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8.30 Surface and ground water  
monitoring (Part 2 of 2)

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Infrastructure Planning (Applications: Prescribed Forms and  
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**Surface and ground water monitoring (Part 2 of 2)**

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## 3.2 Surface water flow

### Automatic flow measurements

- 3.2.1 The raw data from automatic velocity measurements taken between July 2020 and November 2021 for SW2, SW4 and SW6 are shown on Figure 3-1, Figure 3-2 and Figure 3-3, respectively. The data for automatic surface water level measurements taken at SW2, SW4 and SW6 across the same period is shown on Figure 3-4, Figure 3-5 and Figure 3-6 below. The velocity and stage information gathered has been used to determine flows for these monitoring locations, which are shown on Figure 3-7, Figure 3-8 and Figure 3-9.

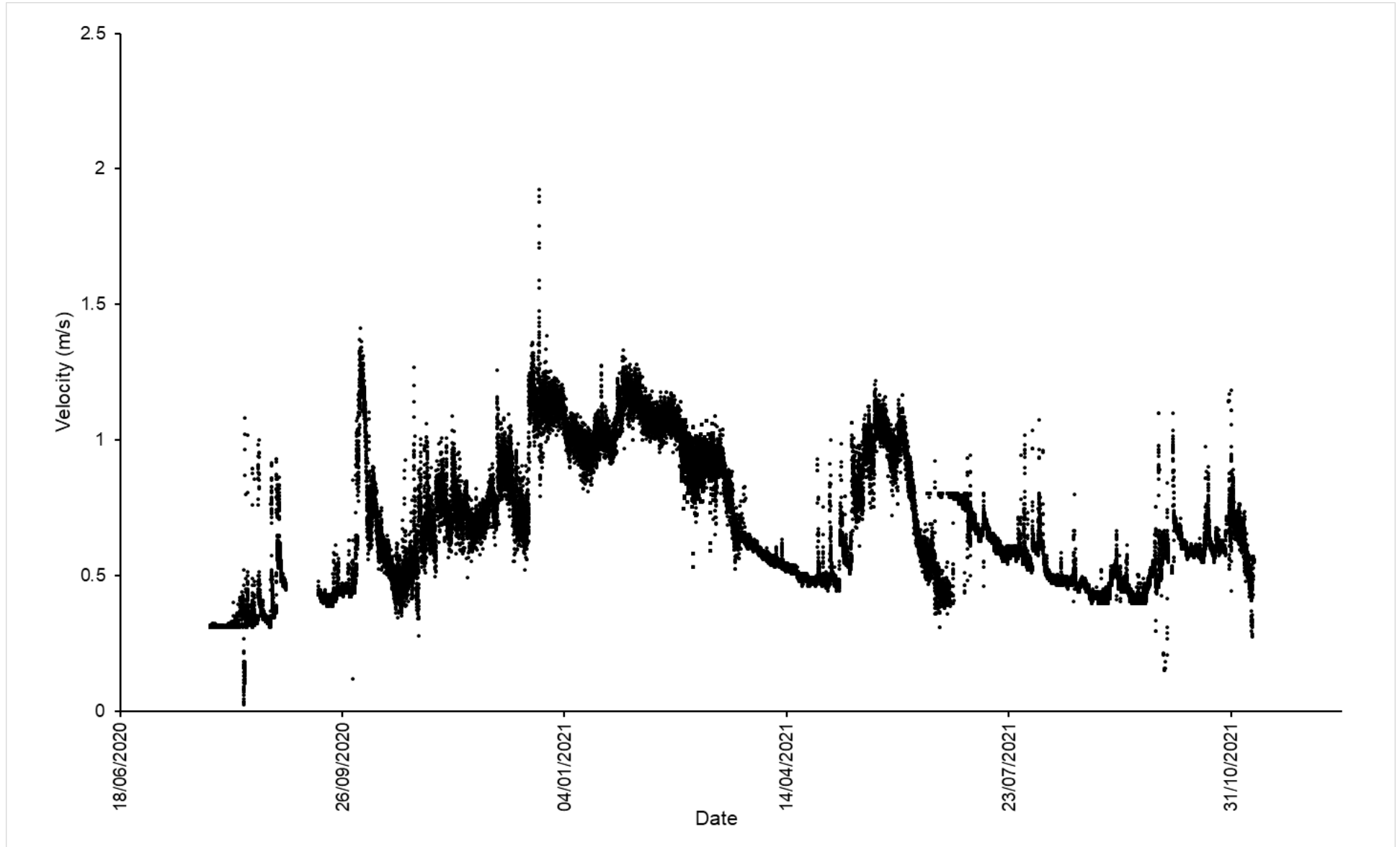


Figure 3-1 SW2 automatic velocity measurements

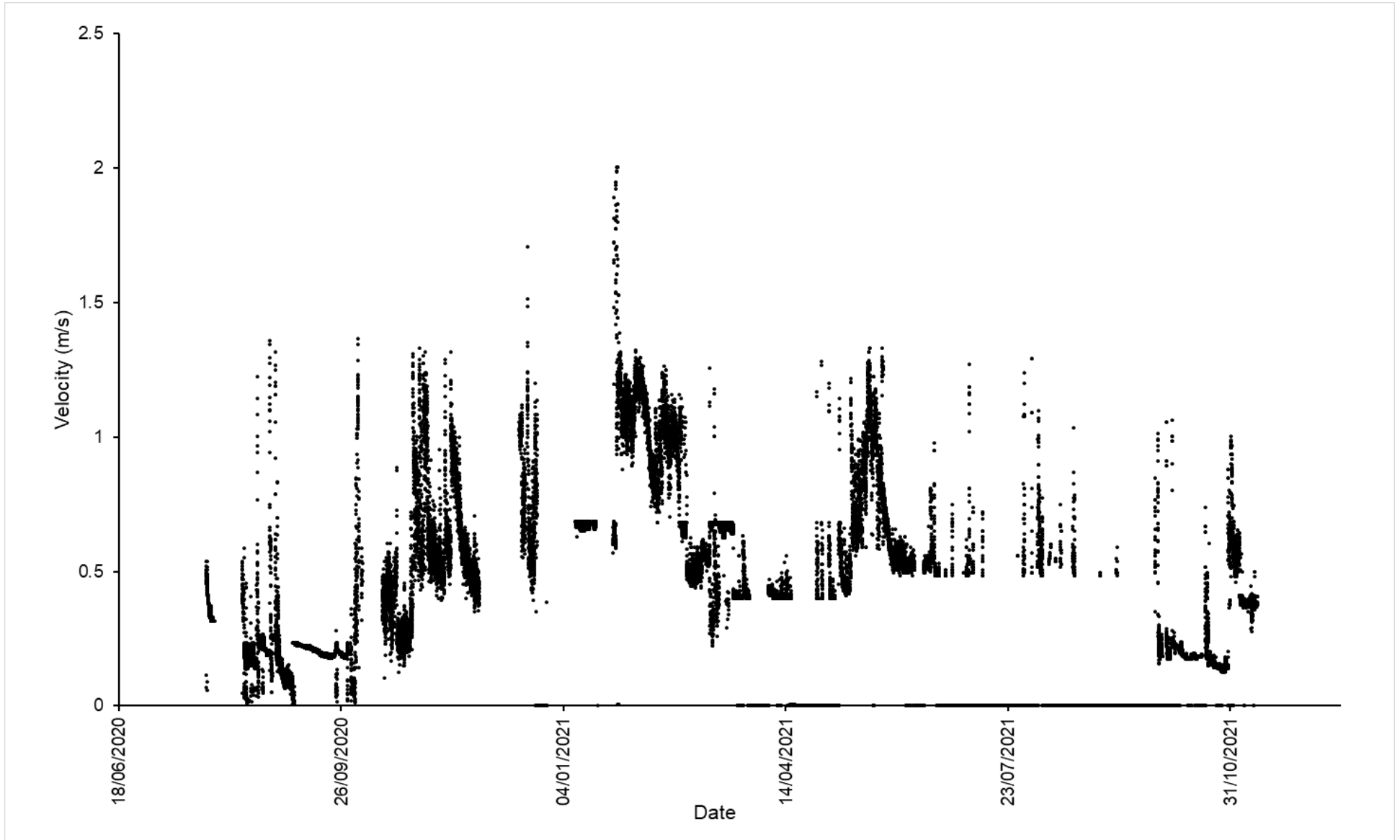


Figure 3-2 SW4 automatic velocity measurements

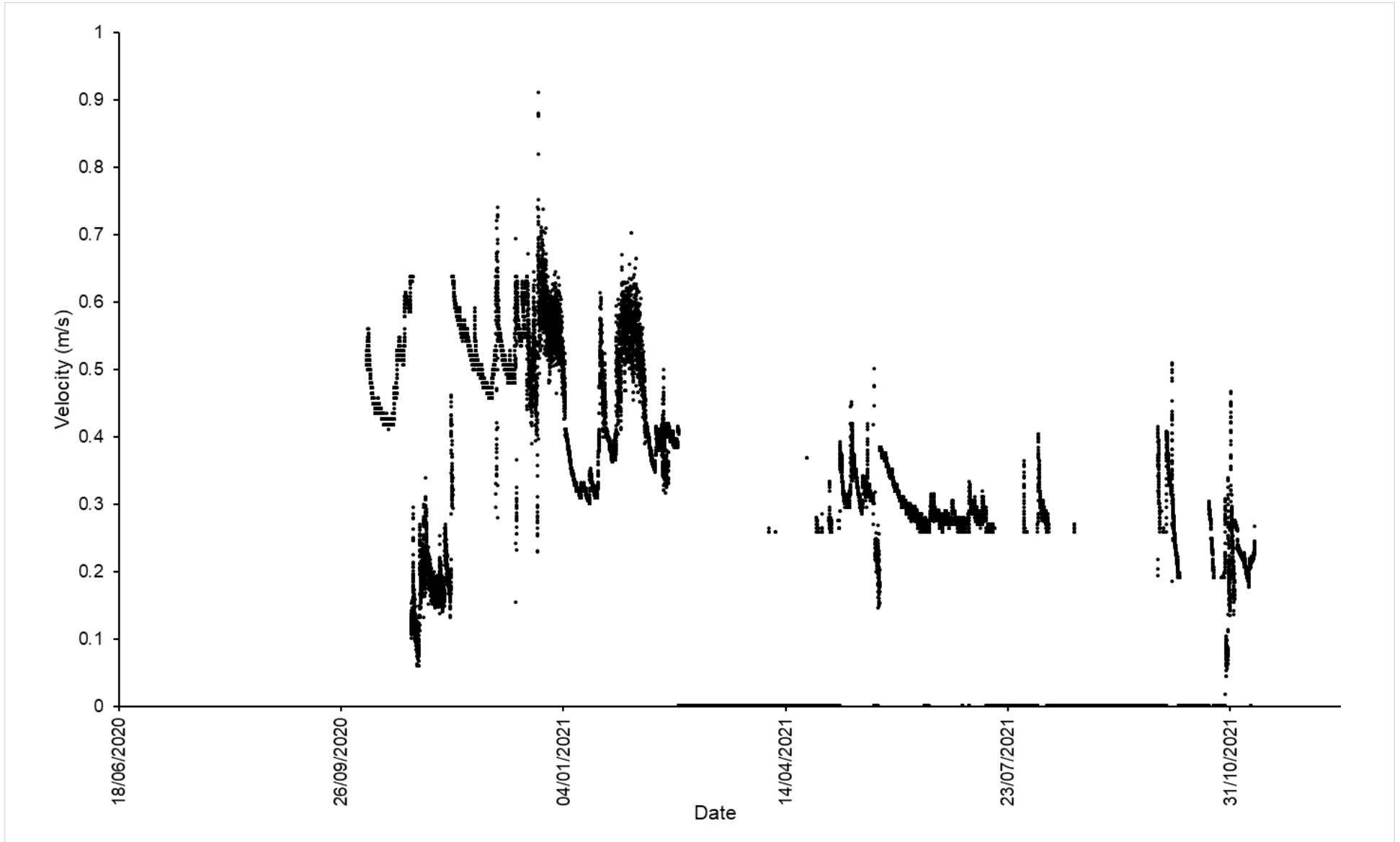


Figure 3-3 SW6 automatic velocity measurements

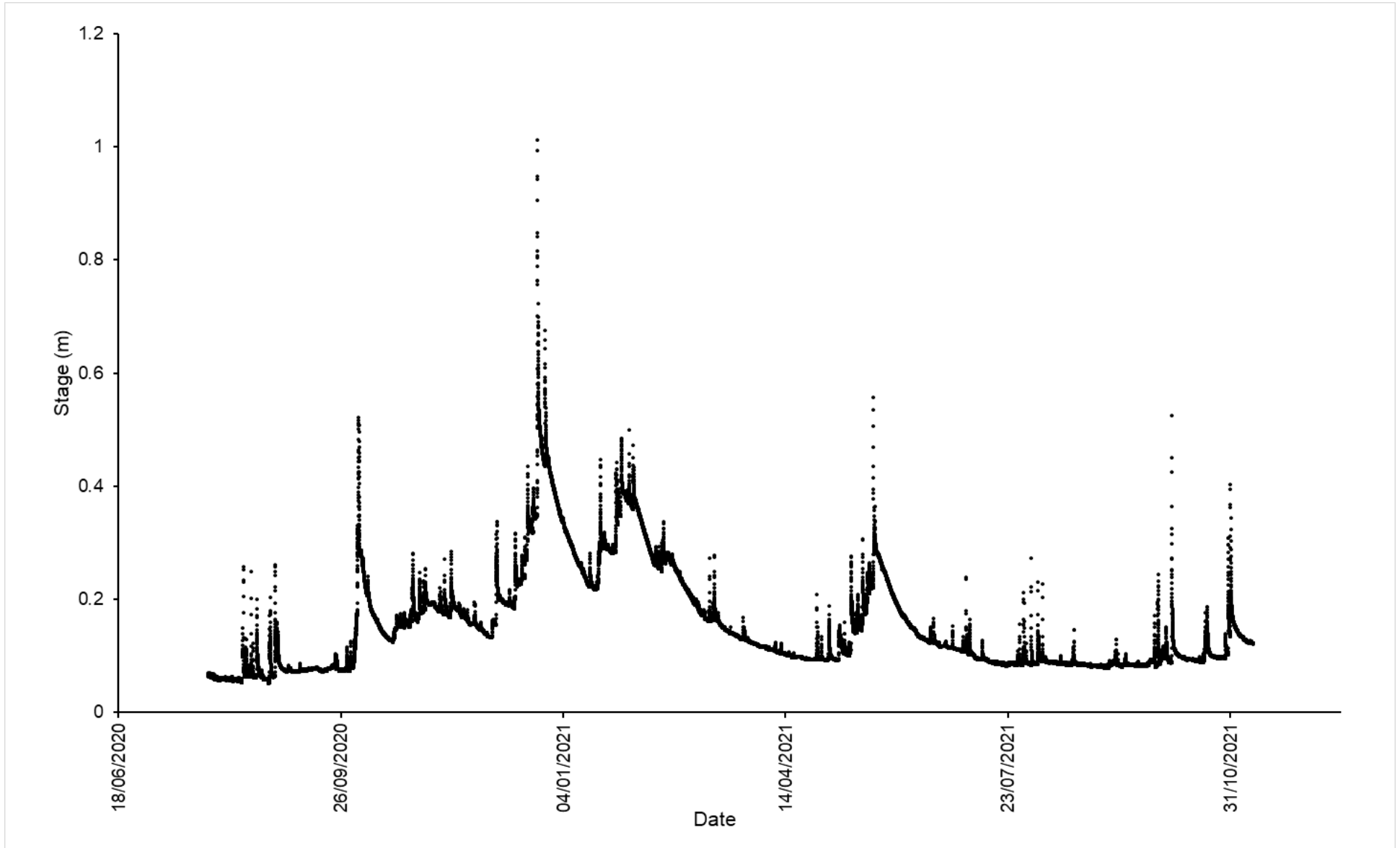


Figure 3-4 SW2 automatic stage measurements

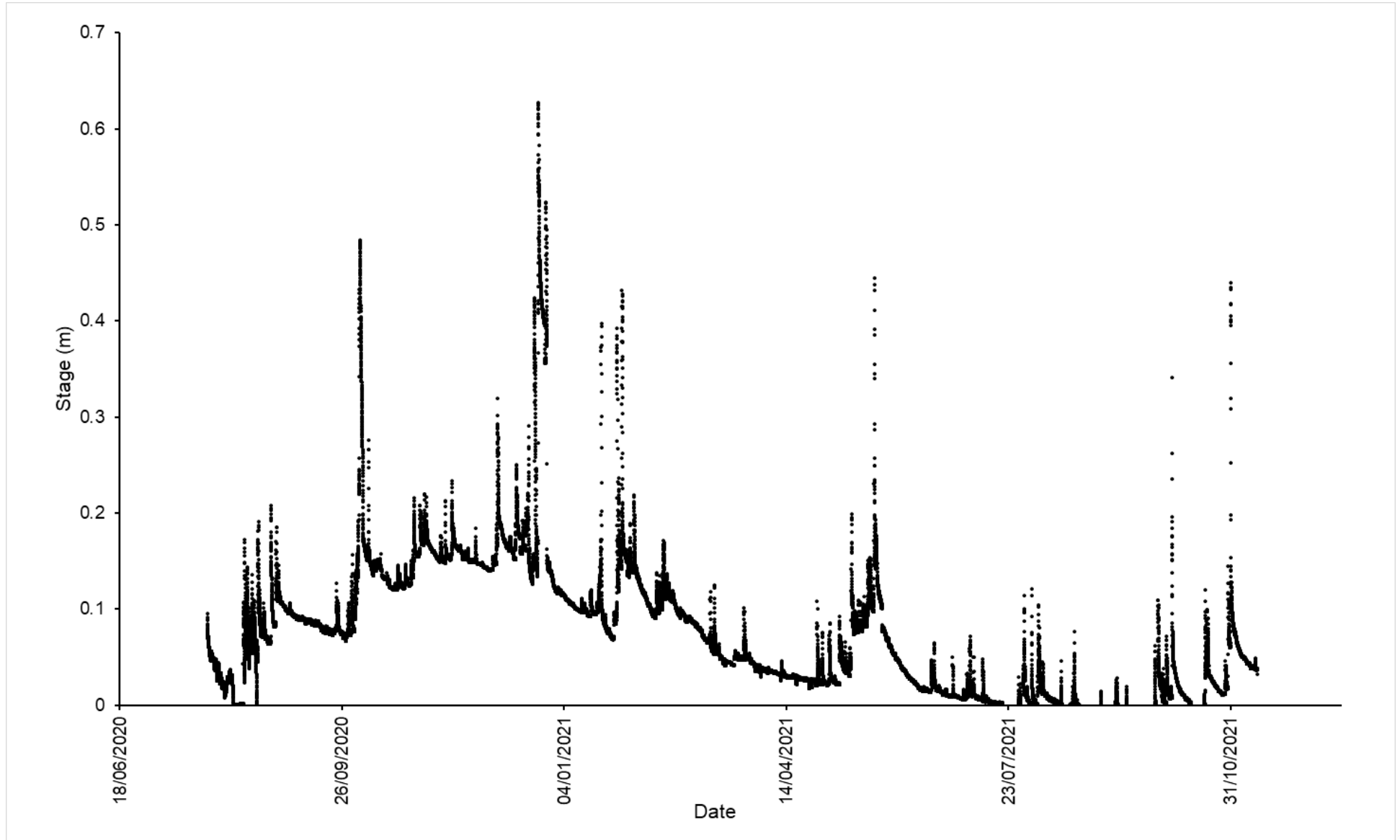


Figure 3-5 SW4 automatic stage measurements



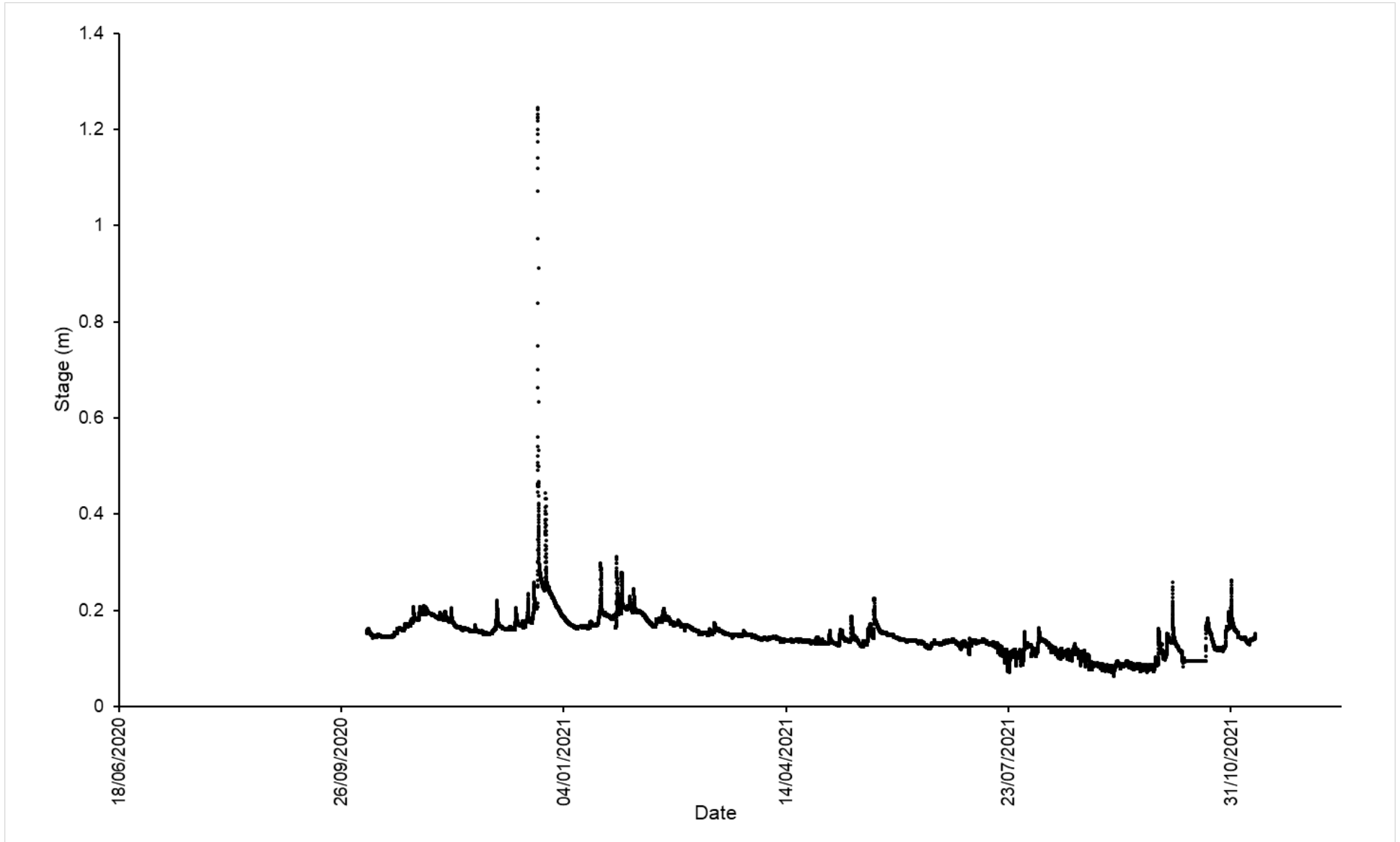


Figure 3-6 SW6 automatic stage measurements

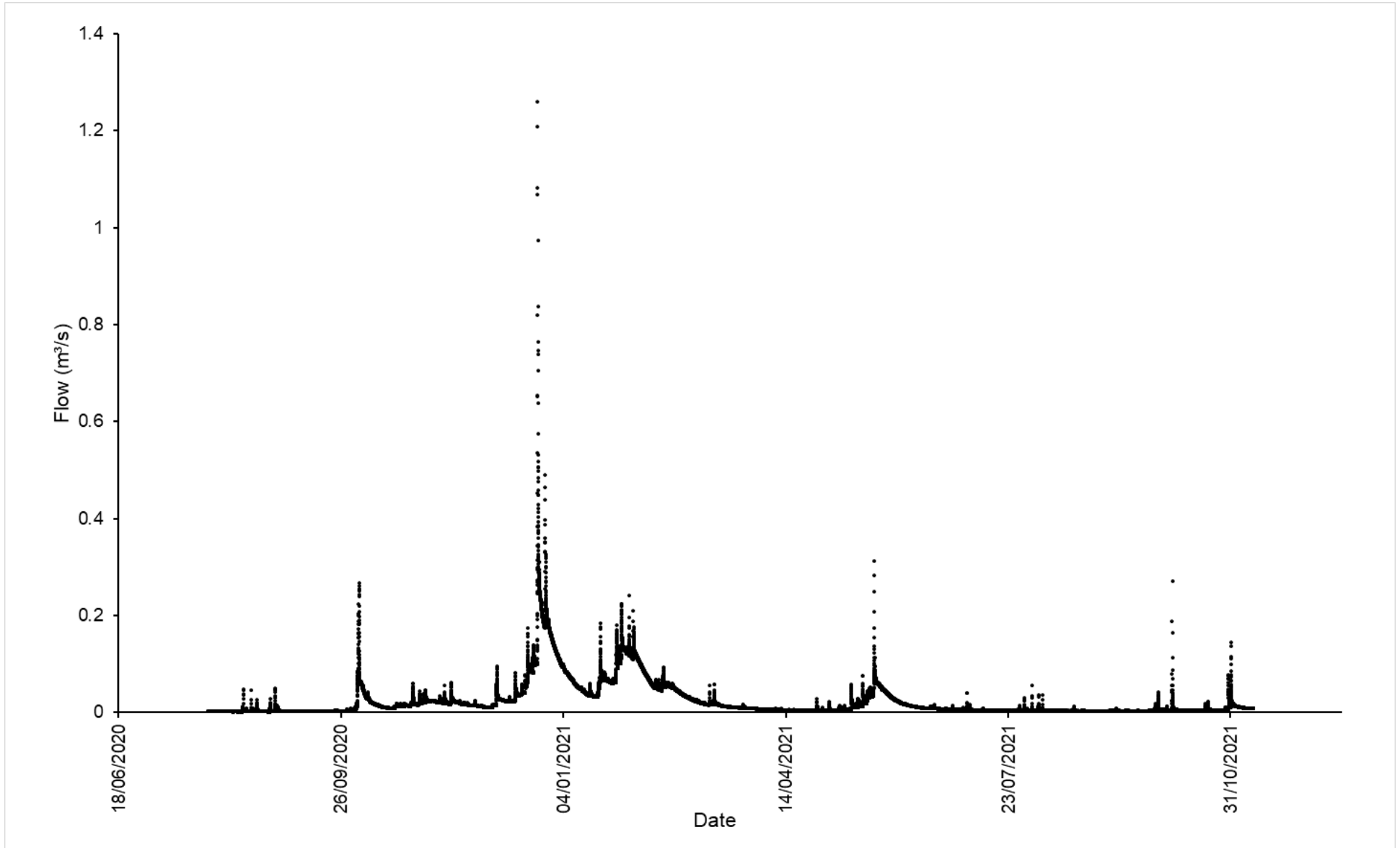


Figure 3-7 SW2 flow measurements

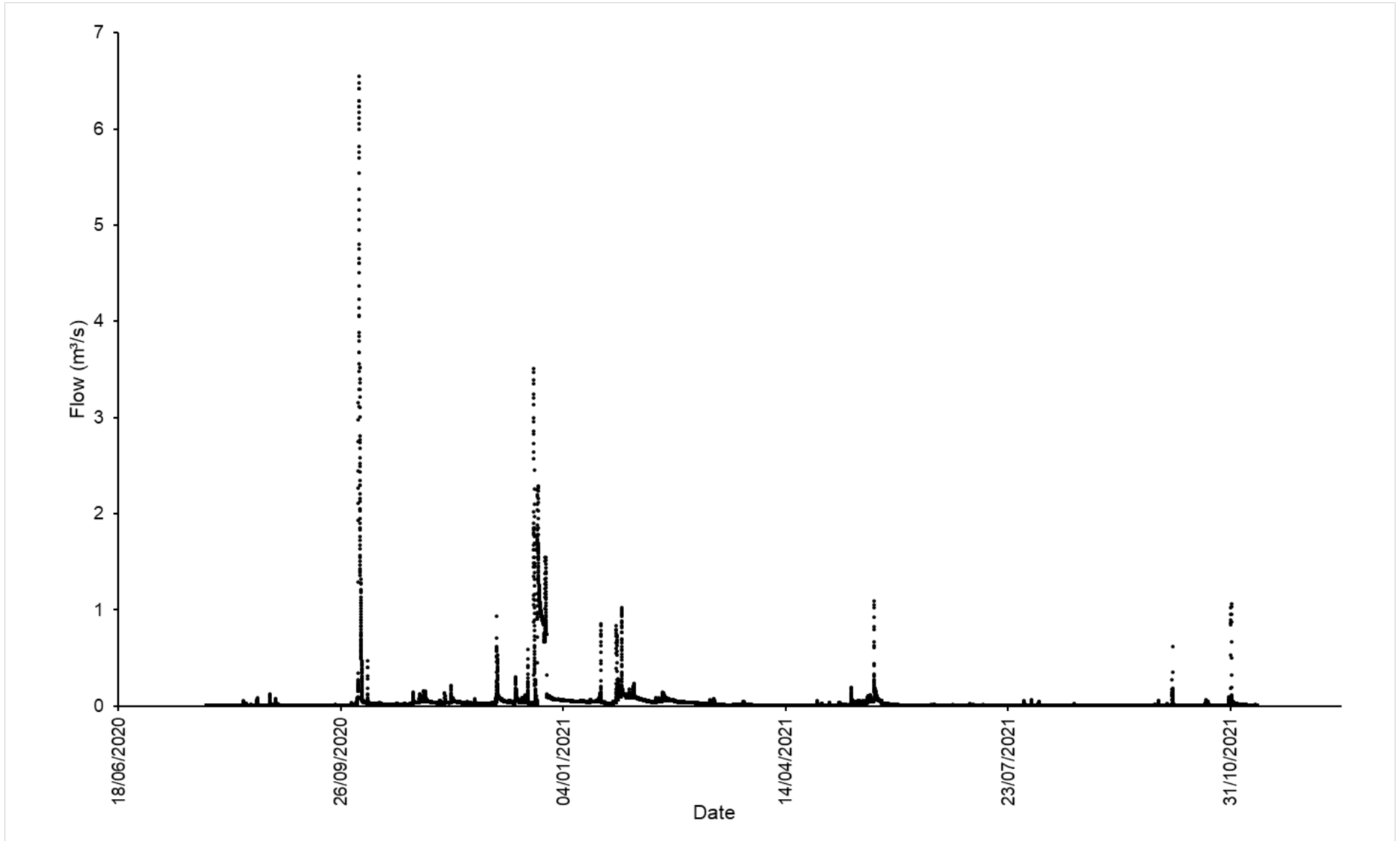


Figure 3-8 SW4 flow measurements

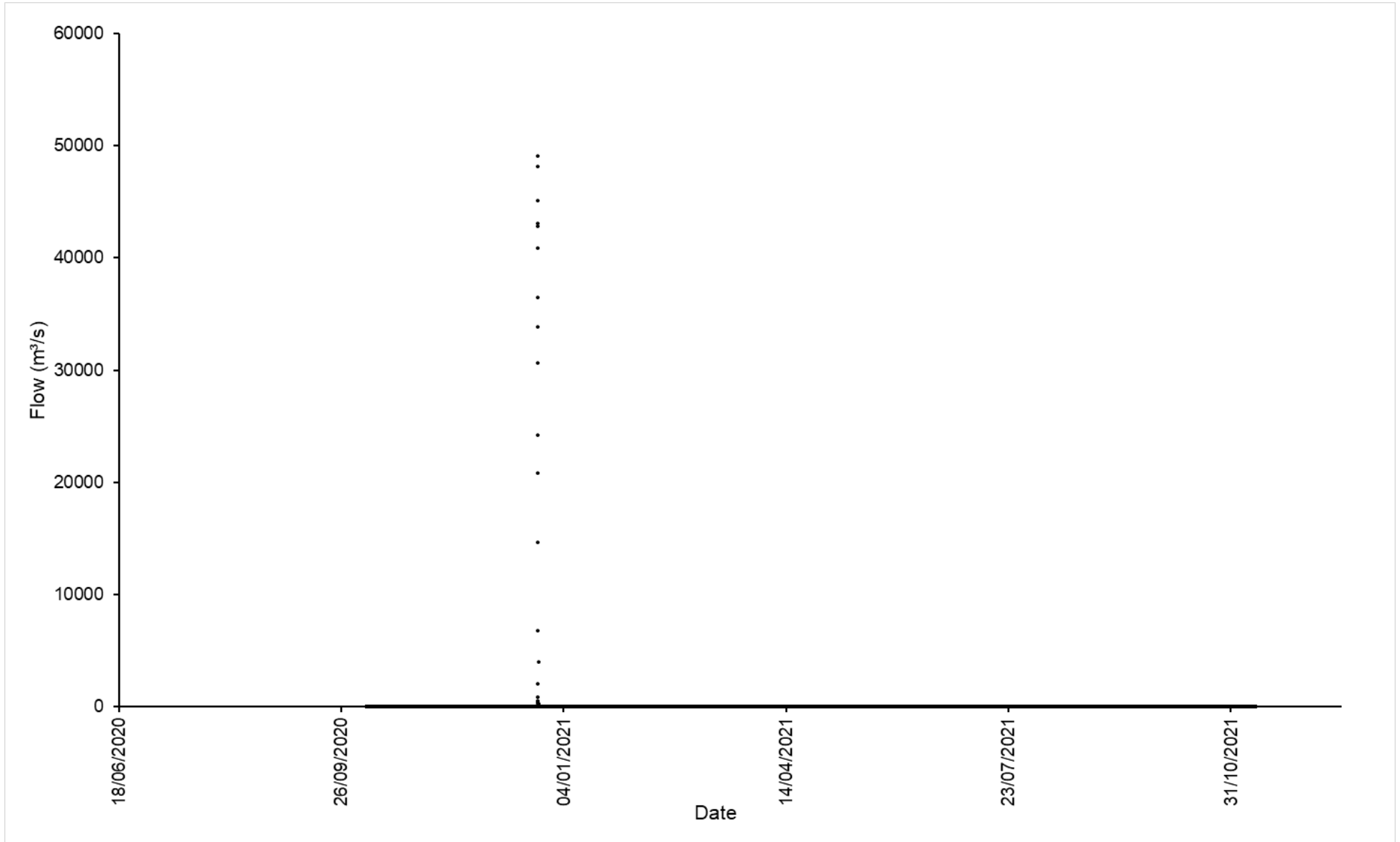


Figure 3-9 SW6 flow measurements

### Manual flow measurements

3.2.2 The raw data from the surface water flow monitoring at SW1 to SW6 monitoring stations between July 2020 and November 2021 is shown in Table 3-39. Monitoring for March 2021 was unable to be conducted and was undertaken in early April 2021. Monitoring was also unable to be conducted in July 2021, and samples were taken in early August 2021.

**Table 3-39 Surface water flows between July 2020 and September 2021**

Date	SW1		SW2		SW3		SW4		SW5		SW6	
	Stage	Flow	Stage	Flow	Stage	Flow	Stage	Flow	Stage	Flow	Stage	Flow
27/07/2020	-	-	-	-	-	-	0.080	0.0013	-	-	No access	
28/07/2020	-	-	0.070	0.001	-	-	-	-	-	-	No access	
24/08/2020	9.202	0.004	0.057	0.003	-	-	-	-	9.036	0.005	No access	
25/08/2020	-	-	-	-	9.608	0.011	0.135	0.022	-	-	No access	
15/09/2020	9.209	0.003	0.078	0.003	-	-	-	-	9.045	0.005	No access	
16/09/2020	-	-	-	-	9.565	0.001	0.083	0.0011	-	-	No access	
07/10/2020	-	-	-	-	-	-	-	-	-	-	0.151	0.004
20/10/2020	9.254	0.010	0.135	0.007	-	-	-	-	-	-	-	-
21/10/2020	-	-	-	-	9.550	0.005	0.130	0.018	-	-	-	-
22/10/2020	-	-	-	-	-	-	-	-	9.105	0.015	0.160	0.002
18/11/2020	-	-	0.188	0.027	-	-	-	-	-	-	0.165	0.004
19/11/2020	9.316	0.021			9.705	0.013	0.153	0.029	9.120	0.015	-	-
14/12/2020	9.350	0.052	0.230	0.032	-	-	-	-	-	-	-	-
15/12/2020	-	-	-	-	-	-	0.160	0.058	-	-	-	-
16/12/2020	-	-	-	-	9.723	0.021	-	-	9.158	0.039	0.169	0.006
21/12/2020	9.390	0.097	0.288	0.062	-	-	-	-	9.210	0.054	-	-
22/12/2020	-	-	-	-	9.790	0.054	0.248	0.166	-	-	0.200	0.018
24/02/2021	-	-	-	-	9.910	0.011	-	-	9.050	0.039	0.170	0.004
25/02/2021	9.390	0.067	0.240	0.043	-	-	0.090	0.027	-	-	-	-
06/04/2021	-	-	0.115	0.005	0.035	0.002	0.037	0.006	9.518	0.014	0.142	0.001

Date	SW1		SW2		SW3		SW4		SW5		SW6	
	Stage	Flow	Stage	Flow	Stage	Flow	Stage	Flow	Stage	Flow	Stage	Flow
07/04/2021	9.226	0.010	-	-	-	-	-	-	-	-	-	-
27/04/2021	9.268	0.006	0.092	0.004	-	-	-	-	-	-	0.136	0.001
28/04/2021	-	-	-	-	0.025	0.001	0.026	0.002	9.016	0.010	-	-
26/05/2021	-	-	-	-	9.880	0.018	-	-	9.056	0.027	0.160	0.007
27/05/2021	9.350	0.074	0.254	0.045	-	-	0.079	0.042	-	-	-	-
14/06/2021	9.257	0.008	0.130	0.009	-	-	-	-	9.030	0.012	-	-
15/06/2021	-	-	-	-	0.030	0.003	0.015	0.005	-	-	0.130	0.001
02/08/2021	-	-	-	-	9.970	0.001	0.000	0.001	9.030	0.007	0.128	0.000
03/08/2021	9.246	0.006	0.089	0.002	-	-	-	-	-	-	-	-
29/09/2021	-	-	0.090	0.002	-	-	-	-	9.035	0.010	-	-
30/09/2021	9.230	0.011	-	-	9.480	0.001	0.010	0.003	-	-	0.128	0.001
20/10/2021	-	-	0.112	0.008	-	-	-	-	9.045	0.017	-	-
