NEXUS WATER GROUP™

2023 ANNUAL DRINKING WATER REPORT

PANORAMA MOUNTAIN RESORT

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Introduction

Panorama Mountain Resort is located approximately 18km west of Invermere, British Columbia. Corix owns and operates all the utility infrastructure associated with the water treatment and water distribution network. The distribution network currently serves 368 connections.

Panorama's water treatment system and water distribution system are both classified as Level ll facilities by the EOCP (Environmental Operators Certification Program). In 2023, Corix had four full time water treatment and distribution operators working on site. This ensured that at least one operator was on site every day, while also providing twenty-four-hour emergency on call coverage.

Providing clean, potable, and aesthetically pleasing drinking water to its customers is at the forefront of Corix's responsibilities. This is accomplished by maintaining a regular monitoring, sampling and maintenance schedule as outlined below.

System Overview

Source Water

Panorama's source water is from two, 10-inch diameter production wells near the Toby Creek. In 2020, Corix transitioned from a surface water source to a clean groundwater source to alleviate the high levels of turbidity in the water during spring runoff. Well 15-02 has a total depth of 106.5 ft (32.5m) and well 20-03 has a total depth of 124.5 ft (37.9m). Both wells have been drilled into the same semi-confined sand and gravel aquifer system. This system is overlain by sediments containing silt and clay, while it is underlain by bedrock.

Please refer to Appendix A for a full potability analysis for Well 20-03. This was completed April 12, 2023. Please refer to Appendix B for a full potability analysis for Well 15-02. This was completed June 27, 2023. This testing was completed prior to any treatment; therefore, it provides a very accurate representation of the water quality coming from the aquifer.

Panorama Well Site

Treatment

Panorama's source water is continuously pumped to a treatment station located at 2130 Trappers Way. There is continuous online turbidity monitoring for all water entering the treatment station. The first stage of disinfection is UV. Corix operates two Trojan UV Swift SC units. This UV disinfection process provides 99.99% inactivation of pathogens such as Cryptosporidium and Giardia. The next stage of disinfection is accomplished with chlorine. Corix administers a dosage using 12% Sodium Hypochlorite. The level of chlorine leaving the treatment station is continuously monitored, and is usually around 0.90 mg/L. The combination of using UV technology and chlorine disinfection creates a very efficient disinfection process by inactivating many microorganisms.

Panorama UV disinfection units

After disinfection is accomplished, the water is pumped into a clear well, which is located underneath the treatment station. This acts as a holding tank, as two booster pumps then move the water from the treatment station to the main resort reservoir. As water demands increase and decrease all tank levels remain constant as well pumps and booster pumps act in unison and modulate their flow rate accordingly.

Treatment Station Booster Pumps

The main reservoir can hold approximately one million gallons. It is located partway up the ski hill near the top of the Discovery chair. The strategic location of the reservoir at that elevation allows the entire distribution system to maintain adequate pressure via gravity only.

Water Distribution

In 2023, Corix treated and distributed approximately 149,280 cubic meters of water (149,280,000L). Figure 1 below illustrates the amount of water that was treated daily over the course of the year. As can be seen, there are fluctuations throughout the year. This is because Panorama is a seasonal resort destination. Higher flows can be expected through winter months (Dec – Apr) and summer months (Jul – Sept) due to higher occupancy rates. Summer irrigation also factors into a higher demand during summer months.

