



MONTHLY REPORTING PERIOD - OCTOBER, 2018

1. SUMMARY

The list below provides a summary of the water quality information collected by BMID in October, 2018. Documentation and figures are provided on the following pages to support this submission.

Source	Total (US Gals)	Total (Mega Litres)
Mission Creek	58,225,000	220.38
Well 4	2,557,189	9.68
Well 5	0	0
Well 6 (Irrigation Only)	0	0
Scotty Creek (Irrigation Only)	0	0
Total	60,782,189	230.06

1. A leak in BMID's primary transmission water main was discovered on October 18. While preparations for repairs were made, BMID utilized both Rutland Water Works and limited flows from BMID's primary intake as sources for domestic water. BMID's distribution intake was shut-down on October 19 and resumed operations on October 24, 2018 after the required repairs were completed;
2. BMID began to utilize cross-ties with RWW as a source for domestic water on October 19, 2018. The Cross-ties with RWW were closed on October 25 whereby BMID continued normal operations;
3. Turbidity levels at the Distribution Intake peaked at 0.57 NTU on October 19. Average turbidity for October was 0.31 NTU;
4. The highest monthly turbidity level recorded at the first customer (Booster #1) was 0.36 NTU on October 26. Average monthly turbidity was 0.27 NTU for October;
5. Weekly samples tested by Caro from the PRV 7 location will no longer be taken due to confined space entry. Kirschner Reservoir will replace PRV 7 samples going forward;
6. Samples taken at the PRV 10 location for Presence/Absence analysis will no longer be utilized due to confined space entry;
7. Mission Creek experienced average flows for October. BMID continued to release water from the upper watershed reservoirs to supplement Mission Creek flows;
8. BMID's Scotty Creek source, used for irrigation in the north-end, was closed for the year on August 24;
9. Well # 4 is the primary source of water for Scotty Creek. Well #5, used as a source for both domestic and irrigation water in the north-end of the system, was placed on stand-by until spring;
10. Well #6 supplies irrigation water in the north-end of the system was be placed on stand-by until spring;
11. *E. Coli* levels at Mission Creek's Point of Diversion averaged 25 counts per sample. The highest raw water *E. Coli* count was 170 on October 29, 2018;

12. *E. Coli* levels at the Distribution Intake, down-stream of the WTP, had zero counts on most samples throughout October, averaging < 1 count per sample, with a peak count of 1 on October 11, 2018;
13. No *E. Coli* or *Total Coliforms* were found in treated water in the distribution system through third-party analysis. In addition, no positive bacteria tests were found from the in-house presence-absence tests during routine testing;
14. The WTP remained in use through part of October as high colour in Mission Creek required treatment during this time. The WTP was shut-down Between October 13 and the October 18, 2018 break in main, as colour in the raw water was of adequate quality to bypass treatment;

1.0 FLOWS - OCTOBER, 2018

Maximum Daily Flow was on October 1, 2018 at 3,900,363 US gallons (14.76 ML)

Minimum Daily Flow was on October 24, 2018 at 62,985 US gallons (0.24 ML)

Mission Creek provided 96% of domestic flow throughout October.

