



## MONTHLY REPORTING PERIOD - JULY, 2018

### 1. SUMMARY

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

July 2018		
Source	Total (US Gals)	Total (Mega Litres)
Mission Creek	709,146,000	2,684.12
Well 4	0	0
Well 5	39,095,627	147.98
Well 6 (Irrigation Only)	34,657,627	131.18
Scotty Creek (Irrigation Only)	2,969,100	11.24
Total	785,868,076	2,974.51

1. Turbidity levels at the Distribution Intake peaked at 0.28 NTU on July 20 and 21. Average turbidity for July was 0.23 NTU;
2. The highest monthly turbidity level recorded at the first customer (Booster #1) was 0.32 NTU on July 20. Average monthly turbidity was 0.25 NTU for July;
3. Mission Creek experienced average flows for July. However, long periods of hot dry weather required BMID to release water from the upper watershed reservoirs to supplement Mission Creek flows;
4. BMID's Scotty Creek source, used for irrigation in the north-end, resumed operations on May 3, 2018 and will be in use for the remainder of the summer;
5. Well #5 was used throughout July 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;
6. Well #6 was used as an irrigation source throughout July. Well #6 supplies irrigation water in the north-end of the system and will be utilized throughout the irrigation season;
7. *E. Coli* levels at Mission Creek's Point of Diversion averaged almost 29 counts per sample. The highest raw water *E. Coli* count was 40 on July 16, 2018;
8. *E. Coli* levels at the Distribution Intake, down-stream of the WTP, had low counts on all samples throughout July, averaging just over one count per sample, with a peak count of 3 on July 23 and 30, 2018;
9. 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;
10. BMID's Water Treatment Plant resumed normal operations on March 15, 2018. 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;

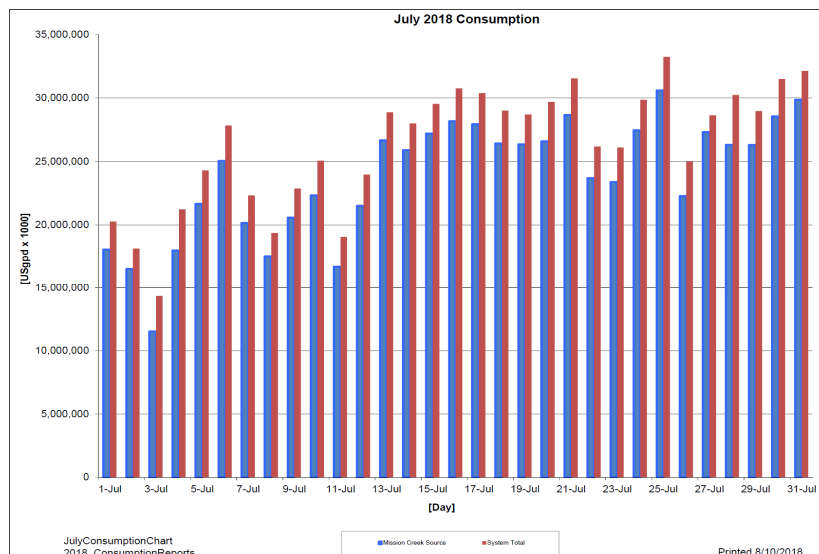
## 1.0 FLOWS - JULY, 2018

Maximum est. Daily Flow was on July 25, 2018 at 33,220,350 US gallons (125.74 ML)

Minimum est. Daily Flow was on July 3, 2018 at 14,328,131 US gallons (54.23 ML)

Mission Creek provided 95% of domestic flow throughout July.

