



MONTHLY REPORTING PERIOD - MARCH, 2024

SUMMARY

This document provides a summary of the water quality information collected by BMID in March 2024. Documentation and figures are provided on the following pages to support this submission.

WATER SUPPLY & USAGE SUMMARY

1. Water usage data for March, 2024 is as follows:

Source	Total (US Gallons)	Total (Mega Litres)
Mission Creek	66,476,316	251.61
Well 4	3,897,564	14.75
Well 5	0	0
Well 6 (Irrigation Only)	0	0
Scotty Creek (Irrigation Only)	0	0
Total	70,373,880	266.37

2. The control gates for all of BMID's high-elevation reservoirs are closed for the season. The reservoirs will be opened after spring freshet 2024, to supplement flows in Mission Creek during the summer/fall;
3. BMID's Scotty Creek source supplying irrigation water to the north-end of the service area, was placed in stand-by mode on September 8th, 2023. The Scotty Creek source will remain in stand-by until irrigation demands increase in the summer of 2024;
4. Well #5, used as the primary water source in the north-end of the system for both irrigation and domestic consumption, was placed in stand-by mode on September 29th, 2023. Well #5 will resume operations in the summer of 2024 as irrigation demands increase in the north-end;
5. Well #4, used as a primary source for domestic water in the north-end of the distribution system during low-flow periods, resumed operation on September 27th, 2023. Well #4 was in operation throughout March and will remain in service until the spring/summer of 2024;
6. Well #6, which supplies water to the north-end irrigation distribution system, was placed in stand-by mode on September 24th, 2023. Well #6 will resume operations in the summer of 2024;
7. A portion of the BMID's transmission main west of the Mission Creek Intake and east of the tunnel is located on an unstable slope. Slope movement continues to be monitored. It is currently stable and is not moving;

WATER QUALITY SUMMARY

1. The WTP was in operation throughout most of March as Mission Creek had experienced increased turbidity and colour in the raw water. The WTP remained in stand-by mode for 4 days in early March when Mission Creek had acceptable turbidity and colour in the raw water. The WTP remains available to treat water when raw water quality diminishes;
2. The water levels of Stevens and Hadden Reservoirs were lowered in late March to allow for inspections of the dam's structural material. To allow for the inspection, the WTP closed the headgates at Mission Creek between March 18th and March 26th;
3. Raw water turbidity levels in Mission Creek peaked at 6.98 NTU on March 19th (during the dam inspection window). Average daily raw water turbidity for March was 2.21 NTU at the Mission Creek Intake;
4. The highest turbidity level at the Distribution Intake (end of Hadden Reservoir) was 0.66 NTU on March 30th, 2024. Average settled water turbidity for March was 0.55 NTU at the Distribution Intake at the lower end of Hadden Reservoir;
5. The highest turbidity level at the first customer (Booster #1) was 0.68 NTU on March 27th. Average monthly turbidity at the first customer was 0.49 NTU;
6. Average daily turbidity at the UV station peaked at 1.02 NTU on March 25th. The turbidity meter reads consistently higher at this location, however, the turbidity results upstream and downstream of the UV plant have lower turbidity results. Average monthly turbidity at the UV disinfection station was 0.84 NTU;
7. BMID's Ultraviolet Treatment Facility treated 253,980.2 m³ of water, 11.4 m³ of which was Off-Spec (0.004%);
8. Regarding microbiological readings, BMID ceased withdrawing water from the upper elevation reservoirs earlier in the fall. Throughout the remainder of winter and early spring, Mission Creek is expected to have stable microbiological readings as freezing conditions continue in the watershed;
9. *E.Coli* levels at Mission Creek's Point-of-Diversion (creek intake prior to WTP) had normal counts for March. The March 5th sample had the peak monthly count of 18 coliforms. The average monthly *E.Coli* was 6.5, based on 4 samples;
10. *E.Coli* levels in the raw water at the water distribution system intake at the east end of Hadden Reservoir, immediately prior to disinfection, had zero counts on all four samples. Reduction in *E.Coli* levels is due to the effectiveness of the Water Treatment Plant as well as the settling of particles as water passes through Stevens and Hadden Reservoirs;
11. No *E.Coli* or *Total Coliforms* were found in treated water in the distribution system through third-party analysis. In addition, zero positive samples were detected by BMID's in-house presence/absence testing throughout March;

1.0 FLOWS - MARCH, 2024

The Maximum Daily Flow was on March 26th, at 2,631,443 US gallons (9.96 ML)

The Minimum Daily Flow was on March 13th, at 2,124,682 US gallons (8.04 ML)

Mission Creek provided just under 95% of domestic flow supplied in March.