Figure 1.1 - Domestic Water System Flow

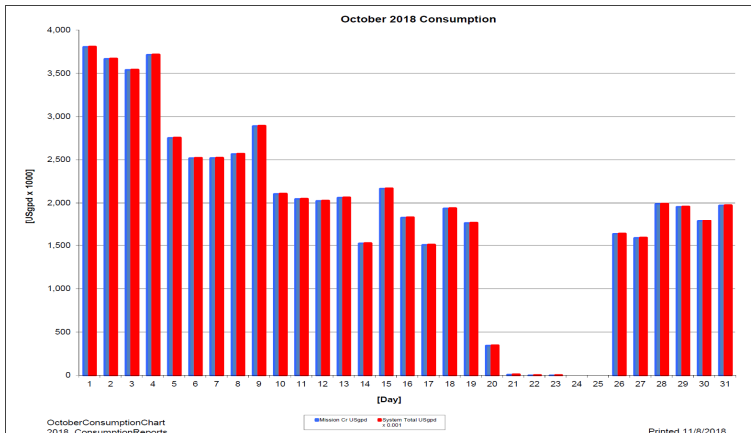


Table 1.2 - October, 2018 Daily Consumption Report

Year	Mission Cr	Well #4	Well #5	System Total	System Total
2018	Usrgpd	Usrgpd	Usrgpd	Usrgpd	ML/Day
1-Oct	3,805,000	95,363	0.0	3,900,363	14.76
2-Oct	3,667,000	80,224	0.0	3,747,224	14.18
3-Oct	3,540,000	112,559	0.0	3,652,559	13.82
4-Oct	3,714,000	79,037	0.0	3,793,037	14.36
5-Oct	2,754,000	150,537	0.0	2,904,537	10.99
6-Oct	2,520,000	94,426	0.0	2,614,426	9.90
7-Oct	2,522,000	100,572	0.0	2,622,572	9.93
8-Oct	2,568,000	0	0.0	2,568,000	9.72
9-Oct	2,891,000	99,606	0.0	2,990,606	11.32
10-Oct	2,106,000	92,282	0.0	2,198,282	8.32
11-Oct	2,047,000	0	0.0	2,047,000	7.75
12-Oct	2,025,000	81,323	0.0	2,106,323	7.97
13-Oct	2,063,000	101,852	0.0	2,164,852	8.19
14-Oct	1,523,000	72,841	0.0	1,595,841	6.04
15-Oct	2,167,000	112,271	0.0	2,279,271	8.63
16-Oct	1,833,000	69,205	0.0	1,902,205	7.20
17-Oct	1,506,000	110,581	0.0	1,616,581	6.12
18-Oct	1,938,000	88,889	0.0	2,026,889	7.67
19-Oct	1,759,000	70,135	0.0	1,829,135	6.92
20-Oct	344,000	102,395	0.0	446,395	1.69
21-Oct	9,000	102,396	0.0	111,396	0.42
22-Oct	1,000	92,547	0.0	93,547	0.35
23-Oct	1,000	95,097	0.0	96,097	0.36
24-Oct	0	62,985	0.0	62,985	0.24
25-Oct	0	111,511	0.0	111,511	0.42
26-Oct	1,633,000	41,668	0.0	1,674,668	6.34
27-Oct	1,586,000	81,806	0.0	1,667,806	6.31
28-Oct	1,990,000	84,527	0.0	2,074,527	7.85
29-Oct	1,957,000	106,317	0.0	2,063,317	7.81
30-Oct	1,783,000	25,659	0.0	1,808,659	6.85
31-Oct	1,973,000	38,578	0.0	2,011,578	7.61
Totals Usrgpd	58,225,000	2,557,189	0	60,782,189	230.06
Totals ML	220.38	9.68	0.00		
Avg's	1,875,067	7.10		1,959,020	7.41
Max	3,805,000	14.40		3,900,363	14.76
Min	0	0.00		62,985	0.24

2.0 RAW WATER QUALITY - BACTERIOLOGICAL MONITORING

Raw water samples were taken at three points at BMID settling ponds before chlorination

Samples were taken twice per week at the Distribution Intake's Point of Disinfection and at the Mission Creek raw water Point of Diversion; one sample is taken per week at Stevens Pond outlet (point halfway between WTP Outlet and Distribution Intake).

Samples from the previous month are also provided to show a two-month trend

The E.Coli readings clearly show the effectiveness in risk reduction from the Water Treatment Plant and extended settling times in Stevens and Hadden Reservoirs.

Figure 2.1 - E.Coli Readings (CARO Lab results) September 2018 - October 2018

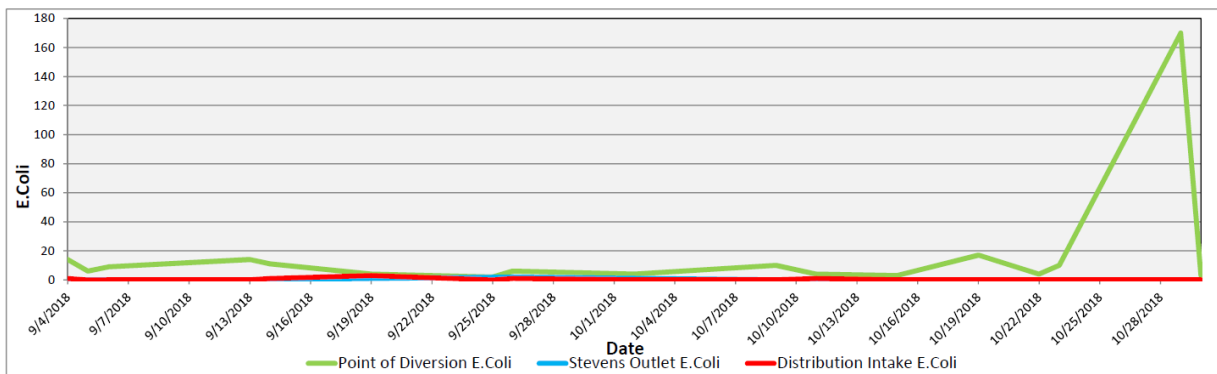


Table 2.2 - E.Coli Readings (CARO Labs)

