REGIONAL DISTRICT NORTH OKANAGAN

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

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 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.coli[3]	Caro	MPN/100 mL	5	-----	<1	1	<1
E.coli[3]	RDNO Lab	MPN/100 mL	10	-----	<1	5.2	1.3
Total Coliform	Caro	MPN/100 mL	5	-----	25	194	110
Total Coliform	RDNO Lab	MPN/100 mL	10	-----	24.9	83.3	51.8
Turbidity[2]	GVW WQ Tech	NTU	5	-----	1.12	2.30	1.54
Turbidity[2]	SCADA[1] Daily Average[4]	NTU	30 Days	-----	0.86	1.99	1.28

[1]SCADA: Supervisory Control and Data Acquisition.
[2]Operation Guideline: As outlined in Deviation Response Plan, turbidity <1 NTU.
[3]Drinking Water Treatment Objectives (Microbilological) 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.
[4]SCADA data for this online anazlyer is an average of 24 readings taken on the hour.

Table 2 Kalamalka Lake Intake

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
E.coli[3]	Caro	MPN/100 mL	5	-----	<1	2	<1
E.coli[3]	RDNO Lab	MPN/100 mL	10	-----	<1	1.0	<1
Total Coliform	Caro	MPN/100 mL	5	-----	<1	4	2
Total Coliform	RDNO Lab	MPN/100 mL	10	-----	<1	5.2	1.5
Turbidity[2]	GVW WQ Tech	NTU	5	-----	0.54	0.87	0.66
Turbidity[2]	SCADA[1] Average[4]	NTU	30 Days	-----	0.32	0.42	0.37

[1]SCADA: Supervisory Control and Data Acquisition.
[2]Operation Guideline: As outlined in Deviation Response Plan, turbidity <3 NTU.
[3]Drinking Water Treatment Objectives (Microbilological) 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.
[4]SCADA data for this online anazlyer is an average of 24 readings taken on the hour.

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)	2067.15	0.97	0.00	1.24
Average (ML/Day)	427.99	0.08	0.00	0.51
Monthly Total (ML)	12411.73	2.40	0.00	14.72

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	30 Days	-----	1.86	2.11	1.91
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	30 Days	-----	0.32	0.42	0.37
Pre UVT[3]	SCADA[1] Daily Average	%	30 Days	-----	85.94	89.66	87.52

[1]SCADA: Supervisory Control and Data Acquisition.
[2]Operation Guideline: As outlined in Deviation Response Plan, free chlorine >0.20 mg/L, turbidity <1.0 NTU.
[3]UVT is monitored pre-UV treatment which is used to determine UV dosage.

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

Table 5 DCWTP – Log Removal of Viruses

Log Removal of Viruses[1]	
Days Monitored	30 Days
Days 4-Log Removal Achieved	30 Days

[1]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
Free Chlorine	SCADA[1] Daily Average	mg/L	30 Days	-----	1.94	2.02	2.00
E.coli	Caro	CFU/100 mL	5	-----	<1	<1	<1
E.coli	RDNO Lab	MPN/100 mL	6	-----	<1	<1	<1
Total Coliform	Caro	CFU/100 mL	5	-----	<1	<1	<1
Total Coliform	RDNO Lab	MPN/100 mL	6	-----	<1	<1	<1
Turbidity[2]	SCADA[1] Daily Average	NTU	30 Days	-----	0.32	0.69	0.46
Pre UVT	SCADA[1] Daily Average	%	30 Days	-----	91.15	91.79	91.44

[1]SCADA: Supervisory Control and Data Acquisition.
[2]Operation Guideline: As outlined in Deviation Response Plan, free chlorine >0.20 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 22,350 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)	5.20	11.85
Max (ML/Day)	24.10	19.76
Average (ML/Day)	14.71	15.60
Monthly Total (ML)	426.70	452.27

