REGIONAL DISTRICT OF NANAIMO

Water Service Area Annual Report 2021

Surfside Water Service Area

June 2022

REGIONAL DISTRICT OF NANAIMO
Water & Utility Services Department
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Table of Contents

1. Introduction

The following annual report describes the Surfside Water Service Area and summarizes the water quality and production data from 2021. 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 2022.

2. Surfside Water Service Area

The Surfside Water Service Area was established in 1986 and comprises an area northwest of Qualicum Beach on Surfside Drive and part of McFeely Drive. There are 39 water service connections in the Surfside Water Service Area. The water source comes from two groundwater wells located nearby. The water source is chlorinated and pumped into the system on-demand via two pressure tanks. A back-up generator is present at the pumphouse, should it be required. A map of the Surfside Water Service Area is provided in Appendix A for reference.

2.1 Groundwater Wells

Two groundwater production wells are present in the well field at 3547 West Island Highway, north of Qualicum Beach, B.C.

Well / Name	Well Depth	Wellhead Protection In Place	Treated/Untreated with Chlorine
#1	9.4 m	Yes	Treated
#2	9.8 m	Yes	Treated

2.2 Reservoirs

There is no water storage reservoir in the Surfside Water Service Area. Water supply is pumped into the system via a dual pressure tank arrangement.

2.3 Distribution System

The water distribution system in Surfside is summarized in the table below. Flushouts are present, but there are no fire hydrants on the system.

Watermain Material	Length of mains in Surfside Water Service Area	Prevalence in Water Service Area
AC: 150mm or smaller AC: 200mm or larger	0.8 km none	72.5% n/a
PVC: 150mm or smaller PVC: 200mm or larger	0.006 km 0.3 km	0.5% 27%

Note: 'AC' is Asbestos-Concrete, 'PVC' is poly-vinylchloride (plastic)

3. Water Sampling and Testing Program

Water sampling and testing is carried out weekly in the distribution system. Notably, an in-line chlorine analyzer was installed in 2020 that monitors chlorine residual in the drinking water constantly, and will send alarm to RDN Operators when chlorine level drops below the operating level. Chlorine residual levels are maintained in order 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 Free chlorine residual, Salinity, TDS
Weekly (or as required)	BC Centre for Disease Control	Total coliforms, E.Coli
Monthly/Quarterly (well water only)	Bureau Veritas	Monthly- Chloride Quarterly- Chloride, Sodium, Conductivity, TDS
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. 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/surfside. 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. Water Quality Inquiries and Complaints

Very few complaints and inquiries were received from the Surfside water service area, and were typically related to high water bill inquiries.

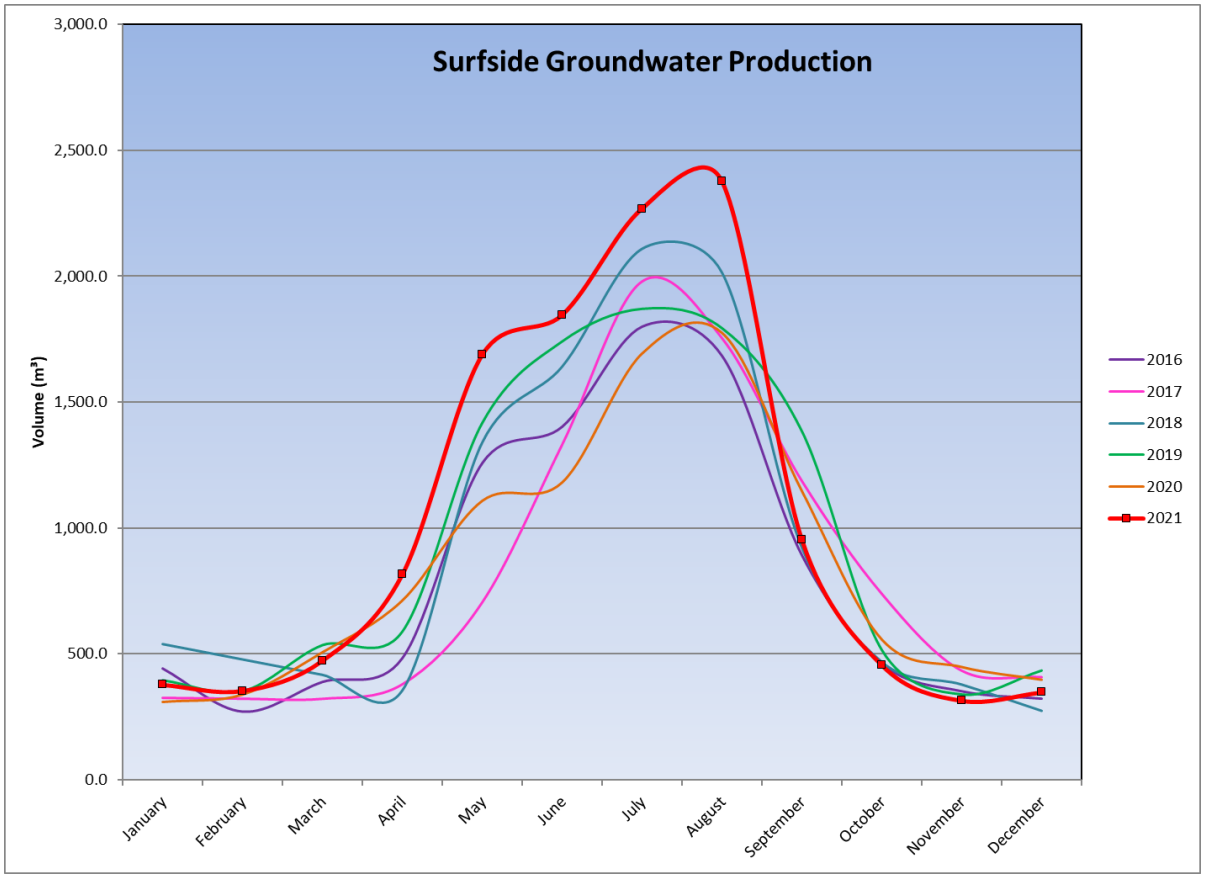
Surfside Pumphouse

A summary of the water system incidents in 2021 is given in the table below.

Activity in 2021	Date(s)	History/Notes
Boil Water Advisories	None	None
High Turbidity Events	None	None
Equipment Malfunction	None	None
Water Main Breaks	None	None
Pump Failures	None	None

6. Groundwater Production

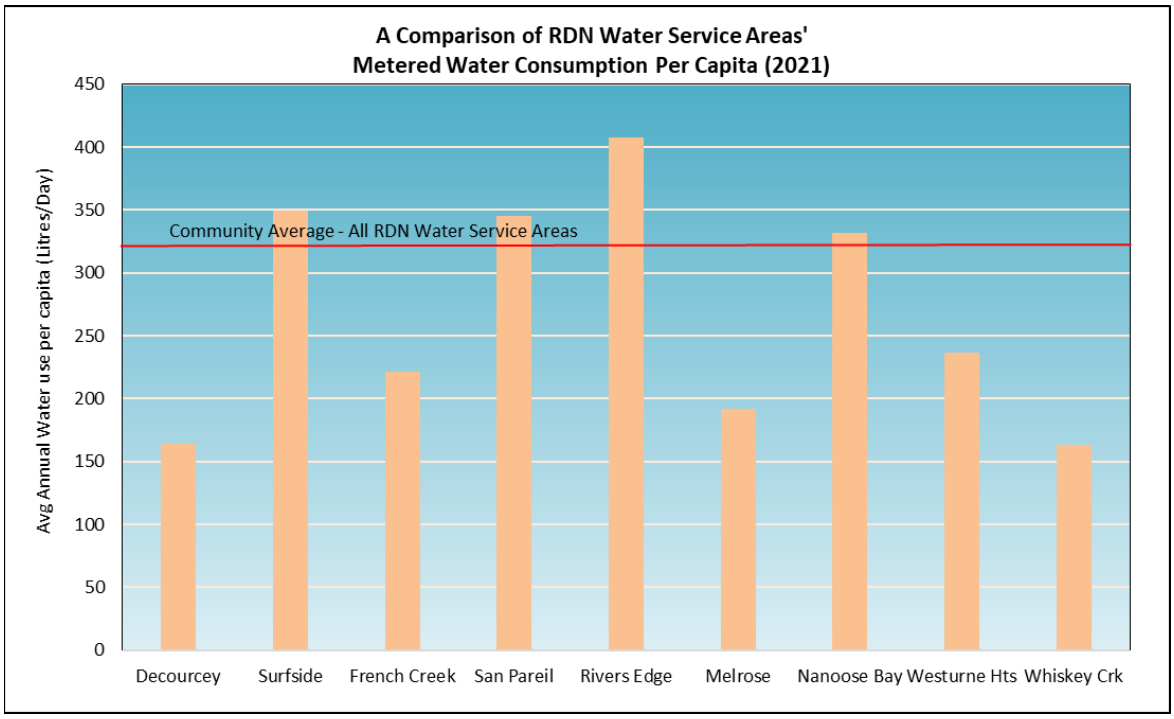
Monthly groundwater production in the Surfside Water Service Area for the past 6 years is shown in the chart below. Groundwater production in 2021 was above average in comparison to previous years.



