

Licence Information

Environment Protection Licence (EPL) Number	13218
Licence Holder	MACKA'S SAND PTY LTD
Licensee Address	Licensee: Macka's Sand Pty Ltd 2684 Nelson Bay Rd Salt Ash NSW 2318 Premises: Macka's Sand Extraction and Processing Facility Off Nelson Bay Road Salt Ash NSW 2318
Link to the full licence on the EPA website	https://apps.epa.nsw.gov.au/prpoeoapp/ViewPOELicence.aspx?DOCID=77948&SYSUID=1&LICID=13218
Anniversary Date:	30-Jun
Information Last Obtained:	11-Jan-24
Date of Publication:	17-Jan-24



1646 - Macka's Sand - EPL 13218

Quarterly Groundwater Monitoring

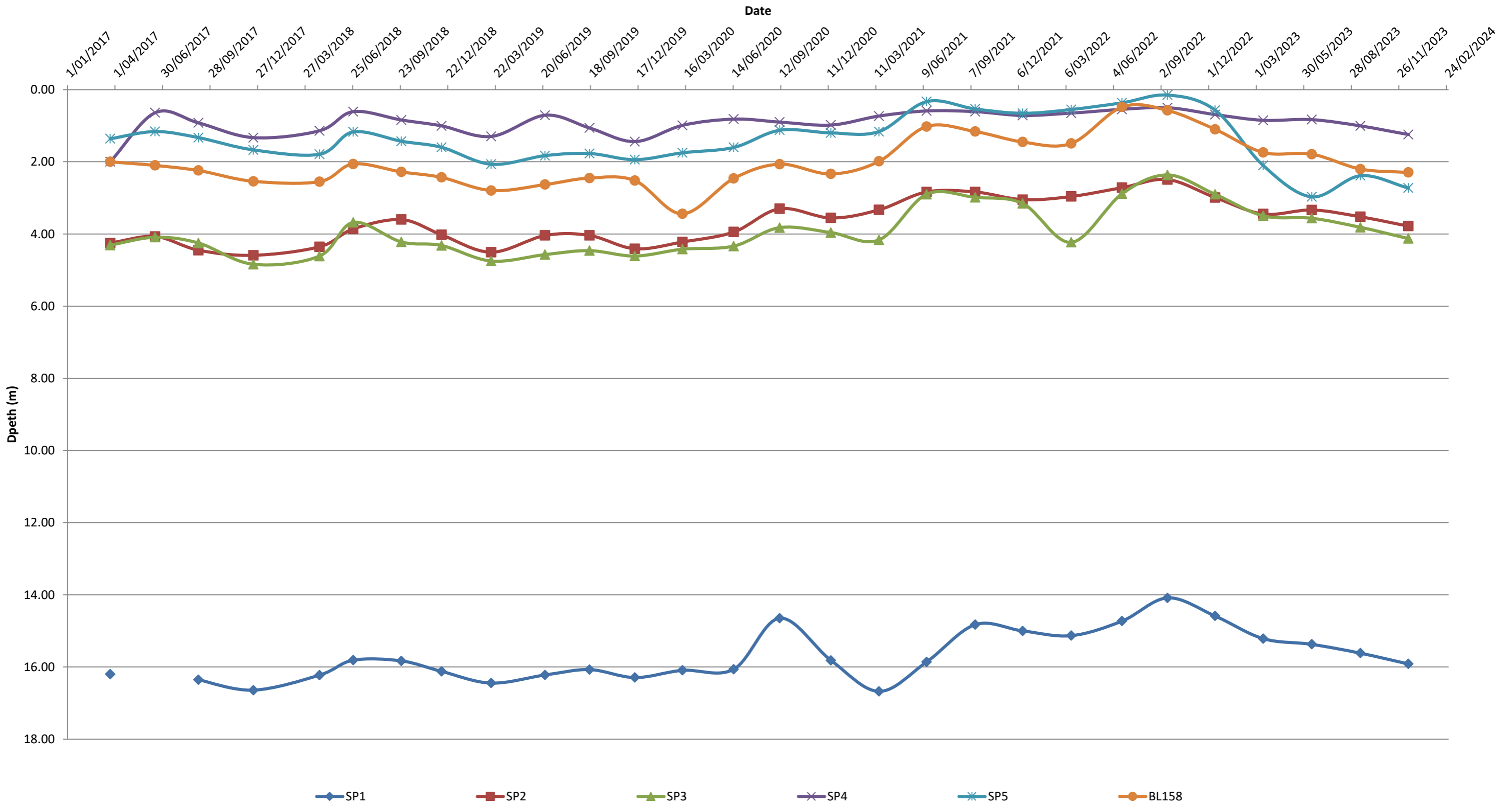
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Sample Date	Depth - EPL (m)						Water Level (PA 08_0142 - SWMP Only)						Comment
	SP1	SP2	SP3	SP4	SP5	BL158	SP1	SP2	SP3	SP4	SP5	BL158	
	EPA Point 1	EPA Point 2	EPA Point 3	EPA Point 4	EPA Point 5	EPA Point 6	EPA Point 1	EPA Point 2	EPA Point 3	EPA Point 4	EPA Point 5	EPA Point 6	
23-Mar-17	16.20	4.25	4.31	2.00	1.36	2.00	1.30	2.15	1.90	-0.25	2.79	2.16	
16-Jun-17		4.07	4.09	0.64	1.16	2.10		2.33	2.12	1.11	2.99	2.06	Sampling error at SP1
06-Sep-17	16.35	4.45	4.25	0.92	1.33	2.24	1.15	1.95	1.96	0.83	2.82	1.92	
19-Dec-17	16.64	4.59	4.84	1.33	1.67	2.54	0.86	1.81	1.37	0.42	2.48	1.62	
23-Apr-18	16.23	4.36	4.61	1.14	1.79	2.55	1.28	2.05	1.60	0.61	2.36	1.61	
26-Jun-18	15.81	3.86	3.68	0.61	1.17	2.06	1.69	2.54	2.53	1.14	2.98	2.10	
25-Sep-18	15.83	3.60	4.22	0.84	1.43	2.28	1.67	2.80	1.99	0.91	2.72	1.88	Standpipe replaced in August 2018.
10-Dec-18	16.12	4.02	4.32	1.00	1.60	2.43	1.39	2.43	1.89	0.72	2.55	1.73	
14-Mar-19	16.44	4.50	4.75	1.30	2.07	2.80	1.06	1.95	1.46	0.42	2.08	1.36	SP4 Casing broken. Indicative water level based off previously surveyed standpipe height. SP1 & SP5 monitoring undertaken on 15/3/19 due to access restrictions on 14/3/2019.
24-Jun-19	16.22	4.04	4.57	0.71	1.83	2.63	1.29	2.41	1.64	1.01	2.32	1.53	SP4 Casing broken (repaired and broken again). Indicative water level based off previously surveyed standpipe height.
16-Sep-19	16.07	4.04	4.46	1.06	1.77	2.45	1.44	2.41	1.75	0.66	2.38	1.71	SP5 Monitoring undertaken on 17/9/19
11-Dec-19	16.29	4.41	4.61	1.44	1.94	2.52	1.22	2.04	1.60	0.28	2.21	1.64	
10-Mar-20	16.09	4.22	4.42	0.99	1.75	3.44	1.42	2.23	1.79	0.73	2.40	0.72	
15-Jun-20	16.06	3.95	4.34	0.82	1.60	2.46	1.45	2.51	1.87	0.91	2.54	1.70	SP4 well casing broken. SP3, SP5 and BL158 sampling conducted on 16/06/20.
10-Sep-20	14.65	3.30	3.82	0.90	1.13	2.07	2.86	3.15	2.38	0.82	3.02	2.09	
16-Dec-20	15.82	3.55	3.96	0.98	1.20	2.34	1.69	2.90	2.25	0.74	2.95	1.83	SP2, SP3 and SP5 sampling conducted on 17/12/2020
17-Mar-21	16.67	3.33	4.16	0.73	1.16	1.99	0.83	3.12	2.04	0.99	2.98	2.18	
15-Jun-21	15.86	2.84	2.90	0.59	0.33	1.02	1.65	3.62	3.31	1.13	3.82	3.14	
15-Sep-21	14.83	2.84	2.99	0.61	0.54	1.16	2.68	3.62	3.22	1.11	3.61	3.00	SP2, SP3, SP4 and SP5 sampling conducted on 20/09/2021
14-Dec-21	15.00	3.05	3.16	0.72	0.66	1.45	2.51	3.40	3.05	1.00	3.49	2.71	
16-Mar-22	15.13	2.96	4.23	0.65	0.55	1.49	2.38	3.49	1.98	1.07	3.60	2.67	
20-Jun-22	14.73	2.72	2.88	0.55	0.37	0.48	2.78	3.73	3.32	1.18	3.78	3.68	
14-Sep-22	14.09	2.49	2.36	0.50	0.15	0.58	3.42	3.96	3.84	1.22	4.00	3.58	
13-Dec-22	14.59	2.99	2.90	0.69	0.57	1.10	2.92	3.46	3.31	1.03	3.58	3.06	
14-Mar-23	15.21	3.45	3.50	0.85	2.10	1.74	2.29	3.01	2.71	0.87	2.05	2.42	
14-Jun-23	15.37	3.34	3.56	0.83	2.97	1.79	2.14	3.12	2.64	0.89	2.17	2.37	
14-Sep-23	15.62	3.52	3.82	1.01	2.38	2.20	1.89	2.93	2.39	0.72	2.76	2.63	
14-Dec-23	15.91	3.78	4.13	1.25	2.73	2.29	1.59	2.67	2.08	0.48	2.42	2.49	Top of well casing elevation at BL158 was recorded as 4.785 on 14/12/23 - Manual calculation as Well Casing damaged from bushfire. The damaged casing length (45cm) has been subtracted from the previously surveyed Top of Well Casing.

