	< 0.005	
	16-Nov-21	< 0.001	0.002	< 0.001	< 0.05	< 0.0001	0.003	< 0.001	< 0.001	0.39	< 0.001	0.003	< 0.0001	0.002	< 0.01	< 0.01	0.007	
	15-Dec-21	< 0.001	-	-	-	-	-	-	-	0.47	-	0.002	-	-	-	-		
	18-Jan-22	< 0.001	-	-	-	-	-	-	-	0.45	-	0.002	-	-	-	-		
	24-Feb-22	< 0.001	0.002	< 0.001	< 0.05	< 0.0001	0.003	< 0.001	< 0.001	0.66	< 0.001	0.003	< 0.0001	0.002	< 0.01	< 0.01	< 0.005	
	12-Apr-22	< 0.001	-	-	-	-	-	-	-	0.43	-	0.004	-	-	-	-		
	27-May-22	< 0.001	0.003	-	-	-	0.003	-	< 0.001	0.52	-	-	-	0.002	-	-	0.005	
	17-Jun-22	< 0.001	-	-	-	-	-	-	-	0.56	-	0.004	-	-	-	-		
	27-Jul-22	< 0.001	-	-	-	-	-	-	-	0.51	-	0.004	-	-	-	-		
	12-Aug-22	< 0.001	0.003	-	-	-	0.002	-	0.003	0.56	-	0.004	-	0.002	-	-	< 0.005	
	16-Sep-22	0.001	-	-	-	-	-	-	-	0.54	-	0.004	-	-	-	-		
	24-Oct-22	< 0.001	-	-	-	-	-	-	-	0.5	-	0.003	-	-	-	-		
	18-Nov-22	0.001	0.002	-	-	-	0.002	< 0.001	< 0.001	0.43	-	0.001	-	0.001	-	-	0.009	
	14-Dec-22	< 0.001	-	-	-	-	-	-	-	0.32	-	0.002	-	-	-	-		
BH8	21-Feb-19	< 0.001	0.011	< 0.001	< 0.05	< 0.0001	0.001	< 0.001	< 0.001	4.1	< 0.001	0.012	< 0.0001	0.002	< 0.01	< 0.01	0.005	
	14-Mar-19	< 0.001	0.006	< 0.001	< 0.05	< 0.0001	0.001	< 0.001	< 0.001	3.25	< 0.001	0.008	< 0.0001	0.002	< 0.01	< 0.01	< 0.005	
	23-Apr-19	0.001	0.008	< 0.001	< 0.05	< 0.0001	0.001	< 0.001	< 0.001	3.2	< 0.001	0.009	< 0.0001	0.002	< 0.01	< 0.01	0.008	
	16-May-19	0.003	0.01	< 0.001	< 0.05	< 0.0001	0.001	< 0.001	< 0.001	3.0	< 0.001	0.01	< 0.0001	0.003	< 0.01	< 0.01	< 0.005	
	14-Jun-19	< 0.001	0.01	< 0.001	< 0.05	< 0.0001	0.001	< 0.001	< 0.001	2.5	< 0.001	0.005	< 0.0001	0.002	< 0.01	< 0.01	0.006	
	16-Jul-19	0.001	0.012	< 0.001	< 0.05	< 0.0001	0.001	< 0.001	< 0.001	2.6	< 0.001	0.004	< 0.0001	0.002	< 0.01	< 0.01	< 0.005	
	15-Aug-19	0.001	0.008	< 0.001	< 0.05	< 0.0001	0.001	< 0.001	< 0.001	1.72	< 0.001	0.004	< 0.0001	0.001	< 0.01	< 0.01	< 0.005	
	16-Sep-19	0.001	0.01	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	< 0.001	2.06	< 0.001	0.005	< 0.0001	0.002	< 0.01	< 0.01	< 0.005	
	15-Oct-19	< 0.001	0.007	< 0.001	< 0.05	< 0.0001	0.001	< 0.001	0.002	-	< 0.001	0.009	< 0.0001	0.002	< 0.01	< 0.01	0.011	
	18-Nov-19	< 0.001	0.012	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	0.002	2.49	< 0.001	0.01	< 0.0001	0.013	< 0.01	< 0.01	0.053	
	16-Sep-20	< 0.001	0.014	< 0.001	< 0.05	< 0.0001	0.001	< 0.001	0.035	3.35	0.001	0.009	< 0.0001	0.009	< 0.01	< 0.01	0.039	
	16-Oct-20	0.001	0.009	< 0.001	< 0.05	< 0.0001	0.001	< 0.001	0.001	3.03	< 0.001	0.007	< 0.0001	0.002	< 0.01	< 0.01	0.012	
	16-Nov-20	< 0.001	0.013	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	3.48	< 0.001	0.008	< 0.0001	0.002	< 0.01	< 0.01	< 0.005		
	16-Dec-20	< 0.001	0.006	< 0.001	< 0.05	< 0.0001	0.001	< 0.001	0.001	2.98	< 0.001	0.01	< 0.0001	0.001	< 0.01	< 0.01	< 0.005	
	14-Jan-21	< 0.001	0.007	< 0.001	< 0.05	< 0.0001	0.001	< 0.001	0.002	2.71	< 0.001	0.01	< 0.0001	0.005	< 0.01	< 0.01	0.009	
	16-Feb-21	0.001	0.009	< 0.001	< 0.05	< 0.0001	0.001	< 0.001	0.004	2.99	< 0.001	0.01	< 0.0001	0.006	< 0.01	< 0.01	0.013	
	17-Mar-21	< 0.001	0.012	< 0.001	< 0.05	< 0.0001	0.001	< 0.001	0.001	3.86	< 0.001	0.01	< 0.00					