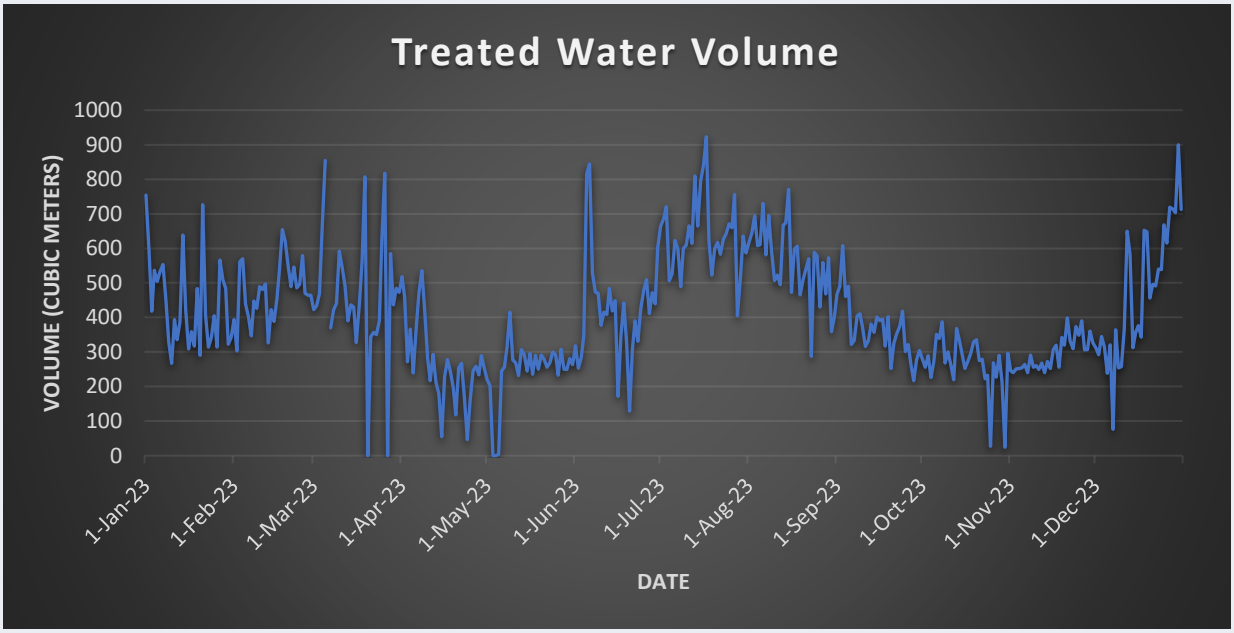

Figure 1

Due to the elevation of the reservoir, the distribution system is divided into multiple pressure zones. These pressure zones are controlled by PRV's (pressure reducing valves) located underground throughout the resort. These PRV's act to maintain a constant water pressure through all areas of the resort, regardless of water usage. Corix employees record operating pressure of these valves and conduct visuals on them monthly to ensure there are no leaks and proper operation is maintained.

Water Quality Control

Every day, Corix operators perform a set of daily rounds consisting of operational checks of the well site and booster station. Turbidity and residual chlorine checks are also competed everyday by an operator. Please refer to Figure 2 and Figure 3 for a snapshot of chlorine and turbidity levels found at the start and near the end of the distribution system throughout 2023. By completing these checks at both the start and end of line, this ensures an adequate chlorine residual and turbidity level throughout the entire system.

Chlorine residual concentrations usually range from 0.20 to 2.0 mg/L in many Canadian drinking water distribution systems. Corix operators try to keep the residual around 0.80 mg/L through the system to ensure proper disinfection while minimizing the taste of chlorine for the customer. As noted in Table 1, the average chlorine residual at the start and the end of the distribution system were 0.80 mg/L and 0.76 mg/L respectively.

Turbidity is one of the most important measurements a water operator conducts. Turbidity is a measurement of the clarity of the water and gives an indication on the number of particles in the water that can't be seen by the naked eye. A rise in turbidity can help alert an operator to changes in raw water quality. Higher turbidity (more particles) can harbor microorganisms, shielding them from disinfection. For a water system that uses ground water, turbidity levels should never exceed 1.0 NTU. As noted in Table 1, the average turbidity level at the start and the end of the distribution system were 0.14 mg/L and 0.13 mg/L respectively.

As seen in Figure 2 & 3 on the following page, turbidity levels did seemingly increase sporadically throughout the year. The increased turbidity levels found in June can be attributed to the flushing program that was being administered at that time. All other spikes above 0.40 NTU can most likely be attributed to operator error in data entry as they were not detected by any continuous monitoring device, nor were they seen in other parts of the distribution system.