21/10/2021	9.262	0.008	-	-	9.525	0.011	0.048	0.023	-	-	0.154	0.003
10/11/2021	9.260	0.013	0.120	0.008	-	-	-	-	9.080	0.017	-	-
11/11/2021	-	-	-	-	9.510	0.005	-	-	-	-	0.150	0.002
12/11/2021	-	-	-	-	-	-	0.040	0.016	-	-	-	-

3.2.3 Figure 3-10 displays the velocity data from Table 3-39 over the period between July 2020 and November 2021.

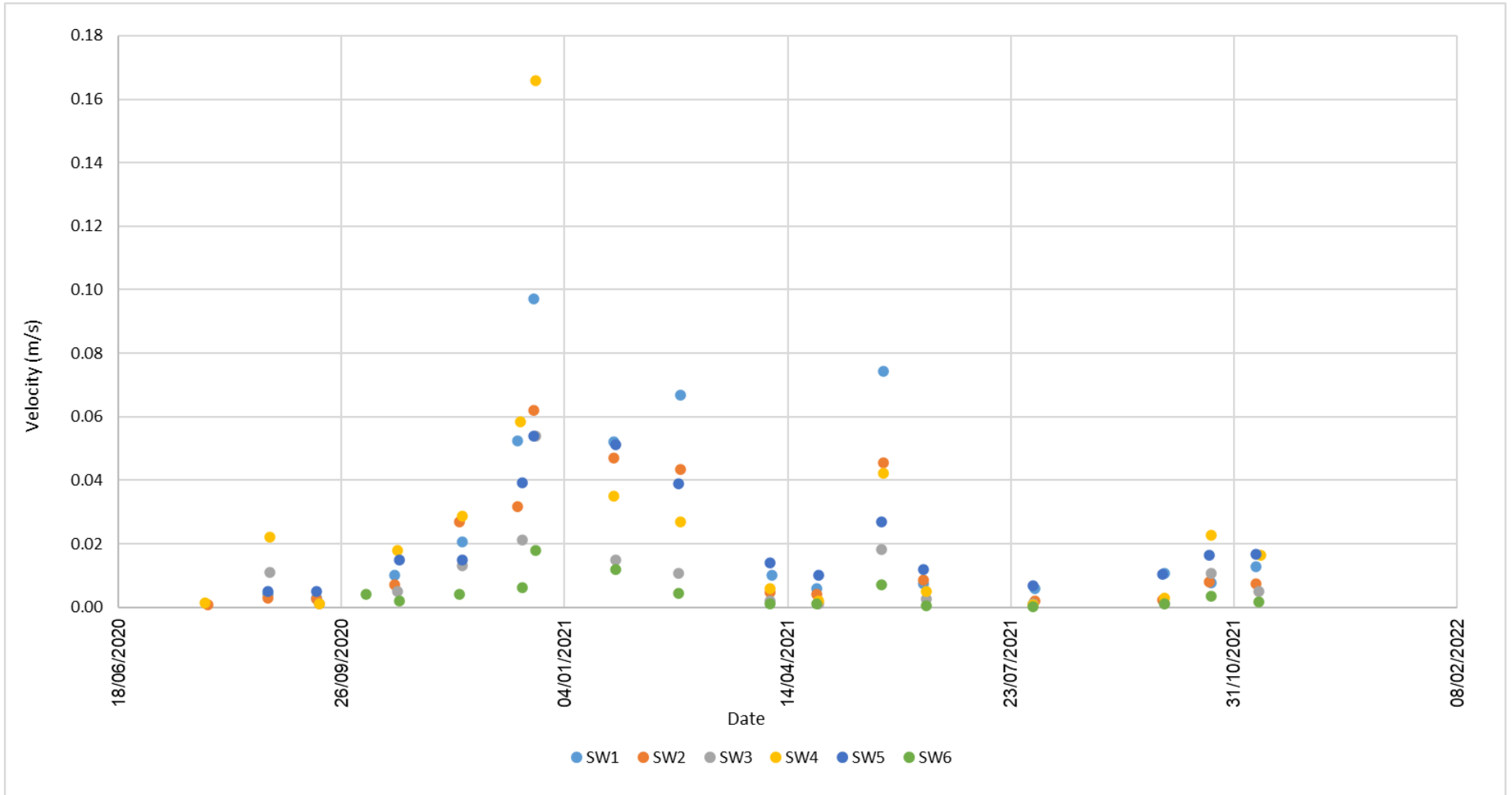


Figure 3-10 Surface water manual velocity data between July 2020 and November 2021

### 3.3 Spring water quality

#### In-situ monitoring

- 3.3.1 Table 3-40 to Table 3-55 display spring water quality results from in-situ monitoring between August 2020 and November 2021. Monitoring for March 2021 was unable to be conducted, and samples were taken in early April 2021. Monitoring was also unable to be conducted in July 2021, and samples were taken in early August 2021.

**Table 3-40 In-situ spring water quality data August 2020**

Location ID	GW1	GW5	GW6
Date	24-Aug-20	25-Aug-20	25-Aug-20
Time (GMT)	Sample unable to be obtained due to low water levels at and around the monitoring location.	11:01	11:38
PH		8.01	7.78
Actual Conductivity ( $\mu\text{S}/\text{cm}$ )		460.1	407.33
Specific Conductivity ( $\mu\text{S}/\text{cm}$ )		550.21	494.46
Salinity (PSU)		0.27	0.24
Total Dissolved Solids (ppt)		0.36	0.32
Turbidity (NTU)		136.66	48.61
Total Suspended Solids (mg/L)		0.00	0.00
RDO Concentration (mg/L)		8.09	7.40
RDO Saturation (%)		83.22	75.11
Oxygen Partial Pressure (Torr)		129.40	116.88
Temperature ( $^{\circ}\text{C}$ )		16.43	15.77



**Table 3.41 In-situ spring water quality data September 2020**

Location ID	GW1	GW5	GW6
Date	15-Sep-20	16-Sep-20	16-Sep-20
Time (GMT)	13:05	Sample unable to be obtained due to low water levels at and around the monitoring location.	13:05
PH	8.31		8.12
Actual Conductivity ( $\mu\text{S/cm}$ )	418.70		578.62
Specific Conductivity ( $\mu\text{S/cm}$ )	522.58		703.45
Salinity (PSU)	0.25		0.35
Total Dissolved Solids (ppt)	0.34		0.46
Turbidity (NTU)	35.21		23.01
Total Suspended Solids (mg/L)	0.00		0.00
RDO Concentration (mg/L)	8.97		8.70
RDO Saturation (%)	88.75		88.11
Oxygen Partial Pressure (Torr)	138.22		137.12
Temperature ( $^{\circ}\text{C}$ )	14.58		15.68

**Table 3-42 In-situ spring water quality data October 2020**

Location ID	GW1	GW2	GW3	GW4	GW5	GW6	GW8
Date	20-Oct-20	20-Oct-20	20-Oct-20	20-Oct-20	21-Oct-20	21-Oct-20	22-Oct-20
Time (GMT)	13:16	13:25	14:15	14:30	15:57	16:05	10:10
PH	8.49	8.41	7.61	7.79	7.39	8.06	7.90
Actual Conductivity ( $\mu\text{S}/\text{cm}$ )	421.23	429.62	313.97	436.15	515.47	499.18	444.82
Specific Conductivity ( $\mu\text{S}/\text{cm}$ )	562.06	576.04	432.88	608.30	688.06	657.13	601.05
Salinity (PSU)	0.27	0.28	0.21	0.29	0.34	0.32	0.29
Total Dissolved Solids (ppt)	0.37	0.37	0.28	0.40	0.45	0.43	0.39
Turbidity (NTU)	12.84	13.65	0.33	0.00	55.15	51.10	25.63
Total Suspended Solids (mg/L)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RDO Concentration (mg/L)	10.37	10.22	10.86	10.50	10.30	9.90	4.05
RDO Saturation (%)	98.98	97.08	100.61	96.33	98.28	95.61	38.20
Oxygen Partial Pressure (Torr)	125.51	123.12	127.76	122.34	124.63	121.18	48.46
Temperature ( $^{\circ}\text{C}$ )	11.88	11.69	10.62	10.19	11.87	12.42	11.39

## 3.3.2

**Table 3-43 In-situ spring water quality data November 2020**

Location ID	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
Date	18-Nov-20	18-Nov-20	18-Nov-20	18-Nov-20	19-Nov-20	19-Nov-20	19-Nov-20	19-Nov-20
Time (GMT)	12:12	12:20	13:51	13:27	11:28	11:41	14:56	09:16
PH	8.55	8.42	7.78	8.01	8.05	8.23	8.31	7.7
Actual Conductivity ( $\mu\text{S}/\text{cm}$ )	378.34	388.83	179.68	397.89	463.41	492.89	356.68	372.15
Specific Conductivity ( $\mu\text{S}/\text{cm}$ )	518.91	535.73	248.79	559.15	639.2	694.94	501.81	563.19
Salinity (PSU)	0.25	0.26	0.12	0.27	0.31	0.34	0.24	0.27
Total Dissolved Solids (ppt)	0.34	0.35	0.16	0.36	0.42	0.45	0.33	0.37
Turbidity (NTU)	89.01	52.64	0	0	1.81	8.89	10.08	5.04
RDO Concentration (mg/L)	11.72	11.64	11.66	11.79	11.33	11.91	12.28	4.24
RDO Saturation (%)	105.01	103.88	103.5	103.41	105	108.26	111.77	36.2
Oxygen Partial Pressure (Torr)	138.51	137.04	136.56	136.5	133.3	137.53	141.89	46.08
Temperature ( $^{\circ}\text{C}$ )	10.83	10.64	10.46	9.91	10.6	9.77	9.85	7.23

