

Wilderness Mountain Water System

2025 Annual Report



Introduction

This report provides a summary of the Wilderness Mountain Water Service for 2025 and includes a description of the service, summary of the water supply, demand and production, drinking water quality, operations highlights, capital project updates and financial report.

Service Description

The community of Wilderness Mountain is a rural residential development located on Mount Matheson in the Juan de Fuca Electoral Area. The area was originally serviced by a private water utility from about 1983, and in 2008 the service converted to the Capital Regional District (CRD). The Wilderness Mountain water service is made up of 82 parcels encompassing a total area of approximately 124 hectares. Of the 82 parcels, 74 were customers to the water system in 2025.

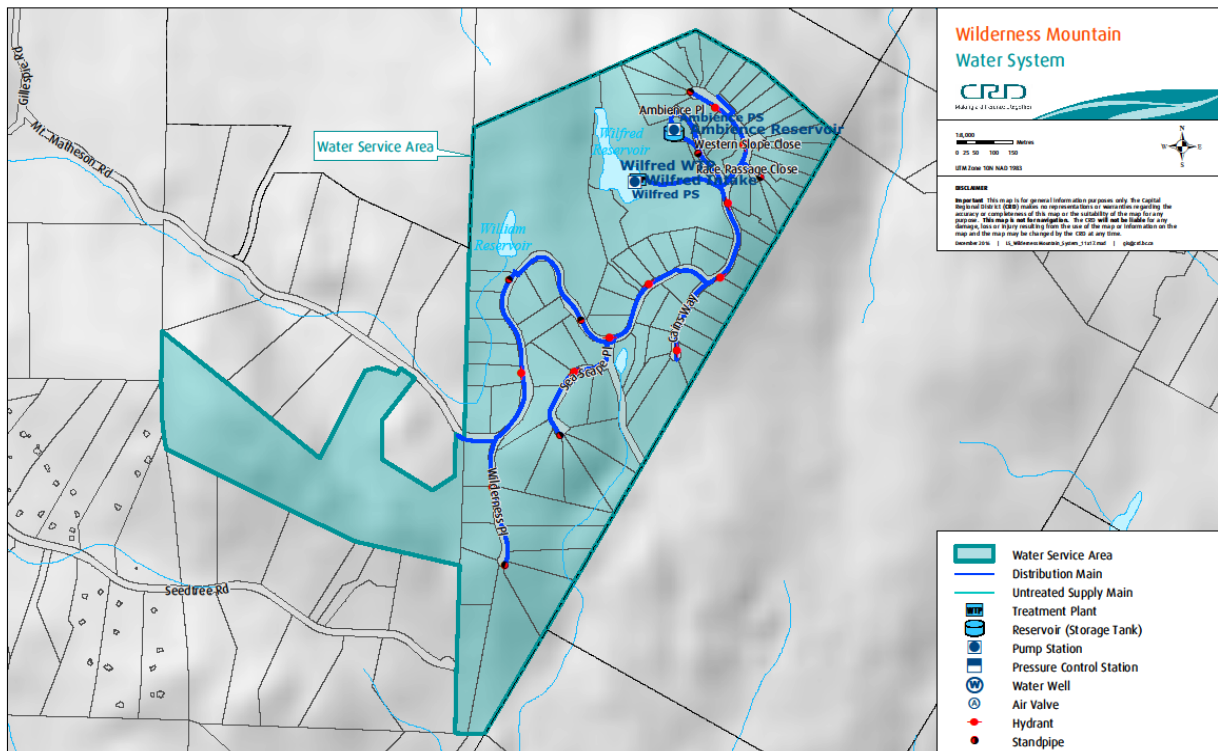


Figure 1: Map of the Wilderness Mountain Water Service Area

The Wilderness Mountain water system is primarily comprised of:

- Raw water obtained from Wilfred Reservoir, a small surface water body which lies within a protected watershed and was created by the construction of two dams.
- Water from Wilfred Reservoir is pumped to the treatment plant which consists of coarse cartridge filtration, ultraviolet disinfection and chloramine disinfection.
- The chloraminated water is then pumped to two distribution system storage tanks (combined capacity of 250 cubic meters or 66,000 US gallons) and the distribution system.
- Distribution system. 3,750-meter network of 150-millimeter (mm) (6 inch) and 100mm (4 inch) polyvinyl chloride (PVC) water mains.
- Other water system assets: 74 service connections, 10 hydrants, six standpipes, 21 gate valves and a Supervisory Control and Data Acquisition (SCADA) system.
- Although the water system also includes the William Brook Dam and related water reservoir, this reservoir is no longer utilized for water supply.

