

## Licence Information



<b>Environment Protection Licence (EPL) Number</b>	13218
<b>License Holder</b>	MACKA'S SAND PTY LTD
<b>Licensee Address</b>	<p>Licensee:  Macka's Sand Pty Ltd  2684 Nelson Bay Rd  Salt Ash NSW 2318</p> <p>Premises:  Macka's Sand Extraction and Processing  Facility  Off Nelson Bay Road  Salt Ash NSW 2318</p>
<b>Link to the full licence on the EPA website</b>	<a href="https://apps.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=13218&amp;id=13218&amp;option=licence&amp;searchrange=licence&amp;range=POEO%20licence&amp;prp=no&amp;status=Issued">https://apps.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=13218&amp;id=13218&amp;option=licence&amp;searchrange=licence&amp;range=POEO%20licence&amp;prp=no&amp;status=Issued</a>
Anniversary Date:	30-Jun
Information Obtained:	16-Apr-19
Date of Publication:	18-Apr-19

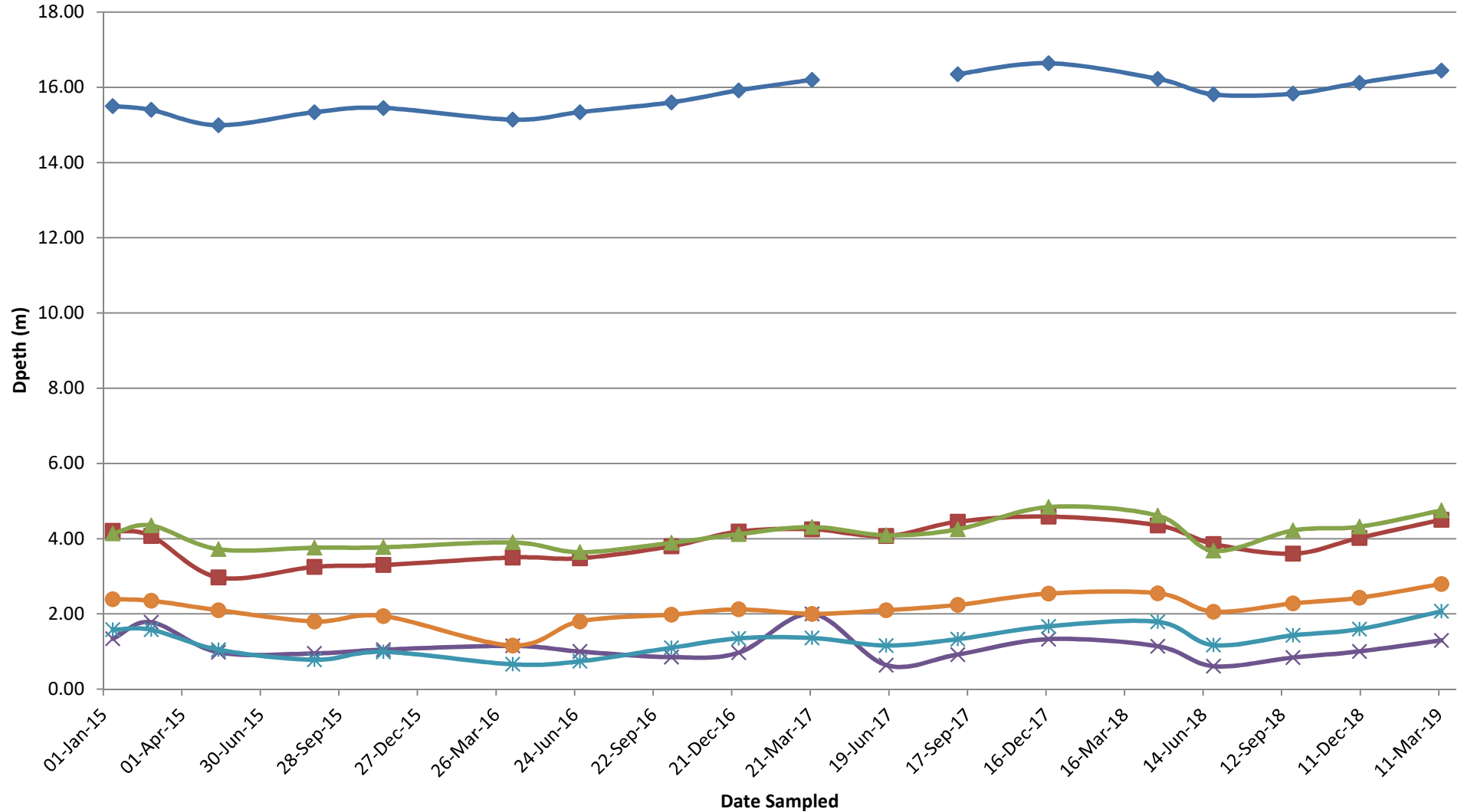
1646 - Macka's Sand - EPL 13218

Quarterly Groundwater Monitoring

Sample Date	Depth - EPL (m)						Water Level (PA 08_0142 Only)						Comment
	EPA Point 1 non-specified	EPA Point 2 non-specified	EPA Point 3 non-specified	EPA Point 4 non-specified	EPA Point 5 non-specified	EPA Point 6 non-specified	SP1 > 3.6	SP2 > 2.8	SP3 > 2.6	SP4 > 1.25	SP5 > 3.6	BL158 > 3.7	
12-Jan-15	15.50	4.21	4.14	1.34	1.58	2.39	2.00	2.19	2.07	0.41	2.57	1.77	
25-Feb-15	15.40	4.07	4.35	1.78	1.58	2.35	2.10	2.33	1.86	-0.03	2.57	1.81	
13-May-15	14.99	2.97	3.72	0.98	1.05	2.10	2.51	3.43	2.49	0.77	3.10	2.06	
31-Aug-15	15.34	3.25	3.76	0.95	0.78	1.80	2.16	3.15	2.45	0.80	3.37	2.36	
18-Nov-15	15.45	3.30	3.77	1.05	0.99	1.94	2.05	3.10	2.44	0.70	3.16	2.22	
14-Apr-16	15.14	3.50	3.90	1.15	0.66	1.16	2.36	2.90	2.31	0.60	3.49	3.00	
30-Jun-16	15.34	3.48	3.64	1.00	0.74	1.80	2.16	2.92	2.57	0.75	3.41	2.36	
13-Oct-16	15.60	3.80	3.89	0.85	1.10	1.98	1.90	2.60	2.32	0.90	3.05	2.18	
29-Dec-16	15.92	4.19	4.12	0.97	1.35	2.12	1.58	2.21	2.09	0.78	2.80	2.04	
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/EPA Point 1
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	0.88	2.72	1.88	Standpipe replaced in August 2018. Value to be updated retrospectively following survey
10-Dec-18	16.12	4.02	4.32	1.00	1.60	2.43	1.38	2.38	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	1.90	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.