**Figure 1.1 - Domestic Water System Flow**



**Table 1.2 - July, 2018 Daily Consumption Report**

Year	Mission Cr	Well #4	Well #5	Well #6	Scotty Crk	System Total	System Total
2018	Usgpd	Usgpd	Usgpd	Usgpd	Usgpd	Usgpd	ML/Day
1-Jul	18,053,000	0	1,000,000.0	1,209,249.0	0.0	20,262,249	76.69
2-Jul	16,533,000	0	532,791.0	1,064,834.0	0.0	18,130,625	68.62
3-Jul	11,525,000	0	793,344.0	1,968,687.0	41,100.0	14,328,131	54.23
4-Jul	17,992,000	0	2,131,642.0	1,071,170.0	23,100.0	21,217,912	80.31
5-Jul	21,656,000	0	1,496,543.0	1,076,078.0	66,200.0	24,294,821	91.96
6-Jul	25,040,000	0	1,496,543.0	1,109,524.0	179,100.0	27,825,167	105.32
7-Jul	20,154,000	0	1,015,215.0	1,040,901.0	113,000.0	22,323,116	84.49
8-Jul	17,523,000	0	675,880.0	1,105,886.0	62,100.0	19,366,866	73.30
9-Jul	20,575,000	0	1,086,691.0	1,127,140.0	73,800.0	22,862,631	86.54
10-Jul	22,321,000	0	1,543,111.0	1,057,354.0	124,500.0	25,045,965	94.80
11-Jul	16,705,000	0	1,126,310.0	1,131,238.0	89,400.0	19,051,948	72.11
12-Jul	21,504,000	0	1,337,789.0	1,035,362.0	86,400.0	23,963,551	90.70
13-Jul	26,657,000	0	1,126,463.0	1,002,393.0	71,800.0	28,857,656	109.23
14-Jul	25,881,000	0	942,828.0	1,108,307.0	46,900.0	27,979,035	105.90
15-Jul	27,193,000	0	1,040,495.0	1,255,170.0	38,900.0	29,527,565	111.76
16-Jul	28,159,000	0	1,241,481.0	1,294,209.0	47,500.0	30,742,190	116.36
17-Jul	27,929,000	0	1,308,024.0	1,064,121.0	77,300.0	30,378,445	114.98
18-Jul	26,412,000	0	1,467,312.0	1,015,497.0	101,100.0	28,995,909	109.75
19-Jul	26,345,000	0	1,171,255.0	1,076,133.0	94,600.0	28,686,988	108.58
20-Jul	26,580,000	0	1,943,974.0	1,057,650.0	100,900.0	29,682,524	112.35
21-Jul	28,647,000	0	1,570,959.0	1,200,812.0	106,900.0	31,525,671	119.32
22-Jul	23,678,000	0	1,342,976.0	1,022,168.0	118,700.0	26,161,844	99.02
23-Jul	23,374,000	0	1,485,439.0	1,129,652.0	100,300.0	26,089,391	98.75
24-Jul	27,443,000	0	1,347,940.0	929,877.0	120,400.0	29,841,217	112.95
25-Jul	30,579,000	0	1,410,987.0	1,091,363.0	139,000.0	33,220,350	125.74
26-Jul	22,267,000	0	1,424,781.0	1,171,254.0	136,300.0	24,999,335	94.62
27-Jul	27,301,000	0	0.0	1,196,036.0	130,300.0	28,627,336	108.35
28-Jul	26,295,000	0	2,930,501.0	878,580.0	118,000.0	30,222,081	114.39
29-Jul	26,288,000	0	1,466,481.0	1,021,236.0	187,800.0	28,963,517	109.63
30-Jul	28,537,000	0	1,637,872.0	1,094,324.0	213,000.0	31,482,196	119.16
31-Jul	29,848,000	0	1,057,421.0	1,051,144.0	160,700.0	32,117,265	121.56
Totals Usgpd	709,146,000	0	39,095,627	34,657,349	2,969,100	785,868,076	2974.51
Totals ML	2,684.12	0.00	147.98	131.18	11.24		
Avg's	23,638,200	89.47				26,155,208	99.00
Max	30,579,000	115.74				33,220,350	125.74
Min	11,525,000	43.62				14,328,131	54.23