Water Supply

The raw water supply level in Wilfred Reservoir is shown in Figure 2. The lake level was at its lowest point in October. The reservoir reached full volume in January 2025.

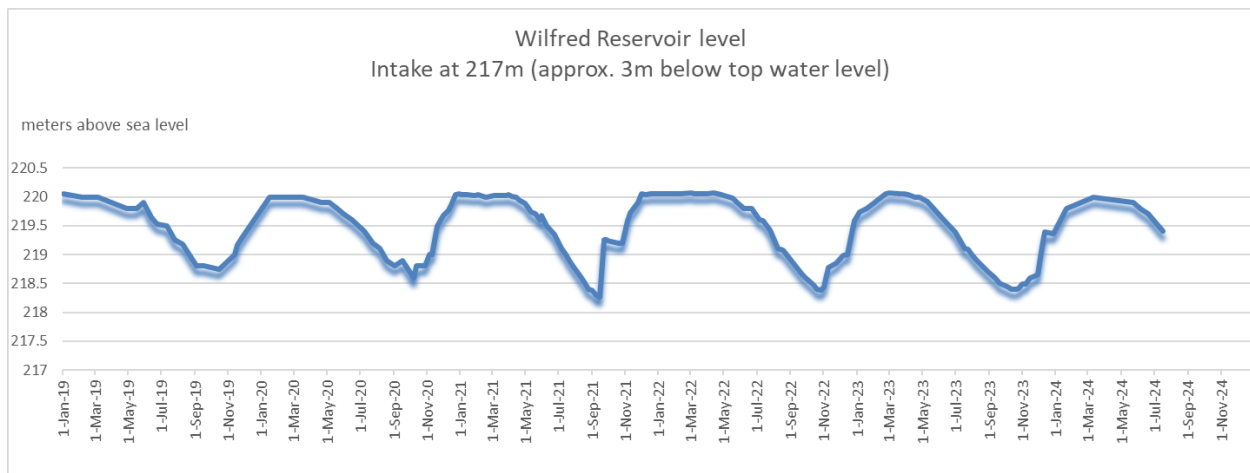


Figure 2: Wilfred Reservoir Water Level 2019-2025

Water Usage

The volume used by the community, or the water demand, is illustrated in Figure 3. The demand in 2025 was 20% higher than in 2024.