BH11	14-Jun-19	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	0.001	< 0.001	< 0.001	0.98	< 0.001	0.005	< 0.0001	0.001	< 0.01	< 0.01	0.005	
	16-Jul-19	< 0.001	0.01	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	< 0.001	0.47	< 0.001	0.003	< 0.0001	0.004	< 0.01	< 0.01	0.007	
	15-Aug-19	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	0.001	0.87	< 0.001	0.007	< 0.0001	0.001	< 0.01	< 0.01	0.005	
	16-Sep-19	< 0.001	0.005	< 0.001	< 0.05	< 0.0001	0.001	< 0.001	< 0.001	0.79	< 0.001	0.008	< 0.0001	0.002	< 0.01	< 0.01	0.012	
	15-Oct-19	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	0.004	-	< 0.001	0.006	< 0.0001	0.003	< 0.01	< 0.01	0.016	
	18-Nov-19	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	< 0.001	0.95	< 0.001	0.008	< 0.0001	0.002	< 0.01	< 0.01	< 0.005	
	16-Sep-20	< 0.001	0.014	< 0.001	< 0.05	< 0.0001	0.001	< 0.001	0.005	0.9	< 0.001	0.008	< 0.0001	< 0.001	< 0.01	< 0.01	0.009	
	16-Oct-20	< 0.001	0.007	< 0.001	< 0.05	< 0.0001	0.001	< 0.001	< 0.001	1.06	< 0.001	0.009	< 0.0001	0.002	< 0.01	< 0.01	0.01	
	16-Nov-20	< 0.001	0.007	< 0.001	< 0.05	< 0.0001	0.001	< 0.001	< 0.001	0.84	< 0.001	0.011	< 0.0001	0.002	< 0.01	< 0.01	0.016	
	16-Dec-20	< 0.001	0.008	< 0.001	< 0.05	< 0.0001	0.001	< 0.001	< 0.001	1.0	< 0.001	0.009	< 0.0001	0.002	< 0.01	< 0.01	0.008	
	14-Jan-21	< 0.001	0.008	< 0.001	< 0.05	< 0.0001	0.001	< 0.001	0.025	0.56	< 0.001	0.006	< 0.0001	0.004	< 0.01	< 0.01	0.018	
	16-Feb-21	< 0.001	0.008	< 0.001	< 0.05	< 0.0001	0.001	< 0.001	0.018	0.59	< 0.001	0.008	< 0.0001	0.007	< 0.01	< 0.01	0.03	
	17-Mar-21	< 0.001	0.01	< 0.001	< 0.05	< 0.0001	0.001	< 0.001	< 0.001	0.2	< 0.001	0.002	< 0.0001	0.003	< 0.01	< 0.01	0.014	
	19-Aug-21	0.001	0.009	< 0.001	< 0.05	< 0.0001	0.003	< 0.001	< 0.001	0.62	< 0.001	0.003	< 0.0001	0.004	< 0.01	< 0.01	0.047	
	22-Sep-21	< 0.001	0.007	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	< 0.001	0.72	< 0.001	0.003	< 0.0001	0.004	< 0.01	< 0.01	0.042	
	13-Oct-21	< 0.001	0.007	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	< 0.001	0.69	< 0.001	0.005	< 0.0001	0.002	< 0.01	< 0.01	0.037	
	16-Nov-21	< 0.001	0.005	< 0.001	< 0.05	< 0.0001	0.003	< 0.001	< 0.001	0.92	< 0.001	0.002	< 0.0001	0.004	< 0.01	< 0.01	0.036	
	15-Dec-21	< 0.001	-	-	-	-	-	-	-	0.92	-	0.003	-	-	-	-		
	18-Jan-22	< 0.001	-	-	-	-	-	-	-	1.06	-	0.003	-	-	-	-		
	24-Feb-22	< 0.001	0.007	< 0.001	< 0.05	< 0.0001	0.003	< 0.001	< 0.001	1.25	< 0.001	0.003	< 0.0001	0.004	< 0.01	< 0.01	0.036	
	06-Mar-22	< 0.001	0.004	-	-	-	0.002	-	< 0.001	1.27	-	-	-	0.002	-	-	0.028	
	12-Apr-22	< 0.001	-	-	-	-	-	-	-	1.06	-	0.004	-	-	-	-		
	17-Jun-22	< 0.001	-	-	-	-	-	-	-	1.24	-	0.004	-	-	-	-		
	27-Jul-22	< 0.001	-	-	-	-	-	-	-	1.03	-	0.004	-	-	-	-		
	16-Sep-22	< 0.001	-	-	-	-	-	-	-	1.14	-	0.004	-	-	-	-		
	24-Oct-22	< 0.001	-	-	-	-	-	-	-	1.14	-	0.003	-	-	-	-		
	18-Nov-22	< 0.001	0.002	-	-	-	0.003	< 0.001	< 0.001	1.06	-	0.003	-	0.003	-	-	0.042	
	14-Dec-22	< 0.001	-	-	-	-	-	-	-	0.96	-	0.003	-	-	-	-		
BH12	16-Nov-20	< 0.001	-	-	-	< 0.0001	0.002	-	-	0.002	-	< 0.001	-	< 0.0001	0.002	-	-	0.017
	24-Feb-22	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	< 0.001	0.33	< 0.001	0.006	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005	
MW239S	22-Feb-19	< 0.001	0.007	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	< 0.001	1.11	< 0.001	0.003	< 0.0001	0.001	< 0.01	< 0.01	0.006	
	14-Mar-19	< 0.001	0.008	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	< 0.001	1.25	< 0.001	0.005	< 0.0001	0.005	< 0.01	< 0.01	0.008	
	23-Apr-19	< 0.001	0.008	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	< 0.001	1.01	< 0.001	0.004	< 0.0001	0.004	< 0.01	< 0.01	0.007	
	16-May-19	< 0.001	0.005	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	< 0.001	0.87	< 0.001	0.003	< 0.0001	0.002	< 0.01	< 0.01	< 0.005	
	14-Jun-19	< 0.001	0.005	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	< 0.001	0.002	< 0.001	0.003	< 0.0001	0.001	< 0.01	< 0.01	< 0.005	
	16-Jul-19	< 0.001	0.006	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	< 0.001	0.87	< 0.001	0.003</b						

Criteria:

SWMP 2021 - Soil and Water Management Plan, July 2021

Notes:

- - Not analysed

< - Less than laboratory limit of reporting

$\mu\text{g/L}$ - Micrograms per litre

Bold indicates a detection above the laboratory limit of reporting

Criteria:

