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BMID FILE: 486

MONTHLY REPORTING PERIOD - NOVEMBER, 2024

SUMMARY

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

WATER SUPPLY & USAGE SUMMARY

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

Source	Total (US Gallons)	Total (Mega Litres)
Mission Creek	6,915,970	26.18
Well 4	2,636,694	9.98
Well 5	0	0
Well 6 (Irrigation Only)	0	0
Scotty Creek (Irrigation Only)	0	0
Rutland Water Works (est)	51,367,402	194.43
Total (est)	60,920,066	230.60

2. Commencing on November 4th, and continuing for the remainder of the month, BMID began working on a new transmission main to the existing distribution system. During the construction period, BMID will shut down the primary Mission Creek water supply and utilize groundwater supplies from Rutland Water Works to supply the distribution system;
3. The Scotty Creek source, used to supplement irrigation flows in the north-end of the system during periods of high irrigation demands, was placed in stand-by mode for the year on September 3rd. Scotty Creek remained in stand-by mode for all of November and will remain off until summer 2025 ;
4. Well #5, used as the primary water source in the north-end of the system for both irrigation and domestic consumption during high consumption periods, was placed in stand-by mode on Sep 17th and will remain in stand-by until summer 2025;
5. Well #4, used as a primary source for domestic water in the north-end of the distribution system during low-flow periods was in operation throughout November. Well #4 will remain operational for the remainder of the year as system flows reduce during the autumn and into the winter;
6. Well #6, which supplies water to the north-end irrigation distribution system during times of high irrigation demands, ceased operations on September 24th. Well #6 will resume operation in summer 2025;
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. On November 4th, a series of crossties between BMID and Rutland Water Works were utilized to supply BMID with potable groundwater to the BMID distribution system. BMID continued its sampling schedule for all potable tests throughout November;
2. Beginning on October 29th, BMID's Mission Creek Intake was closed, the Water Treatment Plant was bypassed, and Stevens and Hadden Reservoirs were drained to allow for the necessary work to safely take place. BMID began to slowly refill the reservoirs on November 22nd with surface water from Mission Creek, however, RWW continued to supply domestic water for the remainder of November;
3. When refilling Stevens and Hadden Reservoirs, the WTP remained in bypass mode as the water quality of Mission Creek was of sufficient quality that no chemical treatment is necessary for clarification;
4. Raw water turbidity levels in Mission Creek peaked at 0.97 NTU on November 29th. Average daily raw water turbidity for November was 0.57 NTU at the Mission Creek Intake;
5. The highest turbidity level at the Distribution Intake, while in operation, was 0.48 NTU on November 5th 2024. Average settled water turbidity for November was 0.38 NTU at the Distribution Intake at the lower end of Hadden Reservoir. The reservoir was drained below the intake level by November 7th;
6. The highest turbidity level at the first customer (Booster #1) was 0.42 NTU on November 4th. Average monthly turbidity at the first customer was 0.12 NTU. Turbidity levels were reduced later in the month as groundwater from Rutland Water Works supplied water to the distribution system;
7. BMID is investigating the use of Well #6 as a possible future potable water source. A monthly sample was taken at the well on November 25th. Testing will continue for the next year to verify its water quality characteristics;
8. BMID's Ultraviolet Treatment Facility treated only 26,180 m^3 of water, none of which was Off-Spec, as the plant was in operation for the first four days of November. The UV plant was shut-down for the remainder of November as groundwater supplied domestic water to the BMID system;
9. *E.Coli* levels at Mission Creek's Point-of-Diversion (creek intake prior to WTP) had normal counts for November. The November 4th sample had the peak count of 9 *E.Coli* Coliforms. The average monthly *E.Coli* count was 3.75, based on 4 samples;
10. No *E.Coli* or *Total* Coliforms were found in treated water in the distribution system through third-party analysis;
11. One positive sample was detected by BMID's in-house presence/absence testing throughout November. The November 12th sample at Kneller Rd sample station was found to have bacteria present. The sample station was resampled and tested by CARO analytical labs on November 14th and the two retested samples were found to have no counts of both *E.Coli* and *Total Coliform* bacteria;

1.0 FLOWS - NOVEMBER, 2024

The Maximum recorded Daily Flow was on November 3rd at 2,215,472 US gallons (8.37 ML)

The Minimum recorded Daily Flow was on November 1st, at 1,939,965 US gallons (7.34 ML)

Mission Creek provided and estimated 11% of domestic flow supplied in November.