Above nominated SWMP trigger level

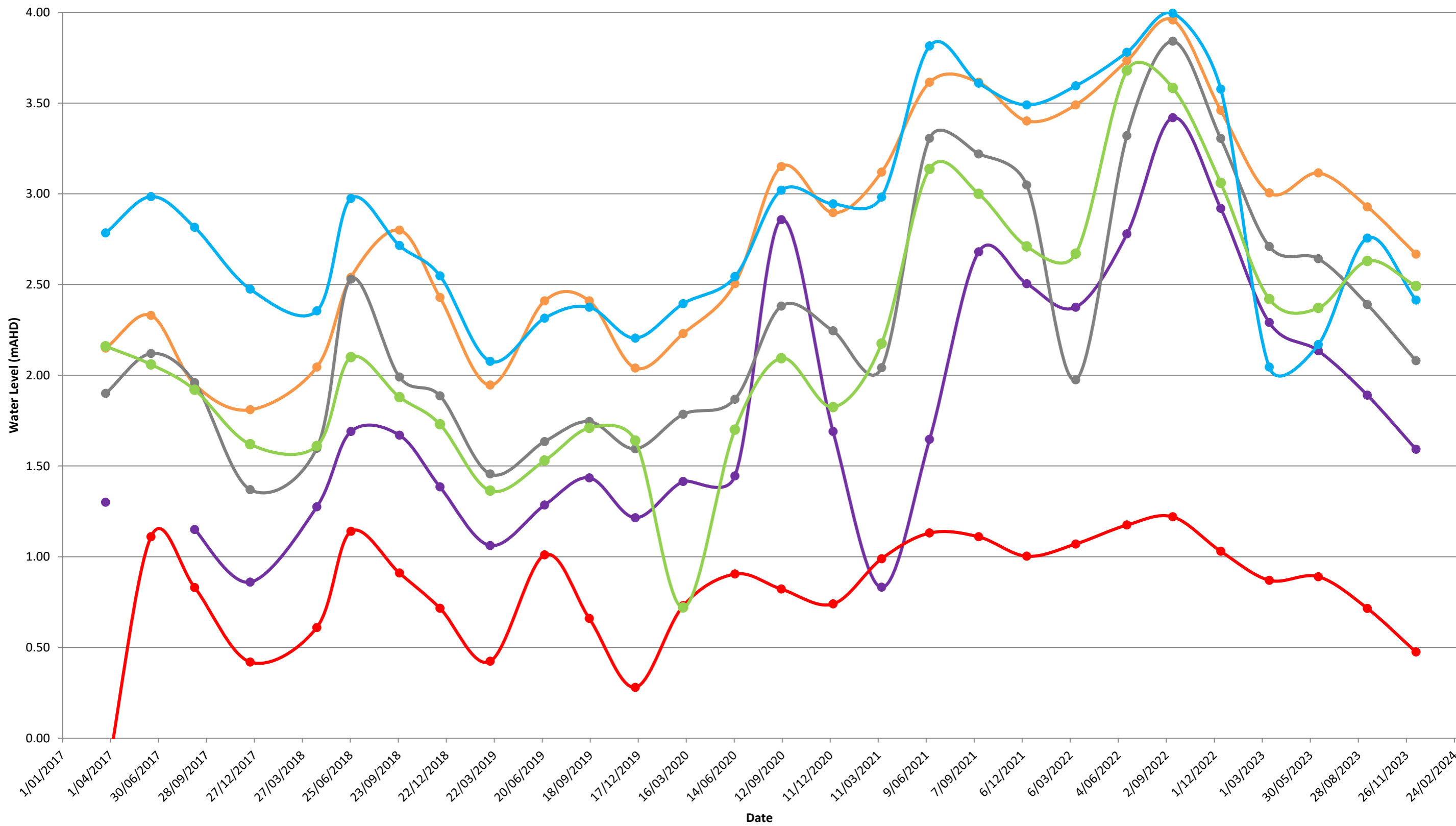
FY 22/23 Statistics	SP1	SP2	SP3	SP4	SP5	BL158	SP1	SP2	SP3	SP4	SP5	BL158	Comment
Count	4	4	4	4	4	4	4	4	4	4	4	4	
Min	14.09	2.49	2.36	0.50	0.15	0.58	2.14	3.01	2.64	0.87	2.05	2.37	
Average	14.81	3.07	3.08	0.72	1.45	1.30	2.69	3.38	3.12	1.00	2.95	2.86	
Max	15.37	3.45	3.56	0.85	2.97	1.79	3.42	3.96	3.84	1.22	4.00	3.58	

Groundwater Depths (m)



Note: No EPL Limit Specified

Groundwater Levels (mAHD)



