island health

DRINKING WATER SYSTEM ANNUAL REPORT

Reporting Period: January 1st to December 31st, 2023 (year)

Water System Carlton Water System

Water System Owner Cowichan Valley Regional District

Primary Contact Name (Operator or Manager) Vanessa Thomson

Phone Number (Operator or Manager) 250-746-2535

E-mail (Operator or Manager) Vanessa.Thomson@cvrd.bc.ca

DESCRIBE YOUR WATER SUPPLY SYSTEM

What is the Source(s) of Raw Water?

☒ Deep Well ☐ Shallow Well ☐ Surface Water ☐ Other

If other, specify details:

Does the Drinking Water System have Primary Disinfection? ☒ Yes ☐ No

☒ Chlorination ☐ Ultraviolet Light ☐ Ozone ☐ Other

If other, specify details:

Does the Drinking Water System have Secondary Disinfection? ☒ Yes ☐ No

☒ Chlorination ☐ Other

If other, specify details:

Does the Drinking Water System have Filtration? ☐ Yes ☒ No

Check all boxes that apply

☐ Cartridge Filter(s) ☐ Carbon Filter ☐ Sand Filtration ☐ Reverse Osmosis ☐ Other

If other, specify details:

PUBLIC REPORTING

Emergency Response & Contingency Plan (ERCP)

Is your ERCP up to Date? ☒ Yes ☐ No

How do you Inform the System Users of the ERCP?

☒ Hand Delivered ☒ Bulletin Board ☒ Newspaper ☐ Utility Bill Insert ☒ Website

☒ Other (specify details) Radio, Social Media

Drinking Water System Annual Report

How do you Inform the System Users of the Annual Report?

☐ Hand Delivered ☐ Bulletin Board ☐ Newspaper ☐ Utility Bill Insert ☒ Website

☐ Other (specify details)

COMPLIANCE WITH OPERATING PERMIT

List the conditions of your Operating Permit (Contact the DWO for a copy if needed):

Operating conditions attached.

Are you in compliance with your Operating Permit? ☒ Yes ☐ No

BACTERIOLOGICAL TESTING AND DRINKING WATER PROTECTION REGULATION WATER QUALITY STANDARDS

How many bacteriological samples were collected during this reporting period? 51

What is the minimum required sampling frequency for this system? (#samples/month) 4 samples/month

Additional sampling details:

Was the minimum required sampling frequency achieved? ☒ Yes ☐ No

Comments:

Bacteriological summary attached to this report? ☒ Yes ☐ No

If no, how do the users of the system view the results?

WATER QUALITY STANDARDS FOR POTABLE WATER

Parameter:	***Standard:***	**Did this system meet standard?**	
Escherichia coli (for all samples)	No detectable *Escherichia coli* per 100ml	☒ Yes	☐ No
Total Coliform Bacteria *(if only 1 sample collected in a 30 day period)*	No detectable total coliform bacteria per 100ml	☒ Yes	☐ No
Total Coliform Bacteria *(if more than 1 sample collected in a 30 day period)*	No more than 10% of samples contain total coliform bacteria, **and** No sample has more than 10 total coliform bacteria per 100ml	☒ Yes	☐ No

If the system did not meet any of above Drinking Water Protection Regulation standards, record the results in the table below; attach additional sheets if necessary.

Date	TC/100ml	E.coli/100ml	Reason	Corrective Action

CHEMICAL SAMPLING COMPLETED DURING THIS REPORTING PERIOD

Was any chemical sampling conducted during reporting period?	■ Yes	☐ No
If no, when were the last chemical samples conducted for this system? (date)		☐ Don't know
If yes, attach a list of the chemical results Full Spectrum Report for Distribution		
If any water samples did not meet the Guidelines for Canadian Drinking Water Quality, record the results in the table below; attach additional sheets if necessary.		
Next scheduled full chemical test (date) Source - March 2024		

Parameter	Result	Corrective Action / Treatment / Comments
Total Manganese	31.4 ug/L	Above AO, below MAC.
Total Coliforms	1 CFU/100mL	Likely lab error. Bacteriological sampling at location on July 11 and 25 was LT1.
E. Coli	1 CFU/100mL	Likely lab error. Bacteriological sampling at location on July 11 and 25 was LT1.

