

Monthly Water Quality Monitoring Results Cabbage Tree Road Sand Quarry, NSW

April 2022 Monitoring Event

NCA22R139010

20 April 2022



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

Attention: Darren Williams

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

Please find enclosed the monthly water quality monitoring results for the April 2022 monitoring event undertaken by Kleinfelder at the Cabbage Tree Road Sand Quarry, NSW.

1 SCOPE OF WORK

The scope of work presented in this report includes the results from the monthly groundwater monitoring event undertaken in accordance with the NSW Environment Protection Authority (EPA) and Department of Planning, Industry and Environment (DPIE) requirements for monthly water quality monitoring at the quarry. **Figure 1 (Attachment 1)** presents the groundwater sampling locations.

The scheduled April 2022 monthly monitoring event included gauging of ten monitoring wells, recording of field parameters for groundwater, and sampling from seven monitoring wells and one wash plant water sample as outlined in the Soil and Water Management Plan (SWMP, 2021).

2 SITE WORK

The monthly monitoring round was conducted on the 12th of April 2022 and comprised:

- Gauging of eight monitoring wells (BH2, BH4, BH6, BH7, BH9, BH9A, BH11 & MW239S).
- Groundwater sampling from seven monitoring wells (BH2, BH4, BH6, BH7, BH9A, BH11 & MW239S) as summarised in **Table 5** and detailed in **Attachment 2**.
- One wash plant water sample (WPW) as summarised in **Table 6** and detailed in **Attachment 2**.
- Gauging of an additional two monitoring wells (BH1 & BH12) requested by the client due to site works being undertaken near the monitoring wells. Monitoring wells BH1 & BH12 will be integrated into the scope of the monthly water quality monitoring, as requested by the client.

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 below 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.

All samples collected were placed into an ice chilled esky and then submitted to a NATA accredited laboratory under a chain of custody (COC) for the analytical schedule as per **Table 1**.

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

Analysis	Number of Samples				
	Primary	Intra-lab (Duplicate)	Inter-lab (Triplicate)	Transport Blank	Rinsate Blank
Metals*	9	1	1	1	1
PFAS (28 analytes, standard level)	1	1	1	1	1

* Metals (dissolved) - Arsenic (As), Iron (Fe), Manganese (Mn).



Table 2 provides a summary of the gauging data. 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 BH1, BH2, and BH11 have triggered TARP rules outlined in **Table 3**, Kleinfelder will undertake weekly monitoring of groundwater levels for BH1, BH2, and BH11 until water levels decline to below high frequency level bores listed in **Table 2**.

Table 2: Summary of Gauging Data

Borehole	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
BH1	8.64	4.561	4.079	-	9.45	4.5	0.421	Well gauged only. Well cap found missing.
BH2	7.79	4.375	3.415	8.97	9.45	3.8	0.385	Dark brown, no sulfur odour, no sheen, well in good condition
BH3	-	-	-	-	-	-	-	Well decommissioned
BH4	3.06	0.845	2.215	6.05	6.45	3.0	0.785	Medium brown, no sulfur odour, no sheen, well in good condition
BH5	7.36	-	-	-	9.28	4.0	-	No sample taken
BH6	3.62	0.737	2.883	4.55	4.95	4.4	1.517	Clear colour, slight sulfur odour, no sheen, well in good condition
BH7	2.98	0.988	1.992	4.53	4.95	3.7	1.708	Medium brown, slight sulfur odour, no sheen, well in good condition
BH8	3.88	-	-	-	6.28	4.0	-	No sample taken
BH9	17.75	15.350	2.4	16.23	18.8	3.0	0.6	No sample taken, well in good condition
BH9A	10.75	8.42	2.33	12.44	16.16	3.0 ²	0.67	Light brown, moderate sulfur odour, no sheen, well in good condition

Borehole	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
BH10	6.69	-	-	-	5.45	4.9	-	No sample taken
BH11	6.63	1.282	5.348	5.25	5.95	5.5	0.152	Yellow, moderate sulfur odour, no sheen
BH12	8.67	5.814	2.856	-	8.39	4.0	1.144	Well gauged only. Well in good condition.
MW239S	3.04	0.630	2.41	3.86	4.0	3.9	0.59	Cloudy brown, moderate sulfur odour, no sheen, well in good condition
MW239D	3.04	-	-	-	20.49	3.9 ³	-	No sample taken
SW01*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No sample taken
SW02*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No sample taken
SW03*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No sample taken
SW04*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No sample taken

* 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 adjacent wells (BH4 & BH9).

³ – Inferred Max Groundwater level based on adjacent well (MW239S).

N/A – Not applicable

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 at BH1 and BH10. (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	Weekly (or more frequent) monitoring (dipping) of groundwater levels.	WSS to issue letter to DPIE, documenting groundwater level and



	historical level (Table 2) at any on-site bore.	Re-analysis and review of Minimum Extraction Level (MEL).	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).	<p>Analysis of recent data by hydrogeologist, including site data and data from local HWC wells and local Defence wells (if available).</p> <p>Revision of MEL.</p> <p>Remediation of earlier excavations to revised MEL if required by DPIE.</p>	<p>WSS to issue letter to DPIE, Dol Water and HWC, documenting groundwater level trends, and revision (if necessary) of MEL.</p> <p>Letter to outline remedial options, considering access, vegetation condition in previously rehabilitated areas. Re-grading of previously rehabilitated areas if required by DPIE.</p>

Table 4 provides a summary of the field parameters taken during the April monitoring event. All field parameters for each monitoring location are detailed in the field sheets provided in **Attachment 2**.

Table 4: Summary of Field Measurements

Borehole	Turbidity (NTU)	Temp (°C)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)
BH1	ND	ND	ND	ND	ND	ND	ND
BH2	462	20.8	5.60	73.4	47.45	4.45	188.5
BH4	60.6	19.9	2.52	80.9	52.7	4.67	190
BH5	ND	ND	ND	ND	ND	ND	ND
BH6	32.6	20.7	1.70	215	140	4.88	-135
BH7	33.3	20.2	1.43	163	106	3.93	-31.3
BH8	ND	ND	ND	ND	ND	ND	ND
BH9	ND	ND	ND	ND	ND	ND	ND
BH9A	289	19.8	2.68	230.1	133	4.45	38.3
BH10	ND	ND	ND	ND	ND	ND	ND
BH11	24.4	20.0	2.80	199.1	129	5.45	-64
BH12	ND	ND	ND	ND	ND	ND	ND
MW239S	104	19.7	8.02	174.9	114	4.73	-101
MW239D	ND	ND	ND	ND	ND	ND	ND
WPW	9340	22.0	6.34	219	142	4.64	191.1

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. Recently approved and updated groundwater criteria outlined in the SWMP (7 July 2021) have been applied to this monthly report including a comment on comparison of results with previous data.

Full results summary tables, including quality control sample analyses, are provided in **Tables 1 – 4, 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

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	
Sample ID	Groundwater			
BH1	NS	NS	NS	Metals for BH1 were not analysed - no sample collected.
BH2	0.001	0.25	0.009	Metal concentrations were generally consistent with historical results and remain below adopted criteria. BH2 is located marginally down hydraulic gradient from the current quarry operations footprint.
BH4	<0.001	0.27	0.017	Metal concentrations were generally consistent with historical variations and remain below adopted criteria. BH4 is located down hydraulic gradient (approximately 140 m) from current quarry operations and on the southernmost boundary of the site adjacent to Cabbage Tree Road.
BH6	<0.001	3.24	0.016	Metal concentrations were generally consistent with historical results (excluding Iron). Iron concentration has increased from previous months. However, all metal concentrations remain below adopted criteria. BH6 is considered up hydraulic gradient (approximately 570 m) from current quarry operations and the most north-eastern location at the Site.
BH7	<0.001	0.43	0.004	Metal concentrations were generally consistent with historical results and below adopted criteria. BH7 is located (approximately 630 m) east of the current quarry operations.
BH8	NS	NS	NS	Metals for BH8 were not analysed - no sample collected.
BH9	NS	NS	NS	Metals for BH9 were not analysed - no sample collected.
BH9A	<0.001	0.48	0.038	Metal concentrations were generally consistent with historical results and below adopted criteria. BH9A is down gradient (approximately 50m) 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.
MW239S	<0.001	0.93	0.007	Metal concentrations were generally consistent with historical results and below adopted criteria. MW239S is located approximately 426 m east and upgradient of the current quarry operations.
BH11	<0.001	1.06	0.004	Metal concentrations were generally consistent with historical results and below adopted criteria. BH11 is located approximately 450 m from current quarry operations and at the north-western most point of the Site.
BH12	NS	NS	NS	Metals for BH12 were not analysed - no sample collected.

Notes:

< - Less than laboratory limit of reporting

NS – No Sample



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	<0.01	<0.01	<0.01	All PFAS analytes were recorded below the Limit of Reporting (LOR) at this location during the April GME. PFOS and PFHxS were not detected during the April 2022 monitoring event, decreased results from the March 2022 results of 0.02 and 0.01 respectively. This results in the Sum of PFOS + PFHxS also not being detected during the April 2022 GME, decreasing from the March 2022 monitoring event result of 0.03.

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 April 2022 exceeded the monthly mean by 113%, a rapid decrease in comparison to the previous March 2022 rainfall data. Based on current rainfall data (mean and monthly totals) for April 2022, it is expected that groundwater elevations will continue to increase which is consistent with groundwater trend data.

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

Date	May (21)	Jun (21)	July (21)	Aug (21)	Sep (21)	Oct (21)	Nov (21)	Dec (21)	Jan (22)	Feb (22)	Mar (22)	Apr (22)
1st	0	0.2	2.6	0	0	0	0.2	0	0	0	18.2	13.6
2nd	0	0.2	1.6	0.8	0	5.4	0	0.2	0	7.6	25.2	1.4
3rd	0	0	0	1.6	0	0	0	0	0	13.0	32.2	0
4th	0	12.8	0.2	0	0	0	0	0.2	1.0	32.8	55.4	ND
5th	6.0	0.8	0	0	3.0	0	4.0	0	7.6	7.2	0.2	0.2
6th	26.4	0	0	0	0	0	0	0	2.2	4.4	11.6	0.2
7th	31.4	0	0	0	0	0	0	2.8	1.0	1.4	5.4	0
8th	0.4	0	0.2	0	0	0	21.0	0.6	10.4	2.0	11.8	36.2
9th	0	7.6	1.4	2.4	0	0	0	10.0	9.2	0.6	68.0	1.2
10th	0.4	0	7.0	0	12.6	0	0.4	0.8	0	0	0.6	2.0
11th	0	2.0	24.8	0.2	0	23.6	20.2	0	0	0	3.8	0.2



Date	May (21)	Jun (21)	July (21)	Aug (21)	Sep (21)	Oct (21)	Nov (21)	Dec (21)	Jan (22)	Feb (22)	Mar (22)	Apr (22)
12th	7.2	0	1.0	0	0	10.2	56.8	0	0	39.4	0.6	8.4
13th	0	0	0	0	0	19.8	0.2	0	0.4	1.0	0.2	15.8
14th	0	0	0.2	0	0	1.2	0	0	0	0	0	10.8
15th	0	0	0.4	0.2	0	3.0	0	0	0	0	0.8	1.2
16th	0	ND	1.2	0	0	0.2	0.2	0.2	5.4	0	0.8	0.2
17th	0	0.4	2.4	0	0	0	0	1.8	0.2	0	0.2	0
18th	0	0	0	0.6	0.4	0	0.6	0	0	8.6	0	0
19th	0	0.2	0	0	0	0	0	0	32.0	0.2	2.2	0
20th	0	26.0	0	0	2.2	3.4	0	0.6	13.2	0	0.4	0.2
21st	0	19.2	0	0.4	8.8	0.2	5.0	0.2	0.2	0	0	0
22nd	13.0	0.6	0	0	0.4	0.2	27.6	0	0	0	0	14.6
23rd	0	0.2	0.2	0.2	0	0	9.4	0	0	25.2	0	6.4
24th	3.0	0.8	0.2	22.2	0	5.4	0.6	0.4	6.8	3.2	35.6	10.0
25th	0.6	1.8	0	20.2	0	0.2	3.4	0	0	6.0	29.4	0.2
26th	0.2	0	0	0	0.6	0	31.2	0	0	6.0	14.4	0.2
27th	0	0	0	0	0	0	16.4	0	0	2.6	6.8	0.2
28th	0	0.4	0	0	0	0	15.8	2.4	0	0.2	0.8	0.6
29th	0	30.8	-	0	0	0	0.8	-	0	-	2.4	0.2
30th	1.8	0.6	-	0	0	0	0	0.2	0	-	12.2	0
31st	0.4	-	-	0	-	1.6	-	0	0	-	14.8	-
Total	90.8	104.6	43.4	48.8	28.0	74.4	213.8	20.4	89.6	161.4	354.0	124.0
Historical Mean	108.6	124.6	72.6	72.8	60.6	75.9	81.9	78.6	99.5	118.3	125.2	109.5

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, the trends indicate a slight increase in groundwater elevations since April 2021. This is likely due to increased rainfall following the December 2021 monitoring event. In more recent months, groundwater elevation has begun to increase since January 2022 in line with increased rainfall. Groundwater levels for the current month appear to be stable or increasing across the locations, with rainfall exceeding the monthly average in both March and April 2022 (as observed in **Section 3**). Based on these trends, groundwater elevations are likely to continue to increase across the quarry.

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

- PFAS – The Sum of PFOS + PFHxS was reported below the laboratory limit of reporting in the WPW sample during the April 2022 monitoring round at decreased concentrations since the previous monitoring event. PFOA was not detected at this location during the April GME, in line with the February 2022 monitoring event.



5 CLOSING

Overall, the results suggest that since quarry operations began in August 2019, there has been a 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

Jai Roby

Graduate Environmental Scientist
Contaminated Land Management

JRoby@kleinfelder.com

Mobile: 0401 499 275

Attachments

Attachment 1: Figures

Attachment 2: Results tables and field records

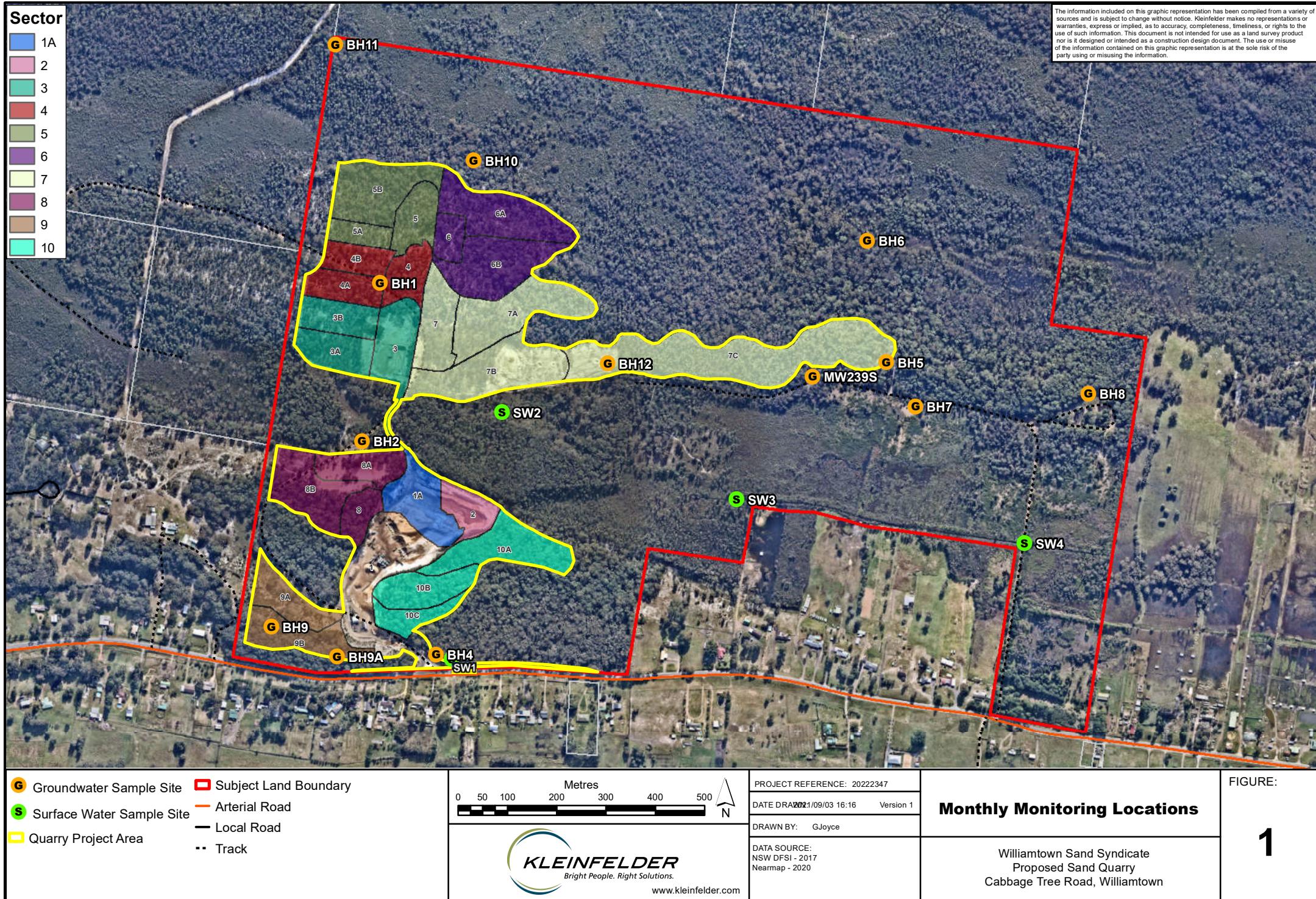
Attachment 3: Lab results

Attachment 4: Data Trends



ATTACHMENT 1: FIGURES







ATTACHMENT 2: RESULTS TABLES AND FIELD RECORDS



Analyte		Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt
Units		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Adopted Site Specific Trigger Values (SWMP 2021) ³		0.003	0.07	0.002	0.1	0.0002	0.004	0.006
NHMRC ADWG 2018		0.01	-	0.06	4	0.002	0.05	-
Sample Name	Sample Date							
BH1	15-Mar-19	< 0.001	0.003	< 0.001	< 0.05	< 0.0001	0.004	< 0.001
	23-Apr-19	< 0.001	0.003	< 0.001	< 0.05	< 0.0001	0.004	< 0.001
	16-May-19	< 0.001	0.002	< 0.001	< 0.05	< 0.0001	0.003	< 0.001
	14-Jun-19	< 0.001	0.001	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	16-Jul-19	< 0.001	0.002	< 0.001	< 0.05	< 0.0001	0.003	< 0.001
	15-Aug-19	< 0.001	0.002	< 0.001	< 0.05	< 0.0001	0.003	< 0.001
	16-Sep-19	< 0.001	0.002	< 0.001	< 0.05	< 0.0001	0.004	< 0.001
	15-Oct-19	< 0.001	0.005	< 0.001	< 0.05	< 0.0001	0.003	< 0.001
	18-Nov-19	< 0.001	0.001	< 0.001	< 0.05	< 0.0001	0.004	< 0.001
	16-Sep-20	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	16-Oct-20	< 0.001	0.006	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	16-Nov-20	< 0.001	0.002	< 0.001	< 0.05	< 0.0001	0.003	< 0.001
	16-Dec-20	< 0.001	0.006	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	14-Jan-21	< 0.001	0.002	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	16-Feb-21	< 0.001	0.003	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	17-Mar-21	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	24-Feb-22	< 0.001	0.003	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	21-Feb-19	< 0.001	0.008	< 0.001	< 0.05	< 0.0001	0.002	0.001
	15-Mar-19	< 0.001	0.005	< 0.001	< 0.05	< 0.0001	0.001	< 0.001
	23-Apr-19	< 0.001	0.006	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	16-May-19	< 0.001	0.005	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	14-Jun-19	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	0.001	< 0.001
	16-Jul-19	< 0.001	0.01	< 0.001	< 0.05	< 0.0001	0.002	< 0.001

BH11	15-Aug-19	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	16-Sep-19	< 0.001	0.005	< 0.001	< 0.05	< 0.0001	0.001	< 0.001
	15-Oct-19	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	18-Nov-19	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	16-Sep-20	< 0.001	0.014	< 0.001	< 0.05	< 0.0001	0.001	< 0.001
	16-Oct-20	< 0.001	0.007	< 0.001	< 0.05	< 0.0001	0.001	< 0.001
	16-Nov-20	< 0.001	0.007	< 0.001	< 0.05	< 0.0001	0.001	< 0.001
	16-Dec-20	< 0.001	0.008	< 0.001	< 0.05	< 0.0001	0.001	< 0.001
	14-Jan-21	< 0.001	0.008	< 0.001	< 0.05	< 0.0001	0.001	< 0.001
	16-Feb-21	< 0.001	0.008	< 0.001	< 0.05	< 0.0001	0.001	< 0.001
	17-Mar-21	< 0.001	0.01	< 0.001	< 0.05	< 0.0001	0.001	< 0.001
	22-Sep-21	< 0.001	0.007	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	13-Oct-21	< 0.001	0.007	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	16-Nov-21	< 0.001	0.005	< 0.001	< 0.05	< 0.0001	0.003	< 0.001
	15-Dec-21	< 0.001	-	-	-	-	-	-
	18-Jan-22	< 0.001	-	-	-	-	-	-
	24-Feb-22	< 0.001	0.007	< 0.001	< 0.05	< 0.0001	0.003	< 0.001
	12-Apr-22	< 0.001	-	-	-	-	-	-
BH12	16-Nov-20	< 0.001	-	-	-	< 0.0001	0.002	-
	24-Feb-22	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
BH2	22-Feb-19	< 0.001	0.005	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	15-Mar-19	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	23-Apr-19	< 0.001	0.005	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	16-May-19	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	14-Jun-19	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	16-Jul-19	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	15-Aug-19	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	16-Sep-19	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	15-Oct-19	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	18-Nov-19	< 0.001	0.007	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	16-Sep-20	< 0.001	0.012	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	16-Oct-20	< 0.001	0.005	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	16-Nov-20	< 0.001	0.005	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	16-Dec-20	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001

	14-Jan-21	< 0.001	0.002	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	16-Feb-21	< 0.001	0.003	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	17-Mar-21	< 0.001	0.005	< 0.001	< 0.05	< 0.0001	0.001	< 0.001
	22-Sep-21	< 0.001	-	-	-	-	-	-
	13-Oct-21	< 0.001	-	-	-	-	-	-
	16-Nov-21	< 0.001	0.003	-	-	-	< 0.001	-
	15-Dec-21	< 0.001	-	-	-	-	-	-
	18-Jan-22	< 0.001	-	-	-	-	-	-
	24-Feb-22	0.002	0.003	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	12-Apr-22	0.001	-	-	-	-	-	-
BH3	21-Feb-19	< 0.001	0.003	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
BH4	21-Feb-19	< 0.001	0.014	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	15-Mar-19	< 0.001	0.014	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	23-Apr-19	< 0.001	0.013	< 0.001	0.05	< 0.0001	< 0.001	< 0.001
	16-May-19	< 0.001	0.013	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	14-Jun-19	< 0.001	0.012	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	16-Jul-19	< 0.001	0.013	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	15-Aug-19	< 0.001	0.013	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	16-Sep-19	< 0.001	0.012	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	15-Oct-19	< 0.001	0.01	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	18-Nov-19	< 0.001	0.011	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	16-Sep-20	< 0.001	0.013	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	16-Oct-20	< 0.001	0.01	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	16-Nov-20	< 0.001	0.008	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	16-Dec-20	< 0.001	0.011	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	14-Jan-21	< 0.001	0.01	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	16-Feb-21	< 0.001	0.02	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	17-Mar-21	< 0.001	0.027	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	22-Sep-21	< 0.001	0.009	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	13-Oct-21	< 0.001	0.009	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	16-Nov-21	< 0.001	0.009	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	15-Dec-21	< 0.001	-	-	-	-	-	-
	18-Jan-22	< 0.001	-	-	-	-	-	-
	24-Feb-22	< 0.001	0.009	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001

