

# REGIONAL DISTRICT OF NANAIMO

## Water Service Area Annual Report 2022



## French Creek Water Service Area

June 2023



**REGIONAL DISTRICT OF NANAIMO**

*Water & Utility Services Department*

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Appendix A - Map of French Creek Water Service Area

Appendix B - Water Quality Testing Results

Appendix C - Emergency Response & Contingency Plan

## 1.0 Introduction

The following annual report describes the French Creek Water Service Area and summarizes the water quality and production data from 2022. This report also includes a summary of inquiries and complaints, completed and proposed maintenance activities, Operator Certification, the Emergency Response & Contingency Plan, and the Cross-Connection Control Program.

This report is to be submitted to Island Health by the spring of 2023.

## 2.0 French Creek Water Service Area

The French Creek Water Service Area was established in 1980 and comprises an area west of Drew Road and south of the Island Highway between the City of Parksville and the Town of Qualicum Beach (the Sandpiper Subdivision). The water source formerly came from a series of groundwater wells located within the neighbourhood. As of 2022, bulk water has been supplied by the Town of Qualicum Beach. The water is chlorinated and stored in one reservoir. There are 238 water service connections in the French Creek Water System. In the event of a power failure or water system emergency, back-up water is immediately supplied by the Town of Qualicum Beach through a pressure-sensing valve located on Ormonde Road. A map of the French Creek Water Service Area is provided in Appendix A for reference.

### 2.1 Groundwater Wells

Six groundwater production wells are present in the French Creek Water Service Area, although none of them are currently in use as drinking water sources.

Well / Name	Well Depth	In Use	Wellhead Protection	Treated/Untreated with Chlorine
#1	39.6 m	No	Yes	n/a
#2	40.5 m	No	Yes	n/a
#4	40.2 m	No	Yes	n/a
#5	50.3 m	No	Yes	n/a
#6	52.4 m	No	Yes	n/a
#7	39.6 m	No	Yes	n/a

French Creek Well #1 was converted to a monitoring well in 2013 due to low production and high iron levels. Wells #5 and #6 are temporarily not in use due to elevated levels of iron and manganese. Wells #2, 4, and 7 were turned off in 2022 when bulk water was supplied by the Town of Qualicum Beach.

### 2.2 Reservoirs

One service reservoir (steel construction) is present at 1225 Sunrise Drive, Parksville, B.C. and has a capacity of 364 m<sup>3</sup> (80,000 imperial gallons).

### 2.3 Distribution System

The water distribution system in the French Creek Water Service Area is summarized in the table below. Fire hydrants (26) are located throughout the water service area.

Watermain Material	Length of mains in service area	Prevalence in service area
<u>Asbestos-concrete:</u> 150mm or smaller 200mm or larger	3.5 km 0.8 km	52% 12%
<u>PVC:</u> 150mm or smaller 200mm or larger	0.9 km 1.5 km	14% 22%

*Note: 'PVC' is poly-vinylchloride (plastic)*

### 3.0 Water Sampling and Testing Program

Water sampling and testing is carried out weekly in the distribution system. Notably, the chlorine residual levels are tested weekly to ensure the absence of bacterial regrowth in the watermains. The following table includes a summary of all testing.

Timing	Location	Tests
Weekly	RDN (in-house) Laboratory	Total coliforms, E.Coli, Temperature, pH, Conductivity, Chlorine residual, Salinity, TDS
Semi-Monthly	BC Centre for Disease Control	Total coliforms, E.Coli
Annual Source Water Testing (every Fall)	Bureau Veritas	Complete potability testing of raw well water, including T-Ammonia
Annual System Water Testing (every Spring)	Bureau Veritas	Complete potability testing of distribution system, including T-Ammonia

### 4.0 Water Quality - Source Water and Distribution System

Up-to-date water quality reports and lab data are posted monthly on the RDN website at [www.rdn.bc.ca/french-creek](http://www.rdn.bc.ca/french-creek). Tables of water quality testing results for both the source water and distribution system are provided at the end of this report under Appendix B.

### 5.0 Water Quality Inquiries and Complaints

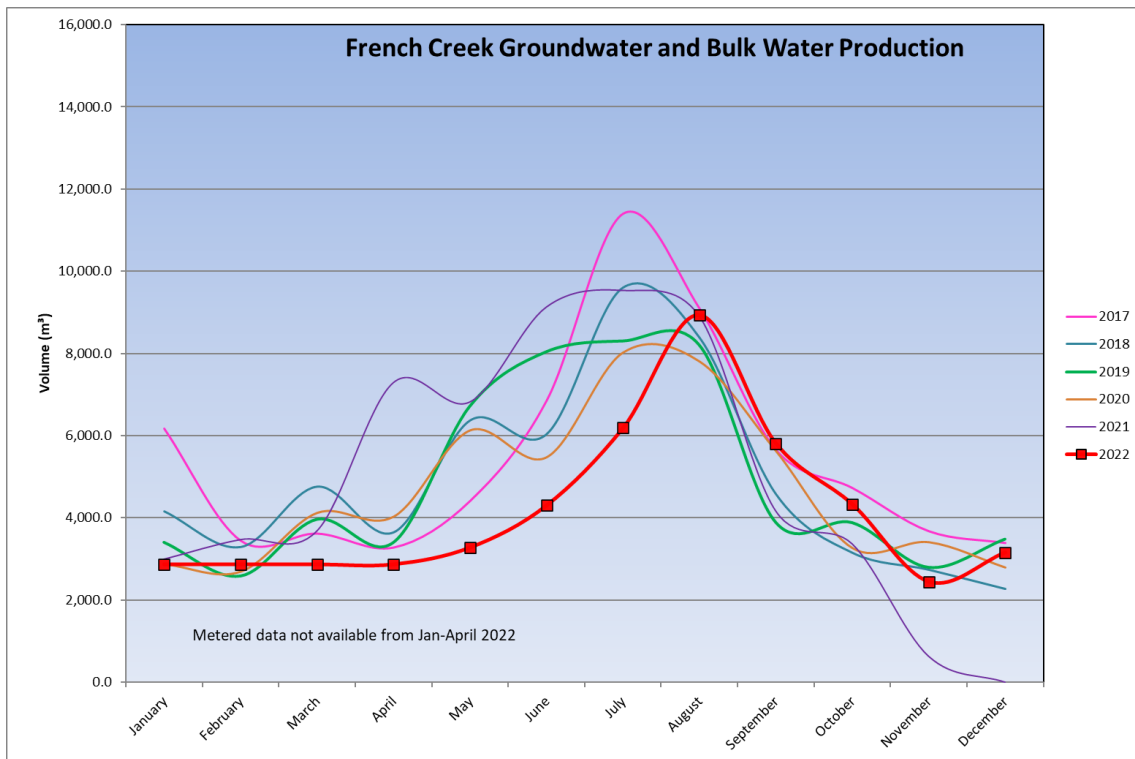
Complaints and inquiries that were received from the French Creek water service area in 2022 were typically related to isolated incidents of iron discolouration in the water. RDN staff respond to discolouration complaints by flushing the owner's water service line at the curb. New federal guidelines put forth in 2019 for the Maximum Allowable Concentration of manganese in drinking water also generated several inquiries from the public. The RDN is compliant with the new Guidelines for Canadian Drinking Water Quality (GCDWQ).