## 3.3.3

**Table 3-44 In-situ spring water quality data December 2020 (round 1)**

Location ID	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
Date	14-Dec-20	14-Dec-20	14-Dec-20	14-Dec-20	16-Dec-20	16-Dec-20	16-Dec-20	16-Dec-20
Time (GMT)	12:42	14:48	14:36	13:59	09:33	09:43	14:41	11:04
PH	8.35	8.25	7.59	7.88	8.11	8.03	7.92	7.36
Actual Conductivity ( $\mu\text{S}/\text{cm}$ )	388.88	412.05	276.81	432.75	446.57	496.89	358.70	333.12
Specific Conductivity ( $\mu\text{S}/\text{cm}$ )	555.11	583.57	385.54	610.70	641.37	719.82	507.73	503.74
Salinity (PSU)	0.27	0.28	0.18	0.30	0.31	0.35	0.24	0.24
Total Dissolved Solids (ppt)	0.36	0.38	0.25	0.40	0.42	0.47	0.33	0.33
Turbidity (NTU)	26.45	13.13	0.00	0.00	7.33	12.07	8.41	3.71
RDO Concentration (mg/L)	11.20	10.98	10.78	10.88	10.88	10.98	10.89	4.91
RDO Saturation (%)	101.46	100.17	99.72	99.58	98.05	98.20	99.03	42.26
Oxygen Partial Pressure (Torr)	139.53	137.73	137.03	136.90	134.87	135.11	136.18	58.21
Temperature ( $^{\circ}\text{C}$ )	9.32	9.61	10.25	9.74	9.09	8.79	9.50	7.26

## 3.3.4

**Table 3-45 In-situ spring water quality data December 2020 (round 2)**

Location ID	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
Date	21-Dec-20	21-Dec-20	21-Dec-20	21-Dec-20	22-Dec-20	22-Dec-20	21-Dec-20	21-Dec-20
Time (GMT)	11:21	12:43	12:54	13:09	11:52	12:08	13:59	15:16
PH	8.37	8.29	7.60	7.88	7.58	8.03	7.96	8.13
Actual Conductivity ( $\mu\text{S}/\text{cm}$ )	358.38	369.09	254.77	380.97	443.48	429.51	359.70	318.59
Specific Conductivity ( $\mu\text{S}/\text{cm}$ )	503.88	516.74	355.87	536.66	633.90	615.88	494.83	467.34
Salinity (PSU)	0.24	0.25	0.17	0.26	0.31	0.30	0.24	0.22
Total Dissolved Solids (ppt)	0.33	0.34	0.23	0.35	0.41	0.40	0.32	0.30
Turbidity (NTU)	47.80	28.00	10.10	0.10	1.96	11.06	5.62	30.64
RDO Concentration (mg/L)	10.82	10.70	10.52	10.70	10.14	10.76	10.61	10.85
RDO Saturation (%)	97.23	96.50	95.04	96.02	90.53	95.79	97.16	93.91
Oxygen Partial Pressure (Torr)	140.68	139.60	137.47	138.91	129.99	137.54	140.48	136.04
Temperature ( $^{\circ}\text{C}$ )	9.87	10.02	10.14	9.82	9.27	9.15	10.70	8.34

**Table 3-46 In-situ spring water quality data January 2021**

Location ID	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
Date	26-Jan-21	26-Jan-21	27-Jan-21	27-Jan-21	27-Jan-21	27-Jan-21	27-Jan-21	27-Jan-21
Time (GMT)	13:45	14:09	15:43	15:30	10:25	10:33	14:55	12:26
PH	8.46	8.38	7.72	7.99	7.99	7.99	8.14	7.89
Actual Conductivity ( $\mu\text{S}/\text{cm}$ )	482.51	457.00	278.77	406.46	464.91	591.57	441.42	309.43
Specific Conductivity ( $\mu\text{S}/\text{cm}$ )	703.33	656.88	392.26	572.67	674.67	889.46	617.54	485.27
Salinity (PSU)	0.34	0.32	0.19	0.28	0.33	0.43	0.30	0.23
Total Dissolved Solids (ppt)	0.46	0.43	0.25	0.37	0.44	0.58	0.40	0.32
Turbidity (NTU)	19.25	8.79	0.00	2.28	2.74	22.44	0.27	29.72
RDO Concentration (mg/L)	12.00	11.75	11.37	11.57	11.41	11.98	12.31	12.52
RDO Saturation (%)	106.64	105.62	104.08	105.86	101.75	103.67	113.31	104.37
Oxygen Partial Pressure (Torr)	142.23	140.81	138.67	141.05	135.68	138.38	150.93	139.46
Temperature ( $^{\circ}\text{C}$ )	8.56	9.07	9.86	9.80	8.72	7.47	10.06	6.02
CaCO <sub>3</sub> Mg/l (PPM)	204	180	165	189	288	285	198	-

**Table 3-47 In-situ spring water quality data February 2021**

Location ID	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
Date	25-Feb-21	25-Feb-21	25-Feb-21	25-Feb-21	24-Feb-21	24-Feb-21	25-Feb-21	24-Feb-21
Time (GMT)	13:29	13:39	11:40	11:30	11:35	11:25	11:06	14:04
PH	8.45	8.42	7.73	8.04	7.87	8.07	8.28	7.60
Actual Conductivity ( $\mu\text{S}/\text{cm}$ )	393.54	391.97	273.68	398.55	474.34	520.56	418.84	430.45
Specific Conductivity ( $\mu\text{S}/\text{cm}$ )	559.45	555.70	386.70	563.22	665.84	728.14	584.82	597.29
Salinity (PSU)	0.27	0.27	0.18	0.27	0.32	0.36	0.28	0.29
Total Dissolved Solids (ppt)	0.36	0.36	0.25	0.37	0.43	0.47	0.38	0.39
Turbidity (NTU)	15.10	5.40	250.81	0.00	34.93	3.09	4.01	2.59
RDO Concentration (mg/L)	12.00	11.92	11.54	11.85	11.18	11.75	13.41	5.43
RDO Saturation (%)	109.00	108.49	105.19	108.14	102.64	108.22	123.61	50.39
Oxygen Partial Pressure (Torr)	145.27	144.58	140.17	144.09	136.73	144.16	164.64	67.10
Temperature ( $^{\circ}\text{C}$ )	9.48	9.59	9.69	9.68	9.94	10.07	10.13	10.37
CaCO <sub>3</sub> Mg/l (PPM)	195.00	174.00	159.00	180.00	369.00	279.00	204.00	276.00

**Table 3-48 In-situ spring water quality data April 2021(in lieu of March 2021 results)**

Location ID	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
Date	07-Apr-21	07-Apr-21	07-Apr-21	- <sup>3</sup>	06-Apr-21	06-Apr-21	06-Apr-21	06-Apr-21
Time (GMT)	10:24	10:56	11:50	-	12:16	12:29	15:10	13:33
PH	8.40	8.32	7.80	-	7.76	8.15	8.15	7.66
Actual Conductivity (µS/cm)	322.95	337.07	260.61	-	452.76	426.00	380.87	405.28
Specific Conductivity (µS/cm)	518.00	520.84	370.35	-	639.48	641.60	540.74	591.16
Salinity (PSU)	0.25	0.25	0.18	-	0.31	0.31	0.26	0.29
Total Dissolved Solids (ppt)	0.34	0.34	0.24	-	0.42	0.42	0.35	0.38
Turbidity (NTU)	19.00	18.58	0.00	-	16.14	69.57	1.26	3.78
RDO Concentration (mg/L)	12.67	11.94	11.25	-	10.96	12.04	12.07	8.78
RDO Saturation (%)	100.74	97.88	99.21	-	97.15	101.01	106.56	75.70
Oxygen Partial Pressure (Torr)	144.59	140.51	141.98	-	139.00	144.77	152.48	108.41
Temperature (°C)	5.28	6.54	9.48	-	9.67	7.40	9.52	8.53
CaCO3 Mg/l (PPM)	213.00	195.00	204.00	-	285.00	273.00	186.00	300.00

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<sup>3</sup> Sample unable to be obtained due to low water levels at and around the monitoring location.



**Table 3-49 In-situ spring water quality data April 2021**

Location ID	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
Date	27-Apr-21	27-Apr-21	28-Apr-21	- <sup>4</sup>	28-Apr-21	28-Apr-21	27-Apr-21	- <sup>4</sup>
Time (GMT)	12:03	12:15	11:29	-	10:26	10:31	15:49	-
PH	8.38	8.37	7.85	-	8.15	8.06	8.29	-
Actual Conductivity (µS/cm)	342.38	348.61	263.06	-	440.96	558.34	403.21	-
Specific Conductivity (µS/cm)	504.42	507.07	374.12	-	638.93	837.24	548.52	-
Salinity (PSU)	0.24	0.24	0.18	-	0.31	0.41	0.27	-
Total Dissolved Solids (ppt)	0.33	0.33	0.24	-	0.42	0.54	0.36	-
Turbidity (NTU)	39.87	4.85	0.00	-	152.89	29.33	2.91	-
RDO Concentration (mg/L)	11.79	11.20	11.12	-	11.04	11.28	11.31	-
RDO Saturation (%)	100.15	96.24	97.38	-	95.30	94.54	103.09	-
Oxygen Partial Pressure (Torr)	143.84	138.18	139.72	-	136.80	135.84	147.71	-
Temperature (°C)	8.18	8.64	9.46	-	8.81	7.56	11.13	-
CaCO3 Mg/l (PPM)	249.00	216.00	174.00	-	288.00	222.00	195.00	-

**Table 3-50 In situ spring water quality data May 2021**

Location ID	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
Date	27-May-21	27-May-21	26-May-21	26-May-21	26-May-21	26-May-21	26-May-21	- <sup>4</sup>
Time (GMT)	10:04	10:32	15:25	15:11	10:50	11:00	14:40	-
PH	8.39	8.14	7.57	7.94	8.00	8.05	8.15	-
Actual Conductivity (µS/cm)	398.49	397.79	251.29	423.02	475.98	522.45	418.04	-
Specific Conductivity (µS/cm)	558.39	558.72	356.56	602.84	628.54	703.09	545.92	-
Salinity (PSU)	0.27	0.27	0.17	0.29	0.31	0.34	0.27	-
Total Dissolved Solids (ppt)	0.36	0.36	0.23	0.39	0.41	0.46	0.35	-
Turbidity (NTU)	16.39	8.76	0.16	13.79	7.63	6.36	13.73	-
RDO Concentration (mg/L)	11.23	11.13	10.74	11.21	9.94	10.67	11.24	-
RDO Saturation (%)	101.37	100.29	95.81	99.86	94.56	99.98	108.04	-
Oxygen Partial Pressure (Torr)	144.26	142.73	136.40	142.17	134.30	142.08	153.37	-
Temperature (°C)	10.01	9.93	9.54	9.44	12.27	11.58	12.73	-
CaCO3 Mg/l (PPM)	201.00	192.00	180.00	195.00	294.00	288.00	210.00	-

**Table 3-51 In-situ spring water quality data June 2021**

Location ID	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
Date	14-Jun-21	14-Jun-21	14-Jun-21	14-Jun-21	15-Jun-21	15-Jun-21	14-Jun-21	-4
Time (GMT)	13:11	16:07	15:47	15:51	11:23	11:34	13:56	-
PH	9.04	8.24	7.33	8.01	7.98	8.17	8.12	-
Actual Conductivity ( $\mu\text{S}/\text{cm}$ )	397.58	392.70	263.97	371.63	525.30	526.08	481.11	-
Specific Conductivity ( $\mu\text{S}/\text{cm}$ )	523.69	527.40	376.90	513.11	616.37	677.20	550.10	-
Salinity (PSU)	0.25	0.26	0.18	0.25	0.30	0.33	0.27	-
Total Dissolved Solids (ppt)	0.34	0.34	0.24	0.33	0.40	0.44	0.36	-
Turbidity (NTU)	20.00	9.82	0.74	0.72	33.09	31.08	1.59	-
RDO Concentration (mg/L)	10.53	10.54	11.09	10.61	9.53	9.94	10.64	-
RDO Saturation (%)	98.66	97.05	96.77	95.27	99.30	95.14	113.55	-
Oxygen Partial Pressure (Torr)	142.57	140.34	140.21	137.90	142.72	137.37	162.96	-
Temperature ( $^{\circ}\text{C}$ )	12.39	11.61	9.32	10.54	17.25	13.30	18.44	-
CaCO <sub>3</sub> Mg/l (PPM)	225.00	222.00	192.00	195.00	276.00	282.00	192.00	-

**Table 3-52 In-situ spring water quality data August 2021**

Location ID	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
Date	03-Aug-21	03-Aug-21	02-Aug-21	02-Aug-21	02-Aug-21	02-Aug-21	02-Aug-21	02-Aug-21
Time (GMT)	10:06	10:20	09:24	-4	12:55	13:10	08:56	-4
PH	8.61	8.37	7.84	-	7.59	8.21	8.24	-
Actual Conductivity ( $\mu\text{S/cm}$ )	421.65	425.52	267.84	-	577.61	559.03	439.24	-
Specific Conductivity ( $\mu\text{S/cm}$ )	549.12	557.40	368.07	-	705.46	698.44	542.66	-
Salinity (PSU)	0.27	0.27	0.18	-	0.35	0.34	0.26	-
Total Dissolved Solids (ppt)	0.36	0.36	0.24	-	0.46	0.45	0.35	-
Turbidity (NTU)	58.09	23.89	0.72	-	8.19	27.47	2.20	-
RDO Concentration (mg/L)	10.93	10.69	11.37	-	10.11	9.96	12.00	-
RDO Saturation (%)	98.11	95.44	96.89	-	96.17	92.84	112.92	-
Oxygen Partial Pressure (Torr)	138.88	135.13	137.42	-	135.78	131.21	159.51	-
Temperature ( $^{\circ}\text{C}$ )	12.85	12.63	10.61	-	15.50	14.56	15.00	-
CaCO <sub>3</sub> Mg/l (PPM)	258.00	228.00	183.00	-	300.00	300.00	216.00	-

**Table 3-53 In-situ spring water quality data September 2021**

Location ID	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
Date	30-Sep-21	29-Sep-21	29-Sep-21	29-Sep-21	30-Sep-21	30-Sep-21	29-Sep-21	29-Sep-21
Time (GMT)	09:35	16:12	13:35	-4	13:33	13:52	12:53	-4
PH	8.39	8.47	7.74	-	7.79	8.26	8.21	-
Actual Conductivity ( $\mu\text{S/cm}$ )	342.57	369.35	245.52	-	519.85	410.12	367.52	-
Specific Conductivity ( $\mu\text{S/cm}$ )	468.62	498.48	337.34	-	661.18	549.37	460.72	-
Salinity (PSU)	0.23	0.24	0.16	-	0.32	0.27	0.22	-
Total Dissolved Solids (ppt)	0.30	0.32	0.22	-	0.43	0.36	0.30	-
Turbidity (NTU)	65.99	25.98	0.63	-	1.78	6.60	9.15	-
RDO Concentration (mg/L)	10.54	10.34	10.91	-	10.12	9.81	11.29	-
RDO Saturation (%)	96.17	95.44	99.15	-	98.63	91.17	111.33	-
Oxygen Partial Pressure (Torr)	138.74	137.62	143.06	-	141.85	131.43	160.07	-
Temperature ( $^{\circ}\text{C}$ )	10.92	11.42	10.78	-	13.81	11.72	14.39	-
CaCO <sub>3</sub> Mg/l (PPM)	195.00	261.00	168.00	-	270.00	240.00	195.00	-

**Table 3-54 In-situ spring water quality data October 2021**

Location ID	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
Date	20-Oct-21	20-Oct-21	20-Oct-21	20-Oct-21	21-Oct-21	21-Oct-21	20-Oct-21	21-Oct-21
Time (GMT)	15:21	16:12	13:27	-	12:01	12:12	12:42	-
PH	8.38	8.23	7.56	-	8.19	8.06	8.25	-
Actual Conductivity ( $\mu\text{S}/\text{cm}$ )	386.05	392.97	270.96	-	433.60	463.52	403.06	-
Specific Conductivity ( $\mu\text{S}/\text{cm}$ )	504.03	515.81	371.74	-	577.80	637.65	502.15	-
Salinity (PSU)	0.24	0.25	0.18	-	0.28	0.31	0.24	-
Total Dissolved Solids (ppt)	0.33	0.34	0.24	-	0.38	0.41	0.33	-
Turbidity (NTU)	110.36	44.28	0.63	-	35.05	13.97	18.94	-
RDO Concentration (mg/L)	10.81	10.37	11.24	-	11.05	11.22	12.58	-
RDO Saturation (%)	96.01	91.60	95.54	-	96.32	95.15	116.53	-
Oxygen Partial Pressure (Torr)	136.55	130.31	136.10	-	137.08	135.56	165.41	-
Temperature ( $^{\circ}\text{C}$ )	12.74	12.53	10.81	-	11.93	10.70	14.67	-
CaCO <sub>3</sub> Mg/l (PPM)	231.00	219.00	174.00	-	276.00	237.00	222.00	-

**Table 3-55 In-situ spring water quality data November 2021**

Location ID	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
Date	10-Nov-21	10-Nov-21	11-Nov-21	11-Nov-21	11-Nov-21	11-Nov-21	10-Nov-21	11-Nov-21
Time (GMT)	14:07	13:42	14:42	-	12:39	12:55	14:56	-
PH	8.38	8.22	7.65	-	8.00	8.04	8.08	-
Actual Conductivity ( $\mu\text{S/cm}$ )	391.33	394.25	265.32	-	489.89	545.06	413.35	-
Specific Conductivity ( $\mu\text{S/cm}$ )	533.12	537.38	365.79	-	662.46	730.01	547.31	-
Salinity (PSU)	0.26	0.26	0.18	-	0.32	0.36	0.26	-
Total Dissolved Solids (ppt)	0.35	0.35	0.24	-	0.43	0.47	0.35	-
Turbidity (NTU)	31.13	7.31	0.56	-	38.02	7.73	5.12	-
RDO Concentration (mg/L)	11.18	10.81	11.18	-	10.60	9.03	11.11	-
RDO Saturation (%)	97.41	94.12	96.22	-	92.96	93.44	99.26	-
Oxygen Partial Pressure (Torr)	140.40	135.68	138.73	-	133.98	134.62	142.93	-
Temperature ( $^{\circ}\text{C}$ )	11.08	11.06	10.62	-	11.35	11.73	12.19	-
CaCO <sub>3</sub> Mg/l (PPM)	267.00	210.00	186.00	-	288.00	297.00	231.00	-

### Laboratory sampling

3.3.5 Table 3-56 to Table 3-71 display spring water quality results from laboratory samples between August 2020 and November 2021. Monitoring for March 2021 was unable to be conducted, and samples were taken in early April 2021. Monitoring was also unable to be conducted in July 2021, and samples were taken in early August 2021.

**Table 3-56 Laboratory spring water quality data August 2020**

Location ID	GW1	GW5	GW6
Date	24-Aug-20	25-Aug-20	25-Aug-20
Time (GMT)	14:45	10:55	11:30
Lab ID	19696094	19619020	19619021
pH	8.3	8	8.1
Conductivity- Electrical 20C, uS/cm	492	622	481
Alkalinity as CaCO <sub>3</sub> , mg/l	253	310	174
Nitrate as N, mg/l	<0.7	1.9	0.7
Phosphates , Total as P, mg/l	0.12	<0.120	0.13
Anions	-	-	-
Cations	-	-	-



**Table 3-57 Laboratory spring water quality data September 2020**

Location ID	GW1	GW5	GW6
Date	15-Sep-20	16-Sep-20	16-Sep-20
Time (GMT)	13:05	12:55	13:05
Lab ID	19690494	19686100	19686101
pH	8.1	8	7.9
Conductivity- Electrical 20C, uS/cm	11300	577	600
Alkalinity as CaCO3, mg/l	207	248	244
Nitrate as N, mg/l	0.8	3.1	1.1
Phosphates , Total as P, mg/l	<0.120	<0.120	<0.120
Anions	-	-	-
Cations	-	-	-

**Table 3-58 Laboratory spring water quality data October 2020**

Location ID	GW1	GW2	GW3	GW4	GW5	GW6	GW8
Date	20-Oct-20	20-Oct-20	20-Oct-20	20-Oct-20	21-Oct-20	21-Oct-20	22-Oct-20
Time (GMT)	13:16	13:24	14:15	14:30	15:55	16:05	10:10
Lab ID	19794635	19794636	19794637	19794638	19799706	19799707	19803377
pH	8.2	8.4	8.1	8.2	7.6	8.1	7.9
Conductivity- Electrical 20C, uS/cm	488	518	336	548	635	582	532
Alkalinity as CaCO3, mg/l	204	211	161	177	306	270	296
Nitrate as N, mg/l	2.2	2.7	3.3	4.2	5.1	2.1	<0.7
Phosphates , Total as P, mg/l	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	0.62
Anions	-	-	-	-	-	-	-
Cations	-	-	-	-	-	-	-

**Table 3-59 Laboratory spring water quality data November 2020**

Location ID	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
Date	18-Nov-20	18-Nov-20	18-Nov-20	18-Nov-20	19-Nov-20	19-Nov-20	19-Nov-20	19-Nov-20
Time (GMT)	12:12	12:20	13:51	13:27	11:27	11:42	14:52	09:17
Lab ID	19885907	19885908	19885909	19885910	19890548	19890547	19890546	19890545
pH	8.4	8.3	8	8.1	7.9	8.2	8	7.8
Conductivity- Electrical 20C, uS/cm	473	486	332	512	594	619	490	509
Alkalinity as CaCO <sub>3</sub> , mg/l	208	197	161	175	294	268	169	284
Nitrate as N, mg/l	2.1	3.1	3.2	3.6	5.4	3.4	15.8	<0.7
Phosphates , Total as P, mg/l	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	0.2
Anions	-	-	-	-	-	-	-	-
Cations	-	-	-	-	-	-	-	-

**Table 3-60 Laboratory spring water quality data December 2020 (round 1)**

Location ID	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
Date	14-Dec-20	14-Dec-20	14-Dec-20	14-Dec-20	16-Dec-20	16-Dec-20	16-Dec-20	16-Dec-20
Time (GMT)	12:40	14:46	14:35	13:58	09:32	09:45	14:38	11:03
Lab ID	19971958	19971959	19971960	19971961	19982072	19982073	19982075	19982074
pH	8.2	8.2	7.9	8	8.1	8	7.9	7.7
Conductivity- Electrical 20C, uS/cm	502	534	357	559	595	652	469	439
Alkalinity as CaCO <sub>3</sub> , mg/l	205	192	166	174	293	254	176	224
Nitrate as N, mg/l	2.5	3.2	3.5	4.4	5.7	3.3	12	<0.7
Phosphates , Total as P, mg/l	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120
Anions	-	-	-	-	-	-	-	-
Cations	-	-	-	-	-	-	-	-