ADDITIONAL TESTING

Does the system have analyzers for continuous monitoring? ■ Yes ☐ No

If yes, check all boxes that apply:

■ Chlorine ☐ Turbidity ☐ Other (details)

Are the results available on request?

If any additional testing or sampling was conducted, record results in the table below; attach additional sheets if necessary.

Additional Testing & Reason for Sampling	Corrective Action Taken

WATER QUALITY COMPLAINTS

Were there any water quality complaints in this reporting period? (e.g. taste, odour, colour etc.) ☐ Yes ■ No

If yes, complete the table below; attach additional sheets if necessary.

Date	Water Quality Complaint	Corrective Action / Treatment

OPERATIONAL PROBLEMS

Were there any operational problems during this reporting period? (e.g. insufficient water supply, malfunction of disinfection equipment, line breaks, elevated turbidity etc.). ☐ Yes ■ No

If yes, complete the table below; attach additional sheets if necessary.

Incident Date	Type of Operational Problem	Corrective Action Taken

MAJOR UPGRADES/REPAIRS & EXPENSES

Were there any major upgrades/repairs or any major costs incurred during this reporting period? ■ Yes ☐ No

If yes, complete the table below; attach additional sheets if necessary.

Major Upgrades/Expenses	Details
Improvements required by DWO	
Additions/changes to system	
Purchase or install new equipment	
Equipment repair or replacement	Upgraded treatment building and electrical and mechanical works
Annual maintenance of system	System flushing and hydrant maintenance
Specialist report	
Other	

FUTURE IMPROVEMENTS

Are there any plans for future improvements? ☐ Yes ■ No

If yes, complete the table below; attach additional sheets if necessary.

Future Upgrades or Improvements	Estimated Date of Completion

Click here to enter a date. February 8, 2024 **DATE COMPLETED:**	Tai Williams **COMPLETED BY:**

APPENDIX A

WATER SYSTEM OPERATING CONDITIONS FOR

Carlton Water System

1365 Carlton Drive

Cobble Hill, BC V0R 1L6

The permit holder is advised that the following Terms and Conditions are in addition to other legislated responsibilities and obligations outlined in the Drinking Water Protection Act, ([SBC 2001] Chapter 9) and the B.C. Reg. 200/2003 O.C. 508/2003 Drinking Water Protection Regulation.

1. **Authorized Waterworks System**
   The water supply system owner is authorized to operate 2 groundwater wells: Well #1 (WTN 102375/WID 34773) and Well #2 (WTN 34331/WID 13295), other related appurtenances to disinfect water, and a distribution system consisting of storage and transmission facilities to supply potable water for domestic purposes to the community consisting of Carlton Drive, Nora Place, Cheal Place, and Sylvania Place in Cobble Hill, BC.

2. **Performance Standards**
   Well #2 WTN 34331/WID13295
   This water source was assessed in accordance with the British Columbia Ministry of Health "Guidance Document for Determining Ground Water at Risk of Containing Pathogens (GARP), Version 3, September 2017" and a determination of "At Risk (GARP-viruses only)" was made.

   Water from this source must be treated in accordance with the Drinking Water Treatment Objectives (Microbiological) for Ground Water Supplies (GWTO) in British Columbia Version 1, November 2015 (or most recent version). The water system operator shall ensure the treatment and disinfection systems are in good working order to achieve the following:
   - 4 log (99.99%) removal/inactivation of viruses
     - If chlorine is proposed to achieve primary disinfection, then the Hepatitis A virus is the target organism.
     - If ultraviolet disinfection is proposed to achieve primary disinfection, then Adenovirus is the target organism.
   - Less than or equal to (≤) one nephelometric turbidity unit (NTU) of turbidity.
   - No detectable E. Coli, fecal coliform and total coliform.

3. Performance Objectives

3.1 Well #1 WTN 102375/WID 34733

This water source was assessed in accordance with the British Columbia Ministry of Health "Guidance Document for Determining Ground Water at Risk of Containing Pathogens (GARP), Version 3, September 2017" and a determination of "At Low Risk (GARP)" was made.

Determining whether a ground water source is GARP is not regarded as a one-time process but is subject to the results of continued long-term monitoring of the water supply system and the conditions of the aquifer, well capture zone, and watershed over time. Changes to water quality or conditions may require the water to be treated in accordance with the Drinking Water Treatment Objectives (Microbiological) for Ground Water Supplies (GWTO) in British Columbia Version 1, November 2015 (or most recent version).