Date	Point of Diversion E.Coli	Stevens Outlet E.Coli	Distribution Intake E.Coli
4-Sep-18	14	0	1
5-Sep-18	6	0	0
6-Sep-18	9	0	0
13-Sep-18	14	0	0
14-Sep-18	11	0	1
19-Sep-18	4	1	3
25-Sep-18	2	0	0
26-Sep-18	6	2	1
2-Oct-18	4	0	0
9-Oct-18	10	0	0
11-Oct-18	4	0	1
15-Oct-18	3	0	0
19-Oct-18	17	0	0
22-Oct-18	4	0	0
23-Oct-18	10	0	0
29-Oct-18	170	0	0
30-Oct-18	3	0	0

Stevens or WTP Intake (Raw) - Sampling of raw water at intake from Mission Creek

Stevens Outlet (Raw) - Sampling point after exiting 142,000 m³ 1st upper balancing reservoir (Stevens Res.)

Hadden Outlet (Raw) - Sampling point after exiting 75,000 m³ 2nd lower balancing reservoir (Hadden Res.)
(Hadden Outlet = Distribution Intake - Point of Disinfection)

3.0 RAW AND TREATED WATER TURBIDITY

Turbidity for the Mission Creek source was measured at Booster Station No. 1 on Gallagher's Road, the first-customer, through October 2018. The highest turbidity recorded at this location was 0.36 NTU on October 26, 2018. The average turbidity for the month was 0.27 NTU during October.

Figure 3.1 – Daily Turbidity Readings (Distribution Intake and Booster Station 1)

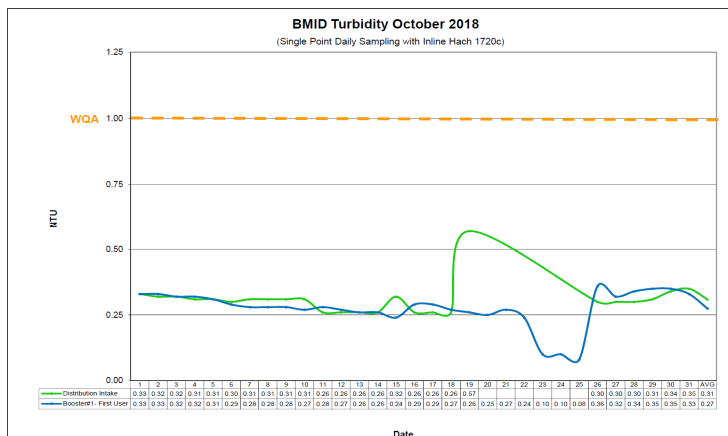


Table 3.2 - Daily Monitoring Record – Turbidity at Distribution Intake & Bst Stn 1

Turbidity Point Sampling for October 2018				
Date	Distribution Intake		Booster#1- First User	
	Sample Time	[NTU]	Sample Time	[NTU]
1	8:53 AM	0.33	8:01 AM	0.33
2	8:39 AM	0.32	7:46 AM	0.33
3	8:59 AM	0.32	7:56 AM	0.32
4	9:20 AM	0.31	8:21 AM	0.32
5	9:49 AM	0.31	8:28 AM	0.31
6	7:36 AM	0.30	7:06 AM	0.29
7	7:44 AM	0.31	7:20 AM	0.28
8	7:50 AM	0.31	7:26 AM	0.28
9	9:36 AM	0.31	8:43 AM	0.28
10	9:08 AM	0.31	8:00 AM	0.27
11	9:23 AM	0.26	7:54 AM	0.28
12	11:27 AM	0.26	9:16 AM	0.27
13	12:18 PM	0.26	11:48 AM	0.26
14	9:41 AM	0.26	9:14 AM	0.26
15	3:04 PM	0.32	2:00 PM	0.24
16	2:07 PM	0.26	1:20 PM	0.29
17	9:24 AM	0.26	8:52 AM	0.29
18	5:46 AM	0.26	11:46 AM	0.27
19	9:14 AM	0.57	8:40 AM	0.26
20			7:42 AM	0.25
21			7:55 AM	0.27
22			9:00 AM	0.24
23			7:58 AM	0.10
24			7:52 AM	0.10
25			8:41 AM	0.08
26	9:01 AM	0.30	7:51 AM	0.36
27	7:45 AM	0.30	7:20 AM	0.32
28	9:18 AM	0.30	8:46 AM	0.34
29	8:53 AM	0.31	8:07 AM	0.35
30	7:58 AM	0.34	7:36 AM	0.35
31	10:22 AM	0.35	7:59 AM	0.33
AVG		0.31		0.27