	Start of Line		End of Line	
	Chlorine (mg/L)	Turbidity (NTU)	Chlorine (mg/L)	Turbidity (NTU)
Min.	0.55	0.04	0.45	0.05
Max.	1.07	0.80	1.10	0.51
Average	0.80	0.14	0.76	0.13

Table 1

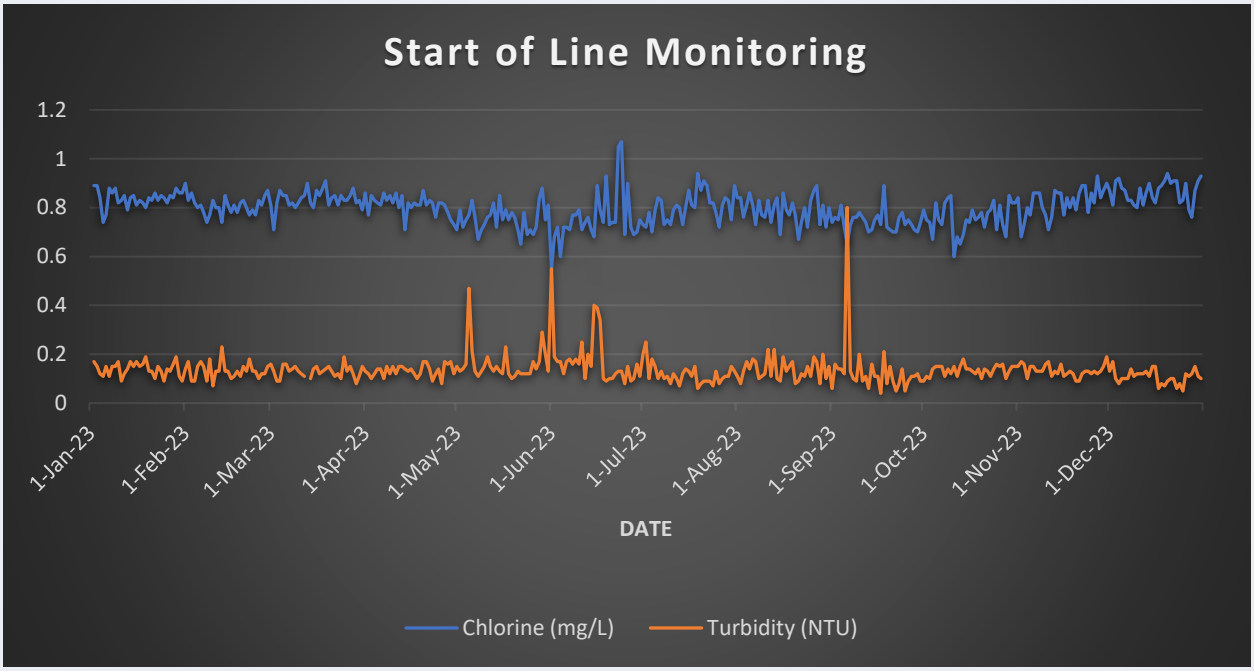

Figure 2

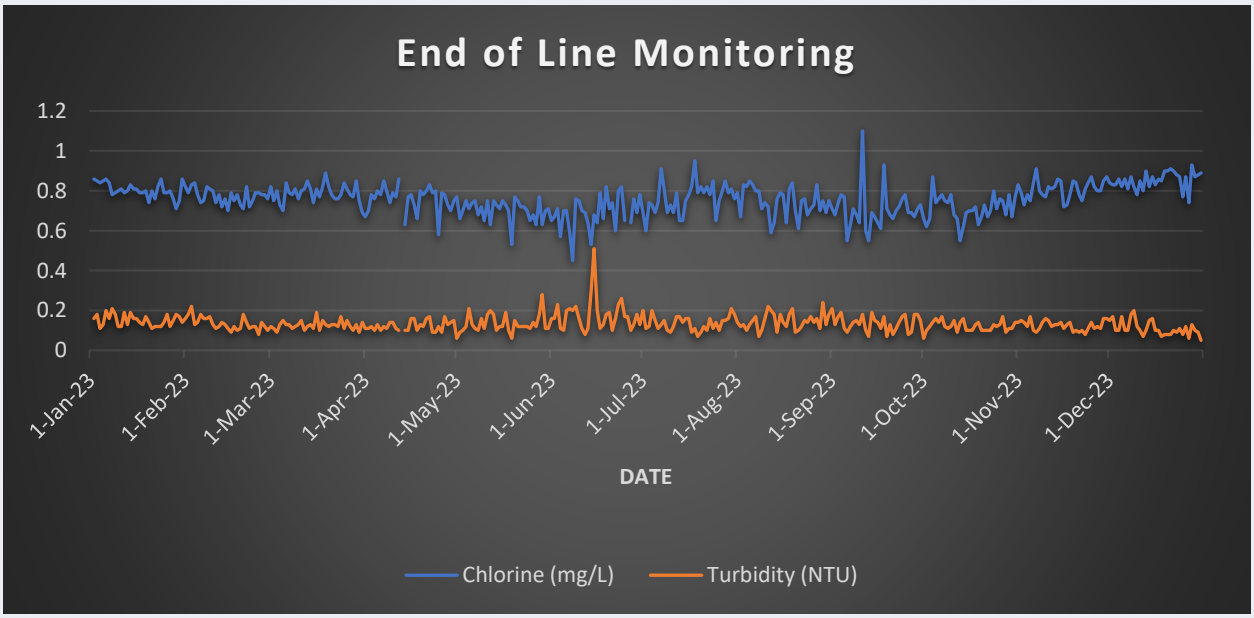

Figure 3

Bacteriological sampling was completed every other week at three different locations. These samples were sent to ALS Laboratories in Calgary where E. Coli bacteria and total coliforms were tested for. Twenty-seven sets of bacteriological samples were taken in 2023. Corix received zero reports of any positive test results.

Sampling for trihalomethanes (THM's) and Halo acetic acids (HAA's) was also completed in 2023. Both THM's and HAA's are formed when chlorine reacts with organic material in water. The results found that the water treated at Panorama was well below the maximum acceptable concentration (MAC) dictated by Canada's "Guidelines for Canadian Drinking Water Quality". Please see Appendix C for details of these results.

As mentioned above, please refer to Appendix A & B for a full potability analysis which was conducted on the raw water source.

System Maintenance/Upgrades

In 2023 Corix undertook a comprehensive flushing program. Corix employees are responsible for the maintenance and the operational reliability of 53 fire hydrants at Panorama Mountain Resort. While moving systematically through the distribution system Corix operators tested hydrants for static pressure and flow rates. The static pressure of forty-nine hydrants was documented while flow testing was carried out on thirty-nine hydrants in 2023. This allowed operators to note the maximum flowrate of the hydrant and the residual pressure maintained during that flow. Extended periods of flushing were carried out at the end of all distribution lines. Full teardowns and inspections were completed on 24 hydrants in 2023. The operational goal is to complete full inspections on a bi-annual basis. All these practices combined help ensure that any fire suppression demand will be met.

Throughout 2023, annual valve exercising took place. There are forty-five documented isolation valves throughout the distribution system. Columbia Valley Sewer and Drain was contracted to clean out numerous valves boxes that had filled with material and left the valve inoperable. Thirty-five valves were successfully exercised. The remaining nine have documented issues which will have to be addressed in the coming year. Fifty-one fire hydrant isolation valves were also exercised throughout the year.

On June 7, 2023, a new flushing hydrant was installed at the bottom of Panorama Pl. In the past, due to a decommissioned PRV vault, the main line which services Panorama Pl would come to a dead end with no means of flushing. With a flush point installed, Corix can ensure better water quality for customers on Panorama Pl by scouring the lines with high water velocity while at the same time eliminating some of the problems associated with stagnant water. A boil water advisory was put into place after this work was completed due to the system isolation required. Two sets of bacteriological samples were taken with all results coming back negative. This allowed the BWA to be rescinded.