Consumption

In the Fall/Winter of 2021, the average usage per home in Surfside was 0.45 cubic metres per day (99 imperial gallons). In the summer, the average water usage was 1.6 cubic metres per day (252 imperial gallons). Based on these figures, the annual consumption per capita is estimated to be 350 L/day

(based on 2.4 people/household). This consumption is *9% more* than all the other RDN system averages of 321 L/day/capita in 2021.



7. Maintenance Program

A weekly pump station inspection is 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 once annually in the spring. There are no fire hydrants in this water service area due to insufficient supply and capacity for fire flows. Twenty-four hour on-call coverage is in place to respond to water system emergencies and alarms.

8. Operator Certification

The Regional District Water & Utility Services staff is comprised of one Manager, one Project Engineer, one Engineering Technologist, one Chief Operator, one Engineering Technician, 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
- ✓ Silica Awareness

9. Water Service Area Projects

9.1 2021 Completed Studies & Projects

- Replaced all residential meters in water service area;
- Corresponded with residents regarding water conservation;
- Enforced outdoor sprinkling regulations;
- Advised residents regarding water leak repairs;
- Implemented 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;
- Implemented the Water Systems SCADA Master Plan; and
- Began valve maintenance program.

9.2 2022 Proposed Projects & Upgrades

- Complete irrigation checks for high-water users;
- Continue watermain flushing program and hydrant maintenance;
- Utilize leak detection equipment and tracking;
- Continue valve maintenance program;
- Continue the 2021-2030 DWWP Water Conservation Plan; and
- Continue to offer numerous water-saving incentives via rebates.

Waterfront access from Surfside Drive

10. 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 2021, and copies are available on our website, at each RDN office, in each pump house, and in each Water Services vehicle. A copy of the ERCP is also attached to this report in Appendix C.

11. 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).

12. 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. Closing

An annual report for the year 2022 will be prepared and submitted to Island Health in the spring of 2023. Annual reports are also available on our website at: www.rdn.bc.ca/surfside.

Surfside Well #2

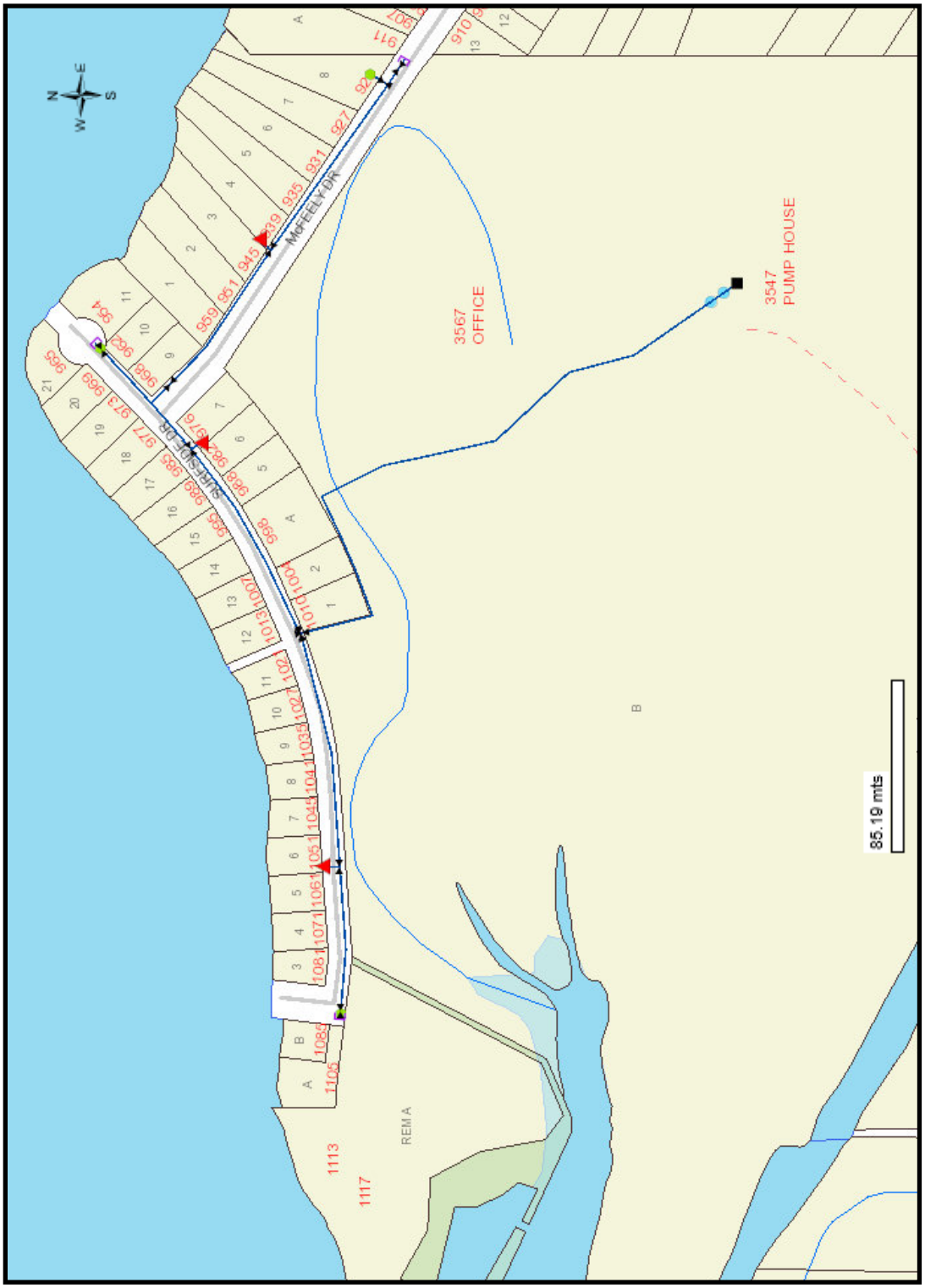
APPENDIX A

MAP OF SURFSIDE

WATER SERVICE AREA

SURFSIDE

WATER SERVICE AREA



APPENDIX B

WATER QUALITY TESTING RESULTS

SURFSIDE
WATER SERVICE AREA

Facility Location: 3547 Island Highway West, Qualicum Beach

Facility Information: Facility Type: 15-300 (DWC)

Facility Sampling History:

Date Collected	Drinking Water System	Total E. Coli	Total Coliform	Site Name
01/06/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	1105 Surfside
11/01/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	1105 Surfside
10/04/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	1105 Surfside
09/07/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	1105 Surfside
04/06/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	1105 Surfside
08/03/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	1105 Surfside
07/06/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	1105 Surfside
06/07/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	1105 Surfside
06/01/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	1105 Surfside
02/03/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	1105 Surfside
12/07/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	1105 Surfside
05/03/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	1105 Surfside
03/03/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	1105 Surfside
02/08/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	923 McFeely
08/09/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	923 McFeely
12/14/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	923 McFeely
05/10/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	923 McFeely
07/12/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	923 McFeely
09/13/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	923 McFeely
10/18/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	923 McFeely
04/12/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	923 McFeely
01/11/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	923 McFeely
03/10/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	923 McFeely
01/18/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	962 Surfside
11/16/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	962 Surfside
05/17/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	962 Surfside
08/16/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	962 Surfside
09/20/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	962 Surfside
06/14/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	962 Surfside
07/19/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	962 Surfside

