REGIONAL DISTRICT OF NANAIMO

Water Service Area Annual Report 2018

French Creek Water Service Area

June 2019

REGIONAL DISTRICT OF NANAIMO
Water & Utility Services Department
6300 Hammond Bay Rd, Nanaimo, BC Canada V9T 6N2 | Ph 250-390-6560 | Fax 250-390-1542

Table of Contents

1.0 Introduction

The following annual report describes the French Creek Water Service Area and summarizes the water quality and production data from 2018. This report also includes a summary of inquiries and complaints, completed and proposed maintenance activities, Operator Certification, the Emergency Response Plan, and the Cross Connection Control Program.

This report is to be submitted to Island Health by the spring of 2019.

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 water source for the French Creek Water Service Area comes from a series of groundwater wells located nearby. The water source is chlorinated and stored in one reservoir. There are 242 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.

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

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.

2.2 Reservoirs

One service reservoir (steel construction) is present at 1225 Sunrise Drive, Parksville, B.C. and has a capacity of 364 m^3 (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
Asbestos-concrete:		
150mm or smaller	3.5 km	52%
200mm or larger	0.8 km	12%
PVC:		
150mm or smaller	0.9 km	14%
200mm or larger	1.5 km	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, Monthly- Iron and Manganese
Semi-Monthly	BC Centre for Disease Control	Total coliforms, E.Coli
Annual Source Water Testing (every Fall)	Bureau Veritas (formerly Maxxam)	Complete potability testing of raw well water, including T-Ammonia
Annual System Water Testing (every Spring)	Bureau Veritas (formerly Maxxam)	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 in the Regional Services section, under "Water & Utility Services" then "WaterSmart Communities". 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

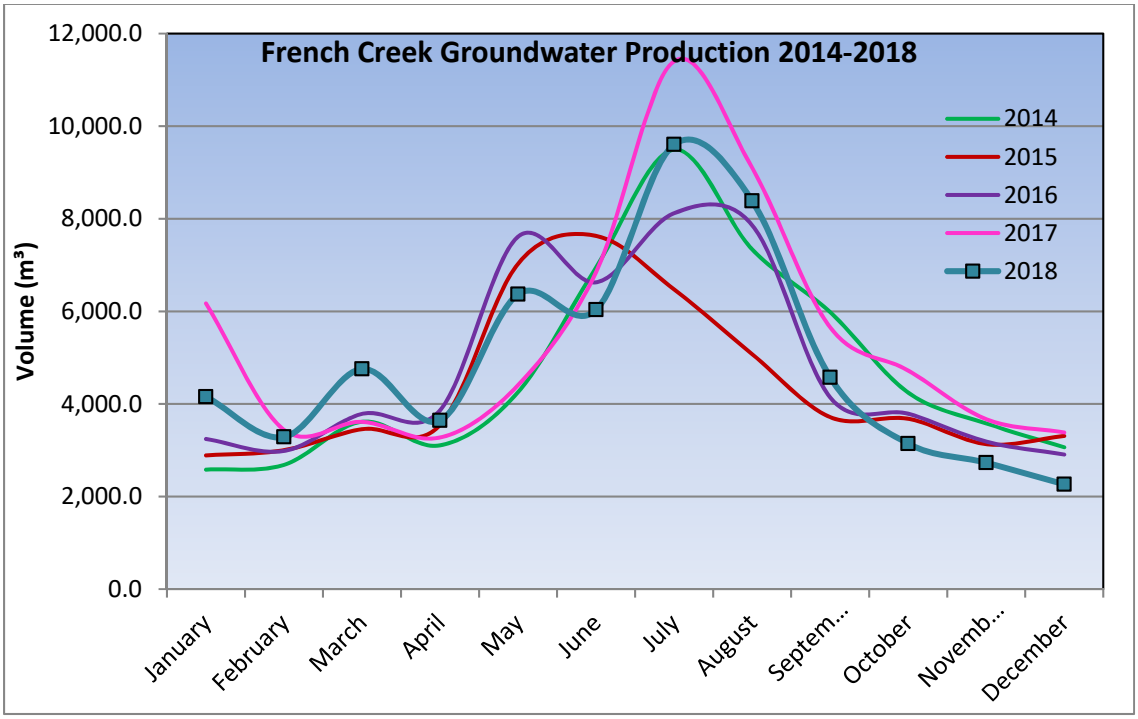
A few complaints and inquiries were received from the French Creek water service area in 2018 and were typically related to isolated incidents of iron discolouration in the water. RDN staff respond to these complaints by flushing the owner's water service line at the curb.

A summary of the water system incidents in 2018 is given in the table below.

Activity in 2018	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 groundwater production in the French Creek Water Service Area for the past 5 years is shown in the chart below. Groundwater production in 2018 was characterized by higher than usual use in summer (though lower than 2017), followed by a period of normal use from September through October. This pattern may be attributed to high summer temperatures and less-than-average precipitation, which resulted in high demand in the summer season.



In the Fall/Winter of 2018, the average usage per home in French Creek was 0.45 cubic metres per day (99.0 imperial gallons). In the summer, the average water usage was 0.96 cubic metres per day (211.2 imperial gallons). Based on these figures, the annual consumption per capita is estimated to be 254 L/day (based on 2.4 people per household). This consumption is ***14% less*** than the average of all the other RDN water systems of 294 L/day/capita for 2018.

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
Main Pump House and 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
- ✓ Water Distribution
- ✓ Wastewater Collection
- ✓ Cross Connection Control
- ✓ Asbestos Awareness
- ✓ Chlorine Handling
- ✓ WHMIS (Workplace Hazardous Material Information System)
- ✓ TDG (Transportation of Dangerous Goods)
- ✓ Confined Space Awareness
- ✓ Traffic Control
- ✓ Fall Protection
- ✓ First Aid

9.0 Water Service Area Projects

9.1 2018 Completed Studies & Projects

- Well #2 wellhead upgrade project completed;
- Corresponded with residents regarding well level and water conservation;
- Completed irrigation checks for high-water users;
- Completed Water Conservation Evaluation Report;
- Advised residents regarding water leak repairs;
- Completed Cross Connection Control Bylaw in draft format;
- Completed regular flushing, reservoir cleaning, and hydrant maintenance projects;
- Enforced outdoor sprinkling regulations;
- Updated the online GIS Water Map update for aquifer and watershed info;
- Maintained a high level of water quality;
- Continued quality control through regular testing and monitoring of water system;
- Began a Water Systems SCADA Master Plan project;
- Initiated New Drinking Water and Watershed Protection Action Plan preparation;
- Began a Water Systems Condition Assessment project;
- Planned water meter replacement.

9.2 2019 Proposed Projects & Upgrades

- Continue watermain flushing program and hydrant maintenance;
- Adopt Cross Connection Control Bylaw;
- Replace water meters;
- Implement a Water Systems SCADA Master Plan;
- Review well protection plans;
- Complete a Water Systems Condition Assessment project;
- Begin DWWP Water Conservation Plan development;
- Implement new Drinking Water and Watershed Protection Action Plan;
- Continue to offer numerous water-saving incentives via rebates;
- Develop Cross Connection Control educational material.

10.0 Emergency Response Plan

The Regional District Emergency Response Plan (ERP) 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 ERP was reviewed and updated in 2018, and copies are available on our website, at each RDN office, in each pumphouse, and in each Water Services vehicle. A copy of the ERP is also attached to this report in Appendix C.

