



MONTHLY REPORTING PERIOD - JUNE, 2018

1. SUMMARY

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

June 2018		
Source	Total (US Gals)	Total (Mega Litres)
Mission Creek	515,332,000	1,950.53
Well 4	0	0
Well 5	41,770,641	158.10
Well 6	17,101,342	64.73
Scotty Creek (Irrigation Only)	1,992,900	7.54
Total	576,196,883	2180.90

1. A malfunctioning valve, used to regulate the flow between Stevens and Hadden Reservoirs, required repairs in late May. As a result, BMID was forced to utilize Hadden Reservoir's Mission Creek intake as the primary supply source for the distribution system. Hadden Reservoir's intake remained in use until June 8 when BMID reverted back to its primary water intake upstream of the Water Treatment Plant;
2. The Water Treatment Plant was turned off and Stevens Reservoir was drained, beginning May 23, to facilitate the required valve repair at Stevens Reservoir outlet. The WTP resumed normal operations on June 6, 2018;
3. Due to poor water quality in Mission Creek entering directly into Hadden Reservoir, BMID was forced to issue a Boil Water Notice beginning May 23, and ending on June 8 2018;
4. As a result of poor water quality remaining in the distribution system, a Water Quality Advisory was issued on June 8 and remained in place until June 15 when good water quality was ensured throughout the distribution system;
5. A leak in BMID's primary transmission main was detected on June 22. BMID immediately began to turn off all irrigation services and notify all customers to stop outdoor watering so the main could be partially drained and repaired. The main was repaired and brought back into service on June 25;
6. During the transmission main leak, BMID utilized cross-ties with Rutland Water Works and Glenmore Ellison Irrigation District, along with reduced flows from Mission Creek, to maintain an adequate supply of domestic water for all BMID customers;
7. BMID began to utilize a new well (Well #6) in the north-end of the district. Well #6 will be used for irrigation only. Well #5 will continue to be used for both irrigation and domestic purposes;

8. Turbidity levels at the Distribution Intake reached 4.13 NTU on June 1, during the Boil Water Notice. After the WTP was back on-line turbidity remained below 1.0 NTU from June 12 to the end of the month;
9. The highest monthly turbidity level recorded at the first customer (Booster #1) was 4.04 NTU on June 1, 2018 during the BWN;
10. Mission Creek experienced average flows for spring freshet during June. However, rain events resulted in several high-flow events and isolated flooding;
11. BMID's Scotty Creek source, used for irrigation in the north-end, resumed operations on May 3, 2018;
12. Well #5 was used throughout June as a source for both domestic and irrigation water in the north-end of the system, in conjunction with Mission Creek system water, as determined by usage and pressures in the area;
13. *E.Coli* levels at Mission Creek's Point of Diversion averaged 14 counts per sample. The highest raw water *E.Coli* count was 49 on June 27, 2018;
14. *E.Coli* levels at the Distribution Intake had low counts on all samples throughout early June, averaging five counts per sample, however a peak count of 13 occurred on June 7, 2018;
15. No *E.Coli* and no *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;
16. BMID's Water Treatment Plant resumed normal operations on March 15, 2018. The WTP was temporarily shut down to facilitate the valve repair at Stevens Reservoir on May 23, 2018. The plant remained off-line until June 6. The WTP will remain in use throughout the spring and summer until the Mission Creek water source is of sufficient quality to by-pass treatment;

1.0 FLOWS - JUNE, 2018

Maximum est. Daily Flow was on June 19, 2018 at 31,315,481 US gallons (118.53 ML)

Minimum est. Daily Flow was on June 24, 2018 at 7,108,662 US gallons (26.91 ML)

Mission Creek provided 89% of domestic flow throughout June.