On July 27, 2023, the water to the Ski Tip condominium was temporarily shut off to facilitate plumbing repairs. Due to the isolation, a BWA was put into place. A set of two bacteriological samples were taken that day. Results from these tests were negative, therefore allowing the BWA to be rescinded.

On August 4/5, 2023, Mechanical Advantage was onsite to complete repairs to one of the main vertical turbine pumps located at the Water Treatment Station. It was discovered that the braided fiber gland packing was causing excessive wear on the pump shaft. It was suspected that high run speeds and insufficient cooling during pump startup caused this. The pump and motor were pulled, and a new machined pump shaft was installed. A new mechanical seal was also installed which should minimize any potential wear on the pump shaft in the future.

On Sept 12, 2023, a new isolation valve was installed on the line feeding water to the RK Heliplex. Due to the isolation required to complete this work, a BWA was temporarily put into place. Two bacteriological samples were taken that day. Results from these tests were negative, therefore allowing the BWA to be rescinded.

SCADA system

Corix utilizes a SCADA (Supervisory control and data acquisition) system to monitor all critical components and operations of the water treatment system. The SCADA system allows Corix operators to monitor alarms, adjust treatment processes and accumulate data. This allows the operator to respond to events or look at data trends, regardless of location. Below (Figure 3) is screen shot of the Panorama water treatment process on SCADA. Pump controls, reservoir levels and crucial parameters such as chlorine and turbidity are all displayed.