**Table 3-61 Laboratory spring water quality data December 2020 (round 2)**

Location ID	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
Date	21-Dec-20	21-Dec-20	21-Dec-20	21-Dec-20	22-Dec-20	22-Dec-20	21-Dec-20	21-Dec-20
Time (GMT)	11:20	11:30	12:52	13:07	11:54	12:10	13:55	15:15
Lab ID	19995632	19995633	19995634	19995635	19999306	19999307	19995636	19995637
pH	8.3	8.3	7.9	8.1	7.8	8.3	8.2	8.3
Conductivity- Electrical 20C, uS/cm	472	484	336	506	601	584	513	428
Alkalinity as CaCO <sub>3</sub> , mg/l	190	190	158	172	293	266	195	219
Nitrate as N, mg/l	2.6	3.4	3.4	4.1	5.4	2.9	13.4	2.1
Phosphates , Total as P, mg/l	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120
Anions	-	-	-	-	-	-	-	-
Cations	-	-	-	-	-	-	-	-

**Table 3-62 Laboratory spring water quality data January 2021**

Location ID	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
Date	26-Jan-21	26-Jan-21	27-Jan-21	27-Jan-21	27-Jan-21	27-Jan-21	27-Jan-21	27-Jan-21
Time (GMT)	13:42	14:02	15:42	15:30	10:24	10:34	14:55	12:28
Lab ID	20082970	20082971	20087918	20087917	20087915	20088275	20087916	20088276
pH	8.4	8.4	8	8.1	7.7	8.2	8	8.1
Conductivity- Electrical 20C, uS/cm	608	575	341	492	611	761	524	416
Alkalinity as CaCO <sub>3</sub> , mg/l	185	181	155	168	286	250	175	210
Nitrate as N, mg/l	3.6	3.9	3.6	4.4	5.3	3	15	2.1
Phosphates , Total as P, mg/l	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120
Anions								
Cations								

**Table 3-63 Laboratory spring water quality data February 2021**

Location ID	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
Date	25-Feb-21	25-Feb-21	25-Feb-21	25-Feb-21	24-Feb-21	24-Feb-21	25-Feb-21	24-Feb-21
Time (GMT)	13:27	13:40	11:40	11:30	11:33	11:22	11:04	14:01
Lab ID	20184691	20184692	20184693	20184694	20178326	20178325	20184695	20178327
pH	8.4	8.3	8	8.1	7.8	8.1	8.1	7.7
Conductivity- Electrical 20C, uS/cm	478	476	325	476	585	609	479	488
Alkalinity as CaCO <sub>3</sub> , mg/l	183	181	158	171	280	258	174	252
Nitrate as N, mg/l	3.1	3.5	3.1	4.3	5.6	3.3	14.6	<0.7
Phosphates , Total as P, mg/l	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120
Anions	-	-	-	-	-	-	-	-
Cations	-	-	-	-	-	-	-	-

**Table 3-64 Laboratory spring water quality data April 2021 (in lieu of March 2021 results)**

Location ID	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
Date	07-Apr-21	07-Apr-21	07-Apr-21	- <sup>4</sup>	06-Apr-21	06-Apr-21	06-Apr-21	06-Apr-21
Time (GMT)	10:23	10:55	11:50	-	12:15	12:28	15:10	13:32
Lab ID	20311134	20311135	20311136	-	20305954	20305955	20305957	20305956
pH	8.2	8.4	8.1	-	8.1	8	8	8.3
Conductivity- Electrical 20C, uS/cm	469	483	344	-	608	565	484	539
Alkalinity as CaCO <sub>3</sub> , mg/l	194	193	160	-	286	258	177	302
Nitrate as N, mg/l	2.2	2.6	4.1	-	5.4	2.6	14	<0.7
Phosphates , Total as P, mg/l	<0.120	<0.120	<0.120	-	<0.120	<0.120	<0.120	0.14
Anions	-	-	-	-	-	-	-	-
Cations	-	-	-	-	-	-	-	-

<sup>4</sup> Location was dry, so unable to sample

**Table 3-65 Laboratory spring water quality data April 2021**

Location ID	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
Date	27-Apr-21	27-Apr-21	28-Apr-21	28-Apr-21	28-Apr-21	28-Apr-21	27-Apr-21	27-Apr-21
Time (GMT)	11:58:00	12:12:00	11:28	- <sup>4</sup>	10:22	10:33:00	15:50:00	- <sup>4</sup>
Lab ID	20379520	20379521	20385791	-	20385789	20385790	20379522	-
pH	8.2	8.2	8.2	-	8	8.1	8.2	-
Conductivity- Electrical 20C, uS/cm	470	475	339	-	584	799	513	-
Alkalinity as CaCO <sub>3</sub> , mg/l	181	179	162	-	226	216	122	-
Nitrate as N, mg/l	1.7	2.1	3.6	-	5.3	1.9	13.9	-
Phosphates , Total as P, mg/l	<0.120	<0.120	<0.120	-	<0.120	<0.120	<0.120	-
Anions	-	-	-	-	-	-	-	-
Cations	-	-	-	-	-	-	-	-

**Table 3-66 Laboratory spring water quality data May 2021**

Location ID	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
Date	27-May-21	27-May-21	26-May-21	26-May-21	26-May-21	26-May-21	26-May-21	26-May-21
Time (GMT)	10:04	10:32	16:25	16:11	11:50	12:00	15:40	- <sup>4</sup>
Lab ID	20489470	20489471	20478834	20478833	20478830	20478831	20478832	-
pH	8.3	8.3	8.3	8.4	8.3	8.2	8.1	-
Conductivity- Electrical 20C, uS/cm	495	496	314	532	554	599	472	-
Alkalinity as CaCO <sub>3</sub> , mg/l	185	181	149	172	279	271	182	-
Nitrate as N, mg/l	3.1	3.3	2.7	3.7	3	2.4	10.3	-
Phosphates , Total as P, mg/l	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	-
Anions	-	-	-	-	-	-	-	-
Cations	-	-	-	-	-	-	-	-

**Table 3-67 Laboratory spring water quality data June 2021**

Location ID	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
Date	14-Jun-21	14-Jun-21	14-Jun-21	14-Jun-21	15-Jun-21	15-Jun-21	14-Jun-21	14-Jun-21
Time (GMT)	13:05	16:07	15:45	15:40	11:23	11:34	13:51	- <sup>4</sup>
Lab ID	20536445	20536454	20536453	20536452	20541090	20541091	20536446	-
pH	8.2	8.1	7.8	7.8	7.8	7.8	9	-
Conductivity- Electrical 20C, uS/cm	479	486	349	475	614	573	497	-
Alkalinity as CaCO <sub>3</sub> , mg/l	187	186	160	165	292	239	184	-
Nitrate as N, mg/l	2.9	3.3	3.2	4.9	5	2.3	14.5	-
Phosphates , Total as P, mg/l	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	-
Anions	-	-	-	-	-	-	-	-
Cations	-	-	-	-	-	-	-	-

**Table 3-68 Laboratory spring water quality data August 2021**

Location ID	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
Date	03-Aug-21	03-Aug-21	02-Aug-21	02-Aug-21	02-Aug-21	02-Aug-21	02-Aug-21	02-Aug-21
Time (GMT)	10:06	10:20	09:24	-4	12:55	13:10	08:56	-4
Lab ID	20709582	20709581	20707824	-	20707825	20707826	20707822	-
pH	8.2	8.2	7.7	-	7.8	8.2	8.1	-
Conductivity- Electrical 20C, uS/cm	511	520	342	-	633	634	473	-
Alkalinity as CaCO <sub>3</sub> , mg/l	219	218	162	-	296	244	166	-
Nitrate as N, mg/l	1.1	1.4	3.1	-	4.6	1.5	13	-
Phosphates , Total as P, mg/l	<0.120	<0.120	<0.120	-	<0.120	<0.120	<0.120	-
Anions	-	-	-	-	-	-	-	-
Cations	-	-	-	-	-	-	-	-

**Table 3-69 Laboratory spring water quality data September 2021**

Location ID	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
Date	30-Sep-21	29-Sep-21	29-Sep-21	29-Sep-21	30-Sep-21	30-Sep-21	29-Sep-21	29-Sep-21
Time (GMT)	09:35	16:12	13:35	-4	13:33	13:52	12:53	-4
Lab ID	20909836	20909837	20909838	-	20909839	20909840	20909841	-
pH	8.5	8.5	8.4	-	8.1	8.2	8.1	-
Conductivity- Electrical 20C, uS/cm	468	536	338	-	662	558	437	-
Alkalinity as CaCO <sub>3</sub> , mg/l	193	221	161	-	323	240	169	-
Alkalinity as HCO <sub>3</sub> , mg/l	235	270	196	-	395	292	206	-
Chloride as Cl, mg/l	41.5	42.7	11.2	-	32.8	39.5	22.3	-
Nitrate as N, mg/l	0.8	0.9	2.7	-	2	<0.7	11.5	-
Phosphates , Total as P, mg/l	<0.120	<0.120	<0.120	-	<0.120	<0.120	<0.120	-
Sulphate as SO <sub>4</sub> , mg/l	31.3	40.8	16.6	-	34.3	46.5	23.1	-
Calcium, total as Ca, mg/l	78.5	90.7	75	-	140	110	97	-
Magnesium, total as Mg, mg/l	6	8	2.7	-	3.5	2.9	2.6	-
Potassium, total as K, mg/l	2	1.7	1.1	-	1.1	2.3	1	-
Sodium, total as Na, mg/l	27	27	5.9	-	16	22	11	-
Nitrate as NO <sub>3</sub> , mg/l	3.4	4	12.1	-	8.7	<3.1	50.8	-

**Table 3-70 Laboratory spring water quality data October 2021**

Location ID	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
Date	20-Oct-21	20-Oct-21	20-Oct-21	20-Oct-21	21-Oct-21	21-Oct-21	20-Oct-21	21-Oct-21
Time (GMT)	15:21	16:08	13:23	-	11:58	12:09	12:47	-
Lab ID	20986552	20986553	20986551	-	20986554	20986555	20986549	-
pH	8.3	8.1	7.7	-	7.9	8.1	7.7	-
Conductivity- Electrical 20C, uS/cm	485	567	341	-	540	615	472	-
Alkalinity as CaCO <sub>3</sub> , mg/l	225	246	162	-	274	266	171	-
Alkalinity as HCO <sub>3</sub> , mg/l	284	300	198	-	349	324	209	-
Chloride as Cl, mg/l	22.4	34.5	8.3	-	19	36.8	20.8	-
Nitrate as N, mg/l	1.1	1.5	3.2	-	4.3	3.3	11.4	-
Phosphates , Total as P, mg/l	<0.120	<0.120	<0.120	-	<0.120	<0.120	<0.120	-
Sulphate as SO <sub>4</sub> , mg/l	25.5	31.3	15	-	14.1	27.8	22.4	-
Calcium, total as Ca, mg/l	99.1	100	73.5	-	140	120	100	-
Magnesium, total as Mg, mg/l	5.5	6.9	2.8	-	2.5	2.6	2.6	-
Potassium, total as K, mg/l	2.1	2.1	1.2	-	1.9	2.4	1.1	-
Sodium, total as Na, mg/l	17	25	5.8	-	11	22	12	-
Nitrate as NO <sub>3</sub> , mg/l	5	6.6	14.3	-	19	14.4	50.6	-



**Table 3-71 Laboratory spring water quality data November 2021**

Location ID	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
Date	10-Nov-21	10-Nov-21	11-Nov-21	11-Nov-21	11-Nov-21	11-Nov-21	10-Nov-21	11-Nov-21
Time (GMT)	14:03	13:44	14:41	-	12:37	13:35	14:53	-
Lab ID	21063725	21063726	21063727	-	21063728	21063729	21063730	-
pH	8.2	8	8	-	7.9	7.7	7.9	-
Conductivity- Electrical 20C, uS/cm	453	491	332	-	610	626	472	-
Alkalinity as CaCO <sub>3</sub> , mg/l	223	223	160	-	302	281	189	-
Alkalinity as HCO <sub>3</sub> , mg/l	273	273	195	-	368	343	230	-
Chloride as Cl, mg/l	19.5	23.7	6.4	-	26.8	45.3	20.9	-
Nitrate as N, mg/l	1.4	1.8	2.6	-	5	2.8	14.3	-
Phosphates , Total as P, mg/l	<0.120	<0.120	<0.120	-	<0.120	<0.120	<0.120	-
Sulphate as SO <sub>4</sub> , mg/l	22.5	27.8	12.5	-	21.3	27	20.9	-
Calcium, total as Ca, mg/l	98.3	100	67	-	140	130	100	-
Magnesium, total as Mg, mg/l	5.2	6.1	2.4	-	2.9	2.7	2.5	-
Potassium, total as K, mg/l	1.3	1.2	0.93	-	0.87	1.5	0.97	-
Sodium, total as Na, mg/l	13	16	4.9	-	14	27	11	-
Nitrate as NO <sub>3</sub> , mg/l	6.1	7.9	11.4	-	22.3	12.5	63.4	-



### Water quality analysis




- 3.3.6 The results from the laboratory have been compared against relevant EQS values to identify where there are exceedances. The parameters that are identified as exceeding their EQS value are noted in red in the tables provided in Appendix C. There are also parameters where an applicable EQS value is not available to compare the results to, however these parameters have also been included in Appendix C for completeness. For some parameters, the level of detection is above the EQS value and therefore it cannot be determined if there is an exceedance. These values are denoted in yellow in Appendix C.
- 3.3.7 For each parameter the minimum, maximum and average value is calculated to help provide an understanding of the existing baseline and typical values for each location. Where a parameter is noted as being below the level of detection ('<'), this value has been excluded from these calculations.
- 3.3.8 No exceedances of EQS values are noted at any of the monitoring locations, however it should be noted that applicable EQS values applicable to the laboratory analysis data only relate to pH, chloride and sulphate.
- 3.3.9 The following points are also noted in relation to water quality:
- The highest values for Nitrate as N are recorded between November 2021 and January 2021 for GW1, GW2, GW5, GW6, GW7 and GW8. The highest values are recorded at GW7 (10.3-15.8mg/l) and the lowest at GW8 (<0.7-2.1 mg/l). Values at GW1-GW6 are all less than 6.0 mg/l.
  - A wide range of electrical conductivity values are recorded at GW1 (468-11300 uS/cm), with the peak occurring in September 2020. Values at all other locations are less than 800 uS/cm.
  - Phosphates are identified as being below the level of detection throughout the monitoring period at GW1, GW2, GW3, GW4, GW5 and GW7. At GW6, phosphates are below the level of detection apart from in August 2021 (0.13 mg/l). At GW8 phosphates are below the level of detection apart from October 2020 (0.62 mg/l), November 2020 (0.2 mg/l) and April 2021 (0.14 mg/l).






**Visual observations**




3.3.10 Table 3-72 to Table 3-79 show visual data collected between July 2020 and November 2021. Monitoring for March 2021 was unable to be conducted, and samples were taken in early April 2021. Monitoring was also unable to be conducted in July 2021, and samples were taken in early August 2021.




**Table 3-72 Visual observations for GW1 between July 2020 and November 2021**



Month	Observations	Images
July 2020	None taken	None taken
August 2020	Photo taken looking down at the site with the flow directed towards observer. Very low flow with slow velocity. There is no vegetation in the channel.	
September 2020	Depth of the water increased since previous visit, with the flow directed towards observer. There was no vegetation in the channel.	

Month	Observations	Images
October 2020	Evidence of high flows between visits due to amount of debris in the channel. The water level was low during the visit.	
November 2020	More water in the channel during the November visit compared to previous visit. Increased turbidity with leaves and debris present in the channel.	
December 2020 (Round 1)	Weather: Cloudy Air temperature: 11°C Water colour: Light brown Algae growth: No Smell: No Dead fish: No	

Month	Observations	Images	
December 2020 (Round 2)	Weather: Cloudy Air temperature: 13°C Water colour: Light brown Algae growth: No Smell: No Dead fish: No		
January 2021	Weather: Overcast Air temperature: 6°C Water colour: Light brown Algae growth: No Smell: No Dead fish: No		
February 2021	Weather: Overcast Air temperature: 11°C Water colour: Clear Algae growth: No Smell: No Dead fish: No		



Month	Observations	Images
April 2021 (in lieu of March 2021 results)	Weather: Overcast Air temperature: 6°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	
April 2021	Weather: Overcast Air temperature: 10°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	
May 2021	Weather: Sunny Air temperature: 13°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	







Month	Observations	Images
June 2021	Weather: Sunny Air temperature: 24°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	
August 2021	Weather: Sunny/ cloudy Air temperature: 17°C Water colour: Slightly brown Algae growth: No Smell: No Dead fish: No	
September 2021	Weather: Cloudy Air temperature: 13°C Water colour: Slightly brown Algae growth: No Smell: No Dead fish: No	





Month	Observations	Images
October 2021	Weather: Sunny/Cloudy Air temperature: 16°C Water colour: Mild brown Algae growth: No Smell: No Dead fish: No	
November 2021	Weather: Drizzle/overcast Air temperature: 12°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	









**Table 3-73 Visual observations for GW2 between July 2020 and November 2021**

Month	Observations	Images
July 2020	Unable to access location	Unable to access location
August 2020	Unable to access location	Unable to access location
September 2020	Unable to access location	Unable to access location
October 2020	Very low flow velocity in the channel and the water level was very shallow. The channel bed was free of vegetation, but there was a small amount of leaves in the channel.	
November 2020	Increased channel flow compared to last visit. The water was turbid. The channel bed was free of vegetation, but there was a small amount of leaves in the channel.	



Month	Observations	Images	
December 2020 (Round 1)	Weather: Cloudy Air temperature: 11°C Water colour: Clear Algae growth: No Smell: No Dead fish: No		
December 2020 (Round 2)	Weather: Cloudy Air temperature: 13°C Water colour: Light brown Algae growth: No Smell: No Dead fish: No		
January 2021	Weather: Overcast Air temperature: 6°C Water colour: Clear Algae growth: No Smell: No Dead fish: No		




Month	Observations	Images	
February 2021	Weather: Overcast Air temperature: 11°C Water colour: Clear Algae growth: No Smell: No Dead fish: No		
April 2021 (in lieu of March 2021 results)	Weather: Overcast Air temperature: 10°C Water colour: Clear Algae growth: No Smell: No Dead fish: No		
April 2021	Weather: Overcast Air temperature: 6°C Water colour: Clear Algae growth: No Smell: No Dead fish: No		




Month	Observations	Images
May 2021	Weather: Sunny Air temperature: 13°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	
June 2021	Weather: Cloud Air temperature: 23°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	
August 2021	Weather: Sunny/Cloudy Air temperature: 14°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	

Month	Observations	Images
September 2021	Weather: Sunny/Cloudy Air temperature: 15°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	
October 2021	Weather: Sunny/Cloudy Air temperature: 16°C Water colour: Mild brown Algae growth: No Smell: No Dead fish: No	
November 2021	Weather: Drizzle/overcast Air temperature: 12°C Water colour: Slightly brown Algae growth: No Smell: No Dead fish: No	



**Table 3-74 Visual observations for GW3 between July 2020 and November 2021**


Month	Observations	Images
July 2020	Unable to access location	Unable to access location
August 2020	Unable to access location	Unable to access location
September 2020	Unable to access location	Unable to access location
October 2020	There was a small amount of water flowing out of the pipe and into the channel bed. No debris or vegetation in the chamber.	
November 2020	There was a small amount of water flowing out of the pipe an onto the channel bed. No debris or vegetation was in the chamber. Water was clear.	

Month	Observations	Images
December 2020 (Round 1)	Weather: Cloudy Air temperature: 11°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	
December 2020 (Round 2)	Weather: Cloudy Air temperature: 13°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	
January 2021	Weather: Overcast Air temperature: 10°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	



Month	Observations	Images
February 2021	Weather: Overcast Air temperature: 11°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	
April 2021 (in lieu of March 2021 results)	Weather: Overcast Air temperature: 6°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	
April 2021	Weather: Overcast Air temperature: 10°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	












Month	Observations	Images
May 2021	Weather: Sunny Air temperature: 11°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	
June 2021	Weather: Cloud Air temperature: 23°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	No photo available.
August 2021	Weather: Sunny/Cloudy Air temperature: 14°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	




Month	Observations	Images
September 2021	Weather: Sunny/Cloudy Air temperature: 14°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	
October 2021	Weather: Sunny/Cloudy Air temperature: 15°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	
November 2021	Weather: Partly cloudy Air temperature: 12°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	




**Table 3-75 Visual observations for GW4 between July 2020 and November 2021**

Month	Observations	Images
July 2020	Unable to access location	Unable to access location
August 2020	Unable to access location	Unable to access location
September 2020	Unable to access location	Unable to access location
October 2020	Limited volume of water flowing from the pipe. Bed contained lots of leaves and debris. The water was clear.	
November 2020	There was a more water flowing in the channel that last month. The water was clear and there was no vegetation present in the channel.	



Month	Observations	Images	
December 2020 (Round 1)	Weather: Cloudy Air temperature: 11°C Water colour: Clear Algae growth: No Smell: No Dead fish: No		
December 2020 (Round 2)	Weather: Cloudy Air temperature: 13°C Water colour: Clear Algae growth: No Smell: No Dead fish: No		
January 2021	Weather: Overcast Air temperature: 10°C Water colour: Clear Algae growth: No Smell: No Dead fish: No		

Month	Observations	Images
February 2021	Weather: Overcast Air temperature: 11°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	
April 2021 (in lieu of March 2021 results)	Weather: Overcast Air temperature: 6°C Water colour: Channel dry Algae growth: No Smell: No Dead fish: No	
April 2021	Weather: Overcast Air temperature: 9°C Water colour: Channel dry Algae growth: No Smell: No Dead fish: No	




Month	Observations	Images
May 2021	Weather: Clear Air temperature: 11°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	
June 2021	Weather: Cloud Air temperature: 23°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	
August 2021	Weather: Sunny/Cloudy Air temperature: 14°C Water colour: Channel dry Algae growth: No Smell: No Dead fish: No	




Month	Observations	Images
September 2021	Weather: Cloudy Air temperature: 13°C Water colour: Channel dry Algae growth: No Smell: No Dead fish: No	
October 2021	Weather: Sunny/cloudy Air temperature: 15°C Water colour: Channel dry Algae growth: No Smell: No Dead fish: No	
November 2021	Weather: Partly cloudy Air temperature: 12°C Water colour: Channel dry Algae growth: No Smell: No Dead fish: No	




**Table 3-76 Visual observations for GW5 between July 2020 and November 2021**




Month	Observations	Images
July 2020	N/A	N/A
August 2020	The site was very muddy with pools of standing water. There was no vegetation in the channel.	
September 2020	The site was completely dry on this visit.	





Month	Observations	Images	
October 2020	The site was very muddy with pools of standing water. There was very little vegetation present in the channel and pools.		
November 2020	The site was very muddy with pools of standing water. There was some vegetation towards the edge of the channel and pools.		
December 2020 (Round 1)	Weather: Heavy rain Air temperature: 10°C Water colour: Clear Algae growth: No Smell: No Dead fish: No		



Month	Observations	Images
December 2020 (Round 2)	Weather: Cloudy Air temperature: 8°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	
January 2021	Weather: Overcast Air temperature: 10°C Water colour: Cloudy Algae growth: No Smell: No Dead fish: No	
February 2021	Weather: Overcast Air temperature: 15°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	

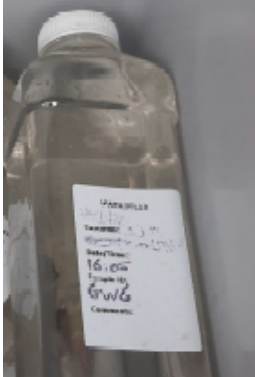

Month	Observations	Images
April 2021 (in lieu of March 2021 results)	Weather: Overcast Air temperature: 7°C Water colour: Cloudy Algae growth: No Smell: No Dead fish: No	
April 2021	Weather: Overcast Air temperature: 8°C Water colour: Cloudy Algae growth: No Smell: No Dead fish: No	
May 2021	Weather: Sunny Air temperature: 11°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	




Month	Observations	Images
June 2021	Weather: Sunny Air temperature: 18°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	
August 2021	Weather: Cloudy Air temperature: 17°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	
September 2021	Weather: Rain Air temperature: 12°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	

Month	Observations	Images
October 2021	Weather: Sunny/light cloud Air temperature: 8°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	
November 2021	Weather: Overcast Air temperature: 12°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	

**Table 3-77 Visual observations for GW6 between July 2020 and November 2021**



Month	Observations	Images
July 2020	None taken	None taken
August 2020	Very low flow at the site, no water was flowing over the brick dam. Water downstream was pooling.	
September 2020	As observed in the August 2020 visit, no water was flowing over the brick dam and water was pooling downstream. There was some debris in the channel.	