Figure 1.1 - Domestic Water System Flow

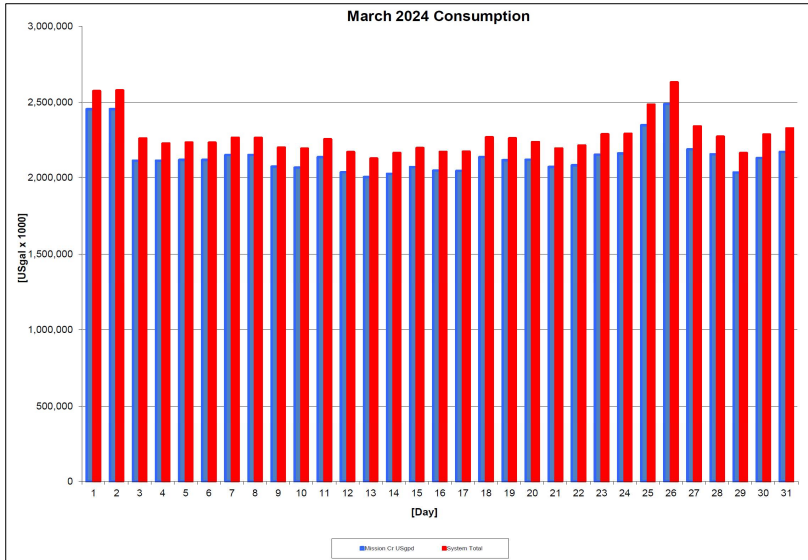


Table 1.2 - March 2024 - Daily Consumption Report

Year	Mission Cr	Well #4	Well #5	System Total	System Total
2024	Usgpd	Usgpd	Usgpd	Usgpd	ML/Day
1-Mar	2,454,919	118,877	0.0	2,573,795	9.74
2-Mar	2,454,924	123,367	0.0	2,578,291	9.76
3-Mar	2,110,946	151,369	0.0	2,262,315	8.56
4-Mar	2,110,998	118,612	0.0	2,229,611	8.44
5-Mar	2,116,097	118,877	0.0	2,234,973	8.46
6-Mar	2,116,150	118,084	0.0	2,234,234	8.46
7-Mar	2,147,824	119,669	0.0	2,267,493	8.58
8-Mar	2,147,877	118,348	0.0	2,266,225	8.58
9-Mar	2,071,716	124,160	0.0	2,195,876	8.31
10-Mar	2,064,900	123,632	0.0	2,188,532	8.28
11-Mar	2,133,559	123,632	0.0	2,257,190	8.54
12-Mar	2,034,706	131,821	0.0	2,166,526	8.20
13-Mar	2,003,428	121,254	0.0	2,124,682	8.04
14-Mar	2,024,403	136,576	0.0	2,160,979	8.18
15-Mar	2,068,467	124,424	0.0	2,192,891	8.30
16-Mar	2,046,171	121,518	0.0	2,167,689	8.20
17-Mar	2,043,291	126,273	0.0	2,169,564	8.21
18-Mar	2,134,378	134,991	0.0	2,269,369	8.59
19-Mar	2,113,402	150,049	0.0	2,263,451	8.57
20-Mar	2,116,467	121,782	0.0	2,238,249	8.47
21-Mar	2,069,339	121,254	0.0	2,190,593	8.29
22-Mar	2,080,856	128,387	0.0	2,209,243	8.36
23-Mar	2,149,885	140,274	0.0	2,290,159	8.67
24-Mar	2,157,440	135,255	0.0	2,292,695	8.68
25-Mar	2,349,308	135,255	0.0	2,484,563	9.40
26-Mar	2,488,527	142,916	0.0	2,631,443	9.96
27-Mar	2,185,601	156,389	0.0	2,341,989	8.86
28-Mar	2,152,315	122,311	0.0	2,274,626	8.61
29-Mar	2,033,622	127,066	0.0	2,160,688	8.18
30-Mar	2,126,928	161,144	0.0	2,288,072	8.66
31-Mar	2,167,875	161,144	0.0	2,329,018	8.82
Totals Usgpd	66,476,316	3,897,564	0	70,373,880	266.37
Totals ML	251.61	14.75	0.00	266.37	
Avg's	2,143,615	8.11		2,273,534	8.61
Max	2,488,527	9.42		2,631,443	9.96
Min	2,003,428	7.58		2,124,682	8.04

