

Greater Vernon Water (GVW) Water Quality Report for March 2023

The following is the water quality summary for the Greater Vernon Water (GVW) utility.

On March 16, 2023, the Water Quality Advisory which was issued September 16, 2022 for GVW was rescinded due to water treatment returning to normal as a result of the Headgates Spillway Project being close to completion. In addition, the Source Change included in the WQA has also been rescinded which means customers usually supplied by Duteau Creek will now continue to do so.

1. Sources

GVW has two sources that are used for potable water. The two sources are Duteau Creek and Kalamalka Lake. Raw (untreated) water samples are taken at the intakes of Duteau Creek and Kalamalka Lake once a week. Tables 1 and 2 summarize the results for bacteria and turbidity.

Table 1 Duteau Creek Intake

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
E.coli²	Caro	MPN/100 mL	4	-----	<1	2	0.50
E.coli²	RDNO Lab	MPN/100 mL	7	-----	<1	3	0.57
Total Coliform	Caro	MPN/100 mL	4	-----	14	45	33.25
Total Coliform	RDNO Lab	MPN/100 mL	7	-----	27.2	45	33.66
Turbidity	GVW WQ Tech	NTU	5	-----	0.88	1.46	1.15
Turbidity	SCADA ¹ Daily Average	NTU	31 Days	-----	0.50	1.41	0.81

¹SCADA: Supervisory Control and Data Acquisition.

²Drinking Water Treatment Objectives_ BC (Sec 4.3): The number of raw water samples should not exceed 20/100 mL in at least 90% of the weekly samples from the previous six months.

Table 2 Kalamalka Lake Intake

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
E.coli ³	Caro	MPN/100 mL	5	-----	<1	3	1.4
E.coli ³	RDNO Lab	MPN/100 mL	8	-----	<1	4.1	1.65
Total Coliform	Caro	MPN/100 mL	5	-----	2	10	4.6
Total Coliform	RDNO Lab	MPN/100 mL	8	-----	1	7.5	3.10
Turbidity ²	GVW WQ Tech	NTU	6	-----	0.54	1.04	0.70
Turbidity ²	SCADA ¹ Average ⁴	NTU	31 Days	-----	0.33	0.88	0.46

¹SCADA: Supervisory Control and Data Acquisition.

²Operation Guideline: As outlined in Deviation Response Plan, turbidity < 3 NTU.

³Drinking Water Treatment Objectives_ BC (Sec 4.3): The number of raw water samples should not exceed 20/100 mL in at least 90% of the weekly samples from the previous six months.

⁴SCADA data for this online analyzer is an average of 24 readings taken on the hour.

2. Agriculture/ Irrigation Sources

The 2023 irrigation season starts April.15.

3. Treatment Plants

GVW has two treatment plants: Duteau Creek Water Treatment Plant (DCWTP) and Mission Hill Water Treatment Plant (MHWTP). At the DCWTP water is first treated with a coagulant and mixed to create a floc, next clarification is achieved by Dissolved Air Flootation (DAF). Chlorine is added after treatment to ensure contact time for the removal of viruses, followed by Ultra-violet (UV) disinfection, and finally chlorine is added before entering the distribution system for residual. MHWTP uses a dual disinfection process of UV and chlorine.

Tables 3 and 5 summarize results for chlorine, bacterial, turbidity, UV Transmittance (UVT) and UV Dosage (UVD). Table 4 summarizes the log removal of viruses at the DCWTP.

Table 3 Duteau Creek Water Treatment Plant Reservoir

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
Free Chlorine²	SCADA ¹ Daily Average	mg/L	31 Days	-----	1.88	1.94	1.91
E.coli	Caro	CFU/100 mL	4	-----	<1	<1	<1
E.coli	RDNO Lab	MPN/100 mL	7	-----	<1	<1	<1
Total Coliform	Caro	CFU/100 mL	4	-----	<1	<1	<1
Total Coliform	RDNO Lab	MPN/100 mL	7	-----	<1	<1	<1
Turbidity²	SCADA ¹ Daily Average	NTU	31 Days	-----	0.30	0.40	0.35
Pre UVT³	SCADA ¹ Daily Average	%	31 Days	-----	87.10	88.77	87.87

¹SCADA: Supervisory Control and Data Acquisition.

²GVW WQ Deviation Response Plan – free chlorine < 0.20 mg/L, turbidity > 1.0 NTU.

³UVT is monitored pre-UV treatment which is used to determine UV dosage.

Table 4 DCWTP – Log Removal of Viruses

Log Removal of Viruses¹	
Days Monitored	31
Days 4-Log Removal Achieved	31

¹4-log virus removal logged by the minute on SCADA.

Table 5 Mission Hill Water Treatment Plant

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
Free Chlorine	SCADA ¹ Daily Average	mg/L	31 Days	-----	1.99	2.24	2.10
E.coli	Caro	CFU/100 mL	5	-----	<1	<1	<1
E.coli	RDNO Lab	MPN/100 mL	7	-----	<1	<1	<1
Total Coliform	Caro	CFU/100 mL	5	-----	<1	<1	<1
Total Coliform	RDNO Lab	MPN/100 mL	7	-----	<1	<1	<1
Turbidity ²	SCADA ¹ Daily Average	NTU	31 Days	-----	0.29	0.83	0.43
Pre UVT	SCADA ¹ Daily Average	%	31 Days	-----	91.42	91.88	91.68

¹SCADA: Supervisory Control and Data Acquisition.