Month	Observations	Images
October 2020	No water flowing over the brick dam and there was pooling downstream. The water was clear.	
November 2020	A small volume of water was observed to be flowing over the brick dam during this visit and water was flowing downstream, whereas in previous visits it has been observed pooling in the channel.	N/A
December 2020 (Round 1)	Weather: Heavy rain Air temperature: 10°C Water colour: Light brown/clear Algae growth: No Smell: No Dead fish: No	

Month	Observations	Images
December 2020 (Round 2)	Weather: Cloudy Air temperature: 8°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	
January 2021	Weather: Overcast Air temperature: 10°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	
February 2021	Weather: Overcast Air temperature: 15°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	





Month	Observations	Images
<p>April 2021 (in lieu of March 2021 results)</p>	<p>Weather: Overcast                      Air temperature: 7°C                      Water colour: Cloudy                      Algae growth: No                      Smell: No                      Dead fish: No</p>	
<p>April 2021</p>	<p>Weather: Overcast                      Air temperature: 8°C                      Water colour: Cloudy                      Algae growth: No                      Smell: No                      Dead fish: No</p>	



Month	Observations	Images
<p>May 2021</p>	<p>Weather: Sunny                      Air temperature: 11°C                      Water colour: Clear                      Algae growth: No                      Smell: No                      Dead fish: No</p>	
<p>June 2021</p>	<p>Weather: Sunny                      Air temperature: 18°C                      Water colour: Clear                      Algae growth: No                      Smell: No                      Dead fish: No</p>	




Month	Observations	Images
August 2021	Weather: Cloudy Air temperature: 17°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	
September 2021	Weather: Rain Air temperature: 12°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	
October 2021	Weather: Sunny/light cloud Air temperature: 8°C Water colour: Slight brown Algae growth: No Smell: No Dead fish: No	




Month	Observations	Images
November 2021	Weather: Overcast Air temperature: 12°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	

**Table 3-78 Visual observations for GW7 between July 2020 and November 2021**

Month	Observations	Images
July 2020	Unable to access location	Unable to access location
August 2020	Unable to access location	Unable to access location
September 2020	Unable to access location	Unable to access location
October 2020	Unable to access location	Unable to access location
November 2020	The channel was mostly clear of vegetation and was flowing very slowly. The water was a slightly turbid.	
December 2020 (Round 1)	Weather: Heavy rain Air temperature: 8°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	

Month	Observations	Images	
December 2020 (Round 2)	Weather: Cloudy Air temperature: 13°C Water colour: Clear Algae growth: No Smell: No Dead fish: No		
January 2021	Weather: Overcast Air temperature: 10°C Water colour: Cloudy Algae growth: No Smell: No Dead fish: No		
February 2021	Weather: Overcast Air temperature: 11°C Water colour: Clear Algae growth: No Smell: No Dead fish: No		



Month	Observations	Images
<p>April 2021 (in lieu of March 2021 results)</p>	<p>Weather: Overcast                      Air temperature: 7°C                      Water colour: Clear                      Algae growth: No                      Smell: No                      Dead fish: No</p>	
<p>April 2021</p>	<p>Weather: Overcast                      Air temperature: 10°C                      Water colour: Clear                      Algae growth: No                      Smell: No                      Dead fish: No</p>	
<p>May 2021</p>	<p>Weather: Sunny                      Air temperature: 11°C                      Water colour: Clear                      Algae growth: No                      Smell: No                      Dead fish: No</p>	




Month	Observations	Images
June 2021	Weather: Sunny Air temperature: 24°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	
August 2021	Weather: Cloudy Air temperature: 14°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	
September 2021	Weather: Sunny/Cloudy Air temperature: 13°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	









Month	Observations	Images
October 2021	Weather: Sunny/Cloudy Air temperature: 16°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	
November 2021	Weather: Overcast Air temperature: 12°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	




**Table 3-79 Visual observations for GW8 between July 2020 and November 2021**

Month	Observations	Images
July 2020	Unable to access location	Unable to access location
August 2020	Unable to access location	Unable to access location
September 2020	Unable to access location	Unable to access location
October 2020	<p>The channel was completely dry and full of debris. It appeared that the channel had been free of water in for quite some time. Just upstream of the channel there is a circular well with a concrete channel that feeds it. This was full of stagnant water, which was filled with debris.</p>	
November 2020	<p>As observed in the October 2020 visit, the channel was completely dry and full of debris. Appears to have had no flow for a long time. The well was filled of stagnant water.</p>	

Month	Observations	Images
December 2020 (Round 1)	Weather: Heavy rain Air temperature: 10°C Water colour: Clear Algae growth: No Smell: No Dead fish: No	
December 2020 (Round 2)	Weather: Cloudy Air temperature: 13°C Water colour: Cloudy Algae growth: No Smell: No Dead fish: No	
January 2021	Weather: Overcast Air temperature: 10°C Water colour: Cloudy Algae growth: No Smell: No Dead fish: No	

Month	Observations	Images
February 2021	Weather: Overcast Air temperature: 15°C Water colour: Clear. Stagnant water. No apparent algal growth Algae growth: No Smell: No Dead fish: No	
April 2021 (in lieu of March 2021 results)	Weather: Overcast Air temperature: 7°C Water colour: Clear. Stagnant water. No apparent algal growth Algae growth: No Smell: No Dead fish: No	
April 2021	Weather: Overcast/Dry Air temperature: 10°C Water colour: Channel dry/ Some vegetation growth within pipe. Algae growth: No Smell: No Dead fish: No	

Month	Observations	Images
May 2021	Weather: Sunny Air temperature: 11°C Water colour: Dry channel Algae growth: No Smell: No Dead fish: No	
June 2021	Weather: Sunny Air temperature: 23°C Water colour: Dry channel Algae growth: No Smell: No Dead fish: No	
August 2021	Weather: Cloudy Air temperature: 16°C Water colour: Dry channel Algae growth: No Smell: No Dead fish: No	

Month	Observations	Images
September 2021	Weather: Cloudy Air temperature: 12°C Water colour: Dry channel Algae growth: No Smell: No Dead fish: No	
October 2021	Weather: Sunny/light cloud Air temperature: 12°C Water colour: Dry channel Algae growth: No Smell: No Dead fish: No	
November 2021	Weather: Overcast Air temperature: 12°C Water colour: Dry channel Algae growth: No Smell: No Dead fish: No	

## 3.4 Spring water flow

### Manual flow measurements

- 3.4.1 The raw data from spring water flow monitoring from stations GW2, GW4, GW6, GW7 and GW8 are displayed in Table 3-80. Data noted that there were times when access to the site was not possible, and GW8 was completely dry on all sampling occasions. Monitoring for March 2021 was unable to be conducted, and samples were taken in early April 2021. Monitoring was also unable to be conducted in July 2021, and samples were taken in early August 2021.

Table 3-80 Spring water flows between July 2020 and November 2021

Date	GW2		GW4		GW6		GW7		GW8	
	Stage	Flow	Stage	Flow	Stage	Flow	Stage	Flow	Stage	Flow
27/07/2020	No access		No access		-	-	No access		No access	
28/07/2020	No access		No access		-	-	No access		No access	
24/08/2020	No access		No access		-	-	No access		No access	
25/08/2020	No access		No access		Very low flow, unable to gauge		No access		No access	
15/09/2020	No access		No access		-	-	No access		No access	
16/09/2020	No access		No access		Very low flow, unable to gauge		No access		No access	
07/10/2020	No access		No access		-	-	No access		No access	
20/10/2020	No access		No access		-	-	No access		No access	
21/10/2020	No access		No access		-	-	No access		No access	
22/10/2020	Very low flow, unable to gauge		Very low flow, unable to gauge		Very low flow, unable to gauge		No access		Dry	Dry
18/11/2020	-	-	-	-	-	-	-	-	-	-
19/11/2020	N/A	0.017	N/A	0.004	9.245	0.008	9.295	0.001	Dry	Dry
14/12/2020	N/A	0.026	N/A	0.007	-	-	-	0.001	-	-
15/12/2020	-	-	-	-	-	-	-	-	-	-
16/12/2020	-	-	-	-	9.245	0.019	9.198	0.001	Dry	Dry
21/12/2020	N/A	0.046	N/A	0.031	-	-	9.341	N/A	Dry	Dry
22/12/2020	-	-	-	-	9.275	0.086	-	-	-	-
24/02/2021	-	-	-	-	9.250	0.023	-	-	Dry	Dry
25/02/2021	N/A	0.044	N/A	0.017	-	-	9.275	0.0003	-	-
06/04/2021	-	-	-	-	9.235	0.009	9.282	N/A	Dry	Dry
07/04/2021	N/A	0.005	Dry	Dry	-	-	-	-	-	-
27/04/2021	N/A	0.003		-	-	-	-	-	-	-



Date	GW2		GW4		GW6		GW7		GW8	
	Stage	Flow	Stage	Flow	Stage	Flow	Stage	Flow	Stage	Flow
28/04/2021	-	-	Dry	Dry	9.230	0.003	9.289	N/A	Dry	Dry
26/05/2021	-	-	N/A	0.022	9.245	0.026	9.290	N/A	Dry	Dry
27/05/2021	N/A	0.056	-	-	-	-	-	-	-	-
14/06/2021	N/A	0.010	N/A	0.004	-	-	9.290	N/A	-	-
15/06/2021	-	-	-	-	N/A	0.004	-	-	-	-
02/08/2021	-	-	-	-	-	-	-	-	-	-
03/08/2021	N/A	0.004	Dry	Dry	N/A	0.001	9.305	0.248	Dry	Dry
29/09/2021	N/A	0.002	Dry	Dry	-	-	N/A	0.005	Dry	Dry
30/09/2021	-	-	-	-	9.225	0.001	-	-	-	-
20/10/2021	N/A	0.003	Dry	Dry	-	-	9.244	0.0004	-	-
21/10/2021	-	-	-	-	9.238	0.017	-	-	Dry	Dry
10/11/2021	N/A	0.005	-	-	-	-	9.294	0.0003	-	-
11/11/2021	-	-	Dry	Dry	9.235	0.008	-	-	Dry	Dry
12/11/2021	-	-	-	-	-	-	-	-	-	-

3.4.2 Figure 3-11 displays the velocity data from Table 3-80 over the period between July 2020 and October 2021.

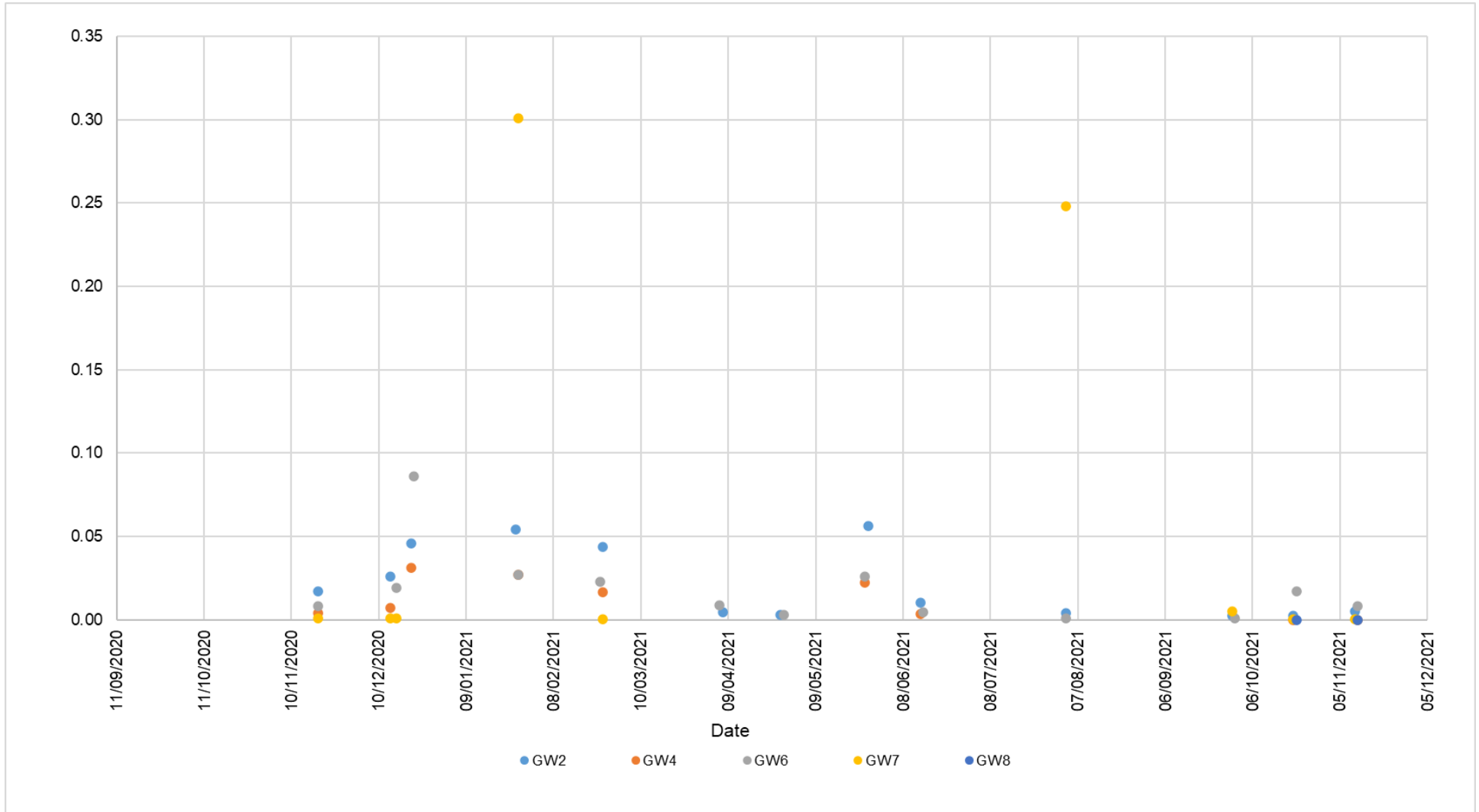


Figure 3-11 Spring water manual flow data between July 2020 and November 2021

### 3.5 Rainfall

Figure 3-12 and Figure 3-13 show Daily Rainfall (mm) data obtained from R1 and R2, respectively