Date Collected	Drinking Water System	Total E. Coli	Total Coliform	Site Name
04/19/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	962 Surfside
10/13/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	962 Surfside
09/22/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	962 Surfside
03/15/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	962 Surfside
12/14/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	962 Surfside
02/17/2021	SURFSIDE WATER SERVICE AREA	LT1	LT1	962 Surfside

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

Regional District of Nanaimo - Water Services Department

Surfside Water Analysis - 2021 Monthly Report

		BC Centre for Disease Control		RDN In-House Laboratory and Spectrophotometer									
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)
07-Dec-21	1105 Surfside			0	0	9	7.02	0.37	74.9	0.07	158.0	Fe and Mn are no longer tested in-house. See Annual Tap Water Results at https://www.rdn.bc.ca/surfside	
14-Dec-21	923 McFeely			0	0	7	7.00	0.37	68.8	0.07	145.1		
14-Dec-21	962 Surfside			0	0	7		0.30					
20-Dec-21	923 McFeely			0	0	7	7.00	0.39	67.5	0.07	142.6		
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

Legend:

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

Green font indicates a value flagged for operational considerations

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:

Iron and Manganese are no longer being tested in-house.

A full potability scan is completed once per year at an external lab that includes metals and minerals.

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

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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01-Nov-21	1105 Surfside	0	0	0	0	12	7.00	0.44	83.1	0.08	174.4	Fe and Mn are no longer tested in-house. See Annual Tap Water Results at https://www.rdn.bc.ca/surfside	
08-Nov-21	923 McFeely	0	0	0	0	10	6.79	0.25	78.3	0.08	165.1		
15-Nov-21	962 Surfside			0	0	9	7.04	0.25	71.4	0.07	150.6		
22-Nov-21	962 Surfside			0	0	8	7.04	0.35	68.2	0.07	139.9		
29-Nov-21	923 McFeely			0	0	9	6.88	0.30	69.2	0.07	146.1		
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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05-Oct-21	1105 Surfside	0	0	0	0	15	6.99	0.20	98.9	0.10	207.9	Fe and Mn are no longer tested in-house. See Annual Tap Water Results at https://www.rdn.bc.ca/surfside	
13-Oct-21	962 Sufside	0	0	0	0	14	6.79	0.24	82.8	0.08	174.1		
18-Oct-21	923 McFeely	0	0	0	0	14	6.97	0.20	81.9	0.08	172.3		
25-Oct-21	962 Sufside					13	7.00	0.28	101.1	0.09	170.1		
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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07-Sep-21	1105 Surfside	0	0	0	0	15	6.67	0.36	100.0	0.11	210.0	Fe and Mn are no longer tested in-house. See Annual Tap Water Results at https://www.rdn.bc.ca/surfside	
13-Sep-21	923 McFeely	0	0	0	0	19	6.70	0.24	102.4	0.11	219.0		
20-Sep-21	962 Surfside	0	0	0	1	17	6.83	0.17	121.0	0.12	253.0		
21-Sep-21	RE.962 Surfside	0	0	0	0			0.34					
21-Sep-21	1105 Surfside			0	0			0.35					
21-Sep-21	923 McFeely			0	0			0.32					
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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04-Aug-21	1105 Surfside	0	0	0	0		6.80	0.34	103.5	0.10	217.6	Fe and Mn are no longer tested in-house. See Annual Tap Water Results at https://www.rdn.bc.ca/surfside	
11-Aug-21	923 McFeely	0	0	0	0	20	6.60	0.31	92.2	0.09	194.1		
16-Aug-21	962 Surfside	0	0	0	0	18	6.66	0.35	96.2	0.09	202.6		
23-Aug-21	962 Surfside			0	0	20	6.51	0.26	116.5	0.11	245.0		
30-Aug-21	923 McFeely			0	0	19	6.60	0.28	111.5	0.11	234.0		
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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06-Jul-21	1105 Surfside	0	0	0	0	19	6.50	0.24	52.0	0.05	108.6	Fe and Mn are no longer tested in-house. See Annual Tap Water Results at https://www.rdn.bc.ca/surfside	
12-Jul-21	923 McFeely	0	0	0	0	20	6.59	0.21	77.7	0.08	164.0		
19-Jul-21	962 Surfside	0	0	0	0	14	6.66	0.24	74.8	0.07	157.8		
27-Jul-21	962 Surfside			0	0	18	6.65	0.37	91.3	0.01	192.2		
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

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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.

Regional District of Nanaimo - Water Services Department

Surfside Water Analysis - 2021 Monthly Report

		BC Centre for Disease Control		RDN In-House Laboratory and Spectrophotometer									
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)
01-Jun-21	1105 Surfside	0	0	0	0	12	6.75	0.33	67.5	0.07	142.8	Fe and Mn are no longer tested in-house. See Annual Tap Water Results at https://www.rdn.bc.ca/surfside	
07-Jun-21	1105 Surfside	0	0	0	0	13	6.79	0.33	66.5	0.07	140.4		
14-Jun-21	962 Surfside	0	0	0	0	14	6.60	0.32	66.4	0.07	141.4		
21-Jun-21	962 Surfside			0	0	14	6.74	0.24	64.5	0.06	136.1		
29-Jun-21	923 McFeely	0	0	0	0	19	7.14	0.24	69.1	0.07	146.0		
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:

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

Green font indicates a value flagged for operational considerations

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:

Iron and Manganese are no longer being tested in-house.

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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

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

Surfside Water Analysis - 2021 Monthly Report

		BC Centre for Disease Control		RDN In-House Laboratory and Spectrophotometer									
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)
03-May-21	1105 Surfside	0	0	0	0	11	6.50	0.31	65.9	0.07	139.4	Fe and Mn are no longer tested in-house. See Annual Tap Water Results at https://www.rdn.bc.ca/surfside	
10-May-21	923 McFeely	0	0	0	0	12	6.67	0.44	64.2	0.06	136.0		
17-May-21	962 Surfside	0	0	0	0	13	6.48	0.40	67.2	0.07	142.0		
25-May-21	962 Surfside			0	0	13	6.71	0.42	65.1	0.06	140.0		
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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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

Surfside Water Analysis - 2021 Monthly Report

		BC Centre for Disease Control		RDN In-House Laboratory and Spectrophotometer									
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)
07-Apr-21	1105 Surfside	0	0	0	0	8	6.52	0.25	66.6	0.06	148.1	Fe and Mn are no longer tested in-house. See Annual Tap Water Results at https://www.rdn.bc.ca/surfside	
12-Apr-21	923 McFeely	0	0	0	0	9	6.51	0.31	63.9	0.06	135.4		
19-Apr-21	962 Surfside	0	0	0	0	11	6.49	0.27	66.9	0.07	141.4		
26-Apr-21	962 Surfside			0	0	11	6.51	0.24	65.4	0.06	138.6		
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

Legend:

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

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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.

Regional District of Nanaimo - Water Services Department

Surfside Water Analysis - 2021 Monthly Report

		BC Centre for Disease Control		RDN In-House Laboratory and Spectrophotometer									
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)
03-Mar-21	1105 Surfside	0	0	0	0	6	6.57	0.21	74.8	0.07	158.1	Fe and Mn are no longer tested in-house. See Annual Tap Water Results at https://www.rdn.bc.ca/surfside	
08-Mar-21	923 McFeely	0	0	0	0	7	6.56	0.20	66.1	0.07	139.8		
15-Mar-21	962 Surfside	0	0	0	0	8	6.53	0.25	65.5	0.06	138.6		
22-Mar-21	962 Surfside			0	0	8	6.58	0.28	67.7	0.05	135.6		
30-Mar-21	962 Surfside			0	0	8	6.48	0.24	67.9	0.07	143.6		
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

Legend:

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

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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.

Regional District of Nanaimo - Water Services Department

Surfside Water Analysis - 2021 Monthly Report

		BC Centre for Disease Control		RDN In-House Laboratory and Spectrophotometer									
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)
03-Feb-21	1105 Surfside	0	0	0	0	7	6.71	0.22	75.1	0.07	158.4	Fe and Mn are no longer tested in-house. See Annual Tap Water Results at https://www.rdn.bc.ca/surfside	
08-Feb-21	923 McFeely	0	0	0	0	6	6.50	0.24	62.9	0.06	133.2		
17-Feb-21	962 Surfside	0	0	0	0	7	6.55	0.24	65.0	0.06	137.0		
22-Feb-21	962 Surfside			0	0	8	6.53	0.23	64.8	0.07	136.7		
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:

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

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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.