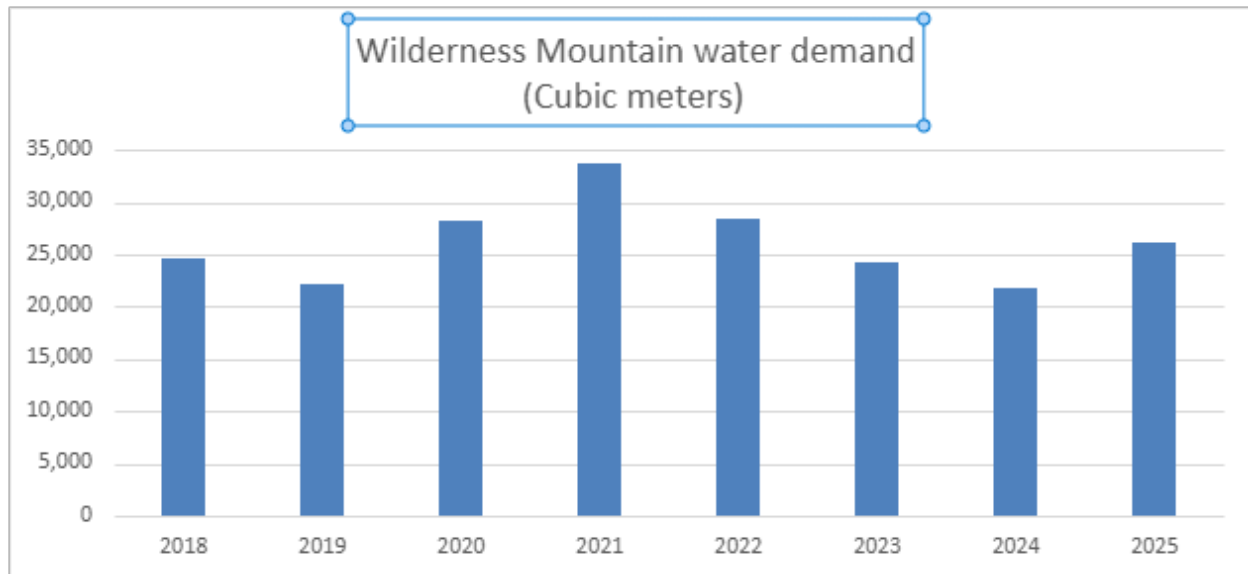


Figure 3: Wilderness Mountain Water Demand (cubic meters) 2018-2025

Drinking Water Quality

The Wilderness Mountain Water System was under three boil water advisories (BWA) in 2025, totaling 104 days, due to elevated turbidity in the treated water. High algal activity and the inability of the existing filtration system to remove very small algal species during bloom conditions were the primary causes of two of these BWAs. Upgrades to the treatment process or development of a new water source are required to meet provincial requirements. The third and shortest BWA was caused by a faulty intake pump that introduced air into the system.

Raw water from Wilfred Reservoir exhibited elevated iron and manganese concentrations throughout the year, with the highest levels occurring from October through December. These increases were primarily driven by lake turnover and rainfall-related runoff. In the absence of treatment designed to remove these metals, the aesthetic objectives for iron and manganese in the Guidelines for Canadian Drinking Water Quality (GCDWQ) were regularly exceeded in the treated water. An exceedance of the manganese maximum acceptable concentration (MAC), the health-based limit in the GCDWQ, resulted in a Water Quality Advisory from November 3 to December 16. Concentrations above the aesthetic objective can cause water discoloration, while exceedances of the MAC may pose health concerns with chronic exposure. Additional treatment is required to address this ongoing issue. Water colour remained high throughout the year.

The data below provides a summary of the water quality characteristics in 2025:

Raw Water:

- From May through July, the raw water showed extremely high total coliform bacteria concentrations. This is the second consecutive year that this pattern has been observed. Outside this period, total coliform concentrations remained relatively low.
- *E. coli* bacteria concentrations were mostly low with occasionally higher concentrations during the wet season.
- Parasitic *Cryptosporidium* oocysts and *Giardia* cysts were sampled and analyzed twice in 2025, with no detections reported for either organism.

- Raw water was tested monthly for metals. Results show that both iron and manganese concentrations were particularly high from October through December, with peak values of 492 µg/L for iron and 193 µg/L for manganese. This pattern is likely driven by a combination of lake turnover and increased runoff during rainfall events. The source water consistently contained elevated iron levels above the GCDWQ aesthetic objective throughout the year. Manganese concentrations were only slightly below the aesthetic limit during August and September.
- The median annual raw water turbidity was 1.00 Nephelometric Turbidity Unit (NTU), slightly higher than in 2024. Turbidity was typically above 1 NTU during the wet season and again in June. The maximum recorded turbidity was 2.0 NTU on November 15. Most turbidity spikes in the raw water coincided with algal and zooplankton blooms in Wilfred Reservoir. Runoff and lake turnover can also adversely affect turbidity.
- The raw water was soft (median hardness 17.2 mg/L CaCO₃).
- The pH was neutral (median pH 7.1).
- The median total organic carbon (TOC) concentration was moderately high at 4.45 mg/L, which is in line with historic results.