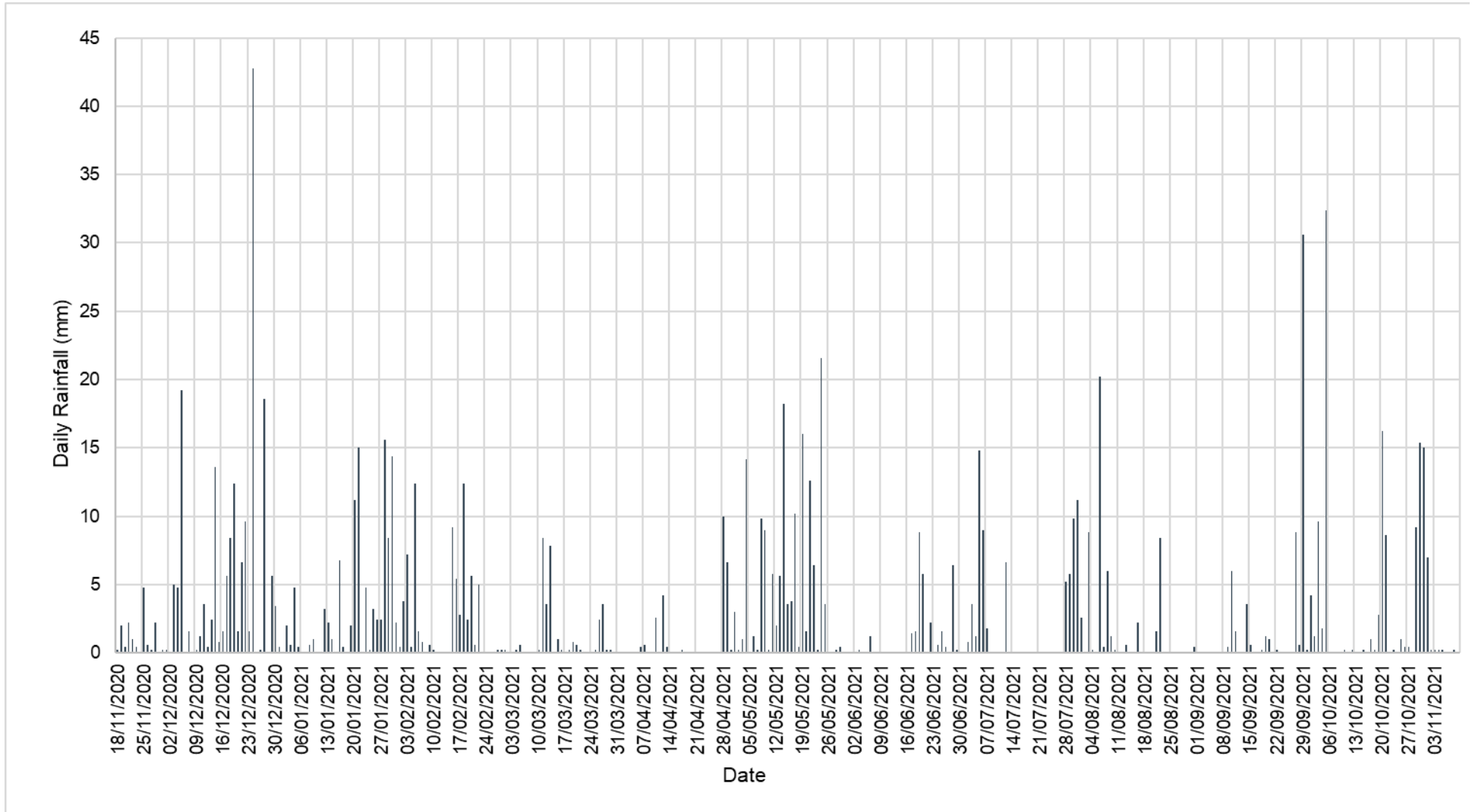


Figure 3-12 Rainfall data for R1 between November 2020 and November 2021

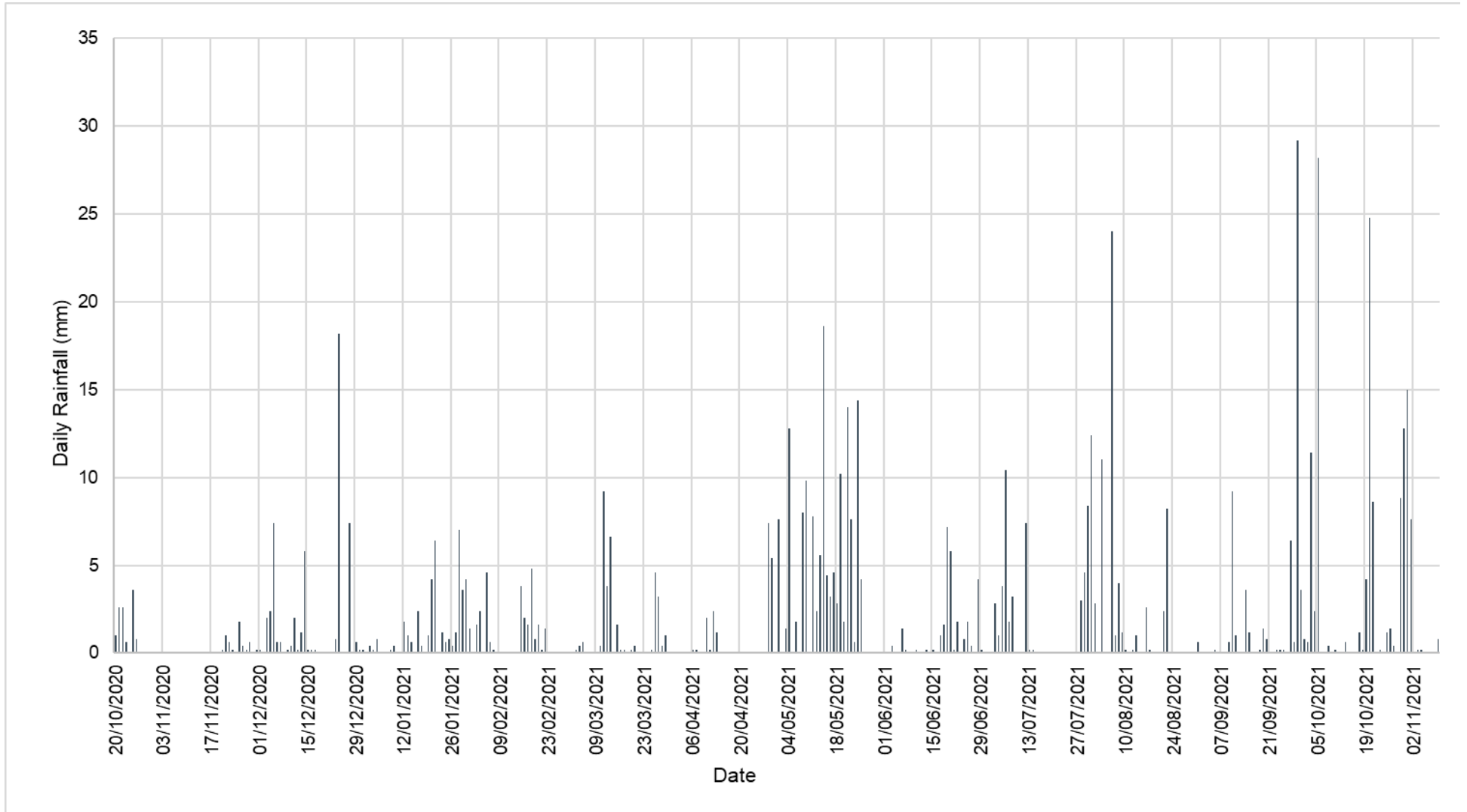


Figure 3-13 Rainfall data for R2 between November 2020 and November 2021

## References

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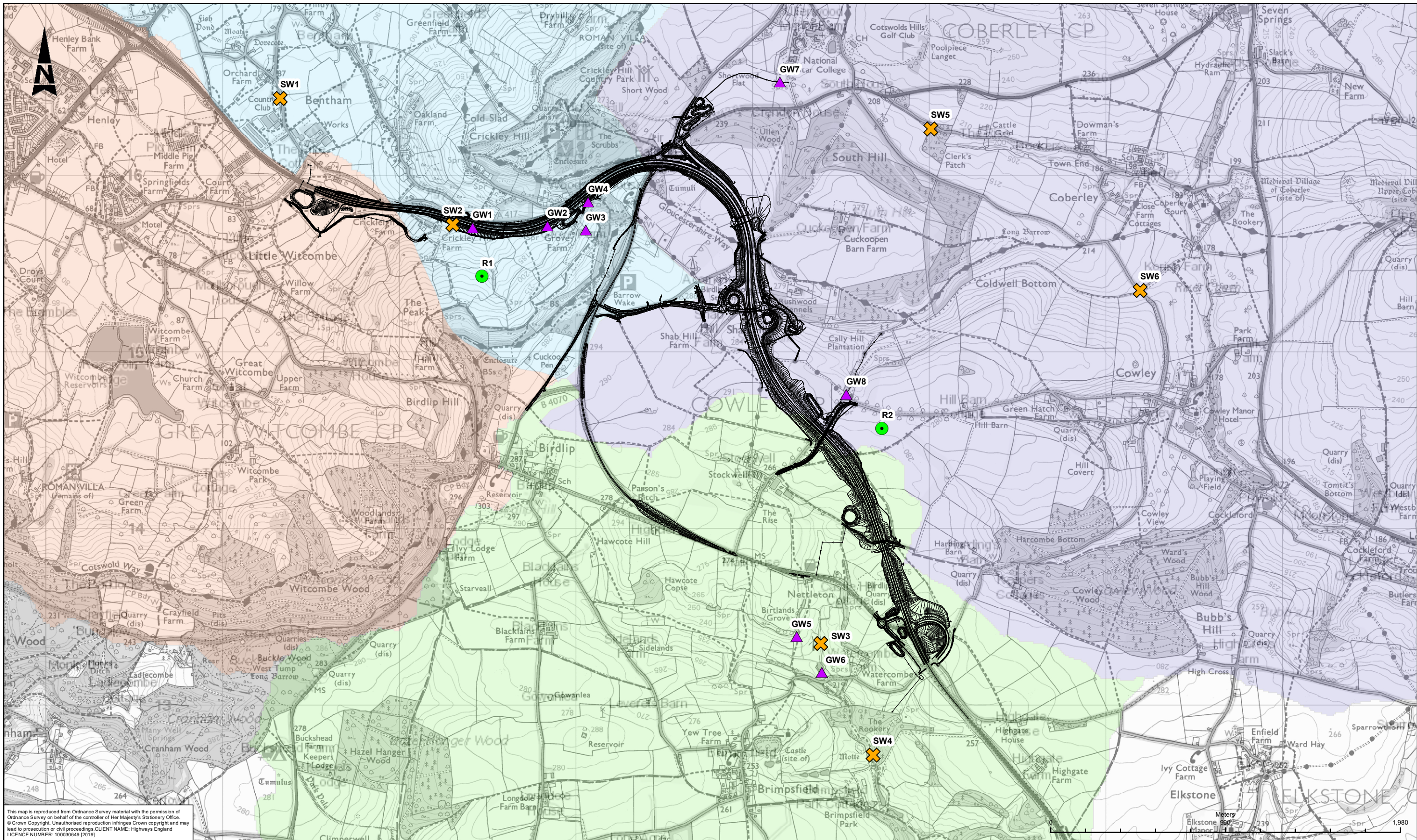
- <sup>i</sup> Fondriest Environmental Inc, 2021. 'Water Temperature Influences: pH, Conductivity and Dissolved Oxygen'. Fundamentals of Environmental Measurements. [Online]. Available at: <https://www.fondriest.com/environmental-measurements/parameters/water-quality/water-temperature/>
- <sup>ii</sup> Fondriest Environmental Inc, 2021. 'pH of Water'. Fundamental of Environmental Measurements. [Online]. Available at: <https://www.fondriest.com/environmental-measurements/parameters/water-quality/ph/>
- <sup>iii</sup> Miller, R.L., Bradford, W.L., & Peters, N.E. (1998). Specific Conductance: Theoretical Considerations and Application to Analytical Quality Control. In U.S Geological Survey Water Supply Paper. [Online]. Available at <https://pubs.usgs.gov/wsp/2311/report.pdf>
- <sup>iv</sup> Federal Interagency Stream Restoration Working Group, 2001. Stream Corridor Restoration: Principles, Processes, and Practices. [Online]. Available at: [https://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprdb1044574.pdf](https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1044574.pdf)[http://www.usda.gov/stream\\_restoration/newgra.html](http://www.usda.gov/stream_restoration/newgra.html)
- <sup>v</sup> Fondriest Environmental Inc, 2021. Dissolved Oxygen. [Online]. Available at: <https://www.fondriest.com/environmental-measurements/parameters/water-quality/dissolved-oxygen/>
- <sup>vi</sup> Fondriest Environmental Inc, 2021. Turbidity, Total Suspended Solids & Water Clarity. [Online]. Available at: <https://www.fondriest.com/environmental-measurements/parameters/water-quality/turbidity-total-suspended-solids-water-clarity/>
- <sup>vii</sup> Lenntech, 2021. Aluminum (Al) and water. [Online]. Available at: <https://www.lenntech.com/periodic/water/aluminium/aluminum-and-water.htm>
- <sup>viii</sup> Scottish Environment Protection Agency (SEPA), 2020. Scottish Pollutant Release Inventory: Arsenic. [Online]. Available at: <http://apps.sepa.org.uk/spripa/Pages/SubstanceInformation.aspx?pid=99>
- <sup>ix</sup> Lenntech, 2021. Calcium (Ca) and water. [Online]. Available at: <https://www.lenntech.com/periodic/water/calcium/calcium-and-water.htm>
- <sup>x</sup> Solomon, F., 2009. Impacts of copper on aquatic ecosystems and human health. [Online]. Available at: [http://www.ushydrotech.com/files/6714/1409/9604/Impacts\\_of\\_Copper\\_on\\_Aquatic\\_Ecosystems\\_and\\_human\\_Health.pdf](http://www.ushydrotech.com/files/6714/1409/9604/Impacts_of_Copper_on_Aquatic_Ecosystems_and_human_Health.pdf)
- <sup>xi</sup> SEPA, 2020. Scottish Pollutant Release Inventory: Cadmium. [Online]. Available at: <http://apps.sepa.org.uk/spripa/Pages/SubstanceInformation.aspx?pid=102>
- <sup>xii</sup> SEPA, 2020. Scottish Pollutant Release Inventory: Lead. [Online]. Available at: <http://apps.sepa.org.uk/spripa/Pages/SubstanceInformation.aspx?pid=105>
- <sup>xiii</sup> McKenzie, E. R., Money, J. E., Green, P. G., & Young, T. M., 2009. Metals associated with stormwater-relevant brake and tire samples. *The Science of the total environment*, 407(22), 5855–5860.
- <sup>xiv</sup> Fondriest Environmental, Inc, 2021. 'Water Temperature'. Fundamentals of Environmental Measurements. [Online]. Available at: <https://www.fondriest.com/environmental-measurements/parameters/water-quality/water-temperature/>
- <sup>xv</sup> Fondriest Environmental Inc, 2021. 'pH of Water'. Fundamental of Environmental Measurements. [Online]. Available at: <https://www.fondriest.com/environmental-measurements/parameters/water-quality/ph/>
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<sup>xix</sup> Fondriest Environmental Inc, 2021. Turbidity, Total Suspended Solids & Water Clarity. [Online]. Available at: <https://www.fondriest.com/environmental-measurements/parameters/water-quality/turbidity-total-suspended-solids-water-clarity/>

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# Appendix A Monitoring Locations



This map is reproduced from Ordnance Survey material with the permission of Ordnance Survey on behalf of the controller of Her Majesty's Stationery Office. © Crown Copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. CLIENT NAME: Highways England LICENCE NUMBER: 10003949 (2019)

**LEGEND**

- SPRINGS MONITORING
- SURFACE WATER MONITORING
- RAIN GAUGE

CATCHMENT (CATCHMENT BOUNDARIES ARE BASED ON WFD SURFACE WATERBODY DATA AND UPDATED FOLLOWING BASELINE DATA COLLECTION, INCLUDING TRACER TESTING)

- RIVER CHURN
- RIVER FROME
- HORSEBERE BROOK
- NORMAN'S BROOK

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION			
IN ADDITION TO THE HAZARDS RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING SIGNIFICANT RESIDUAL RISKS (REFERENCE SHALL ALSO BE MADE IN THE DESIGN HAZARD LOG)			
CONSTRUCTION			
NONE			
MAINTENANCE / CLEANING			
NONE			
USE			
NONE			
DECOMMISSIONING / DEMOLITION			
NONE			
Rev.	Date	Description	By
C01	22/04/21	APPLICATION SUBMISSION (MAY 2021)	EB TS JP SW

Suitability	A3	Drawing Status	STAGE COMPLETED
		Project Title	
		A417 MISSING LINK	
		Drawing Title	
		FIGURE 13.15 WATER ENVIRONMENT MONITORING LOCATIONS	
Scale	1:20,000	By	EB
Original Size	A3	Date	22/04/21
Checked	TS	Approved	JP
Authorised	SW	Date	22/04/21
Drawing Number	HE PIN	Originator	Volume
HE551505 -	ARUP	- VES	C01
X_XX_XXXX_X	-DR	-LE	-000072
Location	Type	Role	Number

Client	highways england														
Revision	<table border="1"> <tr> <th>Rev.</th> <th>Date</th> <th>Description</th> <th>By</th> <th>Chk'd</th> <th>App'd</th> <th>Auth'd</th> </tr> <tr> <td>C01</td> <td>22/04/21</td> <td>APPLICATION SUBMISSION (MAY 2021)</td> <td>EB</td> <td>TS</td> <td>JP</td> <td>SW</td> </tr> </table>	Rev.	Date	Description	By	Chk'd	App'd	Auth'd	C01	22/04/21	APPLICATION SUBMISSION (MAY 2021)	EB	TS	JP	SW
Rev.	Date	Description	By	Chk'd	App'd	Auth'd									
C01	22/04/21	APPLICATION SUBMISSION (MAY 2021)	EB	TS	JP	SW									



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# Appendix B Surface Water Quality Exceedances

Location: SW1			EQS Value Stated	EQS Value Converted	24-Aug-20	15-Sep-20	20-Oct-20	19-Nov-20	14-Dec-20	21-Dec-20	26-Jan-21	25-Feb-21	07-Apr-21	27-Apr-21	27-May-21	14-Jun-21	03-Aug-21	30-Sep-21	21-Oct-21	10-Nov-21	Min	Max	Average	
Date	N/A	N/A			11:45	10:52	15:00	15:40	10:45	09:12	11:11	14:14	09:42	13:14	08:55	12:05	11:17	10:11	16:13	11:40	N/A	N/A	N/A	
Time (GMT)	N/A	N/A																						
Lab ID	N/A	N/A	19696091	19690422	19794641	19890569	19971908	19995616	20082976	20184682	20311120	20379554	20489473	20536449	20709612	20909903	20986535	21063537	N/A	N/A	N/A			
Acenaphthene, ug/l	N/A	N/A	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	-	-	
Acenaphthylene, ug/l	N/A	N/A	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	-	-	
Aliphatic EPH >C10 - C12, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<10	<100	<10	<10	<10	<10					-	-	-	
Aliphatic EPH >C10 - C14, ug/l	N/A	N/A	<10	<10	<10		20	<10	<10	<10	<10	<100	<10	<10	<10	<10					20	20	20	
Aliphatic EPH >C12 - C16, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<10	<100	<10	<10	<10	<10					-	-	-	
Aliphatic EPH >C16 - C35, ug/l	N/A	N/A	<10	<10	<10		20	<10	<10	<10	<10	<100	<10	<10	<10	<10					20	20	20	
Aliphatic EPH >C35 - C44, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<10	<100	<10	<10	<10	<10					-	-	-	
Alkalinity as CaCO3, mg/l	N/A	N/A		225	218	238	226	221	200	198	203	213	155	197	210	236	194	212	239	155	239	211.563		
Aluminium, total as Al (mg/l)	15 µg/l	0.015 mg/l	0.11	0.15		0.18	0.26	0.87	0.2	0.24	0.35	<0.0075	0.26	0.2	0.42	0.29	0.33	0.27	0.11	0.87	0.295			
Anthracene, ug/l	0.1 µg/l	0.1 µg/l	<0.01	<0.01		<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	0.01	0.01	0.01			
Aromatic EPH >C10 - C12, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<100	<10	<10	<10	<10	<10					-	-	-	
Aromatic EPH >C10 - C14, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<100	<10	<10	<10	<10	<10					-	-	-	
Aromatic EPH >C12 - C16, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<100	<10	<10	<10	<10	<10					-	-	-	
Aromatic EPH >C16 - C21, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<100	<10	<10	<10	<10	<10					-	-	-	
Aromatic EPH >C21 - C35, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<100	<10	<10	<10	<10	<10					-	-	-	
Aromatic EPH >C35 - C44, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<100	<10	<10	<10	<10	<10					-	-	-	
Arsenic, filter as As (mg/l)	50 µg/l	0.5 mg/l	0.0011	0.0008	0.0006	0.0005	0.0005	0.0005	0.0004	0.0004	0.0005	0.0005	0.0004	0.0005	0.0009	0.001	0.0009	0.0006	0.0004	0.001	0.00063			
Arsenic, total as As (mg/l)	50 µg/l	0.5 mg/l	0.0014	0.0011	0.0011	0.00081	0.001	0.0014	0.00062	0.00065	0.001	0.0017	0.00083	0.00078	0.0014	0.0014	0.0013	0.00098	0.0006	0.002	0.00109			
Benzo(a)anthracene, ug/l	N/A	N/A	<0.01	<0.01	-	0.01	0.02	0.07	<0.01	<0.01	<0.01	<0.010	0.016	0.01	<0.010	<0.010	<0.010	<0.010	0.01	0.07	0.0252			
Benzo(a)pyrene, ug/l	0.00017 µg/l	0.00017 µg/l	<0.01	<0.01		0.02	0.03	0.09	<0.01	<0.01	<0.01	<0.01	0.032	0.012	0.011	0.012	0.013	<0.010	0.011	0.09	0.0275			
Benzo(b)fluoranthene, ug/l	0.017 µg/l	0.017 µg/l	<0.01	<0.01	-	0.02	0.03	0.09	<0.01	<0.01	<0.01	<0.010	0.016	0.011	0.012	0.014	0.014	<0.010	0.011	0.09	0.02588			
Benzo(ghi)perylene, ug/l	N/A	N/A	<0.01	<0.01	-	0.02	0.03	0.09	<0.01	<0.01	<0.01	<0.010	0.014	0.014	0.013	0.015	0.012	<0.010	0.012	0.09	0.026			
Benzo(k)fluoranthene, ug/l	0.017 µg/l	0.017 µg/l	<0.01	<0.01	-	0.01	0.02	0.07	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	0.01	0.019	0.018	<0.010	0.01	0.07	0.0245			
Bicarbonate Alkalinity, mg/l	N/A	N/A															194	208	239	194	239	213.667		
Cadmium, Filtered as Cd, mg/l	0.15 - 0.25 µg/l	0.0015 - 0.0025 mg/l	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	-	-	-	
Cadmium, Total as Cd, mg/l	0.15 - 0.25 µg/l	0.0015 - 0.0025 mg/l	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	-	-	-	
Calcium, total as Ca (mg/l)	N/A	N/A	110	110	100	100	110	100	100	100	110	120	100	96.4	110	91.7	96.6	100	91.7	120	103.419			
Chrysene, ug/l	N/A	N/A	<0.01	<0.01	-	0.02	0.02	0.08	<0.01	<0.01	<0.01	<0.010	0.014	0.015	0.01	<0.010	0.012	<0.010	0.01	0.08	0.02443			
Conductivity- Electrical 20C, uS/cm	N/A	N/A	608	582	567	532	578	511	552	529	592	623	538	552	620	542	530	503	503	623	559.938			
Copper, Filtered as Cu, mg/l	1 µg/l	0.001 mg/l	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	0.0045	<0.004	<0.0040	0.0045	0.005	0.0045			
Copper, Total as Cu, mg/l	1 µg/l	0.001 mg/l	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	0.0075	0.0058	<0.0018	0.0058	0.008	0.00655			
Dibenzo(ah)anthracene, ug/l	N/A	N/A	<0.01	<0.01	-	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.01	0.01	0.01			
EH >C10 - C16, ug/l	N/A	N/A															<10	<10	<10	-	-	-		
EH >C16 - C24, ug/l	N/A	N/A															22	<10	<10	22	22	22		
EH >C24 - C40, ug/l	N/A	N/A															104	19	<10	19	104	61.5		
EH >C6 - C40, ug/l	N/A	N/A															126	19	<10	19	126	72.5		
EH >C6 - C8, ug/l	N/A	N/A															<10	<10	<10	-	-	-		
EH >C8 - C10, ug/l	N/A	N/A															<10	<10	<10	-	-	-		
EPH >C10 - C44, ug/l	N/A	N/A	<10	-	<10	20	<10	<10	<10	<10	<100	<10	<10	<10	<10	<10					20	20	20	
Fluoranthene, ug/l	0.0063 µg/l	0.0063 µg/l	<0.01	<0.01		0.02	0.03	0.11	<0.01	<0.01	0.01	<0.01	0.03	0.016	0.017	0.029	0.014	<0.010	0.01	0.11	0.03067			
Fluorene, ug/l	N/A	N/A	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	-	-		
Indeno(123cd)pyrene, ug/l	N/A	N/A	<0.01	<0.01	-	0.02	0.03	0.08	<0.01	0.01	<0.01	<0.010	0.016	0.014	0.015	<0.010	0.012	<0.010	0.01	0.08	0.02463			
Lead, Total as Pb, mg/l	1.2 µg/l	0.0012 mg/l	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	-	-	-		
Lead, Filtered as Pb, mg/l	1.2 µg/l	0.0012 mg/l	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.0018	0.0014	0.0007	0.0007	0.002	0.0013		
Magnesium, total as Mg, mg/l	N/A	N/A															6.8	6	6.2	6	6.8	6.33333		
Naphthalene, ug/l	2 µg/l	2 µg/l	<0.01	<0.01		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	0	0	-			
Nitrate as N, mg/l	N/A	N/A	1.2	0.9	1.5	2.1	2.1	2.1	3.3	2.9	1.9	2.1	2.7	2.8	1.3	0.9	1.4	1.2	0.9	3.3	1.9			
Nitrate as NO3	N/A	N/A														4.1	6.2	5.1	4.1	6.2	5.13333			
PAH, Total of 16, ug/l	N/A	N/A	<0.01	<0.01	-	0.15	0.25	0.86	<0.01	0.02	0.03	<0.010	0.181</											

Location: SW2	EQS Value Stated	EQS Value Converted																	Min	Max	Average	
			24-Aug-20	15-Sep-20	20-Oct-20	18-Nov-20	14-Dec-20	21-Dec-20	26-Jan-21	25-Feb-21	06-Apr-21	27-Apr-21	27-May-21	14-Jun-21	03-Aug-21	29-Sep-21	20-Oct-21	10-Nov-21				
Date	N/A	N/A	13:45	12:02	13:00	11:40	11:55	10:17	12:10	12:17	15:43	11:05	09:26	12:26	09:14	14:57	14:31	13:00	N/A	N/A	N/A	
Lab ID	N/A	N/A	19696092	19690423	19794642	19886167	19971909	19995617	20082977	20184683	20305977	20379553	20489474	20536450	20709613	20909904	20986531	21063538	N/A	N/A	N/A	
Acenaphthene, ug/l	N/A	N/A	<0.01	N/S	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	-
Acenaphthylene, ug/l	N/A	N/A	<0.01	N/S	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.013	0.013	0.013
Aliphatic EPH >C10 - C12, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-
Aliphatic EPH >C10 - C44, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-
Aliphatic EPH >C12 - C16, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-
Aliphatic EPH >C16 - C35, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-
Aliphatic EPH >C35 - C44, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-
Alkalinity as CaCO3, mg/l	N/A	N/A	235	221	225	215	200	187	186	187	208	167	198	197	234	236	209	234	167	236	208.6875	
Aluminium, total as Al (mg/l)	15 µg/l	0.015 mg/l	0.47	0.25		0.45	0.48	0.66	0.29	0.26	0.67	0.29	0.2	0.37	0.6	0.3	0.68	0.45	0.2	0.68	0.428	
Anthracene, ug/l	0.1 µg/l	0.1 µg/l	<0.01			0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	0.01
Aromatic EPH >C10 - C12, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-
Aromatic EPH >C10 - C44, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-
Aromatic EPH >C12 - C16, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-
Aromatic EPH >C16 - C21, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-
Aromatic EPH >C21 - C35, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-
Aromatic EPH >C35 - C44, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-
Arsenic, filter as As (mg/l)	50 µg/l	0.5 mg/l	0.0006	0.0007	0.001	0.0007	0.0004	0.0004	0.0008	0.0004	0.0004	0.0005	0.0004	0.0004	0.0007	0.0008	0.0007	0.0006	0.0004	0.001	0.00059375	
Arsenic, total as As (mg/l)	50 µg/l	0.5 mg/l	0.0003	0.0013	0.0041	0.0024	0.0009	0.001	0.00064	0.00064	0.0012	0.00095	0.00065	0.0014	0.0015	0.0012	0.0016	0.00088	0.0003	0.004	0.00129125	
Benzo(a)anthracene, ug/l	N/A	N/A	<0.01	N/S	-	0.06	0.01	0.02	<0.01	<0.01	<0.01	<0.01	0.011	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.06	0.02525	
Benzo(a)pyrene, ug/l	0.00017 µg/l	0.00017 µg/l	<0.01			0.09	0.02	0.03	<0.01	<0.01	<0.01	<0.01	0.012	0.014	0.01	0.01	0.013	<0.01	0.01	0.09	0.024875	
Benzo(b)fluoranthene, ug/l	0.017 µg/l	0.017 µg/l	<0.01	N/S	-	0.09	0.03	0.03	<0.01	<0.01	<0.01	<0.01	0.015	0.011	0.01	<0.01	0.016	<0.01	0.01	0.09	0.02885714	
Benzo(ghi)perylene, ug/l	N/A	N/A	<0.01	N/S	-	0.1	0.03	0.03	<0.01	<0.01		0.01	<0.01	0.012	0.015	0.011	<0.01	0.013	<0.01	0.01	0.1	0.027625
Benzo(k)fluoranthene, ug/l	0.017 µg/l	0.017 µg/l	<0.01	N/S	-	0.06	0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.017	0.02	0.01	0.06	0.0274	
Bicarbonate Alkalinity, mg/l	N/A	N/A													234	209	234	209	234	225.666667		
Cadmium, Filtered as Cd, mg/l	0.15 - 0.25 µg/l	0.0015 - 0.0025 mg/l	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	-	-	-
Cadmium, Total as Cd, mg/l	0.15 - 0.25 µg/l	0.0015 - 0.0025 mg/l	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	-	-	-
Calcium, total as Ca (mg/l)	N/A	N/A	17.1	110	100	100	97.8	86.4	91.8	91.1	94.7	110	91.4	85.7	110	100	92.5	100	17.1	110	92.40625	
Chrysene, ug/l	N/A	N/A	<0.01	N/S	-	0.07	0.02	0.03	<0.01	<0.01	<0.01	<0.01	0.012	0.013	<0.01	<0.01	0.013	<0.01	0.012	0.07	0.02633333	
Conductivity-Electrical 20C, uS/cm	N/A	N/A	579	540	532	488	489	454	493	481	538	562	506	507	585	558	472	477	454	585	516.3125	
Copper, Filtered as Cu, mg/l	1 µg/l	0.001 mg/l	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	-	-	-
Copper, Total as Cu, mg/l	1 µg/l	0.001 mg/l	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	0.0045	0.0064	0.0021	0.0021	0.006	0.00433333	
Dibenzo(ah)anthracene, ug/l	N/A	N/A	<0.01	N/S	-	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.02	0.02	
EH >C10 - C16, ug/l	N/A	N/A														<10	<10	<10	-	-	-	
EH >C16 - C24, ug/l	N/A	N/A														<10	<10	<10	-	-	-	
EH >C24 - C40, ug/l	N/A	N/A														13	39	<10	13	39	26	
EH >C6 - C40, ug/l	N/A	N/A														13	39	<10	13	39	26	
EH >C6 - C8, ug/l	N/A	N/A														<10	<10	<10	-	-	-	
EH >C8 - C10, ug/l	N/A	N/A														<10	<10	<10	-	-	-	
EPH >C10 - C44, ug/l	N/A	N/A	<10	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10				-	-	-	
Fluoranthene, ug/l	0.0063 µg/l	0.0063 µg/l	<0.01			0.1	0.03	0.04	<0.01	<0.01	<0.01	<0.01	0.017	0.016	0.015	<0.01	0.017	<0.01	0.015	0.1	0.03357143	
Fluorene, ug/l	N/A	N/A	<0.01	N/S	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	-
Indeno(123cd)pyrene, ug/l	N/A	N/A	<0.01	N/S	-	0.09	0.02	0.03	<0.01	<0.01	<0.01	<0.01	0.015	0.013	0.013	<0.01	0.013	<0.01	0.013	0.09	0.02771429	
Lead, Total as Pb, mg/l	1.2 µg/l	0.0012 mg/l	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	-	-	-
Lead, Filtered as Pb, mg/l	1.2 µg/l	0.0012 mg/l	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.0013	0.0029	0.001	0.001	0.003	0.00173333	
Magnesium, total as Mg, mg/l	N/A	N/A														7.5	5.7	5.4	5.4	7.5	6.2	
Naphthalene, ug/l	2 µg/l	2 µg/l	<0.01			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	-
Nitrate as N, mg/l	N/A	N/A	0.7	1.1	2	2.2	2.4	2.3	3.4	2.9	2.3	1.9	3	2.6	2	0.8	1.1	1.2	0.7	3.4	1.99375	
Nitrate as NO3	N/A	N/A														3.7	4.9	5.5	3.7	5.5	4.7	
PAH, Total of 16, ug/l	N/A	N/A	<0.01	N/S	-	0.82	0.23	0.3	<0.01	<0.01	0.02	<0.01	0.113	0.103	0.104	<0.01	0.121	0.02	0.02	0.82	0.20344444	
pH	6 to 9	6 to 9	8.3	8.3	8.3	8.3	8.2	8.3	8.4	8.4	8	8.2	8.4	8.1	8.2	8.4	7.8	8.1	7.8	8.4	8.23125	
Phenanthrene, ug/l	N/A	N/A	<0.01																			