A summary of the water system incidents in 2022 is given in the table below.

Activity in 2022	Date(s)	History/Notes
Boil Water Advisories	None	None, ever.
High Turbidity Events	None	None, ever.
Equipment Malfunction	None	None.
Water Main Breaks	None	None.
Pump Failures	None	Temp power outages.

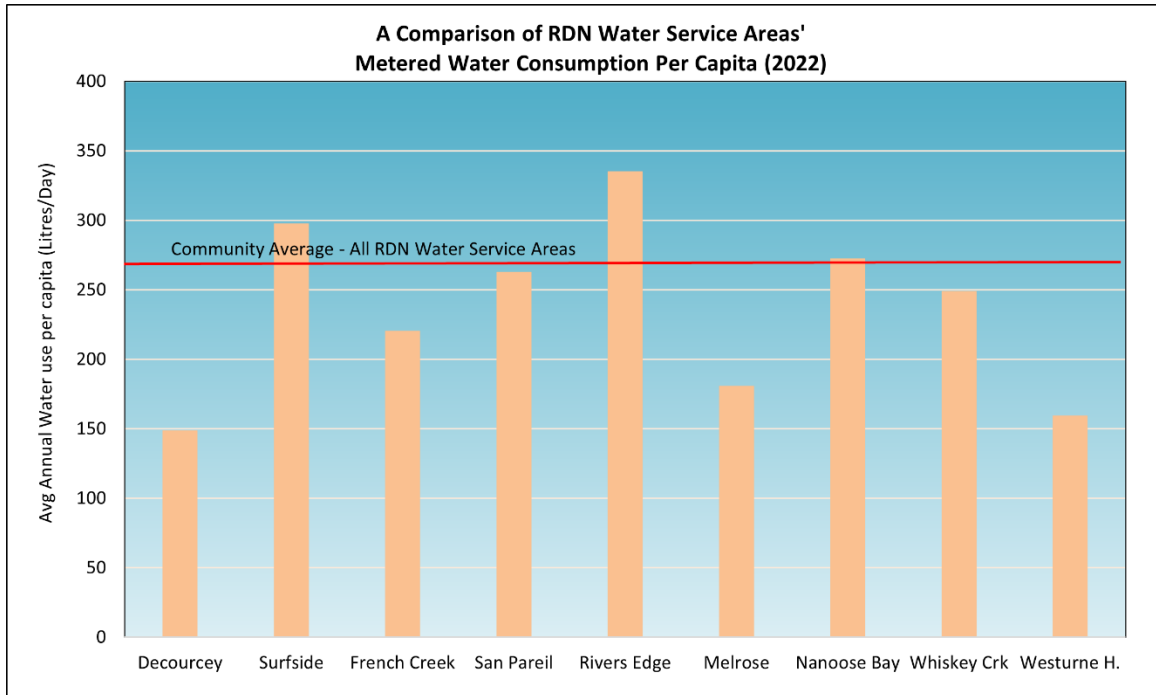
### 6.0 Groundwater Production and Consumption

The monthly water production in the French Creek Water Service Area for the past 5 years is shown in the chart below. Water production in 2022 was roughly average for the area.



#### Consumption

In the Fall/Winter of 2022, the average usage per home in French Creek was 0.40 cubic metres per day (88 imperial gallons). In the summer, the average water usage was 0.78 cubic metres per day (171.6 imperial gallons). Based on these figures, the annual consumption per capita is estimated to be 221 L/day (based on 2.4 people per household). This consumption is **18% less** than the average of all the other RDN water systems of 269 L/day/capita for 2022.



## 7.0 Maintenance Program

Weekly pump station inspections are carried out to reduce or eliminate the risk of contamination and system failure, and to ensure the consistent application of chlorine for treatment purposes. Watermains are flushed twice annually: once in the spring and once in the fall.

Fire hydrants are serviced once per year (either 'A-level' or 'B-level' maintenance). The water storage reservoir is drained and cleaned once every two years. Twenty-four hour on-call coverage is in place to respond to water system emergencies and alarms.



