

Greater Vernon Water (GVW) Water Quality Report for August 2024

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

1. Potable 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 per 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	-----	11	17	15
E.coli²	RDNO Lab	MPN/100 mL	8	-----	10	32.3	17.1
Total Coliform	Caro	MPN/100 mL	4	-----	1990	3450	2570 ⁴
Total Coliform	RDNO Lab	MPN/100 mL	8	-----	1732.9	>2419.6	2167.3 ⁴
Turbidity	GVW WQ Tech	NTU	4	-----	1.25	1.49	1.40
Turbidity	SCADA ¹ Daily Average ³	NTU	31 Days	-----	0.80	1.89	1.12

¹SCADA: Supervisory Control and Data Acquisition.

²Drinking Water Treatment Objectives (Microbiological) for Surface Water Supplies in British Columbia (Sec 4.3): The number of E. coli in raw water samples should not exceed 20/100 mL in at least 90% of the weekly samples from the previous six months.

³SCADA data for this online analyzer is a 24 hour average taken every 10 minutes

⁴Two >2420 were reported from the CARO lab and three >2419.6 were reported from the RDNO Lab. Values of 2420 and 2419.6 were used for the average calculation

Table 2 Kalamalka Lake Intake

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
E.coli ³	Caro	MPN/100 mL	4	-----	<1	2	1
E.coli ³	RDNO Lab	MPN/100 mL	8	-----	<1	3.1	1.4
Total Coliform	Caro	MPN/100 mL	4	-----	19	28	24
Total Coliform	RDNO Lab	MPN/100 mL	8	-----	5.2	10.9	7.7
Turbidity ²	GVW WQ Tech	NTU	4	-----	0.94	1.31	1.12
Turbidity ²	SCADA ¹ Average ⁴	NTU	31 Days	-----	0.74	1.10	0.93

¹SCADA: Supervisory Control and Data Acquisition.

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

³Drinking Water Treatment Objectives (Microbiological) for Surface Water Supplies in British Columbia (Sec 4.3): The number of E. coli in 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 a 24 hour average with readings taken every 15 seconds.

2. Agriculture/ Irrigation Sources

The sources used for irrigation supply include Duteau Creek, King Edward/Deer Creek, Goose Lake, Coldstream Ranch Well #2 and Well #3. Table 3 summarizes the daily flows for each irrigation system.

The majority of the Duteau Creek water (approx. 85%) is treated. The other sources are separated from the potable system and are not chlorinated.

The irrigation season is from April 15 to September 15. Irrigation water used during the off season is used mainly for livestock watering. This water comes from Ranch Well #2, Ranch Well #3, King Edward and Duteau Creek.

Table 3 Irrigation Volumes for Irrigation Sources over the Month

Irrigation Sources	DCWTP	Well 3	Well 2	King Edward
Min (ML/Day)	2.99	0.00	0.00	1.96
Max (ML/Day)	13.56	4.97	1.32	11.24
Average (ML/Day)	10.16	1.73	0.22	7.59
Monthly Total (ML)	314.99	53.51	6.80	235.36

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 treated with a coagulant and mixed to create a floc before clarification is achieved by Dissolved Air Flotation (DAF). Chlorine is added after clarification to ensure contact time for the removal of viruses, followed by Ultra-violet (UV) disinfection. Finally, an additional dose chlorine is added before entering the distribution system to maintain a set point for the residual chlorine value. MHWTP uses a dual disinfection process of UV and chlorine.

Tables 4 and 6 summarize results for chlorine, bacteria, turbidity, and UV Transmittance (UVT). Table 5 summarizes the log removal of viruses at the DCWTP.

Table 4 Duteau Creek Water Treatment Plant Reservoir

Parameter	Laboratory	Units	# of Samples	# of Deviations	Min	Max	Average
Free Chlorine ²	SCADA ¹ Daily Average	mg/L	31 Days	-----	1.84	1.99	1.90
E.coli	Caro	CFU/100 mL	5	-----	<1	<1	<1
E.coli	RDNO Lab	MPN/100 mL	5	-----	<1	<1	<1
Total Coliform	Caro	CFU/100 mL	5	-----	<1	<1	<1
Total Coliform	RDNO Lab	MPN/100 mL	5	-----	<1	<1	<1
Turbidity ²	SCADA ¹ Daily Average	NTU	31 Days	-----	0.21	0.30	0.26
Pre UVT ³	SCADA ¹ Daily Average	%	31 Days	-----	82.28	86.33	84.15

¹SCADA: Supervisory Control and Data Acquisition.

²Operation Guideline: As outlined in Deviation Response Plan, free chlorine >1.0 mg/L, turbidity <1.0 NTU.