SWMP 2021 - Soil and Water Management Plan, July 2021

Analyte		Metals		
		Arsenic	Iron	Manganese
Units		mg/L	mg/L	mg/L
Sample Name	Sample Date			
WPW	19-Aug-21	< 0.001	< 0.05	0.062
	22-Sep-21	< 0.001	0.08	0.051
	13-Oct-21	< 0.001	0.22	0.079
	16-Nov-21	< 0.001	0.29	0.045
	15-Dec-21	< 0.001	0.2	0.078
	18-Jan-22	< 0.001	0.56	0.038
	24-Feb-22	< 0.001	1.02	0.084
	12-Apr-22	< 0.001	0.44	0.042
	27-May-22	< 0.001	0.07	0.038
	17-Jun-22	< 0.001	0.94	0.061
	27-Jul-22	< 0.001	0.27	0.038
	12-Aug-22	< 0.001	0.17	0.026
	16-Sep-22	< 0.001	0.58	0.069
	24-Oct-22	0.002	2.22	0.118
	18-Nov-22	< 0.001	0.56	0.066
	14-Dec-22	< 0.001	0.42	0.062

Notes:

< - Less than laboratory limit of reporting

mg/L - Milligrams per litre

Bold indicates a detection above the laboratory limit of reporting

Analyte		Perfluoroctane sulfonamide (FOSA)	N-Methyl-perfluoroctane sulfonamide (MeFOSA)	N-Ethyl perfluoroctane sulfonamide (EtFOSA)	N-Methyl perfluoroctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluoroctane sulfonamidoethanol (EtFOSE)	N-Ethyl perfluoroctane sulfonamidoacetic acid (EtFOSAA)	N-Methyl perfluoroctane sulfonamidoacetic acid (MeFOSAA)	Perfluorobutanoic acid (PFBA)	Perfluoro-n-pentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluoroctanoate (PFOA)
Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Sample Name	Sample Date												
INPUT	22-Sep-21	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
WPW	19-Aug-21	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
	22-Sep-21	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
	13-Oct-21	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
	16-Nov-21	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
	15-Dec-21	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
	18-Jan-22	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
	24-Feb-22	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
	12-Apr-22	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
	27-May-22	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
	17-Jun-22	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
	27-Jul-22	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
	12-Aug-22	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
	16-Sep-22	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
	24-Oct-22	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
	18-Nov-22	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	0.01
	14-Dec-22	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	0.01

Notes:

< - Less than laboratory limit of reporting

µg/L - Micrograms per litre

Bold indicates a detection above the laboratory limit of reporting

			Sum of PFAS		
6:2 Fluorotelomer Sulfonate (6:2 FtS)	8:2 Fluorotelomer sulfonate (8:2 FtS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	0.01	0.01	0.01
< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	0.03	0.03	0.03
< 0.05	< 0.05	< 0.05	0.03	0.03	0.03
< 0.05	< 0.05	< 0.05	0.01	0.01	0.01
< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	0.03	0.03	0.03
< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	0.03	0.03	0.03
< 0.05	< 0.05	< 0.05	0.04	0.05	0.05
< 0.05	< 0.05	< 0.05	0.03	0.04	0.04

Analyte			Metals		
			Arsenic	Iron	Manganese
Units			mg/L	mg/L	mg/L
Sample Name	Sample Date	Sample Type			
TB_141222_14122022	14-Dec-22	Trip Blank	< 0.001	< 0.05	< 0.001
RB01_14122022	14-Dec-22	Rinsate	< 0.001	< 0.05	< 0.001
WPW_14122022	14-Dec-22	Primary	< 0.001	0.42	0.062
QC01_14122022	14-Dec-22	Duplicate	< 0.001	0.3	0.062
Relative Percentage Difference			NC	33%	0%
WPW_14122022	14-Dec-22	Primary	< 0.001	0.42	0.062
QC01A_14122022	14-Dec-22	Triplicate	< 0.001	0.28	0.065
Relative Percentage Difference			NC	40%	5%

Notes:

< - Less than laboratory limit of reporting

NC - Not calculated

mg/L - Milligrams per litre

Bold indicates a detection above the laboratory limit of reporting

Analyte		Perfluorooctane sulfonamide (FOSA)	N-Methyl-perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	Perfluorobutanoic acid (PFBA)	Perfluoro-n-pentanoic acid (PFPeA)
Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Sample Name	Sample Date	Sample Type								
TB_141222_14122022	14-Dec-22	Trip Blank	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1
RB01_14122022	14-Dec-22	Rinsate	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.02

Notes:

< - Less than laboratory limit of reporting

µg/L - Micrograms per litre

PFAS Compounds											
Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoate (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDaDA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorobutanesulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexanesulfonic acid (PFHxS)
µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.02	< 0.01
< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.02	< 0.01

							Sum of PFAS		
Perfluoroheptane sulfonate (PFHpS)	Perfluorooctanesulfonic acid (PFOS)	Perfluorodecanesulfonic acid (PFDS)	4:2 Fluorotelomer Sulfonate (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonate (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
< 0.02	< 0.01	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.02	< 0.01	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01