Treated Water:

- The treated water was safe to drink outside the 104 total days under BWAs (March 18 to April 11, April 25 to May 2, and October 14 to December 24, 2025). No *E. coli* bacteria were detected in the treated water at any time during the year. On June 10, one distribution system sample tested positive for total coliform bacteria. A resample was negative, confirming that no actual drinking water contamination had occurred.
- Treated water turbidity exceeded the GCDWQ limit of 1.0 NTU in March, April, and again from October through December. These elevated values resulted in two of the three BWAs issued in 2025. The third BWA, from April 25 to May 2, was caused by air entrainment from a faulty intake pump, which produced falsely high turbidity readings at the treatment plant.
- Manganese concentrations exceeded the aesthetic objective in the treated water during most of the year. August and September were the only months with lower manganese levels in the raw water, and because no metal treatment is in place, raw water metal conditions are directly reflected in the treated water. Treated water samples collected on October 22 exceeded the GCDWQ MAC, and a Water Quality Advisory for high manganese concentrations was issued from November 3 to December 16.
- Iron concentrations were in exceedance of the recently lowered aesthetic objective for most parts of the year. The water had a high colour rating for the entire year, likely because of high iron and manganese concentrations.
- The disinfection by-products Trihalomethanes (TTHM) and Haloacetic Acids (HAA) were well below the GCDWQ limits.
- The annual median total chlorine residual in the system was 1.74 mg/L with a range from 0.2 to 3.9 mg/L.

Table 1 and 2 below provide a summary of the 2025 raw and treated water test results.

Water quality data collected from this drinking water system can be reviewed on the CRD website:

<https://www.crd.bc.ca/about/data/drinking-water-quality-reports>

Operational Highlights

The following is a summary of the operational issues that were addressed by CRD Integrated Water Services staff:

- Intake pump replacement;
- Monthly Dam Safety Inspections

Capital Project Updates – 2025

The Capital Projects that were in progress or completed in 2025 include:

- Wooden Intake Platform Replacement – This project was completed in 2025 and the new intake platform, including floating structure are now complete and in use.
- SCADA Communication Upgrade – Budget was set up and preliminary planning efforts commenced in late 2025, with the improvements scheduled to be carried out in 2026.

Financial Report

Please refer to the attached 2025 Statement of Operations and Reserve Balances.

Revenue includes parcel taxes (Transfers from Government), fixed user fees (User Charges), water sales and interest on savings (Interest earnings), and miscellaneous revenue such as late payment charges (Other revenue).

Expenses include all costs of providing the service. General Government Services include budget preparation, financial management, utility billing and risk management services. CRD Labour and Operating Costs include CRD staff time as well as the costs of equipment, tools, and vehicles. Debt servicing costs are interest and principal payments on long term debt. Other Expenses include all other costs to administer and operate the water system, including insurance, supplies, water testing and electricity.

The difference between Revenue and Expenses is reported as Net revenue (expenses). Any transfers to or from capital or reserve funds for the service (Transfers to own funds) are deducted from this amount and it is then added to any surplus or deficit carried forward from the prior year, yielding an Accumulated Surplus (or deficit). In alignment with the *Local Government Act* Section 374 (11), any deficit must be carried forward and included in next year's financial plan.