11.0 Cross Connection Control

In 2017, a more robust Cross Connection Control Plan was prepared that fully defines the CCC program, including standard operating procedures, plumbing code references, reporting procedures, survey schedules, backflow prevention standards, detailed installation schematics, blank test forms, testing reminders, and non-compliance letters. A minimum of two RDN Operators are certified in Backflow Assembly Testing at all times. The RDN Chief Operator is the designated Cross Connection Control Manager.

In 2019, a stand-alone Cross Connection Control Bylaw will be adopted that contains definitions, authorizations, applications, liability, rules, regulations, testing requirements, and reporting requirements. The bylaw will address retrofits, prohibitions, special circumstances, reclaimed water use, alternate water sources, failure to comply, inspections, testing, offences, penalties and more. A webpage will be established on the Water Services website that will educate RDN customers about cross connections and list the relevant links to current standards and resources.

12.0 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.

13.0 Closing

An annual report for the year 2019 will be prepared and submitted to Island Health in the spring of 2020. Annual reports are also available on our website at: https://www.rdn.bc.ca/french-creek.

Yambury Road right-of-way near FC Well No.2

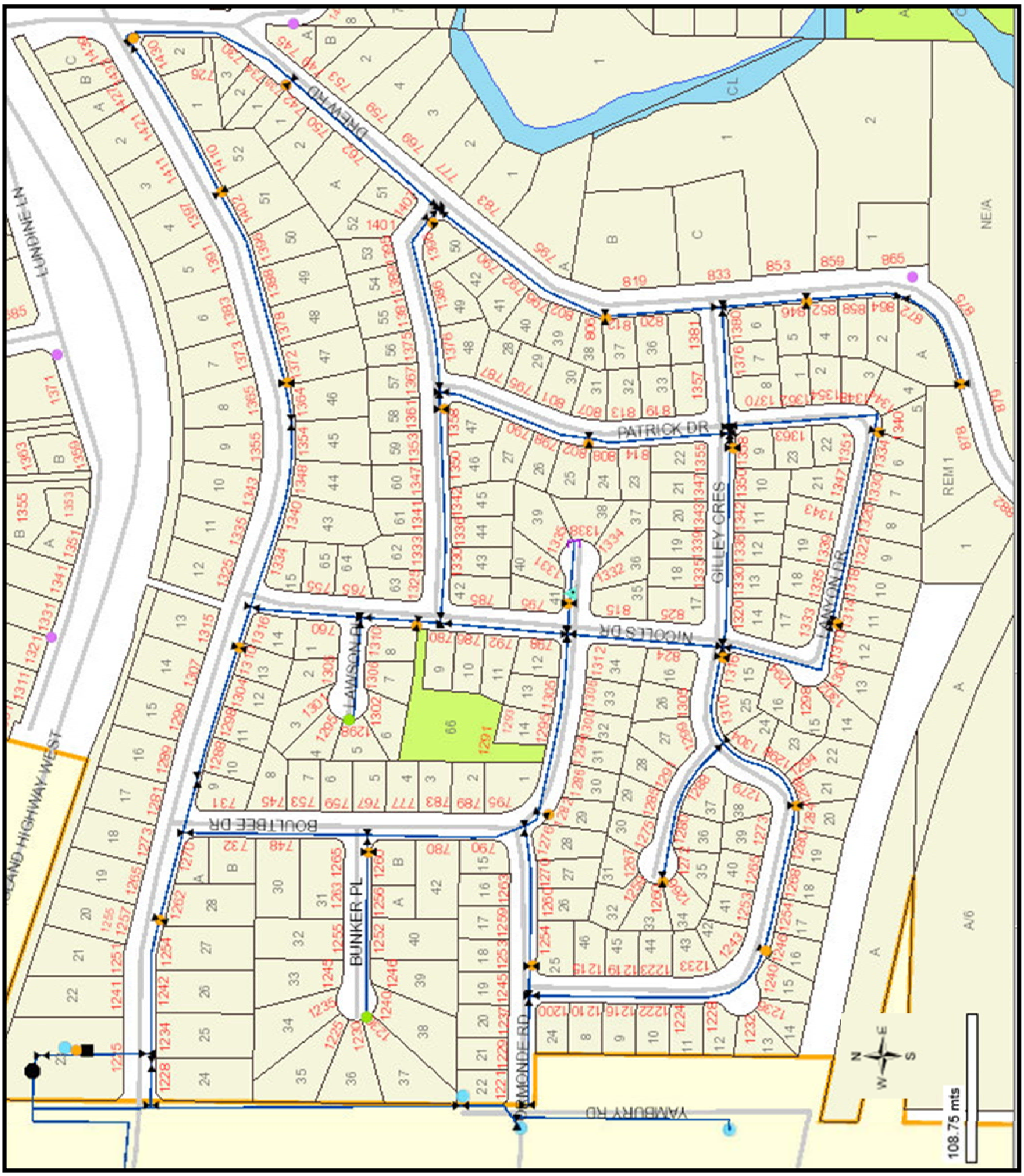
APPENDIX A

MAP OF FRENCH CREEK

WATER SERVICE AREA

FRENCH CREEK

WATER SERVICE AREA



APPENDIX B

WATER QUALITY TESTING RESULTS

FRENCH CREEK WATER SERVICE AREA

island health

Facility Location:
1480 Industrial Way
Parksville

Facility Information: Facility Type: 301-10000 (DWT)

Facility Sampling History:

Location	Date	Total Coliform	E. Coli
1381 Gilley Crescent	10-Dec-2018	L1	L1
1228 Sunrise Drive	3-Dec-2018	L1	L1
1381 Gilley Crescent	14-Nov-2018	L1	L1
1228 Sunrise Drive	7-Nov-2018	L1	L1
1228 Sunrise Drive	9-Oct-2018	L1	L1
1381 Gilley Crescent	1-Oct-2018	L1	L1
1228 Sunrise Drive	10-Sep-2018	L1	L1
1381 Gilley Crescent	5-Sep-2018	L1	L1
1228 Sunrise Drive	13-Aug-2018	L1	L1
1381 Gilley Crescent	7-Aug-2018	L1	L1
1381 Gilley Crescent	9-Jul-2018	L1	L1
1228 Sunrise Drive	3-Jul-2018	L1	L1
1381 Gilley Crescent	11-Jun-2018	L1	L1
1228 Sunrise Drive	5-Jun-2018	L1	L1
1381 Gilley Crescent	14-May-2018	L1	L1
1228 Sunrise Drive	7-May-2018	L1	L1
1381 Gilley Crescent	1-May-2018	L1	L1
1381 Gilley Crescent	9-Apr-2018	L1	L1
1228 Sunrise Drive	4-Apr-2018	L1	L1
1381 Gilley Crescent	12-Mar-2018	L1	L1
1228 Sunrise Drive	5-Mar-2018	L1	L1
1381 Gilley Crescent	14-Feb-2018	L1	L1
1228 Sunrise Drive	5-Feb-2018	L1	L1
1228 Sunrise Drive	8-Jan-2018	L1	L1
1381 Gilley Crescent	2-Jan-2018	L1	L1

Interpreting Sample Reports

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

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

French Creek Distribution Water Analysis
1228 Sunrise Drive

CDWG=Canadian Drinking Water Guidelines
OG= Operational Guidance Value
MAC=Maximum Acceptable Concentration
AO= Asthetic Objective.