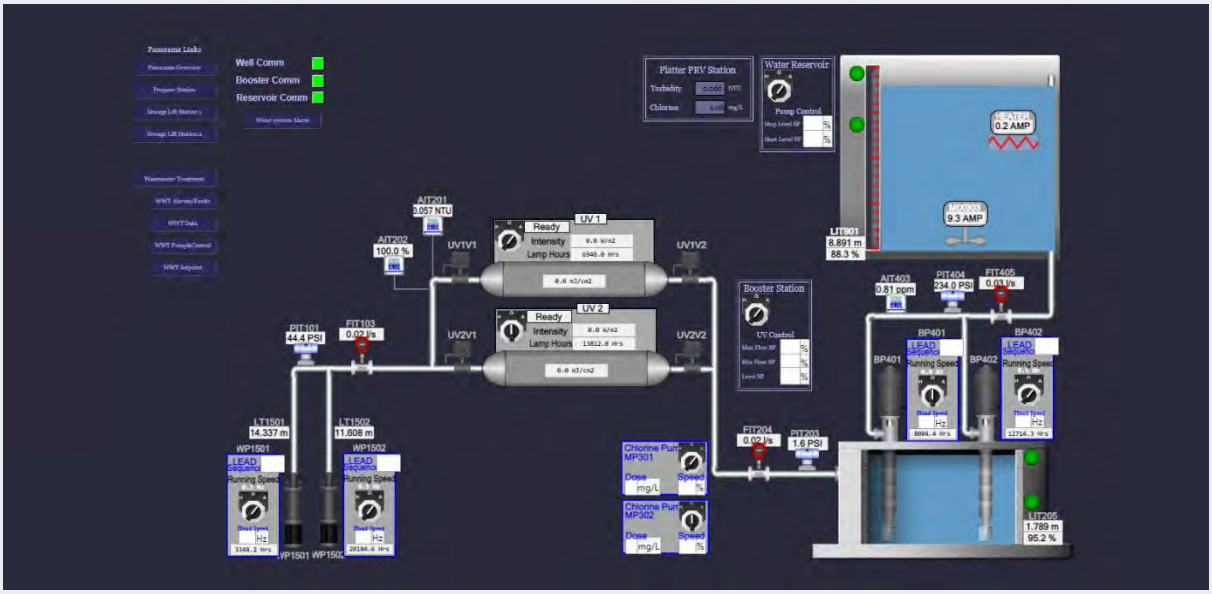

Figure 4

Appendix A - Well 20-03 Full Potability Report

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID: WELL 20-03 Client sampling date / time: 12-Apr-2023 09:00 CG2304445-001 Result
Physical Tests					
Absorbance, UV (@ 254nm)	---	E404	0.0050	AU/cm	<0.0050
Alkalinity, bicarbonate (as CaCO3)	---	E290	1.0	mg/L	235
Alkalinity, carbonate (as CaCO3)	---	E290	1.0	mg/L	<1.0
Alkalinity, hydroxide (as CaCO3)	---	E290	1.0	mg/L	<1.0
Alkalinity, total (as CaCO3)	---	E290	1.0	mg/L	235
Colour, true	---	E329	5.0	CU	<5.0
Conductivity	---	E100	2.0	µS/cm	566
Hardness (as CaCO3), from total Ca/Mg	---	EC100A	0.50	mg/L	302
Langelier index (@ 4°C)	---	EC105A	0.010	-	0.874
pH	---	E108	0.10	pH units	8.17
Solids, total dissolved [TDS]	---	E162	10	mg/L	321
Solids, total suspended [TSS]	---	E160-L	1.0	mg/L	<1.0
Temperature, sample	---	E218	0.10	°C	20.3
Turbidity	---	E121	0.10	NTU	<0.10
Transmittance, UV (@ 254nm)	---	E404	1.0	% T/cm	100
Anions and Nutrients					
Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050
Chloride	16887-00-6	E235.Cl-L	0.10	mg/L	18.2
Fluoride	16984-48-8	E235.F	0.020	mg/L	0.038
Nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010
Nitrogen, total organic	---	EC363	0.050	mg/L	0.176
Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.0020
Sulfate (as SO4)	14808-79-8	E235.SO4-L	0.050	mg/L	52.4
Nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	2.59
Kjeldahl nitrogen, total [TKN]	---	E318	0.050	mg/L	0.176 [MW]
Nitrogen, total	7727-37-9	EC368	0.050	mg/L	2.77
Cyanides					
Cyanide, strong acid dissociable (Total)	---	E333	0.0020	mg/L	<0.0020

Appendix A Continued

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	WELL 20-03
					Client sampling date / time	12-Apr-2023 09:00
Analyte	CAS Number	Method	LOR	Unit	CG2304445-001	
					Result	
Organic / Inorganic Carbon						
Carbon, total organic [TOC]	---	E355-L	0.50	mg/L	0.65	
Microbiological Tests						
Coliforms, total	---	E010	1	MPN/100mL	<1	
Heterotrophic plate count [HPC]	---	E010.HPC	1	MPN/100mL	308	
Coliforms, Escherichia coli [E. coli]	---	E010	1	MPN/100mL	<1	
Total Metals						
Aluminum, total	7429-90-5	E420	0.0030	mg/L	<0.0030	
Antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	
Arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00012	
Barium, total	7440-39-3	E420	0.00010	mg/L	0.0870	
Boron, total	7440-42-8	E420	0.010	mg/L	0.011	
Cadmium, total	7440-43-9	E420	0.0000050	mg/L	<0.0000050	
Calcium, total	7440-70-2	E420	0.050	mg/L	65.0	
Chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	
Copper, total	7440-50-8	E420	0.00050	mg/L	<0.00050	
Iron, total	7439-89-6	E420	0.010	mg/L	<0.010	
Lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	
Magnesium, total	7439-95-4	E420	0.0050	mg/L	33.9	
Manganese, total	7439-96-5	E420	0.00010	mg/L	0.00673	
Mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	
Molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000194	
Potassium, total	7440-09-7	E420	0.050	mg/L	1.15	
Selenium, total	7782-49-2	E420	0.000050	mg/L	0.000254	
Sodium, total	7440-23-5	E420	0.050	mg/L	14.6	
Strontium, total	7440-24-6	E420	0.00020	mg/L	0.291	
Uranium, total	7440-61-1	E420	0.000010	mg/L	0.000901	
Zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	