Table 1

Table 1: 2025 Summary of Raw Water Test Results, Wilderness Mountain Water System										
PARAMETER		2025 ANALYTICAL RESULTS				CANADIAN GUIDELINES	2015 - 2024 ANALYTICAL RESULTS			
Parameter Name	Units of Measure	Annual Median	Samples Analyzed	Range Minimum Maximum		≤ = Less than or equal to	Median	Samples Analyzed	Range Minimum Maximum	
mg/L = parts per million ug/L = parts per billion										
Physical Parameters (ND means Not Detected by analytical method used)										
Carbon, Dissolved Organic	mg/L as C	4.25	2	4	4.5		4	18	1.91	5.4
Carbon, Total Organic	mg/L as C	4.45	4	4	4.8	Guideline Archived	4.2	29	2.96	8.8
Colour, True	TCU	30	4	15	31	≤15 AO	16	47	7	31
Hardness as CaCO ₃	mg/L	17.2	11	15.7	20.1	No Guideline Required	16	41	13.4	19.1
pH	pH units	7.07	11	6.5	7.6	7.0 - 10.5 AO	6.9	88	6.14	8.1
Total Suspended Solids	mg/L	2	1	2	2		<2	11	1.2	7.2
Total Solids	mg/L	<10	1	<10	<10		50	11	42	88
Turbidity, lab tests	NTU	1	21	0.85	2		1.1	190	0.493	3.6
Ultraviolet Transmittance	%	Not tested in 2025					76.55	32	69.9	82.1
Water Temperature	degrees C	15	21	4.4	19.8	≤15 AO	11.45	224	3.5	21.2
Non-Metallic Inorganic Chemicals (ND means Not Detected by analytical method used)										
Ammonia, Total	ug/L as N	< 15	2	< 15	<15		< 15	17	<0.015	71
Bromide	ug/L as Br	0.049	1	0.049	0.049		38	12	0.035	50
Chloride	mg/L as Cl	15	1	15	15	≤ 250 AO	11	11	10	15
Cyanide	mg/L as Cn	0.00062	1	0.00062	0.00092	0.2 MAC	< 0.0005	11	< 0.0005	< 0.005
Fluoride	mg/L as F	< 0.05	1	< 0.05	< 0.05	1.5 MAC	< 0.021	5	0.016	0.024
Nitrogen, Nitrate	ug/L as N	< 20	2	< 20	<20		< 20	16	< 20	115
Nitrogen, Nitrite	ug/L as N	< 5	2	< 5	<5		< 5	18	< 5	< 5
Nitrogen, Total	ug/L as N	267	2	258	276		243	16	180	468
Phosphate, Total	ug/L as P	6.1	2	1.2	11		6.45	18	< 1	71
Silica	mg/L as SiO ₂	3.6	2	2.7	4.5		3.3	17	<0.5	5.5
Silicon	mg/L as Si	1580	11	979	2160		1490	41	380	2920
Sulphate	mg/L as SO ₄	4.3	3	4.2	4.3	≤ 500 AO	5.4	21	3.4	19
Sulphide	mg/L as H ₂ S	< 0.0018	1	< 0.0018	<0.0018	≤ 0.05 AO	< 0.0018	5	< 0.0018	0.0037
Sulphur	mg/L as S	< 3	11	< 3	<3		< 3	41	< 3	< 3
Metals (ND means Not Detected by analytical method used)										
Aluminum	ug/L as Al	16.2	11	7.3	54.4	2900 MAC / 100 OG	24.4	41	5.9	81.5
Antimony	ug/L as Sb	< 0.5	11	< 0.5	< 0.5	6 MAC	< 0.5	41	< 0.5	< 0.5
Arsenic	ug/L as As	0.28	11	0.12	0.63	10 MAC	< 0.1	41	< 0.1	0.14
Barium	ug/L as Ba	1.9	11	1.4	3	1000 MAC	2.2	41	< 1	2.8