Estimates for water usage from Rutland Water Works is based on average daily consumption for the past five years.

Figure 1.1 - Domestic Water System Flow

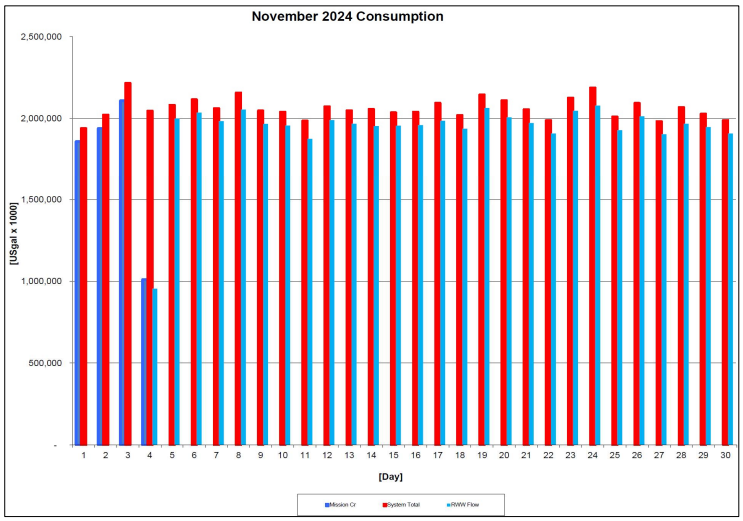


Table 1.2 - November 2024 - Daily Consumption Report

Year	Mission Cr	Estimated flow from RWW	Well #4	Well #5	System Total
2024	Usgpd	Usgpd	Usgpd	Usgpd	Usgpd
1-Nov	1,859,058	NA	80,907	-	1,939,965
2-Nov	1,939,287	NA	82,849	-	2,022,136
3-Nov	2,107,511	NA	107,961	-	2,215,472
4-Nov	1,010,114	954,083	82,260	-	2,046,457
5-Nov	NA	1,999,271	83,221	-	2,082,493
6-Nov	NA	2,035,527	80,250	-	2,115,776
7-Nov	NA	1,984,080	78,031	-	2,062,111
8-Nov	NA	2,054,881	102,355	-	2,157,236
9-Nov	NA	1,966,819	81,338	-	2,048,157
10-Nov	NA	1,956,684	83,961	-	2,040,645
11-Nov	NA	1,876,170	109,567	-	1,985,737
12-Nov	NA	1,990,823	82,646	-	2,073,469
13-Nov	NA	1,967,388	81,473	-	2,048,861
14-Nov	NA	1,953,690	103,518	-	2,057,208
15-Nov	NA	1,955,642	80,606	-	2,036,248
16-Nov	NA	1,959,343	80,926	-	2,040,269
17-Nov	NA	1,986,009	108,164	-	2,094,173
18-Nov	NA	1,937,053	82,947	-	2,019,999
19-Nov	NA	2,064,304	80,997	-	2,145,301
20-Nov	NA	2,006,899	103,761	-	2,110,659
21-Nov	NA	1,972,195	83,095	-	2,055,289
22-Nov	NA	1,908,536	80,094	-	1,988,629
23-Nov	NA	2,046,456	79,742	-	2,126,198
24-Nov	NA	2,078,784	109,324	-	2,188,108
25-Nov	NA	1,928,192	82,511	-	2,010,702
26-Nov	NA	2,012,734	80,831	-	2,093,565
27-Nov	NA	1,903,220	79,653	-	1,982,872
28-Nov	NA	1,967,316	101,317	-	2,068,633
29-Nov	NA	1,947,273	80,870	-	2,028,144
30-Nov	NA	1,908,114	81,520	-	1,989,634
Totals Usgpd	6,915,970	51,367,402	2,636,694	-	60,920,066
Totals ML	26.18	194.43	9.98	0.00	230.6
Avg's	1728992.5		6.54		2062471.6
Max	2107511.4		7.98		2215472.4
Min	1010114.5		3.82		1939965.0

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 Mission Creek raw water intake, the outlet for Stevens Pond, and the point of disinfection at the end of Hadden Reservoir.