4.0 CHLORINE CONTACT TIME

Temperature, pH, current flow and chlorine residual levels are recorded to determine the CT levels that are required to provide 3 log inactivation of *Giardia*. Chlorine Contact times exceeded the CT levels required to provide 3 log (99.9%) inactivation of *Giardia Lamblia* throughout the month of October, 2018.

Figure 4.1 - CT Trending – BMID Mission Creek Source – October 2018

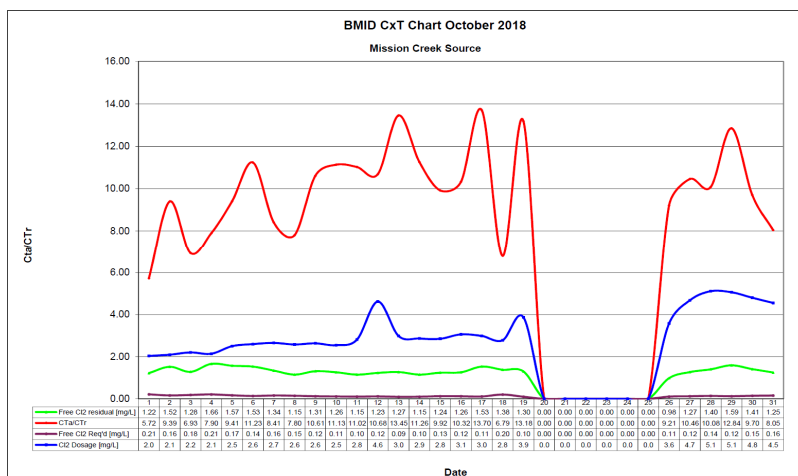


Table 4.2 - CT Table – Mission Creek Source

BMID October 2018													
Mission Creek Source													
DATE	pH	TEMP	PEAK	Free Cl ₂	CT	CT	CTa/CTr	Free Cl ₂	Cl ₂	VOLUME	TIME	FLOW	CL ₂ DOSAGE
	(highest)	(lowest)	FLOW	residual	achieved	req'd		Req'd	Dosage	TOTAL		PRESENT	PRESENT
October			[USgpm]	[mg/L]				[mg/L]	[mg/L]	[USgal]	[mins]	[USGPM]	[PPD]
1	7.39	11.8	4776	1.22	676.8	118.4	5.72	0.21	2.0	2649600	555	4002	98
2	7.43	12.0	3501	1.52	1150.4	122.5	9.39	0.16	2.1	2649600	757	2861	72
3	7.41	11.7	4047	1.28	838.0	121.0	6.93	0.18	2.2	2649600	655	2646	70
4	7.42	11.3	4292	1.66	1024.8	129.8	7.90	0.21	2.1	2649600	617	2061	53
5	7.43	10.9	3330	1.57	1249.2	132.8	9.41	0.17	2.5	2649600	796	2498	75
6	7.46	10.9	2698	1.53	1502.6	133.7	11.23	0.14	2.6	2649600	982	1827	57
7	7.49	10.9	3186	1.34	1114.4	132.5	8.41	0.16	2.7	2649600	832	1411	45
8	7.49	10.6	2952	1.15	1032.2	132.3	7.80	0.15	2.6	2649600	898	1839	57
9	7.47	10.2	2377	1.31	1460.2	137.7	10.61	0.12	2.6	2649600	1115	1707	54
10	7.48	10.2	2184	1.26	1528.6	137.4	11.13	0.11	2.5	2649600	1213	2028	62
11	7.47	10.0	2020	1.15	1508.4	136.9	11.02	0.10	2.8	2649600	1312	1392	47
12	7.48	10.0	2199	1.23	1482.0	138.8	10.68	0.12	4.6	2649600	1205	2055	114
13	7.49	10.4	1838	1.27	1830.8	136.1	13.45	0.09	3.0	2649600	1442	1256	45
14	7.49	10.2	1991	1.15	1530.4	136.0	11.26	0.10	2.9	2649600	1331	1512	52
15	7.49	10.1	2393	1.24	1373.0	138.5	9.92	0.13	2.8	2649600	1107	1577	54
16	7.49	9.7	2266	1.26	1473.3	142.7	10.32	0.12	3.1	2649600	1169	1198	44
17	7.48	9.5	1994	1.53	2033.0	148.4	13.70	0.11	3.0	2649600	1329	1367	49
18	7.48	9.1	3584	1.38	1020.2	150.3	6.79	0.20	2.8	2649600	739	1856	62
19	7.48	9.0	1743	1.30	1976.2	150.0	13.18	0.10	3.9	2649600	1520	602	28
20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
21	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
22	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
23	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
26	7.48	9.1	1976	0.98	1314.1	142.8	9.21	0.11	3.6	2649600	1341	1676	72
27	7.50	8.7	2094	1.27	1607.0	153.7	10.46	0.12	4.7	2649600	1265	1442	81
28	7.52	8.2	2264	1.40	1638.4	162.6	10.08	0.14	5.1	2649600	1170	1744	107
29	7.51	7.9	1945	1.59	2166.0	168.6	12.84	0.12	5.1	2649600	1362	1251	76
30	7.53	8.1	2342	1.41	1595.2	164.5	9.70	0.15	4.8	2649600	1131	1058	61
31	7.54	7.9	2504	1.25	1322.7	164.4	8.05	0.16	4.5	2649600	1058	1610	88
Averages	7.48	9.94	2660	1.33	1417.92	141.29	9.97	0.14	3.22				