Beryllium	ug/L as Be	< 0.1	11	< 0.1	< 0.1		< 0.1	41	< 0.1	< 0.1
Bismuth	ug/L as Bi	< 1	11	< 1	< 1		< 1	41	< 1	< 1
Boron	ug/L as B	< 50	11	< 50	< 50	5000 MAC	< 50	41	< 50	< 50
Cadmium	ug/L as Cd	< 0.01	11	< 0.01	< 0.01	7 MAC	< 0.01	41	< 0.01	0.046
Calcium	mg/L as Ca	3.71	11	3.35	4.37	No Guideline Required	3.48	41	2.9	4.11
Chromium	ug/L as Cr	< 1	11	< 1	< 1	50 MAC	< 1	41	< 1	< 1
Cobalt	ug/L as Co	< 0.2	11	< 0.2	0.23		< 0.2	41	< 0.2	0.5
Copper	ug/L as Cu	5.03	11	3.17	6.35	2000 MAC / ≤ 1000 AO	3.6	41	1.86	28.5
Iron	ug/L as Fe	233	11	97.9	492	≤ 100 AO	170	41	89	902
Lead	ug/L as Pb	0.35	11	0.28	0.54	5 MAC	0.3	41	< 0.2	2.68
Lithium	ug/L as Li	< 2	11	< 2	< 2		< 2	32	< 2	< 5
Magnesium	mg/L as Mg	1.97	11	1.78	2.24	No Guideline Required	1.8	41	1.48	2.21
Manganese	ug/L as Mn	37.9	11	18.1	193	120 MAC / ≤ 20 AO	53.4	41	19.7	364
Mercury	ug/L as Hg	0.00265	4	< 0.0019	0.0059		< 0.0019	32	< 0.0019	< 0.05
Molybdenum	ug/L as Mo	< 1	11	< 1	< 1		< 1	41	< 1	< 1
Nickel	ug/L as Ni	< 1	11	< 1	< 1		< 1	41	< 1	< 1
Potassium	mg/L as K	0.356	11	0.317	0.401		0.342	41	0.249	0.454
Selenium	ug/L as Se	< 0.1	11	< 0.1	< 0.1	50 MAC	< 0.1	41	< 0.1	< 0.1
Silver	ug/L as Ag	< 0.02	11	< 0.02	< 0.02	No Guideline Required	< 0.02	41	< 0.02	< 0.02
Sodium	mg/L as Na	7.53	11	6.25	8.19	≤ 200 AO	6.87	41	6.18	9.44
Strontium	ug/L as Sr	15.5	11	14.7	17.7	7000 MAC	14.5	41	12.2	17.8
Thallium	ug/L as Tl	< 0.01	11	< 0.01	< 0.01		< 0.01	41	< 0.01	< 0.05
Tin	ug/L as Sn	< 5	11	< 5	< 5		< 5	41	< 5	< 5
Titanium	ug/L as Ti	< 5	11	< 5	< 5		< 5	41	< 5	< 5
Uranium	ug/L as U	< 0.1	11	< 0.1	< 0.1	20 MAC	< 0.1	41	< 0.1	< 0.1
Vanadium	ug/L as V	< 5	11	< 5	< 5		< 5	41	< 5	< 5
Zinc	ug/L as Zn	11.6	11	7.1	18.6	≤ 5000 AO	6	41	< 5	42.3
Zirconium	ug/L as Zr	< 0.1	11	< 0.1	< 0.1		< 0.1	41	< 0.1	< 0.5
Microbial Parameters										
Indicator Bacteria										
Coliform, Total	Coliforms/100 mL	640	21	13	120000		150.5	186	< 1	190000
E. coli	E. coli/100 mL	< 1	21	< 1	12		< 2	195	< 1	29
Hetero. Plate Count, 28C (7 day)	CFU/1 mL	Last analyzed in 2014				No Guideline Required	Last analyzed in 2014			
Chlorophyll										
Chlorophyll A	ug/L	2.54	15	1.68	6		3.535	124	0.295	13.2
Parasites										
No MAC E established										
Cryptosporidium, Total oocysts	oocysts/100 L	< 1	2	< 1	< 1	Zero detection desirable	< 0.1	13	< 0.1	< 1
Giardia, Total cysts	cysts/100 L	< 1	2	< 1	< 1	Zero detection desirable	< 0.1	13	< 0.1	< 1