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

Raw water samples at the Mission Creek Intake continued to be carried out throughout the duration of the shut-down to maintain continuity of microbiological records. However, samples at Stevens Outlet and Hadden Outlet did not take place after November 4th as these reservoirs were drained as part of the infrastructure upgrade on the primary transmission water main.

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

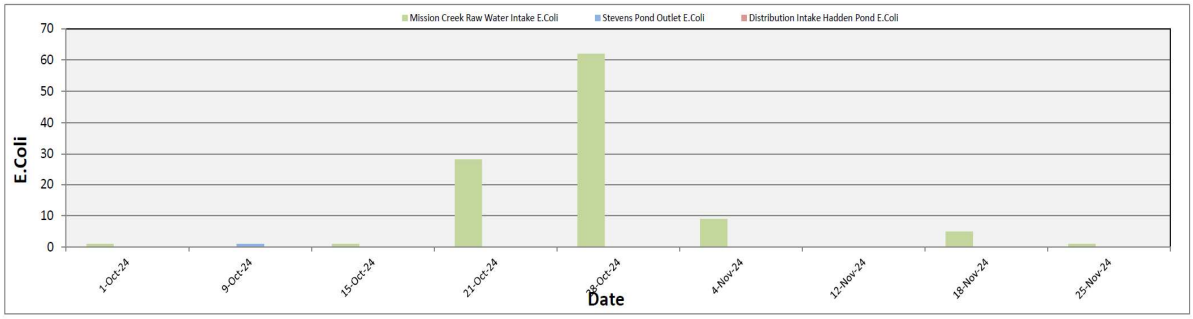


Table 2.1 - *E.Coli* Readings (CARO Labs)

Date	Mission Creek Raw Water Intake E.Coli	Stevens Pond Outlet E.Coli	Distribution Intake Hadden Pond E.Coli
1-Oct-24	1	0	0
9-Oct-24	0	0	0
15-Oct-24	1	0	0
21-Oct-24	28	0	0
28-Oct-24	62	0	0
4-Nov-24	9	1	0
12-Nov-24	0	NA	NA
18-Nov-24	5	NA	NA
25-Nov-24	1	NA	NA

Stevens or WTP Intake (Raw) - Sampling of raw water at intake from Mission Creek
Stevens Outlet (Raw) - Sampling point after exiting 142,000 m^3 1st upper balancing reservoir (Stevens Res.)
Hadden Outlet (Raw) - Sampling point after exiting 75,000 m^3 2nd lower balancing reservoir (Hadden Res.)
(*Hadden Outlet = Distribution Intake - Point of Disinfection*)

3.0 RAW AND TREATED WATER TURBIDITY

Turbidity is measured online at four locations, Mission Creek raw water intake, the Distribution Intake, the UV treatment plant, and Booster#1. The first user of the BMID system is located near Booster #1. The highest turbidity level recorded at this location was 0.42 NTU on November 4th, 2024. BMID utilized groundwater from RWW as its domestic water source for most of November leading to an average turbidity of 0.12 NTU.