Regional District of Nanaimo - Water Services Department

Surfside Water Analysis - 2021 Monthly Report

		BC Centre for Disease Control		RDN In-House Laboratory and Spectrophotometer									
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)
04-Jan-21	1105 Surfside	0	0	0	0	8	6.48	0.27	71.1	0.07	150.4	Fe and Mn are no longer tested in-house. See Annual Tap Water Results at https://www.rdn.bc.ca/surfside	
11-Jan-21	923 McFeely	0	0	0	0	8	6.59	0.23	63.9	0.06	135.2		
18-Jan-21	962 Surfside	0	0	0	0	8	6.57	0.24	64.9	0.06	137.3		
27-Jan-21	923 McFeely			0	0	7	6.53	0.22	62.5	0.06	132.9		
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)**

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Comments:

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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

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

Surfside #1 Raw Well Water Analysis
3547 Island Highway

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

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Orange font indicates non-compliance with the Aesthetic Objective in the Canadian Drinking Water Guidelines (CDWG)
Red font indicates non-compliance with the Maximum Acceptable Concentration (MAC) in the CDWG

	Units	CDWG		September 18 2017	October 25 2018	October 3 2019	October 21 2020	October 21 2021
Miscellaneous Inorganics								
Fluoride	mg/L	1.5	MAC	0.026	0.023	<0.05	<0.05	<0.05
Alkalinity (total as CaCO)	mg/L			55.3	53.4	53	50	57
Anions								
Dissolved Sulphate	mg/L	500	AO	6.2	4.8	4.1	4.4	5.1
Dissolved Chloride	mg/L	250	AO	14	11	22	9	14
Nitrite	mg/L	1	MAC	<0.0050	<0.0050	<0.005	<0.005	<0.005
Miscellaneous								
Apparent Colour	Colour Unit			5	5	<5	5	<5
Nutrients								
Total Ammonia	mg/L			<0.020	<0.020	0.045	<0.015	<0.015
Physical Properties								
Conductivity	µS/cm			170	149	190	140	160
pH	pH	7.0:10.5	OG	7.56	7.75	**6.95**	7.03	7.01
TDS	mg/L	500	AO	120	94	130	100	110
Turbidity	NTU			0.23	<0.10	<0.1	0.13	<0.1
Microbiological Parameters								
E.coli	MPN/100mL	<1	MAC	<1.0	<1.0	0	0	0
Total Coliforms	MPN/100mL	<1	MAC	**17**	<1.0	0	0	0
Calculated Parameters								
Total Hardness (CaCO)	mg/L			64.6	60.6	77.4	57.8	62.4
Nitrate	mg/L	10	MAC	0.519	0.525	0.609	0.597	0.482
Elements								
Total Mercury	mg/L	0.001	MAC	<0.00001	0.0000053	<0.000002	<0.0000019	<0.0000019
Total Metals								
Total Aluminum	mg/L	0.1	OG	<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
Total Arsenic	mg/L	0.01	MAC	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Barium	mg/L	1	MAC	<0.001	<0.001	<0.001	<0.001	<0.001
Total Beryllium	mg/L			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Bismuth	mg/L			<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
Total Cadmium	mg/L	0.005	MAC	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Total Chromium	mg/L	0.05	MAC	<0.001	<0.001	<0.001	<0.001	<0.001
Total Cobalt	mg/L			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Total Copper	mg/L	1	AO	0.00235	0.00339	0.00301	0.00366	0.00272
Total Iron	mg/L	0.3	AO	0.0072	0.0067	0.0054	<0.005	<0.005
Total Lead	mg/L	0.01	MAC	<0.0002	0.00044	0.00041	0.00048	0.00021
Total Manganese	mg/L	0.02 0.12	AO MAC	<0.001	<0.001	<0.001	<0.001	<0.001
Total Molybdenum	mg/L			<0.001	<0.001	<0.001	<0.001	<0.001
Total Nickel	mg/L			<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
Total Silicon	mg/L			7.54	7.37	7.76	7.76	7.69
Total Silver	mg/L			<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Total Strontium	mg/L			0.0463	0.0429	0.0536	0.0406	0.0426
Total Thallium	mg/L			<0.00001	<0.00001	<0.00001	<0.00001	<0.0001
Total Tin	mg/L			<0.005	<0.005	<0.005	<0.005	<0.005
Total Titanium	mg/L			<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
Total Vanadium	mg/L			<0.005	<0.005	<0.005	<0.005	<0.005
Total Zinc	mg/L	5	AO	<0.005	<0.005	0.0062	0.0089	0.0085
Total Zirconium	mg/L			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Calcium	mg/L			19.4	18.4	23.6	17	18.9
Total Magnesium	mg/L			3.92	3.56	4.5	3.5	3.7
Total Potassium	mg/L			0.403	0.349	0.389	0.35	0.366
Total Sodium	mg/L	200	AO	6.25	5.21	6.64	5.29	5.49
Total Sulphur	mg/L			<3.0	<3.0	<3.0	<3	<3

Notes below about pH (2015) from https://www.canada.ca/content/dam/hc-sc/migration/hc-sc/ewh-semt/alt_formats/pdf/pubs/water-eau/sum_guide-res_recom/summary-table-EN-2020-02-11.pdf

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

Surfside #2 Raw Well Water Analysis
3547 Island Highway

*resampled Metals only

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

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

	Units	CDWG		Nov 29 2016*	September 18 2017	October 25 2018	October 3 2019	October 21 2020	October 21 2021
Miscellaneous Inorganics									
Fluoride	mg/L	1.5	MAC		0.023	0.02	<0.05	<0.05	<0.05
Alkalinity (total as CaCO)	mg/L				56.6	49.6	49	48	53
Anions									
Dissolved Sulphate	mg/L	500	AO		9.8	5.8	6.4	5.3	5
Dissolved Chloride	mg/L	250	AO		32	11	47	9.9	16
Nitrite	mg/L	1	MAC		<0.0050	<0.0050	<0.005	<0.005	<0.005
Miscellaneous									
Apparent Colour	Colour Unit				5	<5.0	<5.0	5	<5
Nutrients									
Total Ammonia	mg/L				<0.020	<0.020	0.058	<0.015	<0.015
Physical Properties									
Conductivity	µS/cm				243	142	270	150	160
pH	pH	7.0:10.5	OG		7.51	7.51	7.38	6.99	7.07
TDS	mg/L	500	AO		170	74	160	100	140
Turbidity	NTU				<0.10	0.1	<0.1	0.17	<0.1
Microbiological Parameters									
E.coli	MPN/100mL	<1	MAC		<1.0	<1.0	0	0	0
Total Coliforms	MPN/100mL	<1	MAC		<1.0	<1.0	0	0	0
Calculated Parameters									
Total Hardness (CaCO)	mg/L				85.2	55.4	96.8	54.8	39.5
Nitrate	mg/L	10	MAC		0.463	0.498	0.542	0.525	0.424
Elements									
Total Mercury	mg/L	0.001	MAC		<0.00001	0.0000044	<0.000002	<0.0000019	<0.0000019
Total Metals									
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	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Barium	mg/L	1	MAC	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
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	<0.050	<0.050	<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			<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Total Copper	mg/L	1	AO	0.00159	0.00368	0.00277	0.00217	0.00204	0.00263
Total Iron	mg/L	0.3	AO	0.0101	0.0087	0.0154	0.0152	0.0097	0.0087
Total Lead	mg/L	0.01	MAC	0.00061	0.00104	0.00073	0.00047	0.00023	0.00025
Total Manganese	mg/L	0.02 0.12	AO MAC	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
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	<0.001
Total Silicon	mg/L			7.46	7.81	7.03	7.66	7.26	7.29
Total Silver	mg/L			<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Total Strontium	mg/L			0.0404	0.0651	0.0409	0.0805	0.0413	0.0423
Total Thallium	mg/L			<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
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	0.006	0.0303	0.0107	0.0083	0.0052	0.0138
Total Zirconium	mg/L			<0.0005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Calcium	mg/L			17.5	26	16.8	29.7	16.5	18.2
Total Magnesium	mg/L			3.51	4.95	3.24	5.48	3.31	3.36
Total Potassium	mg/L			0.321	0.459	0.314	0.455	0.328	0.339
Total Sodium	mg/L	200	AO	7.2	12.1	6.41	13.6	7.06	7.12
Total Sulphur	mg/L			<3.0	<3.0	<3.0	<3.0	<3	<3