**French Creek Storage  
Reservoir**

## 8.0 Operator Certification

The Regional District Water & Utility Services staff is comprised of one Manager, one Project Engineer, one Engineering Technologist, one Engineering Technician, one Chief Operator, and seven certified operators. The operators receive ongoing training and certification in:

- ✓ Water Treatment
- ✓ Chlorine Handling
- ✓ Confined Space Awareness
- ✓ Water Distribution
- ✓ Fall Protection
- ✓ Wastewater Collection
- ✓ First Aid

- |                            |   |   |
|----------------------------|---|---|
| ✓ Cross Connection Control | ✓ WHMIS (Workplace Hazardous Material Information System) | ✓ Silica Awareness                        |
| ✓ Asbestos Awareness       |   | ✓ TDG (Transportation of Dangerous Goods) |

## 9.0 Water Service Area Projects

### 9.1 2022 Completed Studies & Projects

- Cleaned reservoir and continued maintenance;
- Commissioned new water supply line from the Town of Qualicum Beach;
- Corresponded with residents regarding water conservation;
- Utilized leak detection equipment and tracking;
- Set new water rates structure based on rewarding conservation;
- Followed Cross Connection Control program to reduce backflow prevention risks;
- Enforced outdoor sprinkling regulations;
- Advised residents regarding water leak repairs;
- Continued the 2021-2030 Water Conservation Plan;
- Completed regular watermain flushing and hydrant maintenance;
- Maintained a high level of water quality;
- Continued quality control through regular testing and monitoring of water system;
- Implement Phase 2 Water Systems SCADA Master Plan; and
- Continued valve maintenance program.

### 9.2 2023 Proposed Projects & Upgrades

- Complete meter replacement program;
- Complete irrigation checks for high-water users;
- Begin billing for metered consumption based on revised water rates;
- Continue watermain flushing program and hydrant maintenance;
- Continue leak detection equipment utilization program;
- Introduce new watermain flushing and metering procedures to promote conservation;
- Continue valve maintenance program;
- Continue the 2021-2030 DWWP Water Conservation Plan; and
- Continue to offer numerous water-saving incentives via rebates.

## 10.0 Emergency Response & Contingency Plan

The Regional District Emergency Response & Contingency Plan (ERCP) contains procedures and contact information to efficiently respond to water system emergencies such as contamination of water supply, loss of supply, pump failure, and drought management. The ERCP was reviewed and updated in 2022, and copies are available on our website, at each RDN office, in each pumphouse, and in each Water Services vehicle. A copy of the ERCP is also attached to this report in Appendix C.



## 11.0 Supply Security

The RDN continues to effectively manage water supply in its service areas in response to ongoing demand and the effects of climate change. Most RDN water service areas are not expected to expand, so growth in demand is not expected. Initiatives that provide resiliency for the groundwater sources that serve residents remain a high priority. Reservoir capacity and redundancy are reviewed with regards to water storage during periods of drought, and water from backup sources is available to be delivered in the case of an emergency. Groundwater quality is regularly tested in all RDN water service areas. The aquifers within the regional district are monitored through the RDN's Drinking Water and Watershed Protection (DWWP) program. The most sustainable way to protect water supply is through demand management (conservation), which is promoted through outreach and stewardship initiatives provided by the RDN's Team WaterSmart , as well as the RDN Water Service Area's Water Conservation Plan 2020-2030. Rebates for well water testing, water smart landscaping, and rainwater harvesting further assist RDN residents to reduce water usage in high demand seasons. A new tiered system for water rates taking effect in 2023 will help promote conservation by rewarding low water users with reduced rates and encouraging high water users to seek ways to use less. Additional planning and preparation initiatives will be introduced in the future to support water supply security.

## 12.0 Cross Connection Control

The RDN's Cross Connection Control Program was put in place to protect the public health by reducing the risk of contaminants flowing back into the public water supply. The RDN Manager of Water Services is the designated Cross Connection Control Manager.

The RDN's Cross Connection Control Program addresses cross connection threats through operating policies and procedures, as well as assisting customers with backflow preventer selection, installation, testing, maintenance and reporting. The program receives its authority from *RDN Cross Connection Control Regulation Bylaw No. 1788*, and the *British Columbia Building Code, Part 7*, which requires that potable water be protected from contamination. Additionally, a webpage has been established at <https://rdn.bc.ca/cross-connection-control-program> to educate RDN water service customers about cross connection hazards, and lists the relevant links to current standards and resources.

Two of the RDN's water system operators received certification as backflow assembly testers through the British Columbia Water & Waste Association (BCWWA).

## 13.0 Cyber Security

The RDN uses a multi-level approach to cyber-security. Corporate network security is employed via a universal threat management gateway that implements various methods of data security, which includes daily definition updates to block known cyber threats. In addition, all RDN PC's are protected with anti-virus software. RDN water systems are connected to the corporate network via IP-Sec VPN's for remote management by information technology and equipment operators. Future infrastructure upgrades will see our water systems located on segregated networks to limit the vulnerability from cybersecurity threats.



#### 14.0 Closing

An annual report for the year 2023 will be prepared and submitted to Island Health in the spring of 2024. Annual reports are also available on our website at: <https://www.rdn.bc.ca/french-creek>.