		DO	ORP	PH	SC	TDS	TEMP	TURB
Location	Date	mg/L	mV	pH units	uS/cm	mg/L	deg C	NTU
BH2	27-Jul-22	5.85	223	4.13	87.6		15.6	131
	12-Aug-22	4.34	269.7	4.52	53		16.7	15.58
	16-Sep-22	3.28	262.7	4.76	80.7	60	18.1	710.34
	24-Oct-22	4.55	218.8	4.71	73.6	55	18.5	33.87
	18-Nov-22	1.9	213.9	4.7	73.2	54	19	52.26
	14-Dec-22	4.14	229.7	4.79	78.6	51	19.3	27.86
BH4	27-Jul-22	3	190.7	4.6	90.2		14.1	121
	12-Aug-22	3.25	236	4.86	77		15.5	10.2
	16-Sep-22	5.35	163.8	5.29	75.2	60	15.4	34.07
	24-Oct-22	3.52	162.3	5.45		57	17.8	45.42
	18-Nov-22	3.57	170.6	5.32	80.2	62	16.8	20.29
	14-Dec-22	3.95	119.8	5.59	92.5	60	18.1	16.36
BH6	27-Jul-22	4.75	-104	4.76	225		14.2	16.8
	12-Aug-22	3.94	-80	5.1	217		14.2	156
	16-Sep-22	2.64	-112.5	5.18	229.4	71	18.1	101.53
	24-Oct-22	1.75	-66.8	4.01	84.3	171	18.3	65.7
	18-Nov-22	2.29	-85.2	4.14	224.4	156	21.7	73.96
	14-Dec-22	1.72	-45.6	4.11	232.3	151	21.1	35
BH7	27-Jul-22	4.21	26	4.43	117		14.3	489
	12-Aug-22	3.98	11	4.84	110		14.9	110.4
	16-Sep-22	2.92	65.6	4.78	94.1	71	17.6	101.6
	24-Oct-22	3.52	-93.2	4.72	81.9	62	17.7	68.09
	18-Nov-22	3.35	-92.5	4.75	78.4	54	22.1	22.45
	14-Dec-22	3.82	-72.2	4.74	70.1	46	21.6	35.8
BH8	12-Aug-22	4.2	-67.9	4.81	135		14.7	782
	18-Nov-22	3.4	-97.2	4.66	98.5	69	20.7	128.9
BH9A	27-Jul-22	4.93	208.5	4.11	182.8		16.6	52
	12-Aug-22	3.96	249	4.46	186		17.6	41.5
	16-Sep-22	3.65	241.4	4.69	132	99	18	45.22
	24-Oct-22	2.84	196.2	4.76	118	87	19	36.09
	18-Nov-22	2.04	86.3	4.79	112	84	18.1	466.51
	14-Dec-22	2.32	166	4.75	107.7	70	18.7	61
BH11	27-Jul-22	4.74	-39	4.2	158		14	9.7
	16-Sep-22	2.46	-63.9	4.54	118.4	89	18	26.3
	24-Oct-22	2.12	-92.9	4.37	120.3	90	18.1	23.72
	18-Nov-22	2.01	-100.5	4.47	120.7	89	18.8	14.15
	14-Dec-22	3.19	-86	4.48	130.2	85	19.1	73
BH12A	24-Oct-22	2.94	141.5	4.95	120.8	89	18.8	146
MW239S	27-Jul-22	4	-71	4.32	125		14.2	175
	12-Aug-22	2.73	-69	4.6	115		15.2	310
	16-Sep-22	3.65	-79.71	4.83	102.4	77	17.9	129.37
	24-Oct-22	2.33	-117.7	4.72	86.5	65	18	83.71
	18-Nov-22	1.93	-113	4.74	97.3	67	22	52.37
	14-Dec-22	3.05	-62	4.62	115.4	75	21.5	239
SW1	12-Aug-22	2.97	182	5.18	140		12.6	4.3
	18-Nov-22	0.89	154.6	5.45	99.5	78	15.9	6.2
SW2	12-Aug-22	1.11	-40	4.95	88.2		12.9	23
	18-Nov-22	2.49	122	4.62	82.5	61	18.4	13.67
SW3	12-Aug-22	1.4	41.1	3.99	259.8		11.9	2.8
	18-Nov-22	3.09	80.4	5.62	227.1	164	19.5	17.11
SW4	12-Aug-22	3.75	224	4.57	214		11.3	1.34
	18-Nov-22	3.5	130.2	4.43	217.9	149	22.4	3.96
WPW	12-Aug-22	10.09	210	5.06	255		14.7	205
	16-Sep-22	9.42	174.5	4.7	208.2	149	20	1000.34
	24-Oct-22	9.11	145.4	4.73	199.4	143	20.2	4120.3
	18-Nov-22	8.57	209.5	4.77	253.6	167	24.3	23.44
	14-Dec-22	8.64	189.5	4.97	267.8	174	22.1	3055.6

HYDRASLEEVE™ SAMPLING LOG

Project Number:	Date:	Site Address:
20232071	14/12	Cabbage Tree Road, Williams Town
Site Name:	Field Manager:	Weather Observations:
WSS	MF	clear



QA/QC SAMPLE REGISTER

Project Number:	Site Name:	Site Address:
20232071	WSS	Cabbage Tree Rd, Williamtown.

Date: 14/12 Field Manager: MF

COMMENTS: _____

KENNARDS

HIRE

EQUIPMENT CERTIFICATION REPORT

PGN9003871 WATER QUALITY METER – MULTIFUNCTION (YSI)

Plant Number: 1090142

SENSOR	CONCENTRATION	SPAN 1	SPAN 2	TRACEABILITY	PASS
pH	pH 4	pH 4		# 371300	<input checked="" type="checkbox"/>
	pH 7	pH 7		# 384001	<input checked="" type="checkbox"/>
Conductivity	12.88 mS/cm	12.88 mS/cm		# 381242	<input checked="" type="checkbox"/>
Dissolved Oxygen	Sodium Sulphite / Air	0.0ppm in Sodium Sulphite	ppm Saturation in Air	# 11897	<input checked="" type="checkbox"/>
ORP	240mV	240mV	Zobell Part A	# 375760	<input checked="" type="checkbox"/>
			Zobell Part B	# 374424	
Turbidity	90 NTU	90 NTU			<input checked="" type="checkbox"/>

Battery Status <u>100</u> (%)	Temperature <u>19.3</u> °C
Electrical Test & Tag (AS/NZS 3760)	Electrodes Cleaned and Checked

Note: Calibration solution traceability information is available upon request.

Please clean/decontaminate instrument and accessories before returning. A minimum 'Cleaning Fee' \$55.00 (Inc GST) may apply if instrument is returned contaminated.

Checked By: Jacob Arnott Date: 08/12/22 Signed: J. Arnott**Accessories List:**

User's Manual	pH and ORP Storage Solution	Transit Case

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ATTACHMENT 3: LAB RESULTS



CERTIFICATE OF ANALYSIS

Work Order	: ES2245316	Page	: 1 of 8
Client	: KLEINFELDER AUSTRALIA PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: DANIEL KOUSBROEK	Contact	: Graeme Jablonskas
Address	: Suite 3, 240 - 244 Pacific Highway Charlestown NSW 2290	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +6138549 9609
Project	: 20232071	Date Samples Received	: 14-Dec-2022 15:27
Order number	: ----	Date Analysis Commenced	: 15-Dec-2022
C-O-C number	: ----	Issue Date	: 22-Dec-2022 16:25
Sampler	: Megan Ferguson		
Site	: WSS - Cabbage Tree Rd GME - December 2022		
Quote number	: EN/222		
No. of samples received	: 11		
No. of samples analysed	: 11		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