SP1 SP2 SP3 SP4 SP5 BL158

1646 - Macka's Sand - EPL 13218

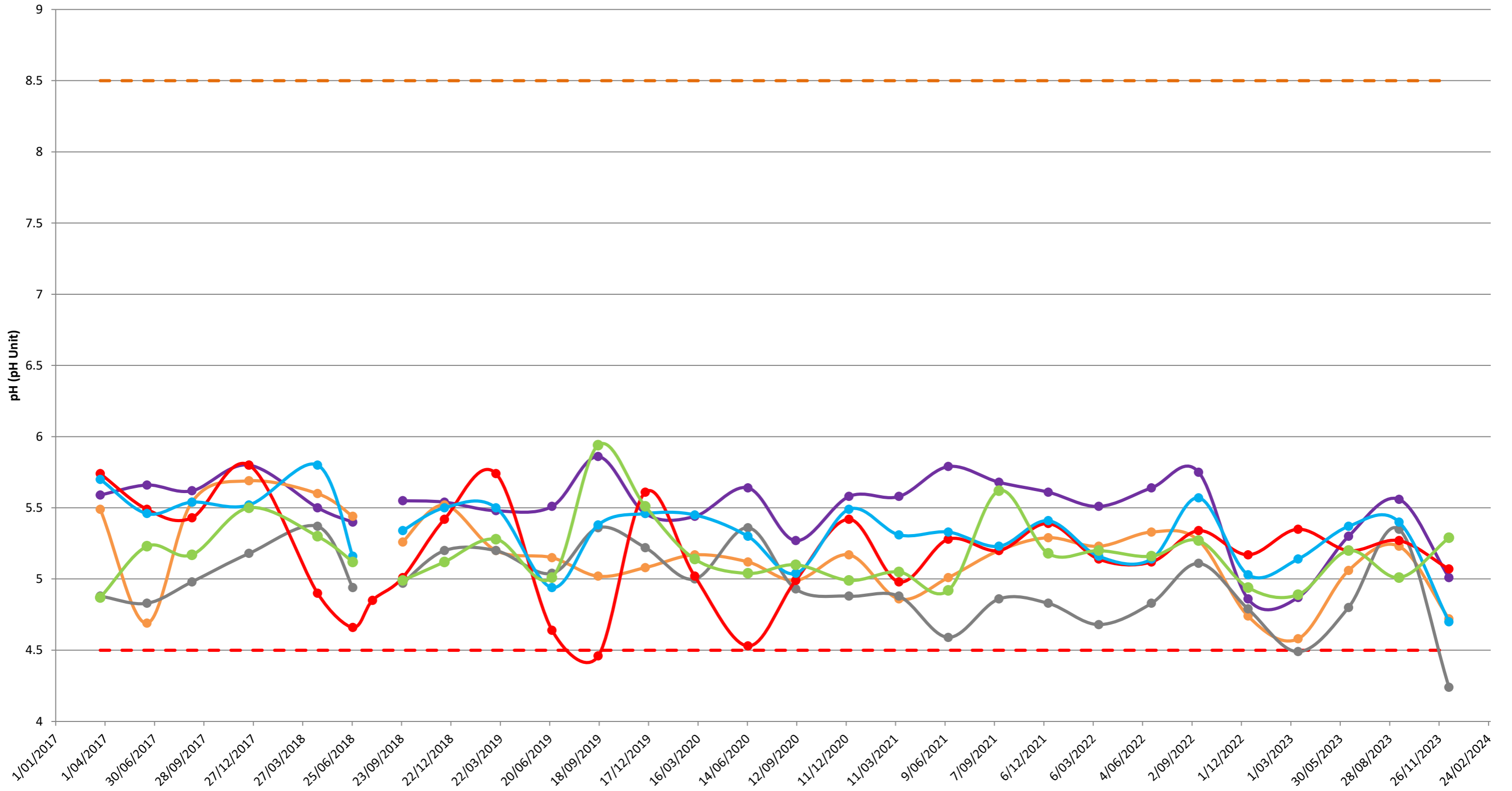
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Sample Date	pH									Comment
	Lower SWMP Trigger	Upper SWMP Trigger	EPL Limit	SP1	SP2	SP3	SP4	SP5	BL158	
				EPA Point 1	EPA Point 2	EPA Point 3	EPA Point 4	EPA Point 5	EPA Point 6	
23-Mar-17	4.5	8.5	non-specified	5.59	5.49	4.88	5.74	5.70	4.87	
16-Jun-17	4.5	8.5	non-specified	5.66	4.69	4.83	5.49	5.46	5.23	
06-Sep-17	4.5	8.5	non-specified	5.62	5.54	4.98	5.43	5.54	5.17	
19-Dec-17	4.5	8.5	non-specified	5.80	5.69	5.18	5.80	5.52	5.50	
23-Apr-18	4.5	8.5	non-specified	5.50	5.60	5.37	4.90	5.80	5.30	
26-Jun-18	4.5	8.5	non-specified	5.40	5.44	4.94	4.66	5.16	5.12	
01-Aug-18	4.5	8.5	non-specified				4.85			Additional SP4 monitoring event due to standpipe replacement
25-Sep-18	4.5	8.5	non-specified	5.55	5.26	4.97	5.01	5.34	4.99	
10-Dec-18	4.5	8.5	non-specified	5.54	5.52	5.20	5.42	5.50	5.12	
14-Mar-19	4.5	8.5	non-specified	5.48	5.20	5.20	5.74	5.50	5.28	SP1 & SP5 monitoring undertaken on 15/3/19 due to access restrictions on 14/3/2019.
24-Jun-19	4.5	8.5	non-specified	5.51	5.15	5.04	4.64	4.94	5.01	
16-Sep-19	4.5	8.5	non-specified	5.86	5.02	5.36	4.46	5.38	5.94	SP5 Monitoring undertaken on 16/9/19
11-Dec-19	4.5	8.5	non-specified	5.46	5.08	5.22	5.61	5.46	5.51	
10-Mar-20	4.5	8.5	non-specified	5.44	5.17	5.00	5.02	5.45	5.14	
15-Jun-20	4.5	8.5	non-specified	5.64	5.12	5.36	4.53	5.30	5.04	SP3, SP5 and BL158 sampling conducted on 16/06/20.
10-Sep-20	4.5	8.5	non-specified	5.27	4.99	4.93	4.99	5.04	5.10	
16-Dec-20	4.5	8.5	non-specified	5.58	5.17	4.88	5.42	5.49	4.99	SP2, SP3 and SP5 sampling conducted on 17/12/2020
17-Mar-21	4.5	8.5	non-specified	5.58	4.86	4.88	4.98	5.31	5.05	
15-Jun-21	4.5	8.5	non-specified	5.79	5.01	4.59	5.28	5.33	4.92	
15-Sep-21	4.5	8.5	non-specified	5.68	5.20	4.86	5.20	5.23	5.62	SP2, SP3, SP4 and SP5 sampling conducted on 20/09/2021
14-Dec-21	4.5	8.5	non-specified	5.61	5.29	4.83	5.39	5.41	5.18	
16-Mar-22	4.5	8.5	non-specified	5.51	5.23	4.68	5.14	5.16	5.20	
20-Jun-22	4.5	8.5	non-specified	5.64	5.33	4.83	5.12	5.14	5.16	
14-Sep-22	4.5	8.5	non-specified	5.75	5.27	5.11	5.34	5.57	5.27	
13-Dec-22	4.5	8.5	non-specified	4.86	4.74	4.79	5.17	5.03	4.94	
14-Mar-23	4.5	8.5	non-specified	4.87	4.58	4.49	5.35	5.14	4.89	
14-Jun-23	4.5	8.5	non-specified	5.30	5.06	4.80	5.20	5.37	5.20	
14-Sep-23	4.5	8.5	non-specified	5.56	5.23	5.35	5.27	5.40	5.01	
14-Dec-23	4.5	8.5	non-specified	5.01	4.72	4.24	5.07	4.70	5.29	

Outside nominated SWMP trigger level range

FY 22/23 Statistics	SP1	SP2	SP3	SP4	SP5	BL158
Count	4	4	4	4	4	4
Min	4.86	4.58	4.49	5.17	5.03	4.89
Average	5.20	4.91	4.80	5.27	5.28	5.08
Max	5.56	5.06	5.11	5.35	5.57	5.27