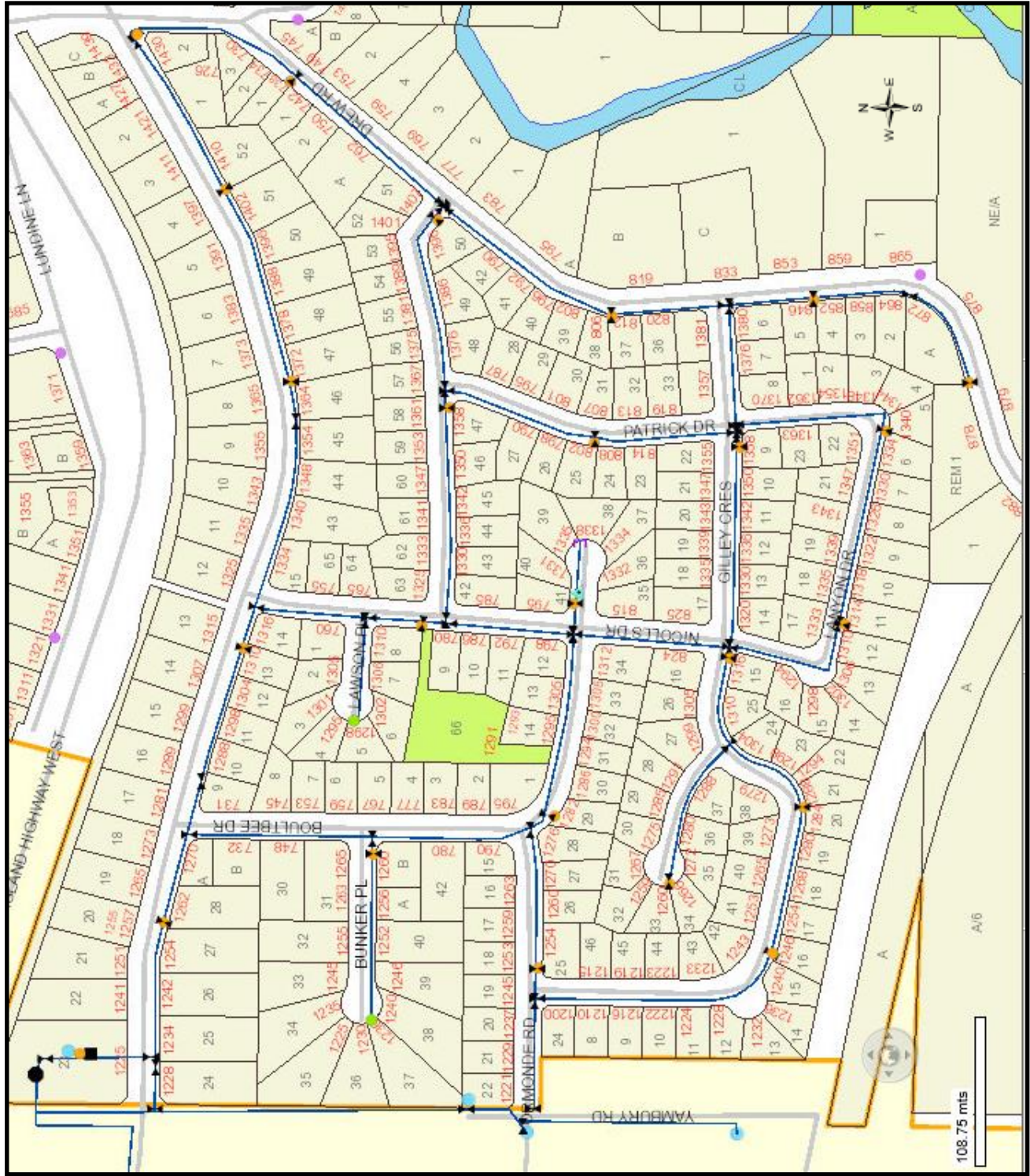
**French Creek Well #2  
pumphouse**

**APPENDIX A**

**MAP OF FRENCH CREEK**

**WATER SERVICE AREA**

# FRENCH CREEK WATER SERVICE AREA



## **APPENDIX B**

### **WATER QUALITY TESTING RESULTS**

# FRENCH CREEK WATER SERVICE AREA


**Facility Location:**

1480 Industrial Way

**Facility Information:** Facility Type:

301-10,000 Connections DWT

**Facility Sampling History:**

<u>Date Collected</u>	<u>Total Coliform</u>	<u>Total E. Coli</u>	<u>Site Name</u>
01/05/2022	QRWRT	QRWRT	1228 Sunrise in ground sampling port at water meter
01/17/2022	LT1	LT1	1228 Sunrise in ground sampling port at water meter
01/26/2022	LT1	LT1	1228 Sunrise in ground sampling port at water meter
02/02/2022	LT1	LT1	1228 Sunrise in ground sampling port at water meter
02/08/2022	LT1	LT1	1228 Sunrise in ground sampling port at water meter
02/16/2022	LT1	LT1	1228 Sunrise in ground sampling port at water meter
02/23/2022	LT1	LT1	1228 Sunrise in ground sampling port at water meter
03/02/2022	LT1	LT1	1228 Sunrise in ground sampling port at water meter
03/08/2022	LT1	LT1	1228 Sunrise in ground sampling port at water meter
03/16/2022	LT1	LT1	1228 Sunrise in ground sampling port at water meter
03/23/2022	LT1	LT1	1228 Sunrise in ground sampling port at water meter
03/29/2022	LT1	LT1	1228 Sunrise in ground sampling port at water meter
04/05/2022	LT1	LT1	1228 Sunrise in ground sampling port at water meter
04/13/2022	LT1	LT1	1228 Sunrise in ground sampling port at water meter
04/20/2022	LT1	LT1	1228 Sunrise in ground sampling port at water meter
04/25/2022	LT1	LT1	1228 Sunrise in ground sampling port at water meter
05/04/2022	LT1	LT1	1228 Sunrise in ground sampling port at water meter
05/11/2022	LT1	LT1	1228 Sunrise in ground sampling port at water meter
05/17/2022	LT1	LT1	1228 Sunrise in ground sampling port at water meter
06/01/2022	LT1	LT1	1228 Sunrise in ground sampling port at water meter
07/06/2022	LT1	LT1	1228 Sunrise in ground sampling port at water meter
08/02/2022	LT1	LT1	1228 Sunrise in ground sampling port at water meter
09/07/2022	LT1	LT1	1228 Sunrise in ground sampling port at water meter
10/05/2022	LT1	LT1	1228 Sunrise in ground sampling port at water meter
11/02/2022	LT1	LT1	1228 Sunrise in ground sampling port at water meter
12/14/2022	LT1	LT1	1228 Sunrise in ground sampling port at water meter
01/05/2022	QRWRT	QRWRT	1381 Gilley Crescent Sample Port
01/17/2022	LT1	LT1	1381 Gilley Crescent Sample Port