	12-Apr-22	< 0.001	-	-	-	-	-
BH5	22-Feb-19	< 0.001	0.01	< 0.001	< 0.05	< 0.0001	0.001
	24-Feb-22	< 0.001	0.024	< 0.001	< 0.05	< 0.0001	0.001
	22-Feb-19	< 0.001	0.03	< 0.001	< 0.05	< 0.0001	< 0.001
BH6	14-Mar-19	< 0.001	0.027	< 0.001	< 0.05	< 0.0001	< 0.001
	23-Apr-19	< 0.001	0.03	< 0.001	< 0.05	< 0.0001	< 0.001
	16-May-19	< 0.001	0.029	< 0.001	< 0.05	< 0.0001	< 0.001
	14-Jun-19	< 0.001	0.027	< 0.001	< 0.05	< 0.0001	< 0.001
	16-Jul-19	< 0.001	0.026	< 0.001	< 0.05	< 0.0001	< 0.001
	15-Aug-19	< 0.001	0.026	< 0.001	< 0.05	< 0.0001	< 0.001
	16-Sep-19	< 0.001	0.034	< 0.001	< 0.05	< 0.0001	< 0.001
	15-Oct-19	< 0.001	0.026	< 0.001	< 0.05	< 0.0001	< 0.001
	18-Nov-19	< 0.001	0.03	< 0.001	< 0.05	< 0.0001	< 0.001
	16-Sep-20	< 0.001	0.047	< 0.001	< 0.05	< 0.0001	< 0.001
	16-Oct-20	< 0.001	0.04	< 0.001	< 0.05	< 0.0001	< 0.001
	16-Nov-20	< 0.001	0.061	< 0.001	< 0.05	< 0.0001	< 0.001
	16-Dec-20	< 0.001	0.07	< 0.001	< 0.05	< 0.0001	< 0.001
	14-Jan-21	< 0.001	0.054	< 0.001	< 0.05	< 0.0001	< 0.001
	16-Feb-21	< 0.001	0.048	< 0.001	< 0.05	< 0.0001	< 0.001
	17-Mar-21	< 0.001	0.068	< 0.001	< 0.05	< 0.0001	< 0.001
	22-Sep-21	0.002	0.02	< 0.001	< 0.05	< 0.0001	< 0.001
	13-Oct-21	0.002	0.014	< 0.001	< 0.05	< 0.0001	< 0.001
	16-Nov-21	< 0.001	0.013	< 0.001	< 0.05	< 0.0001	< 0.001
BH7	15-Dec-21	< 0.001	-	-	-	-	-
	18-Jan-22	< 0.001	-	-	-	-	-
	24-Feb-22	< 0.001	0.011	< 0.001	< 0.05	< 0.0001	< 0.001
	12-Apr-22	< 0.001	-	-	-	-	-
	22-Feb-19	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	0.002
	14-Mar-19	< 0.001	0.01	< 0.001	< 0.05	< 0.0001	0.001
	23-Apr-19	< 0.001	0.012	< 0.001	< 0.05	< 0.0001	0.002

BH7	16-Sep-19	< 0.001	0.016	< 0.001	0.06	< 0.0001	0.002	0.002
	15-Oct-19	< 0.001	0.009	< 0.001	< 0.05	< 0.0001	0.002	0.002
	18-Nov-19	< 0.001	0.016	< 0.001	< 0.05	< 0.0001	0.002	0.002
	16-Sep-20	< 0.001	0.013	< 0.001	< 0.05	< 0.0001	0.002	0.002
	16-Oct-20	< 0.001	0.009	< 0.001	< 0.05	< 0.0001	0.002	0.002
	16-Nov-20	< 0.001	0.006	< 0.001	< 0.05	< 0.0001	0.002	0.003
	16-Dec-20	< 0.001	0.003	< 0.001	< 0.05	< 0.0001	0.002	0.002
	14-Jan-21	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	0.002	0.002
	16-Feb-21	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	0.002	0.002
	17-Mar-21	< 0.001	0.009	< 0.001	< 0.05	< 0.0001	0.002	0.003
	22-Sep-21	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	0.003	< 0.001
	13-Oct-21	< 0.001	0.006	< 0.001	< 0.05	< 0.0001	0.003	< 0.001
	16-Nov-21	< 0.001	0.002	< 0.001	< 0.05	< 0.0001	0.003	< 0.001
	15-Dec-21	< 0.001	-	-	-	-	-	-
	18-Jan-22	< 0.001	-	-	-	-	-	-
	24-Feb-22	< 0.001	0.002	< 0.001	< 0.05	< 0.0001	0.003	< 0.001
	12-Apr-22	< 0.001	-	-	-	-	-	-
BH8	21-Feb-19	< 0.001	0.011	< 0.001	< 0.05	< 0.0001	0.001	< 0.001
	14-Mar-19	< 0.001	0.006	< 0.001	< 0.05	< 0.0001	0.001	< 0.001
	23-Apr-19	0.001	0.008	< 0.001	< 0.05	< 0.0001	0.001	< 0.001
	16-May-19	0.003	0.01	< 0.001	< 0.05	< 0.0001	0.001	< 0.001
	14-Jun-19	< 0.001	0.01	< 0.001	< 0.05	< 0.0001	0.001	< 0.001
	16-Jul-19	0.001	0.012	< 0.001	< 0.05	< 0.0001	0.001	< 0.001
	15-Aug-19	0.001	0.008	< 0.001	< 0.05	< 0.0001	0.001	< 0.001
	16-Sep-19	0.001	0.01	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	15-Oct-19	< 0.001	0.007	< 0.001	< 0.05	< 0.0001	0.001	< 0.001
	18-Nov-19	< 0.001	0.012	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	16-Sep-20	< 0.001	0.014	< 0.001	< 0.05	< 0.0001	0.001	< 0.001
	16-Oct-20	0.001	0.009	< 0.001	< 0.05	< 0.0001	0.001	< 0.001
	16-Nov-20	< 0.001	0.013	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	16-Dec-20	< 0.001	0.006	< 0.001	< 0.05	< 0.0001	0.001	< 0.001
	14-Jan-21	< 0.001	0.007	< 0.001	< 0.05	< 0.0001	0.001	< 0.001
	16-Feb-21	0.001	0.009	< 0.001	< 0.05	< 0.0001	0.001	< 0.001
	17-Mar-21	< 0.001	0.012	< 0.001	< 0.05	< 0.0001	0.001	< 0.001

	16-Nov-21	0.001	0.01	-	-	-	0.002	-
	16-Dec-21	-	-	-	-	-	-	-
	24-Feb-22	0.001	0.009	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
BH9	16-Nov-21	< 0.001	-	-	-	-	-	-
BH9A	16-Sep-20	< 0.001	0.028	< 0.001	< 0.05	< 0.0001	< 0.001	0.002
BH9a	16-Oct-20	< 0.001	0.001	< 0.001	< 0.05	< 0.0001	< 0.001	0.001
	16-Nov-20	< 0.001	0.001	< 0.001	< 0.05	< 0.0001	< 0.001	0.001
	16-Dec-20	< 0.001	0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	14-Jan-21	< 0.001	0.002	< 0.001	< 0.05	< 0.0001	0.001	< 0.001
	16-Feb-21	< 0.001	0.001	< 0.001	< 0.05	< 0.0001	< 0.001	0.001
BH9A	17-Mar-21	< 0.001	0.006	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	22-Sep-21	< 0.001	0.003	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	13-Oct-21	< 0.001	0.003	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001
	16-Nov-21	< 0.001	0.007	< 0.001	< 0.05	< 0.0001	< 0.001	0.001
	15-Dec-21	< 0.001	-	-	-	-	-	-
	18-Jan-22	< 0.001	-	-	-	-	-	-
	24-Feb-22	< 0.001	0.008	< 0.001	< 0.05	< 0.0001	< 0.001	0.001
	12-Apr-22	< 0.001	-	-	-	-	-	-
MW239S	22-Feb-19	< 0.001	0.007	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	14-Mar-19	< 0.001	0.008	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	23-Apr-19	< 0.001	0.008	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	16-May-19	< 0.001	0.005	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	14-Jun-19	< 0.001	0.005	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	16-Jul-19	< 0.001	0.006	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	15-Aug-19	< 0.001	0.006	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	16-Sep-19	< 0.001	0.01	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	15-Oct-19	< 0.001	0.005	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	18-Nov-19	< 0.001	0.01	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	16-Sep-20	< 0.001	0.016	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	16-Oct-20	< 0.001	0.009	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	16-Nov-20	< 0.001	0.01	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	16-Dec-20	< 0.001	0.01	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	14-Jan-21	< 0.001	0.011	< 0.001	< 0.05	< 0.0001	0.001	< 0.001
	16-Feb-21	< 0.001	0.011	< 0.001	< 0.05	< 0.0001	0.002	0.001

	17-Mar-21	< 0.001	0.011	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	22-Sep-21	< 0.001	0.005	< 0.001	< 0.05	< 0.0001	0.001	< 0.001
	13-Oct-21	< 0.001	0.003	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	16-Nov-21	< 0.001	0.005	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	15-Dec-21	< 0.001	-	-	-	-	-	-
	18-Jan-22	< 0.001	-	-	-	-	-	-
	24-Feb-22	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	0.002	< 0.001
	12-Apr-22	< 0.001	-	-	-	-	-	-
WPW	22-Sep-21	< 0.001	-	-	-	-	-	-
	13-Oct-21	< 0.001	-	-	-	-	-	-
	16-Nov-21	< 0.001	-	-	-	-	-	-
	15-Dec-21	< 0.001	-	-	-	-	-	-
	18-Jan-22	< 0.001	-	-	-	-	-	-
	24-Feb-22	< 0.001	-	-	-	-	-	-
	12-Apr-22	< 0.001	-	-	-	-	-	-

Notes:

- - Not analysed

< - Less than laboratory limit of reporting

mg/L - Milligrams per litre

Bold indicates a detection above the laboratory limit of reporting

"*" denotes duplicate/triplicate sample result adopted for analytical use due to RPD >50%

RPD - Relative Percentage Difference

Criteria:

Metals								
Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Vanadium	Zinc
mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
0.083	4.1 (8.84 for BH1)	0.001	0.136	0.0001	0.02	0.01	0.01	0.085 (0.1 for BH1)
2	-	0.01	0.5	0.001	0.02	0.01	-	-
< 0.001	13	< 0.001	0.014	< 0.0001	< 0.001	< 0.01	< 0.01	1.27
0.002	10	0.001	0.015	< 0.0001	0.002	< 0.01	< 0.01	0.363
< 0.001	8.33	< 0.001	0.009	< 0.0001	0.002	< 0.01	< 0.01	0.132
0.001	6.31	< 0.001	0.009	< 0.0001	< 0.001	< 0.01	< 0.01	0.074
0.002	7.35	< 0.001	0.01	< 0.0001	0.001	< 0.01	< 0.01	0.116
0.002	7.96	< 0.001	0.008	< 0.0001	< 0.001	< 0.01	< 0.01	0.023
0.001	8.84	< 0.001	0.009	< 0.0001	< 0.001	< 0.01	< 0.01	0.034
0.006	-	< 0.001	0.007	< 0.0001	< 0.001	< 0.01	< 0.01	0.037
< 0.001	11	< 0.001	0.008	< 0.0001	0.001	< 0.01	< 0.01	0.012
0.005	5.48	< 0.001	0.01	< 0.0001	< 0.001	< 0.01	< 0.01	0.016
0.001	5.55	< 0.001	0.009	< 0.0001	< 0.001	< 0.01	< 0.01	0.017
0.001	7.05	< 0.001	0.012	< 0.0001	< 0.001	< 0.01	< 0.01	0.045
0.008	3.21	< 0.001	0.011	< 0.0001	0.001	< 0.01	< 0.01	0.077
0.001	5.21	< 0.001	0.013	< 0.0001	< 0.001	< 0.01	< 0.01	0.032
0.001	3.24	< 0.001	0.015	< 0.0001	< 0.001	< 0.01	< 0.01	0.652
< 0.001	4.0	< 0.001	0.027	< 0.0001	< 0.001	< 0.01	< 0.01	0.596
< 0.001	7.7	< 0.001	0.018	< 0.0001	< 0.001	< 0.01	< 0.01	0.106
< 0.001	0.26	< 0.001	0.003	< 0.0001	0.005	< 0.01	< 0.01	0.031
< 0.001	1.49	< 0.001	0.007	< 0.0001	0.037	< 0.01	< 0.01	0.016
< 0.001	0.98	< 0.001	0.007	< 0.0001	0.07	< 0.01	< 0.01	0.04
< 0.001	0.97	< 0.001	0.006	< 0.0001	0.004	< 0.01	< 0.01	0.024
< 0.001	0.98	< 0.001	0.005	< 0.0001	0.001	< 0.01	< 0.01	0.005
< 0.001	0.47	< 0.001	0.003	< 0.0001	0.004	< 0.01	< 0.01	0.007

0.001	0.87	< 0.001	0.007	< 0.0001	0.001	< 0.01	< 0.01	0.005
< 0.001	0.79	< 0.001	0.008	< 0.0001	0.002	< 0.01	< 0.01	0.012
0.004	-	< 0.001	0.006	< 0.0001	0.003	< 0.01	< 0.01	0.016
< 0.001	0.95	< 0.001	0.008	< 0.0001	0.002	< 0.01	< 0.01	< 0.005
0.005	0.9	< 0.001	0.008	< 0.0001	< 0.001	< 0.01	< 0.01	0.009
< 0.001	1.06	< 0.001	0.009	< 0.0001	0.002	< 0.01	< 0.01	0.01
< 0.001	0.84	< 0.001	0.011	< 0.0001	0.002	< 0.01	< 0.01	0.016
< 0.001	1.0	< 0.001	0.009	< 0.0001	0.002	< 0.01	< 0.01	0.008
0.025	0.56	< 0.001	0.006	< 0.0001	0.004	< 0.01	< 0.01	0.018
0.018	0.59	< 0.001	0.008	< 0.0001	0.007	< 0.01	< 0.01	0.03
< 0.001	0.2	< 0.001	0.002	< 0.0001	0.003	< 0.01	< 0.01	0.014
< 0.001	0.72	< 0.001	0.003	< 0.0001	0.004	< 0.01	< 0.01	0.042
< 0.001	0.69	< 0.001	0.005	< 0.0001	0.002	< 0.01	< 0.01	0.037
< 0.001	0.92	< 0.001	0.002	< 0.0001	0.004	< 0.01	< 0.01	0.036
-	0.92	-	0.003	-	-	-	-	-
-	1.06	-	0.003	-	-	-	-	-
< 0.001	1.25	< 0.001	0.003	< 0.0001	0.004	< 0.01	< 0.01	0.036
-	1.06	-	0.004	-	-	-	-	-
0.002	-	< 0.001	-	< 0.0001	0.002	-	-	0.017
< 0.001	0.33	< 0.001	0.006	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
0.002	0.14	< 0.001	0.021	< 0.0001	0.015	< 0.01	< 0.01	0.006
0.003	< 0.05	< 0.001	0.02	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
0.004	0.19	< 0.001	0.018	< 0.0001	0.001	< 0.01	< 0.01	0.008
0.001	0.06	< 0.001	0.014	< 0.0001	0.001	< 0.01	< 0.01	< 0.005
0.004	0.08	< 0.001	0.009	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
0.008	0.05	< 0.001	0.013	< 0.0001	0.001	< 0.01	< 0.01	0.006
0.012	0.08	< 0.001	0.011	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
0.008	0.26	< 0.001	0.014	< 0.0001	0.001	< 0.01	< 0.01	0.007
0.006	-	< 0.001	0.011	< 0.0001	< 0.001	< 0.01	< 0.01	0.007
0.013	0.08	< 0.001	0.011	< 0.0001	0.007	< 0.01	< 0.01	0.028
0.026	0.07	< 0.001	0.016	< 0.0001	< 0.001	< 0.01	< 0.01	0.006
0.013	< 0.05	< 0.001	0.015	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
0.02	0.36	< 0.001	0.015	< 0.0001	< 0.001	< 0.01	< 0.01	0.018
0.011	< 0.05	< 0.001	0.014	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005

0.006	< 0.05	< 0.001	0.016	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
0.021	< 0.05	< 0.001	0.009	< 0.0001	0.007	< 0.01	< 0.01	0.017
0.003	< 0.05	< 0.001	0.016	< 0.0001	< 0.001	< 0.01	< 0.01	0.006
-	< 0.05	-	0.013	-	-	-	-	-
-	0.08	-	0.012	-	-	-	-	-
0.006	< 0.05	-	-	-	< 0.001	-	-	< 0.005
-	0.05	-	0.008	-	-	-	-	-
-	0.49	-	0.012	-	-	-	-	-
< 0.001	< 0.05	< 0.001	0.009	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
-	0.25	-	0.009	-	-	-	-	-
< 0.001	0.06	< 0.001	0.005	< 0.0001	0.053	< 0.01	< 0.01	< 0.005
0.002	0.16	< 0.001	0.039	< 0.0001	0.018	< 0.01	< 0.01	0.014
0.001	< 0.05	< 0.001	0.014	< 0.0001	0.022	< 0.01	< 0.01	0.043
0.002	0.99	< 0.001	0.045	< 0.0001	0.007	< 0.01	< 0.01	0.008
< 0.001	0.27	< 0.001	0.022	< 0.0001	0.022	< 0.01	< 0.01	0.011
0.038	< 0.05	< 0.001	0.014	< 0.0001	< 0.001	< 0.01	< 0.01	0.005
0.046	< 0.05	< 0.001	0.019	< 0.0001	< 0.001	< 0.01	< 0.01	0.007
0.026	< 0.05	< 0.001	0.018	< 0.0001	0.001	< 0.01	< 0.01	0.007
0.051	0.19	< 0.001	0.026	< 0.0001	0.002	< 0.01	< 0.01	0.005
0.011	-	< 0.001	0.136	< 0.0001	0.002	< 0.01	< 0.01	0.014
0.005	< 0.05	< 0.001	0.013	< 0.0001	0.001	< 0.01	< 0.01	< 0.005
0.078	0.06	< 0.001	0.012	< 0.0001	< 0.001	< 0.01	< 0.01	0.006
0.003	0.25	< 0.001	0.021	< 0.0001	0.001	< 0.01	< 0.01	0.018
0.005	0.18	< 0.001	0.008	< 0.0001	0.001	< 0.01	< 0.01	0.005
0.002	0.46	< 0.001	0.027	< 0.0001	0.003	< 0.01	< 0.01	< 0.005
0.012	0.27	< 0.001	0.012	< 0.0001	0.002	< 0.01	< 0.01	0.006
0.002	0.94	< 0.001	0.023	< 0.0001	0.003	< 0.01	< 0.01	0.008
0.006	1.39	< 0.001	0.029	< 0.0001	0.002	< 0.01	< 0.01	0.019
0.172	0.1	< 0.001	0.02	< 0.0001	< 0.001	< 0.01	< 0.01	0.006
0.026	1.65	< 0.001	0.019	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
0.012	0.38	< 0.001	0.021	< 0.0001	0.001	< 0.01	< 0.01	0.006
-	0.69	-	0.016	-	-	-	-	-
-	0.52	-	0.018	-	-	-	-	-
< 0.001	0.62	< 0.001	0.017	< 0.0001	< 0.001	< 0.01	< 0.01	0.008

-	0.27	-	0.017	-	-	-	-	-
< 0.001	1.4	< 0.001	0.005	< 0.0001	0.003	< 0.01	< 0.01	0.008
< 0.001	1.64	< 0.001	0.005	< 0.0001	0.002	< 0.01	< 0.01	< 0.005
< 0.001	1.03	< 0.001	0.014	< 0.0001	0.001	< 0.01	< 0.01	0.019
< 0.001	1.9	< 0.001	0.01	< 0.0001	< 0.001	< 0.01	< 0.01	0.012
0.001	0.96	< 0.001	0.01	< 0.0001	< 0.001	< 0.01	< 0.01	0.022
< 0.001	2.57	< 0.001	0.009	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
0.001	2.86	< 0.001	0.008	< 0.0001	< 0.001	< 0.01	< 0.01	0.008
0.002	2.41	< 0.001	0.008	< 0.0001	< 0.001	< 0.01	< 0.01	0.005
0.001	2.19	< 0.001	0.008	< 0.0001	< 0.001	< 0.01	< 0.01	0.007
0.008	2.08	< 0.001	0.012	< 0.0001	0.007	< 0.01	< 0.01	0.035
< 0.001	-	< 0.001	0.009	< 0.0001	< 0.001	< 0.01	< 0.01	0.006
< 0.001	1.58	< 0.001	0.009	< 0.0001	0.008	< 0.01	< 0.01	0.073
0.002	1.78	< 0.001	0.01	< 0.0001	< 0.001	< 0.01	< 0.01	0.006
< 0.001	1.84	< 0.001	0.011	< 0.0001	< 0.001	< 0.01	< 0.01	0.007
< 0.001	1.72	< 0.001	0.014	< 0.0001	< 0.001	< 0.01	< 0.01	0.01
< 0.001	1.64	< 0.001	0.014	< 0.0001	< 0.001	< 0.01	< 0.01	0.007
0.011	1.06	< 0.001	0.014	< 0.0001	0.002	< 0.01	< 0.01	0.025
0.013	1.18	< 0.001	0.012	< 0.0001	0.002	< 0.01	< 0.01	0.012
< 0.001	1.39	< 0.001	0.012	< 0.0001	< 0.001	< 0.01	< 0.01	0.006
< 0.001	0.55	< 0.001	0.005	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
< 0.001	0.65	< 0.001	0.004	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
< 0.001	0.83	< 0.001	0.004	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
-	0.66	-	0.002	-	-	-	-	-
-	0.7	-	0.003	-	-	-	-	-
< 0.001	0.55	< 0.001	0.001	< 0.0001	< 0.001	< 0.01	< 0.01	0.031
-	3.24	-	0.016	-	-	-	-	-
< 0.001	1.8	< 0.001	0.026	< 0.0001	0.004	< 0.01	< 0.01	0.019
< 0.001	1.8	< 0.001	0.02	< 0.0001	0.004	< 0.01	< 0.01	0.009
< 0.001	2.0	< 0.001	0.026	< 0.0001	0.004	< 0.01	< 0.01	0.01
< 0.001	2.32	< 0.001	0.035	< 0.0001	0.005	< 0.01	< 0.01	0.013
< 0.001	2.06	< 0.001	0.03	< 0.0001	0.004	< 0.01	< 0.01	0.006
< 0.001	1.66	< 0.001	0.025	< 0.0001	0.003	< 0.01	< 0.01	< 0.005
< 0.001	1.54	< 0.001	0.023	< 0.0001	0.003	< 0.01	< 0.01	< 0.005