Tables 8 and 9 summarize results for chorine, 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 Chlorine[1]	Operator Grab Samples	mg/L	68	2[3]	0.03	2.04	1.05
Total Chlorine	Operator Grab Samples	mg/L	68	-----	0.10	1.97	1.38
E.coli	Caro	CFU/100 mL	23	-----	<1	<1	<1
E.coli	RDNO lab	MPN/100 mL	36	-----	<1	<1	<1
Total Coliform	Caro	CFU/100 mL	23	-----	<1	<1	<1
Total Coliform	RDNO Lab	MPN/100 mL	36	-----	<1	<1	<1
Turbidity	Operator Grab Samples	NTU	68	1[3]	0.3	10.6	0.75

[1]GVW WQ Deviation Response Plan: free chlorine >0.20 mg/L, turbidity <1 NTU.
[2]Sample site was reanalyzed and turbidity <1 NTU.
[3]Sample site was flushed after reading as part of GVW flushing program

Table 9 Kalamalka Distribution

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
Free Chlorine[1]	Operator Grab Samples	mg/L	77	-----	0.38	2.04	1.16
Total Chlorine	Operator Grab Samples	mg/L	77	-----	0.53	2.34	1.44
E.coli	Caro	CFU/100 mL	43	-----	<1	<1	<1
E.coli	RDNO Lab	MPN/100 mL	35	-----	<1	<1	<1
Total Coliform	Caro	CFU/100 Ml	43	-----	<1	<1	<1
Total Coliform	RDNO Lab	MPN/100 mL	35	-----	<1	<1	<1
Turbidity[1]	Operator Grab Samples	NTU	77	-----	0.29	1.07	0.60

[1]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 6 customer calls this month.

Table 11 Water Quality Customer Calls for the month

# of Calls	Type of Call	Issue/Inquiry	Investigation	Comments
1	Information	Water Hardness inquiry	No	Gave average water hardness ranges for both Duteau and Kalamala sources
1	Issue	High chlorine content in water	No	Customer was advised that chlorine is continuously monitored and is in normal range. Customer will follow up with IH and test independently.
1	Information	Source water and Treatment questions	No	Customer was directed to website for more information.
1	Issue	High TSS caused fridge filter to deplete earlier than expected	No	Customer was advised that they were switched to Kalamalka source water which has a higher mineral content.
1	Information	Customer wanted personal well tested	No	Informed customer that we do not test personal wells.
1	Information	Customer was wanting to know how much chlorine is in the water	No	Chlorine was deteriorating her pipes. Was advised to check the website.

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 56 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
14	Water Service GIS Locate
2	Water Main Break Repair
1	Property Damage Repair
0	Water Valve Maintenance
4	Water Valve Repair
17	Water Service Install
18	Water Service Repair
0	Reservoirs Cleaned
0	New Hydrant Sticker Install

7. Localized WQA's and Other Activity

On April 4, 2024, customers were advised that Francis Street would be closed on April 8, 2024, and customers would be without water due to a water main tie in. On April 8, 2024, a precautionary Water Quality Advisory (WQA) was issued for Francis Street due to the water main tie in.

On April 5, 2024, customers located at 4200-4217 34 St were notified that they would be without water on April 9, 2024, due to a planned water main upgrade event.

On April 8, 2024, customers on Dixon Dam Rd, Malim Rd, Brookside Rd, Huges Rd, Hartnell Rd, Curlew Rd and Maddock Rd were notified that they would be without water on April 9, 2024, to accommodate a pump replacement at SBX2 Pump Station

On April 8, 2024, customers on Lakeridge Dr, Lakeridge Crt, Lakeridge Pl, Amber Dr, Jasper Dr, 6676-6848 Cameo Dr, Garnet Rd, Topaz Rd, Jade Rd, 7310-7392 Bella Vista Rd, Ogata Way, Fleming Rd, and Joharon Rd were notified that they would be without water on April 11, 2024 to accommodate maintenance to a Pressure Reducing Valve

On April 11, 2024, the precautionary WQA issued for the Francis Street water main tie in was rescinded.

On April 22, 2024, a precautionary WQA was issued for some customers along De Roo, Briggs and Dixon Dam Roads due to a maintenance event that resulted in a loss of pressure.

On April 30, 2024, a precautionary Boil Water Notice (BWN) was issued for Shantz Road due to an unplanned repair.