FY 18/19 Statistics	EPA Point 1	EPA Point 2	EPA Point 3	EPA Point 4	EPA Point 5	EPA Point 6	SP1	SP2	SP3	SP4	SP5	BL158	Comment
Count	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Min	15.83	3.60	4.22	0.84	1.43	2.28	1.06	1.90	1.46	0.42	2.08	1.36	
Average	16.13	4.04	4.43	1.05	1.70	2.50	1.37	2.36	1.78	0.67	2.45	1.66	
Max	16.44	4.50	4.75	1.30	2.07	2.80	1.67	2.80	1.99	0.88	2.72	1.88	

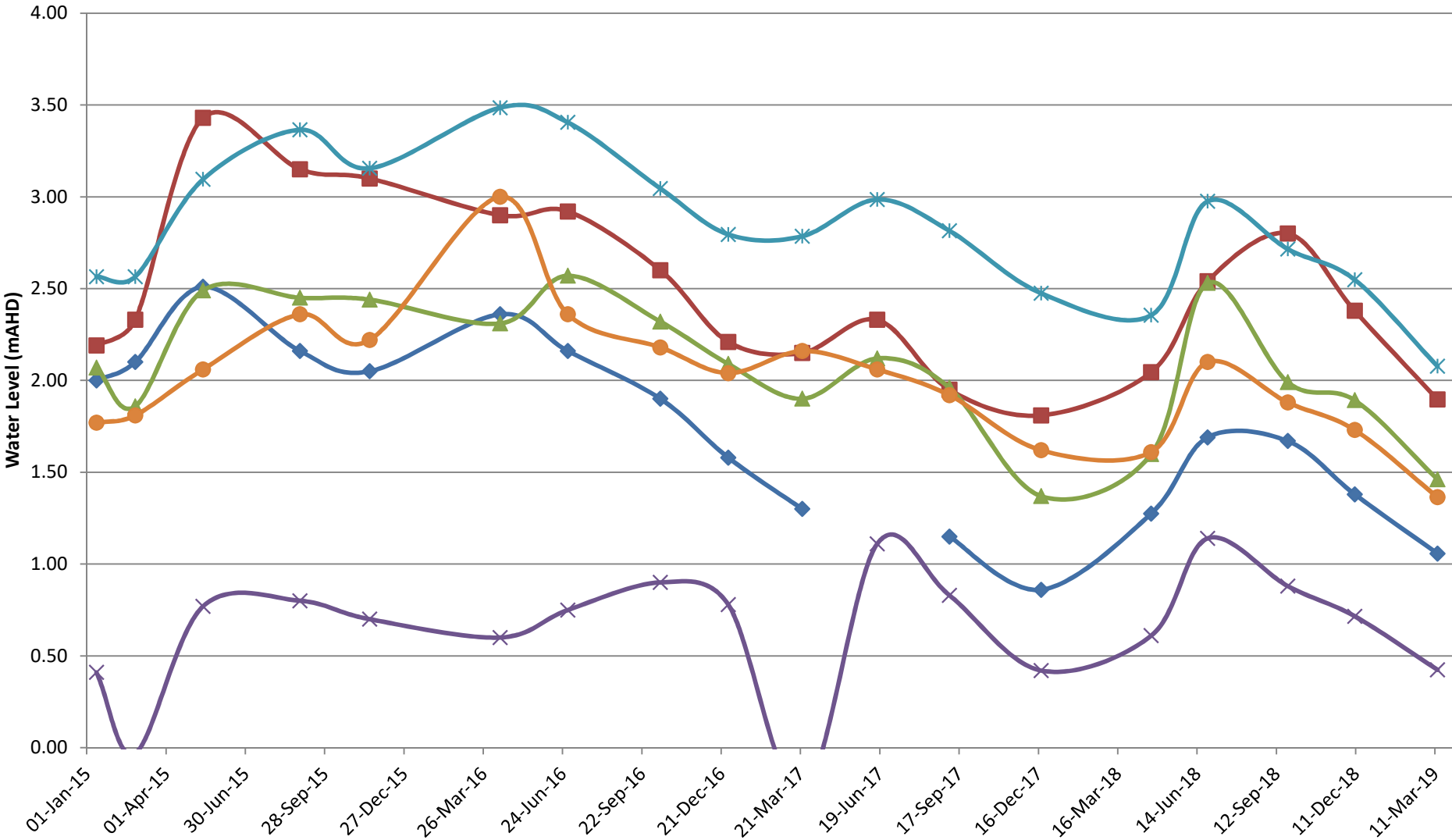
# Groundwater Depths (m)



Note: No EPL Limit Specified

- ◆ EPA Point 1
- EPA Point 2
- ▲ EPA Point 3
- ✕ EPA Point 4
- ✕ EPA Point 5
- EPA Point 6