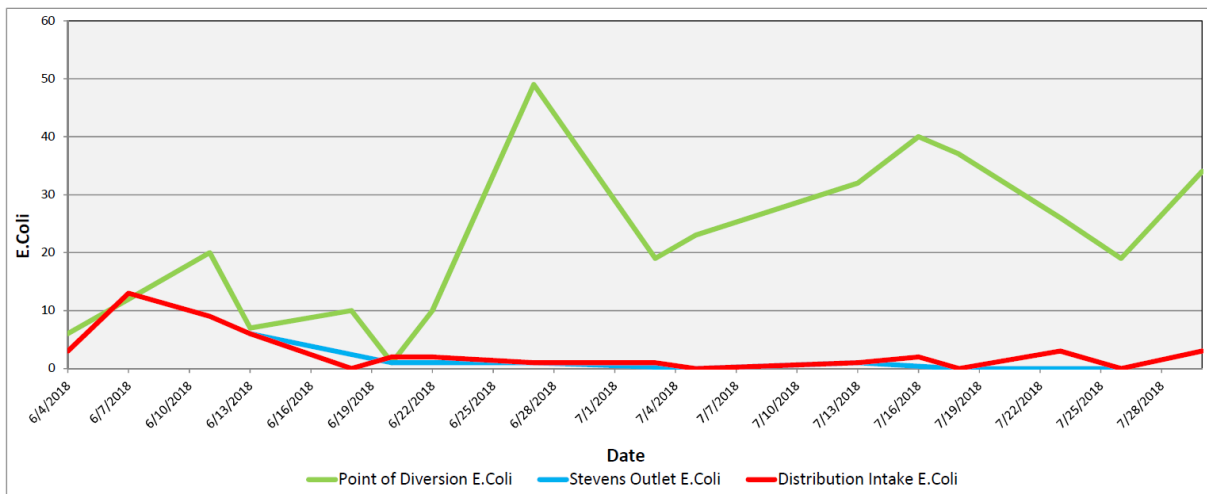
## 2.0 RAW WATER QUALITY - BACTERIOLOGICAL MONITORING

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) June 2018 - July 2018**



**Table 2.2 - E.Coli Readings (CARO Labs)**

Date	Point of Diversion E.Coli	Stevens Outlet E.Coli	Distribution Intake E.Coli
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
3-Jul-18	19		1
5-Jul-18	23	0	0
13-Jul-18	32	1	1
16-Jul-18	40		2
18-Jul-18	37	0	0
23-Jul-18	26		3
26-Jul-18	19	0	0
30-Jul-18	34		3

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

Stevens Outlet (Raw) - Sampling point after exiting 142,000 m<sup>3</sup> 1<sup>st</sup> upper balancing reservoir (Stevens Res.)

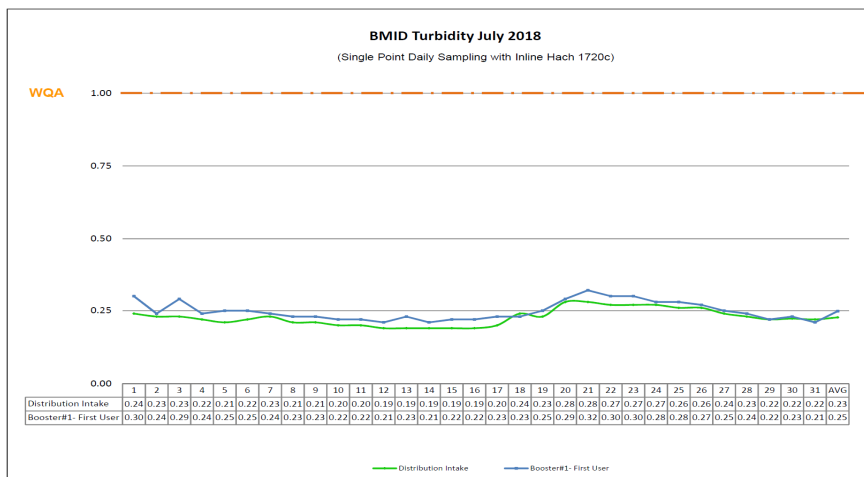
Hadden Outlet (Raw) - Sampling point after exiting 75,000 m<sup>3</sup> 2<sup>nd</sup> lower balancing reservoir (Hadden Res.)

