



**Greater Vernon Water (GVW) Water Quality Report for June 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
<b>E.coli<sup>2</sup></b>	Caro	MPN/100 mL	4	-----	2	7	5
<b>E.coli<sup>2</sup></b>	RDNO Lab	MPN/100 mL	8	-----	<1	6.3	4.8
<b>Total Coliform</b>	Caro	MPN/100 mL	4	-----	214	344	266
<b>Total Coliform</b>	RDNO Lab	MPN/100 mL	8	-----	127.4	307.6	196.3
<b>Turbidity</b>	GVW WQ Tech	NTU	4	-----	0.95	1.45	1.22
<b>Turbidity</b>	SCADA <sup>1</sup> Daily Average <sup>3</sup>	NTU	30 Days	-----	0.63	1.50	0.99

<sup>1</sup>SCADA: Supervisory Control and Data Acquisition.

<sup>2</sup>Drinking 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.

<sup>3</sup>SCADA data for this online analyzer is a 24 hour average taken every 10 minutes.

**Table 2 Kalamalka Lake Intake**

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
E.coli <sup>3</sup>	Caro	MPN/100 mL	5	-----	<1	1	<1
E.coli <sup>3</sup>	RDNO Lab	MPN/100 mL	10	-----	<1	1.0	<1
Total Coliform	Caro	MPN/100 mL	5	-----	<1	7	4
Total Coliform	RDNO Lab	MPN/100 mL	10	-----	3.1	7.4	4.8
Turbidity <sup>2</sup>	GVW WQ Tech	NTU	4	-----	0.65	1.21	0.85
Turbidity <sup>2</sup>	SCADA <sup>1</sup> Average <sup>4</sup>	NTU	30 Days	-----	0.51	0.79	0.62

<sup>1</sup>SCADA: Supervisory Control and Data Acquisition.

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

<sup>3</sup>Drinking 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.

<sup>4</sup>SCADA 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)	0.00	0.00	0.00	0.00
Max (ML/Day)	6.66	4.31	2.41	7.89
Average (ML/Day)	2.86	1.11	0.19	2.84
Monthly Total (ML)	88.61	34.44	6.04	88.18

### 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 <sup>2</sup>	SCADA <sup>1</sup> Daily Average	mg/L	30 Days	-----	1.84	1.99	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
Turbidity <sup>2</sup>	SCADA <sup>1</sup> Daily Average	NTU	30 Days	-----	0.22	0.41	0.33
Pre UVT <sup>3</sup>	SCADA <sup>1</sup> Daily Average	%	30 Days	-----	87.16	91.02	89.28

<sup>1</sup>SCADA: Supervisory Control and Data Acquisition.

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

<sup>3</sup>UVT is monitored pre-UV treatment which is used to determine UV dosage.

This month, 5 m<sup>3</sup> of off-spec water occurred at DCWTP when a row of lamps switched to another row. The UV dose dipped slightly below the validated dose during this event. The volume of offspec water during this event was less than 0.001% of the total water treated at Duteau Creek Water Treatment Plant in June.

**Table 5 DCWTP – Log Removal of Viruses**

Log Removal of Viruses <sup>1</sup>	
Days Monitored	30 Days
Days 4-Log Removal Achieved	30 Days

<sup>1</sup>4-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
<b>Free Chlorine</b>	SCADA <sup>1</sup> Daily Average	mg/L	30 Days	-----	1.80	2.02	1.99
<b>E.coli</b>	Caro	CFU/100 mL	4	-----	<1	<1	<1
<b>E.coli</b>	RDNO Lab	MPN/100 mL	6	-----	<1	<1	<1
<b>Total Coliform</b>	Caro	CFU/100 mL	4	-----	<1	<1	<1
<b>Total Coliform</b>	RDNO Lab	MPN/100 mL	6	-----	<1	<1	<1
<b>Turbidity<sup>2</sup></b>	SCADA <sup>1</sup> Daily Average	NTU	30 Days	-----	0.46	0.73	0.58
<b>Pre UVT</b>	SCADA <sup>1</sup> Daily Average	%	30 Days	-----	90.12	91.61	91.04

<sup>1</sup>SCADA: Supervisory Control and Data Acquisition.

<sup>2</sup>Operation 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
<b>Min (ML/Day)</b>	14.20	17.31
<b>Max (ML/Day)</b>	59.40	31.90

<b>Average (ML/Day)</b>	34.46	25.77
<b>Monthly Total (ML)</b>	1033.70	773.13

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
<b>Free Chlorine<sup>1</sup></b>	Operator Grab Samples	mg/L	58	-----	0.33	1.61	0.96
<b>Total Chlorine</b>	Operator Grab Samples	mg/L	58	-----	0.56	2.00	1.17
<b>E.coli</b>	Caro	CFU/100 mL	23	-----	<1	<1	<1
<b>E.coli</b>	RDNO lab	MPN/100 mL	37	-----	<1	<1	<1
<b>Total Coliform</b>	Caro	CFU/100 mL	23	-----	<1	<1	<1
<b>Total Coliform</b>	RDNO Lab	MPN/100 mL	37	-----	<1	<1	<1
<b>Turbidity</b>	Operator Grab Samples	NTU	59	-----	0.2	1.01	0.51