01/26/2022	LT1	LT1	1381 Gilley Crescent Sample Port
02/02/2022	LT1	LT1	1381 Gilley Crescent Sample Port
02/08/2022	LT1	LT1	1381 Gilley Crescent Sample Port
02/16/2022	LT1	LT1	1381 Gilley Crescent Sample Port
02/23/2022	LT1	LT1	1381 Gilley Crescent Sample Port
03/02/2022	LT1	LT1	1381 Gilley Crescent Sample Port
03/08/2022	LT1	LT1	1381 Gilley Crescent Sample Port
03/16/2022	LT1	LT1	1381 Gilley Crescent Sample Port
03/29/2022	LT1	LT1	1381 Gilley Crescent Sample Port
04/05/2022	LT1	LT1	1381 Gilley Crescent Sample Port
04/13/2022	LT1	LT1	1381 Gilley Crescent Sample Port
04/20/2022	LT1	LT1	1381 Gilley Crescent Sample Port
04/25/2022	LT1	LT1	1381 Gilley Crescent Sample Port
05/04/2022	LT1	LT1	1381 Gilley Crescent Sample Port
05/11/2022	LT1	LT1	1381 Gilley Crescent Sample Port
05/17/2022	LT1	LT1	1381 Gilley Crescent Sample Port
06/08/2022	LT1	LT1	1381 Gilley Crescent Sample Port
07/13/2022	LT1	LT1	1381 Gilley Crescent Sample Port
08/09/2022	LT1	LT1	1381 Gilley Crescent Sample Port
09/14/2022	LT1	LT1	1381 Gilley Crescent Sample Port
10/12/2022	LT1	LT1	1381 Gilley Crescent Sample Port
11/07/2022	LT1	LT1	1381 Gilley Crescent Sample Port
12/05/2022	LT1	LT1	1381 Gilley Crescent Sample Port

### **Interpreting Sample Reports**

In VIHA, the results of drinking water sampling are reported using the following coding system:

LT1 Less than 1 (no detectable bacteria) - Meaning: No bacteria present

L1 Less than 1 (no detectable bacteria) - Meaning: No bacteria present

OG Overgrown - Meaning: Too many background bacteria to give an accurate count

EST Estimated Count

A Sample not tested; Too long in transit

C Sample leaked/broken in transit      D Sample not tested; No collection date given

T Sample submitted unsatisfactory. Exceeded 30 hours holding time, please resample.

NS No sample received with requisition





# Regional District of Nanaimo - Water Services Department

## French Creek Water Analysis - 2022 Monthly Report

Date	Sample Location (Address)	BC Centre for Disease Control		RDN In-House Laboratory and Spectrophotometer								Bureau Veritas Lab	
		E. coli *	Total Coliform *	E.coli *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
5-Dec-22	1381 Gilley	0	0	0	0	8	7.00	0.41	66.1	0.06	131.1		
12-Dec-22	1228 Sunrise	0	0	0	0	9	7.05	0.35	51.3	0.05	108.8		
21-Dec-22	1381 Gilley			0	0	7	7.07	0.32	58.7	0.05	100.9		
CDN Drinking Water Guidelines		<1	<1	<1	<1	n/a	7.0-10.5	n/a	500	n/a	n/a	0.3	0.02 AO 0.12 MAC

**Legend:**

\* Coliforms are measured in colony forming units (CFU) per 100 millilitres of water (CFU/100mL)

Green font indicates a value flagged for operational consideration

Orange font indicates non-compliance with the Aesthetic Objective (AO) in the Canadian Drinking Water Guidelines (CDWG)

Red font indicates non-compliance with the Maximum Acceptable Concentration (MAC) in the CDWG

**Comments:**



# Regional District of Nanaimo - Water Services Department

## French Creek Water Analysis - 2022 Monthly Report

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		E. coli *	Total Coliform *	E.coli *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
3-Nov-22	1228 Sunrise	0	0	0	0	14	7.10	0.41	65.8	0.06	139.1		
7-Nov-22	1381 Gilley	0	0	0	0	13	6.99	0.02	77.7	0.08	163.7		
14-Nov-22	1228 Sunrise			0	0	12	7.19	0.41	54.5	0.05	115.4		
22-Nov-22	1381 Gilley			0	0	10	7.00	0.36	53.0	0.05	112.2		
28-Nov-22	1381 Gilley			0	0	11	6.89	0.37	63.7	0.06	134.6		
CDN Drinking Water Guidelines		<1	<1	<1	<1	n/a	7.0-10.5	n/a	500	n/a	n/a	0.3	0.02 AO 0.12 MAC

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Notes below about pH (2015) from [https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html#\\_ftn1](https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html#_ftn1)

Type	Parameter (published, reaffirmed)	MAC (mg/L)	Other value (mg/L)	Common sources of parameter in water	Health considerations	Comments
Treatment-related	pH (2015)	None	7.0-10.5	Not applicable	Not applicable	The control of pH is important to maximize treatment effectiveness, control corrosion and reduce leaching from distribution system and plumbing components.



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5-Oct-22	1228 Sunrise	0	0	0	0	16	6.86	0.49	67.4	0.07	142.3		
11-Oct-22	1381 Gilley	0	0	0	0	16	6.90	0.28	75.4	0.07	160.4		
17-Oct-22	1228 Sunrise			0	0	15	6.78	0.32	60.9	0.06	128.7		
24-Oct-22	1381 Gilley			0	0	15	6.80	0.34	66.1	0.06	133.0		
CDN Drinking Water Guidelines		<1	<1	<1	<1	n/a	7.0-10.5	n/a	500	n/a	n/a	0.3	0.02 AO 0.12 MAC

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7-Sep-22	1228 Sunrise	0	0	0	0	16	7.02	0.46	73.7	0.07	155.5		
17-Sep-22	1381 Gilley	0	0	0	0	18	6.87	0.34	83.5	0.08	176.0		
21-Sep-22	1228 Sunrise			0	0	16	7.00	0.30	86.1	0.08	169.9		
26-Sep-22	1381 Gilley			0	0		6.88	0.22	84.2	0.08	177.2		
CDN Drinking Water Guidelines		<1	<1	<1	<1	n/a	7.0-10.5	n/a	500	n/a	n/a	0.3	0.02 AO 0.12 MAC