water SMART zero waste

Red font indicates non-compliance with Canadian Drinking Water Guidelines

	Units	CDWG		May 13 2014	May 19 2015	May 10 2016	May 8 2017	May 7 2018	
Miscellaneous Inorganics									
Fluoride	mg/L	1.5	MAC	0.1	0.11	0.11	0.12	0.11	
Alkalinity (total as $CaCO_3$)	mg/L			140	128	141	144	127	
Anions									
Dissolved Sulphate	mg/L	500	AO	25.8	22	29.5	26.4	27.6	
Dissolved Chloride	mg/L	250	AO	9.4	11	12	12	11	
Nitrite	mg/L	1	MAC	<0.05	<0.0050	<0.0050	<0.0050	<0.0050	
Miscellaneous									
Apparent Colour	Colour Unit			36	10	30	10	20	
Nutrients									
Total Ammonia	mg/L			<0.02	0.0099	0.016	0.11	0.028	
Physical Properties									
Conductivity	µS/cm			337	331	350	344	336	
pH	pH	7.0:10.5	AO	8.2	8.17	8.29	8.27	8.12	
TDS	mg/L	500	AO	222	194	188	204	198	
Turbidity	NTU			1.1	1.3	1.29	1.85	1.37	
Microbiological Parameters									
E.coli	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	<1.0	<1.0	
Total Coliforms	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	<1.0	<1..0	
Calculated Parameters									
Total Hardness ($CaCO_3$)	mg/L			160	135	145	181	144	
Nitrate	mg/L	10	MAC	<0.05	<0.020	<0.020	<0.020	<0.020	
Elements									
Total Mercury	mg/L	0.001	MAC	<0.00001	<0.00001	<0.00001	<0.00001	<0.000002	
Total Metals									
Total Aluminum	mg/L	0.1	OG	<0.025	<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	
Total Arsenic	mg/L	0.01	MAC	<0.00025	<0.00012	<0.0001	0.00012	<0.0001	
Total Barium	mg/L	1	MAC	0.0169	0.0151	0.016	0.0191	0.015	
Total Beryllium	mg/L			<0.00025	<0.0001	<0.0001	<0.0001	<0.0001	
Total Bismuth	mg/L			<0.0005	<0.001	<0.001	<0.001	<0.001	
Total Boron	mg/L	5	MAC	0.027	<0.050	<0.050	<0.050	<0.050	
Total Cadmium	mg/L	0.005	MAC	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	
Total Chromium	mg/L	0.05	MAC	<0.0025	<0.001	<0.001	<0.001	<0.001	
Total Cobalt	mg/L			<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	
Total Copper	mg/L	1	AO	0.0025	0.00148	0.00069	0.0009	0.00102	
Total Iron	mg/L	0.3	AO	0.143	0.113	0.117	0.125	0.123	
Total Lead	mg/L	0.01	MAC	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	
Total Manganese	mg/L	0.05	AO	0.139	0.125	0.123	0.142	0.127	
Total Molybdenum	mg/L			0.00056	<0.001	<0.001	<0.001	<0.001	
Total Nickel	mg/L			<0.0010	<0.001	<0.001	<0.001	<0.001	
Total Selenium	mg/L	0.05	MAC	<0.0005	<0.0001	<0.0001	<0.0001	<0.0001	
Total Silicon	mg/L			12.5	11.5	12.4	15.6	12.5	
Total Silver	mg/L			<0.00025	<0.00002	<0.00002	<0.00002	<0.00002	
Total Strontium	mg/L			0.146	0.136	0.146	0.163	0.146	
Total Thallium	mg/L			<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	
Total Tin	mg/L			<0.0005	<0.005	<0.005	<0.005	<0.005	
Total Titanium	mg/L			<0.0025	<0.005	<0.005	<0.005	<0.005	
Total Uranium	mg/L	0.02	MAC	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	
Total Vanadium	mg/L			<0.0005	<0.005	<0.005	<0.005	<0.005	
Total Zinc	mg/L	5	AO	0.0188	<0.005	<0.005	<0.005	<0.005	
Total Zirconium	mg/L				<0.0005	<0.0005	<0.0001	<0.0001	
Total Calcium	mg/L			39	34	34.6	44.7	34.9	
Total Magnesium	mg/L			15.1	12.2	14.2	16.9	13.7	
Total Potassium	mg/L			2.6	2.29	2.48	3.05	2.32	
Total Sodium	mg/L	200	AO	15.4	11.3	12.5	14.1	11.7	
Total Sulphur	mg/L				8.8	8.8	10.9	8.8	

REGIONAL DISTRICT OF NANAIMO

French Creek Well # 2 Water Analysis
Behind 1221 Ormonde Road

CDWG=Canadian Drinking Water Guidelines
OG= Operational Guidance Value

MAC=Maximum Acceptable Concentration
AO= Asthetic Objective.

water SMART zero waste

Red font indicates non-compliance with Canadian Drinking Water Guidelines

	Units	CDWG		November 4 2014	October 26 2015	October 27 2016	October 18 2017	November 8 2018	
Miscellaneous Inorganics									
Fluoride	mg/L	1.5	MAC	0.08	0.11	0.11	0.11	0.13	
Alkalinity (total as $CaCO_3$)	mg/L			130	129	133	140	130	
Anions									
Dissolved Sulphate	mg/L	500	AO	26.9	34.4	35.9	28.9	47.3	
Dissolved Chloride	mg/L	250	AO	6.1	7.2	6.7	7.2	7.4	
Nitrite	mg/L	1	MAC	0.12	<0.0050	<0.0050	0.0051	<0.0050	
Miscellaneous									
Apparent Colour	Colour Unit			6	10	5	15	5	
Nutrients									
Total Ammonia	mg/L			0.26	0.29	0.3	0.22	0.24	
Physical Properties									
Conductivity	µS/cm			317	337	344	341	354	
pH	pH	7.0:10.5	AO	8.3	8.35	8.24	8.28	8.21	
TDS	mg/L	500	AO	206	196	190	190	206	
Turbidity	NTU			<0.5	0.2	0.48	0.85	0.32	
Microbiological Parameters									
E.coli	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	<1.0	<1.0	
Total Coliforms	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	<1.0	<1.0	
Calculated Parameters									
Total Hardness ($CaCO_3$)	mg/L			150	148	148	157	161	
Nitrate	mg/L	10	MAC	<0.05	<0.020	<0.020	0.095	<0.020	
Elements									
Total Mercury	mg/L	0.001	MAC	<0.00001	<0.00001	<0.00001	<0.00001	<0.000002	
Total Metals									
Total Aluminum	mg/L	0.1	OG	<0.005	<0.003	<0.003	<0.003	<0.003	
Total Antimony	mg/L	0.006	MAC	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	
Total Arsenic	mg/L	0.01	MAC	0.00015	<0.0001	0.00017	0.00011	0.00019	
Total Barium	mg/L	1	MAC	0.0173	0.0174	0.0182	0.016	0.0182	
Total Beryllium	mg/L			<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	
Total Bismuth	mg/L			<0.0001	<0.001	<0.001	<0.001	<0.001	
Total Boron	mg/L	5	MAC	0.019	<0.050	<0.050	<0.050	<0.050	
Total Cadmium	mg/L	0.005	MAC	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	
Total Chromium	mg/L	0.05	MAC	<0.0005	<0.001	<0.001	<0.001	<0.001	
Total Cobalt	mg/L			<0.0001	<0.0005	<0.0005	<0.0002	<0.0002	
Total Copper	mg/L	1	AO	0.0005	0.0002	0.00047	0.0268	<0.0002	
Total Iron	mg/L	0.3	AO	0.094	0.0835	0.0585	0.223	0.115	
Total Lead	mg/L	0.01	MAC	<0.0001	<0.0002	<0.0002	0.00198	<0.0002	
Total Manganese	mg/L	0.05	AO	0.145	0.134	0.133	0.122	0.147	
Total Molybdenum	mg/L			0.00073	<0.001	<0.001	<0.001	<0.001	
Total Nickel	mg/L			0.0003	<0.001	<0.001	0.0027	<0.001	
Total Selenium	mg/L	0.05	MAC	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Total Silicon	mg/L			10.7	11.7	10.7	12.5	10.1	
Total Silver	mg/L			<0.00005	<0.00002	<0.00002	<0.00002	<0.00002	
Total Strontium	mg/L			0.147	0.146	0.148	0.145	0.165	
Total Thallium	mg/L			<0.00001	<0.00005	<0.00005	<0.00001	<0.00001	
Total Tin	mg/L			0.0011	<0.005	<0.005	<0.005	<0.005	
Total Titanium	mg/L			<0.0005	<0.005	<0.005	<0.005	<0.005	
Total Uranium	mg/L	0.02	MAC	<0.00001	<0.0001	<0.0001	<0.0001	<0.0001	
Total Vanadium	mg/L			0.0002	<0.005	<0.005	<0.005	<0.005	
Total Zinc	mg/L	5	AO	0.0074	<0.005	0.0068	0.117	<0.005	
Total Zirconium	mg/L				<0.0005	<0.0005	<0.0001	<0.0001	
Total Calcium	mg/L			36.8	37.4	36.5	37.8	39.8	
Total Magnesium	mg/L			13.4	13.3	13.8	15.1	14.9	
Total Potassium	mg/L			2.4	2.39	2.32	2.53	2.51	
Total Sodium	mg/L	200	AO	9.2	9.5	8.58	9.47	9.11	
Total Sulphur	mg/L				11.7	12.4	9.7	14.1	