Figure 1.1 - Domestic Water System Flow

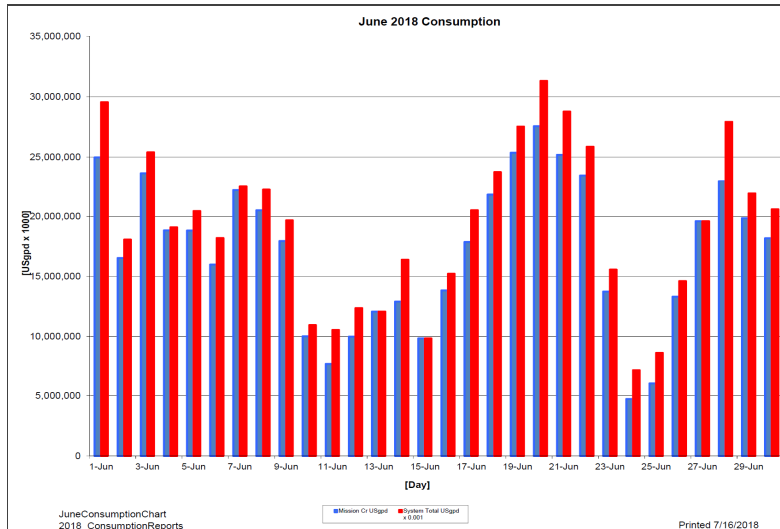


Table 1.2 - June, 2018 Daily Consumption Report

Year	Mission Cr	Well #4	Well #5	Well #6	Scotty Crk	System Total	System Total
2018	Usrgpd	Usrgpd	Usrgpd	Usrgpd	Usrgpd	Usrgpd	ML/Day
1-Jun	24,973,000	0	4,443,148	0	140,700	29,556,848	111.87
2-Jun	16,530,000	0	1,418,278	0	115,100	18,063,378	68.37
3-Jun	23,657,000	0	1,605,114	0	133,900	25,396,014	96.12
4-Jun	18,827,000	0	171,491	0	85,000	19,083,491	72.23
5-Jun	18,816,000	0	1,527,771	0	100,100	20,443,871	77.38
6-Jun	15,985,000	0	2,109,894	0	105,500	18,200,394	68.89
7-Jun	22,193,000	0	201,651	0	106,900	22,501,551	85.17
8-Jun	20,508,000	0	1,601,171	0	115,500	22,224,671	84.12
9-Jun	17,946,000	0	1,618,446	0	107,600	19,672,046	74.46
10-Jun	10,008,000	0	918,632	0	19,800	10,946,432	41.43
11-Jun	7,626,000	0	2,915,710	0	0	10,541,710	39.90
12-Jun	9,985,000	0	2,382,651	0	0	12,367,651	46.81
13-Jun	12,066,000	0	0	0	0	12,066,000	45.67
14-Jun	12,902,000	0	3,480,440	0	9,700	16,392,140	62.04
15-Jun	9,832,000	0	0	0	0	9,832,000	37.21
16-Jun	13,832,000	0	199,264	1,188,732	300	15,220,296	57.61
17-Jun	17,865,000	0	1,461,856	1,186,423	200	20,513,479	77.64
18-Jun	21,807,000	0	768,448	1,095,975	91,300	23,762,723	89.94
19-Jun	25,361,000	0	1,031,106	1,041,251	101,000	27,534,357	104.22
20-Jun	27,558,000	0	2,199,720	1,391,461	166,300	31,315,481	118.53
21-Jun	25,190,000	0	2,430,170	998,168	156,900	28,775,238	108.91
22-Jun	23,469,000	0	1,137,029	1,103,407	152,000	25,861,436	97.89
23-Jun	13,733,000	0	804,812	894,705	126,600	15,559,117	58.89
24-Jun	4,722,000	0	1,234,948	1,068,674	83,000	7,108,622	26.91
25-Jun	6,011,000	0	1,112,714	1,430,615	75,500	8,629,829	32.66
26-Jun	13,308,000	0	0	1,301,271	0	14,609,271	55.30
27-Jun	19,600,000	0	0	0	0	19,600,000	74.19
28-Jun	22,995,000	0	2,635,603	2,292,511	0	27,923,114	105.69
29-Jun	19,850,000	0	1,099,500	960,491	0	21,909,991	82.93
30-Jun	18,177,000	0	1,261,074	1,147,658	0	20,585,732	77.92
Totals Usrgpd	515,332,000	0	41,770,641	17,101,342	1,992,900	576,196,883	2180.91
Totals ML	1,950.53	0.00	158.10	64.73	7.54		
Avg's	17,177,733	65.02				19,206,563	72.70
Max	27,558,000	104.31				31,315,481	118.53
Min	4,722,000	17.87				7,108,622	26.91