∅ = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	BH2	BH4	BH6	BH7	BH9A
			Sampling date / time	14-Dec-2022 00:00				
Compound	CAS Number	LOR	Unit	ES2245316-001	ES2245316-002	ES2245316-003	ES2245316-004	ES2245316-005
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	0.004	0.015	0.012	0.002	0.023
Iron	7439-89-6	0.05	mg/L	0.09	0.14	3.23	0.32	0.18

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID	BH11	MW239S	WPW	QC01	RB01		
Compound	CAS Number	LOR	Unit	Sampling date / time	14-Dec-2022 00:00				
				Result	Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	0.003	0.003	0.062	0.062	<0.001	<0.001
Iron	7439-89-6	0.05	mg/L	0.96	0.26	0.42	0.30	<0.05	<0.05
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	---	---	<0.02	---	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	---	---	<0.02	---	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	---	---	0.01	---	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	---	---	<0.02	---	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	---	---	0.02	---	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	---	---	<0.02	---	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	---	---	<0.1	---	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	---	---	<0.02	---	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	---	---	<0.02	---	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	---	---	<0.02	---	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	---	---	0.01	---	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	---	---	<0.02	---	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	---	---	<0.02	---	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	---	---	<0.02	---	<0.02	<0.02
Perfluorododecanoic acid (PFDaDA)	307-55-1	0.02	µg/L	---	---	<0.02	---	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	---	---	<0.02	---	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	---	---	<0.05	---	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	---	---	<0.02	---	<0.02	<0.02

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID	BH11	MW239S	WPW	QC01	RB01	
Compound	CAS Number	LOR	Sampling date / time	14-Dec-2022 00:00				
			Unit	ES2245316-006	ES2245316-007	ES2245316-008	ES2245316-009	ES2245316-010
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Methyl perfluoroctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	---	---	<0.05	---	<0.05
N-Ethyl perfluoroctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	---	---	<0.05	---	<0.05
N-Methyl perfluoroctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	---	---	<0.05	---	<0.05
N-Ethyl perfluoroctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	---	---	<0.05	---	<0.05
N-Methyl perfluoroctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	---	---	<0.02	---	<0.02
N-Ethyl perfluoroctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	---	---	<0.02	---	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	---	---	<0.05	---	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	---	---	<0.05	---	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	---	---	<0.05	---	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	---	---	<0.05	---	<0.05
EP231P: PFAS Sums								
Sum of PFAS	---	0.01	µg/L	---	---	0.04	---	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	---	---	0.03	---	<0.01
Sum of PFAS (WA DER List)	---	0.01	µg/L	---	---	0.04	---	<0.01
EP231S: PFAS Surrogate								
13C4-PFOS	---	0.02	%	---	---	98.3	---	92.5
13C8-PFOA	---	0.02	%	---	---	91.5	---	96.6

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID	TB_141222	---	---	---	---	---
Compound	CAS Number	LOR	Sampling date / time	14-Dec-2022 00:00	---	---	---	---
			Unit	ES2245316-011	-----	-----	-----	-----
			Result	---	---	---	---	---
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	---	---	---	---
Manganese	7439-96-5	0.001	mg/L	<0.001	---	---	---	---
Iron	7439-89-6	0.05	mg/L	<0.05	---	---	---	---
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	---	---	---	---
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	---	---	---	---
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	---	---	---	---
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	---	---	---	---
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	---	---	---	---
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	---	---	---	---
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	---	---	---	---
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	---	---	---	---
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	---	---	---	---
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	---	---	---	---
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	---	---	---	---
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	---	---	---	---
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	---	---	---	---
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	---	---	---	---
Perfluorododecanoic acid (PFDaDA)	307-55-1	0.02	µg/L	<0.02	---	---	---	---
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	---	---	---	---
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	---	---	---	---
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	---	---	---	---

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID	TB_141222	---	---	---	---	---
Compound	CAS Number	LOR	Sampling date / time	14-Dec-2022 00:00	---	---	---	---
			Unit	ES2245316-011	-----	-----	-----	-----
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Methyl perfluoroctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	---	---	---	---
N-Ethyl perfluoroctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	---	---	---	---
N-Methyl perfluoroctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	---	---	---	---
N-Ethyl perfluoroctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	---	---	---	---
N-Methyl perfluoroctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	---	---	---	---
N-Ethyl perfluoroctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	---	---	---	---
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	---	---	---	---
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	---	---	---	---
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	---	---	---	---
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	---	---	---	---
EP231P: PFAS Sums								
Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	---	---	---	---
Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---
EP231S: PFAS Surrogate								
13C4-PFOS	---	0.02	%	90.4	---	---	---	---
13C8-PFOA	---	0.02	%	94.6	---	---	---	---

Surrogate Control Limits

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	---	60	120
13C8-PFOA	---	60	120

Environment Testing

Kleinfelder Australia Pty Ltd (NEWC)
Suite 3, 240-244 Pacific Hwy
Charlestown
NSW 2290



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition
Arrangement for the mutual recognition of the
equivalence of testing, medical testing, calibration,
inspection, proficiency testing scheme providers and
reference materials producers reports and certificates.

Attention: M Ferguson

Report 951674-W
Project name WSS - CABBAGE TREE RD GME - DECEMBER 2022
Project ID 20232071
Received Date Dec 15, 2022

Client Sample ID			QC01A
Sample Matrix			Water
Eurofins Sample No.			S22- De0044359
Date Sampled			Dec 14, 2022
Test/Reference	LOR	Unit	
Heavy Metals			
Arsenic (filtered)	0.001	mg/L	< 0.001
Iron (filtered)	0.05	mg/L	0.28
Manganese (filtered)	0.005	mg/L	0.065

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Heavy Metals (filtered) - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Sydney	Dec 20, 2022	180 Days



web: www.eurofins.com.au

email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road Dandenong South VIC 3175	19/8 Lewalan Street Grovedale VIC 3216	179 Magowar Road Girraween NSW 2145	Unit 1,2 Dacre Street Mitchell ACT 2911	1/21 Smallwood Place Murarrie QLD 4172	4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293
Tel: +61 3 8564 5000 NATA# 1261 Site# 1254	Tel: +61 3 8564 5000 NATA# 1261 Site# 1254	Tel: +61 2 9900 8400 NATA# 1261 Site# 1254	Tel: +61 2 6113 8091 NATA# 1261 Site# 18217	Tel: +61 7 3902 4600 NATA# 1261 Site# 20794	Tel: +61 2 4968 8448 NATA# 1261 Site# 25079