0.007	1.42	0.001	0.024	< 0.0001	0.02	< 0.01	< 0.01	0.085
0.003	-	< 0.001	0.018	< 0.0001	0.003	< 0.01	< 0.01	0.011
< 0.001	1.1	< 0.001	0.015	< 0.0001	0.013	< 0.01	< 0.01	0.053
< 0.001	1.67	< 0.001	0.021	< 0.0001	0.003	< 0.01	< 0.01	0.006
< 0.001	1.49	< 0.001	0.015	< 0.0001	0.003	< 0.01	< 0.01	0.015
< 0.001	1.72	< 0.001	0.023	< 0.0001	0.003	< 0.01	< 0.01	0.006
< 0.001	1.79	< 0.001	0.024	< 0.0001	0.003	< 0.01	< 0.01	< 0.005
0.004	1.65	< 0.001	0.025	< 0.0001	0.004	< 0.01	< 0.01	0.017
0.002	1.74	< 0.001	0.025	< 0.0001	0.004	< 0.01	< 0.01	0.013
< 0.001	2.28	< 0.001	0.028	< 0.0001	0.005	< 0.01	< 0.01	< 0.005
< 0.001	0.62	< 0.001	0.005	< 0.0001	0.002	< 0.01	< 0.01	< 0.005
< 0.001	0.69	0.002	0.005	< 0.0001	0.002	< 0.01	< 0.01	< 0.005
< 0.001	0.39	< 0.001	0.003	< 0.0001	0.002	< 0.01	< 0.01	0.007
-	0.47	-	0.002	-	-	-	-	-
-	0.45	-	0.002	-	-	-	-	-
< 0.001	0.66	< 0.001	0.003	< 0.0001	0.002	< 0.01	< 0.01	< 0.005
-	0.43	-	0.004	-	-	-	-	-
< 0.001	4.1	< 0.001	0.012	< 0.0001	0.002	< 0.01	< 0.01	0.015 *
< 0.001	3.25	< 0.001	0.008	< 0.0001	0.002	< 0.01	< 0.01	< 0.005
< 0.001	3.2	< 0.001	0.009	< 0.0001	0.002	< 0.01	< 0.01	0.008
< 0.001	3.0	< 0.001	0.01	< 0.0001	0.003	< 0.01	< 0.01	< 0.005
< 0.001	2.5	< 0.001	0.005	< 0.0001	0.002	< 0.01	< 0.01	0.006
< 0.001	2.6	< 0.001	0.004	< 0.0001	0.002	< 0.01	< 0.01	< 0.005
< 0.001	1.72	< 0.001	0.004	< 0.0001	0.001	< 0.01	< 0.01	< 0.005
< 0.001	2.06	< 0.001	0.005	< 0.0001	0.002	< 0.01	< 0.01	< 0.005
0.002	-	< 0.001	0.009	< 0.0001	0.002	< 0.01	< 0.01	0.011
0.002	2.49	< 0.001	0.01	< 0.0001	0.013	< 0.01	< 0.01	0.053
0.035	3.35	0.001	0.009	< 0.0001	0.009	< 0.01	< 0.01	0.039
< 0.001	3.03	< 0.001	0.007	< 0.0001	0.002	< 0.01	< 0.01	0.012
< 0.001	3.48	< 0.001	0.008	< 0.0001	0.002	< 0.01	< 0.01	< 0.005
0.001	2.98	< 0.001	0.01	< 0.0001	0.001	< 0.01	< 0.01	< 0.005
0.002	2.71	< 0.001	0.01	< 0.0001	0.005	< 0.01	< 0.01	0.009
0.004	2.99	< 0.001	0.01	< 0.0001	0.006	< 0.01	< 0.01	0.013
< 0.001	3.86	< 0.001	0.01	< 0.0001	0.002	< 0.01	< 0.01	< 0.005

< 0.001	4.23	-	-	-	0.002	-	-	< 0.005
-	3.78	-	-	-	-	-	-	-
< 0.001	2.98	< 0.001	0.007	< 0.0001	0.002	< 0.01	< 0.01	0.012
-	< 0.05	-	0.014	-	-	-	-	-
0.004	0.14	< 0.001	0.076	< 0.0001	0.002	< 0.01	< 0.01	0.02
0.001	0.06	< 0.001	0.042	< 0.0001	0.003	< 0.01	< 0.01	0.016
0.001	0.11	< 0.001	0.03	< 0.0001	0.002	< 0.01	< 0.01	0.011
0.001	0.31	< 0.001	0.024	< 0.0001	0.002	< 0.01	< 0.01	0.006
0.017	0.14	< 0.001	0.025	< 0.0001	0.004	< 0.01	< 0.01	0.011
< 0.001	0.35	< 0.001	0.024	< 0.0001	0.003	< 0.01	< 0.01	0.006
< 0.001	0.27	< 0.001	0.024	< 0.0001	0.002	< 0.01	< 0.01	0.01
< 0.001	0.32	< 0.001	0.027	< 0.0001	0.003	< 0.01	< 0.01	< 0.005
< 0.001	0.51	< 0.001	0.033	< 0.0001	0.003	< 0.01	< 0.01	0.021
< 0.001	0.33	< 0.001	0.025	< 0.0001	0.003	< 0.01	< 0.01	0.031
-	0.48	-	0.025	-	-	-	-	-
-	0.44	-	0.03	-	-	-	-	-
< 0.001	0.5	< 0.001	0.042	< 0.0001	0.004	< 0.01	< 0.01	0.006
-	0.48	-	0.038	-	-	-	-	-
< 0.001	1.11	< 0.001	0.003	< 0.0001	0.001	< 0.01	< 0.01	0.006
< 0.001	1.25	< 0.001	0.005	< 0.0001	0.005	< 0.01	< 0.01	0.008
< 0.001	1.01	< 0.001	0.004	< 0.0001	0.004	< 0.01	< 0.01	0.007
< 0.001	0.87	< 0.001	0.003	< 0.0001	0.002	< 0.01	< 0.01	< 0.005
0.002	0.8	< 0.001	0.003	< 0.0001	0.001	< 0.01	< 0.01	< 0.005
< 0.001	0.87	< 0.001	0.003	< 0.0001	0.002	< 0.01	< 0.01	< 0.005
< 0.001	1.0	< 0.001	0.004	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
0.002	0.94	< 0.001	0.006	< 0.0001	0.006	< 0.01	< 0.01	0.032
0.003	-	< 0.001	0.004	< 0.0001	0.002	< 0.01	< 0.01	0.011
< 0.001	1.1	< 0.001	0.004	< 0.0001	0.008	< 0.01	< 0.01	0.03
0.002	0.51	< 0.001	0.008	< 0.0001	0.002	< 0.01	< 0.01	0.006
< 0.001	1.17	< 0.001	0.009	< 0.0001	0.002	< 0.01	< 0.01	0.005
0.001	0.3	< 0.001	0.011	< 0.0001	0.003	< 0.01	< 0.01	0.021
< 0.001	1.06	< 0.001	0.011	< 0.0001	0.002	< 0.01	< 0.01	< 0.005
0.005	0.77	< 0.001	0.012	< 0.0001	0.004	< 0.01	< 0.01	0.011
0.01	0.92	< 0.001	0.012	< 0.0001	0.009	< 0.01	< 0.01	0.014

< 0.001	0.95	< 0.001	0.01	< 0.0001	0.004	< 0.01	< 0.01	0.009
< 0.001	0.65	< 0.001	0.004	< 0.0001	0.001	< 0.01	< 0.01	0.005
< 0.001	0.79	< 0.001	0.008	< 0.0001	0.002	< 0.01	< 0.01	0.016
< 0.001	0.68	< 0.001	0.006	< 0.0001	0.002	< 0.01	< 0.01	0.01
-	0.77	-	0.005	-	-	-	-	-
-	0.48	-	0.003	-	-	-	-	-
< 0.001	0.55	< 0.001	0.004	< 0.0001	0.002	< 0.01	< 0.01	0.006
-	0.93	-	0.007	-	-	-	-	-
-	0.08	-	0.051	-	-	-	-	-
-	0.22	-	0.079	-	-	-	-	-
-	0.29	-	0.045	-	-	-	-	-
-	0.2	-	0.078	-	-	-	-	-
-	0.56	-	0.038	-	-	-	-	-
-	1.02	-	0.084	-	-	-	-	-
-	4.3 *	-	0.042	-	-	-	-	-

Analyte		Perfluoroalkyl Sulfonic Acids					Perfluorodecanesulfonic acid (PFDS) µg/L
		Perfluorobutane sulfonic acid (PFBS) µg/L	Perfluoropentane sulfonic acid (PFPeS) µg/L	Perfluorohexane sulfonic acid (PFHxS) µg/L	Perfluoroheptane sulfonate (PFHpS) µg/L	Perfluorooctane sulfonic acid (PFOS) µg/L	
Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Adopted Site Specific Trigger Values							
HEPA NEMP 2020***						0.13	
HEPA NEMP 2020 ⁴							
Sample Name	Sample Date						
BH1	17-Mar-21	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02
	24-Feb-22	< 0.02	< 0.02	< 0.01	< 0.02	< 0.01	< 0.02
BH11	21-Feb-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02
	16-Sep-20	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02
	16-Oct-20	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02
	16-Nov-20	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02
	16-Dec-20	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02
	14-Jan-21	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02
	16-Feb-21	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02
	17-Mar-21	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02
	22-Sep-21	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02
	13-Oct-21	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02
	16-Nov-21	< 0.02	< 0.02	< 0.01	< 0.02	< 0.01	< 0.02
	24-Feb-22	< 0.02	< 0.02	< 0.01	< 0.02	< 0.01	< 0.02
BH12	24-Feb-22	< 0.02	< 0.02	< 0.01	< 0.02	< 0.01	< 0.02
BH2	22-Feb-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02
	16-Sep-20	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02
	16-Oct-20	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02
	16-Nov-20	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02
	16-Dec-20	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02
	14-Jan-21	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02
	16-Feb-21	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02
	17-Mar-21	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02
	16-Nov-21	< 0.02	< 0.02	< 0.01	< 0.02	< 0.01	< 0.02

WPW	22-Sep-21	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02
	13-Oct-21	< 0.02	< 0.02	< 0.02	< 0.02	0.01	< 0.02
	16-Nov-21	< 0.02	< 0.02	< 0.01	< 0.02	< 0.01	< 0.02
	15-Dec-21	< 0.02	< 0.02	< 0.01	< 0.02	0.03	< 0.02
	18-Jan-22	< 0.02	< 0.02	< 0.01	< 0.02	0.03	< 0.02
	24-Feb-22	< 0.02	< 0.02	0.01	< 0.02	< 0.01	< 0.02
	12-Apr-22	< 0.02	< 0.02	< 0.01	< 0.02	< 0.01	< 0.02

Notes:

- - Not analysed

< - Less than laboratory limit of reporting

µg/L - Micrograms per litre

Bold indicates a detection above the laboratory limit of reporting

Criteria:

< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01
< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	0.01	0.01
< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01
< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	0.03	0.03
< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	0.03	0.03
< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	0.01	0.01
< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01

Sum of PFAS

$\mu\text{g/L}$

< 0.01
0.01
< 0.01
0.03
0.03
0.01
< 0.01

Analyte			Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Sample Name	Sample Date	Sample Type						
TRIP BLANK_13022019	13-Feb-19	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
TRIP BLANK_130319	13-Mar-19	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
TRIP BLANK02_150319	15-Mar-19	Trip Blank	< 0.001	0.002	< 0.001	< 0.05	< 0.0001	< 0.001
TRIP BLANK 03_23042019	23-Apr-19	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
TRIP BLANK 04_16052019	16-May-19	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
TRIP BLANK 05_14062019	14-Jun-19	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
TRIP BLANK 06_16072019	16-Jul-19	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
TRIP BLANK 08_16092019	16-Sep-19	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
TRIP BLANK_15102019	15-Oct-19	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
TRIPBLANK09_181119	18-Nov-19	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
QW33_160920	16-Sep-20	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
QW39_161020	16-Oct-20	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
QW39_161120	16-Nov-20	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
QW39_140121	14-Jan-21	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
QW40_170321	17-Mar-21	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
TRIP BLANK_SEP_220921	22-Sep-21	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
TRIP BLANK_131021	13-Oct-21	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
QC02_161121	16-Nov-21	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
QC02_15122021	15-Dec-21	Trip Blank	< 0.001	-	-	-	-	-
QC02_180122	18-Jan-22	Trip Blank	< 0.001	-	-	-	-	-
QC02_24022022	24-Feb-22	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
QC02_12042022	12-Apr-22	Trip Blank	< 0.001	-	-	-	-	-
RINSATE01_21022019	21-Feb-19	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
RINSATE02_140319	14-Mar-19	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
RINSATE 03_23042019	23-Apr-19	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
RINSATE 04_16052019	16-May-19	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001

RINSATE 05_14062019	14-Jun-19	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
RINSATE06_16072019	16-Jul-19	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
RINSATE07_15082019	15-Aug-19	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
RINSATE 08_16092019	16-Sep-19	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
RINSATE 15102019	15-Oct-19	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
RINSATE09_181119	18-Nov-19	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
QW32_160920	16-Sep-20	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
QW38_161020	16-Oct-20	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
QW38_161120	16-Nov-20	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
QW38_161220	16-Dec-20	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
QW39_161220	16-Dec-20	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
QW38_140121	14-Jan-21	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
QW38_160221	16-Feb-21	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
QW39_160221	16-Feb-21	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
QW41_170321	17-Mar-21	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
RINSATE SEP_220921	22-Sep-21	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
RINSATE_131021	13-Oct-21	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
QC01_161121	16-Nov-21	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
QC01_15122021	15-Dec-21	Rinsate	< 0.001	-	-	-	-	-
QC01_180122	18-Jan-22	Rinsate	< 0.001	-	-	-	-	-
QC01_24022022	24-Feb-22	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001
QC01_12042022	12-Apr-22	Rinsate	< 0.001	-	-	-	-	-
BH8_21022019	21-Feb-19	Primary	< 0.001	0.011	< 0.001	< 0.05	< 0.0001	0.001
DUP01_21022019	21-Feb-19	Duplicate	0.001	0.014	< 0.001	< 0.05	< 0.0001	0.001
Relative Percentage Difference			0%	24%	NC	NC	NC	0%
BH8_21022019	21-Feb-19	Primary	< 0.001	0.011	< 0.001	< 0.05	< 0.0001	0.001
TRIP01_21022019	21-Feb-19	Triplicate	0.001	< 0.02	< 0.001	< 0.05	< 0.0002	< 0.005
Relative Percentage Difference			0%	58%	NC	NC	NC	133%
BH7_140319	14-Mar-19	Primary	< 0.001	0.01	< 0.001	< 0.05	< 0.0001	0.001
DUP02_140319	14-Mar-19	Duplicate	< 0.001	0.01	< 0.001	< 0.05	< 0.0001	0.001
Relative Percentage Difference			NC	0%	NC	NC	NC	0%
BH7_140319	14-Mar-19	Primary	< 0.001	0.01	< 0.001	< 0.05	< 0.0001	0.001
TRIP02_14032019	14-Mar-19	Triplicate	< 0.001	< 0.02	< 0.001	< 0.05	< 0.0002	0.001
Relative Percentage Difference			NC	67%	NC	NC	NC	0%

WPW_15122021	15-Dec-21	Primary	< 0.001	-	-	-	-	-
QW72_15122021	15-Dec-21	Duplicate	< 0.001	-	-	-	-	-
Relative Percentage Difference			NC	NC	NC	NC	NC	NC
WPW_15122021	15-Dec-21	Primary	< 0.001	-	-	-	-	-
QW73_15122021	15-Dec-21	Triplicate	< 0.001	-	-	-	-	-
Relative Percentage Difference			NC	NC	NC	NC	NC	NC
WPW_180122	18-Jan-22	Primary	< 0.001	-	-	-	-	-
QW74_180122	18-Jan-22	Duplicate	< 0.001	-	-	-	-	-
Relative Percentage Difference			NC	NC	NC	NC	NC	NC
WPW_180122	18-Jan-22	Primary	< 0.001	-	-	-	-	-
QW75_18012022	18-Jan-22	Triplicate	< 0.001	-	-	-	-	-
Relative Percentage Difference			NC	NC	NC	NC	NC	NC
WPW_12042022	12-Apr-22	Primary	< 0.001	-	-	-	-	-
QW82_12042022	12-Apr-22	Duplicate	< 0.001	-	-	-	-	-
Relative Percentage Difference			NC	NC	NC	NC	NC	NC
WPW_12042022	12-Apr-22	Primary	< 0.001	-	-	-	-	-
QW83_04122022	12-Apr-22	Triplicate	0.001	-	-	-	-	-
Relative Percentage Difference			0%	NC	NC	NC	NC	NC

Notes:

-- Not analysed

< - Less than laboratory limit of reporting

NC - Not calculated

mg/L - Milligrams per litre

RPD - Relative Percentage Difference

Criteria:

-	-	-	0.2	-	0.078	-	-	-	-
-	-	-	0.17	-	0.081	-	-	-	-
NC	NC	NC	16%	NC	4%	NC	NC	NC	NC
-	-	-	0.2	-	0.078	-	-	-	-
-	-	-	0.14	-	0.07	-	-	-	-
NC	NC	NC	35%	NC	11%	NC	NC	NC	NC
-	-	-	0.56	-	0.038	-	-	-	-
-	-	-	0.49	-	0.04	-	-	-	-
NC	NC	NC	13%	NC	5%	NC	NC	NC	NC
-	-	-	0.56	-	0.038	-	-	-	-
-	-	-	1.7	-	0.049	-	-	-	-
NC	NC	NC	101%	NC	25%	NC	NC	NC	NC
-	-	-	0.44	-	0.042	-	-	-	-
-	-	-	0.2	-	0.042	-	-	-	-
NC	NC	NC	75%	NC	0%	NC	NC	NC	NC
-	-	-	0.44	-	0.042	-	-	-	-
-	-	-	4.3	-	0.049	-	-	-	-
NC	NC	NC	163%	NC	15%	NC	NC	NC	NC

Zinc
mg/L
< 0.005
< 0.005
< 0.005
< 0.005
< 0.005
< 0.005
< 0.005
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< 0.005
< 0.005
< 0.005
< 0.005
-
-
< 0.005
-
0.005
0.015
100%
0.005
0.006
18%
0.009
0.007
25%
0.009
< 0.005
57%

-
-
NC
-
-
NC

Analyte			Perfluoroalkyl Sulfonic Acids				
			Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonate (PFHpS)	Perfluorooctane sulfonic acid (PFOS)
Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Sample Name	Sample Date	Sample Type					
TRIP BLANK_13022019	13-Feb-19	Trip Blank	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
TRIP BLANK_130319	13-Mar-19	Trip Blank	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
TRIP BLANK02_150319	15-Mar-19	Trip Blank	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
TRIP BLANK 03_23042019	23-Apr-19	Trip Blank	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
TRIP BLANK 04_16052019	16-May-19	Trip Blank	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
TRIP BLANK 05_14062019	14-Jun-19	Trip Blank	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
TRIP BLANK 06_16072019	16-Jul-19	Trip Blank	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
TRIP BLANK 08_16092019	16-Sep-19	Trip Blank	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
TRIP BLANK_15102019	15-Oct-19	Trip Blank	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
TRIPBLANK09_181119	18-Nov-19	Trip Blank	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
QW33_160920	16-Sep-20	Trip Blank	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
QW39_161020	16-Oct-20	Trip Blank	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
QW39_161120	16-Nov-20	Trip Blank	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
QW39_140121	14-Jan-21	Trip Blank	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
QW40_170321	17-Mar-21	Trip Blank	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
TRIP BLANK_SEP_220921	22-Sep-21	Trip Blank	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
TRIP BLANK_131021	13-Oct-21	Trip Blank	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
QC02_161121	16-Nov-21	Trip Blank	< 0.02	< 0.02	< 0.01	< 0.02	< 0.01
QC02_15122021	15-Dec-21	Trip Blank	< 0.02	< 0.02	< 0.01	< 0.02	< 0.01
QC02_180122	18-Jan-22	Trip Blank	< 0.02	< 0.02	< 0.01	< 0.02	< 0.01
QC02_24022022	24-Feb-22	Trip Blank	< 0.02	< 0.02	< 0.01	< 0.02	< 0.01
QC02_12042022	12-Apr-22	Trip Blank	< 0.02	< 0.02	< 0.01	< 0.02	< 0.01
RINSATE01_21022019	21-Feb-19	Rinsate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
RINSATE02_140319	14-Mar-19	Rinsate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
RINSATE 03_23042019	23-Apr-19	Rinsate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
RINSATE 04_16052019	16-May-19	Rinsate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
RINSATE 05_14062019	14-Jun-19	Rinsate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01

RINSATE06_16072019	16-Jul-19	Rinsate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
RINSATE07_15082019	15-Aug-19	Rinsate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
RINSATE_08_16092019	16-Sep-19	Rinsate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
RINSATE_15102019	15-Oct-19	Rinsate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
RINSATE09_181119	18-Nov-19	Rinsate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
QW32_160920	16-Sep-20	Rinsate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
QW38_161020	16-Oct-20	Rinsate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
QW38_161120	16-Nov-20	Rinsate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
QW38_161220	16-Dec-20	Rinsate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
QW39_161220	16-Dec-20	Rinsate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
QW38_140121	14-Jan-21	Rinsate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
QW38_160221	16-Feb-21	Rinsate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
QW39_160221	16-Feb-21	Rinsate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
QW41_170321	17-Mar-21	Rinsate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
RINSATE_SEP_220921	22-Sep-21	Rinsate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
RINSATE_131021	13-Oct-21	Rinsate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
QC01_161121	16-Nov-21	Rinsate	< 0.02	< 0.02	< 0.01	< 0.02	< 0.01
QC01_15122021	15-Dec-21	Rinsate	< 0.02	< 0.02	< 0.01	< 0.02	< 0.01
QC01_180122	18-Jan-22	Rinsate	< 0.02	< 0.02	< 0.01	< 0.02	< 0.01
QC01_24022022	24-Feb-22	Rinsate	< 0.02	< 0.02	< 0.01	< 0.02	< 0.01
QC01_12042022	12-Apr-22	Rinsate	< 0.02	< 0.02	< 0.01	< 0.02	< 0.01
BH8_21022019	21-Feb-19	Primary	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
DUP01_21022019	21-Feb-19	Duplicate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
Relative Percentage Difference			NC	NC	NC	NC	NC
BH8_21022019	21-Feb-19	Primary	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
TRIP01_21022019	21-Feb-19	Triplicate	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Relative Percentage Difference			NC	NC	NC	NC	NC
BH7_140319	14-Mar-19	Primary	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
DUP02_140319	14-Mar-19	Duplicate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
Relative Percentage Difference			NC	NC	NC	NC	NC
BH7_140319	14-Mar-19	Primary	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
TRIP02_14032019	14-Mar-19	Triplicate	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Relative Percentage Difference			NC	NC	NC	NC	NC
BH4_161020	16-Oct-20	Primary	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01