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

Figure 2.1 - E.Coli Readings (CARO Lab results) May 2018 - June 2018

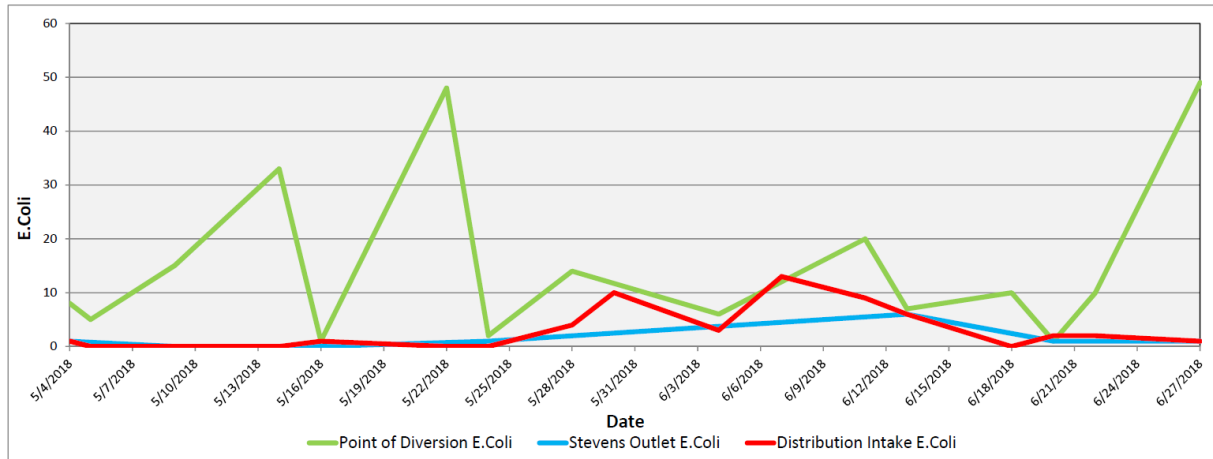


Table 2.2 - E.Coli Readings (CARO Labs)

Date	Point of Diversion E.Coli	Stevens Outlet E.Coli	Distribution Intake E.Coli
4-May-18	8	1	1
5-May-18	5	0	0
9-May-18	15	0	0
14-May-18	33	0	0
16-May-18	1	0	1
22-May-18	48	1	0
24-May-18	2	1	0
28-May-18	14		4
30-May-18			10
4-Jun-18	6		3
7-Jun-18	12		13
11-Jun-18	20		9
13-Jun-18	7	6	6
18-Jun-18	10		0
20-Jun-18	1	1	2
22-Jun-18	10		2
27-Jun-18	49	1	1

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 June 2018. The highest turbidity recorded at this location was 4.04 NTU on June 1, 2018.

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

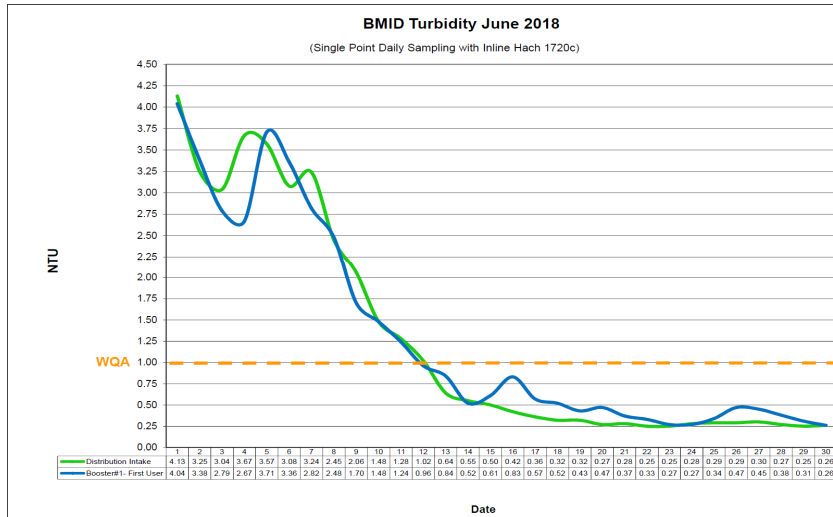


Table 3.2 - Daily Monitoring Record – Turbidity at Distribution Intake & Bst Stn 1