3.2 The water supply system owner shall ensure:

A minimum chlorine residual as outlined in the "British Columbia Guidelines (Microbiological) on Maintaining Water Quality in Distribution Systems, Version 1 / August 2016 (or most recent edition)

Minor deviations of these objectives may need attention by operating staff, but may not necessarily constitute a treatment violation.

4. Water Quality Monitoring and Reporting Requirements

The water supply system owner shall submit a water quality monitoring program for approval by the Drinking Water Officer. The monitoring plan must outline the parameters to be monitored and the frequencies at which those parameters will be monitored. The water system operator shall adhere to the monitoring plan, and maintain detailed and accurate records of all monitoring performed. The monitoring program must include but is not limited to the following:

4.1 Chemical, Physical, Protozoan, and Bacteria Monitoring

4.1.1 Monthly Bacteriological Sampling

- S 2 1380 Carlton Drive
- S 3 Water Treatment
- S 4 WELL #1 Nora Place
- S 5 WELL #2 Carlton Drive

Semi-Monthly Bacteriological Sampling

- S 1 1264 Carlton Drive

4.1.2 A chemical analysis of finished/treated water from the distribution system in accordance with the list of parameters specified in the Island Health *Source Water Assessment Guideline Appendix B: Minimum Sampling Parameters for Ground Water Sources* at a frequency of no less than once every 5 years. Maximum acceptable concentrations must comply with the Guidelines for Canadian Drinking Water Quality.

4.1.3 CT Value

The water supply system owner shall determine the CT value on a weekly basis where CT is the product of C and T, where C, represents the residual disinfectant concentration in mg/L and T, represents the contact time in minutes.

Once per week, at maximum hourly flow, the water supply system owner shall monitor the temperature of the disinfected water, the residual disinfectant concentration, C, and the pH at the sampling point. The sampling point should be located before or at the first customer. Also at the peak hourly flow, the water supply system owner shall measure the contact time, T, based on the time of travel that the water takes to reach the first customer from the disinfection point. The contact time, T, will be based on the travel time within the pipelines and retention time in the reservoir.

Virus reduction will be based on the CT tables listed in the document "Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Enteric Viruses", Water, Air and Climate Change Bureau, Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario. (Catalogue No H129-6/2011E), 2011.