5.0 WATER DISTRIBUTION SAMPLING (TREATED)

Third Party Analysis (CARO Analytical Services)

- Samples taken once per week at ten locations around the BMID service area
- 36 samples were found to be absent of Coliforms.
- 36 samples were found to be absent of *E. Coli*.

Table 5.1 - CARO Independent Lab Testing – Total Coliforms – E.Coli

Date	PRV 7		Booster 1		Elison Blow-Off		Elison School		612 Adams Rd		3976 Highway 97		Prospect Reservoir		Tower Reservoir		Well #5		Well #4		Kirschner Res	
	Coliforms	E.coli	Coliforms	E.coli	Coliforms	E.coli	Coliforms	E.coli	Coliforms	E.coli	Coliforms	E.coli	Coliforms	E.coli	Coliforms	E.coli	Coliforms	E.coli	Coliforms	E.coli	Coliforms	E.coli
4-Sep-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-
6-Sep-18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8-Sep-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	0
13-Sep-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	0
19-Sep-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	0
26-Sep-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	0
9-Oct-18	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	0	0	0
15-Oct-18	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	0	0	0
22-Oct-18	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	0	0	0
29-Oct-18	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	0	0	0

In-House Analysis (BMID Staff)

- Presence/Absence samples taken on a three week cycle at ten sites around the BMID service area.
- All samples were found to be absent of both Total Coliforms and *E. Coli*.

Table 5.2 - BMID In-house Testing – Presence Absence

Location	10/1/2018				10/9/2018				10/15/2018				10/22/2018				10/29/2018			
	Cl2	Temp.	Pres.	Abs.	Cl2	Temp.	Pres.	Abs.	Cl2	Temp.	Pres.	Abs.	Cl2	Temp.	Pres.	Abs.	Cl2	Temp.	Pres.	Abs.
Sylvania Cres	1.04	13.0	-	X	0.77	9.0	-	X	0.78	15.0	-	X	0.10	13.0	-	X	1.06	11.2	-	X
170 Kneller Rd																				
2105 Morrison	1.02	14.0	-	X	0.45	11.6	-	X	0.20	14.4	-	X	0.28	12.0	-	X	0.09	12.0	-	X
Pearson School																				
Staymen Rd					0.47	10.0	-	X	0.43	12.0	-	X	NA	NA	NA	NA	0.04	13.8	-	X
PRV #10	1.13	12.0	-	X																
260 Campion Rd					0.83	10	-	X	0.43	12.0	-	X								
Fenwick Rd																				
2931 Belgo Rd					0.83	10	-	X	0.43	12.0	-	X								
Solly Ct																				

- BMID Population = 22,550

RECOMMENDED TESTS

- Recommended number of samples per month = 22
(as per Guide for Canadian Drinking Water Quality)

ACTUAL TESTS

- Total tests by BMID staff (presence/absence) = 15
- Total tests sampled by BMID and tested by Caro Labs = 36
- Total tests sampled in BMID treated distribution system = 51 (Zero Positive Samples)