Appendix B - Well 15-02 Full Potability Report

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

				Client sample ID	LOCATION #1
				Client sampling date / time	27-Jun-2023 08:45
Analyte	CAS Number	Method/Lab	LOR	Unit	CG2308641-001 Result
Physical Tests					
Absorbance, UV (@ 254nm)	---	E404/VA	0.0050	AU/cm	<0.0050
Alkalinity, bicarbonate (as CaCO3)	---	E290/CG	1.0	mg/L	228
Alkalinity, carbonate (as CaCO3)	---	E290/CG	1.0	mg/L	<1.0
Alkalinity, hydroxide (as CaCO3)	---	E290/CG	1.0	mg/L	<1.0
Alkalinity, total (as CaCO3)	---	E290/CG	1.0	mg/L	228
Colour, true	---	E329/CG	5.0	CU	<5.0
Conductivity	---	E100/CG	2.0	µS/cm	619
Hardness (as CaCO3), from total Ca/Mg	---	EC100A/CG	0.50	mg/L	300
Langelier Index (@ 4°C)	---	EC105A/CG	0.010	-	0.639
pH	---	E108/CG	0.10	pH units	8.15
Solids, total dissolved [TDS]	---	E162/CG	10	mg/L	334
Solids, total suspended [TSS]	---	E160-L/CG	1.0	mg/L	<1.0
Temperature, sample	---	E218/CG	0.10	°C	17.5
Turbidity	---	E121/CG	0.10	NTU	<0.10
Transmittance, UV (@ 254nm)	---	E404/VA	1.0	% T/cm	100
Anions and Nutrients					
Ammonia, total (as N)	7664-41-7	E298/CG	0.0050	mg/L	<0.0050
Chloride	16887-00-6	E235.Cl-L/CG	0.10	mg/L	31.2
Fluoride	16984-48-8	E235.F/CG	0.020	mg/L	0.036
Nitrite (as N)	14797-65-0	E235.NO2-L/CG	0.0010	mg/L	<0.0010
Nitrogen, total organic	---	EC363/CG	0.050	mg/L	<0.500
Phosphorus, total	7723-14-0	E372-U/CG	0.0020	mg/L	<0.0020
Sulfate (as SO4)	14808-79-8	E235.SO4-L/CG	0.050	mg/L	55.4
Nitrate (as N)	14797-55-8	E235.NO3-L/CG	0.0050	mg/L	4.24
Kjeldahl nitrogen, total [TKN]	---	E318/CG	0.050	mg/L	<0.500 DLM
Nitrogen, total	7727-37-9	EC368/CG	0.050	mg/L	4.24

Appendix B Continued

Cyanides					
Cyanide, strong acid dissociable (Total)	---	E333/WT	0.0020	mg/L	<0.0020
Organic / Inorganic Carbon					
Carbon, total organic [TOC]	---	E355-L/CG	0.50	mg/L	<0.50
Microbiological Tests					
Coliforms, total	---	E010/CG	1	MPN/100mL	<1
Heterotrophic plate count [HPC]	---	E010.HPC/CG	1	MPN/100mL	2
Bacteria, iron related, population estimate	---	E030.IRB/CG	1	CFU/mL	9000
Coliforms, Escherichia coli [E. coli]	---	E010/CG	1	MPN/100mL	<1
Bacteria, dominant	---	E030.IRB/CG	-	-	IRB
Aggressivity	---	E030.IRB/CG	-	-	Aggressive
Total Metals					
Aluminum, total	7429-90-5	E420/CG	0.0030	mg/L	<0.0030
Antimony, total	7440-36-0	E420/CG	0.00010	mg/L	<0.00010
Arsenic, total	7440-38-2	E420/CG	0.00010	mg/L	<0.00010
Barium, total	7440-39-3	E420/CG	0.00010	mg/L	0.116
Boron, total	7440-42-8	E420/CG	0.010	mg/L	0.017
Cadmium, total	7440-43-9	E420/CG	0.0000050	mg/L	<0.0000050
Calcium, total	7440-70-2	E420/CG	0.050	mg/L	65.3
Chromium, total	7440-47-3	E420/CG	0.00050	mg/L	<0.00050
Copper, total	7440-50-8	E420/CG	0.00050	mg/L	<0.00050
Iron, total	7439-89-6	E420/CG	0.010	mg/L	<0.010
Lead, total	7439-92-1	E420/CG	0.000050	mg/L	<0.000050
Magnesium, total	7439-95-4	E420/CG	0.0050	mg/L	33.4
Manganese, total	7439-96-5	E420/CG	0.00010	mg/L	<0.00010
Mercury, total	7439-97-6	E508/CG	0.0000050	mg/L	<0.0000050
Molybdenum, total	7439-98-7	E420/CG	0.000050	mg/L	0.000117
Potassium, total	7440-09-7	E420/CG	0.050	mg/L	1.91
Selenium, total	7782-49-2	E420/CG	0.000050	mg/L	0.000232
Sodium, total	7440-23-5	E420/CG	0.050	mg/L	20.3
Strontium, total	7440-24-6	E420/CG	0.00020	mg/L	0.265
Uranium, total	7440-61-1	E420/CG	0.000010	mg/L	0.000769
Zinc, total	7440-66-6	E420/CG	0.0030	mg/L	<0.0030