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

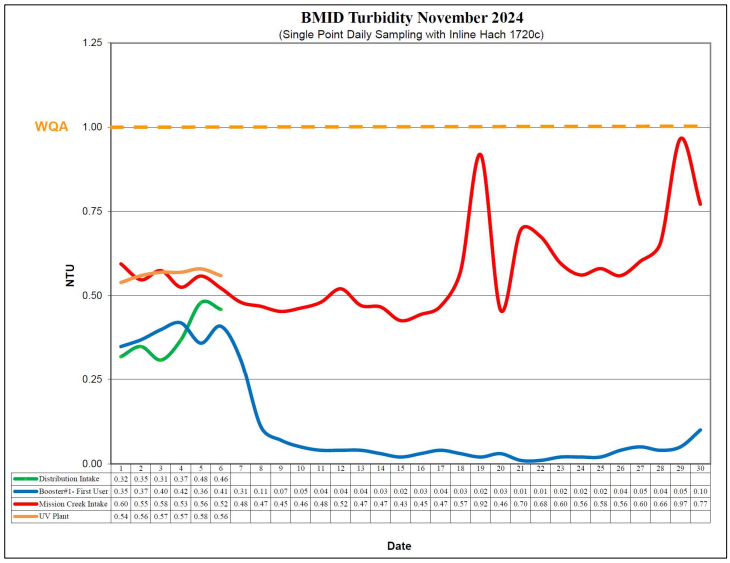


Table 3.1 - Daily Monitoring Record – Turbidity at On-Line Turbidity Analyzers

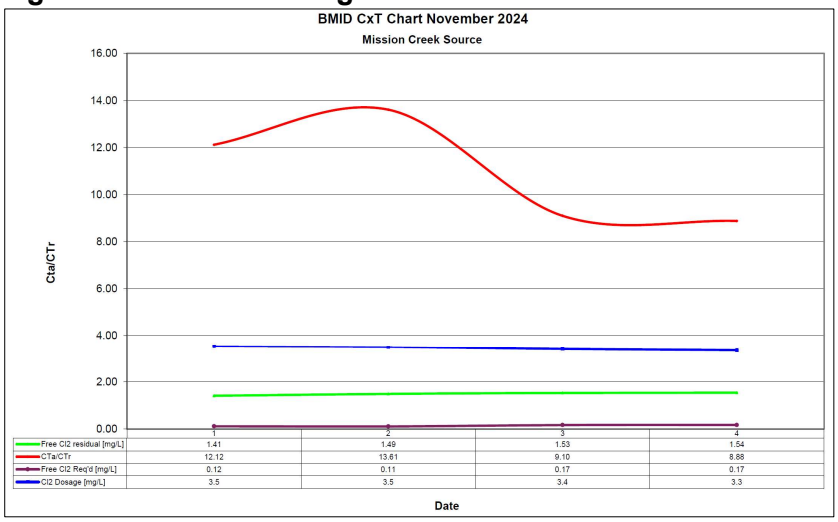
Date	Mission Creek Intake Daily Average [NTU]	Distribution Intake Daily Average [NTU]	Booster#1- First User Daily Average [NTU]	UV Plant Daily Average [NTU]
1	0.60	0.32	0.35	0.54
2	0.55	0.35	0.37	0.56
3	0.58	0.31	0.40	0.57
4	0.53	0.37	0.42	0.57
5	0.56	0.48	0.36	0.58
6	0.52	0.46	0.41	0.56
7	0.48	NA	0.31	NA
8	0.47	NA	0.11	NA
9	0.45	NA	0.07	NA
10	0.46	NA	0.05	NA
11	0.48	NA	0.04	NA
12	0.52	NA	0.04	NA
13	0.47	NA	0.04	NA
14	0.47	NA	0.03	NA
15	0.43	NA	0.02	NA
16	0.45	NA	0.03	NA
17	0.47	NA	0.04	NA
18	0.57	NA	0.03	NA
19	0.92	NA	0.02	NA
20	0.46	NA	0.03	NA
21	0.70	NA	0.01	NA
22	0.68	NA	0.01	NA
23	0.60	NA	0.02	NA
24	0.56	NA	0.02	NA
25	0.58	NA	0.02	NA
26	0.56	NA	0.04	NA
27	0.60	NA	0.05	NA
28	0.66	NA	0.04	NA
29	0.97	NA	0.05	NA
30	0.77	NA	0.10	NA
AVG	0.57	0.38	0.12	0.56

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 November, 2024.