### Legend:

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2-Aug-22	1228 Sunrise	0	0	0	0	n/a	7.26	0.63	69.0	0.07	146.0		
9-Aug-22	1381 Gilley	0	0	0	0	18	6.87	0.60	78.9	0.08	166.1		
16-Aug-22	1228 Sunrise			0	0	18	7.03	0.38	74.5	0.07	157.1		
24-Aug-22	1381 Gilley			0	0	18	6.79	0.40	83.6	0.08	176.0		
CDN Drinking Water Guidelines		<1	<1	<1	<1	n/a	7.0-10.5	n/a	500	n/a	n/a	0.3	0.02 AO 0.12 MAC

### Legend:

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### Comments:

Notes below about pH (2015) from [https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html#\\_ftn1](https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html#_ftn1)

Type	Parameter (published, reaffirmed)	MAC (mg/L)	Other value (mg/L)	Common sources of parameter in water	Health considerations	Comments
Treatment-related	pH (2015)	None	7.0-10.5	Not applicable	Not applicable	The control of pH is important to maximize treatment effectiveness, control corrosion and reduce leaching from distribution system and plumbing components.



# Regional District of Nanaimo - Water Services Department

## French Creek Water Analysis - 2022 Monthly Report

Date	Sample Location (Address)	BC Centre for Disease Control		RDN In-House Laboratory and Spectrophotometer								Bureau Veritas Lab	
		E. coli *	Total Coliform *	E.coli *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
6-Jul-22	1228 Sunrise	0	0	0	0	15	7.23	0.48	54.8	0.05	116.0		
13-Jul-22	1381 Gilley	0	0	0	0	15	6.95	0.53	63.7	0.06	134.7		
20-Jul-22	1228 Sunrise			0	0	16	6.77	0.69	54.5	0.05	115.4		
27-Jul-22	1381 Gilley			0	0	18	6.90	0.59	70.6	0.07	149.2		
CDN Drinking Water Guidelines		<1	<1	<1	<1	n/a	7.0-10.5	n/a	500	n/a	n/a	0.3	0.02 AO 0.12 MAC

### Legend:

\* Coliforms are measured in colony forming units (CFU) per 100 millilitres of water (CFU/100mL)

Green font indicates a value flagged for operational consideration

Orange font indicates non-compliance with the Aesthetic Objective (AO) in the Canadian Drinking Water Guidelines (CDWG)

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### Comments:

Notes below about pH (2015) from [https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html#\\_ftn1](https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html#_ftn1)

Type	Parameter (published, reaffirmed)	MAC (mg/L)	Other value (mg/L)	Common sources of parameter in water	Health considerations	Comments
Treatment-related	pH (2015)	None	7.0-10.5	Not applicable	Not applicable	The control of pH is important to maximize treatment effectiveness, control corrosion and reduce leaching from distribution system and plumbing components.





# Regional District of Nanaimo - Water Services Department

## French Creek Water Analysis - 2022 Monthly Report

Date	Sample Location (Address)	BC Centre for Disease Control		RDN In-House Laboratory and Spectrophotometer								Bureau Veritas Lab	
		E. coli *	Total Coliform *	E.coli *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
1-Jun-22	1228 Sunrise	0	0	0	0	12	7.19	0.36	55.7	0.05	117.0		
8-Jun-22	1381 Gilley	0	0	0	0	13	7.15	0.39	56.2	0.06	118.5		
20-Jun-22	1381 Gilley			0	0	14	7.13	0.25	53.3	0.05	112.8		
29-Jun-22	1381 Gilley			0	0	15	7.22	0.34	61.2	0.06	129.7		
CDN Drinking Water Guidelines		<1	<1	<1	<1	n/a	7.0-10.5	n/a	500	n/a	n/a	0.3	0.02 AO 0.12 MAC

### Legend:

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### Comments:

Notes below about pH (2015) from [https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html#\\_ftn1](https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html#_ftn1)

Type	Parameter (published, reaffirmed)	MAC (mg/L)	Other value (mg/L)	Common sources of parameter in water	Health considerations	Comments
Treatment-related	pH (2015)	None	7.0-10.5	Not applicable	Not applicable	The control of pH is important to maximize treatment effectiveness, control corrosion and reduce leaching from distribution system and plumbing components.



# Regional District of Nanaimo - Water Services Department

## French Creek Water Analysis - 2022 Monthly Report

Date	Sample Location (Address)	BC Centre for Disease Control		RDN In-House Laboratory and Spectrophotometer								Bureau Veritas Lab	
		E. coli *	Total Coliform *	E.coli *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
4-May-22	1228 Sunrise	0	0	0	0	10	6.99	0.06	44.1	0.04	94.8		
4-May-22	1381 Gilley	0	0	0	0	10	7.02	0.05	60.1	0.06	110.0		
11-May-22	1228 Sunrise	0	0	0	0	10	7.24	0.52	67.4	0.06	130.0		
11-May-22	1381 Gilley	0	0	0	0	10	7.19	0.58	60.1	0.06	127.1		
17-May-22	1381 Gilley	0	0	0	0	10	7.20	0.50	60.9	0.06	121.0		
17-May-22	1228 Sunrise	0	0	0	0	10	7.18	0.48	60.0	0.05	127.0		
25-May-22	1381 Gilley			0	0	12	6.98	0.38	53.6	0.05	113.5		
CDN Drinking Water Guidelines		<1	<1	<1	<1	n/a	7.0-10.5	n/a	500	n/a	n/a	0.3	0.02 AO 0.12 MAC

### Legend:

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# Regional District of Nanaimo - Water Services Department