# Groundwater Levels (mAHD)



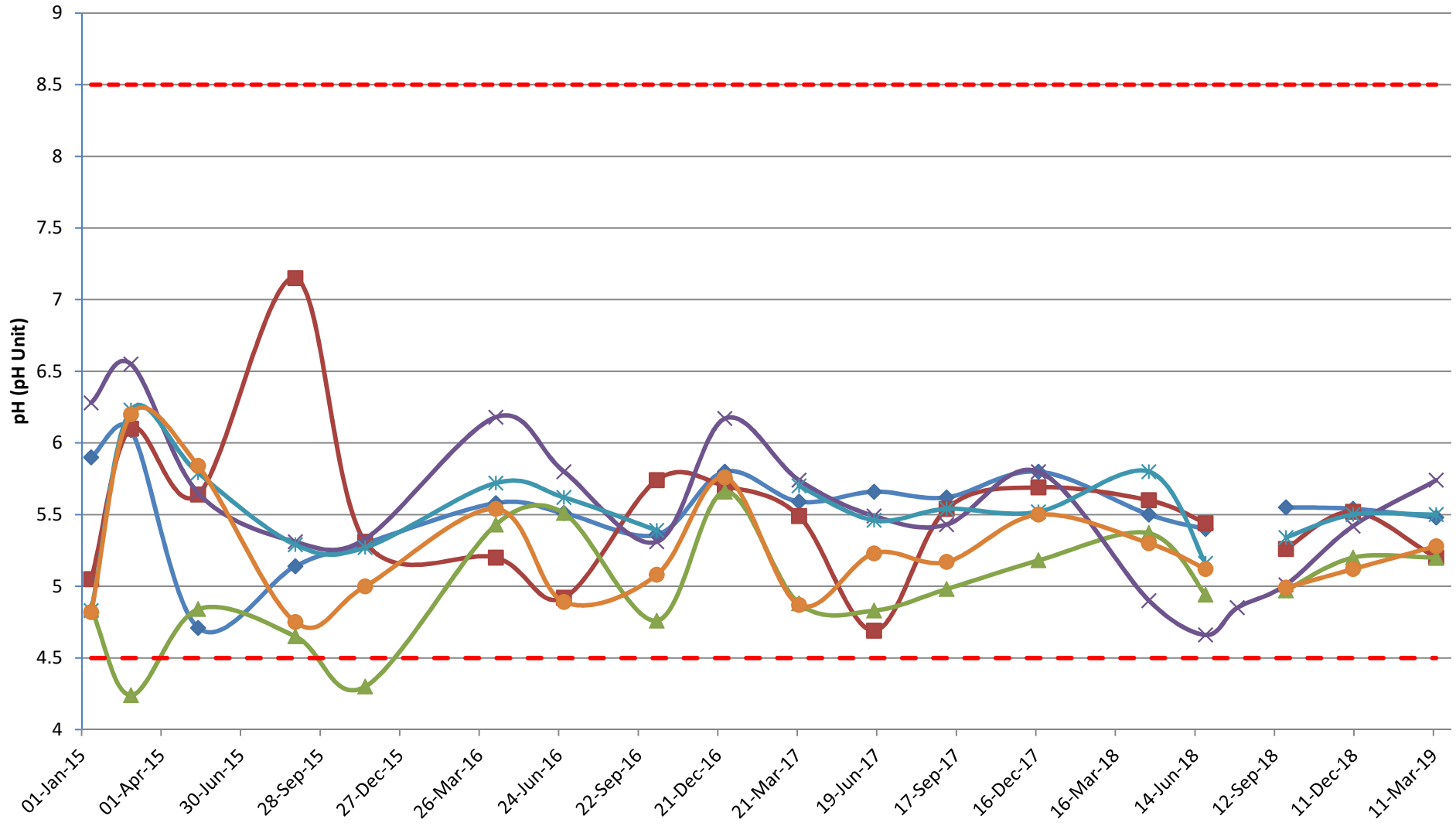
◆ SP1   ■ SP2   ▲ SP3   ✕ SP4   \* SP5   ● BL158

Quarterly Groundwater Monitoring

pH										
Sample Date	Lower SWMP Trigger	Upper SWMP Trigger	EPL Limit	EPA Point 1	EPA Point 2	EPA Point 3	EPA Point 4	EPA Point 5	EPA Point 6	Comment
				SP1	SP2	SP3	SP4	SP5	BL158	
12-Jan-15	4.5	8.5	non-specified	5.9	5.05	4.84	6.28	4.83	4.82	
26-Feb-15	4.5	8.5	non-specified	6.09	6.1	4.24	6.55	6.23	6.2	
13-May-15	4.5	8.5	non-specified	4.71	5.64	4.84	5.65	5.79	5.84	
31-Aug-15	4.5	8.5	non-specified	5.14	7.15	4.65	5.31	5.29	4.75	
18-Nov-15	4.5	8.5	non-specified	5.3	5.31	4.3	5.33	5.27	5	
14-Apr-16	4.5	8.5	non-specified	5.58	5.2	5.43	6.18	5.72	5.54	
30-Jun-16	4.5	8.5	non-specified	5.51	4.92	5.51	5.8	5.62	4.89	
13-Oct-16	4.5	8.5	non-specified	5.36	5.74	4.76	5.31	5.39	5.08	
29-Dec-16	4.5	8.5	non-specified	5.8	5.7	5.66	6.17		5.76	Sampling error at SP5
23-Mar-17	4.5	8.5	non-specified	5.59	5.49	4.88	5.74	5.7	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.