Eurofins ARL Pty Ltd

ABN: 91 05 0159 898

Perth	Auckland	Christchurch
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Eurofins Environment Testing NZ Ltd

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35 O'Rorke Road Penrose, Auckland 1061	43 Detroit Drive Rolleston, Christchurch 7675
Tel: +64 9 526 45 51 IANZ# 1327	Tel: 0800 856 450 IANZ# 1290

Company Name: Kleinfelder Aust Pty Ltd (NEWCASTLE)
Address: Suite 3, 240-244 Pacific Hwy
 Charlestown
 NSW 2290

Project Name: WSS - CABBAGE TREE RD GME - DECEMBER 2022
Project ID: 20232071

Order No.:
Report #: 951674
Phone: 02 4949 5200
Fax:

Received: Dec 15, 2022 6:30 PM
Due: Dec 22, 2022
Priority: 10 Day
Contact Name: M Ferguson

Eurofins Analytical Services Manager : Andrew Black

Sample Detail

Arsenic (filtered)	Iron (filtered)	Manganese (filtered)
---------------------------	------------------------	-----------------------------

Sydney Laboratory - NATA # 1261 Site # 18217**External Laboratory**

No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	QC01A	Dec 14, 2022		Water	S22-De0044359	X	X	X
						1	1	1

Test Counts

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

µg/L: micrograms per litre

ppm: parts per million

ppb: parts per billion

%: Percentage

org/100 mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100 mL: Most Probable Number of organisms per 100 millilitres

CFU: Colony forming unit

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBT0	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
Heavy Metals									
Arsenic (filtered)		mg/L	< 0.001				0.001	Pass	
Iron (filtered)		mg/L	< 0.05				0.05	Pass	
Manganese (filtered)		mg/L	< 0.005				0.005	Pass	
LCS - % Recovery									
Heavy Metals									
Arsenic (filtered)		%	97				80-120	Pass	
Iron (filtered)		%	95				80-120	Pass	
Manganese (filtered)		%	98				80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals									
Arsenic (filtered)	S22-De0045864	NCP	%	91			75-125	Pass	
Iron (filtered)	S22-De0035827	NCP	%	95			75-125	Pass	
Manganese (filtered)	S22-De0045864	NCP	%	93			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Heavy Metals									
Arsenic (filtered)	S22-De0044359	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Iron (filtered)	S22-De0044359	CP	mg/L	0.28	0.29	1.8	30%	Pass	
Manganese (filtered)	S22-De0044359	CP	mg/L	0.065	0.064	1.5	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised by:

Bonnie Pu Analytical Services Manager
Fang Yee Tan Senior Analyst-Metal



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#)

Measurement uncertainty of test data is available on request or please [click here](#).

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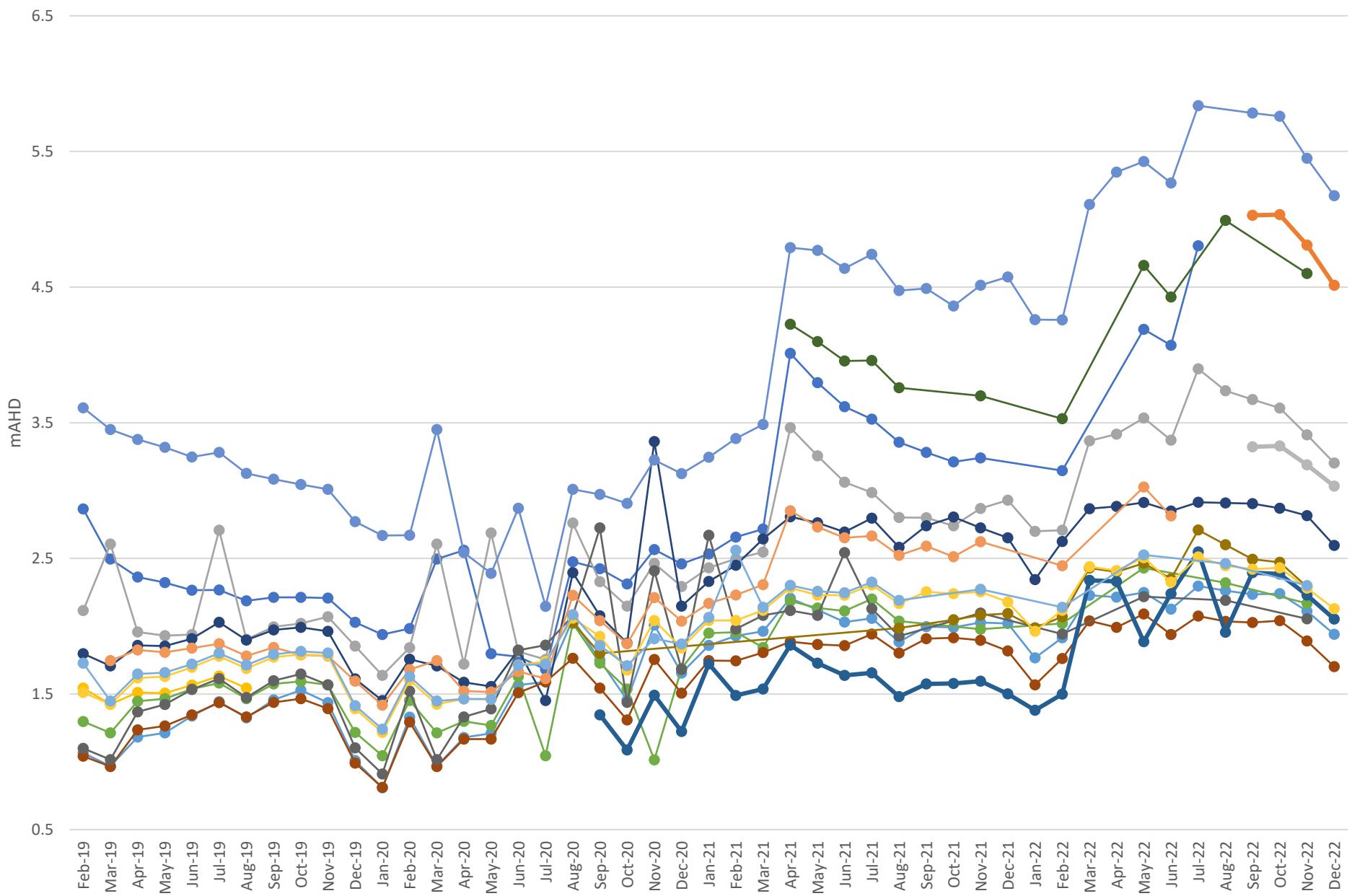
ATTACHMENT 4: DATA TRENDS