## French Creek Water Analysis - 2022 Monthly Report

Date	Sample Location (Address)	BC Centre for Disease Control		RDN In-House Laboratory and Spectrophotometer								Bureau Veritas Lab	
		E. coli *	Total Coliform *	E.coli *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
5-Apr-22	1228 Sunrise	0	0	0	0	9	7.18	0.08	47.3	0.05	100.2		
5-Apr-22	1381 Gilley	0	0	0	0	9	7.27	0.01	68.8	0.07	143.1		
13-Apr-22	1381 Gilley	0	0	0	0	9	6.87	0.03	70.5	0.07	148.9		
13-Apr-22	1228 Sunrise	0	0	0	0	9	6.99	0.10	46.5	0.05	98.7		
20-Apr-22	1381 Gilley	0	0	0	0	8	7.00	0.05	69.0	0.07	145.2		
20-Apr-22	1228 Sunrise	0	0	0	0	8	7.10	0.06	72.1	0.07	142.1		
25-Apr-22	1381 Gilley	0	0	0	0	10	6.89	0.06	45.2	0.04	95.0	0.0273	0.001
25-Apr-22	1228 Sunrise	0	0	0	0	10	6.84	0.05	46.2	0.04	92.4	0.0189	0.0012
CDN Drinking Water Guidelines		<1	<1	<1	<1	n/a	7.0-10.5	n/a	500	n/a	n/a	0.3	0.02 AO 0.12 MAC

**Legend:**

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Notes below about pH (2015) from [https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html#\\_ftn1](https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html#_ftn1)

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Treatment-related	pH (2015)	None	7.0-10.5	Not applicable	Not applicable	The control of pH is important to maximize treatment effectiveness, control corrosion and reduce leaching from distribution system and plumbing



# Regional District of Nanaimo - Water Services Department

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Date	Sample Location (Address)	BC Centre for Disease Control		RDN In-House Laboratory and Spectrophotometer								Bureau Veritas Lab	
		E. coli *	Total Coliform *	E.coli *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
2-Mar-22	1381 Gilley	0	0	0	0	8	6.96	0.12	51.4	0.05	109.9		
2-Mar-22	1228 Sunrise	0	0	0	0	8	6.94	0.12	69.0	0.06	122.4		
8-Mar-22	1381 Gilley	0	0	0	0	8	7.18	0.06	66.5	0.07	140.6		
8-Mar-22	1228 Sunrise	0	0	0	0	8	7.17	0.10	49.5	0.05	105.1	0.0251	0.0015
16-Mar-22	1381 Gilley	0	0	0	0	8	7.06	0.06	47.8	0.06	101.8	0.0262	0.0015
16-Mar-22	1228 Sunrise	0	0	0	0	8	7.03	0.07	66.6	0.07	140.7		
23-Mar-22	1381 Gilley			0	0	8	7.01	0.06	121.2	0.06	121.2		
23-Mar-22	1228 Sunrise	0	0	0	0	8	n/a	0.10	n/a	n/a	n/a		
29-Mar-22	1228 Sunrise	0	0	0	0	9	7.21	0.04	68.9	0.07	144.0		
29-Mar-22	1381 Gilley	0	0	0	0	9	7.27	0.10	47.8	0.05	101.5		
CDN Drinking Water Guidelines		<1	<1	<1	<1	n/a	7.0-10.5	n/a	500	n/a	n/a	0.3	0.02 AO 0.12 MAC

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Treatment-related	pH (2015)	None	7.0-10.5	Not applicable	Not applicable	The control of pH is important to maximize treatment effectiveness, control corrosion and reduce leaching from distribution system and plumbing



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Date	Sample Location (Address)	BC Centre for Disease Control		RDN In-House Laboratory and Spectrophotometer								Bureau Veritas Lab	
		E. coli *	Total Coliform *	E.coli *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
2-Feb-22	1228 Sunrise	0	0	0	0	8	7.01	0.08	75	0.06	155		
2-Feb-22	1381 Gilley	0	0	0	0	8	7.1	0.04	70	0.05	159		
8-Feb-22	1381 Gilley	0	0	0	0	8	6.95	0.03	79.0	0.08	166.5	0.0131	0.0014
8-Feb-22	1228 Sunrise	0	0	0	0	8	6.85	0.10	55.4	0.05	117.2	0.0165	<0.001
16-Feb-22	1381 Gilley	0	0	0	0	8	7.18	0.04	74.5	0.04	157.7		
16-Feb-22	1228 Sunrise	0	0	0	0	8	7.20	0.08	76.0	0.07	158.1		
23-Feb-22	1381 Gilley	0	0	0	0	7	7.02	0.11	72.5	0.07	153.0		
23-Feb-22	1228 Sunrise	0	0	0	0	7	7.10	0.13	53.1	0.05	112.5		
CDN Drinking Water Guidelines		<1	<1	<1	<1	n/a	7.0-10.5	n/a	500	n/a	n/a	0.3	0.02 AO 0.12 MAC

### Legend:

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		E. coli *	Total Coliform *	E.coli *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
5-Jan-22	1228 Sunrise	0	0	0	0	7	7.50	0.03	57.6	0.06	122.5		
5-Jan-22	1381 Gilley	0	0	0	0	7	7.49	0.05	59.0	0.06	123.6		
12-Jan-22	1381 Gilley			0	0	7	6.89	0.04	82.5	0.08	173.3		
12-Jan-22	1228 Sunrise			0	0	7	7.17	0.09	59.5	0.06	125.9		
17-Jan-22	1381 Gilley	0	0	0	0	7	6.88	0.06	82.9	0.06	174.7		
17-Jan-22	1228 Sunrise	0	0	0	0	7	6.81	0.10	82.7	0.06	176.1	0.0129	0.0014
26-Jan-22	1228 Sunrise	0	0	0	0	9	7.04	0.04	80.7	0.08	170.5	0.0231	0.0019
26-Jan-22	1381 Gilley	0	0	0	0	8	7.18	0.09	56.4	0.06	118.6		
CDN Drinking Water Guidelines		<1	<1	<1	<1	n/a	7.0-10.5	n/a	500	n/a	n/a	0.3	0.02 AO 0.12 MAC

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Type	Parameter (published, reaffirmed)	MAC (mg/L)	Other value (mg/L)	Common sources of parameter in water	Health considerations	Comments
Treatment-related	pH (2015)	None	7.0-10.5	Not applicable	Not applicable	The control of pH is important to maximize treatment effectiveness, control corrosion and reduce leaching from distribution system and plumbing components.