REGIONAL DISTRICT OF NANAIMO

French Creek Well # 4 Water Analysis
SE of 785 York Place

CDWG=Canadian Drinking Water Guidelines
OG= Operational Guidance Value

MAC=Maximum Acceptable Concentration
AO= Asthetic Objective.

water SMART zero waste

Red font indicates non-compliance with Canadian Drinking Water Guidelines

	Units	CDWG		November 4 2014	October 26 2015	October 27 2016	October 18 2017	November 8 2018	
Miscellaneous Inorganics									
Fluoride	mg/L	1.5	MAC	0.09	0.11	0.11	0.11	0.13	
Alkalinity (total as $CaCO_3$)	mg/L			130	125	134	135	130	
Anions									
Dissolved Sulphate	mg/L	500	AO	18.9	19.4	19.8	26.7	20.1	
Dissolved Chloride	mg/L	250	AO	8.3	6.9	7.2	8.6	8.4	
Nitrite	mg/L	1	MAC	<0.05	<0.0050	<0.0050	<0.0050	<0.0050	
Miscellaneous									
Apparent Colour	Colour Unit			6	10	10	10	5	
Nutrients									
Total Ammonia	mg/L			0.4	0.42	0.47	0.37	0.4	
Physical Properties									
Conductivity	µS/cm			309	309	319	326	312	
pH	pH	7.0:10.5	AO	8.2	8.17	8.27	8.28	8.19	
TDS	mg/L	500	AO	196	194	162	174	196	
Turbidity	NTU			<0.5	0.19	0.27	0.48	0.2	
Microbiological Parameters									
E.coli	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	<1.0	<1.0	
Total Coliforms	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	<1.0	<1.0	
Calculated Parameters									
Total Hardness ($CaCO_3$)	mg/L			140	135	133	152	138	
Nitrate	mg/L	10	MAC	<0.05	<0.020	<0.020	<0.020	<0.020	
Elements									
Total Mercury	mg/L	0.001	MAC	<0.00001	<0.00001	<0.00001	<0.00001	<0.000002	
Total Metals									
Total Aluminum	mg/L	0.1	OG	<0.005	<0.003	<0.003	<0.003	<0.003	
Total Antimony	mg/L	0.006	MAC	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	
Total Arsenic	mg/L	0.01	MAC	0.00013	<0.0001	<0.0001	0.0001	<0.0001	
Total Barium	mg/L	1	MAC	0.014	0.0134	0.0137	0.0147	0.0134	
Total Beryllium	mg/L			<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	
Total Bismuth	mg/L			<0.0001	<0.001	<0.001	<0.001	<0.001	
Total Boron	mg/L	5	MAC	0.023	<0.05	<0.050	<0.050	<0.050	
Total Cadmium	mg/L	0.005	MAC	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	
Total Chromium	mg/L	0.05	MAC	<0.0005	<0.001	<0.001	<0.001	<0.001	
Total Cobalt	mg/L			<0.0001	<0.0005	<0.0005	<0.0002	<0.0002	
Total Copper	mg/L	1	AO	0.0009	0.00042	<0.0002	0.00024	0.00081	
Total Iron	mg/L	0.3	AO	0.122	0.118	0.124	0.149	0.13	
Total Lead	mg/L	0.01	MAC	<0.0001	0.00023	<0.0002	<0.0002	<0.0002	
Total Manganese	mg/L	0.05	AO	0.15	0.136	0.141	0.149	0.145	
Total Molybdenum	mg/L			0.00054	<0.001	<0.001	<0.001	<0.001	
Total Nickel	mg/L			<0.0002	<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	
Total Silicon	mg/L			12.2	13.2	11.9	13	11.5	
Total Silver	mg/L			<0.00005	<0.00002	<0.00002	<0.00002	<0.00002	
Total Strontium	mg/L			0.135	0.129	0.133	0.14	0.134	
Total Thallium	mg/L			<0.00001	<0.00005	<0.00005	<0.00001	<0.00001	
Total Tin	mg/L			0.0005	<0.005	<0.005	<0.005	<0.005	
Total Titanium	mg/L			<0.0005	<0.005	<0.005	<0.005	<0.005	
Total Uranium	mg/L	0.02	MAC	<0.00001	<0.0001	<0.0001	<0.0001	<0.0001	
Total Vanadium	mg/L			0.0003	<0.005	<0.005	<0.005	<0.005	
Total Zinc	mg/L	5	AO	0.0156	0.0061	<0.005	<0.005	0.0065	
Total Zirconium	mg/L				<0.0005	<0.0005	<0.0001	<0.0001	
Total Calcium	mg/L			34.2	33.1	31.8	37.1	32.5	
Total Magnesium	mg/L			13.1	12.7	12.9	14.4	13.8	
Total Potassium	mg/L			2.6	2.42	2.39	2.54	2.56	
Total Sodium	mg/L	200	AO	12	10.7	9.45	10	9.79	
Total Sulphur	mg/L				5.6	7.2	8.5	6.8	

REGIONAL DISTRICT OF NANAIMO

French Creek Well # 5 Water Analysis
1140 Sunrise Drive
Not sampled in 2016. Well Offline.