FY 18/19 Statistics	EPA Point 1	EPA Point 2	EPA Point 3	EPA Point 4	EPA Point 5	EPA Point 6
Count	3.0	3.0	3.0	4.0	3.0	3.0
Min	5.48	5.20	4.97	4.85	5.34	4.99
Average	5.52	5.33	5.12	5.26	5.45	5.13
Max	5.55	5.52	5.20	5.74	5.50	5.28

# Groundwater - pH



Note: No EPL Limit Specified

Date Sampled

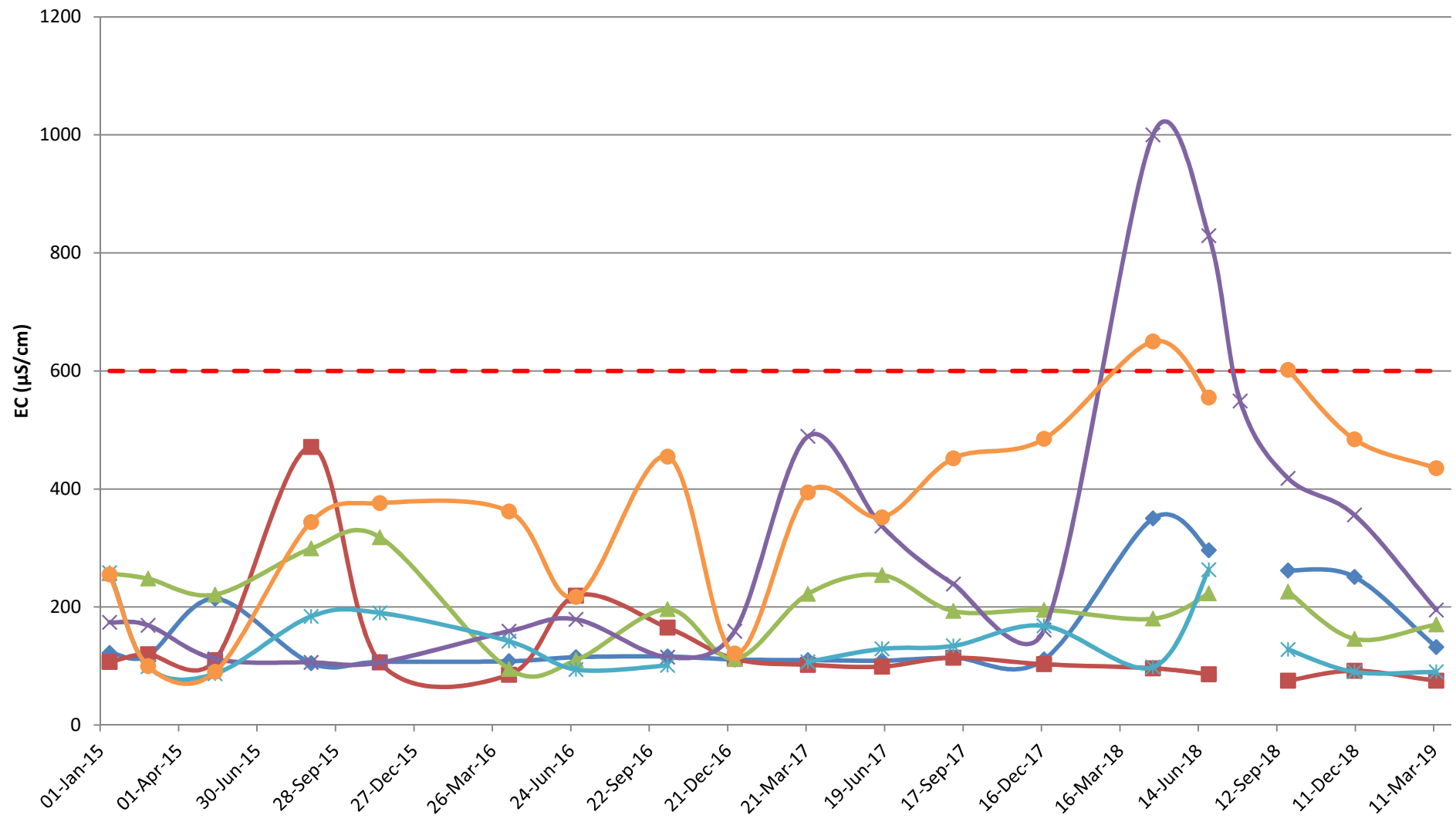
—◆— EPA Point 1    —■— EPA Point 2    —▲— EPA Point 3    —×— EPA Point 4    —\*— EPA Point 5    —●— EPA Point 6    - - - Lower Trigger    - - - Upper Trigger

Quarterly Groundwater Monitoring

Electrical Conductivity (µS/cm)									
Sample Date	SWMP Trigger	EPL Limit	EPA Point 1	EPA Point 2	EPA Point 3	EPA Point 4	EPA Point 5	EPA Point 6	Comment
			SP1	SP2	SP3	SP4	SP5	BL158	
12-Jan-15	600	non-specified	122	107	257	174	258	255	
25-Feb-15	600	non-specified	118	120	248	169	99	100	
13-May-15	600	non-specified	214	110	221	112	87	90	
31-Aug-15	600	non-specified	105	471	299	106	184	344	
18-Nov-15	600	non-specified	107	106	318	106	190	376	
14-Apr-16	600	non-specified	108	85	95	159	142	362	
30-Jun-16	600	non-specified	115	219	110	179	94	217	
13-Oct-16	600	non-specified	116	165	196	115	101	455	
29-Dec-16	600	non-specified	111	112	112	159		121	Sampling Error at SP5
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.

FY 18/19 Statistics	EPA Point 1	EPA Point 2	EPA Point 3	EPA Point 4	EPA Point 5	EPA Point 6
Count	3.0	3.0	3.0	4.0	3.0	3.0
Min	132.0	75.0	146.0	195.0	90.0	435.0
Average	215.0	80.7	180.7	379.5	102.7	507.0
Max	262.0	92.0	226.0	549.0	128.0	602.0

## Groundwater - Electrical Conductivity (EC)



Note: No EPL Limit Specified

- - - SWMP Trigger
- ◆ EPA Point 1
- EPA Point 2
- ▲ EPA Point 3
- × EPA Point 4
- ✱ EPA Point 5
- EPA Point 6