²GVW WQ Deviation Response Plan – free chlorine < 0.20 mg/L, turbidity > 3.0 NTU.

This month, 0 m³ of off-spec water occurred at MHWTP.

4. Distribution

GVW has two distribution systems that interconnect: Duteau System supplied by Duteau Creek and Kalamalka System supplied by Kalamalka Lake. GVW has approximately 22,350 service connections.

During the large infrastructure project the Mission Hill WTP will be supplying the normal distribution system as well as supplementing flows into the 580 Zone when demand in the distribution system normally fed from Duteau Creek source cannot be met by Duteau WTP.

Table 6 summarizes the daily flow for each distribution system. The Duteau and Kalamalka systems have many locations where they can be interconnected. This means there are areas where there is a blend of water quality and can be identified by the conductivity of the water.

Table 6 Volumes for GVW Distribution Systems over the Month

Volumes	DCWTP	MHWTP
Min (ML/Day)	3.60	10.74
Max (ML/Day)	10.60	20.11
Average (ML/Day)	6.07	16.19
Monthly Total (ML)	182.2	485.66

Tables 7 and 8 summarize results for chlorine, bacterial, and turbidity for each distribution system. These systems are monitored by handheld instruments weekly.

Table 7 Duteau Distribution

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
Free Chlorine ¹	Operator Grab Samples	mg/L	47	-----	0.50	1.85	1.10
Total Chlorine	Operator Grab Samples	mg/L	47	-----	0.75	2.09	1.31
E.coli	Caro	CFU/100 mL	18	-----	<1	<1	<1
E.coli	RDNO lab	MPN/100 mL	43	-----	<1	<1	<1
Total Coliform	Caro	CFU/100 mL	18	-----	<1	<1	<1
Total Coliform	RDNO Lab	MPN/100 mL	43	-----	<1	<1	<1
Turbidity	Operator Grab Samples	NTU	47	-----	0.24	1.34	0.59

¹GVW WQ Deviation Response Plan: free chlorine < 0.20 mg/L

Table 8 Kalamalka Distribution

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
Free Chlorine¹	Operator Grab Sample	mg/L	67	-----	0.53	1.87	1.21
Total Chlorine	Operator Grab Sample	mg/L	67	-----	0.82	2.20	1.49
E.coli	Caro	CFU/100 mL	42	-----	<1	<1	<1
E.coli	RDNO Lab	MPN/100 mL	59	-----	<1	<1	<1
Total Coliform	Caro	CFU/100 MI	42	-----	<1	<1	<1
Total Coliform	RDNO Lab	MPN/100 mL	59	-----	<1	<1	<1
Turbidity¹	Operator Grab Sample	NTU	67	-----	0.19	1.45	0.57

¹Operation Guidelines: free chlorine > 0.20 mg/L, turbidity < 3 NTU.

The GVW distribution system contains six sampling sites (Table 9) that frequently have free chlorine < 0.2 mg/L due to the sample sites being located at the end of the distribution line. Measures are currently in place to mitigate this issue including regular monitoring and flushing. The three sites at Boss Creek represent a localized area.

Table 9 Low Chlorine Sites and Mitigation Measures

Frequent Low Free Chlorine Sites	Mitigation Measures
O'Keefe Ranch SS	On a localized Water Quality Advisory
9007 Aberdeen Rd SS	Regular monitoring and flushing
Noble Canyon B/O	Regular monitoring and flushing
Boss Creek PH 1 (Lower) Return/Inlet	Regular monitoring
Boss Creek PH 2 (Upper) Discharge/Outlet	Regular monitoring
Boss Creek PH 2 (Upper) return/inlet	Regular monitoring

5. Customer Calls and Notifications

Customer calls within the GVW Service area are tracked and recorded. There was a total of 4 customer calls this month.

Table 10 Water Quality customer calls for the month

# of Calls	Type of Call	Issue/Inquiry	Investigation	Comments
1	Inquiry	Water Quality	No	Called customer with information on Bacterial Source Tracking Study
1	Inquiry	WQA for Headgates project	No	Left message with update on the project and advisory
1	Inquiry	Water Quality Monthly Reports	No	Confirmed monthly reports will be updated on website upon arrival of new staff
1	Inquiry	Source Water & Swan Lake WQ	No	Email response with water source and Swan Lake WQ Assessment

6. Operational or Maintenance Activity

Operational activity within the GVW service area are tracked and recorded using an online database. There was a total of 25 operational activities this month.

Table 10 Monthly operational work and maintenance for the City of Vernon

NUMBER OF LOCATIONS	TYPE OF WORK
0	Hydrant Maintenance
0	Hydrant Maintenance – Corrective
0	New Hydrant Install
5	Water Service GIS Locate
0	Water Main Break Repair
0	Property Damage Repair
2	Water Valve Maintenance
1	Water Valve Repair
4	Water Service Install
13	Water Service Repair
0	Reservoirs Cleaned
0	New Hydrant Sticker Install