CDWG=Canadian Drinking Water Guidelines
OG= Operational Guidance Value
MAC=Maximum Acceptable Concentration
AO= Asthetic Objective.

water SMART zero waste

Red font indicates non-compliance with Canadian Drinking Water Guidelines

	Units	CDWG		November 4 2014	October 26 2015	October 18 2017	November 8 2018		
Miscellaneous Inorganics									
Fluoride	mg/L	1.5	MAC	0.11	0.16	0.16	0.18		
Alkalinity (total as $CaCO_3$)	mg/L			120	125	127	118		
Anions									
Dissolved Sulphate	mg/L	500	AO	<0.5	<0.50	<1.0	<1.0		
Dissolved Chloride	mg/L	250	AO	5.7	7	7.4	7		
Nitrite	mg/L	1	MAC	<0.05	<0.0050	<0.0050	<0.0050		
Miscellaneous									
Apparent Colour	Colour Unit			32	30	30	30		
Nutrients									
Total Ammonia	mg/L			1.5	1.6	1.5	1.5		
Physical Properties									
Conductivity	µS/cm			252	260	259	245		
pH	pH	7.0:10.5	AO	7.8	8.26	8.16	8.04		
TDS	mg/L	500	AO	166	166	146	140		
Turbidity	NTU			0.9	0.44	0.73	4.01		
Microbiological Parameters									
E.coli	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	<1.0		
Total Coliforms	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	<1.0		
Calculated Parameters									
Total Hardness ($CaCO_3$)	mg/L			83	80.2	81.2	75.4		
Nitrate	mg/L	10	MAC	<0.05	<0.020	<0.020	<0.020		
Elements									
Total Mercury	mg/L	0.001	MAC	<0.00001	<0.00001	<0.00001	<0.000002		
Total Metals									
Total Aluminum	mg/L	0.1	OG	0.007	<0.003	0.0045	0.0041		
Total Antimony	mg/L	0.006	MAC	<0.0001	<0.0005	<0.0005	<0.0005		
Total Arsenic	mg/L	0.01	MAC	0.00037	0.00031	0.00039	0.00027		
Total Barium	mg/L	1	MAC	0.0063	0.0055	0.0059	0.0076		
Total Beryllium	mg/L			<0.00005	<0.0001	<0.0001	<0.0001		
Total Bismuth	mg/L			<0.0001	<0.001	<0.001	<0.001		
Total Boron	mg/L	5	MAC	0.057	0.064	0.062	0.057		
Total Cadmium	mg/L	0.005	MAC	<0.00001	<0.00001	<0.00001	<0.00001		
Total Chromium	mg/L	0.05	MAC	<0.0005	<0.001	<0.001	<0.001		
Total Cobalt	mg/L			<0.0001	<0.0005	<0.0002	<0.0002		
Total Copper	mg/L	1	AO	1.71	0.00247	0.00142	0.00744		
Total Iron	mg/L	0.3	AO	0.674	0.683	0.725	1.74		
Total Lead	mg/L	0.01	MAC	0.0001	<0.0002	<0.0002	0.0122		
Total Manganese	mg/L	0.05	AO	0.18	0.177	0.181	0.206		
Total Molybdenum	mg/L			0.00073	<0.001	<0.001	0.001		
Total Nickel	mg/L			<0.0002	<0.001	<0.001	<0.001		
Total Selenium	mg/L	0.05	MAC	<0.0001	<0.0001	<0.0001	<0.0001		
Total Silicon	mg/L			18.4	20.5	19.1	12.3		
Total Silver	mg/L			<0.00005	<0.00002	<0.00002	<0.00002		
Total Strontium	mg/L			0.0707	0.0656	0.0700	0.0723		
Total Thallium	mg/L			<0.00001	<0.00005	<0.00001	<0.00001		
Total Tin	mg/L			0.0004	<0.005	<0.005	<0.005		
Total Titanium	mg/L			0.001	<0.005	<0.005	<0.005		
Total Uranium	mg/L	0.02	MAC	<0.00001	<0.0001	<0.0001	<0.0001		
Total Vanadium	mg/L			0.0011	<0.005	<0.005	<0.005		
Total Zinc	mg/L	5	AO	0.0191	0.0173	0.0265	0.766		
Total Zirconium	mg/L				<0.0005	<0.0001	<0.0001		
Total Calcium	mg/L			20.2	19.5	19	18		
Total Magnesium	mg/L			7.87	7.67	8.17	7.41		
Total Potassium	mg/L			2.7	2.61	2.67	2.52		
Total Sodium	mg/L	200	AO	22.1	23.7	22.5	20.1		
Total Sulphur	mg/L				<3.0	<3.0	<3.0		

REGIONAL DISTRICT OF NANAIMO

French Creek Well # 6 Water Analysis
1108 Wellington Drive
Well Offline.

CDWG=Canadian Drinking Water Guidelines
OG= Operational Guidance Value
MAC=Maximum Acceptable Concentration
AO= Asthetic Objective.

water SMART zero waste

Red font indicates non-compliance with Canadian Drinking Water Guidelines

	Units	CDWG		November 4 2014	October 26 2015	October 27 2016	October 18 2017	November 8 2018	
Miscellaneous Inorganics									
Fluoride	mg/L	1.5	MAC	0.09	0.15	0.14	0.14	0.17	
Alkalinity (total as $CaCO_3$)	mg/L			110	106	105	105	105	
Anions									
Dissolved Sulphate	mg/L	500	AO	<0.5	<0.50	<0.50	<1.0	<1.0	
Dissolved Chloride	mg/L	250	AO	4.6	4.5	4.1	4.5	4.4	
Nitrite	mg/L	1	MAC	0.12	<0.0050	<0.0050	<0.0050	<0.0050	
Miscellaneous									
Apparent Colour	Colour Unit			30	30	30	30	15	
Nutrients									
Total Ammonia	mg/L			1.04	1.2	1.4	1	1.1	
Physical Properties									
Conductivity	µS/cm			217	216	217	213	209	
pH	pH	7.0:10.5	AO	7.8	8.24	8.1	8.08	8.09	
TDS	mg/L	500	AO	126	136	140	122	124	
Turbidity	NTU			1.2	0.62	0.83	0.55	0.54	
Microbiological Parameters									
E.coli	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	<1.0	<1.0	
Total Coliforms	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	<1.0	<1.0	
Calculated Parameters									
Total Hardness ($CaCO_3$)	mg/L			78	85.5	72.3	75.8	75.1	
Nitrate	mg/L	10	MAC	<0.05	<0.020	<0.020	<0.020	<0.020	
Elements									
Total Mercury	mg/L	0.001	MAC	<0.00001	<0.00001	<0.00001	<0.00001	<0.000002	
Total Metals									
Total Aluminum	mg/L	0.1	OG	<0.005	<0.003	<0.003	<0.003	0.0138	
Total Antimony	mg/L	0.006	MAC	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	
Total Arsenic	mg/L	0.01	MAC	0.00121	0.00139	0.00118	0.0014	0.00116	
Total Barium	mg/L	1	MAC	0.0048	0.0055	0.0044	0.0046	0.0041	
Total Beryllium	mg/L			<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	
Total Bismuth	mg/L			<0.0001	<0.001	<0.001	<0.001	<0.001	
Total Boron	mg/L	5	MAC	0.032	<0.050	<0.050	<0.050	<0.050	
Total Cadmium	mg/L	0.005	MAC	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	
Total Chromium	mg/L	0.05	MAC	0.0006	<0.001	<0.001	<0.001	<0.001	
Total Cobalt	mg/L			<0.0001	<0.0005	<0.0005	<0.0002	<0.0002	
Total Copper	mg/L	1	AO	0.0024	0.00182	0.00117	0.00073	0.00206	
Total Iron	mg/L	0.3	AO	0.812	0.873	0.817	0.814	0.842	
Total Lead	mg/L	0.01	MAC	0.0005	0.00089	0.00044	0.00055	0.00058	
Total Manganese	mg/L	0.05	AO	0.162	0.182	0.157	0.161	0.161	
Total Molybdenum	mg/L			0.00092	<0.001	<0.001	<0.001	0.001	
Total Nickel	mg/L			0.0003	<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	
Total Silicon	mg/L			17	20.6	16.7	16.9	16.7	
Total Silver	mg/L			<0.00005	<0.00002	<0.00002	<0.00002	<0.00002	
Total Strontium	mg/L			0.0571	0.0654	0.0553	0.0576	0.0547	
Total Thallium	mg/L			<0.00001	<0.00005	<0.00005	<0.00001	<0.00001	
Total Tin	mg/L			0.0006	<0.005	<0.005	<0.005	<0.005	
Total Titanium	mg/L			0.0008	<0.005	<0.005	<0.005	<0.005	
Total Uranium	mg/L	0.02	MAC	<0.00001	<0.0001	<0.0001	<0.0001	<0.0001	
Total Vanadium	mg/L			0.0013	<0.005	<0.005	<0.005	<0.005	
Total Zinc	mg/L	5	AO	0.0243	0.0262	0.0387	0.0169	0.0242	
Total Zirconium	mg/L				<0.0005	<0.0005	0.00012	0.00015	
Total Calcium	mg/L			18.8	20	16.8	16.9	17.3	
Total Magnesium	mg/L			7.5	8.63	7.35	8.14	7.74	
Total Potassium	mg/L			2	2.29	1.86	2.06	2.01	
Total Sodium	mg/L	200	AO	17	18	13.7	15.6	15.2	
Total Sulphur	mg/L				<3.0	<3.0	<3.0	<3.0	