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

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

Table 5 DCWTP – Log Removal of Viruses

Log Removal of Viruses ¹	
Days Monitored	31 Days
Days 4-Log Removal Achieved	31 Days

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

Table 6 Mission Hill Water Treatment Plant

Parameter	Laboratory	Units	# of Samples	# of Deviations	Min	Max	Average
Free Chlorine	SCADA ¹ Daily Average	mg/L	31 Days	-----	2.16	2.22	2.19
E.coli	Caro	CFU/100 mL	4	-----	<1	<1	<1
E.coli	RDNO Lab	MPN/100 mL	4	-----	<1	<1	<1
Total Coliform	Caro	CFU/100 mL	4	-----	<1	<1	<1
Total Coliform	RDNO Lab	MPN/100 mL	4	-----	<1	<1	<1
Turbidity²	SCADA ¹ Daily Average	NTU	31 Days	-----	0.74	1.09	0.92
Pre UVT	SCADA ¹ Daily Average	%	31 Days	-----	90.83	91.89	91.50

¹SCADA: Supervisory Control and Data Acquisition.

²Operation Guideline: As outlined in Deviation Response Plan, free chlorine >0.8 mg/L, turbidity <3.0 NTU.

This month, no off-spec water occurred at MHWTP.

4. Distribution

GVW has two distribution systems that interconnect: Duteau System typically supplied by Duteau Creek and Kalamalka System typically supplied by Kalamalka Lake. GVW has approximately 23,000 service connections.

Table 7 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 7 Volumes for GVW Distribution Systems over the Month

Volumes	DCWTP	MHWTP
Min (ML/Day)	19.70	20.90
Max (ML/Day)	83.10	35.63
Average (ML/Day)	58.29	28.94
Monthly Total (ML)	1748.60	868.12

Tables 8 and 9 summarize results for chlorine, bacteria, and turbidity for each distribution system. These systems are monitored by handheld instruments weekly.

Table 8 Duteau Distribution

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
Free Chlorine¹	Operator Grab Samples	mg/L	55	5	0.02 ³	1.79	0.89
Total Chlorine	Operator Grab Samples	mg/L	55	4	0.12 ⁴	2.01	1.10
E.coli	Caro	CFU/100 mL	25	-----	<1	<1	<1
E.coli	RDNO lab	MPN/100 mL	33	-----	<1	<1	<1
Total Coliform	Caro	CFU/100 mL	25	-----	<1	<1	<1
Total Coliform	RDNO Lab	MPN/100 mL	33	-----	<1	<1	<1
Turbidity	Operator Grab Samples	NTU	55	1	0.2	1.38 ²	0.45

¹GVW WQ Deviation Response Plan: free chlorine >0.20 mg/L, turbidity <1 NTU.

²One sample had turbidity >1 NTU but below the 5 NTU upper threshold outline in the RDNO Deviation Response Plan. All other parameters were within range.

^{3,4}Three of the free and total chlorine samples below the 0.20mg/L threshold set out by the Canadian Drinking Water Guidelines were from the Low Chlorine Sites and mitigation measures are in place (see Table 10). Additional analysis show that there is no negative impact on water quality at any of these sites.

Table 9 Kalamalka Distribution

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
Free Chlorine¹	Operator Grab Samples	mg/L	67	1	0.11 ²	1.89	1.31
Total Chlorine	Operator Grab Samples	mg/L	67	-----	0.27	2.19	1.61
E.coli	Caro	CFU/100 mL	45	-----	<1	<1	<1
E.coli	RDNO Lab	MPN/100 mL	30	-----	<1	<1	<1
Total Coliform	Caro	CFU/100 ml	45	-----	<1	1 ³	<1
Total Coliform	RDNO Lab	MPN/100 mL	30	-----	<1	<1	<1
Turbidity¹	Operator Grab Samples	NTU	67	-----	0.21	1.95	1.07

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

²One site was below the 0.20mg/L of free chlorine. Additional analysis shows no negative impact on water quality. The next reading was above the 0.20 mg/L threshold.

³One Total Coliform result. Sample site was resampled and result was <1 mg/L

The GVW distribution system contains six sampling sites (Table 10) 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 10 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. Water Quality and Customer Calls and Notifications

Water Quality Customer calls within the GVW Service area are tracked and recorded. There was a total of 3 customer calls this month.