BMID's Mission Creek source was in use from November 1st to November 4th. After the 4th, the Mission Creek source was bypassed to allow for infrastructure upgrades. Domestic water was provided by Rutland Water Works for the remainder of the month.

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



CTa – CT achieved
CTr – CT Required

The minimum CT that BMID achieved was 8.88 X that of what was required

Table 4.2 - CT Table – Mission Creek Source

	BMID November 2024												
	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
	(Average)	(Present)	FLOW	residual	achieved	req'd		Req'd	Dosage	TOTAL		Daily Average	Average
November		[°C]	[Usgpm]	[mg/L]				[mg/L]	[mg/L]	[USgal]	[mins]	[USGPM]	[PPD]
1	7.16	7.3	2,030.43	1.41	1840.0	151.9	12.12	0.12	3.5	2649600	1305	1,312	56
2	7.14	7.6	1,949.60	1.49	2025.0	148.8	13.61	0.11	3.5	2649600	1359	1,374	58
3	7.15	7.2	2,889.52	1.53	1403.0	154.2	9.10	0.17	3.4	2649600	917	1,494	61
4	7.16	7.2	2,967.19	1.54	1375.2	154.9	8.88	0.17	3.3	2649600	893	703	28
Averages	7.15	7.33	2459.19	1.49	#DIV/0!	20.33	#DIV/0!	#DIV/0!	#DIV/0!			1221	50.7

5.0 ULTRAVIOLET DISINFECTION

Total Water Treated:	26,180 m^3	100.00%
On-Spec Water:	26,180 m^3	100.00%
Off-Spec Water:	0 m^3	0.00%

Average monthly chlorine residual before UV Treatment was 1.37 mg/L
The average monthly chlorine residual after UV treatment and re-chlorination was 1.40 mg/L.

The BMID UV treatment plant was in operation from November 1st to November 4th, after which the station was placed in stand-by mode while BMID was utilizing RWW as the primary source for domestic water.

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

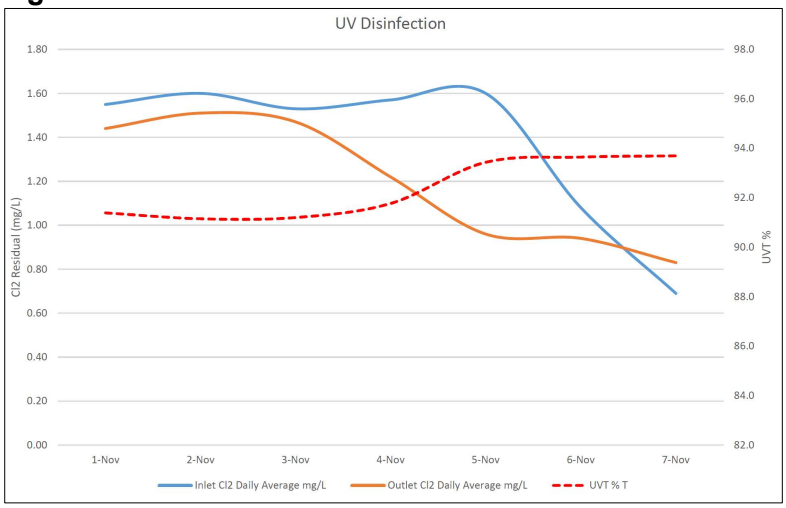


Table 5.2 - UV Disinfection Table – Mission Creek Source

Date	Inlet Cl2 Daily mg/L	Outlet Cl2 Daily mg/L		UVT % T	Turbidity NTU		In Spec Water Cubic Meters	Off Spec Water Cubic Meters	Off Spec % of Water Percentage
1-Nov	1.55	1.44		91.4	0.54		7,037	0	0.00%
2-Nov	1.60	1.51		91.2	0.56		7,341	0	0.00%
3-Nov	1.53	1.47		91.2	0.57		7,978	0	0.00%
4-Nov	1.57	1.22		91.8	0.57		3,824	0	0.00%
5-Nov	1.60	0.96		93.4	0.58		NA	NA	NA
6-Nov	1.08	0.94		93.6	0.56		NA	NA	NA
7-Nov	0.69	0.83		93.7	0.53		NA	NA	NA
Average	1.37	1.40		92.33	0.56	Total	26,180	0	0.000%