CDWG=Canadian Drinking Water Guidelines  
OG= Operational Guidance Value

MAC=Maximum Acceptable Concentration  
AO= Asthetic Objective

Orange font indicates non-compliance with the Aesthetic Objective in the Canadian Drinking Water Guidelines (CDWG)  
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	Units	CDWG		May 8 2017	May 7 2018	May 13 2019	May 21 2020	May 6 2021	May 5 2022
<b>Miscellaneous Inorganics</b>									
Fluoride	mg/L	1.5	MAC	0.12	0.11	0.11	0.11	0.096	<0.05
Alkalinity (total as CaCO )	mg/L			144	127	137	130	140	49
<b>Anions</b>									
Dissolved Sulphate	mg/L	500	AO	26.4	27.6	28.4	36	29	3.7
Dissolved Chloride	mg/L	250	AO	12	11	12	13	14	4.2
Nitrite	mg/L	1	MAC	<0.0050	<0.0050	<0.005	<0.005	<0.005	0.183
<b>Miscellaneous</b>									
Apparent Colour	Colour Unit			10	20	<2	20	20	<5
<b>Nutrients</b>									
Total Ammonia	mg/L			0.11	0.028	<0.015	0.061	<0.015	<0.015
<b>Physical Properties</b>									
Conductivity	µS/cm			344	336	354	350	360	120
pH	pH	7.0:10.5	AO	8.27	8.12	8.14	8.09	8.16	7.14
TDS	mg/L	500	AO	204	198	210	210	210	66
Turbidity	NTU			1.85	1.37	1.33	1.5	1.1	5
<b>Microbiological Parameters</b>									
E.coli	MPN/100mL	<1	MAC	<1.0	<1.0	0	0	0	0
Total Coliforms	MPN/100mL	<1	MAC	<1.0	<1.0	0	0	0	0
<b>Calculated Parameters</b>									
Total Hardness (CaCO )	mg/L			181	144	154	154	150	49.6
Nitrate	mg/L	10	MAC	<0.020	<0.020	<0.02	<0.02	<0.02	0.183
<b>Elements</b>									
Total Mercury	mg/L	0.001	MAC	<0.00001	<0.000002	<0.000002	<0.0000019	<0.0000019	<0.0000019
<b>Total Metals</b>									
Total Aluminum	mg/L	0.1	OG	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Total Antimony	mg/L	0.006	MAC	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Total Arsenic	mg/L	0.01	MAC	0.00012	<0.0001	<0.00012	<0.0001	<0.0001	<0.0001
Total Barium	mg/L	1	MAC	0.0191	0.015	0.0156	0.0163	0.163	0.0186
Total Beryllium	mg/L			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Bismuth	mg/L			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Boron	mg/L	5	MAC	<0.050	<0.050	<0.05	<0.05	<0.05	<0.05
Total Cadmium	mg/L	0.005	MAC	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Total Chromium	mg/L	0.05	MAC	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Cobalt	mg/L			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Total Copper	mg/L	1	AO	0.0009	0.00102	0.00119	0.00096	0.00112	0.0135
Total Iron	mg/L	0.3	AO	0.125	0.123	0.11	0.104	0.0905	0.781
Total Lead	mg/L	0.01	MAC	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.00154
Total Manganese	mg/L	0.02 0.12	AO MAC	0.142	0.127	0.107	0.105	0.124	0.124
Total Molybdenum	mg/L			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Nickel	mg/L			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Selenium	mg/L	0.05	MAC	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Silicon	mg/L			15.6	12.5	11.4	11.7	11.7	5.54
Total Silver	mg/L			<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Total Strontium	mg/L			0.163	0.146	0.137	0.15	0.153	0.0394
Total Thallium	mg/L			<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.000001
Total Tin	mg/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Titanium	mg/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Uranium	mg/L	0.02	MAC	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Vanadium	mg/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Zinc	mg/L	5	AO	<0.005	<0.005	<0.005	<0.005	<0.005	0.0166
Total Zirconium	mg/L			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Calcium	mg/L			44.7	34.9	37.3	37.5	35.7	15.2
Total Magnesium	mg/L			16.9	13.7	14.7	14.5	14.7	2.83
Total Potassium	mg/L			3.05	2.32	2.49	2.5	2.53	0.284
Total Sodium	mg/L	200	AO	14.1	11.7	12.2	12	12.3	3.11
Total Sulphur	mg/L			10.9	8.8	9.4	9.7	8.8	<3

Notes below about Manganese (2019) from: <https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html>

Type	Parameter (published, reaffirmed)	MAC (mg/L)	Other value (mg/L)	Common sources of parameter in water	Health considerations	Comments
I= Inorganic chemical parameter	Manganese (2019)	0.12	AO: <0.02	Dissolution of naturally-occurring minerals commonly found in soil and rock. Other sources include industrial discharge, mining activities and leaching from landfills.	<b>Health Basis of MAC:</b> Effects on neurological development and behaviour; deficits in memory, attention, and motor skills. <b>Other:</b> Formula-fed infants (where water containing manganese at levels above the MAC is used to prepare formula) may be especially at risk.	AO based on minimizing the occurrence of discoloured water, consumer complaints and staining of laundry.

French Creek Distribution (Tap Water) Analysis  
1381 Gilley Cres

CDWG=Canadian Drinking Water Guidelines

MAC=Maximum Acceptable Concentration

OG= Operational Guidance Value

AO= Asthetic Objective

**Red font indicates non-compliance with Canadian Drinking Water Guidelines**

	Units	CDWG		May 13 2019	May 21 2020	May 6 2021	May 19 2022		
<b>Volatiles</b>									
Total Trihalomethanes	mg/L	0.1	MAC	0.024	0.024	0.025	0.0068		
Bromodichloromethane	mg/L			0.0076	0.0077	0.0075	0.0018		
Bromoform	mg/L			<0.001	<0.001	<0.001	<0.001		
Chlorodibromomethane	mg/L			0.003	0.0032	0.0036	<0.001		
Chloroform	mg/L			0.014	0.013	0.014	0.005		