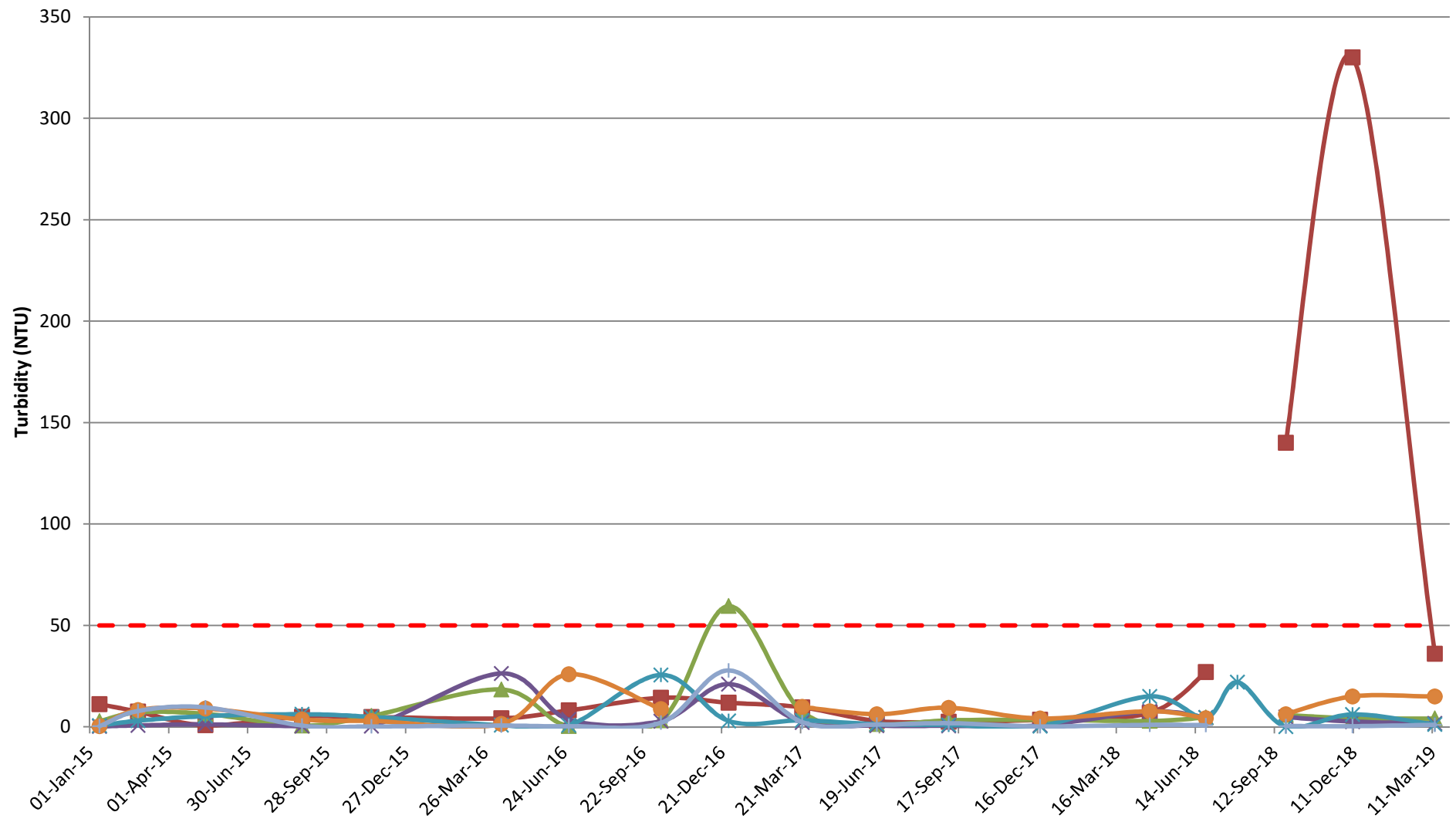


Quarterly Groundwater Monitoring

Turbidity (NTU)									
Sample Date	SWMP Trigger	EPL Limit	EPA Point 1	EPA Point 2	EPA Point 3	EPA Point 4	EPA Point 5	EPA Point 6	Comment
			SP1	SP2	SP3	SP4	SP5	BL158	
12-Jan-15	50	non-specified	11.2	2.8	0.2	0.6	0.3	0.3	
25-Feb-15	50	non-specified	7.5	7.1	0.7	3.0	8.3	7.8	
13-May-15	50	non-specified	0.8	6.4	1.2	5.3	9.0	9.6	
31-Aug-15	50	non-specified	5.0	0.6	0.3	6.2	3.6	0.6	
18-Nov-15	50	non-specified	4.8	5.4	0.3	4.9	2.9	0.2	
14-Apr-16	50	non-specified	4.2	18.4	26.3	0.8	1.5	0.6	
30-Jun-16	50	non-specified	8.1	0.3	3.6	0.7	25.9	0.3	
13-Oct-16	50	non-specified	14.3	3.1	2.8	25.6	8.7	2.0	
29-Dec-16	50	non-specified	11.9	59.5	21.1	2.9		27.8	Sampling Error at SP5
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.

FY 18/19 Statistics	EPA Point 1	EPA Point 2	EPA Point 3	EPA Point 4	EPA Point 5	EPA Point 6
Count	3.0	3.0	3.0	4.0	3.0	3.0
Min	36.0	4.1	1.7	0.1	6.2	0.3
Average	168.7	4.7	3.0	7.4	12.1	0.6
Max	330.0	5.8	4.8	22.0	15.0	1.0

# Groundwater - Turbidity (NTU)



Note: No EPL Limit Specified

- SWMP Trigger
- EPA Point 1
- EPA Point 2
- EPA Point 3
- EPA Point 4
- EPA Point 5
- EPA Point 6