Location: SW4		EQS Value Stated	EQS Value Converted	25-Aug-20	16-Sep-20	21-Oct-20	19-Nov-20	15-Dec-20	22-Dec-20	26-Jan-21	25-Feb-21	06-Apr-21	27-Apr-21	27-May-21	15-Jun-21	02-Aug-21	30-Sep-21	21-Oct-21	12-Nov-21	Min	Max	Average
Date	N/A	N/A	N/A	13:08	11:07	14:50	13:55	11:48	09:40	16:17	09:16	11:00	09:52	11:35	09:51	14:12	11:30	09:51	09:30	N/A	N/A	N/A
Time (GMT)	N/A	N/A	N/A	13:08	11:07	14:50	13:55	11:48	09:40	16:17	09:16	11:00	09:52	11:35	09:51	14:12	11:30	09:51	09:30	N/A	N/A	N/A
Lab ID	N/A	N/A	19619034	19686156	19799581	19890571	19981985	19999303	20082978	20184684	20305973	20379552	20489475	20541122	20707857	20909906	20986532	21063540	N/A	N/A	N/A	
Acenaphthene, ug/l	N/A	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	-	-
Acenaphthylene, ug/l	N/A	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	-	-
Aliphatic EPH >C10 - C12, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<100	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-
Aliphatic EPH >C10 - C44, ug/l	N/A	N/A	<10	<10	12	<10	<10	<10	<10	<10	<100	<10	<10	<10	<10	<10	<10	<10	<10	12	12	12
Aliphatic EPH >C12 - C16, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<100	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-
Aliphatic EPH >C16 - C35, ug/l	N/A	N/A	<10	<10	12	<10	<10	<10	<10	<10	<100	<10	<10	<10	<10	<10	<10	<10	<10	12	12	12
Aliphatic EPH >C35 - C44, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<100	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-
Alkalinity as CaCO3, mg/l	N/A	N/A	158	247	266	232	240	263	239	246	231	165	219	208	229	221	253	250	250	158	266	229.1875
Aluminium, total as Al (mg/l)	15 µg/l	0.015 mg/l	0.2	0.032	0.12	0.11	0.11	0.34	0.097	0.026	0.027	0.023	0.027	0.026	0.053	0.082	0.062	0.017	0.017	0.34	0.0845	
Anthracene, ug/l	0.1 µg/l	0.1 µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	-
Aromatic EPH >C10 - C12, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<100	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-
Aromatic EPH >C10 - C44, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<100	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-
Aromatic EPH >C12 - C16, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<100	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-
Aromatic EPH >C16 - C21, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<100	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-
Aromatic EPH >C21 - C35, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<100	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-
Aromatic EPH >C35 - C44, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<100	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-
Arsenic, filter as As (mg/l)	50 µg/l	0.5 mg/l	0.0008	0.0005	0.0003	0.0002	0.0004	0.0004	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0004	0.0005	0.0005	0.0003	0.0002	0.0008	0.00035
Arsenic, total as As (mg/l)	50 µg/l	0.5 mg/l	0.00097	0.0004	0.00036	0.00029	0.00039	0.00066	0.00028	0.00024	0.00025	0.00024	0.00026	0.00025	0.00059	0.00057	0.0005	0.00027	0.00024	0.00097	0.0004075	
Benzo(a)anthracene, ug/l	N/A	N/A	0.012	<0.01	0.01	0.03	<0.01	0.01	<0.01	<0.01	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.01	0.03	0.0144
Benzo(a)pyrene, ug/l	0.00017 µg/l	0.00017 µg/l	0.029	<0.01	<0.01	0.05	0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.05	0.02725
Benzo(b)fluoranthene, ug/l	0.017 µg/l	0.017 µg/l	0.029	<0.01	0.02	0.05	0.01	0.02	<0.01	<0.01	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.01	0.05	0.023166667
Benzo(ghi)perylene, ug/l	N/A	N/A	0.026	<0.01	0.02	0.05	<0.01	0.01	<0.01	<0.01	0.01	<0.010	0.013	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.01	0.05	0.0215
Benzo(k)fluoranthene, ug/l	0.017 µg/l	0.017 µg/l	0.015	<0.01	<0.01	0.03	<0.01	0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	0.012	0.011	<0.010	0.021	0.01	0.03	0.0165	
Bicarbonate Alkalinity, mg/l	N/A	N/A														218	244	250	218	250	237.3333333	
Cadmium, Filtered as Cd, mg/l	0.15 - 0.25 µg/l	0.0015-0.0025 mg/l	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.00002	<0.00002	<0.00002	<0.00002	-	-	-
Cadmium, Total as Cd, mg/l	0.15 - 0.25 µg/l	0.0015-0.0025 mg/l	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.00007	<0.00007	<0.00007	<0.00007	-	-	-
Calcium, total as Ca (mg/l)	N/A	N/A	75.9	120	120	130	110	130	130	130	110	110	130	110	110	99.2	110	120	75.9	130	115.31875	
Chrysene, ug/l	N/A	N/A	0.016	<0.01	0.01	0.03	<0.01	0.02	<0.01	<0.01	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.01	0.03	0.0172
Conductivity- Electrical 20C, uS/cm	N/A	N/A	396	563	601	547	529	548	1030	574	568	548	553	508	538	489	549	540	396	1030	567.5625	
Copper, Filtered as Cu, mg/l	1 µg/l	0.001 mg/l	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.004	<0.004	<0.004	<0.004	-	-	-
Copper, Total as Cu, mg/l	1 µg/l	0.001 mg/l	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	0.003	0.0019	<0.0018	0.0019	0.003	0.00245	
Dibenzo(ah)anthracene, ug/l	N/A	N/A	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.01	0.01	0.01
EH >C10 - C16, ug/l	N/A	N/A														<10	<10	<10	-	-	-	
EH >C16 - C24, ug/l	N/A	N/A														<10	<10	<10	-	-	-	
EH >C24 - C40, ug/l	N/A	N/A														<10	12	<10	12	12	12	12
EH >C6 - C40, ug/l	N/A	N/A														<10	12	<10	12	12	12	12
EH >C6 - C8, ug/l	N/A	N/A														<10	<10	<10	-	-	-	
EH >C8 - C10, ug/l	N/A	N/A														<10	<10	<10	-	-	-	
EPH >C10 - C44, ug/l	N/A	N/A	<10	<10	12	<10	<10	<10	<10	<10	<100	<10	<10	<10	<10	<10	<10	<10	<10	12	12	12
Fluoranthene, ug/l	0.0063 µg/l	0.0063 µg/l	0.034	<0.01	0.02	0.04	0.02	0.02	0.01	0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.04	0.02175
Fluorene, ug/l	N/A	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	-	-
Indeno(123cd)pyrene, ug/l	N/A	N/A	0.029	<0.01	0.02	0.05	<0.01	0.01	0.01	<0.01	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.01	0.05	0.0215
Lead , Total as Pb, mg/l	1.2 µg/l	0.0012 mg/l	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.0003	<0.0003	<0.0003	-	-	-	
Lead, Filtered as Pb, mg/l	1.2 µg/l	0.0012 mg/l	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.0008	<0.0003	<0.0003	0.0008	0.0008	0.0008	
Magnesium, total as Mg, mg/l	N/A	N/A														3	2.4	2.9	2.4	3	2.766666667	
Naphthalene, ug/l	2 µg/l	2 µg/l	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	0.01	0.01	0.01	
Nitrate as N, mg/l	N/A	N/A	0.9	1.9	2.2	3.6	3.2	3	4	3.6	3.3	3	3.6	2.9	2.5	<0.7	2.6	2.9	0.9	4	2.88	
Nitrate as NO3	N/A	N/A														<3.1	11.5	13	11.5	13	12.25	
PAH, Total of 16, ug/l	N/A	N/A	0.224	0.01	0.13	0.37	0.06	0.14	0.02	<0.01	0.12	<0.010	0.013	<0.010	0.012	0.011	<0.010	0.021	0.01	0.37	0.09425	
pH	6 to 9	6 to 9	8.3	8.2	7.9	8	8	8.4	8.1	8.1	7.9	8.1	8.1	7.8	8.3	8.3	8.3	7.6	7.6	8.4	8.08125	
Phenanthrene, ug/l	N/A	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.01	0.01	0.01
Phosphates , Total as P, mg/l	N/A	N/A	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	0.064	0.054	<0.013	0.054	0.064	0.059	
Potassium, total as K, mg/l	N/A	N/A					</															

Location: SW5			EQS Value Stated	EQS Value Converted	24-Aug-20	15-Sep-20	22-Oct-20	18-Nov-20	16-Dec-20	21-Dec-20	27-Jan-21	24-Feb-21	06-Apr-21	27-Apr-21	26-May-21	14-Jun-21	02-Aug-21	29-Sep-21	20-Oct-21	10-Nov-21	Min	Max	Average	
Date	N/A	N/A			16:15	13:58	12:05	14:21	14:00	14:35	14:10	15:31	14:45	15:11	14:10	14:11	10:37	12:22	12:05	15:35	N/A	N/A	N/A	
Time (GMT)	N/A	N/A																						
Lab ID	N/A	N/A	19696093	19690424	19803374	19886168	19981988	19995618	20087903	20178336	20305976	20379556	20478815	20536451	20707855	20909907	20986530	21063541	N/A	N/A	N/A	N/A	N/A	
Acenaphthene, ug/l	N/A	N/A	<0.01	N/S	<0.10	<0.01	0.12	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.12	0.12	0.12	
Acenaphthylene, ug/l	N/A	N/A	<0.01	N/S	<0.10	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.03	0.03	0.03	
Aliphatic EPH >C10 C12, ug/l	N/A	N/A	<10	<10	<10	<10	<20	<10	<10	<10	<10	<100	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-	
Aliphatic EPH >C10 C44, ug/l	N/A	N/A	<10	12	<10	<10	31	<10	<10	<10	<10	<100	<10	<10	<10	<10	<10	<10	<10	<10	12	31	21.5	
Aliphatic EPH >C12 C16, ug/l	N/A	N/A	<10	<10	<10	<10	<20	<10	<10	<10	<10	<100	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-	
Aliphatic EPH >C16 C35, ug/l	N/A	N/A	<10	12	<10	<10	31	<10	<10	<10	<10	<100	<10	<10	<10	<10	<10	<10	<10	<10	12	31	21.5	
Aliphatic EPH >C35 C44, ug/l	N/A	N/A	<10	<10	<10	<10	<20	<10	<10	<10	<10	<100	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-	
Alkalinity as CaCO3, mg/l	N/A	N/A	198	189	209	222	212	211	202	201	198	190	224	200	203	215	217	211	189	224	206.375			
Aluminium, total as Al (mg/l)	15 µg/l	0.015 mg/l	0.25	0.05	0.1	0.069	1	0.095	0.057	0.057	0.079	0.067	0.062	0.081	0.036	0.11	0.11	0.043	0.036	1	0.141625			
Anthracene, ug/l	0.1 µg/l	0.1 µg/l	<0.01	<0.1	<0.01	0.09	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.09	0.09	0.09	
Aromatic EPH >C10 C12, ug/l	N/A	N/A	<10	<10	<10	<10	<20	<10	<10	<10	<10	<100	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-	
Aromatic EPH >C10 C44, ug/l	N/A	N/A	<10	<10	<10	<10	<20	<10	<10	<10	<10	<100	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-	
Aromatic EPH >C12 C16, ug/l	N/A	N/A	<10	<10	<10	<10	<20	<10	<10	<10	<10	<100	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-	
Aromatic EPH >C16 C21, ug/l	N/A	N/A	<10	<10	<10	<10	<20	<10	<10	<10	<10	<100	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-	
Aromatic EPH >C21 C35, ug/l	N/A	N/A	<10	<10	<10	<10	<20	<10	<10	<10	<10	<100	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-	
Aromatic EPH >C35 C44, ug/l	N/A	N/A	<10	<10	<10	<10	<20	<10	<10	<10	<10	<100	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-	
Arsenic, filter as As (mg/l)	50 µg/l	0.5 mg/l	0.0011	0.001	0.0007	0.0007	0.0008	0.0005	0.0005	0.0006	0.0006	0.0006	0.0006	0.0006	0.0005	0.0008	0.0008	0.001	0.0009	0.0006	0.0005	0.0011	0.00073125	
Arsenic, total as As (mg/l)	50 µg/l	0.5 mg/l	0.0017	0.0011	0.00099	0.00082	0.0027	0.00063	0.00062	0.00061	0.00077	0.00085	0.00076	0.00098	0.00096	0.0012	0.0011	0.00073	0.00061	0.0027	0.0010325			
Benzo(a)anthracene, ug/l	N/A	N/A	<0.01	N/S	<0.10	<0.01	0.68	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	0.016	0.018	<0.010	<0.010	<0.010	<0.010	0.016	0.68	0.238		
Benzo(a)pyrene, ug/l	0.00017 µg/l	0.00017 µg/l	<0.01	<0.1	<0.01	1.01	0.01	0.01	<0.01	<0.01	<0.01	0.012	0.015	0.021	0.019	0.011	0.014	<0.010	0.01	1.01	0.12466667			
Benzo(b)fluoranthene, ug/l	0.017 µg/l	0.017 µg/l	<0.01	N/S	<0.10	<0.01	1.01	0.01	0.01	<0.01	<0.01	0.013	0.015	0.02	0.021	0.013	0.016	<0.010	0.01	1.01	0.12533333			
Benzo(ghi)perylene, ug/l	N/A	N/A	<0.01	N/S	<0.10	<0.01	0.99	0.01	0.01	<0.01	<0.01	0.012	0.012	0.019	0.015	0.012	0.015	<0.010	0.01	0.99	0.12166667			
Benzo(k)fluoranthene, ug/l	0.017 µg/l	0.017 µg/l	<0.01	N/S	<0.10	<0.01	0.76	<0.01	<0.01	<0.01	<0.01	<0.010	0.01	0.011	0.024	<0.010	0.019	<0.010	0.01	0.76	0.1648			
Bicarbonate Alkalinity, mg/l	N/A	N/A														215	217	211	211	217	214.333333			
Cadmium, Filtered as Cd, mg/l	0.15 - 0.25 µg/l	0.0015-0.0025 mg/l	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	-	-	-	
Cadmium, Total as Cd, mg/l	0.15 - 0.25 µg/l	0.0015-0.0025 mg/l	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	-	-	-	
Calcium, total as Ca (mg/l)	N/A	N/A	120	97	110	120	94.3	110	100	110	100	110	120	100	100	100	97.1	100	94.3	120	105.525			
Chrysene, ug/l	N/A	N/A	<0.01	N/S	<0.10	<0.01	0.68	<0.01	0.01	<0.01	<0.01	0.01	0.012	0.02	0.018	<0.010	0.01	<0.010	0.01	0.68	0.10857143			
Conductivity-Electrical 20C, uS/cm	N/A	N/A	636	615	557	553	489	532	594	543	542	606	549	575	559	595	568	594	489	636	569.1875			
Copper, Filtered as Cu, mg/l	1 µg/l	0.001 mg/l	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	-	-	-	
Copper, Total as Cu, mg/l	1 µg/l	0.001 mg/l	<0.009	<0.009	<0.009	<0.009	0.012	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	0.0023	0.0026	0.0019	0.0019	0.012	0.0047			
Dibenzo(ah)anthracene, ug/l	N/A	N/A	<0.01	N/S	<0.10	<0.01	0.2	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.2	0.2	0.2		
EH >C10 - C16, ug/l	N/A	N/A														<10	<10	<10	-	-	-			
EH >C16 - C24, ug/l	N/A	N/A														<10	<10	<10	-	-	-			
EH >C24 - C40, ug/l	N/A	N/A														13	33	<10	13	33	23			
EH >C6 - C40, ug/l	N/A	N/A														13	33	<10	13	33	23			
EH >C6 - C8, ug/l	N/A	N/A														<10	<10	<10	-	-	-			
EH >C8 - C10, ug/l	N/A	N/A														<10	<10	<10	-	-	-			
EPH >C10 - C44, ug/l	N/A	N/A	<10	-	<10	<10	<10	<10	<10	<10	<10	<100	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-	
Fluoranthene, ug/l	0.0063 µg/l	0.0063 µg/l	<0.01	<0.1	<0.01	1.14	0.02	0.02	<0.01	<0.01	0.016	0.022	0.027	0.024	0.011	0.012	<0.010	0.011	1.14	0.14355556				
Fluorene, ug/l	N/A	N/A	<0.01	N/S	<0.10	<0.01	0.12	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.12	0.12	0.12		
Indeno(123cd)pyrene, ug/l	N/A	N/A	<0.01	N/S	<0.10	<0.01	1.08	<0.01	0.01	<0.01	<0.01	0.013	0.014	0.019	0.014	0.012	0.015	<0.010	0.01	1.08	0.147125			
Lead, Total as Pb, mg/l	1.2 µg/l	0.0012 mg/l	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	-	-	-	
Lead, Filtered as Pb, mg/l	1.2 µg/l	0.0012 mg/l	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.0011	0.001	0.0004	0.0004	0.0011	0.00083333			
Magnesium, total as Mg, mg/l	N/A	N/A														3.9	3.2	3	3	3.9	3.36666667			
Naphthalene, ug/l	2 µg/l	2 µg/l	<0.01	<0.1	<0.01	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.0											

Location: SW6			EQS Value Stated	EQS Value Converted	22-Oct-20	18-Nov-20	16-Dec-20	22-Dec-20	27-Jan-21	24-Feb-21	06-Apr-21	27-Apr-21	26-May-21	15-Jun-21	02-Aug-21	30-Sep-21	21-Oct-21	11-Nov-21	Min	Max	Average		
Date	N/A	N/A			10:40	15:30	12:38	15:55	13:45	14:23	14:02	14:01	13:40	13:05	11:32	15:27	15:02	10:00	N/A	N/A	N/A		
Time (GMT)	N/A	N/A																					
Lab ID	N/A	N/A	19803375	19886169	19981987	19999305	20088125	20178335	20305975	20379555	20478814	20541124	20707856	20909908	20986534	21063542	N/A	N/A	N/A	N/A	N/A		
Acenaphthene, ug/l	N/A	N/A	<0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	-	-		
Acenaphthylene, ug/l	N/A	N/A	<0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	-	-		
Aliphatic EPH >C10 - C12, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<100	<10	<10	<10	<100				-	-	-		
Aliphatic EPH >C10 - C44, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<100	<10	<10	<10	<100				-	-	-		
Aliphatic EPH >C12 - C16, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<100	<10	<10	<10	<100				-	-	-		
Aliphatic EPH >C16 - C35, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<100	<10	<10	<10	<100				-	-	-		
Aliphatic EPH >C35 - C44, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<100	<10	<10	<10	<100				-	-	-		
Alkalinity as CaCO3, mg/l	N/A	N/A	257	247	232	231	216	213	238	186	251	237	238	262	249	266	186	266	237.3571429				
Aluminium, total as Al (mg/l)	15 µg/l	0.015 mg/l	0.021	0.015	0.044	0.16	0.083	0.095	0.36	0.008	0.027	0.014	0.01	0.04	0.042	<0.0075	0.008	0.36	0.070692308				
Anthracene, ug/l	0.1 µg/l	0.1 µg/l	<0.1	<0.1	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	-	-	-			
Aromatic EPH >C10 - C12, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<100	<10	<10	<10	<100				-	-	-		
Aromatic EPH >C10 - C44, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<100	<10	<10	<10	<100				-	-	-		
Aromatic EPH >C12 - C16, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<100	<10	<10	<10	<100				-	-	-		
Aromatic EPH >C16 - C21, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<100	<10	<10	<10	<100				-	-	-		
Aromatic EPH >C21 - C35, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<100	<10	<10	<10	<100				-	-	-		
Aromatic EPH >C35 - C44, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<100	<10	<10	<10	<100				-	-	-		
Arsenic, filter as As (mg/l)	50 µg/l	0.5 mg/l	0.001	0.0008	0.0006	0.0005	0.0004	0.0005	0.0005	0.0006	0.0006	0.0007	0.0008	0.0009	0.0006	0.0007	0.0004	0.001	0.000657143				
Arsenic, total as As (mg/l)	50 µg/l	0.5 mg/l	0.0014	0.00097	0.0011	0.0014	0.00083	0.001	0.0022	0.00089	0.00091	0.0011	0.0013	0.0015	0.0011	0.00092	0.00083	0.0022	0.001187143				
Benzo(a)anthracene, ug/l	N/A	N/A	<0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	-	-		
Benzo(a)pyrene, ug/l	0.00017 µg/l	0.00017 µg/l	<0.1	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	0.01	0.01	0.01			
Benzo(b)fluoranthene, ug/l	0.017 µg/l	0.017 µg/l	<0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	-	-		
Benzo(ghi)perylene, ug/l	N/A	N/A	<0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	-	-		
Benzo(k)fluoranthene, ug/l	0.017 µg/l	0.017 µg/l	<0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	0.013	<0.010	<0.010	<0.010	0.013	0.013	0.013			
Bicarbonate Alkalinity, mg/l	N/A	N/A												262	249	266	249	266	259				
Cadmium, Filtered as Cd, mg/l	0.15 - 0.25 µg/l	0.0015-0.0025 mg/l	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	-	-	-		
Cadmium, Total as Cd, mg/l	0.15 - 0.25 µg/l	0.0015-0.0025 mg/l	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	-	-	-		
Calcium, total as Ca (mg/l)	N/A	N/A	110	100	87.7	96.1	90	96.4	94.7	100	110	98.1	100	110	99.9	110	87.7	110	100.2071429				
Chrysene, ug/l	N/A	N/A	<0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	-	-		
Conductivity- Electrical 20C, uS/cm	N/A	N/A	457	439	451	425	406	398	427	449	424	430	443	479	458	474	398	479	440				
Copper, Filtered as Cu, mg/l	1 µg/l	0.001 mg/l	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	-	-	-		
Copper, Total as Cu, mg/l	1 µg/l	0.001 mg/l	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	0.0018	0.0018	0.0018		
Dibenzo(ah)anthracene, ug/l	N/A	N/A	<0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	-	-		
EH >C10 - C16, ug/l	N/A	N/A												<10	<10	<10	-	-	-				
EH >C16 - C24, ug/l	N/A	N/A												<10	<10	<10	-	-	-				
EH >C24 - C40, ug/l	N/A	N/A												<10	<10	<10	-	-	-				
EH >C6 - C40, ug/l	N/A	N/A												<10	<10	<10	-	-	-				
EH >C6 - C8, ug/l	N/A	N/A												<10	<10	<10	-	-	-				
EH >C8 - C10, ug/l	N/A	N/A												<10	<10	<10	-	-	-				
EPH >C10 - C44, ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<100	<10	<10	<10	<100	<10	<10	<10	<10	<10	-	-	-		
Fluoranthene, ug/l	0.0063 µg/l	0.0063 µg/l	0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.011	<0.01	<0.01	<0.010	0.011	0.1	0.0555			
Fluorene, ug/l	N/A	N/A	<0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	-	-		
Indeno(123cd)pyrene, ug/l	N/A	N/A	<0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	-	-		
Lead , Total as Pb, mg/l	1.2 µg/l	0.0012 mg/l	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	-	-	-		
Lead, Filtered as Pb, mg/l	1.2 µg/l	0.0012 mg/l	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	-	-	-		
Magnesium, total as Mg, mg/l	N/A	N/A												2.8	2.4	2.7	2.4	2.8	2.633333333				
Naphthalene, ug/l	2 µg/l	2 µg/l	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	-	-	-		
Nitrate as N, mg/l	N/A	N/A	0.8	1.4	1.7	2.3	2	2.4	1.9	1.9	1	2	1.7	<0.7	1.9	1	0.8	2.4	1.692307692				
Nitrate as NO3	N/A	N/A												<3.1	8.6	4.6	4.6	8.6	6.6				
PAH, Total of 16, ug/l	N/A	N/A	<0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	0.024	<0.010	<0.010	<0.010	0.024	0.024	0.024			
pH	6 to 9	6 to 9	8.1	8.1	7.8	8.1	8	8.1	8.2	7.8	8.3	8.1											