QW36_161020	16-Oct-20	Duplicate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
Relative Percentage Difference			NC	NC	NC	NC	NC
BH4_161020	16-Oct-20	Primary	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
QW37_16102020	16-Oct-20	Triplicate	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Relative Percentage Difference			NC	NC	NC	NC	NC
BH4_161120	16-Nov-20	Primary	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
QW36_161120	16-Nov-20	Duplicate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
Relative Percentage Difference			NC	NC	NC	NC	NC
BH4_161120	16-Nov-20	Primary	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
QW37_16112020	16-Nov-20	Triplicate	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Relative Percentage Difference			NC	NC	NC	NC	NC
BH4_161220	16-Dec-20	Primary	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
QW36_161220	16-Dec-20	Duplicate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
Relative Percentage Difference			NC	NC	NC	NC	NC
BH4_161220	16-Dec-20	Primary	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
QW37_16122020	16-Dec-20	Triplicate	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Relative Percentage Difference			NC	NC	NC	NC	NC
BH4_160221	16-Feb-21	Primary	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
QW36_160221	16-Feb-21	Duplicate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
Relative Percentage Difference			NC	NC	NC	NC	NC
BH4_160221	16-Feb-21	Primary	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01
QW37_16022021	16-Feb-21	Triplicate	< 0.01	< 0.01	< 0.01	< 0.01	0.01
Relative Percentage Difference			NC	NC	NC	NC	0%
BH4_161121	16-Nov-21	Primary	< 0.02	< 0.02	< 0.01	< 0.02	< 0.01
QW70_161121	16-Nov-21	Duplicate	< 0.02	< 0.02	< 0.01	< 0.02	< 0.01
Relative Percentage Difference			NC	NC	NC	NC	NC
BH4_161121	16-Nov-21	Primary	< 0.02	< 0.02	< 0.01	< 0.02	< 0.01
QW71_16112021	16-Nov-21	Triplicate	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Relative Percentage Difference			NC	NC	NC	NC	NC
WPW_15122021	15-Dec-21	Primary	< 0.02	< 0.02	< 0.01	< 0.02	0.03
QW72_15122021	15-Dec-21	Duplicate	< 0.02	< 0.02	< 0.01	< 0.02	0.03
Relative Percentage Difference			NC	NC	NC	NC	0%
WPW_15122021	15-Dec-21	Primary	< 0.02	< 0.02	< 0.01	< 0.02	0.03
QW73_15122021	15-Dec-21	Triplicate	< 0.01	< 0.01	< 0.01	< 0.01	0.03

Relative Percentage Difference			NC	NC	NC	NC	0%
WPW_180122	18-Jan-22	Primary	< 0.02	< 0.02	< 0.01	< 0.02	0.03
QW74_180122	18-Jan-22	Duplicate	< 0.02	< 0.02	< 0.01	< 0.02	0.01
Relative Percentage Difference			NC	NC	NC	NC	100%
WPW_180122	18-Jan-22	Primary	< 0.02	< 0.02	< 0.01	< 0.02	0.03
QW75_18012022	18-Jan-22	Triplicate	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Relative Percentage Difference			NC	NC	NC	NC	100%
BH4_24022022	24-Feb-22	Primary	< 0.02	< 0.02	< 0.01	< 0.02	< 0.01
QW78_24022022	24-Feb-22	Duplicate	< 0.02	< 0.02	< 0.01	< 0.02	< 0.01
Relative Percentage Difference			NC	NC	NC	NC	NC
BH4_24022022	24-Feb-22	Primary	< 0.02	< 0.02	< 0.01	< 0.02	< 0.01
QW79_23022022	23-Feb-22	Triplicate	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Relative Percentage Difference			NC	NC	NC	NC	NC
WPW_12042022	12-Apr-22	Primary	< 0.02	< 0.02	< 0.01	< 0.02	< 0.01
QW82_12042022	12-Apr-22	Duplicate	< 0.02	< 0.02	< 0.01	< 0.02	< 0.01
Relative Percentage Difference			NC	NC	NC	NC	NC

Notes:

-- Not analysed

< - Less than laboratory limit of reporting

NC - Not calculated

µg/L - Micrograms per litre

RPD - Relative Percentage Difference

Criteria:

< 0.01	< 0.01
< 0.01	< 0.01
< 0.01	< 0.01
< 0.01	< 0.01
< 0.01	< 0.01
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< 0.01	< 0.01
< 0.01	< 0.01
< 0.01	< 0.01
< 0.01	< 0.01
NC	NC
< 0.01	< 0.01
< 0.05	< 0.1
NC	NC
< 0.01	< 0.01
< 0.01	< 0.01
NC	NC
< 0.01	< 0.01
< 0.05	< 0.1
NC	NC
< 0.01	< 0.01

< 0.01	< 0.01
NC	NC
< 0.01	< 0.01
< 0.05	< 0.1
NC	NC
< 0.01	< 0.01
< 0.01	< 0.01
NC	NC
< 0.01	< 0.01
< 0.05	< 0.1
NC	NC
< 0.01	< 0.01
< 0.01	< 0.01
NC	NC
< 0.01	< 0.01
< 0.05	< 0.1
NC	NC
< 0.01	< 0.01
< 0.01	< 0.01
NC	NC
< 0.01	< 0.01
< 0.05	< 0.1
NC	NC
< 0.01	< 0.01
< 0.01	< 0.01
NC	NC
< 0.01	< 0.01
< 0.05	< 0.1
NC	NC
0.15	0.15
0.16	0.16
6%	6%
0.15	0.15
0.13	0.13
14%	14%
0.03	0.03
0.03	0.03
0%	0%
0.03	0.03
< 0.05	< 0.1

50%	108%
0.03	0.03
0.01	0.01
100%	100%
0.03	0.03
< 0.05	< 0.1
50%	108%
0.06	0.06
< 0.01	< 0.01
143%	143%
0.06	0.06
< 0.05	< 0.1
18%	50%
< 0.01	< 0.01
< 0.01	< 0.01
NC	NC

Table 5
Gauging Data and Field Parameters
Williantown Sand Syndicate

Date	Borehole	Top of Casing (mAHD)	Depth to Water (mTOC)	Groundwater Elevation (mAHD)	Well Total Depth at point of sampling (mTOC)	Time	Temp (°C)	EC (us/cm)	pH	Redox (mV)	Comment
Feb-19	BH1	8.64	5.776	2.864	8.89	-	-	-	-	-	No water sample taken due to top of well casing being melted.
Mar-19	BH1	8.64	6.145	2.495	8.12	8:30	18.93	111	5.49	81	Well recently reinstated. Strong acrylic odour when gauging. Light brown in colour.
Apr-19	BH1	8.64	6.277	2.363	8.12	13:15	21.41	87	5.48	91.9	Well in good condition, will require well end cap. Slightly cloudy, no apparent odour
May-19	BH1	8.64	6.319	2.321	8.12	12:20	20.57	150	5.42	25.6	Very light brown, no odour.
Jun-19	BH1	8.64	6.375	2.265	8.12	12:30	19.97	111	6.43	33.6	Clear, no odour.
Jul-19	BH1	8.64	6.373	2.267	8.12	11:45	18.4	122	5.42	51	Slightly cloudy, no apparent odour
Aug-19	BH1	8.64	6.453	2.187	8.12	11:45	19.69	165	5.47	103	Slightly cloudy, slight sulfur odour
Sep-19	BH1	8.64	6.428	2.212	8.28	11:30	21.02	125	5.43	101	Slightly cloudy brown, no odour
Oct-19	BH1	8.64	6.427	2.213	8.28	11:40	21.12	18	5.5	78	Slightly cloudy brown, no odour
Nov-19	BH1	8.64	6.422	2.308	8.28	12:50	21.56	182	5.42	67.2	Cloudy brown, sulfur odour
Dec-19	BH1	8.64	6.558	2.082	8.28	12:25	20.53	163	6.12	15.2	Slight cloudy brown, no odour
Jan-20	BH1	8.64	6.701	1.939	8.28	11:45	22.52	123	5.39	27.7	Slight cloudy brown, no odour
Feb-20	BH1	8.64	6.701	1.939	8.28	11:45	22.52	123	5.39	27.7	Slight cloudy brown, no odour
Mar-20	BH1	8.64	6.701	1.939	8.28	11:45	22.52	123	5.39	27.7	Slight cloudy brown, no odour
Apr-20	BH1	8.64	6.08	2.560	8.28	-	20	126.2	5.34	122.4	-
May-20	BH1	8.64	6.842	1.798	8.28	11:45	19.1	132.3	5.21	135.3	Slight cloudy brown, no odour
Jun-20	BH1	8.64	6.865	1.775	8.28	11:45	19.3	121.2	5.29	118.5	Clear, no odour
Jul-20	BH1	8.64	6.958	1.682	8.28	-	17.6	108	5.4	135	Clear, no odour
Aug-20	BH1	8.64	6.165	2.475	8.22	-	18.61	273.4	4.89	278.4	Clear, no odour
Sep-20	BH1	8.64	6.216	2.424	8.22	-	20.44	103	5	220	Clear, no odour
Oct-20	BH1	8.64	6.329	2.311	9.45	-	19.1	119.7	4.84	198.5	Clear, no odour
Nov-20	BH1	8.64	6.075	2.565	9.45	-	24.23	348	5.43	131.1	Clear, no odour
Dec-20	BH1	8.64	6.181	2.459	9.45	-	22.6	233	5.62	70.1	Clear, no odour
Jan-21	BH1	8.64	6.107	2.533	9.45	-	21.6	308	6.1	-65.1	Clear, sulphur odour
Feb-21	BH1	8.64	5.954	2.686	9.45	13:00	21.1	345	5.96	51.8	clear, sulfur odour
Mar-21	BH1	8.64	5.923	2.717	9.45	13:00	21	152	5.84	-18	Clear, no odour
Apr-21	BH1	8.64	4.628	4.012	8.25	9:15	20.32	51	4.88	225	Very light brown, no odour
May-21	BH1	8.64	4.844	3.796	8.25	13:30	19.6	141	5.36	144	Clear, no odour, well cap missing
Jun-21	BH1	8.64	5.021	3.619	8.25	13:00	19.2	132	5.42	35.2	Clear, no odour / sheen
Jul-21	BH1	8.64	5.113	3.527	8.212	12:58	18.9	62	4.48	297.7	Deep yellow / brown, no odour / sheen, well cap hinge broken
Aug-21	BH1	8.64	5.284	3.356	8.212	12:50	18.4	113.7	4.79	261	Deep orange / yellow, no odour / sheen, well cap hinge broken
Sep-21	BH1	8.64	5.259	3.281	8.2	-	18.4	104	5.07	224	Light brown, no odour / sheen, well cap hinge broken
Oct-21	BH1	8.64	5.429	3.211	8.18	12:53	18.5	113.1	5.03	180.6	Light yellow, no odour / sheen
Nov-21	BH1	8.64	5.4	3.240	8.19	14:45	20.4	110.9	4.78	224.2	Deep orange, no odour, no sheen
Feb-19	BH2	7.79	5.674	2.116	8.93	10:30	22.7	124.1	4.29	111	Slightly Cloudy, light brown, slight sulfur odour.
Mar-19	BH2	7.79	5.184	2.606	8.93	9:15	19.35	101	4.49	264	Dark brown – No Odour.
Apr-19	BH2	7.79	5.833	1.957	9.02	12:45	22.9	87	4.59	308	Dark brown to black, no odour
May-19	BH2	7.79	5.86	1.930	9.02	12:00	21.13	124	4.56	111	Dark brown, no odour
Jun-19	BH2	7.79	8.852	-1.062	9.02	12:15	20.84	77	6.41	255	Very cloudy, dark brown, no odour
Jul-19	BH2	7.79	5.083	2.707	9.02	11:30	18.3	124.5	4.76	88	Dark, cloudy, no odour
Aug-19	BH2	7.79	5.888	1.902	9.02	11:20	19.66	136	4.7	275	Silty Base, dark brown, no odour
Sep-19	BH2	7.79	5.296	1.994	9.08	11:00	21.61	111	4.7	263	Dark brown, slight sulfur odour
Oct-19	BH2	7.79	5.769	2.021	9.03	11:15	20.76	48	4.83	222	Dark brown, slight sulfur odour
Nov-19	BH2	7.79	5.721	2.069	9.03	13:30	21.76	133	4.61	230	Dark brown, slight sulfur odour
Dec-19	BH2	7.79	5.936	1.854	9.03	12:00	20.13	131	5.38	178	Dark brown, slight sulfur odour
Jan-20	BH2	7.79	6.153	1.637	9.03	11:30	24.49	94	4.84	186.5	Cloudy brown, slight sulfur odour
Feb-20	BH2	7.79	6.153	1.637	9.03	11:30	24.49	94	4.84	186.5	Cloudy brown, slight sulfur odour
Mar-20	BH2	7.79	6.153	1.637	9.03	11:30	24.49	94	4.84	186.5	Cloudy brown, slight sulfur odour
Apr-20	BH2	7.79	6.069	1.721	9.03	-	20.2	106.4	4.63	253.2	-
May-20	BH2	7.79	5.102	2.688	9.03	11:30	18.7	109.9	4.5	272.2	Cloudy brown, slight sulfur odour
Jun-20	BH2	7.79	5.978	1.812	9.03	11:30	19.8	102.2	4.68	218.7	Brown, no odour
Jul-20	BH2	7.79	6.035	1.755	9.03	-	17.6	70	4.63	340	Light brown, no odour
Aug-20	BH2	7.79	5.03	2.760	8.46	-	-	-	-	-	Dark brown, no odour
Sep-20	BH2	7.79	5.462	2.328	8.46	-	20.23	103	4.53	280	Dark brown, no odour
Oct-20	BH2	7.79	5.643	2.147	9.45	-	20.8	118.6	4.38	274.7	Dark brown, sulphur odour
Nov-20	BH2	7.79	5.328	2.462	9.45	-	29.5	346	4.91	297.2	Dark brown, sulphur odour
Dec-20	BH2	7.79	5.498	2.292	9.45	-	21.78	293	4.87	201.9	Light brown, sulphur odour
Jan-21	BH2	7.79	5.36	2.430	9.45	-	23.5	229	5.69	232.1	Dark brown, sulphur odour
Feb-21	BH2	7.79	5.293	2.497	9.45	12:45	22.6	279	5.58	170.7	light brown, sulfur odour
Mar-21	BH2	7.79	5.244	2.546	9.45	12:40	21.4	114	5.62	140	very cloudy brown
Apr-21	BH2	7.79	4.326	3.464	8.97	8:45	20.66	59.57	4.73	250	Light brown, no odour
May-21	BH2	7.79	4.535	3.255	8.97	13:05	20	60.1	4.98	251.8	Very turbid brown, no odour, well in good condition
Jun-21	BH2	7.79	4.728	3.062	8.97	12:45	19.1	64.7	4.78	209	Slight cloudy brown, no odour / sheen, well in good condition
Jul-21	BH2	7.79	4.805	2.985	8.905	12:35	18.9	91	4.74	216.5	Medium brown, no odour / sheen, well in good condition
Aug-21	BH2	7.79	4.989	2.801	8.905	12:25	18.4	96.1	4.75	228	Light brown, no odour / sheen, well in good condition
Sep-21	BH2	7.79	4.99	2.800	8.85	12:25	18.9	96	4.75	224	Light brown, no odour / sheen, well in good condition
Oct-21	BH2	7.79	5.05	2.740	8.85	11:08	18.4	93	4.83	254	Dark brown, no odour / sheen
Nov-21	BH2	7.79	4.922	2.868	8.87	14:30	20.4	85.2	4.63	22.7	Clear, no odour, no sheen
Dec-21	BH2	7.79	4.861	2.929	8.93	12:10	21.9	83.4	4.87	169	light brown, no odour, no sheen
Jan-22	BH2	7.79	5.091	2.699	8.975	9:35	20.4	9	4.57	78.3	medium brown, no odour/sheen
Mar-22	BH2	7.79	4.7423	3.367	8.95	8:30	19.8	78.7	4.68	194.6	Light brown, no odour / no sheen
Apr-22	BH2	7.79	4.375	3.415	8.97	11:00	20.8	73.4	4.45	188.5	Dark brown, no odour / no sheen
Feb-19	BH3	7.57	6.026	1.544	8.94	14:40	22.1	82.4	4.54	94	Light Brown - No Odour.
Mar-19	BH3	7.57	6.146	1.424	8.75	-	-	-	-	-	No odour – No sample taken.
Apr-19	BH3	7.57	6.059	1.511	9.03	-	-	-	-	-	Data logger attached, Silty material at base. No sample taken.
May-19	BH3	7.57	6.064	1.506	9.03	-	-	-	-	-	Data logger downloaded.
Jun-19	BH3	7.57	6.005	1.565	9.03	-	-	-	-	-	Data logger attached, Silty material at base. No sample taken.
Jul-19	BH3	7.57	5.938	1.632	9.03	-	-	-	-	-	Data logger attached, Silty material at base. No sample taken.
Aug-19	BH3	7.57	6.027	1.543	9.03	-	-	-	-	-	Data logger attached, Silty material at base. No sample taken.
Sep-19	BH3	7.57	-	-	9.03	-	-	-	-	-	Well Decommissioned
Feb-19	BH4	3.06	1.994	1.066	5.92	14:20	20.4	129.2	3.85	135	light discolouration – Brown.
Mar-19	BH4	3.06	2.091	0.969	5.92	9:50	18.92	79	4.52	311	Light Brown – No Odour.
Apr-19	BH4	3.06	1.878	1.182	5.92	12:10	21.43	43	4.88	269.9	Cloudy, no odour.
May-19	BH4	3.06	1.847	1.213	5.92	11:45	20.14	110	4.65	98.5	Stained brown, no odour.
Jun-19	BH4	3.06	1.723	1.337	5.92	11:45	19.01	55	6.41	321.9	Mildly cloudy, no odour.
Jul-19	BH4	3.06	1.617	1.443	5.92	11:00	17.6	91.5	4.78	88	Cloudy, no odour.
Aug-19	BH4	3.06	1.736	1.324	5.92	11:00	17.96	102	4.76	266	Slightly Cloudy brown
Sep-19	BH4	3.06	1.604	1.456	6.11	12:45	20.53	96	4.27	251	Clear, no odour
Oct-19	BH4	3.06	1.531	1.529	6.11	10:30	19.18	8	4.93	221	Clear, no odour
Nov-19	BH4	3.06	1.624	1.436	6.11	10:10	21.07	95	4.53	290	Cloudy brown, slight sulfur odour
Dec-19	BH4	3.06	2.051	1.009	6.11	11:45	20.93	109	6.49	174	Slight cloudy brown, no odour
Jan-20	BH4	3.06	2.252	0.808	6.11	11:00	23.3	85	4.63	221	Slight cloudy brown, no odour
Feb-20	BH4	3.06	2.252	0.808	6.11	11:00	23.3	85	4.63	221	Slight cloudy brown, no odour
Mar-20	BH4	3.06	2.252	0.808	6.11	11:00	23.3	85	4.63	221	Slight cloudy brown, no odour
Apr-20	BH4	3.06	1.881	1.179	6.11	-	19	132.1	5.04	206.3	-
May-20	BH4	3.06	1.85	1.210	6.11	11:00	18.1	174.8	4.78	282.7	Slight cloudy brown, no odour
Jun-20	BH4	3.06	1.494								