# 1646 - Macka's Sand

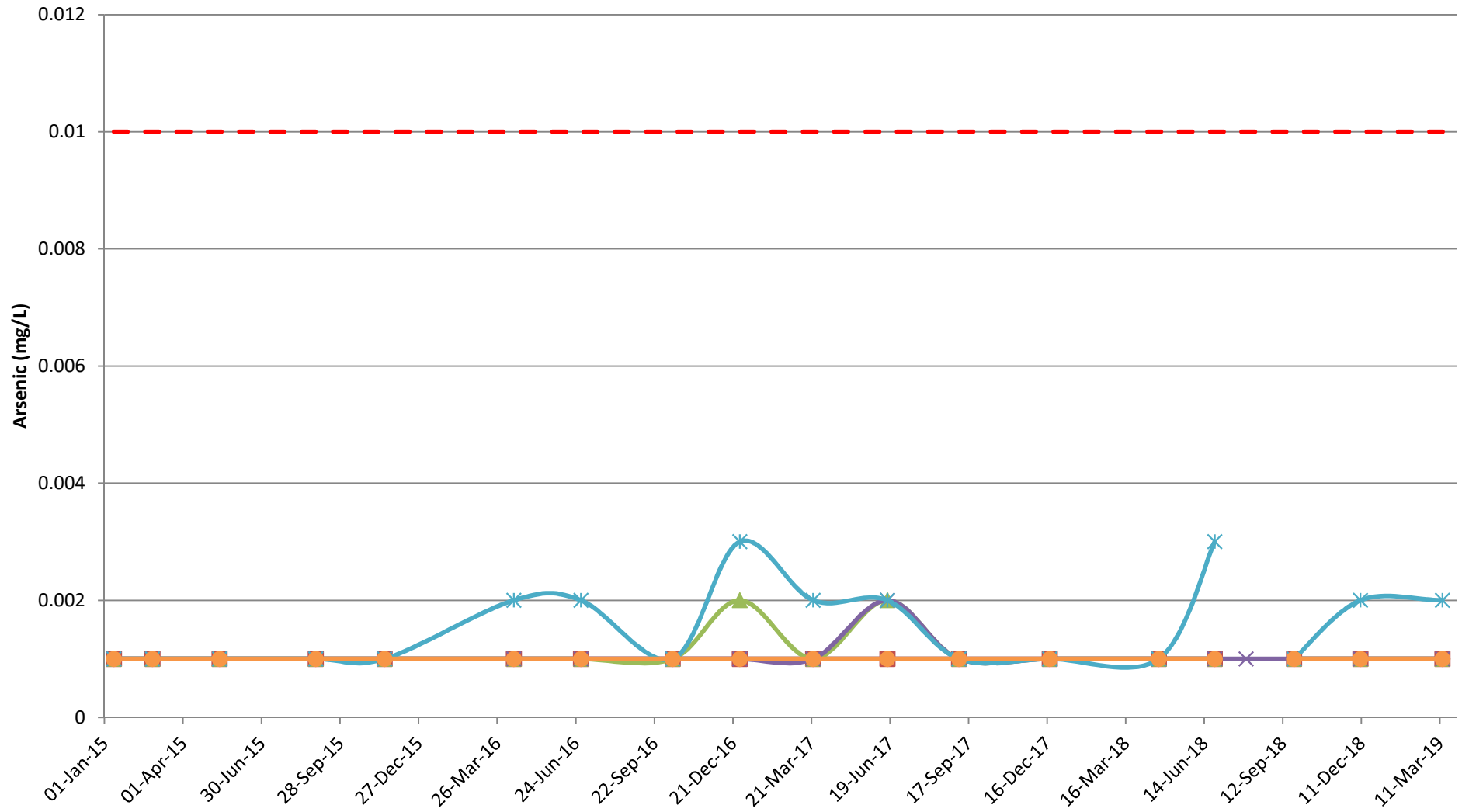
## Quarterly Groundwater Monitoring

Sample Date	SWMP Trigger	EPL Limit	Arsenic (mg/L)						Comment	
			EPA Point 1	EPA Point 2	EPA Point 3	EPA Point 4	EPA Point 5	EPA Point 6		
			SP1	SP2	SP3	SP4	SP5	BL158		
12-Jan-15	0.01	non-specified	0.001	0.001	0.001	0.001	0.001	0.001	0.001	
25-Feb-15	0.01	non-specified	0.001	0.001	0.001	0.001	0.001	0.001	0.001	
13-May-15	0.01	non-specified	0.001	0.001	0.001	0.001	0.001	0.001	0.001	
31-Aug-15	0.01	non-specified	0.001	0.001	0.001	0.001	0.001	0.001	0.001	
18-Nov-15	0.01	non-specified	0.001	0.001	0.001	0.001	0.001	0.001	0.001	
14-Apr-16	0.01	non-specified	0.001	0.001	0.001	0.001	0.002	0.001	0.001	
30-Jun-16	0.01	non-specified	0.001	0.001	0.001	0.001	0.002	0.001	0.001	
13-Oct-16	0.01	non-specified	0.001	0.001	0.001	0.001	0.001	0.001	0.001	
29-Dec-16	0.01	non-specified	0.001	0.001	0.002	0.001	0.003	0.001	0.001	
23-Mar-17	0.01	non-specified	0.001	0.001	0.001	0.001	0.002	0.001	0.001	
16-Jun-17	0.01	non-specified	0.001	0.001	0.002	0.002	0.002	0.001	0.001	
06-Sep-17	0.01	non-specified	0.001	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	0.001	
23-Apr-18	0.01	non-specified	0.001	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	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	0.001	
10-Dec-18	0.01	non-specified	0.001	0.001	0.001	0.001	0.002	0.001	0.001	
14-Mar-19	0.01	non-specified	0.001	0.001	0.001	0.001	0.002	0.001	0.001	SP1 & SP5 monitoring undertaken on 15/3/19 due to access restrictions on 14/3/2019.