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# Appendix C Spring Water Quality Exceedances



Location: GW1		EQS Value Stated	EQS Value Converted	24-Aug-20	15-Sep-20	20-Oct-20	18-Nov-20	14-Dec-20	21-Dec-20	26-Jan-21	25-Feb-21	07-Apr-21	27-Apr-21	27-May-21	14-Jun-21	03-Aug-21	30-Sep-21	20-Oct-21	10-Nov-21	Min	Max	Average
Date	N/A	N/A		14:45	13:05	13:16	12:12	12:40	11:20	13:42	13:27	10:23	11:58:00	10:04	13:05	10:06	09:35	15:21	14:03	N/A	N/A	N/A
Time (GMT)	N/A	N/A																				
Lab ID	N/A	N/A		19696094	19690494	19794635	19885907	19971958	19995632	20082970	20184691	20311134	20379520	20489470	20536445	20709582	20909836	20986552	21063725	N/A	N/A	N/A
pH	6 to 9	6 to 9		8.3	8.1	8.2	8.4	8.2	8.3	8.4	8.4	8.2	8.2	8.3	8.2	8.2	8.5	8.3	8.2	8.1	8.5	8.28
Conductivity- Electrical 20C, uS/cm	N/A	N/A		492	11300	488	473	502	472	608	478	469	470	495	479	511	468	485	453	453	11300	1165.19
Alkalinity as CaCO3, mg/l	N/A	N/A		253	207	204	208	205	190	185	183	194	181	185	187	219	193	225	223	181	253	202.63
Nitrate as N, mg/l	N/A	N/A		<0.7	0.8	2.2	2.1	2.5	2.6	3.6	3.1	2.2	1.7	3.1	2.9	1.1	0.8	1.1	1.4	0.8	3.6	2.08
Phosphates , Total as P, mg/l	N/A	N/A		0.12	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	-	-	-
Anions	N/A	N/A		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cations	N/A	N/A		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride as Cl, mg/l	250000 µg/l	250 mg/l															41.5	22.4	19.5	20	41.5	27.8
Sulphate as SO4, mg/l	400000 µg/l	400 mg/l															31.3	25.5	22.5	23	31.3	26.4333
Calcium, total as Ca, mg/l	N/A	N/A															78.5	99.1	98.3	79	99.1	91.9667
Magnesium, total as Mg, mg/l	N/A	N/A															6	5.5	5.2	5.2	6	5.56667
Potassium, total as K, mg/l	N/A	N/A															2	2.1	1.3	1.3	2.1	1.8
Sodium, total as Na, mg/l	N/A	N/A															27	17	13	13	27	19
Nitrate as NO3, mg/l	N/A	N/A															3.4	5	6.1	3.4	6.1	4.83333
Alkalinity as HCO3, mg/l	N/A	N/A															235	284	273	235	284	264

No exceedance of EQS value
Exceedance of EQS value
Value below level of detection

Location: GW2			EQS Value Stated	EQS Value Converted	20-Oct-20	18-Nov-20	14-Dec-20	21-Dec-20	26-Jan-21	25-Feb-21	07-Apr-21	27-Apr-21	27-May-21	14-Jun-21	03-Aug-21	29-Sep-21	20-Oct-21	10-Nov-21	Min	Max	Average
Date	N/A	N/A			13:24	12:20	14:46	11:30	14:02	13:40	10:55	12:12	10:32	16:07	10:20	16:12	16:08	13:44	N/A	N/A	N/A
Time (GMT)	N/A	N/A																			
Lab ID	N/A	N/A	19794636	19885908	19971959	19995633	20082971	20184692	20311135	20379521	20489471	20536454	20709581	20909837	20986553	21063726	N/A	N/A	N/A	N/A	N/A
pH	6 to 9	6 to 9	8.4	8.3	8.2	8.3	8.4	8.3	8.4	8.2	8.3	8.1	8.2	8.5	8.1	8	8	8.5	8.26		
Conductivity- Electrical 20C, uS/cm	N/A	N/A	518	486	534	484	575	476	483	475	496	486	520	536	567	491	475	575	509.07		
Alkalinity as CaCO3, mg/l	N/A	N/A	211	197	192	190	181	181	193	179	181	186	218	221	246	223	179	246	199.93		
Nitrate as N, mg/l	N/A	N/A	2.7	3.1	3.2	3.4	3.9	3.5	2.6	2.1	3.3	3.3	1.4	0.9	1.5	1.8	0.9	3.9	2.62		
Phosphates , Total as P, mg/l	N/A	N/A	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	-	-	-		
Anions	N/A	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Cations	N/A	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Chloride as Cl, mg/l	250000 µg/l	250 mg/l												42.7	34.5	23.7	23.7	42.7	33.6333333		
Sulphate as SO4, mg/l	400000 µg/l	400 mg/l												40.8	31.3	27.8	27.8	40.8	33.3		
Calcium, total as Ca, mg/l	N/A	N/A												90.7	100	100	90.7	100	96.9		
Magnesium, total as Mg, mg/l	N/A	N/A												8	6.9	6.1	6.1	8	7		
Potassium, total as K, mg/l	N/A	N/A												1.7	2.1	1.2	1.2	2.1	1.66666667		
Sodium, total as Na, mg/l	N/A	N/A												27	25	16	16	27	22.6666667		
Nitrate as NO3, mg/l	N/A	N/A												4	6.6	7.9	4	7.9	6.16666667		
Alkalinity as HCO3, mg/l	N/A	N/A												270	300	273	270	300	281		

No exceedance of EQS value
Exceedance of EQS value
Value below level of detection

<u>Location: GW3</u>	EQS Value Stated	EQS Value Converted																	
Date	N/A	N/A	20-Oct-20	18-Nov-20	14-Dec-20	21-Dec-20	27-Jan-21	25-Feb-21	07-Apr-21	28-Apr-21	26-May-21	14-Jun-21	02-Aug-21	29-Sep-21	20-Oct-21	11-Nov-21	Min	Max	Average
Time (GMT)	N/A	N/A	14:15	13:51	14:35	12:52	15:42	11:40	11:50	11:28	16:25	15:45	09:24	13:35	13:23	14:41	N/A	N/A	N/A
Lab ID	N/A	N/A	19794637	19885909	19971960	19995634	20087918	20184693	20311136	20385791	20478834	20536453	20707824	20909838	20986551	21063727	N/A	N/A	N/A
pH	6 to 9	6 to 9	8.1	8	7.9	7.9	8	8	8.1	8.2	8.3	7.8	7.7	8.4	7.7	8	7.7	8.4	8.01
Conductivity- Electrical 20C, uS/cm	N/A	N/A	336	332	357	336	341	325	344	339	314	349	342	338	341	332	314	357	337.57
Alkalinity as CaCO3, mg/l	N/A	N/A	161	161	166	158	155	158	160	162	149	160	162	161	162	160	149	166	159.64
Nitrate as N, mg/l	N/A	N/A	3.3	3.2	3.5	3.4	3.6	3.1	4.1	3.6	2.7	3.2	3.1	2.7	3.2	2.6	2.6	4.1	3.24
Phosphates , Total as P, mg/l	N/A	N/A	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	-	-	-
Anions	N/A	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cations	N/A	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride as Cl, mg/l	250000 µg/l	250 mg/l												11.2	8.3	6.4	6.4	11.2	8.63333333
Sulphate as SO4, mg/l	400000 µg/l	400 mg/l												16.6	15	12.5	12.5	16.6	14.7
Calcium, total as Ca, mg/l	N/A	N/A												75	73.5	67	67	75	71.83333333
Magnesium, total as Mg, mg/l	N/A	N/A												2.7	2.8	2.4	2.4	2.8	2.63333333
Potassium, total as K, mg/l	N/A	N/A												1.1	1.2	0.93	0.93	1.2	1.07666667
Sodium, total as Na, mg/l	N/A	N/A												5.9	5.8	4.9	4.9	5.9	5.53333333
Nitrate as NO3, mg/l	N/A	N/A												12.1	14.3	11.4	11.4	14.3	12.6
Alkalinity as HCO3, mg/l	N/A	N/A												196	198	195	195	198	196.333333

No exceedance of EQS value
Exceedance of EQS value
Value below level of detection

<b>Location: GW4</b>	<b>EQS Value Stated</b>	<b>EQS Value Converted</b>																	
<b>Date</b>	<b>N/A</b>	<b>N/A</b>	<b>20-Oct-20</b>	<b>18-Nov-20</b>	<b>14-Dec-20</b>	<b>21-Dec-20</b>	<b>27-Jan-21</b>	<b>25-Feb-21</b>	<b>07-Apr-21</b>	<b>28-Apr-21</b>	<b>26-May-21</b>	<b>14-Jun-21</b>	<b>02-Aug-21</b>	<b>29-Sep-21</b>	<b>20-Oct-21</b>	<b>11-Nov-21</b>	<b>Min</b>	<b>Max</b>	<b>Average</b>
<b>Time (GMT)</b>	N/A	N/A	14:30	13:27	13:58	13:07	15:30	11:30	-	-	16:11	15:40	-	-	-	-	N/A	N/A	N/A
<b>Lab ID</b>	N/A	N/A	19794638	19885910	19971961	19995635	20087917	20184694	-	-	20478833	20536452	-	-	-	-	N/A	N/A	N/A
<b>pH</b>	<b>6 to 9</b>	<b>6 to 9</b>	8.2	8.1	8	8.1	8.1	8.1	-	-	8.4	7.8	-	-	-	-	7.8	8.4	8.1
<b>Conductivity- Electrical 20C, uS/cm</b>	N/A	N/A	548	512	559	506	492	476	-	-	532	475	-	-	-	-	475	559	512.5
<b>Alkalinity as CaCO3, mg/l</b>	N/A	N/A	177	175	174	172	168	171	-	-	172	165	-	-	-	-	165	177	171.75
<b>Nitrate as N, mg/l</b>	N/A	N/A	4.2	3.6	4.4	4.1	4.4	4.3	-	-	3.7	4.9	-	-	-	-	3.6	4.9	4.2
<b>Phosphates , Total as P, mg/l</b>	N/A	N/A	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	-	-	<0.120	<0.120	-	-	-	-	-	-	-
<b>Anions</b>	N/A	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Cations</b>	N/A	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Chloride as Cl, mg/l</b>	<b>250000 µg/l</b>	<b>250 mg/l</b>															-	-	-
<b>Sulphate as SO4, mg/l</b>	<b>400000 µg/l</b>	<b>400 mg/l</b>															-	-	-
<b>Calcium, total as Ca, mg/l</b>	N/A	N/A															-	-	-
<b>Magnesium, total as Mg, mg/l</b>	N/A	N/A															-	-	-
<b>Potassium, total as K, mg/l</b>	N/A	N/A															-	-	-
<b>Sodium, total as Na, mg/l</b>	N/A	N/A															-	-	-
<b>Nitrate as NO3, mg/l</b>	N/A	N/A															-	-	-
<b>Alkalinity as HCO3, mg/l</b>	N/A	N/A															-	-	-

No exceedance of EQS value
Exceedance of EQS value
Value below level of detection

<u>Location: GW5</u>	EQS Value Stated	EQS Value Converted																				
Date	N/A	N/A	25-Aug-20	16-Sep-20	21-Oct-20	19-Nov-20	16-Dec-20	22-Dec-20	27-Jan-21	24-Feb-21	06-Apr-21	28-Apr-21	26-May-21	15-Jun-21	02-Aug-21	30-Sep-21	21-Oct-21	11-Nov-21	Min	Max	Average	
Time (GMT)	N/A	N/A	10:55	12:55	15:55	11:27	09:32	11:54	10:24	11:33	12:15	10:22	11:50	11:23	12:55	13:33	11:58	12:37	N/A	N/A	N/A	
Lab ID	N/A	N/A	19619020	19686100	19799706	19890548	19982072	19999306	20087915	20178326	20305954	20385789	20478830	20541090	20707825	20909839	20986554	21063728	N/A	N/A	N/A	
pH	6 to 9	6 to 9	8	8	7.6	7.9	8.1	7.8	7.7	7.8	8.1	8	8.3	7.8	7.8	8.1	7.9	7.9	7.6	8.3	7.9	
Conductivity- Electrical 20C, uS/cm	N/A	N/A	622	577	635	594	595	601	611	585	608	584	554	614	633	662	540	610	540	662	601.6	
Alkalinity as CaCO3, mg/l	N/A	N/A	310	248	306	294	293	293	286	280	286	226	279	292	296	323	274	302	226	323	286.8	
Nitrate as N, mg/l	N/A	N/A	1.9	3.1	5.1	5.4	5.7	5.4	5.3	5.6	5.4	5.3	3	5	4.6	2	4.3	5	1.9	5.7	4.5	
Phosphates , Total as P, mg/l	N/A	N/A	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	-	-	-	
Anions	N/A	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-				-	-	-	
Cations	N/A	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-				-	-	-	
Chloride as Cl, mg/l	250000 µg/l	250 mg/l														32.8	19	26.8	19	32.8	26.2	
Sulphate as SO4, mg/l	400000 µg/l	400 mg/l														34.3	14.1	21.3	14.1	34.3	23.2333	
Calcium, total as Ca, mg/l	N/A	N/A														140	140	140	140	140	140	
Magnesium, total as Mg, mg/l	N/A	N/A														3.5	2.5	2.9	2.5	3.5	2.96667	
Potassium, total as K, mg/l	N/A	N/A														1.1	1.9	0.87	0.87	1.9	1.29	
Sodium, total as Na, mg/l	N/A	N/A														16	11	14	11	16	13.6667	
Nitrate as NO3, mg/l	N/A	N/A														8.7	19	22.3	8.7	22.3	16.6667	
Alkalinity as HCO3, mg/l	N/A	N/A														395	349	368	349	395	370.667	

No exceedance of EQS value
Exceedance of EQS value
Value below level of detection

Location: GW6	EQS Value Stated	EQS Value Converted																Min	Max	Average	
			25-Aug-20	16-Sep-20	21-Oct-20	19-Nov-20	16-Dec-20	22-Dec-20	27-Jan-21	24-Feb-21	06-Apr-21	28-Apr-21	26-May-21	15-Jun-21	02-Aug-21	30-Sep-21	21-Oct-21	11-Nov-21			
Date	N/A	N/A																			
Time (GMT)	N/A	N/A	11:30	13:05	16:05	11:42	09:45	12:10	10:34	11:22	12:28	10:33:00	12:00	11:34	13:10	13:52	12:09	13:35	N/A	N/A	N/A
Lab ID	N/A	N/A	19619021	19686101	19799707	19890547	19982073	19999307	20088275	20178325	20305955	20385790	20478831	20541091	20707826	20909840	20986555	21063729	N/A	N/A	N/A
pH	6 to 9	6 to 9	8.1	7.9	8.1	8.2	8	8.3	8.2	8.1	8	8.1	8.2	7.8	8.2	8.2	8.1	7.7	7.7	8.3	8.075
Conductivity- Electrical 20C, uS/cm	N/A	N/A	481	600	582	619	652	584	761	609	565	799	599	573	634	558	615	626	481	799	616.0625
Alkalinity as CaCO3, mg/l	N/A	N/A	174	244	270	268	254	266	250	258	258	216	271	239	244	240	266	281	174	281	249.9375
Nitrate as N, mg/l	N/A	N/A	0.7	1.1	2.1	3.4	3.3	2.9	3	3.3	2.6	1.9	2.4	2.3	1.5	<0.7	3.3	2.8	0.7	3.4	2.44
Phosphates , Total as P, mg/l	N/A	N/A	0.13	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	0.13	0.13	0.13	0.13
Anions	N/A	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cations	N/A	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride as Cl, mg/l	250000 µg/l	250 mg/l														39.5	36.8	45.3	36.8	45.3	40.53333333
Sulphate as SO4, mg/l	400000 µg/l	400 mg/l														46.5	27.8	27	27	46.5	33.76666667
Calcium, total as Ca, mg/l	N/A	N/A													110	120	130	110	130	120	120
Magnesium, total as Mg, mg/l	N/A	N/A													2.9	2.6	2.7	2.6	2.9	2.733333333	2.733333333
Potassium, total as K, mg/l	N/A	N/A													2.3	2.4	1.5	1.5	2.4	2.066666667	2.066666667
Sodium, total as Na, mg/l	N/A	N/A													22	22	27	22	27	23.66666667	23.66666667
Nitrate as NO3, mg/l	N/A	N/A													<3.1	14.4	12.5	12.5	14.4	13.45	13.45
Alkalinity as HCO3, mg/l	N/A	N/A													292	324	343	292	343	319.6666667	319.6666667

No exceedance of EQS value
Exceedance of EQS value
Value below level of detection

Location: GW7	EQS Value Stated	EQS Value Converted	19-Nov-20	16-Dec-20	21-Dec-20	27-Jan-21	25-Feb-21	06-Apr-21	27-Apr-21	26-May-21	14-Jun-21	02-Aug-21	29-Sep-21	20-Oct-21	10-Nov-21	Min	Max	Average
Date	N/A	N/A																
Time (GMT)	N/A	N/A	14:52	14:38	13:55	14:55	11:04	15:10	15:50	15:40	13:51	08:56	12:53	12:47	14:53	N/A	N/A	N/A
Lab ID	N/A	N/A	19890546	19982075	19995636	20087916	20184695	20305957	20379522	20478832	20536446	20707822	20909841	20986549	21063730	N/A	N/A	N/A
pH	6 to 9	6 to 9	8	7.9	8.2	8	8.1	8	8.2	8.1	9	8.1	8.1	7.7	7.9	7.7	9	8.1
Conductivity- Electrical 20C, uS/cm	N/A	N/A	490	469	513	524	479	484	513	472	497	473	437	472	472	437	524	484.2
Alkalinity as CaCO3, mg/l	N/A	N/A	169	176	195	175	174	177	122	182	184	166	169	171	189	122	195	173.0
Nitrate as N, mg/l	N/A	N/A	15.8	12	13.4	15	14.6	14	13.9	10.3	14.5	13	11.5	11.4	14.3	10.3	15.8	13.4
Phosphates , Total as P, mg/l	N/A	N/A	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	<0.120	-	-	-
Anions	N/A	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cations	N/A	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride as Cl, mg/l	250000 µg/l	250 mg/l											22.3	20.8	20.9	20.8	22.3	21.3333333
Sulphate as SO4, mg/l	400000 µg/l	400 mg/l											23.1	22.4	20.9	20.9	23.1	22.1333333
Calcium, total as Ca, mg/l	N/A	N/A											97	100	100	97	100	99
Magnesium, total as Mg, mg/l	N/A	N/A											2.6	2.6	2.5	2.5	2.6	2.56666667
Potassium, total as K, mg/l	N/A	N/A											1	1.1	0.97	0.97	1.1	1.02333333
Sodium, total as Na, mg/l	N/A	N/A											11	12	11	11	12	11.3333333
Nitrate as NO3, mg/l	N/A	N/A											50.8	50.6	63.4	50.6	63.4	54.9333333
Alkalinity as HCO3, mg/l	N/A	N/A											206	209	230	206	230	215

No exceedance of EQS value
Exceedance of EQS value
Value below level of detection

<b>Location: GW8</b>	<b>EQS Value Stated</b>	<b>EQS Value Converted</b>																	
<b>Date</b>	<b>N/A</b>	<b>N/A</b>	<b>22-Oct-20</b>	<b>19-Nov-20</b>	<b>16-Dec-20</b>	<b>21-Dec-20</b>	<b>27-Jan-21</b>	<b>24-Feb-21</b>	<b>06-Apr-21</b>	<b>27-Apr-21</b>	<b>26-May-21</b>	<b>14-Jun-21</b>	<b>02-Aug-21</b>	<b>29-Sep-21</b>	<b>21-Oct-21</b>	<b>11-Oct-21</b>	<b>Min</b>	<b>Max</b>	<b>Average</b>
<b>Time (GMT)</b>	<b>N/A</b>	<b>N/A</b>	10:10	09:17	11:03	15:15	12:28	14:01	13:32	-	-	-	-	-	-	-	N/A	N/A	N/A
<b>Lab ID</b>	<b>N/A</b>	<b>N/A</b>	19803377	19890545	19982074	19995637	20088276	20178327	20305956	-	-	-	-	-	-	-	N/A	N/A	N/A
<b>pH</b>	<b>6 to 9</b>	<b>6 to 9</b>	7.9	7.8	7.7	8.3	8.1	7.7	8.3	-	-	-	-	-	-	-	7.7	8.3	8.0
<b>Conductivity- Electrical 20C, uS/cm</b>	<b>N/A</b>	<b>N/A</b>	532	509	439	428	416	488	539	-	-	-	-	-	-	-	416	539	479
<b>Alkalinity as CaCO3, mg/l</b>	<b>N/A</b>	<b>N/A</b>	296	284	224	219	210	252	302	-	-	-	-	-	-	-	210	302	255
<b>Nitrate as N, mg/l</b>	<b>N/A</b>	<b>N/A</b>	<0.7	<0.7	<0.7	2.1	2.1	<0.7	<0.7	-	-	-	-	-	-	-	2.1	2.1	2.1
<b>Phosphates , Total as P, mg/l</b>	<b>N/A</b>	<b>N/A</b>	0.62	0.2	<0.120	<0.120	<0.120	<0.120	0.14	-	-	-	-	-	-	-	0.14	0.62	0.32
<b>Anions</b>	<b>N/A</b>	<b>N/A</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Cations</b>	<b>N/A</b>	<b>N/A</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Chloride as Cl, mg/l</b>	<b>250000 µg/l</b>	<b>250 mg/l</b>															-	-	-
<b>Sulphate as SO4, mg/l</b>	<b>400000 µg/l</b>	<b>400 mg/l</b>															-	-	-
<b>Calcium, total as Ca, mg/l</b>	<b>N/A</b>	<b>N/A</b>															-	-	-
<b>Magnesium, total as Mg, mg/l</b>	<b>N/A</b>	<b>N/A</b>															-	-	-
<b>Potassium, total as K, mg/l</b>	<b>N/A</b>	<b>N/A</b>															-	-	-
<b>Sodium, total as Na, mg/l</b>	<b>N/A</b>	<b>N/A</b>															-	-	-
<b>Nitrate as NO3, mg/l</b>	<b>N/A</b>	<b>N/A</b>															-	-	-
<b>Alkalinity as HCO3, mg/l</b>	<b>N/A</b>	<b>N/A</b>															-	-	-

No exceedance of EQS value
Exceedance of EQS value
Value below level of detection