2.0 RAW WATER QUALITY - BACTERIOLOGICAL MONITORING

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

Samples were taken at the Distribution Intake's Point of Disinfection and at the Mission Creek raw water Point of Diversion and 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 control gates on BMID's high-elevation reservoirs were closed throughout March, making for a greater contribution of ground water to the overall flow of Mission Creek leading to reduced E.Coli levels in the raw water.

Figure 2.1 - Raw Water *E.Coli* Readings (CARO Lab results) February 2024 - March 2024

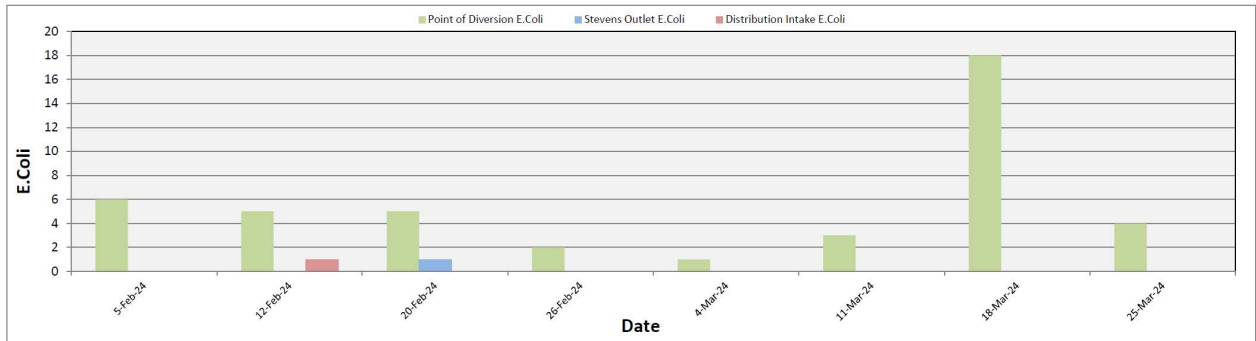


Table 2.1 - *E.Coli* Readings (CARO Labs)

Date	Point of Diversion E.Coli	Stevens Outlet E.Coli	Distribution Intake E.Coli
5-Feb-24	6	0	0
12-Feb-24	5	0	1
20-Feb-24	5	1	0
26-Feb-24	2	0	0
4-Mar-24	1	0	0
11-Mar-24	3	0	0
18-Mar-24	18	0	0
25-Mar-24	4	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

Through March 2024, turbidity for the Mission Creek source was measured at Booster Station No. 1 on Gallagher’s Road, which is the approximate location of the first-customer. The highest turbidity level recorded at this location was 0.68 NTU on March 27th 2024. The lowest turbidity level was 0.33 NTU and the average turbidity was 0.49 NTU.

The distribution intake is where the water leaves Hadden Reservoir and enters a closed conduit. Turbidity levels are greatly reduced through the settling process as Mission Creek water makes its way through the reservoirs.