REGIONAL DISTRICT OF NANAIMO

French Creek Well # 7 Water Analysis
846 Yambury Road

CDWG=Canadian Drinking Water Guidelines
OG= Operational Guidance Value

MAC=Maximum Acceptable Concentration
AO= Asthetic Objective.

water SMART zero waste

Red font indicates non-compliance with Canadian Drinking Water Guidelines

	Units	CDWG		November 4 2014	October 26 2015	October 27 2016	October 18 2017	November 8 2018	
Miscellaneous Inorganics									
Fluoride	mg/L	1.5	MAC	0.09	0.1	0.1	0.1	0.11	
Alkalinity (total as $CaCO_3$)	mg/L			140	142	150	149	149	
Anions									
Dissolved Sulphate	mg/L	500	AO	32.4	24.7	26.7	30.3	31.2	
Dissolved Chloride	mg/L	250	AO	4.5	5.6	5.4	6.4	7.1	
Nitrite	mg/L	1	MAC	0.17	<0.0050	<0.0050	<0.0050	<0.0050	
Miscellaneous									
Apparent Colour	Colour Unit			6	10	10	10	<5.0	
Nutrients									
Total Ammonia	mg/L			0.26	0.29	0.36	0.28	0.28	
Physical Properties									
Conductivity	µS/cm			339	332	348	351	349	
pH	pH	7.0:10.5	AO	8.2	8.35	8.33	8.24	8.25	
TDS	mg/L	500	AO	210	202	214	196	194	
Turbidity	NTU			<0.5	0.16	0.23	0.25	0.28	
Microbiological Parameters									
E.coli	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	<1.0	<1.0	
Total Coliforms	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	<1.0	<1.0	
Calculated Parameters									
Total Hardness ($CaCO_3$)	mg/L			160	169	154	165	170	
Nitrate	mg/L	10	MAC	<0.05	<0.020	<0.020	<0.020	<0.020	
Elements									
Total Mercury	mg/L	0.001	MAC	<0.00001	<0.00001	<0.00001	<0.00001	<0.000002	
Total Metals									
Total Aluminum	mg/L	0.1	OG	<0.005	<0.003	<0.003	<0.003	<0.003	
Total Antimony	mg/L	0.006	MAC	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	
Total Arsenic	mg/L	0.01	MAC	0.00011	<0.0001	<0.0001	<0.0001	<0.0001	
Total Barium	mg/L	1	MAC	0.016	0.0187	0.016	0.0152	0.0165	
Total Beryllium	mg/L			<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	
Total Bismuth	mg/L			<0.0001	<0.001	<0.001	<0.001	<0.001	
Total Boron	mg/L	5	MAC	0.018	<0.05	<0.050	<0.050	<0.050	
Total Cadmium	mg/L	0.005	MAC	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	
Total Chromium	mg/L	0.05	MAC	<0.0005	<0.001	<0.001	<0.001	<0.001	
Total Cobalt	mg/L			<0.0001	<0.0005	<0.0005	<0.0002	<0.0002	
Total Copper	mg/L	1	AO	0.0003	0.00046	0.00025	<0.0002	<0.0002	
Total Iron	mg/L	0.3	AO	0.121	0.125	0.123	0.127	0.13	
Total Lead	mg/L	0.01	MAC	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002	
Total Manganese	mg/L	0.05	AO	0.143	0.148	0.139	0.144	0.152	
Total Molybdenum	mg/L			0.00057	<0.001	<0.001	<0.001	<0.001	
Total Nickel	mg/L			0.0008	<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	
Total Silicon	mg/L			11.6	13.5	11.7	12	11.4	
Total Silver	mg/L			<0.00005	<0.00002	<0.00002	<0.00002	<0.00002	
Total Strontium	mg/L			0.15	0.169	0.147	0.131	0.162	
Total Thallium	mg/L			<0.00001	<0.00005	<0.00005	<0.00001	<0.00001	
Total Tin	mg/L			0.0008	<0.005	<0.005	<0.005	<0.005	
Total Titanium	mg/L			<0.0005	<0.005	<0.005	<0.005	<0.005	
Total Uranium	mg/L	0.02	MAC	<0.00001	<0.0001	<0.0001	<0.0001	<0.0001	
Total Vanadium	mg/L			0.0002	<0.005	<0.005	<0.005	<0.005	
Total Zinc	mg/L	5	AO	0.0049	<0.005	<0.005	<0.005	0.0224	
Total Zirconium	mg/L				<0.0005	<0.0005	<0.0001	<0.0001	
Total Calcium	mg/L			40.2	40.1	37.5	39.3	40.6	
Total Magnesium	mg/L			14.8	16.8	14.7	16.2	16.7	
Total Potassium	mg/L			2.5	2.66	2.34	2.59	2.6	
Total Sodium	mg/L	200	AO	9.5	10.9	8.89	9.59	9.57	
Total Sulphur	mg/L				8.7	8.7	10.2	10.5	

Regional District of Nanaimo - Water Services Department

French Creek Water Analysis - 2018 Monthly Report

		Health Department		In-House									
Date	Sample Location (Address)	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-Dec-18	1228 Sunrise	0	0	0	0	11	7.84	0.46	175.6	0.10	366.0	0.09	0.135
10-Dec-18	1381 Gilley	0	0	0	0	10	7.80	0.50	177.1	0.18	368.0		
17-Dec-18	1228 Sunrise			0	0	9	7.88	0.50	175.8	0.18	366.0		
	Average	0	0	0	0	10.0	7.8	0.49	176.2	0.15	366.7	0.09	0.135
	Maximum	0	0	0	0	11	7.88	0.50	177.1	0.18	368.0	0.09	0.135
	Minimum	0	0	0	0	9	7.8	0.46	175.6	0.10	366.0	0.09	0.135

Red font indicates non-compliance with Canadian Drinking Water Guidelines

Aesthetic Objective for Iron is ≤0.3 mg/L Aesthetic Objective for Manganese is ≤0.05mg/L

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

Yellow Column Coliform tests are completed by Health Department

Blue column tests are completed by RDN

Comments:

Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.