Notes below about pH (2015) from https://www.canada.ca/content/dam/hc-sc/migration/hc-sc/ewh-semt/alt_formats/pdf/pubs/water-eau/sum_guide-res_recom/summary-table-EN-2020-02-11.pdf

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

Surfside Distribution (Tap Water) Analysis
1105 Surfside Drive

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

Orange font indicates non-compliance with the Aesthetic Objective in the Canadian Drinking Water Guidelines (CDWG)
Red font indicates non-compliance with the Maximum Acceptable Concentration (MAC) in the CDWG

	Units	CDWG		May 13 2014	May 19 2015	May 10 2016	May 8 2017	May 7 2018	May 13 2019	May 20 2020	May 6 2021
Miscellaneous Inorganics											
Fluoride	mg/L	1.5	MAC	<0.05	0.024	0.026	0.029	0.026	0.025	<0.05	<0.05
Alkalinity (total as CaCO)	mg/L			54	53.7	61.4	66.7	51.8	57.2	51	54
Anions											
Dissolved Sulphate	mg/L	500	AO	4.1	5.19	5.38	5.11	5.7	4.5	4.1	7.2
Dissolved Chloride	mg/L	250	AO	9	10	8.6	13	11	10	11	8.8
Nitrite	mg/L	1	MAC	<0.05	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.005	<0.005
Miscellaneous											
Apparent Colour	Colour Unit			<5	<5	10	10	5	<2	5	10
Nutrients											
Total Ammonia	mg/L			0.02	0.017	0.017	0.091	<0.020	<0.015	0.021	<0.015
Physical Properties											
Conductivity	µS/cm			161	154	157	184	157	153	150	140
pH	pH	7.0:10.5	AO	7	7.68	7.55	7.85	7.72	7.32	7.09	7.3
TDS	mg/L	500	AO	126	90	78	108	98	100	90	88
Turbidity	NTU			<0.5	<0.10	0.2	0.17	0.27	0.2	<0.1	<0.1
Microbiological Parameters											
E.coli	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	<1.0	<1.0	0	0	0
Total Coliforms	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	<1.0	<1.0	0	0	0
Calculated Parameters											
Total Hardness (CaCO)	mg/L			66	59.4	60	85.3	61	59.2	58.9	52.2
Nitrate	mg/L	10	MAC	0.71	0.533	0.555	0.529	0.637	0.633	0.85	0.773
Elements											
Total Mercury	mg/L	0.001	MAC	<0.00001	<0.00001	<0.00001	<0.00001	<0.000002	<0.000002	<0.0000019	<0.0000019
Total Metals											
Total Aluminum	mg/L	0.1	OG	<0.025	0.003	<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	<0.0005	<0.0005
Total Arsenic	mg/L	0.01	MAC	<0.00025	<0.0001	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001
Total Barium	mg/L	1	MAC	0.00357	0.0011	0.0017	0.0035	0.0018	0.0018	0.0011	<0.001
Total Beryllium	mg/L			<0.00025	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Bismuth	mg/L			<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Boron	mg/L	5	MAC	0.023	<0.050	<0.050	<0.050	<0.050	<0.05	<0.05	<0.05
Total Cadmium	mg/L	0.005	MAC	<0.00005	<0.00001	<0.00001	<0.00001	<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	0.001	<0.001	<0.001
Total Cobalt	mg/L			<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Total Copper	mg/L	1	AO	0.0088	0.00594	0.00898	0.00451	0.00513	0.00789	0.00638	0.00692
Total Iron	mg/L	0.3	AO	0.068	0.011	0.0288	0.0483	0.0137	0.0296	0.0223	0.0194
Total Lead	mg/L	0.01	MAC	0.0019	0.00054	0.00101	0.0003	0.00034	0.00048	0.00044	0.00042
Total Manganese	mg/L	0.02 0.12	AO MAC	<0.0050	<0.001	<0.001	<0.001	<0.001	<0.001	0.0011	<0.001
Total Molybdenum	mg/L			<0.00025	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Nickel	mg/L			<0.0010	<0.001	<0.001	<0.001	<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	<0.0001	<0.0001	0.0001
Total Silicon	mg/L			8.18	7.91	8.16	10.4	7.87	7.66	7.69	7.19
Total Silver	mg/L			0.00031	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Total Strontium	mg/L			0.065	0.0495	0.0551	0.0799	0.0549	0.0517	0.0466	0.0421
Total Thallium	mg/L			<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Total Tin	mg/L			<0.0005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Titanium	mg/L			<0.0025	<0.005	<0.005	<0.005	<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	<0.0001	<0.0001	<0.0001
Total Vanadium	mg/L			<0.0005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Zinc	mg/L	5	AO	0.0229	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Zirconium	mg/L				<0.0005	<0.0005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Calcium	mg/L			22.8	18.9	19.4	29.7	20	19.5	18.5	15.9
Total Magnesium	mg/L			2.31	2.96	2.81	2.69	2.69	2.54	3.06	3.05
Total Potassium	mg/L			<0.5	0.355	0.404	0.569	0.386	0.411	0.381	0.353
Total Sodium	mg/L	200	AO	8.2	6.63	7.03	8.58	6.48	6.71	6.53	6.11
Total Sulphur	mg/L				<3.0	<3.0	<3.0	<3.0	<3	<3	<3