Groundwater - pH



Note: No EPL Limit Specified

Date
- - Lower SWMP Trigger - - Upper SWMP Trigger -●- SP1

1646 - Macka's Sand - EPL 13218

Quarterly Groundwater Monitoring

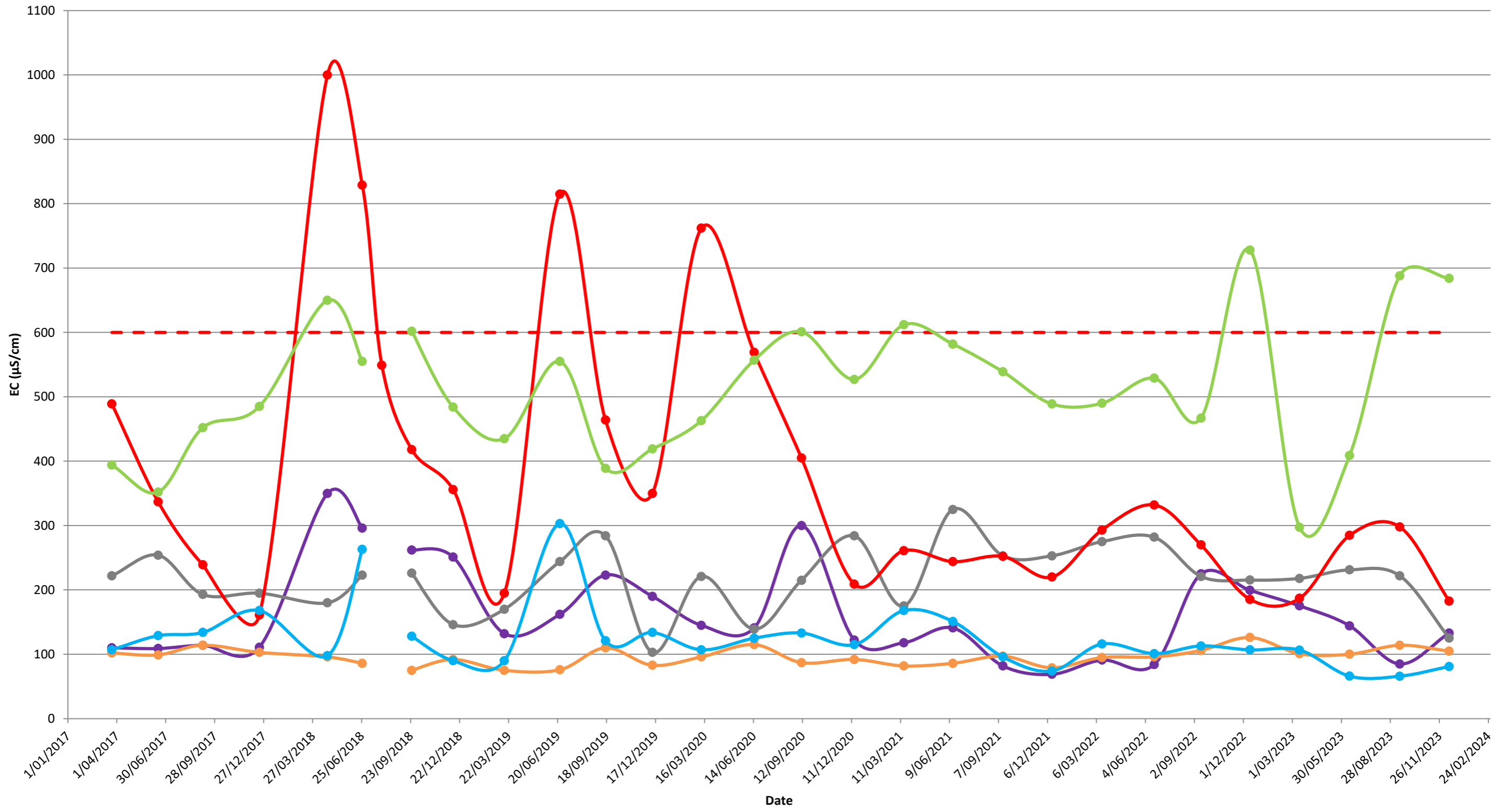
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Sample Date	Electrical Conductivity ($\mu\text{S}/\text{cm}$)								Comment
	SWMP Trigger	EPL Limit	SP1	SP2	SP3	SP4	SP5	BL158	
			EPA Point 1	EPA Point 2	EPA Point 3	EPA Point 4	EPA Point 5	EPA Point 6	
23-Mar-17	600	non-specified	110	102	222	489	107	394	
16-Jun-17	600	non-specified	109	99	254	337	129	352	
06-Sep-17	600	non-specified	114	114	193	239	134	452	
19-Dec-17	600	non-specified	111	103	195	161	168	485	
23-Apr-18	600	non-specified	350	96	180	1000	98	650	
26-Jun-18	600	non-specified	296	86	223	829	263	555	
01-Aug-18	600	non-specified				549			Additional SP4 monitoring event due to standpipe replacement
25-Sep-18	600	non-specified	262	75	226	418	128	602	
10-Dec-18	600	non-specified	251	92	146	356	90	484	
14-Mar-19	600	non-specified	132	75	170	195	90	435	SP1 & SP5 monitoring undertaken on 15/3/19 due to access restrictions on 14/3/2019.
24-Jun-19	600	non-specified	162	76	244	815	303	555	
16-Sep-19	600	non-specified	223	110	284	464	121	389	SP5 monitoring undertaken on 17/9/19
11-Dec-19	600	non-specified	190	83	103	350	134	419	
10-Mar-20	600	non-specified	145	96	221	762	107	463	
15-Jun-20	600	non-specified	141	115	139	569	125	557	SP3, SP5 and BL158 sampling conducted on 16/06/20.
10-Sep-20	600	non-specified	300	87	215	405	133	601	
16-Dec-20	600	non-specified	122	92	284	209	115	527	SP2, SP3 and SP5 sampling conducted on 17/12/2020
17-Mar-21	600	non-specified	118	82	175	261	168	612	
15-Jun-21	600	non-specified	141	86	325	244	151	582	
15-Sep-21	600	non-specified	82	97	253	252	96	539	SP2, SP3, SP4 and SP5 sampling conducted on 20/09/2021
14-Dec-21	600	non-specified	69	79	253	220	74	489	
16-Mar-22	600	non-specified	91	95	275	293	116	490	
20-Jun-22	600	non-specified	84	96	282	332	101	529	
14-Sep-22	600	non-specified	225	106	221	270	113	467	
13-Dec-22	600	non-specified	200	126	215	185	107	728	
14-Mar-23	600	non-specified	175	101	218	187	107	297	
14-Jun-23	600	non-specified	144	100	231	285	66	409	
14-Sep-23	600	non-specified	85	114	222	298	66	688	
14-Dec-23	600	non-specified	133	105	125	183	81	684	

Above nominated SWMP trigger level

FY 22/23 Statistics	SP1	SP2	SP3	SP4	SP5	BL158
Count	4	4	4	4	4	4
Min	144	100	215	185	66	297
Average	186	108	221	232	98	475
Max	225	126	231	285	113	728

Groundwater - Electrical Conductivity (EC)