Table 5
Gauging Data and Field Parameters
Williantown Sand Syndicate

Date	Borehole	Top of Casing (mAHD)	Depth to Water (mTOC)	Groundwater Elevation (mAHD)	Well Total Depth at point of sampling (mTOC)	Time	Temp (°C)	EC (us/cm)	pH	Redox (mV)	Comment
Jan-22	BH4	3.06	1.294	1.766	6.035	10:00	20.1	9.1	4.74	170	medium brown, no odour/sheen
Mar-22	BH4	3.06	0.833	2.227	6.04	8:00	19.7	90.8	4.93	147.2	Medium brown, slight sulfur odour, no sheen
Apr-22	BH4	3.06	0.845	2.215	6.05	10:30	19.9	80.9	4.67	190	Medium brown, no odour / no sheen
Feb-19	BH5	7.36	6.063	1.297	8.63	8:30	20.1	320	4.06	122	Roots evident. Brown slight sulfur odour.
Mar-19	BH5	7.36	6.146	1.214	8.63	-	-	-	-	-	Slight sulfur odour - No sample taken.
Apr-19	BH5	7.36	5.914	1.446	8.71	-	-	-	-	-	Slight sulfur odour - No sample taken.
May-19	BH5	7.36	5.894	1.466	8.71	-	-	-	-	-	No sample taken. Data logger downloaded.
Jun-19	BH5	7.36	5.823	1.537	8.71	-	-	-	-	-	No odour - No sample taken.
Jul-19	BH5	7.36	5.779	1.581	8.71	-	-	-	-	-	No odour - No sample taken.
Aug-19	BH5	7.36	5.694	1.466	8.71	-	-	-	-	-	No odour - No sample taken.
Sep-19	BH5	7.36	5.786	1.574	8.71	-	-	-	-	-	No odour - No sample taken.
Oct-19	BH5	7.36	5.767	1.593	8.8	-	-	-	-	-	No odour - No sample taken.
Nov-19	BH5	7.36	5.792	1.568	8.8	-	-	-	-	-	No odour - No sample taken.
Dec-19	BH5	7.36	6.143	1.217	8.8	-	-	-	-	-	No odour - No sample taken.
Jan-20	BH5	7.36	6.315	1.045	8.8	-	-	-	-	-	No odour - No sample taken.
Feb-20	BH5	7.36	6.315	1.045	8.8	-	-	-	-	-	No odour - No sample taken.
Mar-20	BH5	7.36	6.315	1.045	8.8	-	-	-	-	-	No odour - No sample taken.
Apr-20	BH5	7.36	6.061	1.299	8.8	-	-	-	-	-	-
May-20	BH5	7.36	6.092	1.268	8.8	-	-	-	-	-	No odour - No sample taken.
Jun-20	BH5	7.36	5.732	1.628	8.8	-	-	-	-	-	No sample taken.
Jul-20	BH5	7.36	5.76	1.600	8.8	-	-	-	-	-	No sample taken.
Aug-20	BH5	7.36	5.339	2.021	8.75	-	16.93	171.91	4.35	299.4	Light brown, no odour
Sep-20	BH5	7.36	5.632	1.728	8.75	-	18.87	254.16	4.25	71	Light brown, no odour
Oct-20	BH5	7.36	5.824	1.536	9.28	-	18.4	329.4	4.14	15.8	Light brown, no odour
Nov-20	BH5	7.36	6.345	1.015	9.28	-	21.33	356	4.7	-29.8	Clear, sulphur odour
Dec-20	BH5	7.36	5.671	1.689	9.28	-	ND	ND	ND	ND	No sample taken
Jan-21	BH5	7.36	5.411	1.949	9.28	-	ND	ND	ND	ND	No sample taken
Feb-21	BH5	7.36	5.404	1.956	9.28	-	-	-	-	-	No sample taken
Mar-21	BH5	7.36	5.216	2.044	9.28	-	-	-	-	-	No sample taken
Apr-21	BH5	7.36	5.174	2.186	8.8	10:10	ND	ND	ND	ND	No sample taken
May-21	BH5	7.36	5.226	2.134	8.8	9:15	ND	ND	ND	ND	No sample taken, well in good condition
Jun-21	BH5	7.36	5.248	2.112	8.8	-	ND	ND	ND	ND	No sample taken, well in good condition
Jul-21	BH5	7.36	5.159	2.201	8.72	-	ND	ND	ND	ND	No sample taken, well in good condition
Aug-21	BH5	7.36	5.322	2.038	8.72	-	ND	ND	ND	ND	No sample taken, well in good condition
Nov-21	BH5	7.36	5.382	1.978	8.72	-	ND	ND	ND	ND	No sample taken, well in good condition
Feb-19	BH6	3.62	1.823	1.797	4.43	8:50	23.1	228	4.28	111	Clear to slightly cloudy, sulfur odour.
Mar-19	BH6	3.62	1.913	1.707	4.44	14:15	23.17	159	4.74	178	Brown - No odour
Apr-19	BH6	3.62	1.761	1.859	4.52	15:10	22.03	144	4.52	140.1	Cloudy with slight sulfur odour.
May-19	BH6	3.62	1.766	1.854	4.52	14:15	20.62	226	4.7	-5.2	Light brown, no odour.
Jun-19	BH6	3.62	1.713	1.907	4.52	14:10	19.73	176	5.45	-104.7	Cloudy, slight sulfur odour
Jul-19	BH6	3.62	1.591	2.029	4.52	13:30	17.2	191	4.54	101	Slightly cloudy, no odour
Aug-19	BH6	3.62	1.723	1.897	4.52	13:30	18.32	277	4.69	140	Slight brown colour, slight sulfur odour
Sep-19	BH6	3.62	1.647	1.973	4.62	15:15	18.66	215	4.61	57	Clear, slight odour
Oct-19	BH6	3.62	1.628	1.992	4.62	15:30	21.09	110	5.05	-144	Slight brown colour, slight sulfur odour
Nov-19	BH6	3.62	1.657	1.963	4.62	12:30	23.12	335	4.8	6.4	Cloudy brown, slight sulfur odour
Dec-19	BH6	3.62	2.009	1.611	4.62	13:45	21.96	256	5.52	-86.2	Mostly clear, slight sulfur odour
Jan-20	BH6	3.62	2.169	1.451	4.62	13:20	24.62	190	4.39	92	Brown, no odour
Feb-20	BH6	3.62	2.169	1.451	4.62	13:20	24.62	190	4.39	92	Brown, no odour
Mar-20	BH6	3.62	2.169	1.451	4.62	13:20	24.62	190	4.39	92	Brown, no odour
Apr-20	BH6	3.62	2.033	1.587	4.62	-	20.7	232.2	4.68	138.4	-
May-20	BH6	3.62	2.065	1.555	4.62	13:20	19.2	305.8	4.5	138.7	Brown, no odour
Jun-20	BH6	3.62	1.798	1.822	4.62	13:20	20.1	447.8	4.74	-33.3	Clear, no odour
Jul-20	BH6	3.62	1.728	1.892	4.62	-	15.7	204	4.68	-52.4	Light brown, no odour
Aug-20	BH6	3.62	1.425	2.395	4.5	-	15.17	350.62	4.66	-30.4	Clear, sulphur odour
Sep-20	BH6	3.62	1.544	2.076	4.5	-	20.02	269	4.48	62.5	Clear, sulphur odour
Oct-20	BH6	3.62	1.745	1.875	4.95	-	19.5	292.4	4.49	17.6	Clear, sulphur odour
Nov-20	BH6	3.62	0.259	3.361	4.95	-	24.95	226	4.07	5.5	Clear, sulphur odour
Dec-20	BH6	3.62	1.472	2.148	4.95	-	22.8	1036	4.76	-134	Clear, sulphur odour
Jan-21	BH6	3.62	1.29	2.330	4.95	-	24.2	859	4.96	-94.8	Clear, sulphur odour
Feb-21	BH6	3.62	1.171	2.449	4.95	14:10	2	1160	5.23	-167.9	Ants nest in casing, clear, sulfur odour
Mar-21	BH6	3.62	0.977	2.643	4.95	-	22.9	495	5.23	-172	clear, slight sulfur odour
Apr-21	BH6	3.62	0.813	2.807	4.52	10:15	18.56	307	4.35	-3.8	Clear, strong sulphur odour
May-21	BH6	3.62	0.857	2.763	4.52	14:40	18	395	4.71	61.9	Light brown, strong sulphur odour, well in good condition
Jun-21	BH6	3.62	0.926	2.694	4.52	14:07	15.2	298	4.69	-71	Clear, strong sulphur odour, no sheen, well in good condition
Jul-21	BH6	3.62	0.823	2.797	4.52	14:45	15.3	134.1	4.79	-94.1	Light yellow, light - moderate sulphur odour, no sheen, well in good condition
Aug-21	BH6	3.62	1.038	2.582	4.52	14:10	15.7	384.8	4.87	-86.3	Clear, moderate sulphur odour, no sheen, well in good condition
Sep-21	BH6	3.62	0.88	2.740	4.5	9:55	15.2	318	5.15	-155	Clear, strong sulphur odour, no sheen, well in good condition
Oct-21	BH6	3.62	0.815	2.805	4.52	9:55	16.2	250	5.26	-72.2	Medium brown, moderate sulphur odour, no sheen
Nov-21	BH6	3.62	0.895	2.725	4.52	11:15	18.2	223.6	4.97	-116.1	Very light brown, moderate sulphur odour, no sheen
Dec-21	BH6	3.62	0.968	2.652	4.53	9:45	21.2	202	4.67	-86	very light brown, moderate sulphur odour, no sheen
Jan-22	BH6	3.62	1.276	2.344	4.54	8:45	22.3	20.8	4.58	-116	very light brown, moderate sulphur odour, no sheen
Mar-22	BH6	3.62	0.754	2.866	4.55	9:40	23.4	291	3.49	33.4	Clear, slight sulfur odour, no sheen
Apr-22	BH6	3.62	0.737	2.883	4.55	9:40	20.7	215	4.88	-135	Clear, slight sulfur odour, no sheen
Feb-19	BH7	2.98	1.938	1.042	4.42	9:20	23.7	283	4.04	125	Slightly Cloudy, light brown, slight sulfur odour.
Mar-19	BH7	2.98	2.015	0.965	4.42	13:30	25	251	4.34	179	Slightly Cloudy, light brown, slight sulfur odour.
Apr-19	BH7	2.98	1.744	1.236	4.51	15:30	22.9	233	4.45	94.3	Slightly Cloudy, light brown, slight sulfur odour.
May-19	BH7	2.98	1.744	1.236	4.51	14:45	20.62	226	4.7	-5.2	Slightly cloudy sulfur odour.
Jun-19	BH7	2.98	1.634	1.346	4.51	14:30	19.56	217	5.47	-227.9	Slightly cloudy sulfur odour.
Jul-19	BH7	2.98	1.544	1.436	4.51	14:00	17.2	228	4.58	100	Slightly cloudy sulfur odour.
Aug-19	BH7	2.98	1.649	1.331	4.51	13:45	17.71	329	4.88	55	Cloudy brown, sulfur odour
Sep-19	BH7	2.98	1.542	1.438	4.61	14:15	18.34	232	4.73	-22	Light brown, sulfur odour
Oct-19	BH7	2.98	1.514	1.466	4.61	13:50	21.79	183	4.89	-139	Slightly Cloudy, light brown, slight sulfur odour.
Nov-19	BH7	2.98	1.588	1.392	4.61	12:10	21.79	391	4.6	13.1	Cloudy brown, slight sulfur odour.
Dec-19	BH7	2.98	1.999	0.991	4.61	14:00	21.87	292	5.93	-92.6	Cloudy brown, slight sulfur odour.
Jan-20	BH7	2.98	2.169	0.811	4.61	14:10	22.39	164	4.45	23.1	Light brown, slight sulfur odour.
Feb-20	BH7	2.98	2.169	0.811	4.61	14:10	22.39	164	4.45	23.1	Light brown, slight sulfur odour.
Mar-20	BH7	2.98	2.169	0.811	4.61	14:10	22.39	164	4.45	23.1	Light brown, slight sulfur odour.
Apr-20	BH7	2.98	1.813	1.167	4.61	-	20.8	190	4.88	-71.2	-
May-20	BH7	2.98	1.813	1.167	4.61	14:10	19	196.3	4.63	-34.4	Light brown, slight sulfur odour.
Jun-20	BH7	2.98	1.471	1.509	4.61	14:10	18.5	170	4.89	-70.3	Light brown, sulphur odour.
Jul-20	BH7	2.98	1.43	1.550	4.61	-	15.8	155	4.83	-102	Light brown, no odour.
Aug-20	BH7	2.98	1.217	1.763	4.49	-	15.24	237.95	4.72	-66	Light brown, sulphur odour.
Sep-20	BH7	2.98	1.437	1.543	4.49	-	21.64	253	4.57	21.9	Light brown, sulphur odour.
Oct-20	BH7	2.98	1.672	1.308	4.95	-	18.7	284.6	4.27	-29.1	Light brown, sulphur odour.
Nov-20	BH7	2.98	1.225	1.755	4.95	-	22.8	792	4.42	-104	clear, sulphur odour.
Dec-20	BH7	2.98	1.473	1.507	4.95	-	24.38	770	4.42	-75.5	Clear, sulphur odour.
Jan-21	BH7	2.98	1.234	1.746	4.95	-	24.3	810	4.76	-67.2	Light brown, sulphur odour.
Feb-21	BH7	2.98	1.235	1.745	4.95	14:35	24.1	892	5.02	-146.3	light brown, sulfur odour
Mar-21	BH7	2.98	1.174	1.806	4.95	-	22.8	350	5.1	-137	clear, sulfur odour
Apr-21	BH7	2.98	1.095	1.885	4.53	10:25	18.21	348	4.46	-35	Slight yellow, strong sulphur od

Table 5
Gauging Data and Field Parameters
Williantown Sand Syndicate

Date	Borehole	Top of Casing (mAHD)	Depth to Water (mTOC)	Groundwater Elevation (mAHD)	Well Total Depth at point of sampling (mTOC)	Time	Temp (°C)	EC (us/cm)	pH	Redox (mV)	Comment
Jun-19	BH8	3.88	2.346	1.534	6.18	14:40	18.78	289	7.43	-340.8	Dark brown cloudy, sulfur odour
Jul-19	BH8	3.88	2.266	1.614	6.18	14:30	16.8	347	4.55	101	Cloudy brown, sulfur odour
Aug-19	BH8	3.88	2.406	1.474	6.18	14:15	18.2	374	4.66	27	Cloudy brown, sulfur odour
Sep-19	BH8	3.88	2.282	1.598	6.27	13:30	18.64	300	4.72	-10	Dark brown cloudy, sulfur odour
Oct-19	BH8	3.88	2.233	1.647	6.28	14:15	20.44	224	4.89	-160	Dark brown cloudy, sulfur odour
Nov-19	BH8	3.88	2.312	1.568	6.28	14:50	22.5	545	4.51	-28.8	Cloudy brown, sulfur odour
Dec-19	BH8	3.88	2.778	1.102	6.28	14:30	22.05	995	6.16	-96.8	Cloudy brown, sulfur odour
Jan-20	BH8	3.88	2.969	0.911	6.28	14:40	21.99	284	4.08	45.6	Cloudy brown, sulfur odour
Feb-20	BH8	3.88	2.969	0.911	6.28	14:40	21.99	284	4.08	45.6	Cloudy brown, sulfur odour
Mar-20	BH8	3.88	2.965	0.911	6.28	14:40	21.99	284	4.08	45.6	Cloudy brown, sulfur odour
Apr-20	BH8	3.88	2.549	1.331	6.28	-	19.8	218.7	4.65	-70.6	-
May-20	BH8	3.88	2.489	1.391	6.28	14:40	18.2	242.6	4.49	-42.2	Cloudy brown, sulfur odour
Jun-20	BH8	3.88	2.058	1.822	6.28	14:40	17	282.9	4.8	-50.9	Light brown, no odour
Jul-20	BH8	3.88	2.02	1.860	6.28	-	16	268	4.69	-90	Light brown, no odour
Aug-20	BH8	3.88	1.804	2.076	6.14	-	15.4	367.95	4.62	-63.2	Light brown, sulphur odour
Sep-20	BH8	3.88	1.156	2.724	6.14	-	19.41	379	4.46	1.5	Light brown, sulphur odour
Oct-20	BH8	3.88	2.442	1.438	6.28	-	17.7	314.1	4.3	-57.5	Light brown, sulphur odour
Nov-20	BH8	3.88	1.472	2.408	6.28	-	22.7	1053	4.64	-116.1	clear, sulphur odour
Dec-20	BH8	3.88	2.198	1.682	6.28	-	23.5	701	4.71	-124.6	Clear, sulphur odour
Jan-21	BH8	3.88	1.209	2.671	6.28	-	22.7	846	4.97	-114	Light brown, sulphur odour
Feb-21	BH8	3.88	1.9	1.980	6.28	15:00	20.7	1105	5.26	-167.6	-
Mar-21	BH8	3.88	1.801	2.079	6.28	10:32	21.3	366	5.002	-159	slight cloudy brown, sulfur odour
Apr-21	BH8	3.88	1.765	2.115	6.1	10:32	17.9	280	3.92	9.4	Slight yellow, strong sulphur odour
May-21	BH8	3.88	1.8	2.080	6.1	15:00	17.5	311	4.73	78	Light brown, strong sulphur odour, well in good condition
Jun-21	BH8	3.88	1.338	2.542	6.1	14:20	16.6	391	4.72	-53.9	Clear, strong sulphur odour, no sheen, well in good condition
Jul-21	BH8	3.88	1.751	2.129	6.04	15:30	16.3	159.3	4.71	72.2	Medium brown, slight sulphur odour, no sheen, well in good condition
Aug-21	BH8	3.88	1.954	1.926	6.04	14:45	16.6	389	4.68	-57.4	Light brown, moderate sulphur odour, no sheen, well in good condition
Nov-21	BH8	3.88	1.783	2.097	6.06	10:45	17.5	452.1	4.6	-103.6	Light brown, moderate sulphur odour, no sheen
Feb-19	BH9	17.75	Dry	-	15.82	-	-	-	-	-	Well was dry.
Mar-19	BH9	17.75	Dry	-	16.01	-	-	-	-	176	Well was dry.
Apr-19	BH9	17.75	Dry	-	16.01	-	-	-	-	-	Well was dry.
May-19	BH9	17.75	Dry	-	16.01	-	-	-	-	-	Well was dry.
Jun-19	BH9	17.75	Dry	-	16.01	-	-	-	-	-	Well was dry.
Jul-19	BH9	17.75	Dry	-	16.01	-	-	-	-	-	Well was dry.
Aug-19	BH9	17.75	Dry	-	16.01	-	-	-	-	-	Well was dry.
Sep-19	BH9	17.75	Dry	-	16.01	-	-	-	-	-	Well was dry.
Oct-19	BH9	17.75	Dry	-	16.01	-	-	-	-	-	Well was dry.
Nov-19	BH9	17.75	Dry	-	16.01	-	-	-	-	-	Well was dry.
Dec-19	BH9	17.75	Dry	-	16.01	-	-	-	-	-	Well was dry.
Jan-20	BH9	17.75	Dry	-	16.01	-	-	-	-	-	Well was dry.
Feb-20	BH9	17.75	Dry	-	16.01	-	-	-	-	-	Well was dry.
Mar-20	BH9	17.75	Dry	-	16.01	-	-	-	-	-	Well was dry.
Apr-20	BH9	17.5	Dry	-	16.01	-	-	-	-	-	-
May-20	BH9	17.75	Dry	-	16.01	-	-	-	-	-	Well was dry.
Jun-20	BH9	17.75	Dry	-	16.01	-	-	-	-	-	Well was dry.
Jul-20	BH9	17.75	Dry	-	16.01	-	-	-	-	-	Well was dry.
Aug-20	BH9	17.75	15.723	2.027	16.2	-	18.43	84.33	4.79	317	Bailer used due to insufficient volume, clear, no odour
Sep-20	BH9	17.75	15.951	1.799	16.2	-	-	-	-	-	Insufficient volume to sample
Oct-20	BH9	17.75	Dry	-	18.8	-	-	-	-	-	Insufficient well volume for sampling
Aug-21	BH9	17.75	15.764	1.986	15.99	-	-	-	-	-	Insufficient well volume for sampling
Oct-21	BH9	17.75	15.702	2.048	15.98	7:45	-	-	-	-	insufficient volume to sample
Nov-21	BH9	17.75	15.668	2.082	16.15	7:55	19.1	155.2	4.66	-10.1	Clear, no odour, no sheen
Dec-21	BH9	17.75	15.656	2.094	16.19	-	-	-	-	-	no sample taken
Jan-22	BH9	17.75	15.762	1.988	16.18	-	-	-	-	-	no sample taken
Mar-22	BH9	17.75	15.321	2.429	16.18	-	-	-	-	-	no sample taken
Apr-22	BH9	17.75	15.35	2.400	16.23	-	-	-	-	-	no sample taken
Sep-20	BH9A	10.75	8.903	1.847	16.16	-	19.85	266	4.97	317	Newly installed, Silty brown, no odour.
Oct-20	BH9A	10.75	9.163	1.587	16.16	-	20.2	279.8	4.77	274.7	Newly installed well
Nov-20	BH9A	10.75	8.76	1.990	16.16	-	24.6	686	5.73	304.3	Dark brown, no odour
Dec-20	BH9A	10.75	9.026	1.724	16.16	-	22.8	516	4.66	-120.6	Dark brown, no odour
Jan-21	BH9A	10.75	8.528	2.222	16.16	-	22	562	5.65	52.6	Dark brown, no odour
Feb-21	BH9A	10.75	8.761	1.989	16.16	12:00	22.5	609	5.46	-141.8	dark brown, sulfur odour
Mar-21	BH9A	10.75	8.713	2.037	16.16	12:15	20.4	214	5.72	-161	cloudy brown, sulfur odour
Apr-21	BH9A	10.75	8.389	2.361	12.44	8:24	18.45	182.2	4.79	234	Dark brown, sulphur odour
May-21	BH9A	10.75	8.523	2.227	12.44	12:40	18.9	204	4.95	248	Slight brown stain, odour, well in good condition
Jun-21	BH9A	10.75	8.613	2.137	12.44	12:30	18.3	173	4.7	-17.5	Moderate brown, sulphur odour, no sheen, well in good condition
Jul-21	BH9A	10.75	8.594	2.156	12.485	12:15	18.6	92.5	4.67	193	Moderate brown, slight sulphur odour, no sheen, well in good condition
Aug-21	BH9A	10.75	8.769	1.981	12.485	12:10	18.3	183.4	4.66	19.1	Light yellow, no odour / sheen, well in good condition
Sep-21	BH9A	10.75	8.675	2.075	8.675	12:00	18.8	166	4.8	40.7	Medium brown, slight sulphur odour, no sheen
Oct-21	BH9A	10.75	8.672	2.078	12.44	12:21	18.6	165	4.88	-9.9	Medium brown, slight sulphur odour, no odour
Nov-21	BH9A	10.75	8.656	2.094	12.4	14:10	19.2	167.5	4.65	-6	Light brown, slight sulphur odour, no sheen
Dec-21	BH9A	10.75	8.749	2.001	12.54	11:25	21.7	162	4.77	-20.8	medium brown, very slight sulfur odour, no sheen
Jan-22	BH9A	10.75	8.87	1.880	12.49	10:15	20.9	16.3	4.54	-71	medium brown, light sulfur odour, no sheen
Mar-22	BH9A	10.75	8.411	2.339	12.45	8:15	19.5	226.2	4.44	40.2	Light brown, moderate sulfur odour, no sheen
Apr-22	BH9A	10.75	8.42	2.330	12.44	8:30	19.8	230.1	4.45	38.3	Light brown, moderate sulfur odour, no sheen
Feb-19	BH10	6.69	Dry	-	3.58	-	-	-	-	-	Well was dry.
Mar-19	BH10	6.69	Dry	-	3.58	-	-	-	-	-	Well was dry.
Apr-19	BH10	6.69	Dry	-	3.58	-	-	-	-	-	Well was dry.
May-19	BH10	6.69	Dry	-	3.58	-	-	-	-	-	Well was dry.
Jun-19	BH10	6.69	Dry	-	3.58	-	-	-	-	-	Well was dry.
Jul-19	BH10	6.69	Dry	-	3.58	-	-	-	-	-	Well was dry.
Aug-19	BH10	6.69	Dry	-	3.58	-	-	-	-	-	Well was dry.
Sep-19	BH10	6.69	Dry	-	3.58	-	-	-	-	-	Well was dry.
Oct-19	BH10	6.69	Dry	-	3.58	-	-	-	-	-	Well was dry.
Nov-19	BH10	6.69	Dry	-	3.58	-	-	-	-	-	Well was dry.
Dec-20	BH10	6.69	Dry	-	3.68	-	-	-	-	-	Well was dry.
Jan-21	BH10	6.69	Dry	-	3.68	-	-	-	-	-	Well was dry.
Feb-21	BH10	6.69	DRY	-	3.68	-	-	-	-	-	Well was dry.
Mar-21	BH10	6.69	DRY	-	3.68	-	-	-	-	-	Well was dry.
Apr-21	BH10	6.69	2.464	4.226	3.46	9:00	19.75	245.7	5.05	35.2	Light brown, sulphur odour
May-21	BH10	6.59	2.591	4.099	3.46	13:20	18.9	227	4.77	196	Clear, moderate sulphur odour, well in good condition
Jun-21	BH10	6.69	2.734	3.956	3.44	11:05	17.1	229	4.55	24.2	Clear, slight sulphur odour, no sheen, well in good condition
Jul-21	BH10	6.69	2.731	3.959	3.42	8:20	16	284.5	4.61	52	Clear, strong sulphur odour, no sheen, well in good condition
Aug-21	BH10	6.69	2.932	3.758	3.42	-	ND	ND	ND	ND	No sample taken
Nov-21	BH10	6.69	2.991	3.699	3.43	-	ND	ND	ND	ND	No sample taken
Feb-19	BH11	6.63	3.02	3.610	5.21	-	-	402	-	-	Brown - No Odour.
Mar-19	BH11	6.63	3.181	3.449	5.21	7:45	18.87	168	4.95	10	Light Brown – Slight Odour.
Apr-19	BH11	6.63	3.254	3.376	5.29	13:45	21.64	155	4.75	78.3	Cloudy, slight sulfur smell
May-19	BH11	6.63	3.311	3.319	5.29	12:45	19.94	232	4.68	-71.5	Data logger downloaded, Light brown, no odour.
Jun-19	BH11	6.63	3.382	3.248	5.29	12:50	18.93	185	6.41	-78.5	Cloudy with sulfur odour
Jul-19	BH11	6.63	3.348	3.282	5.29	12:15	16.9	296	4.53	101	Cloudy no odour
Aug-19	BH11	6.63	3.503	3.127	5.29	12:15	17.66	261	4.74	126	Cloudy light brown, sulfur odour
Sep-19	BH11	6.63	3.546	3.084	5.39	12:00	20.26	195	4.64	31.2	Cloudy light brown, sulfur odour