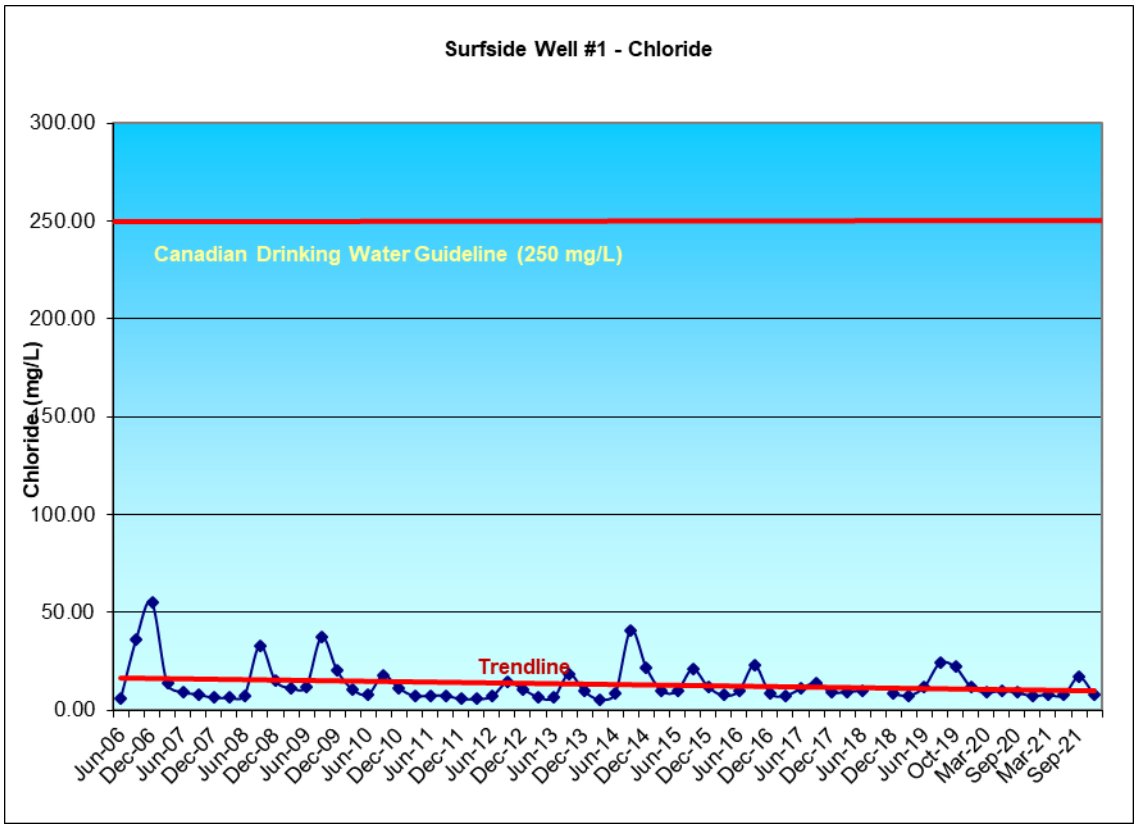
Date	Chloride	Sodium
	(mg/L)	(mg/L)
Jun-06	5.90	5.10
Sep-06	36.00	7.00
Dec-06	55.00	6.90
Mar-07	13.60	6.30
Jun-07	9.30	5.40
Sep-07	8.10	6.30
Dec-07	6.40	5.70
Mar-08	6.50	6.54
Jun-08	7.50	5.80
Sep-08	33.10	11.40
Dec-08	15.1	6.34
Mar-09	11.40	5.77
Jun-09	11.90	5.63
Sep-09	37.30	7.87
Dec-09	20.2	6.12
Mar-10	10.7	5.41
Jun-10	8.1	6.3
Oct-10	17.8	16.4
Dec-10	11.2	4.26
Mar-11	7.4	5.64
Jun-11	7.5	5.64
Oct-11	7.5	5.87
Dec-11	5.8	5.11
Mar-12	5.8	5.15
Jun-12	6.9	5.1
Sep-12	14.3	6.4
Dec-12	10.8	5.9
Mar-13	6.8	6.1
Jun-13	6.3	6.43
Sep-13	18.5	5.15
Dec-13	9.6	5.9
Mar-14	5.5	5.1
Jun-14	8.52	5.6
Sep-14	40.8	10.8
Dec-14	21.8	6.2
Mar-15	10	5.76
Jun-15	9.8	5.86
Sep-15	21	7.52
Dec-15	12	6.87
Mar-16	7.6	5.77
Jun-16	9.8	5.85
Sep-16	23	6.97
Dec-16	8.7	5.91
Mar-17	7.5	5.5
Jun-17	11	5.94
Sep-17	14	6.25
Dec-17	9.1	5.69
Mar-18	9.5	5.22
Jun-18	10	5.61
Sep-18		5.59
Dec-18	8.4	5.78
Mar-19	7.5	4.91
Jun-19	12	7.04
Sep-19	24	7.11
Oct-19	22	6.67
Dec-19	12	5.92
Mar-20	9.1	5.71
Jun-20	10	5.38
Sep-20	9	5.5
Dec-20	7.3	5.47
Mar-21	8	5.12
Jun-21	7.6	4.81
Sep-21	17	6.05
Dec-21	7.7	5.79