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

**Table 9 Kalamalka Distribution**

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
<b>Free Chlorine<sup>1</sup></b>	Operator Grab Samples	mg/L	64	-----	0.32	2.00	1.11
<b>Total Chlorine</b>	Operator Grab Samples	mg/L	64	-----	0.58	2.20	1.38
<b>E.coli</b>	Caro	CFU/100 mL	42	-----	<1	<1	<1
<b>E.coli</b>	RDNO Lab	MPN/100 mL	30	-----	<1	<1	<1
<b>Total Coliform</b>	Caro	CFU/100 ml	42	-----	<1	<1	<1
<b>Total Coliform</b>	RDNO Lab	MPN/100 mL	30	-----	<1	<1	<1
<b>Turbidity<sup>1</sup></b>	Operator Grab Samples	NTU	64	-----	0.37	1.42	0.77

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

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 were a total of 12 customer calls this month.

**Table 11 Water Quality Customer Calls for the month**

# of Calls	Type of Call	Issue/Inquiry	Investigation	Comments
1	Issue	Turbid Water	Yes	CoV had shut down a water main in the area to repair a leak. Customer was advised to flush taps to clear water.
1	Issue	Black Ring in Toilet	No	Customer was told bacteria can grow as chlorine dissipates. Suggested cleaning with a strong cleaner and adding a chlorine puck in toilet if they wish. They were notified that there were no changes to the system in the area.
1	Information	Question about water source. Rapidly going through water filters.	No	Customer was told about hard water and high mineral counts in Kalamalka lake. Flushing was being done in the area. Customer will look at a larger filter and by-pass filter when flushing is occurring.

1	Issue	Septic smelling water.	No	Called customer and left a message for more information. No return call from customer.
1	Information	Customer needs water quality reports.	No	Emailed customer with links to the monthly reports.
1	Information	Customer was under a WQA and was inquiring if water is safe to drink.	No	Spoke with customer about information contained within the notice as well as what to do during a WQA.
1	Issue	Customers tenant has gotten a rash from the hot water. Customers other tenant did not get a rash from the water.	No	Customer was advised to call a plumber to flush the hot water tank, Water quality report for the area was supplied to the customer.
1	Issue	Customer works at hotel and noticed their alkalinity and pH levels were higher than previous and needs to meet drinking water guidelines.	Yes	Customer was on a different source due to operational work. Customer asked if they could have their pH altered but was told that cannot be done by RDNO. Customer requested that they be put on a specific source but were told that was not possible
1	Information	Customer requested analysis on sample.	No	Customer was advised to speak with IH.
1	Issue	Customer complaint of yellow colored water. Suggested it could be due to water main replacement outside her building.	Yes	It was determined that the line to the customer building was cut and capped due to the new line going in. Customer was now the only house connected to the old line and it dead ended at her residence. Sampling at residence showed high turbidity (19.7 NTU) and low Chlorine (<0.2ppm). A blow off was installed on the old main outside residence and construction crew is flushing main 2x per week. Subsequent sampling show that water is now within guidelines. Residence will be tied into the new main at the end of August.
1	Issue	Customer complaint; water staining clothes in washing machine and something coming in through the water lines	Yes	Customer clothes are coming out of the washing machine with grease stains on both sets of washing machines. Customer cleaned washing machines to no avail. Called plumber to look at tankless hot water and found a build up on a filter coming into the hot water tank. Stated that there was something coming through the water line from outside the house. Sampling on site is scheduled.

1	Issue	Customer tastes chlorine in their water	No	Called customer and left message explaining why we chlorinate the water and how it is monitored.
---	-------	---	----	--

**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 27 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
2	Water Service GIS Locate
4	Water Main Break Repair
1	Property Damage Repair
2	Water Valve Maintenance
4	Water Valve Repair
0	Water Service Install
14	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 10 Water Quality Advisories and 2 Boil Water Notices outlined below.

On June 6, 2024, some customers along Kalamalka Lake Rd were put on a Boil Water Notice due to a water main break in the area.

On June 11, 2024, the Boil Water Notice issued on June 6, 2024, to some customers along Kalamalka Lake Rd was rescinded.

On June 14, 2024, a WQA was issued in advance of water main tie-ins to be completed on June 17<sup>th</sup>, June 19<sup>th</sup> and June 21<sup>st</sup>. The WQA was set to automatically rescind at midnight June 23<sup>rd</sup>.



On June 25, 2024, customers in the area along 32<sup>nd</sup> Ave between 38<sup>th</sup> St and Bella Vista Rd were put on a precautionary Boil Water Notice due to a rupture in the water main,

On June 26, 2024, the Boil Water Notice sent to customers on June 25 was reissued with a smaller affected area due to better mapping of the area.

On June 28, 2024, the Boil Water Notice that was sent to customers on 32<sup>nd</sup> Ave between 38<sup>th</sup> St and Bella Vista Rd on June 25, 2024, was rescinded.