Note: No EPL Limit Specified

--- SWMP Trigger ● SP1 ● SP2 ● SP3 ● SP4 ● SP5 ● BL158

1646 - Macka's Sand - EPL 13218

Quarterly Groundwater Monitoring

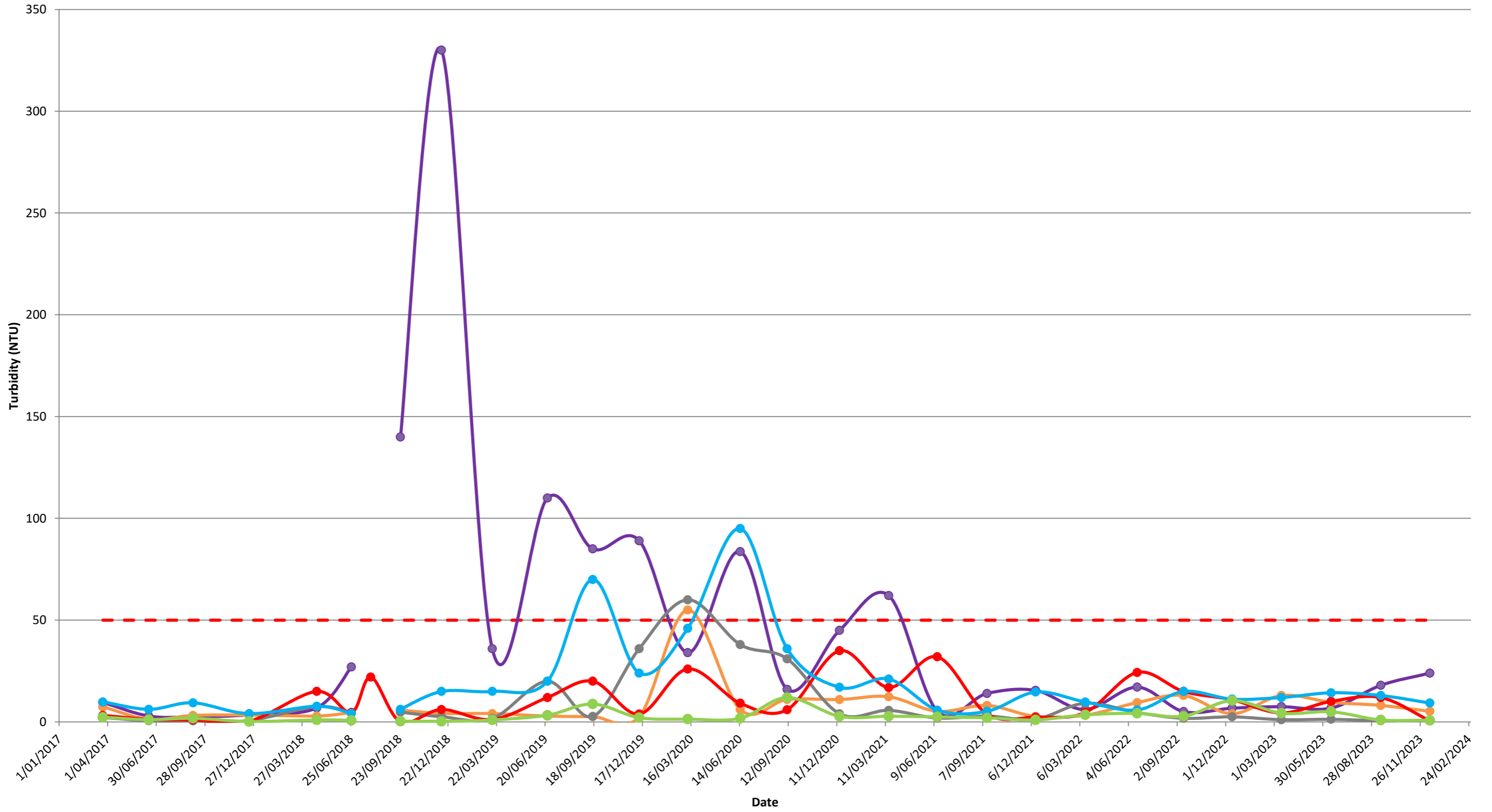
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Sample Date	Turbidity (NTU)								Comment
	SWMP Trigger	EPL Limit	SP1 EPA Point 1	SP2 EPA Point 2	SP3 EPA Point 3	SP4 EPA Point 4	SP5 EPA Point 5	BL158 EPA Point 6	
23-Mar-17	50	non-specified	9.6	7.4	2.2	3.2	9.8	2.3	
16-Jun-17	50	non-specified	2.9	1.3	0.6	1.3	6.2	1.1	
06-Sep-17	50	non-specified	2.5	3.2	0.5	1.0	9.4	1.8	
19-Dec-17	50	non-specified	3.5	3.4	0.7	0.4	4.1	0.2	
23-Apr-18	50	non-specified	6.9	2.9	7.6	15.0	7.7	1.0	
26-Jun-18	50	non-specified	27.0	4.6	4.6	4.6	4.2	0.8	
01-Aug-18	50	non-specified				22.0			Additional SP4 monitoring event due to standpipe replacement
25-Sep-18	50	non-specified	140.0	5.8	4.8	0.1	6.2	0.4	
10-Dec-18	50	non-specified	330.0	4.2	2.6	6.1	15.0	0.3	
14-Mar-19	50	non-specified	36.0	4.1	1.7	1.2	15.0	1.0	SP1 & SP5 monitoring undertaken on 15/3/19 due to access restrictions on 14/3/2019.
24-Jun-19	50	non-specified	110.0	2.9	20.0	12.0	20.0	3.3	
16-Sep-19	50	non-specified	85.0	2.6	2.7	20.0	70.0	8.8	SP5 monitoring undertaken on 17/9/19
11-Dec-19	50	non-specified	89.0	2.6	36.0	3.9	24.0	2.1	
10-Mar-20	50	non-specified	34.0	55.0	60.0	26.0	46.0	1.4	
15-Jun-20	50	non-specified	83.7	6.1	38.0	9.2	95.0	1.8	SP3, SP5 and BL158 sampling conducted on 16/06/20.
10-Sep-20	50	non-specified	16.0	11.0	31.0	6.0	36.0	12.0	
16-Dec-20	50	non-specified	45.0	11.0	4.0	35.0	17.0	2.7	SP2, SP3 and SP5 sampling conducted on 17/12/2020
17-Mar-21	50	non-specified	62.1	12.4	5.7	16.9	21.1	2.8	
15-Jun-21	50	non-specified	5.2	5.2	1.9	32.0	5.8	2.5	
15-Sep-21	50	non-specified	14.0	8.1	2.9	3.9	5.2	2.0	SP2, SP3, SP4 and SP5 sampling conducted on 20/09/2021
14-Dec-21	50	non-specified	15.5	2.7	1.4	2.4	14.7	1.0	
16-Mar-22	50	non-specified	6.1	3.3	9.2	4.7	9.8	3.5	
20-Jun-22	50	non-specified	17.1	9.5	4.6	24.3	5.9	4.2	
14-Sep-22	50	non-specified	5.1	13.0	1.8	15.0	15.0	2.8	
13-Dec-22	50	non-specified	6.8	4.0	2.5	10.9	11.2	10.5	
14-Mar-23	50	non-specified	7.5	13.0	1.1	4.4	12.0	4.3	
14-Jun-23	50	non-specified	6.8	9.7	1.3	10.1	14.3	5.0	
14-Sep-23	50	non-specified	18.0	8.1	0.6	12.0	13.0	1.0	
14-Dec-23	50	non-specified	24.0	5.2	0.7	0.6	9.3	0.8	

Above nominated SWMP trigger level

FY 22/23 Statistics	SP1	SP2	SP3	SP4	SP5	BL158
Count	4	4	4	4	4	4
Min	5.1	4.0	1.1	4.4	11.2	2.8
Average	6.6	9.9	1.7	10.1	13.1	5.7
Max	7.5	13.0	2.5	15.0	15.0	10.5

Groundwater - Turbidity (NTU)