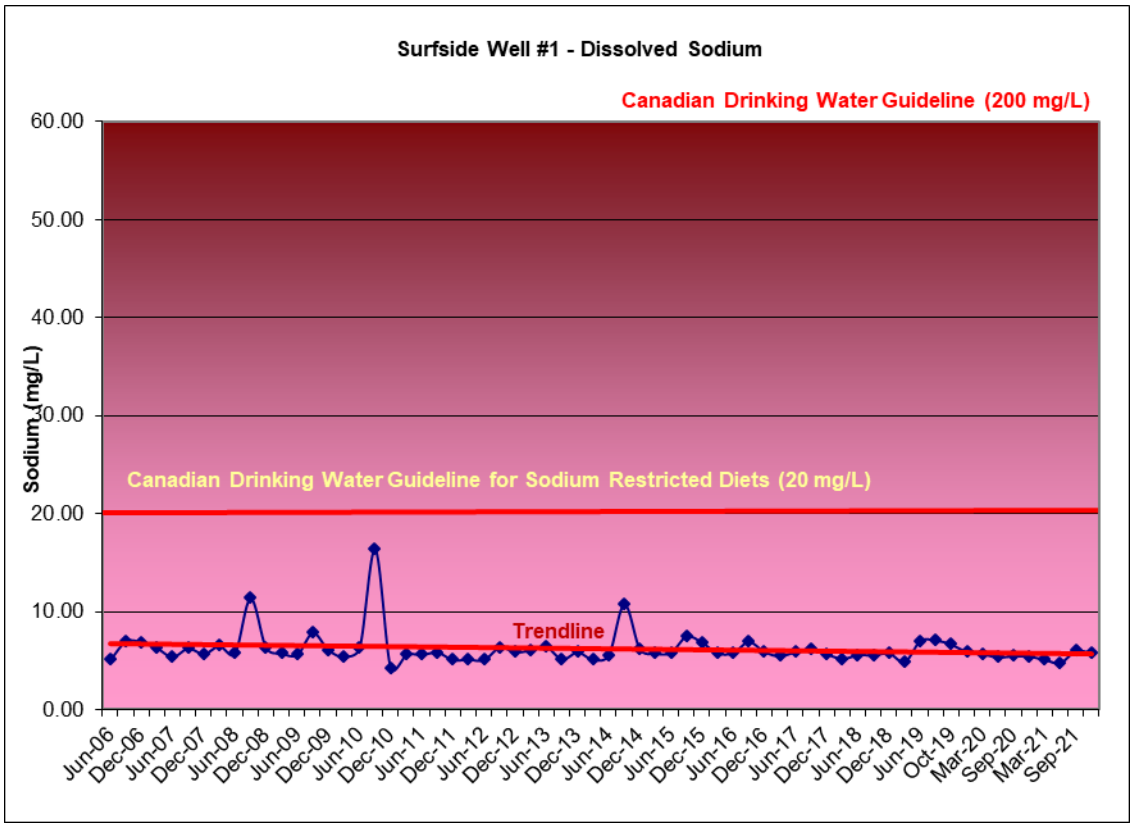
REGIONAL DISTRICT OF NANAIMO

Lab Analysis - Surfside Well #1

Quarterly **Chloride - Sodium Comparison**

Chloride - CDWG = 250 mg/L
Diss. Sodium - CDWG = 200 mg/L





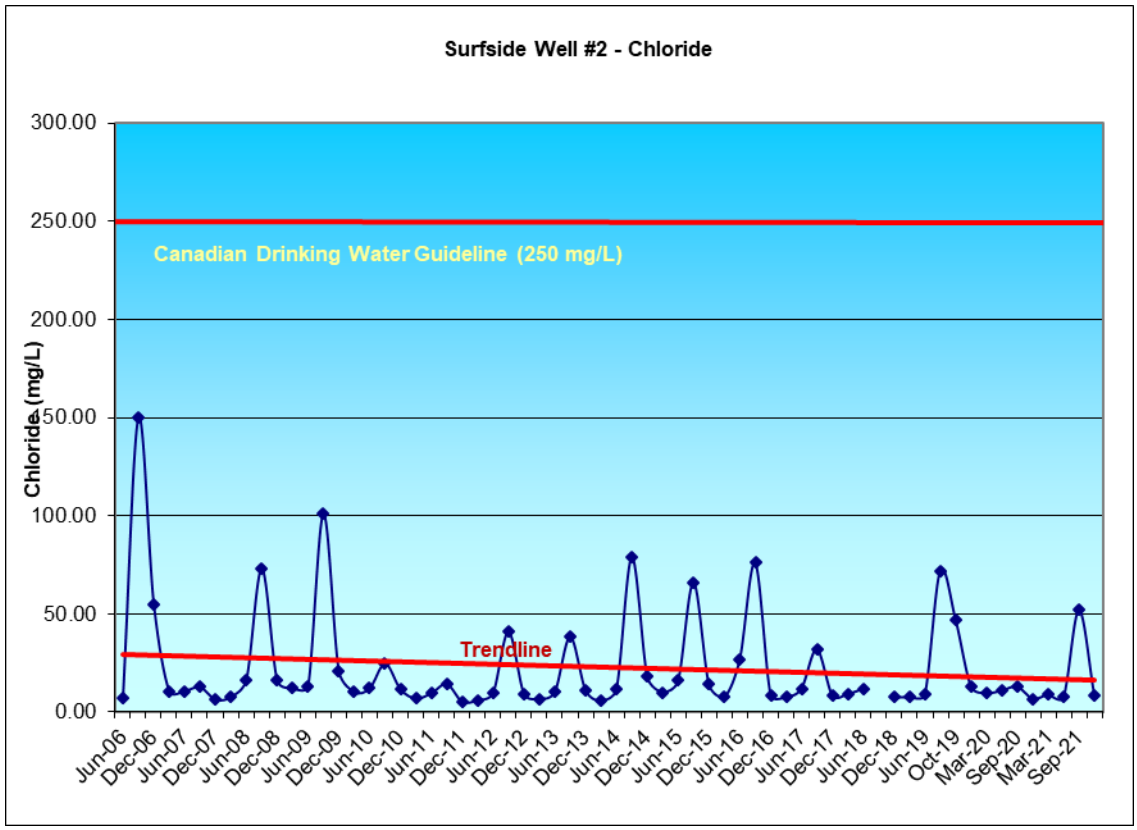
Date	Chloride	Sodium
	(mg/L)	(mg/L)
Jun-06	7.10	5.00
Sep-06	150.00	30.00
Dec-06	55.00	13.00
Mar-07	10.70	5.90
Jun-07	10.70	7.70
Sep-07	12.70	10.20
Dec-07	6.3	6.6
Mar-08	7.70	6.91
Jun-08	16.50	8.30
Sep-08	73.20	24.40
Dec-08	16	8.16
Mar-09	12.10	6.30
Jun-09	13.10	7.85
Sep-09	101.00	24.20
Dec-09	20.8	7.34
Mar-10	10.2	5.85
Jun-10	12.1	8.41
Oct-10	24.7	22.1
Dec-10	11.6	7.4
Mar-11	6.9	5.96
Jun-11	9.6	7.64
Oct-11	14.3	10.1
Dec-11	5.3	5.74
Mar-12	6	5.59
Jun-12	9.8	6.5
Sep-12	40.9	13.3
Dec-12	9.4	7.2
Mar-13	6.7	6.3
Jun-13	10.2	8.31
Sep-13	38.3	9.06
Dec-13	11.1	7.4
Mar-14	5.6	5.5
Jun-14	11.7	8.5
Sep-14	79	22.3
Dec-14	18.1	7.5
Mar-15	10	6.08
Jun-15	16	9.03
Sep-15	66	17
Dec-15	14	9.25
Mar-16	7.7	6.45
Jun-16	27	8.9
Sep-16	76	18.5
Dec-16	8.7	6.41
Mar-17	7.7	5.61
Jun-17	12	7.13
Sep-17	32	12.1
Dec-17	8.6	6.17
Mar-18	9.2	5.8
Jun-18	12	7.06
Sep-18		8.73
Dec-18	7.7	6.77
Mar-19	7.7	5.05
Jun-19	8.9	5.49
Sep-19	72	16.9
Oct-19	47	13.6
Dec-19	13	6.83
Mar-20	9.7	5.76
Jun-20	11	6.35
Sep-20	13	8.05
Dec-20	6.8	5.93
Mar-21	8.8	5.36
Jun-21	7.6	6.45
Sep-21	52	12.5
Dec-21	8.4	5.46