Table 2

Table 2: 2025 Summary of Treated Water Test Results, Wilderness Mountain Water System										
PARAMETER		2025 ANALYTICAL RESULTS				CANADIAN GUIDELINES	2015-2024 ANALYTICAL RESULTS			
Parameter Name	Units of Measure	Annual Median	Samples Analyzed	Range Minimum Maximum		≤ = Less than or equal to	Median	Samples Analyzed	Range Minimum Maximum	
mg/L = parts per million	ug/L = parts per billion									
Physical Parameters										
Colour, True	TCU	23.5	4	15	28	≤ 15 AO	11	49	5	24
Hardness as CaCO3	mg/L	18.2	36	15.5	21.4		16.1	25	13.6	18.1
pH	pH units	7.23	15	6.78	8.6	7.0 - 10.5 AO	7	79	6.45	9.1
Total Organic Carbon	mg/L	4.35	4	4.1	4.7		3.95	16	2.5	8.7
Turbidity, lab tests	NTU	0.9	51	0.5	1.6	1 MAC and ≤ 5 AO	0.69	304	0.17	3.3
Water Temperature	degrees C	12.9	152	3	20.4	≤ 15 AO	11.1	1971	1.8	21.1
Microbial Parameters										
Indicator Bacteria										
Coliform, Total	CFU/100 mL	< 1	122	< 1	18	0 MAC	< 1	846	<1	330
<i>E. coli</i>	CFU/100 mL	< 1	122	< 1	< 1	0 MAC	< 1	846	<1	40
Hetero. Plate Count, 28C (7 day)	CFU/1 mL	15000	1	15000	15000	No Guideline Required	4600	76	60	22000
Disinfectants										
Disinfectants										
Chlorine, Total Residual	mg/L as Cl ₂	1.74	128	0.2	3.9	No Guideline Required	1.4	1188	0	5.2
Monochloramine, Field - 1 Station	mg/L	2.655	18	1.47	3.44		2.3	85	0.17	3.45
Disinfection By-Products (ND means Not Detected by analytical method used)										
Trihalomethanes (THMs)										
Bromodichloromethane (BDCM)	ug/L	< 1	4	< 1	< 1		< 1	52	<0.2	26
Bromoform (BRFM)	ug/L	< 1	4	< 1	< 1		< 1	52	< 0.1	< 2
Chloroform (CHLF)	ug/L	2.6	4	1.7	3.5		2.45	52	<1	130
Chlorodibromomethane (DBCm)	ug/L	< 1	4	< 1	< 1		< 1	52	<0.1	3.1
Total Trihalomethanes (TTHM)	ug/L	2.6	4	1.7	3.5	100 MAC	2.4	52	< 1	160
Haloacetic Acids (HAAs)										
Haloacetic Acids (*5 Total, HAA5)	ug/L	Not tested in 2025				80 MAC	11.5	44	0.75	88
Metals (ND means Not Detected by analytical method used)										
Aluminum	ug/L as Al	14.7	36	4	49.4	2900 MAC / 100 OG	19.3	25	4.5	62.1
Antimony	ug/L as Sb	< 0.5	36	< 0.5	< 0.5	6 MAC	< 0.5	25	< 0.5	< 0.5
Arsenic	ug/L as As	0.2	36	0.1	0.54	10 MAC	< 0.1	25	< 0.1	0.14
Barium	ug/L as Ba	1.95	36	< 1	3.3	1000 MAC	2	25	< 1	2.6
Beryllium	ug/L as Be	< 0.1	36	< 0.1	< 0.1		< 0.1	25	< 0.1	< 0.1
Bismuth	ug/L as Bi	< 1	36	< 1	< 1		< 1	25	< 1	< 1
Boron	ug/L as B	< 50	36	< 50	< 50	5000 MAC	< 50	25	< 50	< 50
Cadmium	ug/L as Cd	< 0.01	36	< 0.01	< 0.01	5 MAC	< 0.01	25	< 0.01	< 0.01
Calcium	mg/L as Ca	3.955	36	3.27	4.88	No Guideline Required	3.49	25	2.93	3.93
Chromium	ug/L as Cr	< 1	36	< 1	< 1	50 MAC	< 1	25	< 1	< 1
Cobalt	ug/L as Co	< 0.2	36	< 0.2	0.22		< 0.2	25	< 0.2	< 0.5
Copper	ug/L as Cu	11.15	36	5.73	29.1	2000 MAC / ≤ 1000 AO	10.2	25	3.57	92.7
Iron	ug/L as Fe	243.5	36	50.6	461	≤ 100 AO	176	25	49.7	573
Lead	ug/L as Pb	0.35	36	< 0.2	0.71	5 MAC	0.4	25	0.2	0.99
Lithium	ug/L as Li	< 2	36	< 2	< 2		< 2	21	< 2	< 5
Magnesium	mg/L as Mg	2.01	36	1.69	2.23	No Guideline Required	1.79	25	1.52	2.07
Manganese	ug/L as Mn	47.4	36	6.1	140	120 MAC / ≤ 20 AO	37.7	25	8	208
Mercury	ug/L as Hg	< 0.0019	4	< 0.0019	0.0042		< 0.0019	19	< 0.0019	0.0032
Molybdenum	ug/L as Mo	< 1	36	< 1	< 1		< 1	25	< 1	< 1
Nickel	ug/L as Ni	< 1	36	< 1	< 1		< 1	25	< 1	< 1
Potassium	mg/L as K	0.3685	36	0.317	0.451		0.342	25	0.241	0.397
Selenium	ug/L as Se	< 0.1	36	< 0.1	< 0.1	50 MAC	< 0.1	25	< 0.1	< 0.1
Silicon	mg/L as Si	1520	36	1000	2310		1540	25	408	2860
Silver	ug/L as Ag	< 0.02	36	< 0.02	< 0.02	No Guideline Required	< 0.02	25	< 0.02	< 0.02
Sodium	mg/L as Na	10.8	36	9.4	11.9	≤ 200 AO	9.57	25	7.22	11.4
Strontium	ug/L as Sr	17	36	14.2	19.9	7000 MAC	14.4	25	12.3	16.4
Sulfur	mg/L as S	< 3	36	< 3	< 3		< 3	25	< 3	4.6
Thallium	ug/L as Tl	< 0.01	36	< 0.01	< 0.01		< 0.01	25	< 0.01	< 0.05
Tin	ug/L as Sn	< 5	36	< 5	< 5		< 5	25	< 5	< 5
Titanium	ug/L as Ti	< 5	36	< 5	< 5		< 5	25	< 5	< 5
Uranium	ug/L as U	< 0.1	36	< 0.1	< 0.1	20 MAC	< 0.1	25	< 0.1	< 0.1
Vanadium	ug/L as V	< 5	36	< 5	< 5		< 5	25	< 5	< 5
Zinc	ug/L as Zn	< 5	36	< 5	21.9	≤ 5000 AO	< 5	25	< 5	18.6
Zirconium	ug/L as Zr	< 0.1	36	< 0.1	< 0.1		< 0.1	25	< 0.1	< 0.5