Turbidity Point Sampling for June 2018				
Date	Distribution Intake		Booster#1- First User	
	Sample Time	[NTU]	Sample Time	[NTU]
1	10:47 AM	4.13	12:40 PM	4.04
2	7:13 AM	3.25	6:44 AM	3.38
3	8:20 AM	3.04	7:50 AM	2.79
4	12:00 AM	3.67	10:39 AM	2.67
5	1:00 PM	3.57	1:00 AM	3.71
6	8:43 AM	3.08	7:43 AM	3.36
7	8:25 AM	3.24	7:51 AM	2.82
8	8:47 AM	2.45	8:06 AM	2.48
9	5:38 AM	2.06	12:38 PM	1.70
10	12:20 PM	1.48	11:49 AM	1.48
11	8:56 AM	1.28	8:03 AM	1.24
12	8:36 AM	1.02	7:56 AM	0.96
13	8:55 AM	0.64	8:16 AM	0.84
14	11:45 AM	0.55	11:08 AM	0.52
15	9:17 AM	0.50	8:37 AM	0.61
16	7:56 AM	0.42	7:25 AM	0.83
17	8:00 AM	0.36	7:34 AM	0.57
18	8:57 AM	0.32	8:07 AM	0.52
19	11:35 AM	0.32	8:17 AM	0.43
20	8:29 AM	0.27	7:50 AM	0.47
21	8:37 AM	0.28	7:54 AM	0.37
22	8:56 AM	0.25	7:54 AM	0.33
23	6:37 AM	0.25	5:57 AM	0.27
24	8:29 AM	0.28	7:45 AM	0.27
25	9:21 AM	0.29	8:20 AM	0.34
26	8:44 AM	0.29	8:13 AM	0.47
27	8:56 AM	0.30	8:08 AM	0.45
28	8:46 AM	0.27	8:05 AM	0.38
29	8:47 AM	0.25	8:05 AM	0.31
30	9:35 AM	0.26	9:00 AM	0.26
AVG		1.28		1.30

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 June, 2018.