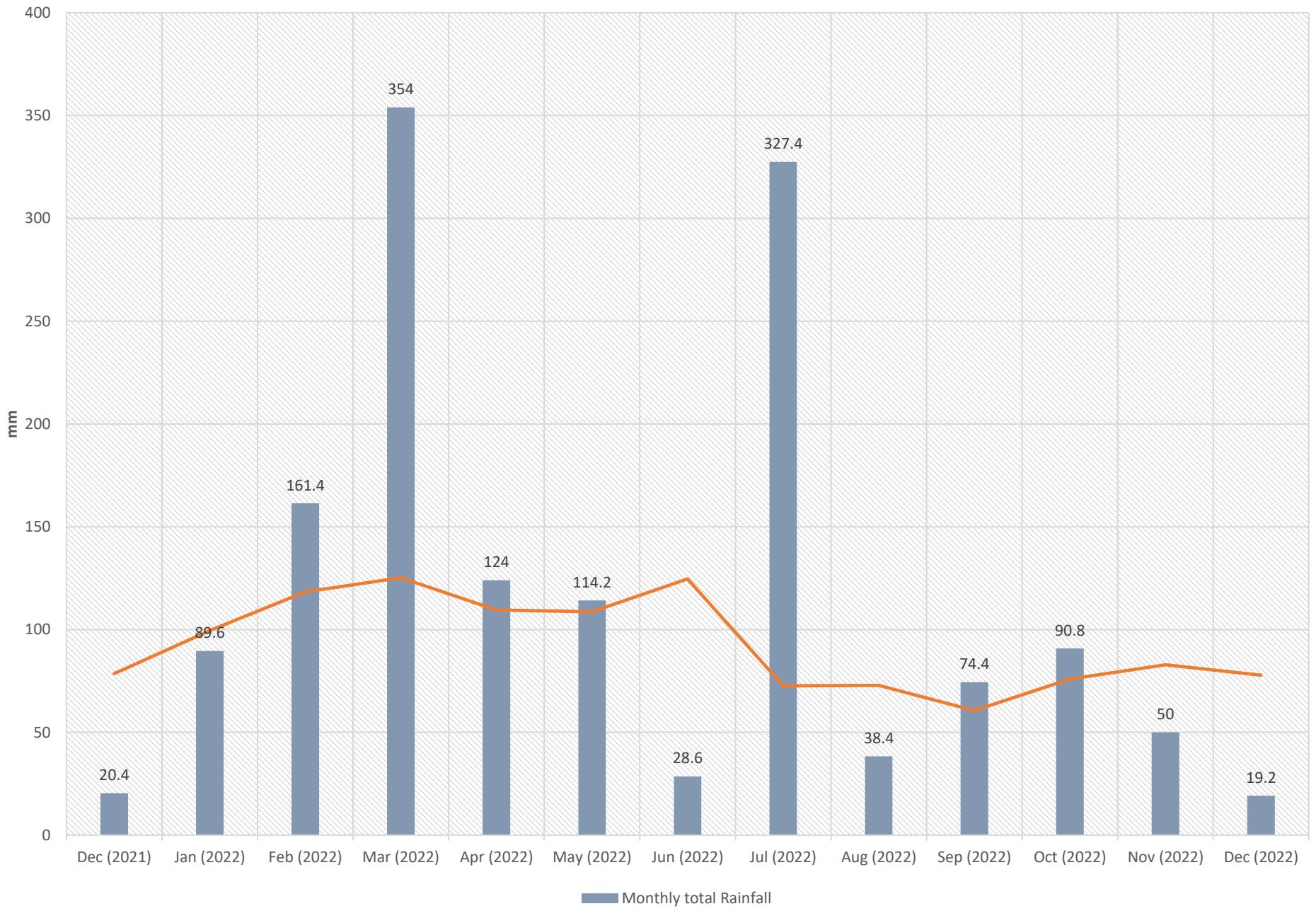
Groundwater Elevation (mAHD)