Table 5
Gauging Data and Field Parameters
Williantown Sand Syndicate

Date	Borehole	Top of Casing (mAHD)	Depth to Water (mTOC)	Groundwater Elevation (mAHD)	Well Total Depth at point of sampling (mTOC)	Time	Temp (°C)	EC (us/cm)	pH	Redox (mV)	Comment
Oct-19	BH11	6.63	3.586	3.044	5.39	12:05	19.93	124	4.83	-117	Cloudy light brown, sulfur odour
Nov-19	BH11	6.63	3.621	3.009	5.39	-	-	324	-	-	Cloudy light brown, sulfur odour
Dec-19	BH11	6.63	3.859	2.771	5.39	13:00	20.55	239	5.42	-60.7	Cloudy brown, sulfur odour
Jan-20	BH11	6.63	3.962	2.668	5.39	12:15	22.37	129	4.61	42	Cloudy brown, sulfur odour
Feb-20	BH11	6.63	3.962	2.668	5.39	12:15	22.37	129	4.61	42	Cloudy brown, sulfur odour
Mar-20	BH11	6.63	3.962	2.668	5.39	12:15	22.37	129	4.61	42	Cloudy brown, sulfur odour
Apr-20	BH11	6.63	4.087	2.543	5.39	-	20	140.4	4.84	-39.7	-
May-20	BH11	6.63	4.241	2.389	5.39	12:15	18.2	147.4	4.69	-65.4	Cloudy brown, sulfur odour
Jun-20	BH11	6.63	4.343	2.287	5.39	12:15	18.2	146.2	4.71	-24.7	Brown, dirt odour, well blockage
Jul-20	BH11	6.63	4.484	2.146	5.39	-	15.8	121	4.6	124	Light Brown, no odour - bore blocked
Aug-20	BH11	6.63	3.621	3.009	5.82	-	17.28	172.83	4.71	270.4	Light Brown, no odour
Sep-20	BH11	6.63	3.658	2.972	5.82	-	20.02	220.49	4.52	115.4	Light Brown, no odour
Oct-20	BH11	6.63	3.725	2.905	5.95	-	19	255.1	4.3	111	Light Brown, no odour
Nov-20	BH11	6.63	3.405	3.225	5.95	-	23.4	541	4.77	6.6	clear, no odour
Dec-20	BH11	6.63	3.505	3.125	5.95	-	23.6	459	4.81	-95.6	Clear, sulphur odour
Jan-21	BH11	6.63	3.384	3.246	5.95	-	22.6	668	5.23	-73.3	Clear, sulphur odour
Feb-21	BH11	6.63	3.246	3.384	5.95	13:15	21.1	68	5.3	-107.4	light brown, slight odour
Mar-21	BH11	6.63	3.143	3.487	5.95	13:25	20.8	291	5.43	-95	Clear, no odour
Apr-21	BH11	6.63	1.839	4.791	5.29	9:27	18.87	160	4.47	224	Light yellow, slight sulphur odour
May-21	BH11	6.63	1.86	4.770	5.29	13:50	18.1	200	4.54	235	Light yellow, no odour, well in good condition
Jun-21	BH11	6.63	1.993	4.637	5.29	13:20	16.8	225	4.62	132	Light yellow / brown, slight sulphur odour, no sheen, well in good condition
Jul-21	BH11	6.63	1.889	4.741	5.298	13:42	16.9	178	4.54	162	Light yellow, no odour, no sheen, well in good condition
Aug-21	BH11	6.63	2.156	4.474	5.298	13:15	16.5	411.9	4.25	67.8	Light yellow, slight sulphur odour, no sheen, well in good condition
Sep-21	BH11	6.63	2.141	4.489	5.29	12:55	18	362	4.39	-4.8	Very light brown, slight sulphur odour, no sheen, well in good condition
Oct-21	BH11	6.63	2.269	4.361	5.29	13:10	17	323	4.5	18.8	Light yellow, very slight sulphur odour, no sheen
Nov-21	BH11	6.63	2.116	4.514	5.3	15:00	18	270	4.27	-32.1	Light yellow, slight sulphur odour, no sheen
Dec-21	BH11	6.63	2.055	4.575	5.31	12:20	21.1	224	4.68	-63	light yellow brown, slight sulfur odour, no sheen
Jan-22	BH11	6.63	2.37	4.260	5.31	8:06	20.8	27.3	4.44	-90	light yellow, moderate sulfur odour, no sheen
Mar-22	BH11	6.63	1.52	5.110	5.29	9:00	20.5	249.1	4.37	-20.4	Light brown, moderate sulfur odour, no sheen
Apr-22	BH11	6.63	1.282	5.348	5.25	9:00	20	199.1	5.45	-64	Yellow, moderate sulfur odour, no sheen
Feb-19	BH12	8.67	Dry		6.17	-	-	-	-	-	Well was dry.
Mar-19	BH12	8.67	6.924	1.746	8.03	-	-	-	-	-	40mm inner tube installed, No odour - No sample taken
Apr-19	BH12	8.67	6.846	1.824	8.12	-	-	-	-	-	40mm inner tube installed, No odour - No sample taken
May-19	BH12	8.67	6.863	1.807	8.12	-	-	-	-	-	Acrylic odour, No sample taken.
Jun-19	BH12	8.67	6.832	1.838	8.12	-	-	-	-	-	Slight acrylic odour, No sample taken.
Jul-19	BH12	8.67	6.799	1.871	8.12	-	-	-	-	-	Slight acrylic odour, No sample taken.
Aug-19	BH12	8.67	6.889	1.781	8.12	-	-	-	-	-	Slight acrylic odour, No sample taken.
Sep-19	BH12	8.67	6.827	1.843	8.2	-	-	-	-	-	No sample taken.
Oct-19	BH12	8.67	6.881	1.789	8.2	-	-	-	-	-	No sample taken.
Nov-19	BH12	8.67	6.89	1.780	8.2	-	-	-	-	-	No sample taken.
Dec-19	BH12	8.67	7.076	1.594	8.2	-	-	-	-	-	No sample taken.
Jan-20	BH12	8.67	7.252	1.418	8.2	-	-	-	-	-	No sample taken.
Feb-20	BH12	8.67	7.252	1.418	8.2	-	-	-	-	-	No sample taken.
Mar-20	BH12	8.67	7.252	1.418	8.2	-	-	-	-	-	No sample taken.
Apr-20	BH12	8.67	7.149	1.521	8.2	-	-	-	-	-	-
May-20	BH12	8.67	7.156	1.514	8.2	-	-	-	-	-	No sample taken.
Jun-20	BH12	8.67	7.003	1.667	8.2	-	-	-	-	-	No sample taken.
Jul-20	BH12	8.67	7.057	1.613	8.2	-	-	-	-	-	No sample taken.
Aug-20	BH12	8.67	6.443	2.227	8.17	-	17.78	163.09	5.25	-48	Light Brown, no odour
Sep-20	BH12	8.67	6.629	2.041	8.17	-	21.85	206.44	4.66	134	Light Brown, no odour
Oct-20	BH12	8.67	6.799	1.871	8.39	-	-	-	-	-	No sample take, well too skinny
Nov-20	BH12	8.67	6.459	2.211	8.39	-	24.9	525	5.02	-34.6	Light brown, sulphur odour
Dec-20	BH12	8.67	6.632	2.038	8.39	-	22.43	532	5	203.3	Clear, no odour
Jan-21	BH12	8.67	6.502	2.168	8.39	-	21.9	282	5.53	43.7	Clear, no odour
Feb-21	BH12	8.67	6.441	2.229	8.39	13:35	21.5	534	5.73	-172.9	Well damaged, clear, sulfur odour
Mar-21	BH12	8.67	6.364	2.306	8.39	13:45	20.6	211	5.77	-186	Clear, no odour
Apr-21	BH12	8.67	5.82	2.850	8.22	9:45	20	201	5.65	196	Clear, no odour
May-21	BH12	8.67	6.5938	2.732	8.22	14:15	19.4	249	5.62	62.6	Cloudy brown, slight sulphur odour, broken hinge on well casing
Jun-21	BH12	8.67	6.019	2.651	8.22	13:37	18.1	94.6	5.2	288	Clear, no odour / sheen, broken hinge on well casing
Jul-21	BH12	8.67	6.005	2.665	8.22	-	ND	ND	ND	ND	No sample taken, Hydrasleeve would not fit in 35mm inner PVC piping. Suggest removing inner tube
Aug-21	BH12	8.67	6.147	2.523	8.22	13:35	19.1	249.7	4.77	250.8	Clear, no odour / sheen, well in good condition
Sep-21	BH12	8.67	6.079	2.591	8.21	10:10	17.5	210	4.98	86.7	Light grey / brown, no odour / sheen, well in good condition
Oct-21	BH12	8.67	6.18	2.490	8.21	10:35	18.6	226.2	5.15	188.5	Dark brown, no odour / sheen
Nov-21	BH12	8.67	6.048	2.622	8.21	12:10	19.8	180.8	4.76	165.9	Light brown, no odour, no sheen
Feb-19	MW239D	3.04	1.312	1.728	20.21	-	-	-	-	-	-
Mar-19	MW239D	3.04	1.591	1.449	20.19	-	-	-	-	-	No odour - No sample taken
Apr-19	MW239D	3.04	1.392	1.648	20.2	-	-	-	-	-	No odour - No sample taken
May-19	MW239D	3.04	1.383	1.657	20.2	-	-	-	-	-	No odour - No sample taken
Jun-19	MW239D	3.04	1.32	1.720	20.2	-	-	-	-	-	No odour - No sample taken
Jul-19	MW239D	3.04	1.239	1.801	20.2	-	-	-	-	-	No odour - No sample taken
Aug-19	MW239D	3.04	1.327	1.713	20.2	-	-	-	-	-	Slight Sulfur odour, no sample taken
Sep-19	MW239D	3.04	1.248	1.792	20.2	-	-	-	-	-	Slight Sulfur odour, no sample taken
Oct-19	MW239D	3.04	1.226	1.814	20.32	-	-	-	-	-	Slight Sulfur odour, no sample taken
Nov-19	MW239D	3.04	1.238	1.802	20.32	-	-	-	-	-	Slight Sulfur odour, no sample taken
Dec-19	MW239D	3.04	1.626	1.414	20.32	-	-	-	-	-	Slight Sulfur odour, no sample taken
Jan-20	MW239D	3.04	1.795	1.241	20.32	-	-	-	-	-	Slight Sulfur odour, no sample taken
Feb-20	MW239D	3.04	1.799	1.241	20.32	-	-	-	-	-	Slight Sulfur odour, no sample taken
Mar-20	MW239D	3.04	1.799	1.241	20.32	-	-	-	-	-	Slight Sulfur odour, no sample taken
Apr-20	MW239D	3.04	-	-	20.32	-	-	-	-	-	-
Jun-20	MW239D	3.04	1.328	1.712	20.32	-	-	-	-	-	No sample taken
Jul-20	MW239D	3.04	1.32	1.720	20.32	-	-	-	-	-	No sample taken
Aug-20	MW239D	3.04	0.955	2.085	20.49	-	-	-	-	-	No sample taken
Sep-20	MW239D	3.04	1.183	1.857	20.49	-	-	-	-	-	No sample taken
Oct-20	MW239D	3.04	1.331	1.709	20.49	-	-	-	-	-	No sample taken
Nov-20	MW239D	3.04	1.132	1.908	20.49	-	-	-	-	-	No sample taken
Dec-20	MW239D	3.04	1.172	1.868	20.49	-	-	-	-	-	No sample taken
Jan-21	MW239D	3.04	0.975	2.065	20.49	-	-	-	-	-	No sample taken
Feb-21	MW239D	3.04	0.984	2.056	20.49	-	-	-	-	-	-
Mar-21	MW239D	3.04	0.901	2.139	20.49	-	-	-	-	-	No sample
Apr-21	MW239D	3.04	0.739	2.301	20.57	10:00	ND	ND	ND	ND	No sample taken
May-21	MW239D	3.04	0.783	2.257	20.57	9:10	ND	ND	ND	ND	No sample taken, well in good condition
Jun-21	MW239D	3.04	0.794	2.246	20.57	-	ND	ND	ND	ND	No sample taken, well in good condition
Jul-21	MW239D	3.04	0.716	2.324	20.57	-	ND	ND	ND	ND	No sample taken, well in good condition
Aug-21	MW239D	3.04	0.85	2.190	20.57	-	ND	ND	ND	ND	No sample taken, well in good condition
Nov-21	MW239D	3.04	0.768	2.272	20.52	-	ND	ND	ND	ND	No sample taken, well in good condition
Feb-19	MW239S	3.04	1.529	1.511	3.89	7:30	21.7	526	4.09	121	Light Brown - Slight Sulfur odour.
Mar-19	MW239S	3.04	1.615	1.425	3.89	14:45	23.1	323	4.43	-	Dark Brown - Slight Sulfur odour.
Apr-19	MW239S	3.04	1.421	1.619	3.89	14:45	21.43	352	4.72	45.3	Light Brown - Slight Sulfur odour.
May-19	MW239S	3.04	1.412	1.628	3.89	13:45	19.49	392	4.64	-65.8	Data logger downloaded, Dark brown, sulfur odour.
Jun-19	MW239S	3.04	1.344	1.696	3.89	13:50	19.3	305	5.7	-117.9	Cloudy, sulfur odour.
Jul-19	MW239S	3.04	1.262	1.778	3.89	13:15	15.8	37	4.67	94	Cloudy, sulfur odour.
Aug-19	MW239S	3.04	1.352	1.688	3.89	13:00	17.99	530	4.75	72.8	Dark Brown - Slight Sulfur odour.
Sep-19	MW239S	3.04	1.269								

Table 5
Gauging Data and Field Parameters
Williantown Sand Syndicate

Date	Borehole	Top of Casing (mAHD)	Depth to Water (mTOC)	Groundwater Elevation (mAHD)	Well Total Depth at point of sampling (mTOC)	Time	Temp (°C)	EC (us/cm)	pH	Redox (mV)	Comment
Oct-20	MW239S	3.04	1.364	1.676	4	-	19.6	522	4.27	28.7	Light Brown, sulphur odour
Nov-20	MW239S	3.04	0.998	2.042	4	-	22.4	1443	4.55	-83.8	Light Brown, sulphur odour
Dec-20	MW239S	3.04	1.2	1.840	4	-	23	1389	4.6	-126.1	Dark brown, sulphur odour
Jan-21	MW239S	3.04	0.998	2.042	4	-	23.6	1221	5.08	-127.7	Dark brown, sulphur odour
Feb-21	MW239S	3.04	0.998	2.042	4	13:50	22.8	1676	5.12	-155.7	dark brown, sulfur odour
Mar-21	MW239S	3.04	0.923	2.117	4	-	22.3	402	5.19	-158	slight cloudy brown, sulfur odour
Apr-21	MW239S	3.04	0.757	2.283	3.84	9:55	18.43	276	4.43	8.3	Dark brown/organic material, strong sulphur odour
May-21	MW239S	3.04	0.81	2.230	3.84	14:30	17.5	348	4.61	117	Dark brown/organic material, strong sulphur odour, well in good condition
Jun-21	MW239S	3.04	0.812	2.228	3.84	13:53	16.1	246	4.59	38	Slight cloudy yellow, moderate sulphur odour, no sheen, well in good condition
Jul-21	MW239S	3.04	0.736	2.304	3.86	14:09	15.3	146	4.58	50.9	Medium brown, slight - moderate sulphur odour, no sheen, well in good condition
Aug-21	MW239S	3.04	0.874	2.166	3.86	13:55	15.6	166.5	4.6	-28.4	Light brown, moderate sulphur odour, no sheen, well in good condition
Sep-21	MW239S	3.04	0.786	2.254	3.82	10:00	15.4	205	4.66	-142	Cloudy brown, slight sulphur odour, no sheen, well in good condition
Oct-21	MW239S	3.04	0.801	2.239	3.83	1:12	16.9	160.8	4.83	-34.8	Medium brown, slight sulphur odour, no sheen
Nov-21	MW239S	3.04	0.787	2.253	3.83	11:40	18.7	179.9	4.5	-74.9	Light brown, light sulphur odour, no sheen
Dec-21	MW239S	3.04	0.862	2.178	3.85	10:00	21	151.4	4.8	-91	light brown, moderate sulfur odour, no sheen
Jan-22	MW239S	3.04	1.078	1.962	3.87	9:20	21.5	20.4	4.38	-75	medium brown, slight sulfur odour, no sheen
Mar-22	MW239S	3.04	0.602	2.438	3.86	9:20	21.3	92.8	4.69	-42.4	Light brown, slight sulfur odour, no sheen
Apr-22	MW239S	3.04	0.63	2.410	3.86	9:20	19.7	174.9	4.73	-101	Cloudy brown, moderate sulfur odour, no sheen
Feb-19	SW1	2.5	Dry	-	N/A	-	-	-	-	-	Location was dry.
Mar-19	SW1	2.5	Dry	-	N/A	-	-	-	-	-	Location was dry.
Apr-19	SW1	2.5	2.49	0.010	N/A	12:00	23.16	1003	3.95	405.9	Small pool of surface water with stained brown water.
May-19	SW1	2.5	0.01	2.490	N/A	11:15	14.9	966	4.42	106.7	Small pool of surface water with stained brown water.
Jun-19	SW1	N/A	0.14	#VALUE!	N/A	11:40	14.5	811	6.4	298.4	Small pool of surface water with stained brown water.
Jul-19	SW1	N/A	0.2	#VALUE!	N/A	11:05	9.7	827	4.56	99	Dark brown, no odour, slight sheen
Aug-19	SW1	N/A	0.15	#VALUE!	N/A	10:45	9.52	1205	4.6	263	Natural tannin stained brown, sulfur odour
Sep-19	SW1	N/A	0.26	#VALUE!	N/A	13:00	16.59	1138	4.21	323	Natural tannin stained brown, sulfur odour
Oct-19	SW1	N/A	0.29	#VALUE!	N/A	10:45	16.56	857	4.35	339	Natural tannin stained brown, sulfur odour
Nov-19	SW1	N/A	0.02	#VALUE!	N/A	11:45	23.75	1964	4.53	230	Significant reduction in water level, tannins stained brown, sulfur odour
Dec-19	SW1	N/A	Dry	-	N/A	-	-	-	-	-	Location was dry
Jan-20	SW1	N/A	Dry	-	N/A	-	-	-	-	-	Location was dry
Feb-20	SW1	N/A	Dry	-	N/A	-	-	-	-	-	Location was dry
Mar-20	SW1	N/A	Dry	-	N/A	-	-	-	-	-	Location was dry
Apr-20	SW1	N/A	1.9	-	N/A	-	18.3	144.6	8.23	126.5	-
May-20	SW1	N/A	3	-	N/A	13:10	14	169.4	7.4	183.1	-
Jun-20	SW1	N/A	0.52	-	N/A	13:10	11.9	120.5	6.9	139.8	Light brown, no odour
Jul-20	SW1	N/A	0.54	-	N/A	-	12	98	7.4	226	Light brown, no odour
Aug-20	SW1	N/A	>0.6	-	N/A	-	14.21	83.65	6.38	229.4	Light brown, no odour
Sep-20	SW1	N/A	0.6	-	N/A	-	16.51	116	6.36	229.4	Light brown, no odour
Oct-20	SW1	N/A	0.6	N/A	N/A	-	18.2	313.3	6.68	131	Light brown, no odour
Nov-20	SW1	N/A	0.6	N/A	N/A	-	22.9	461	6.91	1140	Clear, no odour
Dec-20	SW1	N/A	0.6	N/A	N/A	-	26.4	658	6.61	49.8	Clear, no odour
Jan-21	SW1	N/A	0.6	N/A	N/A	-	25.1	594	6.77	67.2	Clear, no odour
Feb-21	SW1	N/A	-	-	-	11:00	22.58	608	6.68	65.1	Clear, no odour, very full
Mar-21	SW1	N/A	> 0.6	-	-	11:30	21.1	184	6.59	118	Slight brown/tan, no odour
Apr-21	SW1	N/A	> 0.6	N/A	N/A	12:45	15.4	310.66	5.38	41.7	Slight brown stain, sulphur odour
May-21	SW1	N/A	1.5	N/A	N/A	12:00	11	265.5	5.43	186.5	Dark brown stain, no odour
Jun-21	SW1	N/A	1.4	N/A	N/A	11:49	10.1	219	5.77	202	Natural tannin brown, no odour / sheen
Jul-21	SW1	N/A	0.65	N/A	N/A	11:56	12.2	202.3	5.29	208.2	Deep yellow, no odour / sheen
Aug-21	SW1	N/A	0.6	N/A	N/A	11:52	12	187	6.05	194.6	Clear / slight yellow, no odour / sheen
Sep-21	SW1	N/A	-	N/A	N/A	-	10.8	145	6.04	139.4	Slight yellow, no odour / sheen
Oct-21	SW1	N/A	0.7	N/A	N/A	12:13	16.6	108	6.17	152	Dark tannin red / brown, no odour / sheen
Nov-21	SW1	N/A	-	N/A	N/A	13:30	17.8	92.2	5.72	153.7	Natural tannin orange / brown, no odour, no sheen
Feb-19	SW2	3.3	Dry	-	N/A	-	-	-	-	-	Location was dry.
Mar-19	SW2	3.3	Dry	-	N/A	-	-	-	-	-	Location was dry.
Apr-19	SW2	3.3	Dry	-	N/A	-	-	-	-	-	Location was dry.
May-19	SW2	3.3	Dry	-	N/A	-	-	-	-	-	Location was dry.
Jun-19	SW2	N/A	Dry	-	N/A	-	-	-	-	-	Location was dry.
Jul-19	SW2	N/A	Dry	-	N/A	-	-	-	-	-	Location was dry.
Aug-19	SW2	N/A	Dry	-	N/A	-	-	-	-	-	Location was dry.
Sep-19	SW2	N/A	Dry	-	N/A	-	-	-	-	-	Location was dry.
Oct-19	SW2	N/A	Dry	-	N/A	-	-	-	-	-	Location was dry.
Nov-19	SW2	N/A	Dry	-	N/A	-	-	-	-	-	Location was dry.
Dec-19	SW2	N/A	Dry	-	N/A	-	-	-	-	-	Location was dry.
Jan-20	SW2	N/A	Dry	-	N/A	-	-	-	-	-	Location was dry.
Feb-20	SW2	N/A	Dry	-	N/A	-	-	-	-	-	Location was dry.
Mar-20	SW2	N/A	Dry	-	N/A	-	-	-	-	-	Location was dry.
Apr-20	SW2	N/A	Dry	-	N/A	-	-	-	-	-	-
May-20	SW2	N/A	Dry	-	N/A	-	-	-	-	-	Location was dry.
Jun-20	SW2	N/A	Dry	-	N/A	-	-	-	-	-	Location was dry.
Jul-20	SW2	N/A	Dry	-	N/A	-	-	-	-	-	Location was dry – ground damp
Aug-20	SW2	N/A	Dry	-	N/A	-	-	-	-	-	Location was dry – ground damp
Sep-20	SW2	N/A	Dry	-	N/A	-	-	-	-	-	Location was dry
Oct-20	SW2	N/A	Dry	N/A	N/A	-	-	-	-	-	Location was dry
Nov-20	SW2	N/A	Dry	N/A	N/A	-	-	-	-	-	Location was dry
Dec-20	SW2	N/A	Dry	N/A	N/A	-	-	-	-	-	Location was dry
Jan-21	SW2	N/A	Dry	N/A	N/A	-	-	-	-	-	Location was dry
Feb-21	SW2	N/A	0.1	-	-	11:00	20.3	132	6.16	244	Slight brown/tan, sulfur odour
Mar-21	SW2	N/A	0.1	N/A	N/A	12:10	14.67	91.5	5.07	19	Slight brown stain, sulphur odour
May-21	SW2	N/A	0.25	N/A	N/A	11:10	11.1	89.1	4.99	166	Slight brown stain, no odour
Jun-21	SW2	N/A	0.25	N/A	N/A	10:40	12.8	105	4.69	64.2	Clear, no odour / sheen
Jul-21	SW2	N/A	0.25	N/A	N/A	10:33	12.2	96.4	4.43	87.4	Natural tannin brown, slight sulphur odour, no sheen
Aug-21	SW2	N/A	0.2	N/A	N/A	13:10	11	98.8	4.56	294	Natural tannin brown, slight sulphur odour, no sheen
Sep-21	SW2	N/A	0.6	N/A	N/A	-	13.4	103	4.57	346	Natural tannin orange, no odour / sheen
Oct-21	SW2	N/A	0.6	N/A	N/A	10:50	16.5	93.6	4.65	270.5	Dark tannin red / brown, no odour / sheen
Nov-21	SW2	N/A	0.6	N/A	N/A	-	17.1	89	4.96	156.8	Water was at a low level and was not seen to be flowing.
Feb-19	SW3	2.1	1.1	1.000	N/A	16:15	26	313	5.11	62	Water was at a low level and was not seen to be flowing.
Mar-19	SW3	2.1	1.1	1.000	N/A	15:15	25.87	342	6.08	-	Water was at a low level and was not seen to be flowing.
Apr-19	SW3	2.1	1.1	1.000	N/A	14:30	19.88	311	6.02	-12.8	Water clear, no odour.
May-19	SW3	2.1	0.1	2.000	N/A	13:15	14.54	344	5.54	71.6	Water clear, no odour.
Jun-19	SW3	N/A	0.15	1.100	N/A	13:30	16.36	290	6.41	52.4	Water clear, no odour.
Jul-19	SW3	N/A	0.215	1.215	N/A	12:45	14.6	431	4.27	116	Water clear, no odour.
Aug-19	SW3	N/A	0.195	1.195	N/A	12:45	11.96	464	4.67	152	Water clear, no odour.
Sep-19	SW3	N/A	0.24	1.240	N/A	14:45	17.05	449	5.02	86.7	Water clear, no odour.
Oct-19	SW3	N/A	0.29	1.290	N/A	12:30	18.77	313	4.36	315	Water clear, no odour.
Nov-19	SW3	N/A	0.02	1.020	N/A	9:45	19.54	470	5.04	97.7	Mostly clear (red algae present), no odour
Dec-19	SW3	N/A	Dry	-	N/A	10:00	20	440	5.69	29.3	Small amount of standing water
Jan-20	SW3	N/A	Dry	-	N/A	-	-	-	-	-	Location was dry.
Feb-20	SW3	N/A	Dry	-	N/A	-	-	-	-	-	Location was dry.
Mar-20	SW3	N/A	Dry	-	N/A	-	-	-	-	-	Location was dry.
Apr-20	SW3	N/A	0.76	-	N/A	-	17.5	276.9	4.24	235.6	-
May-20	SW3	N/A	0.85	-	N/A	13:30	14.3	286.6	4.72	304.7	-
Jun-20	SW3	N/A	0.24	-	N/A	13:30	14.5	468.6	4.18	220.9	Clear, no odour
Jul-20	SW3	N/A	0.3	-	N/A	-	14	395	4	381	Clear, no odour
Aug-20	SW3	N/A	0.56	-	N/A	-	13.56	47.36	3.77	4.08	Clear, no odour
Sep-20	SW3	N/A	0.39	-	N/A	-	16.99	399	3.79	4.08	Clear, no odour
Oct-20	SW3	N/A	0.39	N/A	N/A	-	18.3	375.4	3.74	318	Clear, no odour
Nov-20	SW3	N/A	0.39	N/A	N/A	-	20.1	1218	4.78	398.5	Clear, slight odour
Dec-20	SW3	N/A	0.31	N/A	N/A	-	23.6	1097	5.45	171.1	Clear, no odour
Jan-21	SW3	N/A	0.31	N/A	N/A	-	22.1	1056	5.31	147.2	Clear, no odour
Feb-21	SW3	N/A	-	-	-	10:15	21.2	1101	5.95	36.9	Clear, no odour
Mar-21	SW3	N/A	> 0.6	-	-	10:30	20.6	291	6.54	1	