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*

	2921 Belgo Rd		Booster 1		Ellison Blow-Off		Ellison School		3976 Highway 97		Prospect Reservoir		Tower Reservoir		Well #4		Kirschner Res		Pearson School	
Date	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
1-Oct-24	0	0	0	0							0	0			0	0	0	0	0	0
9-Oct-24			0	0	0	0	0	0	0	0			0	0	0	0				
15-Oct-24	0	0	0	0							0	0			0	0	0	0	0	0
21-Oct-24			0	0	0	0	0	0	0	0			0	0	0	0				
28-Oct-24	0	0	0	0									0	0	0	0	0	0	0	0
1-Nov-24													0	0						
4-Nov-24			0	0	0	0	0	0	0	0			0	0	0	0				
12-Nov-24	0	0	0	0							0	0			0	0	0	0	0	0
18-Nov-24			0	0	0	0	0	0	0	0			0	0	0	0				
25-Nov-24	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.
- 8 of the 9 samples were found to be absent of both *Total Coliforms* and *E.Coli*.
  - The November 12 sample at Kneller Rd turned positive after incubation.
  - Third-party retesting from CARO Analytical came back as negative for *E.Coli* and *Total Coliforms.*

Table 6.2 - BMID In-house Testing – Presence Absence

	11/4/2024				11/12/2024				11/19/2024				11/25/2024			
Location	Cl2	Temp.	Pres.	Abs.	Cl2	Temp.	Pres.	Abs.	Cl2	Temp.	Pres.	Abs.	Cl2	Temp.	Pres.	Abs.
Sylvania Cres					0.11	16.2	-	X								
170 Kneller Rd					0.11	16.2	X	-								
2105 Morrison									0.14	12.2	-	X				
Staymen Rd									0.12	11.2	-	X				
260 Campion Rd	0.44	16.4	-	X									0.06	10.8	-	X
Fenwick Rd	0.61	15.8	-	X									0.00	11.2	-	X
Solly Ct					0.31	15.2	-	X								

7.0 WELL #6 POTENTIAL POTABILITY TESTING

- BMID will take monthly bacterial samples on the raw water at Well #6 to determine the potential potability of the source. Results are as follows:

Well 6 Bacterial Testing		
Date	Total Coliforms	E.Coli Coliforms
24-Jun-24	0	0
29-Jul-24	0	0
26-Aug-24	0	0
28-Oct-24	0	0
25-Nov-24	0	0

- 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
- Zero Positive E.Coli and Total Coliform Samples
- 1 Positive Presence/Absence sample

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Black Mountain Irrigation District	WORK ORDER	24K1658
PROJECT	Drinking Water/ Bacteria	REPORTED	2024-11-15 14:30

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
215 kneller Road Sample # 1 (24K1658-01) | Matrix: Water | Sampled: 2024-11-14						
Field Parameters						
Chlorine, Free	**0.12**	N/A	0.02	mg/L	2024-11-14	
Temperature, field	**12.6**	AO ≤ 15		°C	2024-11-14	
Microbiological Parameters						
Coliforms, Total	< 1	MAC = 0	1	CFU/100 mL	2024-11-14	
E. coli	< 1	MAC = 0	1	CFU/100 mL	2024-11-14	
215 kneller Road Sample # 2 (24K1658-02) | Matrix: Water | Sampled: 2024-11-14						
Field Parameters						
Chlorine, Free	**0.12**	N/A	0.02	mg/L	2024-11-14	
Temperature, field	**12.6**	AO ≤ 15		°C	2024-11-14	
Microbiological Parameters						
Coliforms, Total	< 1	MAC = 0	1	CFU/100 mL	2024-11-14	
E. coli	< 1	MAC = 0	1	CFU/100 mL	2024-11-14	

November 14th Kneller Rd Bacterial Results