Figure 3.1 – Daily Turbidity Readings (Mission Creek Raw - Distribution Intake - Booster Station 1 and UV Plant)

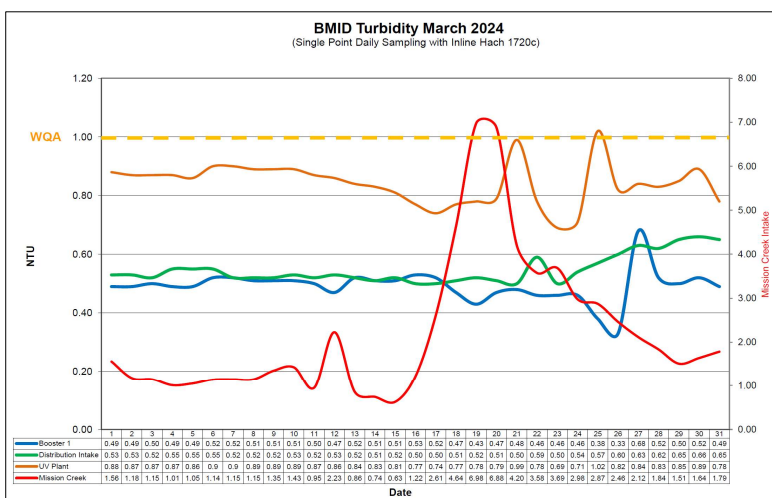


Table 3.1 - Daily Monitoring Record – Turbidity at On-Line Turbidity Analysers

Turbidity Point Sampling for March 2024				
Date	Mission Creek Intake	Distribution Intake	Booster#1- First User	UV Plant
	Daily Average [NTU]	Daily Average NTU	Daily Average NTU	Daily Average [NTU]
1	1.56	0.53	0.49	0.88
2	1.18	0.53	0.49	0.87
3	1.15	0.52	0.50	0.87
4	1.01	0.55	0.49	0.87
5	1.05	0.55	0.49	0.86
6	1.14	0.55	0.52	0.9
7	1.15	0.52	0.52	0.9
8	1.15	0.52	0.51	0.89
9	1.35	0.52	0.51	0.89
10	1.43	0.53	0.51	0.89
11	0.95	0.52	0.50	0.87
12	2.23	0.53	0.47	0.86
13	0.86	0.52	0.52	0.84
14	0.74	0.51	0.51	0.83
15	0.63	0.52	0.51	0.81
16	1.22	0.50	0.53	0.77
17	2.61	0.50	0.52	0.74
18	4.64	0.51	0.47	0.77
19	6.98	0.52	0.43	0.78
20	6.88	0.51	0.47	0.79
21	4.20	0.50	0.48	0.99
22	3.58	0.59	0.46	0.78
23	3.69	0.50	0.46	0.69
24	2.98	0.54	0.46	0.71
25	2.87	0.57	0.38	1.02
26	2.46	0.60	0.33	0.82
27	2.12	0.63	0.68	0.84
28	1.84	0.62	0.52	0.83
29	1.51	0.65	0.50	0.85
30	1.64	0.66	0.52	0.89
31	1.79	0.65	0.49	0.78
AVG	2.21	0.55	0.49	0.84

4.0 CHLORINE CONTACT TIME

Temperature, pH, peak 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 March, 2024.