Note: Shaded cells indicate values less than 0.001 (i.e. limit of detection). '<' removed to populate graph

FY 18/19 Statistics	EPA Point 1	EPA Point 2	EPA Point 3	EPA Point 4	EPA Point 5	EPA Point 6
Count	3.0	3.0	3.0	4.0	3.0	3.0
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	0.001	0.002	0.001

# Groundwater - Arsenic (mg/L)



Note: No EPL Limit Specified

Date Sampled

SWMP Trigger EPA Point 1 EPA Point 2 EPA Point 3 EPA Point 4 EPA Point 5 EPA Point 6

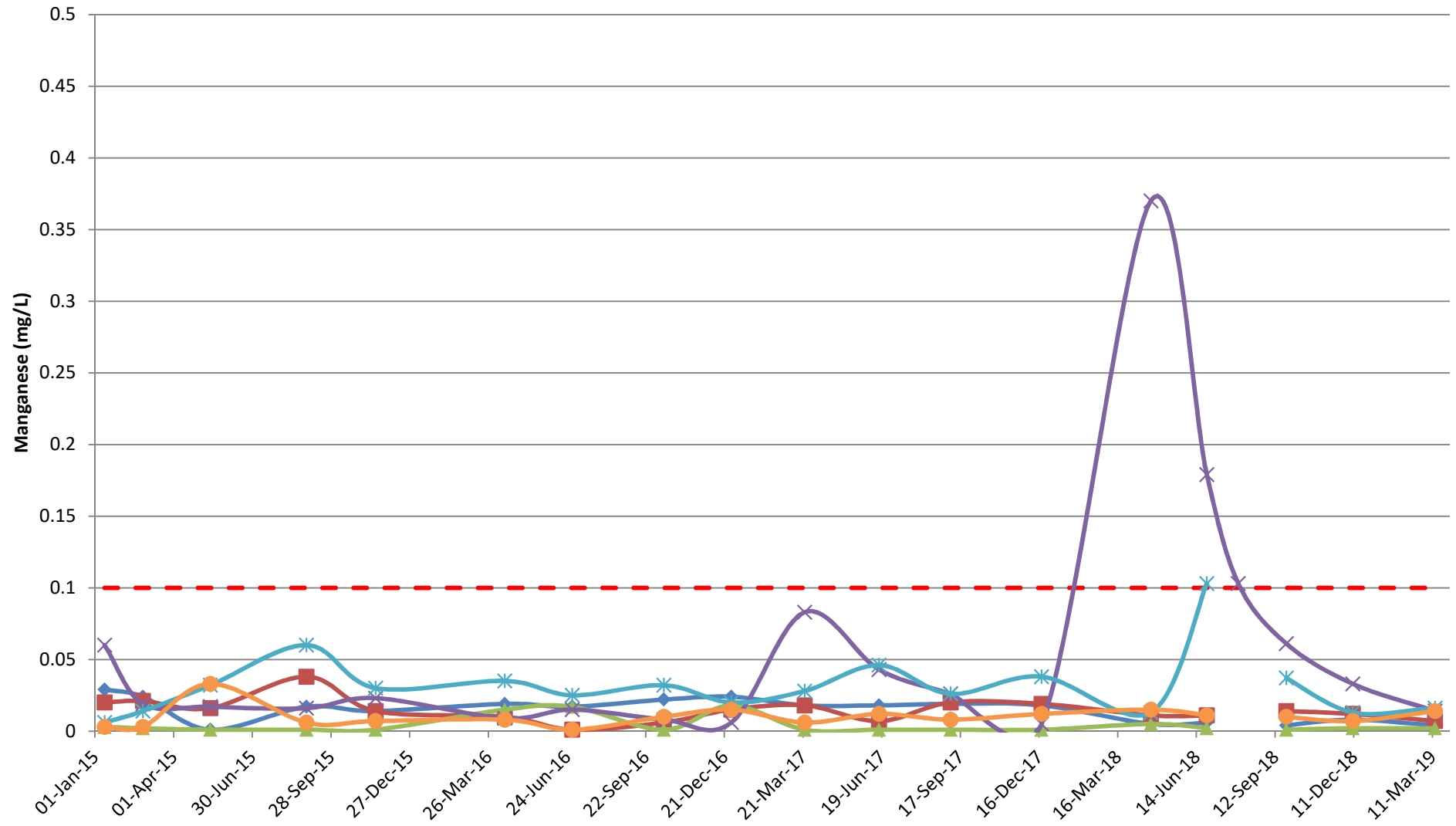
Quarterly Groundwater Monitoring

Manganese (mg/L)									
Sample Date	SWMP Trigger	EPL Limit	EPA Point 1	EPA Point 2	EPA Point 3	EPA Point 4	EPA Point 5	EPA Point 6	Comment
			SP1	SP2	SP3	SP4	SP5	BL158	
12-Jan-15	0.1	non-specified	0.029	0.020	0.003	0.060	0.006	0.003	
25-Feb-15	0.1	non-specified	0.024	0.021	0.002	0.019	0.014	0.003	
13-May-15	0.1	non-specified	0.001	0.016	0.001	0.017	0.032	0.033	
31-Aug-15	0.1	non-specified	0.017	0.038	0.001	0.016	0.060	0.006	
18-Nov-15	0.1	non-specified	0.014	0.014	0.001	0.023	0.030	0.007	
14-Apr-16	0.1	non-specified	0.019	0.010	0.015	0.009	0.035	0.008	
30-Jun-16	0.1	non-specified	0.017	0.001	0.017	0.015	0.025	0.001	
13-Oct-16	0.1	non-specified	0.022	0.006	0.001	0.008	0.032	0.010	
29-Dec-16	0.1	non-specified	0.024	0.015	0.018	0.006	0.020	0.015	
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.

Note: Shaded cells indicate values less than 0.001 (i.e. limit of detection). '<' removed to populate graph

FY 18/19 Statistics	EPA Point 1	EPA Point 2	EPA Point 3	EPA Point 4	EPA Point 5	EPA Point 6
Count	3	3	3	4	3	3
Min	0.004	0.007	0.001	0.014	0.013	0.007
Average	0.005	0.011	0.002	0.053	0.022	0.010
Max	0.008	0.014	0.002	0.103	0.037	0.014