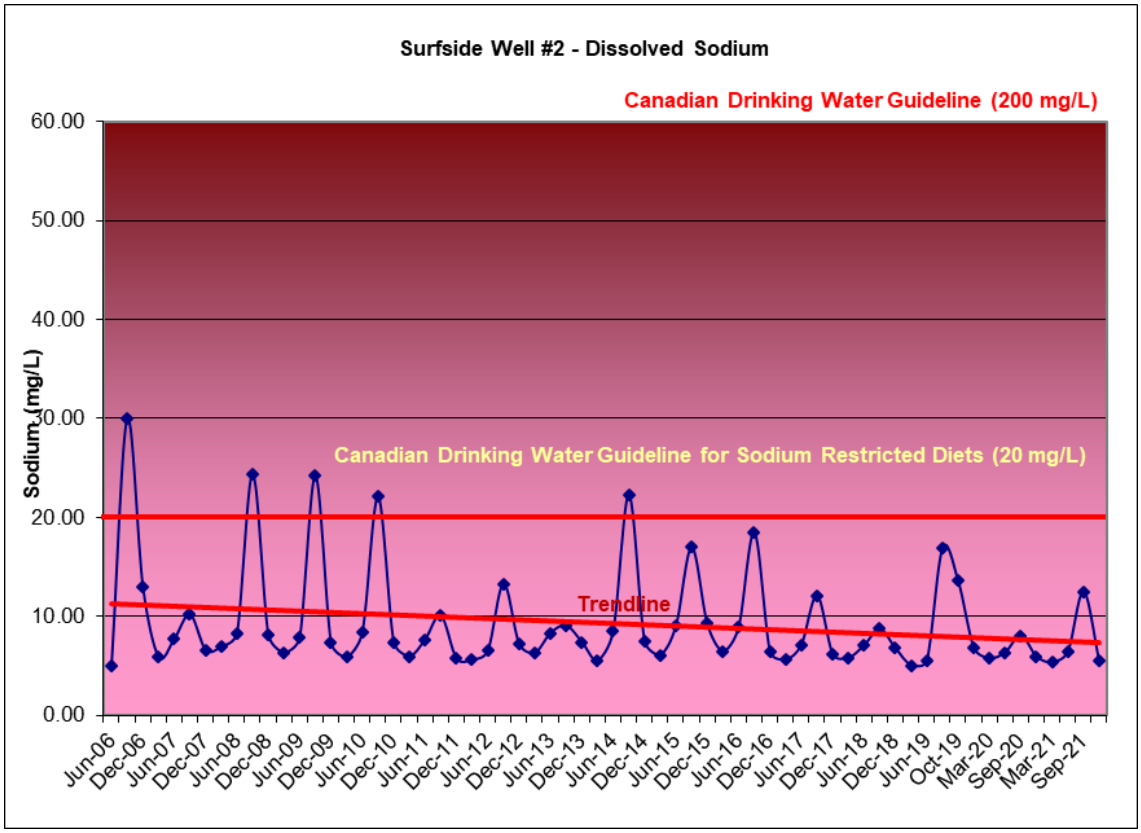
REGIONAL DISTRICT OF NANAIMO

Lab Analysis - Surfside Well #2

Quarterly **Chloride - Sodium Comparison**

Chloride - CDWG = 250 mg/L
Diss. Sodium - CDWG = 200 mg/L



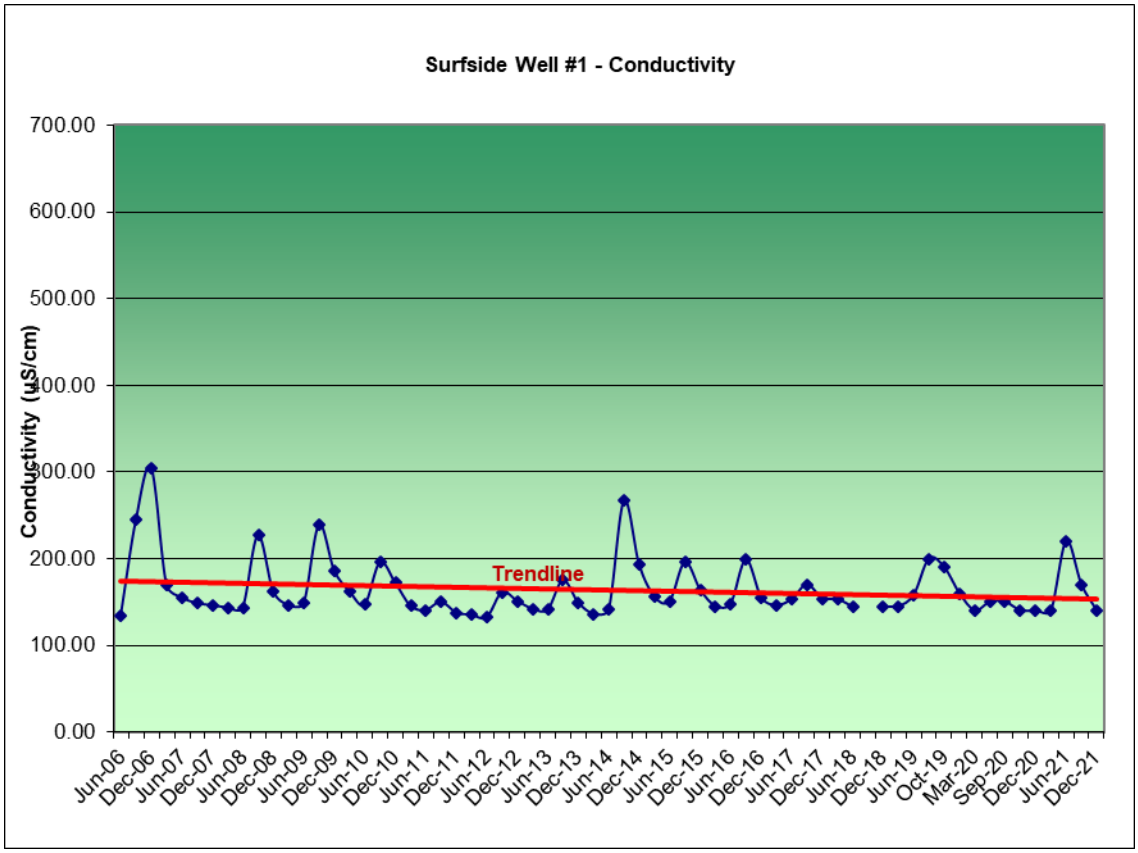


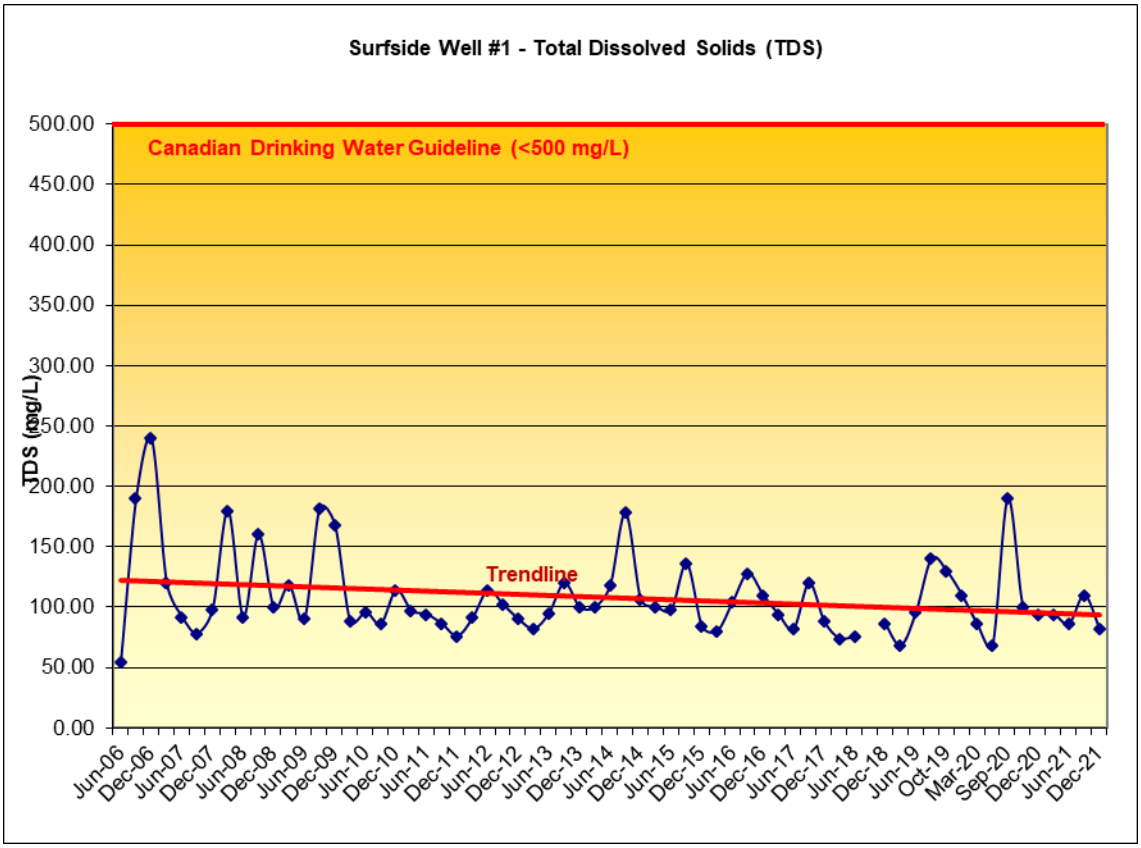
Date	Cond.	TDS
	µS	(mg/L)
Jun-06	134.10	54.00
Sep-06	245.00	190.00
Dec-06	305.00	240.00
Mar-07	169.60	120.00
Jun-07	155.00	92.00
Sep-07	148.30	78.00
Dec-07	146.00	98.00
Mar-08	143.40	180.00
Jun-08	143.40	92.00
Sep-08	227.00	160.00
Dec-08	162.00	100.00
Mar-09	146.00	118.00
Jun-09	148.40	90.00
Sep-09	239.00	182.00
Dec-09	186.1	168
Mar-10	162.2	88
Jun-10	146.9	96
Oct-10	195.7	86
Dec-10	172	114
Mar-11	145.3	97
Jun-11	140.4	94
Oct-11	150.1	86
Dec-11	137.4	76
Mar-12	135	91
Jun-12	132	114
Sep-12	161	102
Dec-12	151	90
Mar-13	142	82
Jun-13	141	95
Sep-13	175	120
Dec-13	149	100
Mar-14	136	100
Jun-14	141	118
Sep-14	267	178
Dec-14	193	106
Mar-15	156	100
Jun-15	151	98
Sep-15	196	136
Dec-15	164	84
Mar-16	145	80
Jun-16	148	104
Sep-16	199	128
Dec-16	155	110
Mar-17	146	94
Jun-17	153	82
Sep-17	170	120
Dec-17	154	88
Mar-18	153	74
Jun-18	144	76
Sep-18		
Dec-18	145	86
Mar-19	145	68
Jun-19	158	96
Sep-19	200	140
Oct-19	190	130
Dec-19	160	110
Mar-20	140	86
Jun-20	150	68
Sep-20	150	190
Oct-20	140	100
Dec-20	140	94
Mar-21	140	94
Jun-21	220	86
Sep-21	170	110

REGIONAL DISTRICT OF NANAIMO

Lab Analysis - Surfside Well #1

TDS – CDWG = < 500mg/L





Lab Analysis - Surfside Well #2

TDS – CDWG = < 500mg/L

Date	Cond.	TDS
	µS	(mg/L)
Jun-06	135.20	84.00
Sep-06	650.00	446.00
Dec-06	315.00	220.00
Mar-07	160.80	90.00
Jun-07	158.60	110.00
Sep-07	177.00	82.00
Dec-07	139.00	92.00
Mar-08	134.10	246.00
Jun-08	180.60	118.00
Sep-08	372.00	294.00
Dec-08	164.00	288.0
Mar-09	141.00	110.00
Jun-09	154.50	90.00
Sep-09	467.00	388.00
Dec-09	185.6	134
Mar-10	156.9	80
Jun-10	162.9	106
Oct-10	222	124
Dec-10	171	94
Mar-11	140.3	94
Jun-11	146.1	98
Oct-11	185.5	96
Dec-11	130.8	68
Mar-12	127	74
Jun-12	142	170
Oct-12	259	162
Dec-12	146	90
Mar-13	137	78
Jun-13	130	87
Sep-13	244	164
Dec-13	153	104
Mar-14	127	98
Jun-14	153	98
Sep-14	407	292
Dec-14	180	98
Mar-15	151	90
Jun-15	176	106
Sep-15	348	276
Dec-15	172	84
Mar-16	140	94
Jun-16	200	136
Sep-16	377	274
Dec-16	152	116
Mar-17	143	92
Jun-17	156	78
Sep-17	243	170
Dec-17	146	80
Mar-18	144	86
Jun-18	155	90
Sep-18		
Dec-18	139	90
Mar-19	139	74
Jun-19	144	88
Sep-19	360	290
Oct-19	270	160
Dec-19	160	100
Mar-20	140	70
Jun-20	140	66
Sep-20	160	120
Oct-20	150	100
Dec-20	130	94
Mar-21	130	62
Jun-21	220	94
Sep-21	290	230