Note: No EPL Limit Specified

--- SWMP Trigger ● SP1 ● SP2 ● SP3 ● SP4 ● SP5 ● BL158

1646 - Macka's Sand - EPL 13218

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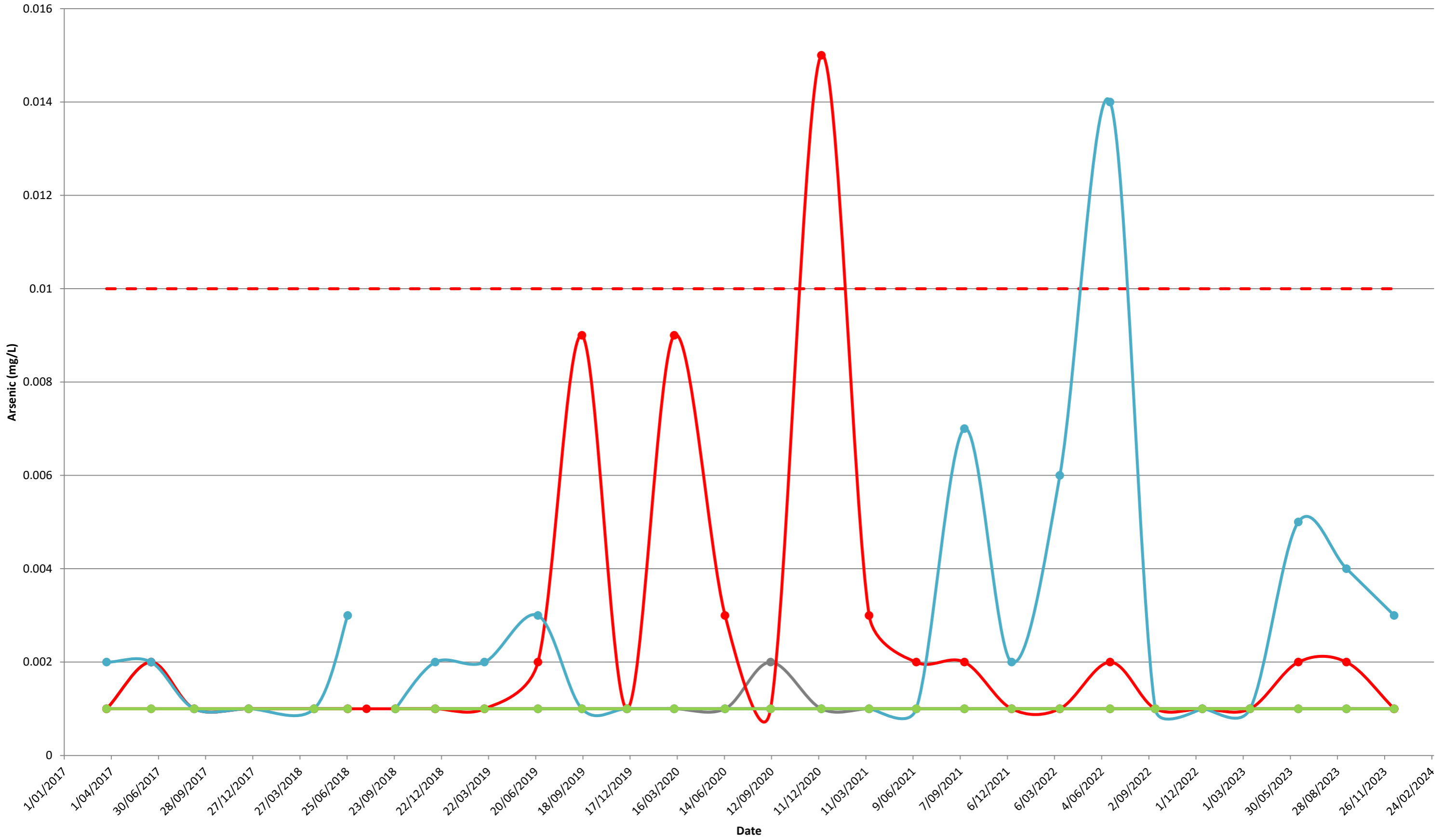
Sample Date	Arsenic (mg/L)								Comment
	SWMP Trigger	EPL Limit	SP1	SP2	SP3	SP4	SP5	BL158	
			EPA Point 1	EPA Point 2	EPA Point 3	EPA Point 4	EPA Point 5	EPA Point 6	
23-Mar-17	0.01	non-specified	0.001	0.001	0.001	0.001	0.002	0.001	
16-Jun-17	0.01	non-specified	0.001	0.001	0.002	0.002	0.002	0.001	
06-Sep-17	0.01	non-specified	0.001	0.001	0.001	0.001	0.001	0.001	
19-Dec-17	0.01	non-specified	0.001	0.001	0.001	0.001	0.001	0.001	
23-Apr-18	0.01	non-specified	0.001	0.001	0.001	0.001	0.001	0.001	
26-Jun-18	0.01	non-specified	0.001	0.001	0.001	0.001	0.003	0.001	
01-Aug-18	0.01	non-specified				0.001			Additional SP4 monitoring event due to standpipe replacement
25-Sep-18	0.01	non-specified	0.001	0.001	0.001	0.001	0.001	0.001	
10-Dec-18	0.01	non-specified	0.001	0.001	0.001	0.001	0.002	0.001	
14-Mar-19	0.01	non-specified	0.001	0.001	0.001	0.001	0.002	0.001	SP1 & SP5 monitoring undertaken on 15/3/19 due to access restrictions on 14/3/2019.
24-Jun-19	0.01	non-specified	0.001	0.001	0.001	0.002	0.003	0.001	
16-Sep-19	0.01	non-specified	0.001	0.001	0.001	0.009	0.001	0.001	SP5 Monitoring undertaken on 16/9/19
11-Dec-19	0.01	non-specified	0.001	0.001	0.001	0.001	0.001	0.001	
10-Mar-20	0.01	non-specified	0.001	0.001	0.001	0.009	0.001	0.001	
15-Jun-20	0.01	non-specified	0.001	0.001	0.001	0.003	0.001	0.001	SP3, SP5 and BL158 sampling conducted on 16/06/20.
10-Sep-20	0.01	non-specified	0.001	0.001	0.002	0.001	0.001	0.001	
16-Dec-20	0.01	non-specified	0.001	0.001	0.001	0.015	0.001	0.001	SP2, SP3 and SP5 sampling conducted on 17/12/2020
17-Mar-21	0.01	non-specified	0.001	0.001	0.001	0.003	0.001	0.001	
15-Jun-21	0.01	non-specified	0.001	0.001	0.001	0.002	0.001	0.001	
15-Sep-21	0.01	non-specified	0.001	0.001	0.001	0.002	0.007	0.001	SP2, SP3, SP4 and SP5 sampling conducted on 20/09/2021
14-Dec-21	0.01	non-specified	0.001	0.001	0.001	0.001	0.002	0.001	
16-Mar-22	0.01	non-specified	0.001	0.001	0.001	0.001	0.006	0.001	
20-Jun-22	0.01	non-specified	0.001	0.001	0.001	0.002	0.014	0.001	
14-Sep-22	0.01	non-specified	0.001	0.001	0.001	0.001	0.001	0.001	
13-Dec-22	0.01	non-specified	0.001	0.001	0.001	0.001	0.001	0.001	
14-Mar-23	0.01	non-specified	0.001	0.001	0.001	0.001	0.001	0.001	
14-Jun-23	0.01	non-specified	0.001	0.001	0.001	0.002	0.005	0.001	
14-Sep-23	0.01	non-specified	0.001	0.001	0.001	0.002	0.004	0.001	
14-Dec-23	0.01	non-specified	0.001	0.001	0.001	0.001	0.003	0.001	

Above nominated SWMP trigger level

Note: Bold values indicate values greater than laboratory Limit of Reporting (0.001 mg/L) (i.e. limit of detection).

FY 22/23 Statistics	SP1	SP2	SP3	SP4	SP5	BL158
Count	4	4	4	4	4	4
Min	0.001	0.001	0.001	0.001	0.001	0.001
Average	0.001	0.001	0.001	0.001	0.002	0.001
Max	0.001	0.001	0.001	0.002	0.005	0.001

Groundwater - Arsenic (mg/L)