(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 July 2018. The highest turbidity recorded at this location was 0.32 NTU on July 21, 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 July 2018				
Date	Distribution Intake		Booster#1- First User	
	Sample Time	[NTU]	Sample Time	[NTU]
1	1:01 PM	0.24	12:10 PM	0.30
2	12:49 PM	0.23	12:40 PM	0.24
3	9:03 AM	0.23	7:47 AM	0.29
4	8:38 AM	0.22	8:08 AM	0.24
5	8:08 AM	0.21	7:40 AM	0.25
6	8:27 AM	0.22	7:45 AM	0.25
7	8:46 AM	0.23	8:08 AM	0.24
8	8:51 AM	0.21	8:39 AM	0.23
9	8:28 AM	0.21	7:48 AM	0.23
10	8:12 AM	0.20	7:41 AM	0.22
11	8:24 AM	0.20	7:58 AM	0.22
12	8:11 AM	0.19	7:41 AM	0.21
13	8:23 AM	0.19	7:55 AM	0.23
14	7:42 AM	0.19	7:12 AM	0.21
15	7:33 AM	0.19	7:04 AM	0.22
16	8:41 AM	0.19	8:04 AM	0.22
17	8:21 AM	0.20	7:53 AM	0.23
18	8:38 AM	0.24	7:59 AM	0.23
19	8:26 AM	0.23	7:57 AM	0.25
20	8:54 AM	0.28	7:58 AM	0.29
21	12:04 PM	0.28	11:27 AM	0.32
22	11:31 AM	0.27	11:01 AM	0.30
23	8:42 AM	0.27	8:03 AM	0.30
24	8:24 AM	0.27	7:56 AM	0.28
25	11:41 AM	0.26	12:07 PM	0.28
26	8:28 AM	0.26	7:55 AM	0.27
27	8:41 AM	0.24	8:07 AM	0.25
28	8:30 AM	0.23	8:05 AM	0.24
29	8:02 AM	0.22	7:42 AM	0.22
30	8:24 AM	0.22	7:49 AM	0.23
31	10:05 AM	0.22	9:14 AM	0.21
AVG		0.23		0.25