Table 11 Water Quality Customer Calls for the month

# of Calls	Type of Call	Issue/Inquiry	Investigation	Comments
1	Issue	Poor Water Quality	Yes	<p>Caller stated that both they and their neighbors had turbid water and collected a sample of the event. RDNO staff sampled the property and adjacent properties. High turbidity was not present during testing. Attributed to a previous BWN stirring up sediment as the hydrant at the end of the street was used to flush the larger area. Customer was advised to flush premises.</p> <p>Customers street is going to be looped around and hooked back into the system to help with future water quality issues.</p>
1	Issue	Poor Water Quality	Yes	<p>Customer noticed water discoloration and yellow water. Customer was advised to flush due to water main work in the area. Customer called back a couple of days later saying water quality had not improved.</p>

				RDNO staff sampled the residence and noticed high turbidity and low chlorine residual. It was determined that a valve to the new water main was not turned on after installation creating a dead end in front of the customers residence. Valve was opened and water quality returned to normal. RDNO staff did a follow up test and results were within normal operating parameters.
1	Issue	Poor Water Quality	Yes	<p>Industrial customer noticed biological growth in their deionized water tanks and noticed that their filters upstream of the tanks also had a slimy growth on it. RDNO staff sampled and noted that residual chlorine was below the lower threshold of 0.2ppm while the total chlorine was above the upper limit of the meter (>2.20ppm).</p> <p>Sample of the slime was sent to an external consultant who identified the slime as an algae not previously noted in RDNO water sources.</p> <p>Because the algae is not present in RDNO water sources and the water was sitting in tanks on site for an indeterminate amount of time, it was determined that the water quality issue most likely originated onsite, possibly due to a backflow event during irrigation. An existing sample station outside the business confirmed that water quality remained acceptable before entering the property.</p>

6. Operational or Maintenance Activity

Operational activity within the GVW service area are tracked and recorded using an online database. There were a total of 30 operational activities this month outlined in Table 12.

Table 12 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
1	Water Service GIS Locate
9	Water Main Break Repair
0	Property Damage Repair
0	Water Valve Maintenance
6	Water Valve Repair
1	Water Service Install
13	Water Service Repair
0	Reservoirs Cleaned
0	New Hydrant Sticker Install

7. Localized WQA’s and Other Activity

Water quality events are tracked and recorded below. There were a total of 8 Water Quality Advisories and 4 Boil Water Notices outlined below.

On August 2, 2024, the WQA’s issued July 26 and July 31 to customers along 32 Ave between Alexis Park Dr and Bella Vista Rd and 38 St between 32 Ave and 30 Ave was rescinded.

On August 6, 2024, planned water service interruption notices were sent to some customers on 33 Ave, 34 Ave and 35 Ave between 34 St and 35 St for an August 8 outage and a planned outage for customers on 35 St between 32 Ave and 34 Ave for an August 9 outage. Both areas were placed on a WQA until August 12, 2024.

On August 7, 2024, a BWN was issued for Pottery Rd between 15 St and Hwy 6 as well as 18 Ave cul-de-sac west of 15 St due to multiple breaks in the water main.

On August 9, 2024, A planned water service interruption notice was issued for 32 Ave between 15 St and 18 St. The planned service interruption occurred between August 12 to August 14 and a 48 hour WQA was issued to affected resident. This WQA automatically rescinded after 48 hours.

On August 13, 2024, a planned water service interruption notice was issued to some customers along Harbour Heights Rd and Bench Row Rd due to a construction project in the area. Customers were placed on a WQA which rescinded automatically on August 16 at 16:00.

On August 15, 2024, the BWN issued on August 7, 2024, to some customers on Pottery Rd and 18 Ave was rescinded.

On August 16, 2024, a water reduction request was sent to residents of 3806 35 Ave. It was requested that residents reduce water use from 7:00 to 9:00 and 16:00 to 21:00 as water was being lost to some units of the building due to the ongoing work on the water main. This reduction was requested to occur until August 27, 2024.

On August 21, 2024, some customers along 32 Ave between Alexis Park Dr and Bella Vista Rd and 38 St between 32 Ave and 30 Ave were put on a BWN due to a water main break. This BWN replaced the previously placed WQA in this area.

On August 28, 2024, the BWN issued August 21 to customers along 32 Ave between Alexis Park Dr and Bella Vista Rd and 38 St between 32 Ave and 30 Ave was rescinded.

On August 30, 2024, some customers along 32 Ave between Alexis Park Dr and Bella Vista Rd and 38 St between 32 Ave and 30 Ave were put on a BWN due to a water main break.

On August 30, 2024, customers on Fairweather Pl were put on a BWN due to a water main break.

On August 30, 2024, a WQA was issued for some customers in the areas of Coldstream Creek Rd west of McClonie Rd, Hillside Rd, Priest Valley Dr, Summit Dr, Wyatt Way, Palfrey Dr W, Palfrey Dr E, Upper Summit Dr, Lochhaven Dr, Marwood Pl, Cunliffe Rd and Kidston Rd due to a water main break in the area.