Regional District of Nanaimo - Water Services Department

French Creek Water Analysis - 2018 Monthly Report

		Health Department		In-House									
Date	Sample Location (Address)	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)
7-Nov-18	1228 Sunrise	0	0	0	0	11	7.79	0.37	174.6	0.17	363.0	0.08	0.138
14-Nov-18	1381 Gilley	0	0	0	0	12	8.22	0.43	179.5	0.18	373.0		
20-Nov-18	1228 Sunrise			0	0	10	7.70	0.66	176.6	0.18	368.0		
27-Nov-18	1381 Gilley			0	0	11	8.49	0.29	176.7	0.18	368.0		
	Average	0	0	0	0	11.0	8.1	0.44	176.9	0.18	368.0	0.08	0.138
	Maximum	0	0	0	0	12	8.49	0.66	179.5	0.18	373.0	0.08	0.138
	Minimum	0	0	0	0	10	7.7	0.29	174.6	0.17	363.0	0.08	0.138

Red font indicates non-compliance with Canadian Drinking Water Guidelines

Aesthetic Objective for Iron is ≤0.3 mg/L Aesthetic Objective for Manganese is ≤0.05mg/L

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

Yellow Column Coliform tests are completed by Health Department

Blue column tests are completed by RDN

Comments:

Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.

Regional District of Nanaimo - Water Services Department

French Creek Water Analysis - 2018 Monthly Report

		Health Department		In-House									
Date	Sample Location (Address)	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-Oct-18	1381 Gilley	0	0	0	0	15	8.23	0.21	180.6	0.18	376.0	0.10	0.107
9-Oct-18	1228 Sunrise	0	0	0	0	13	7.89	0.32	177.1	0.18	368.0		
15-Oct-18	1381 Gilley			0	0	14	8.26	0.43	181.7	0.18	378.0		
22-Oct-18	1228 Sunrise			0	0	12	7.92	0.33	179.0	0.18	373.0		
30-Oct-18	1381 Gilley			0	0	13	8.55	0.30	181.8	0.18	378.0		
	Average	0	0	0	0	13.4	8.2	0.32	180.0	0.18	374.6	0.10	0.107
	Maximum	0	0	0	0	15	8.55	0.43	181.8	0.18	378.0	0.10	0.107
	Minimum	0	0	0	0	12	7.89	0.21	177.1	0.18	368.0	0.10	0.107

Red font indicates non-compliance with Canadian Drinking Water Guidelines

Aesthetic Objective for Iron is ≤0.3 mg/L **Aesthetic Objective for Manganese is ≤0.05mg/L**

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

Yellow Column Coliform tests are completed by Health Department

Blue column tests are completed by RDN

Comments:

Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.

Regional District of Nanaimo - Water Services Department

French Creek Water Analysis - 2018 Monthly Report

		Health Department		In-House									
Date	Sample Location (Address)	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-Sep-18	1381 Gilley	0	0	0	0	19	7.96	0.29	179.1	0.18	372.0	0.10	0.145
10-Sep-18	1228 Sunrise	0	0	0	0	13	7.92	0.42	177.1	0.18	368.0		
17-Sep-18	1381 Gilley			0	0	13	8.32	0.45	180.3	0.18	375.0		
24-Sep-18	1228 Sunrise			0	0	14	8.12	0.57	177.8	0.18	372.0		
	Average	0	0	0	0	14.8	8.1	0.43	178.6	0.18	371.8	0.10	0.145
	Maximum	0	0	0	0	19	8.32	0.57	180.3	0.18	375.0	0.10	0.145
	Minimum	0	0	0	0	13	7.92	0.29	177.1	0.18	368.0	0.10	0.145

Red font indicates non-compliance with Canadian Drinking Water Guidelines

Aesthetic Objective for Iron is ≤0.3 mg/L **Aesthetic Objective for Manganese is ≤0.05mg/L**

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

Yellow Column Coliform tests are completed by Health Department

Blue column tests are completed by RDN

Comments:

Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.

Regional District of Nanaimo - Water Services Department

French Creek Water Analysis - 2018 Monthly Report

		Health Department		In-House									
Date	Sample Location (Address)	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)
7-Aug-18	1381 Gilley	0	0	0	0	17	7.61	0.52	176.5	0.18	368.0	0.10	0.147
13-Aug-18	1228 sunrise	0	0	0	0	13.5	7.90	0.60	174.2	0.17	363.0		
20-Aug-18	1381 Gilley			0	0	13	7.46	0.12	173.2	0.17	361.0		
29-Aug-18	1228 sunrise			0	0	13	7.78	0.48	175.9	0.17	366.0		
	Average	0	0	0	0	14.1	7.7	0.43	175.0	0.17	364.5	0.10	0.147
	Maximum	0	0	0	0	17	7.9	0.60	176.5	0.18	368.0	0.10	0.147
	Minimum	0	0	0	0	13	7.46	0.12	173.2	0.17	361.0	0.10	0.147

Red font indicates non-compliance with Canadian Drinking Water Guidelines

Aesthetic Objective for Iron is ≤0.3 mg/L **Aesthetic Objective for Manganese is ≤0.05mg/L**

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

Yellow Column Coliform tests are completed by Health Department

Blue column tests are completed by RDN

Comments:

Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.

Regional District of Nanaimo - Water Services Department

French Creek Water Analysis - 2018 Monthly Report

		Health Department		In-House									
Date	Sample Location (Address)	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-Jul-18	1228 Sunrise	0	0	0	0	13	7.65	0.34	175.6	0.17	365.0	0.11	0.155
9-Jul-18	1381 Gilley	0	0	0	0	14	7.70	0.58	176.1	0.17	366.0		
16-Jul-18	1228 Sunrise			0	0	13	7.83	0.68	176.3	0.18	367.0		
24-Jul-18	1381 Gilley			0	0	17	7.65	0.24	176.4	0.17	367.0		
30-Jul-18	1228 Sunrise			0	0	13	7.95	0.50	174.2	0.17	363.0		
	Average	0	0	0	0	14.0	7.8	0.47	175.7	0.17	365.6	0.11	0.155
	Maximum	0	0	0	0	17	7.95	0.68	176.4	0.18	367.0	0.11	0.155
	Minimum	0	0	0	0	13	7.65	0.24	174.2	0.17	363.0	0.11	0.155

Red font indicates non-compliance with Canadian Drinking Water Guidelines

Aesthetic Objective for Iron is ≤0.3 mg/L Aesthetic Objective for Manganese is ≤0.05mg/L

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

Yellow Column Coliform tests are completed by Health Department

Blue column tests are completed by RDN

Comments:

Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.