Table 5
Gauging Data and Field Parameters
Williamtown Sand Syndicate

Date	Borehole	Top of Casing (mAHD)	Depth to Water (mBTOC)	Groundwater Elevation (mAHD)	Well Total Depth at point of sampling (mBTOC)	Time	Temp (°C)	EC (us/cm)	pH	Redox (mV)	Comment
Aug-21	SW3	N/A	0.6	N/A	N/A	9:51	8.7	203	5.02	-12.7	Natural tannin brown, strong sulphur odour, no sheen
Nov-21	SW3	N/A	-	N/A	N/A	12:00	17.8	218.3	4.03	87.3	Natural tannin orange / brown, no odour, no sheen
Feb-19	SW4	2	Dry	-	N/A	-	-	-	-	-	Location was dry.
Mar-19	SW4	2	Dry	-	N/A	-	-	-	-	-	Location was dry.
Apr-19	SW4	2	1.9	1.900	N/A	11:15	17.57	339	3.69	430.5	Water clear, no odour.
May-19	SW4	2	0.135	2.135	N/A	10:30	12.03	389	3.69	211.4	Water clear, no odour.
Jun-19	SW4	N/A	0.175	2.135	N/A	10:45	13.34	313	6.44	377.3	Water clear, no odour.
Jul-19	SW4	N/A	0.281	2.281	N/A	9:30	9.9	371	4.23	116	Light brown, no odour.
Aug-19	SW4	N/A	0.18	2.180	N/A	9:50	8.07	485	4.17	294	Clear, no odour.
Sep-19	SW4	N/A	0.29	2.290	N/A	10:30	14.8	371	4.19	360	Clear, no odour.
Oct-19	SW4	N/A	0.35	2.350	N/A	9:45	16.45	325	4.36	370	Clear, no odour.
Nov-19	SW4	N/A	0.15	2.150	N/A	10:45	18.46	538	4.56	219	Clear, no odour.
Dec-19	SW4	N/A	Dry	-	N/A	-	-	-	-	-	Location was dry
Jan-20	SW4	N/A	Dry	-	N/A	-	-	-	-	-	Location was dry
Feb-20	SW4	N/A	Dry	-	N/A	-	-	-	-	-	Location was dry
Mar-20	SW4	N/A	Dry	-	N/A	-	-	-	-	-	Location was dry
Apr-20	SW4	N/A	0.68	-	N/A	-	16.2	306.1	4.83	205.6	-
May-20	SW4	N/A	1.28	-	N/A	14:00	12.1	337.5	4.69	230.1	-
Jun-20	SW4	N/A	0.38	-	N/A	14:00	12.5	375	4.82	236.2	Clear, No odour
Jul-20	SW4	N/A	0.47	-	N/A	-	13	324	4.7	311	Clear, no odour
Aug-20	SW4	N/A	0.52	-	N/A	-	12.4	433.79	4.22	389	Clear, no odour
Sep-20	SW4	N/A	0.5	-	N/A	-	17.02	383	3.88	389	Clear, no odour
Oct-20	SW4	N/A	0.5	N/A	N/A	-	17.7	397.2	3.62	303	Clear, no odour
Nov-20	SW4	N/A	0.5	N/A	N/A	-	20.3	1239	5.66	256	Clear, slight odour
Dec-20	SW4	N/A	0.5	N/A	N/A	-	21	1397	6.72	-204.6	Natural sheen, no odour
Jan-21	SW4	N/A	0.5	N/A	N/A	-	21.7	1311	7.24	-226.5	Natural sheen, sulphur odour
Feb-21	SW4	N/A	-	-	-	9:45	20.6	1468	6.98	-140.4	Natural sheen, no odour, very full
Mar-21	SW4	N/A	> 0.6	-	-	10:00	19.5	529	7.34	-15.2	Brown/Tan, sulfur odour
Apr-21	SW4	N/A	> 0.6	N/A	N/A	11:21	16.14	257.88	6.18	-65	Brown stain, sulphur odour
May-21	SW4	N/A	1.5	N/A	N/A	10:15	10.4	322	6.26	-54	Natural sheen (brown algae), no odour, water flowing in E direction
Jun-21	SW4	N/A	1.2	N/A	N/A	10:00	10.4	277	4.79	260	Natural tannin brown, no odour / sheen
Jul-21	SW4	N/A	0.65	N/A	N/A	9:55	10.2	247	5.3	152	Natural tannin brown, no odour / sheen, flowing towards eastern boundary
Aug-21	SW4	N/A	0.6	N/A	N/A	9:27	9.4	269	5.13	104	Natural tannin brown (orange algae), no odour / sheen
Sep-21	SW4	N/A	0.6	N/A	N/A	-	12.1	236	5.8	149	Natural tannin orange / yellow, no odour / sheen
Oct-21	SW4	N/A	0.65	N/A	N/A	9:26	15.4	281	6.12	37.1	Dark tannin red / brown, no odour / sheen
Nov-21	SW4	N/A	-	N/A	N/A	10:30	15.9	247.3	5.9	-75.7	Natural tannin orange / brown, no odour, no sheen
Oct-21	WPW	N/A	-	N/A	N/A	-	16.6	284	4.94	318	Dark brown
Nov-21	WPW	N/A	-	N/A	N/A	11:58	18	401.4	4.86	253	Dark brown
Dec-21	WPW	N/A	-	N/A	N/A	12:40	21.1	267	4.81	251	Very light brown, no odour, no sheen
Jan-22	WPW	N/A	-	N/A	N/A	10:30	26	273	6.25	-30	light brown, no odour, no sheen
Mar-22	WPW	N/A	-	N/A	N/A	9:50	25.7	26.2	4.7	179	dark brown, no odour/sheen
Apr-22	WPW	N/A	-	N/A	N/A	10:40	24.1	224.6	4.71	195.6	Dark brown, no odour / sheen
	WPW	N/A	-	N/A	N/A	10:45	22	219	4.64	191.1	Cloudy brown, no odour / sheen

KENNARDS**HIRE****EQUIPMENT CERTIFICATION REPORT****PGN9003871 WATER QUALITY METER – MULTIFUNCTION (YSI)**Plant Number: 1077463

SENSOR	CONCENTRATION	SPAN 1	SPAN 2	TRACEABILITY	PASS
pH	pH 7	pH 7		# 367754	<input checked="" type="checkbox"/>
pH	pH 4	pH 4		# 366070	<input checked="" type="checkbox"/>
Conductivity	12.88 mS/cm	12.88 mS/cm		# 364215	<input checked="" type="checkbox"/>
Dissolved Oxygen	Sodium Sulphite / Air	0.0ppm in Sodium Sulphite	ppm Saturation in Air	# 10640	<input checked="" type="checkbox"/>
ORP	240mV	240mV		# 6393	<input checked="" type="checkbox"/>

Battery Status <u>100 (%)</u>	Temperature <u>19.2 °C</u>
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: Jacobs Arnott Date: 05/04/22 Signed: J Arnott

Accessories List:

User's Manual	pH and ORP Storage Solution	Transit Case

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HYDRASLEEVE™ SAMPLING LOG

KLEINFELDER

QW82 & QW83 = WPZ

gcol = rinsate

QCO2 = trip binar.



ATTACHMENT 3: LAB RESULTS



CERTIFICATE OF ANALYSIS

Work Order	: ES2212734	Page	: 1 of 8
Client	: KLEINFELDER AUSTRALIA PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: Megan Ferguson	Contact	: Shirley LeCornu
Address	: 95 MITCHELL ROAD CARDIFF NSW 2285	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +6138549 9630
Project	: 20222347 WSS - CABBAGE TREE RD WATER MONITORING APRIL 2022	Date Samples Received	: 12-Apr-2022 12:01
Order number	: WSS - CABBAGE TREE RD WATER MONITORING APRIL 2022	Date Analysis Commenced	: 13-Apr-2022
C-O-C number	: ----	Issue Date	: 20-Apr-2022 13:49
Sampler	: Megan Ferguson		
Site	: ----		
Quote number	: ME/114/19 ALS Compass		
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
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
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 Contact 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	12-Apr-2022 00:00				
Compound	CAS Number	LOR	Unit	ES2212734-001	ES2212734-002	ES2212734-003	ES2212734-004	ES2212734-005
				Result	Result	Result	Result	Result
EA045: Turbidity								
Turbidity	---	0.1	NTU	462	60.6	32.6	33.3	289
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	0.009	0.017	0.016	0.004	0.038
Iron	7439-89-6	0.05	mg/L	0.25	0.27	3.24	0.43	0.48

Analytical Results

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID	BH11	MW239S	WPW	QW82	QC01	
Compound	CAS Number	LOR	Sampling date / time	12-Apr-2022 00:00				
			Unit	ES2212734-006	ES2212734-007	ES2212734-008	ES2212734-009	ES2212734-010
EP231C: Perfluoroalkyl Sulfonamides - Continued								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	---	---	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	---	---	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	---	---	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	---	---	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	---	---	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	---	---	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	---	---	<0.02	<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	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	---	---	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	---	---	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	---	---	<0.05	<0.05	<0.05
EP231P: PFAS Sums								
Sum of PFAS	---	0.01	µg/L	---	---	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	---	---	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	---	0.01	µg/L	---	---	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate								
13C4-PFOS	---	0.02	%	---	---	89.5	101	101
13C8-PFOA	---	0.02	%	---	---	93.0	99.7	98.7

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID	QC02	---	---	---	---	---	
Compound	CAS Number	LOR	Unit	Sampling date / time	12-Apr-2022 00:00	---	---	---	---
				Result	ES2212734-011	-----	-----	-----	-----
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	QC02	---	---	---	---	---
Compound	CAS Number	LOR	Sampling date / time	12-Apr-2022 00:00	---	---	---	---
			Unit	ES2212734-011	-----	-----	-----	-----
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	%	105	---	---	---	---
13C8-PFOA	---	0.02	%	97.0	---	---	---	---

Surrogate Control Limits

Sub-Matrix: WATER

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

QUALITY CONTROL REPORT

Work Order	: ES2212734	Page	: 1 of 6
Client	: KLEINFELDER AUSTRALIA PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: Megan Ferguson	Contact	: Shirley LeCornu
Address	: 95 MITCHELL ROAD CARDIFF NSW 2285	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +6138549 9630
Project	: 20222347 WSS - CABBAGE TREE RD WATER MONITORING APRIL 2022	Date Samples Received	: 12-Apr-2022
Order number	: WSS - CABBAGE TREE RD WATER MONITORING APRIL 2022	Date Analysis Commenced	: 13-Apr-2022
C-O-C number	: ----	Issue Date	: 20-Apr-2022
Sampler	: Megan Ferguson		
Site	: ----		
Quote number	: ME/114/19 ALS Compass		
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 Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



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

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
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW

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.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot

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

RPD = Relative Percentage Difference

= Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: WATER

Laboratory Duplicate (DUP) Report									
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA045: Turbidity (QC Lot: 4288687)									
ES2212293-010	Anonymous	EA045: Turbidity	----	0.1	NTU	1.7	1.7	0.0	0% - 50%
ES2212734-006	BH11	EA045: Turbidity	----	0.1	NTU	24.4	24.2	0.8	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 4289839)									
ES2212734-001	BH2	EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.009	0.009	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.25	0.25	0.0	No Limit
ES2212734-011	QC02	EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4291399)									
ES2213192-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.04	0.03	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.13	0.12	9.5	0% - 50%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4291399)									
ES2213192-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.02	0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: WATER

		Laboratory Duplicate (DUP) Report							
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4291399) - continued									
ES2213192-001	Anonymous	EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4291399)									
ES2213192-001	Anonymous	EP231X: Perfluoroctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluoroctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluoroctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluoroctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluoroctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluoroctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluoroctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4291399)									
ES2213192-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	0.09	0.08	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4291399)									
ES2213192-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.28	0.24	15.4	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Result	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
EA045: Turbidity (QCLot: 4288687)								
EA045: Turbidity	----	0.1	NTU	<0.1	40 NTU	96.5	91.0	105
EG020F: Dissolved Metals by ICP-MS (QCLot: 4289839)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	93.1	85.0	114
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	90.0	82.0	110
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	95.4	82.0	112
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4291399)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	118	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	101	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	124	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	90.8	69.0	134
EP231X: Perfluoroctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	92.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	124	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4291399)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	88.5	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	107	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	127	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	96.8	72.0	130
EP231X: Perfluoroctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	112	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	103	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	101	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	99.4	69.0	133
EP231X: Perfluorododecanoic acid (PFDaDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	114	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	78.8	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	100	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4291399)								
EP231X: Perfluoroctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	105	67.0	137
EP231X: N-Methyl perfluoroctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	77.1	68.0	141
EP231X: N-Ethyl perfluoroctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	79.1	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	90.9	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	101	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	106	65.0	136

Sub-Matrix: WATER					Method Blank (MB) Report	Laboratory Control Spike (LCS) Report					
	Method: Compound	CAS Number	LOR	Unit		Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)		
							LCS	Low	High		
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4291399) - continued											
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EfFOSAA)	2991-50-6	0.02		µg/L	<0.02	0.25 µg/L	97.4	61.0	135		
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4291399)											
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05		µg/L	<0.05	0.25 µg/L	95.0	63.0	143		
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05		µg/L	<0.05	0.25 µg/L	114	64.0	140		
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05		µg/L	<0.05	0.25 µg/L	107	67.0	138		
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05		µg/L	<0.05	0.25 µg/L	99.8	71.4	144		

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: WATER

				Matrix Spike (MS) Report				
		Method: Compound	CAS Number	Spike	Spike Recovery(%)	Acceptable Limits (%)		
Laboratory sample ID	Sample ID					MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4291399) - continued								
ES2213192-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	111	67.0	137	
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	97.4	68.0	141	
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	82.1	62.6	147	
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	104	66.0	145	
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	115	57.6	145	
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	111	65.0	136	
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	94.2	61.0	135	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4291399)								
ES2213192-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	88.4	63.0	143	
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	97.2	64.0	140	
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	102	67.0	138	
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	114	71.4	144	



Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2212734	Page	: 1 of 5
Client	: KLEINFELDER AUSTRALIA PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: Megan Ferguson	Telephone	: +6138549 9630
Project	: 20222347 WSS - CABBAGE TREE RD WATER MONITORING APRIL 2022	Date Samples Received	: 12-Apr-2022
Site	: ----	Issue Date	: 20-Apr-2022
Sampler	: Megan Ferguson	No. of samples received	: 11
Order number	: WSS - CABBAGE TREE RD WATER MONITORING APRIL 2022	No. of samples analysed	: 11

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- **NO** Matrix Spike outliers occur.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- **NO** Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

Matrix: WATER

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	20	5.00	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: WATER

Evaluation: ✘ = Holding time breach ; ✓ = Within holding time.

Method	Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA045: Turbidity									
Clear Plastic Bottle - Natural (EA045)	BH2, BH6, BH9A, MW239S,	BH4, BH7, BH11, WPW	12-Apr-2022	----	----	---	14-Apr-2022	14-Apr-2022	✓
EG020F: Dissolved Metals by ICP-MS									
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)	BH2, BH6, BH9A, MW239S, QW82, QC02	BH4, BH7, BH11, WPW, QC01,	12-Apr-2022	----	----	---	16-Apr-2022	09-Oct-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids									
HDPE (no PTFE) (EP231X)	WPW, QC01,	QW82, QC02	12-Apr-2022	19-Apr-2022	09-Oct-2022	✓	19-Apr-2022	09-Oct-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids									
HDPE (no PTFE) (EP231X)	WPW, QC01,	QW82, QC02	12-Apr-2022	19-Apr-2022	09-Oct-2022	✓	19-Apr-2022	09-Oct-2022	✓
EP231C: Perfluoroalkyl Sulfonamides									
HDPE (no PTFE) (EP231X)	WPW, QC01,	QW82, QC02	12-Apr-2022	19-Apr-2022	09-Oct-2022	✓	19-Apr-2022	09-Oct-2022	✓

Page : 3 of 5
 Work Order : ES2212734
 Client : KLEINFELDER AUSTRALIA PTY LTD
 Project : 20222347 WSS - CABBAGE TREE RD WATER MONITORING APRIL 2022



Matrix: WATER									Evaluation: ✗ = Holding time breach ; ✓ = Within holding time.					
Method	Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis								
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation						
EP231D: (n:2) Fluorotelomer Sulfonic Acids														
HDPE (no PTFE) (EP231X)	WPW, QC01,	QW82, QC02	12-Apr-2022	19-Apr-2022	09-Oct-2022	✓	19-Apr-2022	09-Oct-2022	✓					
EP231P: PFAS Sums														
HDPE (no PTFE) (EP231X)	WPW, QC01,	QW82, QC02	12-Apr-2022	19-Apr-2022	09-Oct-2022	✓	19-Apr-2022	09-Oct-2022	✓					

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: WATER

Evaluation: ✗ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Analytical Methods	Method	Count		Rate (%)		Quality Control Specification
			QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)							
Dissolved Metals by ICP-MS - Suite A		EG020A-F	2	20	10.00	10.00	✓ NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS		EP231X	1	20	5.00	10.00	✗ NEPM 2013 B3 & ALS QC Standard
Turbidity		EA045	2	20	10.00	10.00	✓ NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Dissolved Metals by ICP-MS - Suite A		EG020A-F	1	20	5.00	5.00	✓ NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS		EP231X	1	20	5.00	5.00	✓ NEPM 2013 B3 & ALS QC Standard
Turbidity		EA045	1	20	5.00	5.00	✓ NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Dissolved Metals by ICP-MS - Suite A		EG020A-F	1	20	5.00	5.00	✓ NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS		EP231X	1	20	5.00	5.00	✓ NEPM 2013 B3 & ALS QC Standard
Turbidity		EA045	1	20	5.00	5.00	✓ NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Dissolved Metals by ICP-MS - Suite A		EG020A-F	1	20	5.00	5.00	✓ NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS		EP231X	1	20	5.00	5.00	✓ NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

<i>Analytical Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Turbidity	EA045	WATER	In house: Referenced to APHA 2130 B. This method is compliant with NEPM Schedule B(3)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

Client:		Laboratory:		
Kleinfielder Australia Pty Ltd	Site Name:	WSS - Cabbag Tree Rd Water Monitoring April 2022	Sample Name:	Megan Ferguson
Suite 3, 240-244 Pacific Hwy	QUOTE NUMBER	ME114/19	Contact Number:	0455 981 953
Charlestown, NSW 2300	Job No.:	20222347	Contact e-mail:	mferguson@kleinfelder.com
Phone: 02 4949 5200	Required TAT:	24 hrs 48 hrs 3 days 5 days 7 days	PM name (if not sampler):	
	Data QA level:	LAB minimum unless specified:	PM e-mail:	

CHAIN OF CUSTODY

Reinquished by (print):

(sign)

Megan Ferguson

(sign)

12/4/22 12:00

(sign)

12/4/22 12 p.m.