Appendix C - THM Analysis

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	LOCATION #1	LOCATION #2	LOCATION #3	LOCATION #4
					Client sampling date / time	12-Jul-2023 10:00	12-Jul-2023 09:15	12-Jul-2023 08:15	12-Jul-2023 08:40
						CG2309469-001	CG2309469-002	CG2309469-003	CG2309469-004
						Result	Result	Result	Result
Anions and Nutrients									
Chloride	16887-00-6	E235.Cl/CG	0.50	mg/L		31.9	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3-L/CG	0.0050	mg/L		3.96	----	----	----
Nitrate + Nitrite (as N)	----	EC235.N+N/CG	0.0050	mg/L		3.96	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2-L/CG	0.0010	mg/L		<0.0010	----	----	----
Microbiological Tests									
Coliforms, total	----	E010/CG	1	MPN/100mL		<1	<1	<1	----
Coliforms, Escherichia coli [E. coli]	----	E010/CG	1	MPN/100mL		<1	<1	<1	----
Total Metals									
Sodium, total	7440-23-5	E420/CG	0.050	mg/L		19.4	----	----	----
Volatile Organic Compounds [THMs]									
Bromodichloromethane	75-27-4	E611B/CG	1.0	µg/L		----	----	1.4	1.8
Bromoform	75-25-2	E611B/CG	1.0	µg/L		----	----	1.0	1.1
Chloroform	67-66-3	E611B/CG	1.0	µg/L		----	----	1.6	1.8
Dibromochloromethane	124-48-1	E611B/CG	1.0	µg/L		----	----	2.2	2.6
Trihalomethanes [THMs], total	----	E611B/CG	2.0	µg/L		----	----	6.2	7.3
Volatile Organic Compounds [THMs] Surrogates									
Bromofluorobenzene, 4-	460-00-4	E611B/CG	1.0	%		----	----	87.3	95.1
Difluorobenzene, 1,4-	540-36-3	E611B/CG	1.0	%		----	----	87.9	87.3
Haloacetic Acids									
Bromochloroacetic acid	5589-96-8	E750/WT	1.00	µg/L		----	----	<1.00	<1.00
Dibromoacetic acid	631-64-1	E750/WT	1.00	µg/L		----	----	<1.00	<1.00
Dichloroacetic acid	79-43-6	E750/WT	1.00	µg/L		----	----	<1.00	<1.00
Monobromoacetic acid	79-08-3	E750/WT	1.00	µg/L		----	----	<1.00	<1.00
Monochloroacetic acid	79-11-8	E750/WT	1.00	µg/L		----	----	<1.00	<1.00
Trichloroacetic acid	76-03-9	E750/WT	1.00	µg/L		----	----	<1.00	<1.00
Haloacetic acids, total [HAA5]	----	E750/WT	5.00	µg/L		----	----	<5.00	<5.00