Regional District of Nanaimo - Water Services Department

French Creek Water Analysis - 2018 Monthly Report

		Health Department		In-House									
Date	Sample Location (Address)	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-Jun-18	1228 Sunrise	0	0	0	0	12	7.75	0.55	173.6	0.17	362.0		
11-Jun-18	1381 Gilley	0	0	0	0	12	8.15	0.39	176.2	0.18	367.0	0.08	0.092
18-Jun-18	1228 Sunrise			0	0	17	7.32	0.62	175.4	0.17	365.0		
25-Jun-18	1381 Gilley			0	0	15	7.80	0.34	175.5	0.17	365.0		
	Average	0	0	0	0	14.0	7.8	0.48	175.2	0.2	364.8	0.08	0.092
	Maximum	0	0	0	0	17	8.15	0.62	176.2	0.18	367	0.08	0.092
	Minimum	0	0	0	0	12	7.32	0.34	173.6	0.17	362	0.08	0.092

Red font indicates non-compliance with Canadian Drinking Water Guidelines

Aesthetic Objective for Iron is ≤0.3 mg/L **Aesthetic Objective for Manganese is ≤0.05mg/L**

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

Yellow Column Coliform tests are completed by Health Department

Blue column tests are completed by RDN

Comments:

Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.

Regional District of Nanaimo - Water Services Department

French Creek Water Analysis - 2018 Monthly Report

		Health Department		In-House									
Date	Sample Location (Address)	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-May-18	1381 Gilley	0	0	0	0	11	8.19	0.23	173.3	0.17	361.0		
7-May-18	1228 Sunrise	0	0	0	0	13	7.90	0.23	168.8	0.17	351.0	0.10	0.135
14-May-18	1381 Gilley			0	0	13	8.10	0.43	175.3	0.17	364.0		
22-May-18	1228 Sunrise			0	0	12	7.81	0.44	174.3	0.17	362.0		
29-May-18	1381 Gilley			0	0	14	7.84	0.66	175.4	0.17	365.0		
	Average	0	0	0	0	12.6	8.0	0.40	173.4	0.17	360.6	0.10	0.135
	Maximum	0	0	0	0	14	8.19	0.66	175.4	0.17	365.0	0.10	0.135
	Minimum	0	0	0	0	11	7.81	0.23	168.8	0.17	351.0	0.10	0.135

Red font indicates non-compliance with Canadian Drinking Water Guidelines

Aesthetic Objective for Iron is ≤0.3 mg/L Aesthetic Objective for Manganese is ≤0.05mg/L

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

Yellow Column Coliform tests are completed by Health Department

Blue column tests are completed by RDN

Comments:

Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.

Regional District of Nanaimo - Water Services Department

French Creek Water Analysis - 2018 Monthly Report

		Health Department		In-House									
Date	Sample Location (Address)	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-Apr-18	1228 Sunrise	0	0	0	0	9	7.27	0.54	171.9	0.17	358.0	0.07	0.128
9-Apr-18	1381 Gilley	0	0	0	0	9	7.49	0.26	175.7	0.18	365.0		
16-Apr-18	1228 Sunrise			0	0	11	7.38	0.59	172.9	0.17	360.0		
24-Apr-18	1381 Gilley			0	0	10	8.11	0.56	173.3	0.17	361.0		
	Average	0	0	0	0	9.8	7.6	0.49	173.5	0.17	361.0	0.07	0.128
	Maximum	0	0	0	0	11	8.11	0.59	175.7	0.18	365.0	0.07	0.128
	Minimum	0	0	0	0	9	7.27	0.26	171.9	0.17	358.0	0.07	0.128

Red font indicates non-compliance with Canadian Drinking Water Guidelines

Aesthetic Objective for Iron is ≤0.3 mg/L **Aesthetic Objective for Manganese is ≤0.05mg/L**

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

Yellow Column Coliform tests are completed by Health Department

Blue column tests are completed by RDN

Comments:

Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.

Regional District of Nanaimo - Water Services Department

French Creek Water Analysis - 2018 Monthly Report

		Health Department		In-House									
Date	Sample Location (Address)	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-Mar-18	1228 Sunrise	0	0	0	0	10	7.41	0.56	173.2	0.17	361.0	0.12	0.219
12-Mar-18	1381 Gilley	0	0	0	0	8	7.49	0.26	172.0	0.17	354.0		
20-Mar-18	1228 Sunrise			0	0	11	7.29	0.44	173.2	0.17	359.0		
27-Mar-18	1381 Gilley			0	0	7	7.84	0.13	173.0	0.17	360.0		
	Average	0	0	0	0	9.0	7.5	0.35	172.9	0.17	358.5	0.12	0.219
	Maximum	0	0	0	0	11	7.84	0.56	173.2	0.17	361.0	0.12	0.219
	Minimum	0	0	0	0	7	7.29	0.13	172.0	0.17	354.0	0.12	0.219

Red font indicates non-compliance with Canadian Drinking Water Guidelines

Aesthetic Objective for Iron is ≤0.3 mg/L **Aesthetic Objective for Manganese is ≤0.05mg/L**

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

Yellow Column Coliform tests are completed by Health Department

Blue column tests are completed by RDN

Comments:

Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.

Regional District of Nanaimo - Water Services Department

French Creek Water Analysis - 2018 Monthly Report

		Health Department		In-House									
Date	Sample Location (Address)	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-Feb-18	1228 Sunrise	0	0	0	0	9	7.15	0.57	174.3	0.17	363.0	0.09	0.139
14-Feb-18	1381 Gilley	0	0	0	0			0.41	174.4	0.17	363.0		
20-Feb-18	1228 Sunrise			0	0	9	7.78	0.61	173.4	0.17	359.0		
26-Feb-18	1381 Gilley			0	0	7	7.68	0.32	175.0	0.17	364.0		
	Average	0	0	0	0	8.3	7.5	0.48	174.3	0.17	362.3	0.09	0.139
	Maximum	0	0	0	0	9	7.78	0.61	175.0	0.17	364.0	0.09	0.139
	Minimum	0	0	0	0	7	7.15	0.32	173.4	0.17	359.0	0.09	0.139

Red font indicates non-compliance with Canadian Drinking Water Guidelines

Aesthetic Objective for Iron is ≤0.3 mg/L Aesthetic Objective for Manganese is ≤0.05mg/L

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

Yellow Column Coliform tests are completed by Health Department

Blue column tests are completed by RDN

Comments:

Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.

Regional District of Nanaimo - Water Services Department

French Creek Water Analysis - 2018 Monthly Report

		Health Department		In-House									
Date	Sample Location (Address)	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-Jan-18	1381 Gilley	0	0	0	0		7.77	0.21	175.3	0.17	365.0	0.07	0.108
8-Jan-18	1228 Sunrise	0	0	0	0	8	7.56	0.63	173.8	0.17	362.0		
15-Jan-18	1381 Gilley			0	0	9	8.10	0.49	176.9	0.18	367.0		
24-Jan-18	1228 Sunrise			0	0	10	7.44	0.68	179.3	0.18	374.0		
29-Jan-18	1381 Gilley			0	0	8	7.50	0.51	172.9	0.17	358.0		
	Average	0	0	0	0	8.8	7.7	0.50	175.6	0.17	365.2	0.07	0.108
	Maximum	0	0	0	0	10	8.10	0.68	179.3	0.18	374.0	0.07	0.108
	Minimum	0	0	0	0	8	7.44	0.21	172.9	0.17	358.0	0.07	0.108

Red font indicates non-compliance with Canadian Drinking Water Guidelines

Aesthetic Objective for Iron is ≤0.3 mg/L Aesthetic Objective for Manganese is ≤0.05mg/L

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

Yellow Column Coliform tests are completed by Health Department

Blue column tests are completed by RDN

Comments:

Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.