## 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 July, 2018.

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

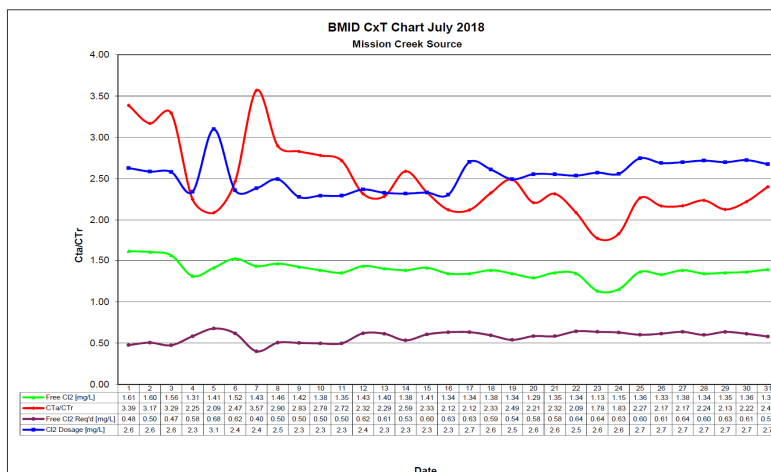


Table 4.2 - CT Table – Mission Creek Source

BMID July 2018 Mission Creek Source													
DATE	pH (highest)	TEMP (lowest)	PEAK FLOW	Free Cl <sub>2</sub> [mg/L]	CT achieved	CT req'd	CTa/CTr	Free Cl <sub>2</sub> Req'd [mg/L]	Cl <sub>2</sub> Dosage [mg/L]	VOLUME TOTAL [USgal]	TIME [mins]	FLOW PRESENT [USGPM]	CL <sub>2</sub> DOSAGE PRESENT [PPD]
July		[°C]	[USgpm]										
1	6.94	14.3	14370	1.61	296.9	87.7	3.39	0.48	2.6	2649600	184	11271	356
2	6.90	14.2	15411	1.60	275.1	86.8	3.17	0.50	2.6	2649600	172	8690	270
3	6.99	14.2	14017	1.56	294.9	89.6	3.29	0.47	2.6	2649600	189	10386	322
4	7.07	14.3	17263	1.31	201.1	89.3	2.25	0.58	2.3	2649600	153	12585	354
5	7.07	14.8	20516	1.41	182.1	87.2	2.09	0.68	3.1	2649600	129	15930	593
6	7.06	15.7	19775	1.52	203.7	82.6	2.47	0.62	2.4	2649600	134	16830	477
7	7.06	16.2	13433	1.43	282.1	79.0	3.57	0.40	2.4	2649600	197	9356	268
8	7.11	16.9	17345	1.46	223.0	77.0	2.90	0.50	2.5	2649600	153	14352	430
9	7.14	17.4	17755	1.42	211.9	74.9	2.83	0.50	2.3	2649600	149	15416	422
10	7.13	17.7	18070	1.38	202.3	72.8	2.78	0.50	2.3	2649600	147	12919	356
11	7.20	17.2	17074	1.35	209.5	77.1	2.72	0.50	2.3	2649600	155	13382	369
12	7.23	17.5	21237	1.43	178.4	77.0	2.32	0.62	2.4	2649600	125	15917	453
13	7.23	18.1	22037	1.40	168.3	73.6	2.29	0.61	2.3	2649600	120	17545	491
14	7.23	19.2	20742	1.38	176.3	68.1	2.59	0.53	2.3	2649600	128	18910	527
15	7.28	18.4	21768	1.41	171.6	73.5	2.33	0.60	2.3	2649600	122	17956	503
16	7.33	18.4	22497	1.34	157.8	74.3	2.12	0.63	2.3	2649600	118	18122	502
17	7.33	18.6	22830	1.34	155.5	73.3	2.12	0.63	2.7	2649600	116	17738	576
18	7.37	19.1	21774	1.38	167.9	72.2	2.33	0.59	2.6	2649600	122	16701	524
19	7.39	19.4	20120	1.34	176.5	70.9	2.49	0.54	2.5	2649600	132	19127	573
20	7.39	19.1	21495	1.29	159.0	72.0	2.21	0.58	2.6	2649600	123	16813	516
21	7.39	18.2	20020	1.35	178.7	77.1	2.32	0.58	2.6	2649600	132	17114	525
22	7.39	17.7	21318	1.34	166.5	79.8	2.09	0.64	2.5	2649600	124	16336	498
23	7.40	17.7	21583	1.13	138.7	78.0	1.78	0.64	2.6	2649600	123	17889	553
24	7.34	17.9	22029	1.15	138.3	75.5	1.83	0.63	2.6	2649600	120	18705	575
25	7.31	18.1	21068	1.36	171.0	75.5	2.27	0.60	2.7	2649600	126	16029	529
26	7.32	18.2	21657	1.33	162.7	75.0	2.17	0.61	2.7	2649600	122	20425	660
27	7.29	18.1	22415	1.38	163.1	75.1	2.17	0.64	2.7	2649600	118	17111	555
28	7.27	18.3	21683	1.34	163.7	73.2	2.24	0.60	2.7	2649600	122	15763	515
29	7.26	18.4	23183	1.35	154.3	72.5	2.13	0.63	2.7	2649600	114	18464	599
30	7.25	18.6	22732	1.36	158.5	71.3	2.22	0.61	2.7	2649600	117	16558	542
31	7.24	18.9	21952	1.39	167.8	69.8	2.40	0.58	2.7	2649600	121	18355	590
Averages	7.22	17.445	19973	1.38	188.947	76.8	2.45	0.5753	2.5327				

## 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
- 38 samples were found to be absent of Coliforms.
- 38 samples were found to be absent of *E. Coli*.

**Table 5.1 - CARO Independent Lab**

Date	PRV 7		Booster 1		Ellison Blow-Off		Ellison 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
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
3-Jul-18	-	-	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0
5-Jul-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13-Jul-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18-Jul-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26-Jul-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	7/3/2018				7/9/2018				7/16/2018				7/23/2018				7/30/2018			
	Cl2	Temp.	Pres.	Abs.	Cl2	Temp.	Pres.	Abs.	Cl2	Temp.	Pres.	Abs.	Cl2	Temp.	Pres.	Abs.	Cl2	Temp.	Pres.	Abs.
Sylvania Cres					0.75	18.0	-	X									0.74	22.0	-	X
170 Kneller Rd									1.02	20.0	-	X								
2105 Morrison					1.29	17.0	-	X									1.25	20.0	-	X
Pearson School	1.35		-	X									0.95	20.6	-	X				
Staymen Rd									1.08	19.0	-	X								
PRV #10					1.20	18.0	-	X									1.20	18.0	-	X
260 Campion Rd	0.50		-	X									0.28	18.4	-	X				
Fenwick Rd									0.69	21.0	-	X								
2931 Belgo Rd	1.36		-	X									0.97	20.2	-	X				
Solly Ct	1.52		-	X									1.02	20	-	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) = 17
- Total tests sampled by BMID and tested by Caro Labs = 38
- Total tests sampled in BMID treated distribution system = 55 (Zero Positive Samples)