(sign)

Temp. (°C)

(sign)

Notes:

(sign)

Seals intact / no seal

(sign)

Notes:

(sign)

seals intact / no seal

(sign)

Send Results to:

(sign)

mferguson@kleinfelder.com

(sign)

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne	Sydney	Brisbane	Newcastle
6 Monterey Road Dandenong South VIC 3175	179 Magowar Road Girraween NSW 2066	1/21 Smallwood Place Murarrie QLD 4172	4/52 Industrial Drive Mayfield East NSW 2304
Phone : +61 3 8564 5000	Phone : +61 2 9900 8400	Phone : +61 7 3902 4600	PO Box 60 Wickham 2293
NATA # 1261 Site # 1254	NATA # 1261 Site # 18217	NATA # 1261 Site # 20794	Phone : +61 2 4968 8448 NATA # 1261 Site # 25079

www.eurofins.com.au

EnviroSales@eurofins.com

Eurofins ARL Pty Ltd

ABN: 91 05 0159 898

Perth	Christchurch
46-48 Banksia Road Welshpool WA 6106	43 Detroit Drive Rolleston, Christchurch 7675
Phone : +61 8 6253 4444	Penrose, Auckland 1061
NATA # 2377 Site # 2370	Phone : +64 9 526 45 51
	IANZ # 1290

Eurofins Environment Testing NZ Limited

NZBN: 9429046024954

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

Sample Receipt Advice

Company name: Kleinfelder Aust Pty Ltd (NEWCASTLE)
Contact name: M Ferguson
Project name: WSS-CABBAGE TREE RD WATER MONITORING APRIL 2022
Project ID: 20222347
Turnaround time: 5 Day
Date/Time received
Eurofins reference Apr 19, 2022 5:01 PM
880847

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ All samples have been received as described on the above COC.
- ✓ COC has been completed correctly.
- ✓ Attempt to chill was evident.
- ✓ Appropriately preserved sample containers have been used.
- ✓ All samples were received in good condition.
- ✓ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ✓ Appropriate sample containers have been used.
- ✓ Sample containers for volatile analysis received with zero headspace.
- ✗ Split sample sent to requested external lab.
- ✗ Some samples have been subcontracted.
- N/A** Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Andrew Black on phone : (+61) 2 9900 8490 or by email: AndrewBlack@eurofins.com

Results will be delivered electronically via email to M Ferguson - mferguson@kleinfelder.com.

Note: A copy of these results will also be delivered to the general Kleinfelder Aust Pty Ltd (NEWCASTLE) email address.



Environment Testing

web: www.eurofins.com.au

email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261 Site # 1254

Sydney
179 Magowar Road
Girraween NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Newcastle
4/52 Industrial Drive
Mayfield East NSW 2304
PO Box 60 Wickham 2293
Phone : +61 2 4968 8448
NATA # 1261 Site # 25079

Eurofins ARL Pty Ltd

ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool WA 6106
Phone : +61 8 6253 4444
NATA # 2377 Site # 2370

Eurofins Environment Testing NZ Limited

NZBN: 9429046024954

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 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 WATER MONITORING APRIL 2022
Project ID: 20222347

Order No.:

880847

Report #:

02 4949 5200

Phone:

Fax:

Received:

Apr 19, 2022 5:01 PM

Due:

Apr 27, 2022

Priority:

5 Day

Contact Name:

M Ferguson

Eurofins Analytical Services Manager : Andrew Black

Sample Detail

		Arsenic	Iron	Manganese	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254					
Sydney Laboratory - NATA # 1261 Site # 18217		X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794					
Mayfield Laboratory - NATA # 1261 Site # 25079					
Perth Laboratory - NATA # 2377 Site # 2370					
External Laboratory					
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID
1	QW83	Apr 12, 2022		Water	S22-Ap0036563
Test Counts					
		1	1	1	1

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 880847-W
Project name WSS-CABBAGE TREE RD WATER MONITORING APRIL 2022
Project ID 20222347
Received Date Apr 19, 2022

Client Sample ID			QW83
Sample Matrix			Water
Eurofins Sample No.			S22- Ap0036563
Date Sampled	LOR	Unit	Apr 12, 2022
Test/Reference			
Heavy Metals			
Arsenic	0.001	mg/L	0.001
Iron	0.05	mg/L	4.3
Manganese	0.005	mg/L	0.049

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 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Sydney	Apr 27, 2022	28 Days

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne
 6 Monterey Road
 Dandenong South VIC 3175
 Phone : +61 3 8564 5000
 NATA # 1261 Site # 1254

Sydney
 179 Magowar Road
 Girraween NSW 2066
 Phone : +61 2 9900 8400
 NATA # 1261 Site # 18217

Brisbane
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 PO Box 60 Wickham 2293
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 NATA # 1261 Site # 25079

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 NATA # 2377 Site # 2370

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NZBN: 9429046024954

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 35 O'Rorke Road
 Penrose, Auckland 1061
 Phone : +64 9 526 45 51
 IANZ # 1327

Christchurch
 43 Detroit Drive
 Rolleston, Christchurch 7675
 Phone : 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 WATER MONITORING APRIL 2022
Project ID: 20222347**Order No.:**

880847

Report #: 02 4949 5200
Phone:
Fax:**Received:**

Apr 19, 2022 5:01 PM

Due: Apr 27, 2022**Priority:** 5 Day**Contact Name:** M Ferguson**Eurofins Analytical Services Manager :** Andrew Black**Sample Detail**

		Arsenic	Iron	Manganese	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254					
Sydney Laboratory - NATA # 1261 Site # 18217		X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794					
Mayfield Laboratory - NATA # 1261 Site # 25079					
Perth Laboratory - NATA # 2377 Site # 2370					
External Laboratory					
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID
1	QW83	Apr 12, 2022		Water	S22-Ap0036563
Test Counts					
		1	1	1	1

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

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.
TBTO	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		mg/L	< 0.001				0.001	Pass	
Iron		mg/L	< 0.05				0.05	Pass	
Manganese		mg/L	< 0.005				0.005	Pass	
LCS - % Recovery									
Heavy Metals									
Arsenic		%	106				80-120	Pass	
Iron		%	106				80-120	Pass	
Manganese		%	105				80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals									
Arsenic	S22-Ap0037150	NCP	%	113			75-125	Pass	
Iron	S22-Ap0037150	NCP	%	117			75-125	Pass	
Manganese	S22-Ap0037150	NCP	%	114			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Heavy Metals									
Arsenic	S22-Ap0042304	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Iron	S22-Ap0042304	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Manganese	S22-Ap0042304	NCP	mg/L	< 0.005	< 0.005	<1	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:



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](#).

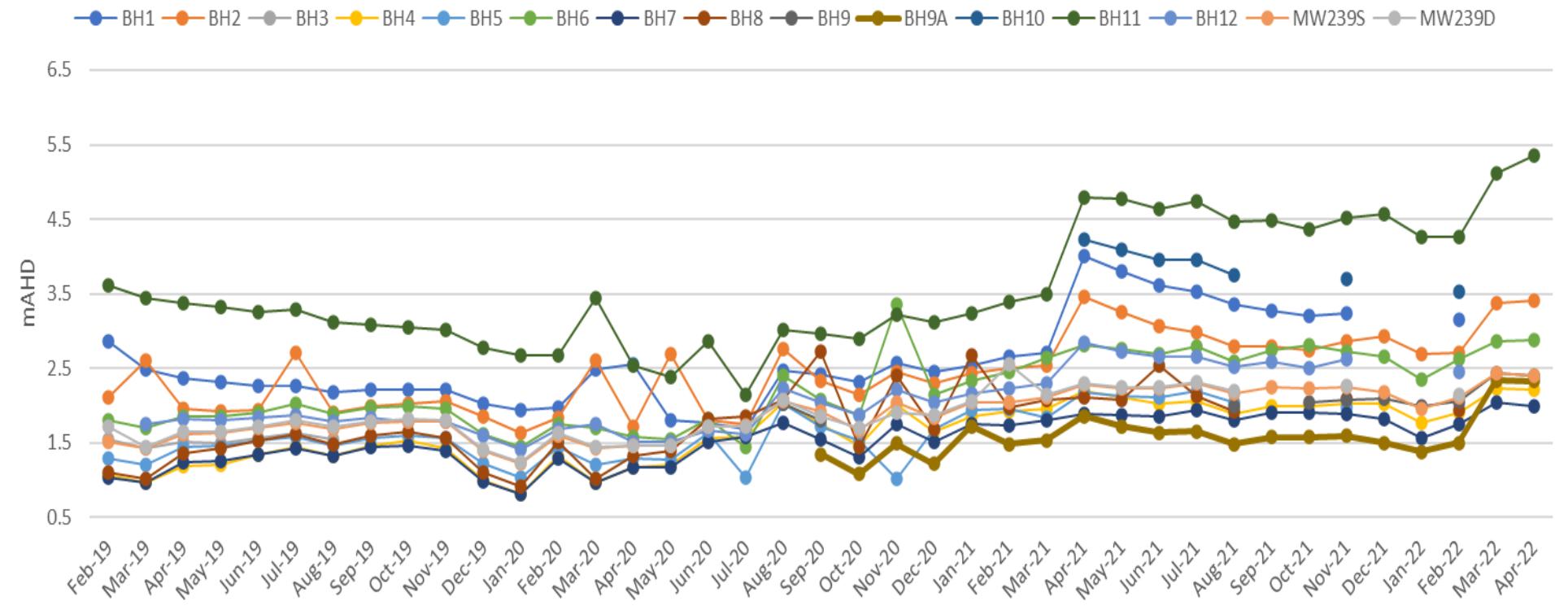
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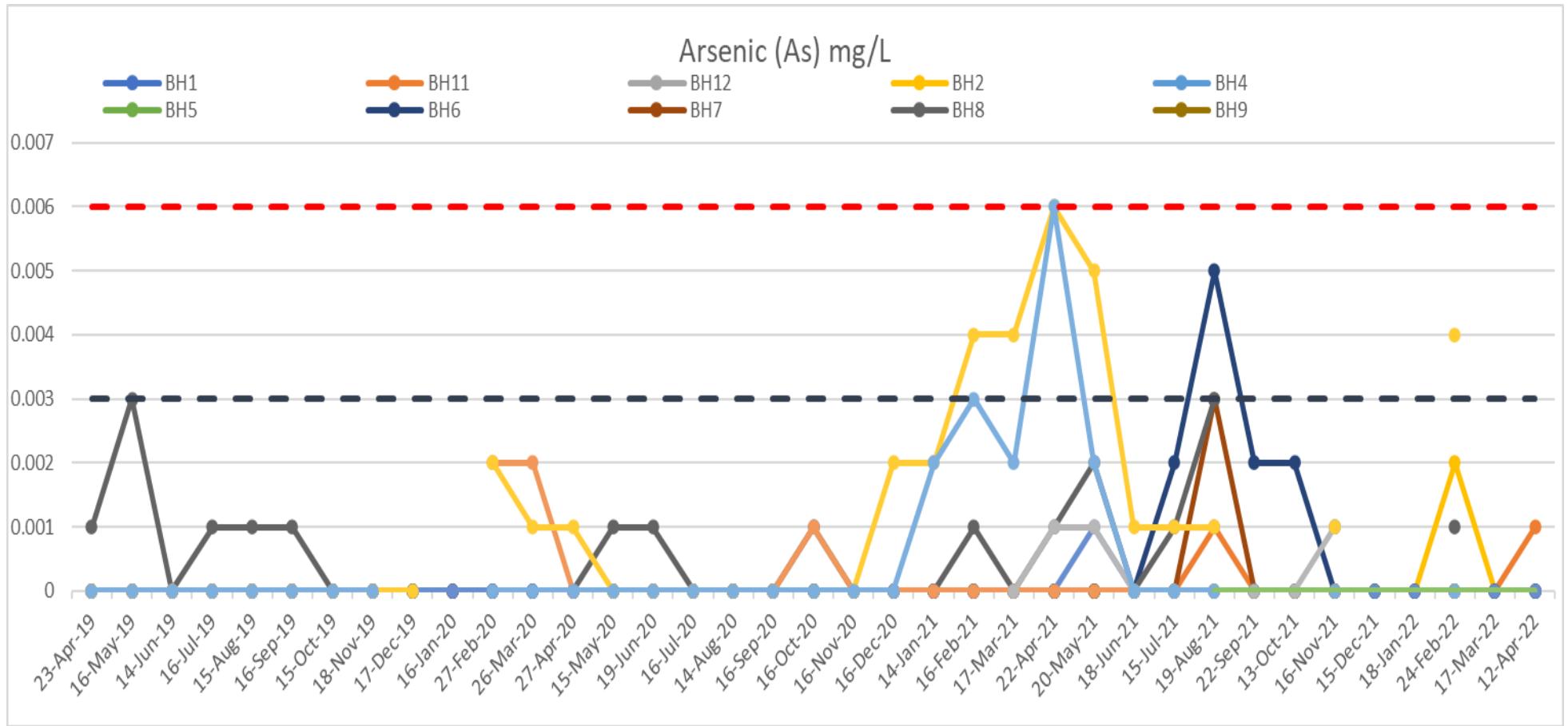


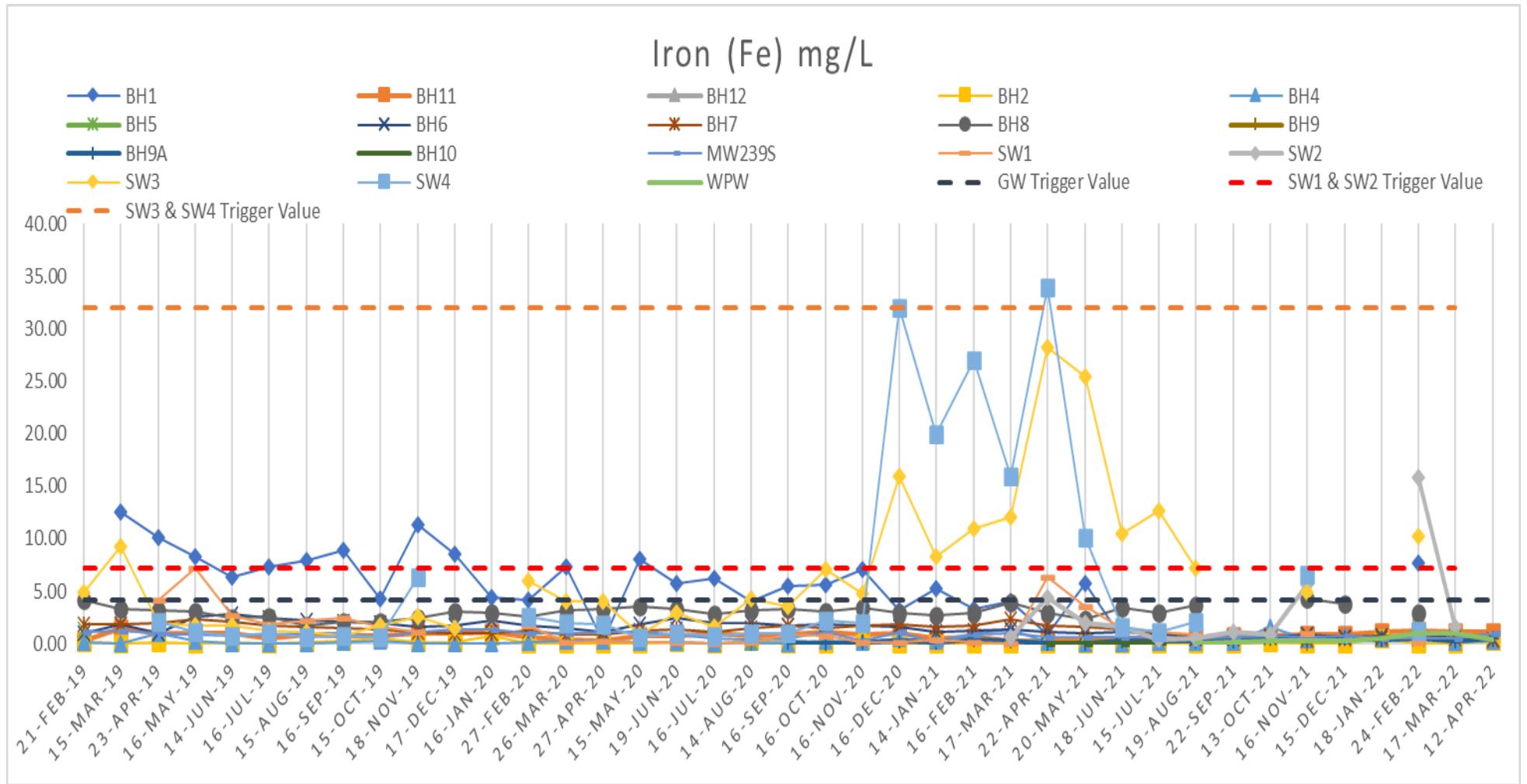
ATTACHMENT 4: DATA TRENDS



Groundwater Elevation (mAHD)







Manganese (Mn) mg/L

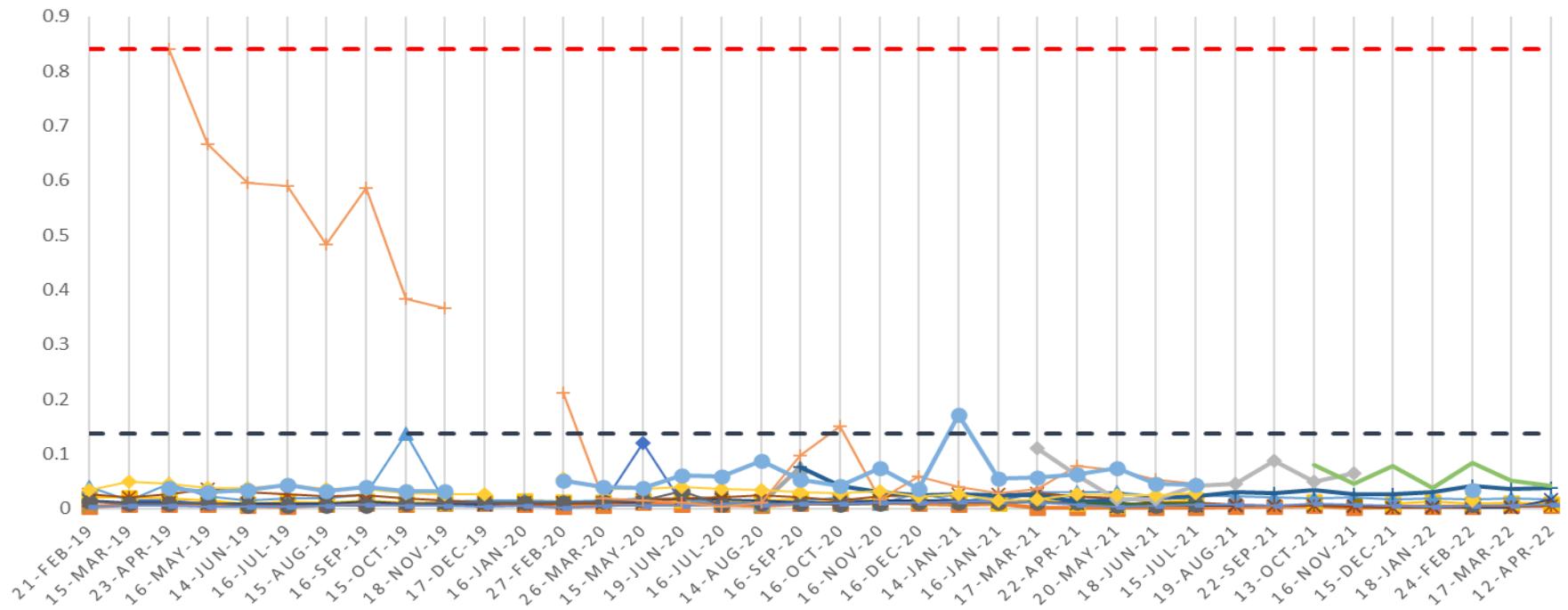
BH1
BH5
BH9A
SW3

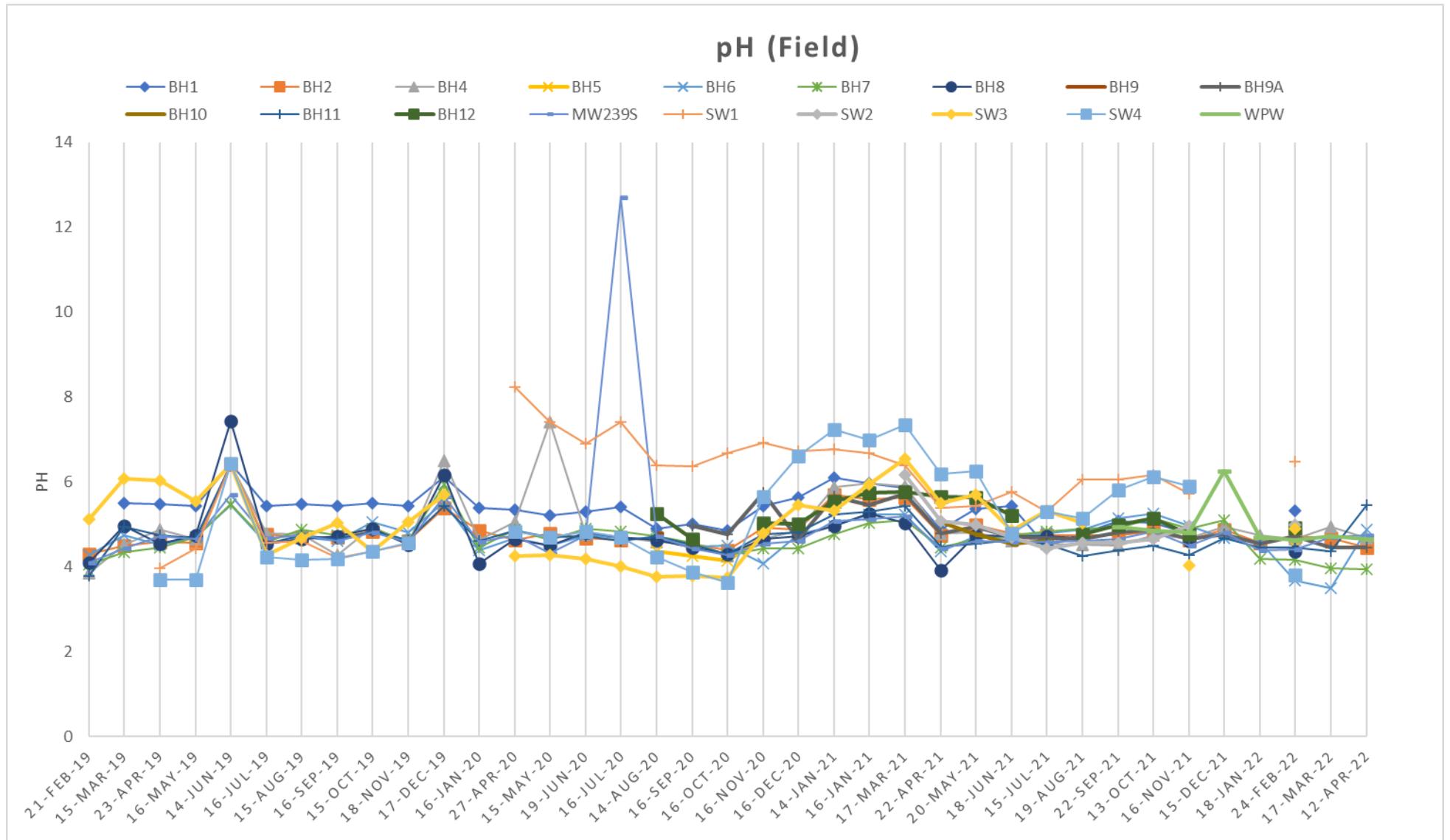
BH11
BH6
BH10
SW4

BH12
BH7
MW239S
WPW

BH2
BH8
SW1
GW Trigger Values

BH4
BH9
SW2
SW Trigger Values





Monthly Rainfall Totals 2021-2022 (mm)