Figure 4.1 - CT Trending – BMID Mission Creek Source – March 2024

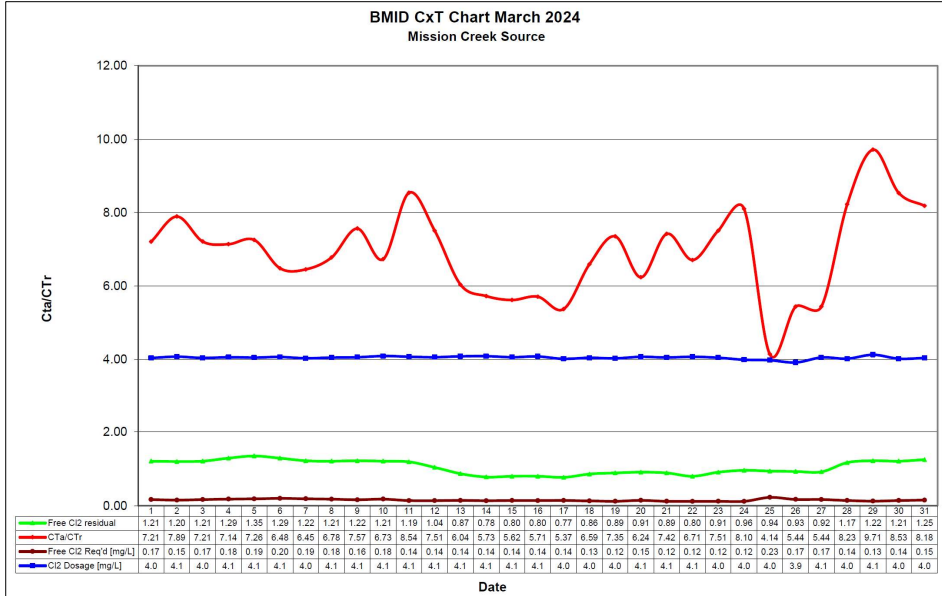


Table 4.2 - CT Table – Mission Creek Source

BMID March 2024 Mission Creek Source													
DATE	pH	TEMP	PEAK	Free Cl2	CT	CT	CTa/CTr	Free Cl2	Cl2	VOLUME	TIME	FLOW	CL2 DOSAGE
	(Average)	(Present)	FLOW	residual	achieved	req'd		Req'd	Dosage	TOTAL	[mins]	Daily Average	Average
March								[mg/L]	[mg/L]	[USgal]		[USGPM]	[PPD]
1	7.33	3.5	2162	1.21	1482.9	205.7	7.21	0.17	4.0	2649600	1226	1451	70.5
2	7.32	3.7	1995	1.20	1593.9	201.9	7.89	0.15	4.1	2649600	1328	1440	70.5
3	7.32	3.6	2183	1.21	1468.4	203.6	7.21	0.17	4.0	2649600	1214	1495	72.6
4	7.32	3.6	2329	1.29	1467.4	205.5	7.14	0.18	4.1	2649600	1138	1461	71.3
5	7.37	3.7	2355	1.35	1518.6	209.3	7.26	0.19	4.1	2649600	1125	1481	72.1
6	7.36	2.5	2342	1.29	1459.5	225.1	6.48	0.20	4.1	2649600	1131	1447	70.7
7	7.37	2.8	2282	1.22	1416.2	219.4	6.45	0.19	4.0	2649600	1161	1517	73.5
8	7.37	3.0	2188	1.21	1465.2	216.1	6.78	0.18	4.1	2649600	1211	1464	71.3
9	7.37	3.5	2044	1.22	1581.5	209.0	7.57	0.16	4.1	2649600	1296	1453	70.9
10	7.37	3.6	2297	1.21	1395.9	207.3	6.73	0.18	4.1	2649600	1154	1498	73.7
11	7.37	4.2	1861	1.19	1694.4	198.4	8.54	0.14	4.1	2649600	1424	1397	68.4
12	7.37	4.8	1969	1.04	1399.8	186.5	7.51	0.14	4.1	2649600	1346	1437	70.1
13	7.36	3.9	1983	0.87	1162.5	192.6	6.04	0.14	4.1	2649600	1336	1412	69.3