Note: No EPL Limit Specified

--- SWMP Trigger ● SP1 ● SP2 ● SP3 ● SP4 ● SP5 ● BL158

1646 - Macka's Sand - EPL 13218

Quarterly Groundwater Monitoring

Licence Holder

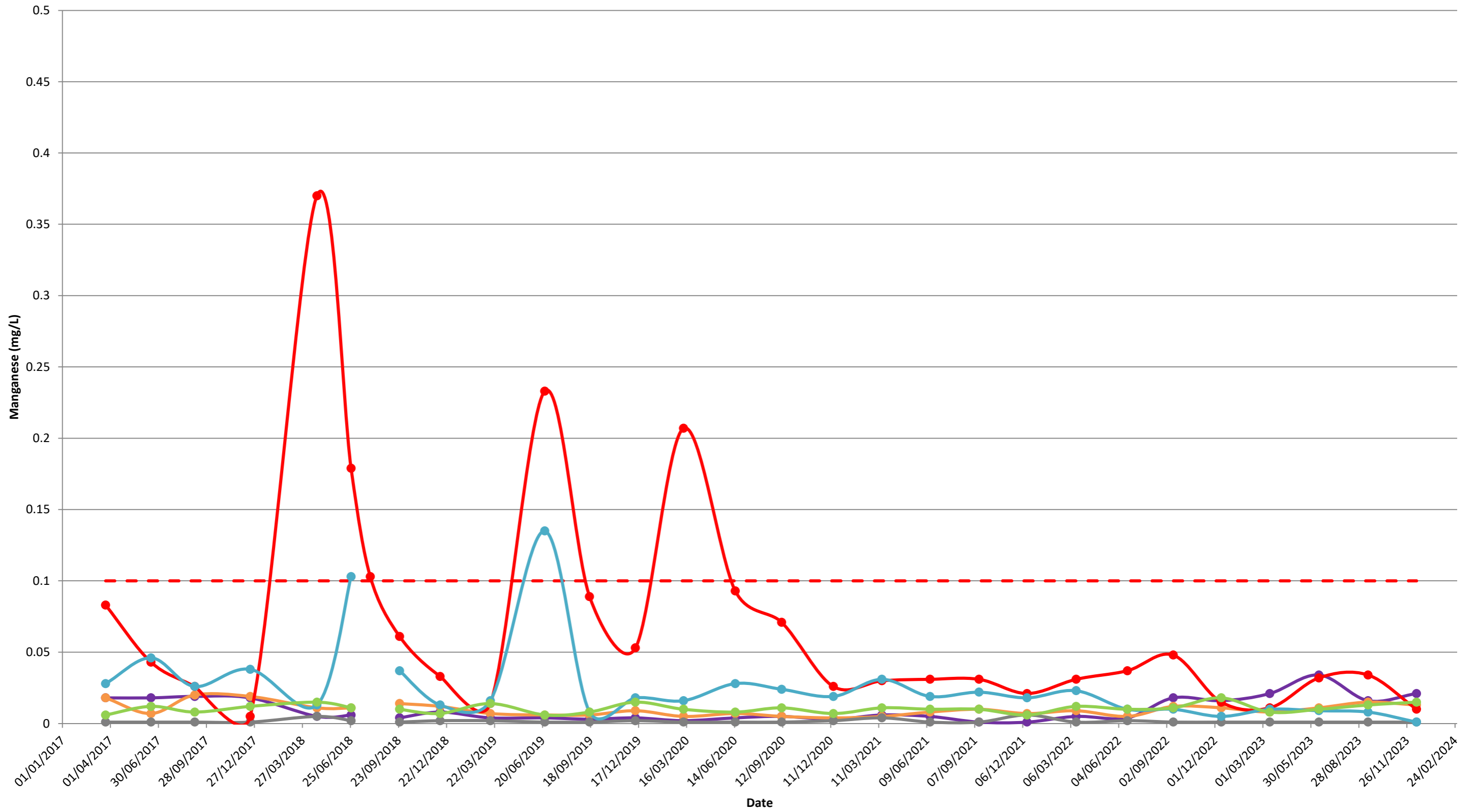
Sample Date	Manganese (mg/L)								Comment
	SWMP Trigger	EPL Limit	SP1	SP2	SP3	SP4	SP5	BL158	
			EPA Point 1	EPA Point 2	EPA Point 3	EPA Point 4	EPA Point 5	EPA Point 6	
23-Mar-17	0.1	non-specified	0.018	0.018	0.001	0.083	0.028	0.006	
16-Jun-17	0.1	non-specified	0.018	0.007	0.001	0.043	0.046	0.012	
06-Sep-17	0.1	non-specified	0.019	0.020	0.001	0.026	0.026	0.008	
19-Dec-17	0.1	non-specified	0.018	0.019	0.001	0.005	0.038	0.012	
23-Apr-18	0.1	non-specified	0.005	0.011	0.005	0.37	0.013	0.015	
26-Jun-18	0.1	non-specified	0.006	0.011	0.002	0.179	0.103	0.011	
01-Aug-18	0.1	non-specified				0.103			Additional SP4 monitoring event due to standpipe replacement
25-Sep-18	0.1	non-specified	0.004	0.014	0.001	0.061	0.037	0.010	
10-Dec-18	0.1	non-specified	0.008	0.012	0.002	0.033	0.013	0.007	
14-Mar-19	0.1	non-specified	0.004	0.007	0.002	0.014	0.016	0.014	SP1 & SP5 monitoring undertaken on 15/3/19 due to access restrictions on 14/3/2019.
24-Jun-19	0.1	non-specified	0.004	0.006	0.001	0.233	0.135	0.006	
16-Sep-19	0.1	non-specified	0.003	0.006	0.001	0.089	0.008	0.008	
11-Dec-19	0.1	non-specified	0.004	0.009	0.002	0.053	0.018	0.015	
10-Mar-20	0.1	non-specified	0.002	0.005	0.001	0.207	0.016	0.010	
15-Jun-20	0.1	non-specified	0.004	0.007	0.001	0.093	0.028	0.008	SP3, SP5 and BL158 sampling conducted on 16/06/20.
10-Sep-20	0.1	non-specified	0.005	0.005	0.001	0.071	0.024	0.011	
16-Dec-20	0.1	non-specified	0.003	0.004	0.002	0.026	0.019	0.007	SP2, SP3 and SP5 sampling conducted on 17/12/2020
17-Mar-21	0.1	non-specified	0.006	0.005	0.004	0.03	0.031	0.011	
15-Jun-21	0.1	non-specified	0.005	0.008	0.001	0.031	0.019	0.010	
15-Sep-21	0.1	non-specified	0.001	0.01	0.001	0.031	0.022	0.010	SP2, SP3, SP4 and SP5 sampling conducted on 20/09/2021
14-Dec-21	0.1	non-specified	0.001	0.007	0.006	0.021	0.018	0.006	
16-Mar-22	0.1	non-specified	0.005	0.009	0.001	0.031	0.023	0.012	
20-Jun-22	0.1	non-specified	0.004	0.005	0.002	0.037	0.010	0.010	
14-Sep-22	0.1	non-specified	0.018	0.012	0.001	0.048	0.010	0.011	
13-Dec-22	0.1	non-specified	0.016	0.011	0.001	0.015	0.005	0.018	
14-Mar-23	0.1	non-specified	0.021	0.008	0.001	0.011	0.010	0.008	
14-Jun-23	0.1	non-specified	0.034	0.011	0.001	0.032	0.009	0.010	
14-Sep-23	0.1	non-specified	0.016	0.015	0.001	0.034	0.008	0.013	
14-Dec-23	0.1	non-specified	0.021	0.013	0.001	0.01	0.001	0.015	

Above nominated SWMP trigger level

Note: Bold values indicate values greater than laboratory Limit of Reporting (0.001 mg/L) (i.e. limit of detection).