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

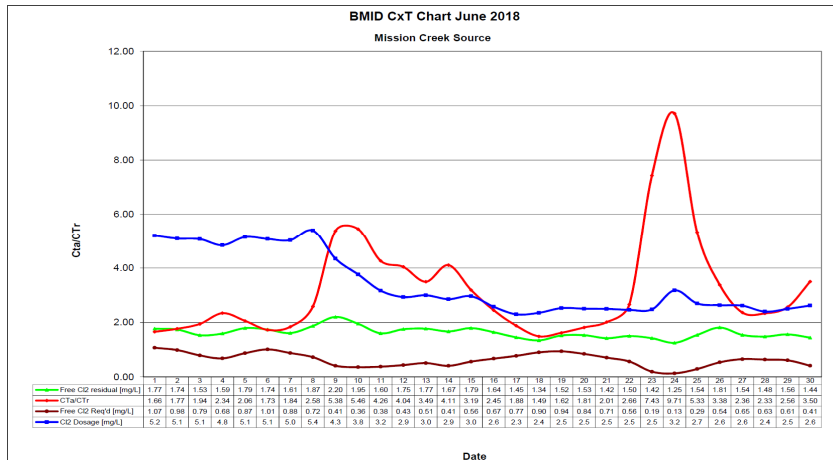


Table 4.2 - CT Table – Mission Creek Source

BMID June 2018													
Mission Creek Source													
DATE	pH (highest)	TEMP (lowest)	PEAK FLOW	Free Cl2 residual	CT achieved	CT req'd	CTa/CTr	Free Cl2 Req'd	Cl2 Dosage	VOLUME TOTAL	TIME	FLOW PRESENT	CL2 DOSAGE PRESENT
June		[°C]	[Usgpm]	[mg/L]				[mg/L]	[mg/L]	[USgal]	[mins]	[USGPM]	[PPD]
1	6.82	8.1	21739	1.77	215.7	130.3	1.66	1.07	5.2	2649600	122	13460	841
2	6.85	9.9	22464	1.74	205.2	116.2	1.77	0.98	5.1	2649600	118	14497	887
3	6.85	10.2	18696	1.53	216.8	111.6	1.94	0.79	5.1	2649600	142	14413	878
4	6.82	9.2	15105	1.59	278.9	119.2	2.34	0.68	4.8	2649600	175	8490	494
5	6.81	9.4	19435	1.79	244.0	118.7	2.06	0.87	5.1	2649600	136	11967	740
6	6.85	8.8	21241	1.74	217.0	125.8	1.73	1.01	5.1	2649600	125	15057	918
7	6.87	10.4	20763	1.61	205.5	111.8	1.84	0.88	5.0	2649600	128	15120	914
8	6.83	10.9	17651	1.87	280.7	108.7	2.58	0.72	5.4	2649600	150	11781	764
9	6.77	13.0	11517	2.20	506.1	94.0	5.38	0.41	4.3	2649600	230	9664	505
10	6.90	12.5	9411	1.95	549.0	100.6	5.46	0.36	3.8	2649600	282	6542	296
11	6.96	11.9	9541	1.60	444.3	104.2	4.26	0.38	3.2	2649600	278	5677	216
12	6.95	11.6	10676	1.75	434.3	107.5	4.04	0.43	2.9	2649600	248	7469	263
13	6.94	11.7	12606	1.77	372.0	106.5	3.49	0.51	3.0	2649600	210	8747	315
14	6.97	11.4	9885	1.67	447.6	109.0	4.11	0.41	2.9	2649600	268	5716	196
15	6.98	11.5	13534	1.79	350.4	109.8	3.19	0.56	3.0	2649600	196	7899	281
16	7.05	12.3	16856	1.64	257.8	105.3	2.45	0.67	2.6	2649600	157	11668	361
17	7.07	12.5	19928	1.45	192.8	102.8	1.88	0.77	2.3	2649600	133	13482	372
18	7.12	13.1	24032	1.34	147.7	99.3	1.49	0.90	2.4	2649600	110	14683	415
19	7.13	14.2	26440	1.52	152.3	94.1	1.62	0.94	2.5	2649600	100	19507	592
20	7.09	15.3	25993	1.53	156.0	86.0	1.81	0.84	2.5	2649600	102	18252	549
21	7.08	16.2	23525	1.42	159.9	79.6	2.01	0.71	2.5	2649600	113	17298	519
22	7.06	16.2	18791	1.50	211.5	79.6	2.66	0.56	2.5	2649600	141	14206	420
23	7.05	15.9	6304	1.42	596.8	80.3	7.43	0.19	2.5	2649600	420	6115	182
24	7.02	15.2	4171	1.25	794.1	81.8	9.71	0.13	3.2	2649600	635	3064	117
25	6.99	16.8	10253	1.54	398.0	74.6	5.33	0.29	2.7	2649600	258	5370	174
26	7.00	16.4	17986	1.81	266.6	78.9	3.38	0.54	2.6	2649600	147	10054	318
27	6.98	15.9	21826	1.54	187.0	79.1	2.36	0.65	2.6	2649600	121	13850	435
28	6.93	15.4	21055	1.48	186.2	79.9	2.33	0.63	2.4	2649600	126	14935	430
29	6.92	14.3	18645	1.56	221.7	86.6	2.56	0.61	2.5	2649600	142	12070	362
30	6.91	16.5	14906	1.44	256.0	73.1	3.50	0.41	2.6	2649600	178	9028	284
Averages	6.95	12.89		1.627	305.074	98.5	3.21	0.63	3.40599				

5.0 WATER DISTRIBUTION SAMPLING (TREATED)

Third Party Analysis (CARO Analytical Services)

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

Table 5.1 - CARO Independent Lab

Date	PRV 7		Booster 1		Elison Blow-Off		Elison School		612 Adams Rd		3976 Highway 97		Prospect Reservoir		Tower Reservoir		Well #5	
	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-May-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
8-May-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
16-May-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
24-May-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
30-May-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
6-Jun-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
13-Jun-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20-Jun-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27-Jun-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Testing – Total Coliforms – E.Coli

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	6/4/2018				6/11/2018				6/18/2018				6/25/2018			
	Cl2	Temp.	Pres.	Abs.	Cl2	Temp.	Pres.	Abs.	Cl2	Temp.	Pres.	Abs.	Cl2	Temp.	Pres.	Abs.
Sylvania Cres									0.42	17.0	-	X				
170 Kneller Rd	0.48	13.8	-	X									1.24	16.4	-	X
2105 Morrison									1.34	16.4	-	X				
Pearson School					1.25	17.0	-	X								
Staymen Rd	0.76	14.4	-	X									0.76	16.8	-	X
PRV #10									1.30	14.4	-	X				
260 Campion Rd					0.04	16.0	-	X								
Fenwick Rd	0.04	15.2	-	X									0.99	14.0	-	X
2931 Belgo Rd					1.23	14.0	-	X								
Solly Ct					1.32	15	-	X								

- 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) = 13
- Total tests sampled by BMID and tested by Caro Labs = 35
- Total tests sampled in BMID treated distribution system = 48 (Zero Positive Samples)