14	7.32	3.9	1934	0.78	1068.7	186.7	5.73	0.14	4.1	2649600	1370	1423	69.9
15	7.32	4.4	2084	0.80	1017.0	181.0	5.62	0.14	4.1	2649600	1271	1455	71.0
16	7.32	4.5	2065	0.80	1026.3	179.7	5.71	0.14	4.1	2649600	1283	1438	70.5
17	7.32	4.8	2169	0.77	940.6	175.0	5.37	0.14	4.0	2649600	1222	1458	70.4
18	7.31	5.3	2019	0.86	1128.9	171.3	6.59	0.13	4.0	2649600	1313	1504	73.1
19	7.27	6.0	1984	0.89	1188.3	161.6	7.35	0.12	4.0	2649600	1335	1497	72.5
20	7.24	6.1	2427	0.91	993.3	159.2	6.24	0.15	4.1	2649600	1092	1472	72.0
21	7.23	6.3	2038	0.89	1157.3	155.9	7.42	0.12	4.1	2649600	1300	1460	71.1
22	7.26	7.1	2152	0.80	984.8	146.8	6.71	0.12	4.1	2649600	1231	1461	71.5
23	7.22	7.2	2193	0.91	1099.5	146.4	7.51	0.12	4.0	2649600	1208	1513	73.6
24	7.15	6.4	2065	0.96	1231.6	152.0	8.10	0.12	4.0	2649600	1283	1536	73.7
25	7.07	6.8	4207	0.94	592.1	143.0	4.14	0.23	4.0	2649600	630	1662	79.5
26	7.03	6.3	3112	0.93	791.8	145.6	5.44	0.17	3.9	2649600	851	1776	83.6
27	7.12	6.6	3042	0.92	801.2	147.3	5.44	0.17	4.1	2649600	871	1532	74.6
28	7.28	6.6	2324	1.17	1333.7	162.1	8.23	0.14	4.0	2649600	1140	1525	73.7
29	7.28	6.7	2054	1.22	1573.6	162.0	9.71	0.13	4.1	2649600	1290	1415	70.2
30	7.25	6.3	2284	1.21	1403.7	164.5	8.53	0.14	4.0	2649600	1160	1509	72.9
31	7.23	6.3	2466	1.25	1342.9	164.1	8.18	0.15	4.0	2649600	1074	1528	74.2
Averages	7.28	4.97	2278	1.05	1104.2	180.2	7.00	0.14	4.0	2649600	1133.3	1523.22	73.77