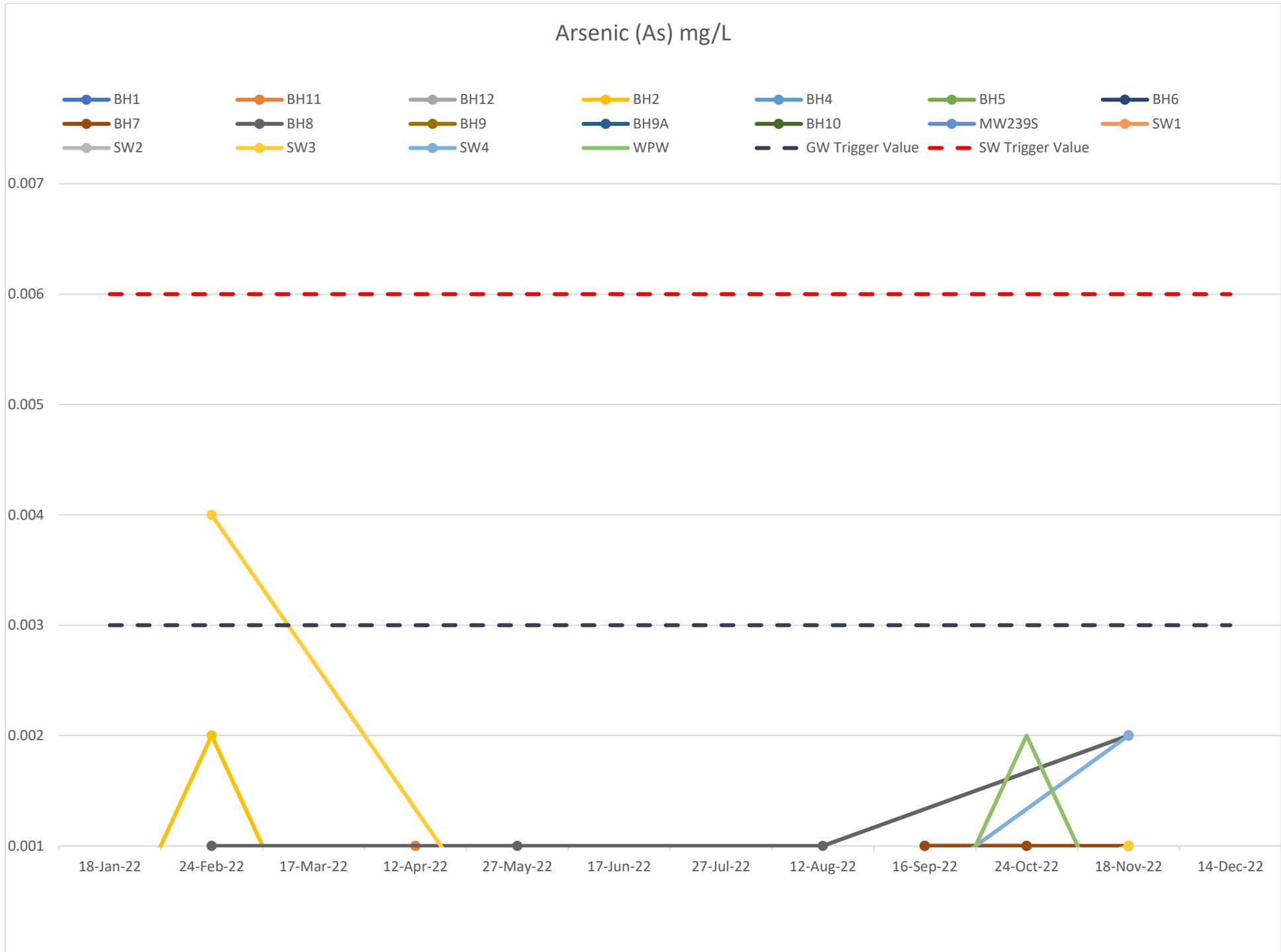
Legend:

- BH1 ● BH1A ● BH2 ● BH3 ● BH4 ● BH5 ● BH6 ● BH7 ● BH8
- BH9 ● BH9A ● BH10 ● BH11 ● BH12 ● BH12A ● MW239S ● MW239D

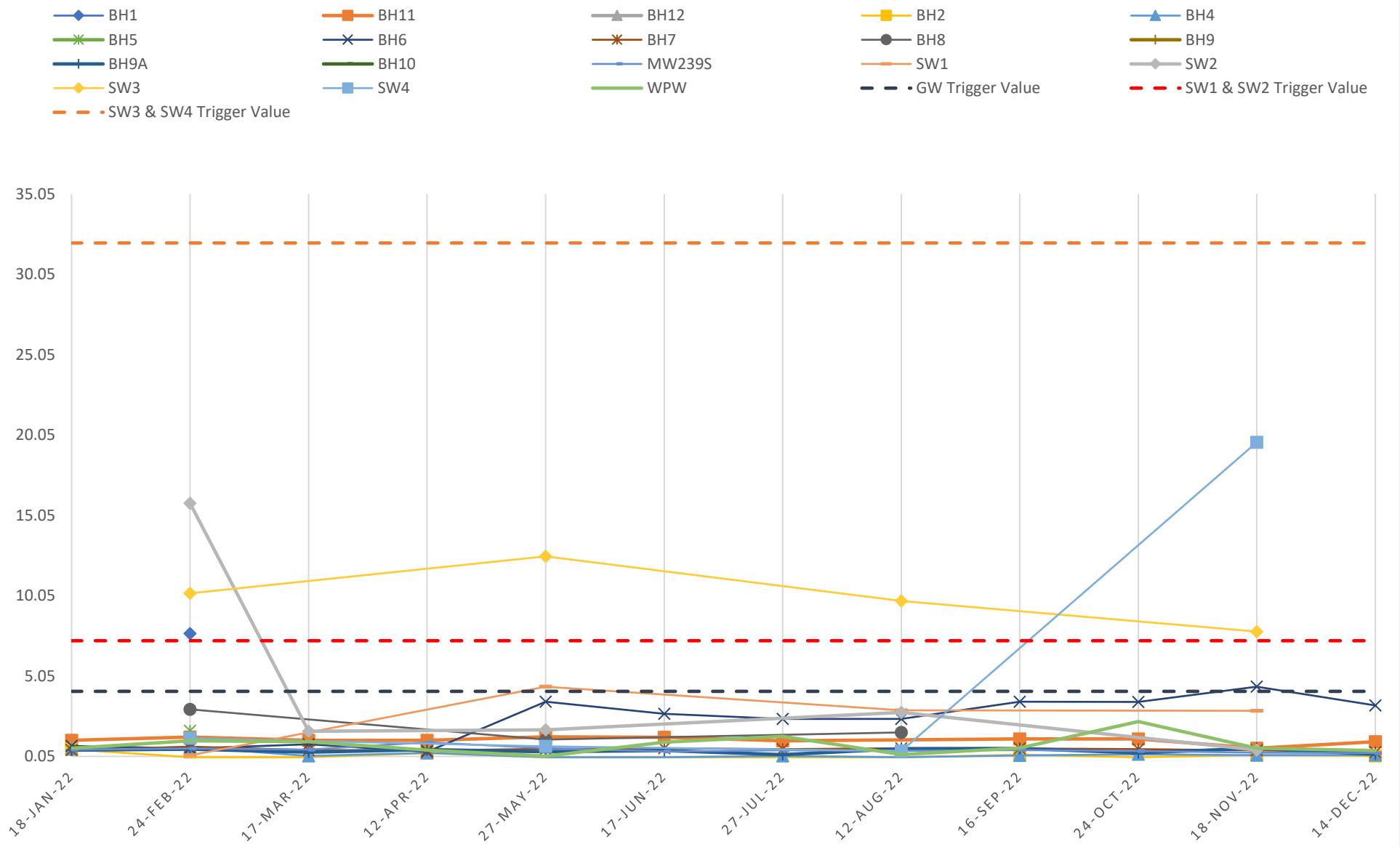


Monthly Rainfall Totals 2021-2022 (mm)





Iron (Fe) mg/L



Manganese (Mn) mg/L