FY 22/23 Statistics	SP1	SP2	SP3	SP4	SP5	BL158
Count	4	4	4	4	4	4
Min	0.016	0.008	0.001	0.011	0.005	0.008
Average	0.022	0.011	0.001	0.027	0.009	0.012
Max	0.034	0.012	0.001	0.048	0.010	0.018

Groundwater - Manganese (mg/L)



Note: No EPL Limit Specified

--- SWMP Trigger ● SP1 ● SP2 ● SP3 ● SP4 ● SP5 ● BL158

1646 - Macka's Sand - EPL 13218

Quarterly Groundwater Monitoring

Licence Holder

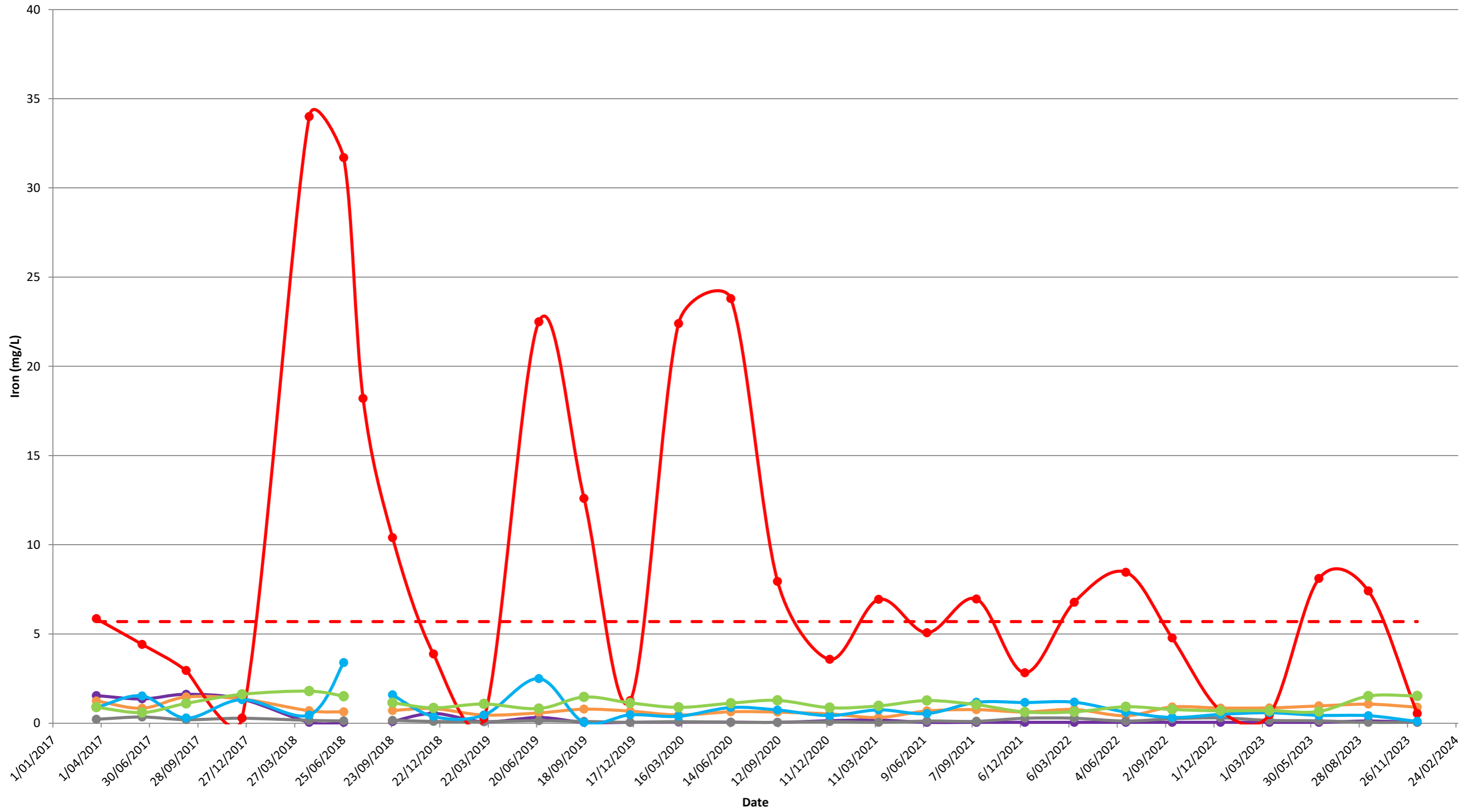
Sample Date	Iron (mg/L)								Comment
	SWMP Trigger	EPL Limit	SP1	SP2	SP3	SP4	SP5	BL158	
			EPA Point 1	EPA Point 2	EPA Point 3	EPA Point 4	EPA Point 5	EPA Point 6	
23-Mar-17	5.7	non-specified	1.55	1.25	0.22	5.86	0.89	0.90	
16-Jun-17	5.7	non-specified	1.36	0.84	0.35	4.42	1.53	0.60	
06-Sep-17	5.7	non-specified	1.62	1.47	0.20	2.95	0.29	1.11	
19-Dec-17	5.7	non-specified	1.35	1.36	0.28	0.29	1.32	1.62	
23-Apr-18	5.7	non-specified	0.05	0.70	0.16	34.00	0.46	1.80	
26-Jun-18	5.7	non-specified	0.05	0.64	0.13	31.70	3.40	1.51	
01-Aug-18	5.7	non-specified				18.20			Additional SP4 monitoring event due to standpipe replacement
25-Sep-18	5.7	non-specified	0.09	0.71	0.16	10.40	1.59	1.15	
10-Dec-18	5.7	non-specified	0.55	0.82	0.10	3.88	0.38	0.86	
14-Mar-19	5.7	non-specified	0.08	0.46	0.09	0.27	0.46	1.08	SP1 & SP5 monitoring undertaken on 15/3/19 due to access restrictions on 14/3/2019.
24-Jun-19	5.7	non-specified	0.32	0.58	0.14	22.50	2.50	0.82	
16-Sep-19	5.7	non-specified	0.05	0.79	0.10	12.60	0.05	1.47	
11-Dec-19	5.7	non-specified	0.05	0.68	0.05	1.26	0.47	1.14	
10-Mar-20	5.7	non-specified	0.07	0.46	0.09	22.40	0.39	0.89	
15-Jun-20	5.7	non-specified	0.06	0.64	0.05	23.80	0.88	1.12	SP3, SP5 and BL158 sampling conducted on 16/06/20.
10-Sep-20	5.7	non-specified	0.05	0.62	0.05	7.95	0.74	1.28	
16-Dec-20	5.7	non-specified	0.14	0.52	0.09	3.58	0.43	0.87	SP2, SP3 and SP5 sampling conducted on 17/12/2020
17-Mar-21	5.7	non-specified	0.18	0.32	0.05	6.94	0.75	0.97	
15-Jun-21	5.7	non-specified	0.05	0.69	0.12	5.07	0.54	1.27	
15-Sep-21	5.7	non-specified	0.05	0.76	0.11	6.96	1.17	1.04	SP2, SP3, SP4 and SP5 sampling conducted on 20/09/2021
14-Dec-21	5.7	non-specified	0.05	0.63	0.28	2.83	1.16	0.63	
16-Mar-22	5.7	non-specified	0.05	0.77	0.28	6.78	1.18	0.64	
20-Jun-22	5.7	non-specified	0.05	0.42	0.12	8.46	0.62	0.92	
14-Sep-22	5.7	non-specified	0.05	0.91	0.25	4.78	0.32	0.77	
13-Dec-22	5.7	non-specified	0.05	0.85	0.30	0.71	0.50	0.70	
14-Mar-23	5.7	non-specified	0.05	0.86	0.16	0.48	0.59	0.71	
14-Jun-23	5.7	non-specified	0.05	0.97	0.13	8.11	0.44	0.66	
14-Sep-23	5.7	non-specified	0.12	1.07	0.05	7.41	0.42	1.52	
14-Dec-23	5.7	non-specified	0.05	0.90	0.05	0.55	0.10	1.53	

Above nominated SWMP trigger level

Note: Bold values indicate values greater than laboratory Limit of Reporting (0.001 mg/L) (i.e. limit of detection).

FY 22/23 Statistics	SP1	SP2	SP3	SP4	SP5	BL158
Count	4	4	4	4	4	4
Min	0.05	0.85	0.13	0.48	0.32	0.66
Average	0.05	0.90	0.21	3.52	0.46	0.71
Max	0.05	0.97	0.30	8.11	0.59	0.77

Groundwater - Iron (mg/L)



Note: No EPL Limit Specified

--- SWMP Trigger ● SP1 ● SP2 ● SP3 ● SP4 ● SP5 ● BL158