5.0 ULTRAVIOLET DISINFECTION

Total Water Treated: 253,980.2 m³ 100.00%
 On-Spec Water: 253,968.8 m³ 99.996%
 Off-Spec Water: 11.4 m³ 0.004%

Average monthly chlorine residual before UV Treatment was 1.45 mg/L
 The average monthly chlorine residual after UV treatment and re-chlorination was 1.40 mg/L.

Figure 5.1 - UV Disinfection – BMID Mission Creek Source – March 2024

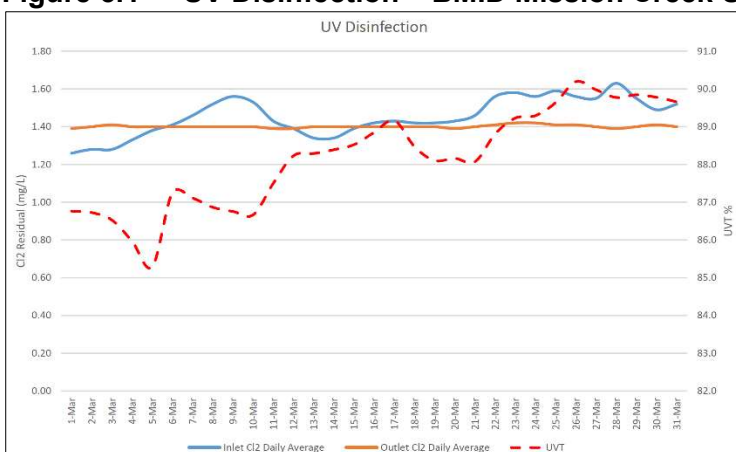


Table 5.2 - UV Disinfection Table – Mission Creek Source

	Inlet Cl2 Daily	Outlet Cl2 Daily	UVT	Turbidity	In Spec Water Volume	Off Spec Water Volume	Off Spec % of Water
Date	mg/L	mg/L	% T	NTU	Cubic Meters	Cubic Meters	Percentage
1-Mar	1.26	1.39	86.8	0.88	11632.8	0	0.00%
2-Mar	1.28	1.40	86.7	0.87	9292.9	0	0.00%
3-Mar	1.28	1.41	86.5	0.87	7990.8	0	0.00%
4-Mar	1.33	1.40	86.0	0.87	7991.0	0	0.00%
5-Mar	1.38	1.40	85.3	0.86	8004.6	5.7	0.07%
6-Mar	1.41	1.40	87.3	0.90	8004.8	5.7	0.07%
7-Mar	1.46	1.40	87.1	0.90	8130.4	0	0.00%
8-Mar	1.52	1.40	86.9	0.89	8130.6	0	0.00%
9-Mar	1.56	1.40	86.8	0.89	7842.3	0	0.00%
10-Mar	1.53	1.40	86.7	0.89	7816.5	0	0.00%
11-Mar	1.43	1.39	87.5	0.87	8076.4	0	0.00%
12-Mar	1.39	1.39	88.2	0.86	7702.2	0	0.00%
13-Mar	1.34	1.40	88.3	0.84	7583.8	0	0.00%
14-Mar	1.34	1.40	88.4	0.83	7663.2	0	0.00%
15-Mar	1.39	1.40	88.5	0.81	7830.0	0	0.00%
16-Mar	1.42	1.40	88.9	0.77	7745.6	0	0.00%
17-Mar	1.43	1.40	89.2	0.74	7734.7	0	0.00%
18-Mar	1.42	1.40	88.5	0.77	8079.5	0	0.00%
19-Mar	1.42	1.40	88.1	0.78	8000.1	0	0.00%
20-Mar	1.43	1.39	88.2	0.79	8011.7	0	0.00%
21-Mar	1.46	1.40	88.1	0.99	7833.3	0	0.00%
22-Mar	1.56	1.41	88.8	0.78	7876.9	0	0.00%
23-Mar	1.58	1.42	89.2	0.69	8138.2	0	0.00%
24-Mar	1.56	1.42	89.3	0.71	8166.8	0	0.00%
25-Mar	1.59	1.41	89.6	1.02	8893.1	0	0.00%
26-Mar	1.56	1.41	90.2	0.82	9420.1	0	0.00%
27-Mar	1.55	1.40	90.0	0.84	8273.4	0	0.00%
28-Mar	1.63	1.39	89.8	0.83	8147.4	0	0.00%
29-Mar	1.55	1.40	89.8	0.85	7698.1	0	0.00%
30-Mar	1.49	1.41	89.8	0.89	8051.3	0	0.00%
31-Mar	1.52	1.40	89.7	0.78	8206.3	0	0.00%
Average	1.45	1.40	88.2		Total	11.4	0.004%

6.0 WATER DISTRIBUTION SAMPLING (TREATED)

Third Party Analysis (CARO Analytical Services)

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

Table 6.1 - CARO Independent Lab Testing – Total Coliforms – E. Coli

Date	2921 Belgo Rd		Booster 1		Ellison Blow-Off		Ellison School		3976 Highway 97		Prospect Reservoir		Tower Reservoir		Well #4		Kirschner Res		Pearson School	
	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
5-Feb-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12-Feb-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20-Feb-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26-Feb-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4-Mar-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11-Mar-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18-Mar-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25-Mar-24	0	0	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 seven sites around the BMID service area.
- All 9 samples were found to be absent of both *Total Coliforms* and *E. Coli*.

Table 6.2 - BMID In-house Testing – Presence Absence

Location	3/4/2024				3/11/2024				3/18/2024				3/25/2024			
	Cl2	Temp	Pres.	Abs.	Cl2	Temp	Pres.	Abs.	Cl2	Temp	Pres.	Abs.	Cl2	Temp	Pres.	Abs.
Sylvania Cres													0.85	13.8	-	X
170 Kneller Rd													0.94	11.2	-	X
2105 Morrison	0.69	9.8	-	X												
Staymen Rd	0.61	10.4	-	X												
260 Campion Rd					0.46	11.6	-	X	0.74	15.6	-	X				
Fenwick Rd					0.44	11.2	-	X	0.49	12.2	-	X				
Solly Ct													1.05	10.6	-	X

- BMID Population = 28,000

RECOMMENDED TESTS

- Recommended number of samples per month = 28
 (as per Guide for Canadian Drinking Water Quality)

ACTUAL TESTS

- Total tests by BMID staff (presence/absence) = 9
- Total tests sampled by BMID and tested by Caro Labs 25
- Total tests sampled in BMID treated distribution system = 34
- 0 Positive *E. Coli* and Total Coliform Samples