CAPITAL REGIONAL DISTRICT

WILDERNESS MOUNTAIN WATER
Statement of Operations (Unaudited)
For the Year Ended December 31, 2025

	2025	2024
Revenue		
Transfers from government	78,970	67,495
User Charges	93,720	80,106
Water Sales	22,653	19,358
Fees and Charges	427	322
Other revenue from own sources:		
Transfer from Operating Reserve Fund	-	4,301
Other revenue	118	134
Total Revenue	195,888	171,716
Expenses		
General government services	6,820	6,659
Contract for services	6,640	4,807
CRD Labour and Operating costs	84,885	76,636
Debt Servicing Costs	25,782	25,796
Supplies	25,504	41,589
Other expenses	22,977	22,229
Total Expenses	172,608	177,716
Net revenue (expenses)	23,280	(6,000)
Transfers to own funds:		
Capital Reserve Fund	4,540	-
Operating Reserve Fund	3,740	6,000
Annual surplus/(deficit)	15,000	(12,000)
Accumulated surplus/(deficit), beginning of year	(15,000)	(3,000)
Accumulated surplus/(deficit), end of year	\$ -	(15,000)

CAPITAL REGIONAL DISTRICT

WILDERNESS MOUNTAIN WATER
Statement of Reserve Balances (Unaudited)
For the Year Ended December 31, 2025

	Capital Reserve	
	2025	2024
Beginning Balance	43,494	46,513
Transfer from Operating Budget	4,540	-
Transfer to Capital Projects	(20,000)	(5,000)
Interest Income	1,301	1,981
Ending Balance	29,335	43,494

	Operating Reserve	
	2025	2024
Beginning Balance	1,795	53
Transfer from Operating Budget	3,740	6,000
Transfer to Operating Budget	-	(4,301)
Interest Income	79	43
Ending Balance	5,614	1,795