# Groundwater - Manganese (mg/L)



Note: No EPL Limit Specified

Date Sampled

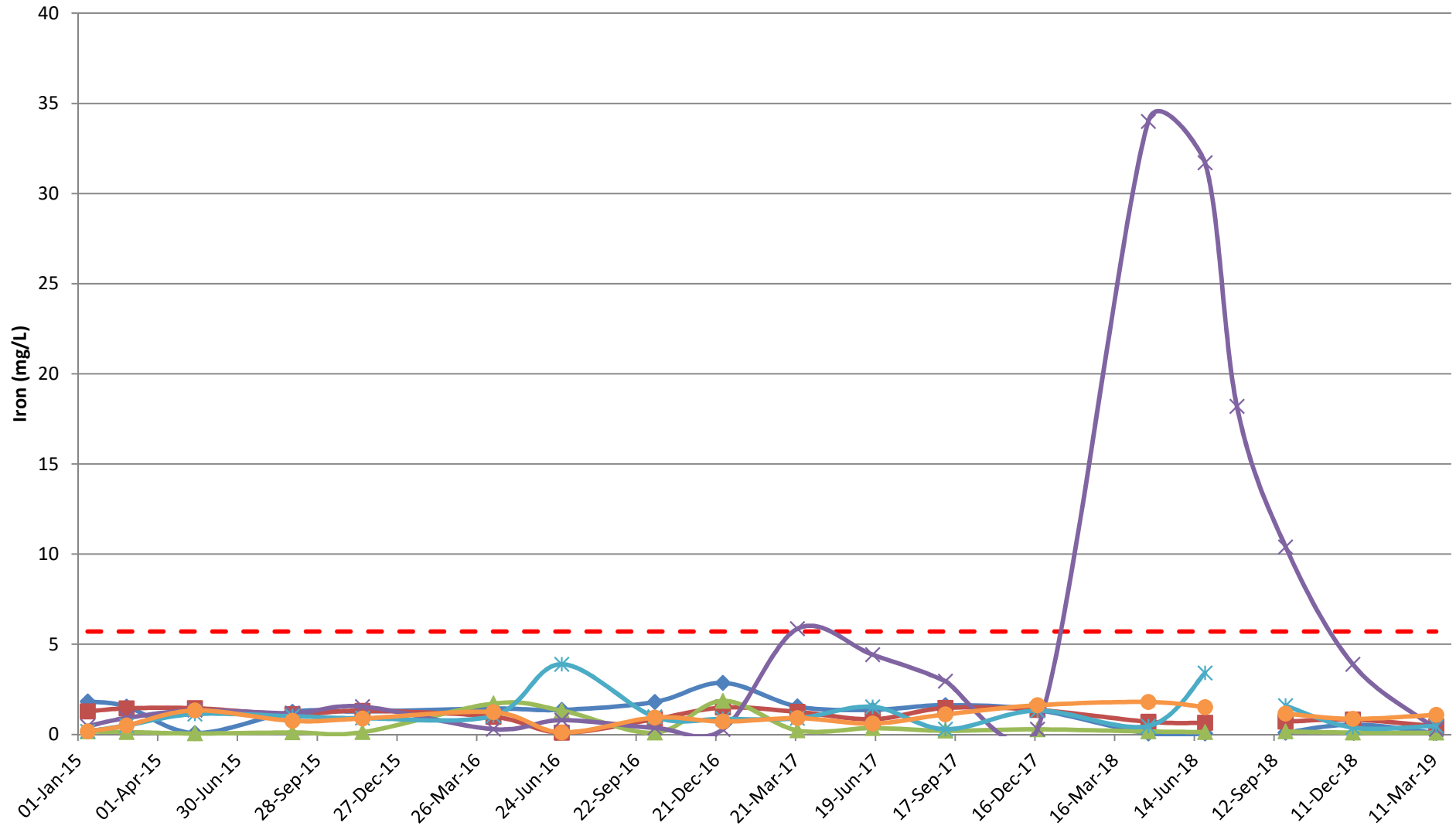
- SWMP Trigger
- EPA Point 1
- EPA Point 2
- EPA Point 3
- EPA Point 4
- EPA Point 5
- EPA Point 6

Quarterly Groundwater Monitoring

Iron (mg/L)									
Sample Date	SWMP Trigger	EPL Limit	EPA Point 1	EPA Point 2	EPA Point 3	EPA Point 4	EPA Point 5	EPA Point 6	Comment
			SP1	SP2	SP3	SP4	SP5	BL158	
12-Jan-15	5.7	non-specified	1.83	1.28	0.16	0.46	0.17	0.16	
25-Feb-15	5.7	non-specified	1.54	1.44	0.13	0.91	0.50	0.50	
13-May-15	5.7	non-specified	0.07	1.45	0.05	1.34	1.13	1.33	
31-Aug-15	5.7	non-specified	1.25	1.12	0.11	1.18	1.01	0.75	
18-Nov-15	5.7	non-specified	1.27	1.31	0.12	1.54	0.90	0.88	
14-Apr-16	5.7	non-specified	1.43	0.98	1.71	0.29	1.03	1.23	
30-Jun-16	5.7	non-specified	1.36	0.10	1.32	0.79	3.89	0.11	
13-Oct-16	5.7	non-specified	1.80	0.85	0.09	0.36	0.97	0.93	
29-Dec-16	5.7	non-specified	2.86	1.49	1.86	0.28	0.86	0.71	
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	0.46	1.80	
26-Jun-18	5.7	non-specified	0.05	0.64	0.13	31.7	3.40	1.51	
01-Aug-18	5.7	non-specified				18.2			Additional SP4 monitoring event due to standpipe replacement
25-Sep-18	5.7	non-specified	0.09	0.71	0.16	10.4	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.

FY 17/18 Statistics	EPA Point 1	EPA Point 2	EPA Point 3	EPA Point 4	EPA Point 5	EPA Point 6
Count	3.0	3.0	3.0	4.0	3.0	3.0
Min	0.08	0.46	0.09	0.27	0.38	0.86
Average	0.24	0.66	0.12	8.19	0.81	1.03
Max	0.55	0.82	0.16	18.20	1.59	1.15

# Groundwater - Iron (mg/L)



Note: No EPL Limit Specified

Date Sampled

- SWMP Trigger
- EPA Point 1
- EPA Point 2
- EPA Point 3
- EPA Point 4
- EPA Point 5
- EPA Point 6