Date: October 20, 2023

Issued By: A Gardner

Environmental Health Officer

Carlton Water System

Facility Information

Location 175 Ingram Street Duncan

Type 15 - 300 Connections

Facility Sampling History

Location	Date	Total Coliform	E.Coli/Enterococci
S2 1380 Carlton Drive	18-Dec-2023	LT1	LT1
S1 1264 Carlton Drive	11-Dec-2023	LT1	LT1
S3 Water Treatment Building	04-Dec-2023	LT1	LT1
S1 1264 Carlton Drive	27-Nov-2023	LT1	LT1
S1 1264 Carlton Drive	20-Nov-2023	LT1	LT1
S1 1264 Carlton Drive	14-Nov-2023	LT1	LT1
S3 Water Treatment Building	07-Nov-2023	LT1	LT1
S1 1264 Carlton Drive	30- Oct-2023	LT1	LT1
S2 1380 Carlton Drive	23- Oct-2023	LT1	LT1
S1 1264 Carlton Drive	16- Oct-2023	LT1	LT1
S3 Water Treatment Building	10- Oct-2023	LT1	LT1
S1 1264 Carlton Drive	04- Oct-2023	LT1	LT1
S2 1380 Carlton Drive	25-Sep-2023	LT1	LT1
S1 1264 Carlton Drive	18-Sep-2023	LT1	LT1
S3 Water Treatment Building	11-Sep-2023	LT1	LT1
S1 1264 Carlton Drive	05-Sep-2023	LT1	LT1
S2 1380 Carlton Drive	29-Aug-2023	LT1	LT1
S1 1264 Carlton Drive	22-Aug-2023	LT1	LT1
S3 Water Treatment Building	14-Aug-2023	LT1	LT1
S1 1264 Carlton Drive	08-Aug-2023	LT1	LT1
S2 1380 Carlton Drive	01-Aug-2023	LT1	LT1
S1 1264 Carlton Drive	25-Jul-2023	LT1	LT1
S3 Water Treatment Building	18-Jul-2023	LT1	LT1
S1 1264 Carlton Drive	11-Jul-2023	LT1	LT1
S2 1380 Carlton Drive	04-Jul-2023	LT1	LT1
S1 1264 Carlton Drive	27-Jun-2023	LT1	LT1
S3 Water Treatment Building	20-Jun-2023	LT1	LT1
S1 1264 Carlton Drive	12-Jun-2023	LT1	LT1
S2 1380 Carlton Drive	05-Jun-2023	LT1	LT1
S1 1264 Carlton Drive	29-May-2023	LT1	LT1
S2 1380 Carlton Drive	23-May-2023	LT1	LT1
S3 Water Treatment Building	16-May-2023	LT1	LT1
S1 1264 Carlton Drive	08-May-2023	LT1	LT1
S2 1380 Carlton Drive	01-May-2023	LT1	LT1
S1 1264 Carlton Drive	25-Apr-2023	LT1	LT1
S3 Water Treatment Building	17-Apr-2023	LT1	LT1
S1 1264 Carlton Drive	11-Apr-2023	LT1	LT1
S2 1380 Carlton Drive	03-Apr-2023	LT1	LT1
S1 1264 Carlton Drive	27-Mar-2023	LT1	LT1
S2 1380 Carlton Drive	21-Mar-2023	LT1	LT1
S1 1264 Carlton Drive	13-Mar-2023	LT1	LT1
S3 Water Treatment Building	07-Mar-2023	LT1	LT1
S2 1380 Carlton Drive	01-Mar-2023	LT1	LT1

Carlton Water System

Facility Information

Location 175 Ingram Street Duncan

Type 15 - 300 Connections

Facility Sampling History

Location	Date	Total Coliform	E.Coli/Enterococci
S1 1264 Carlton Drive	21-Feb-2023	LT1	LT1
S2 1380 Carlton Drive	13-Feb-2023	LT1	LT1
S1 1264 Carlton Drive	06-Feb-2023	LT1	LT1
S3 Water Treatment Building	31-Jan-2023	LT1	LT1
S1 1264 Carlton Drive	24-Jan-2023	LT1	LT1
S3 Water Treatment Building	17-Jan-2023	LT1	LT1
S2 1380 Carlton Drive	10-Jan-2023	LT1	LT1
S1 1264 Carlton Drive	03-Jan-2023	LT1	LT1

CARLTON WATER

DISTRIBUTION - S1

			Sample ID	S1-1264 CARLTON DR (WTX 2CA94)
			Sampling Date	07/20/23
			Sampling Time	10:45 AM
Parameter Name	***MAC***	***AO***	***Units***	***Result***
Nitrite (N)	1		mg/L	<0.0050
Nitrate (N)	10		mg/L	<0.020
Conductivity			uS/cm	240
pH			pH	7.97
Total Dissolved Solids		500	mg/L	150
Alkalinity (PP as CaCO3)			mg/L	<1.0
Alkalinity (Total as CaCO3)			mg/L	96
Bicarbonate (HCO3)			mg/L	120
Carbonate (CO3)			mg/L	<1.0
Hydroxide (OH)			mg/L	<1.0
Chloride (Cl)		250	mg/L	8
Sulphate (SO4)		500	mg/L	15
True Colour		15	Col. Unit	<5.0
Nitrate plus Nitrite (N)			mg/L	<0.020
Langelier Index (@ 20C)			N/A	0.048
Langelier Index (@ 4C)			N/A	-0.202
Saturation pH (@ 20C)			N/A	7.93
Saturation pH (@ 4C)			N/A	8.18
Dissolved Fluoride (F)	1.5		mg/L	0.054
Tannins and Lignins			mg/L	<0.2
Turbidity	see remark	see remark	NTU	0.31
Total Hardness (CaCO3)			mg/L	102
Total Aluminum (Al)	2900		ug/L	<3.0
Total Antimony (Sb)	6		ug/L	<0.50
Total Arsenic (As)	10		ug/L	4.78
Total Barium (Ba)	2000		ug/L	3.5
Total Beryllium (Be)			ug/L	<0.10
Total Bismuth (Bi)			ug/L	<1.0
Total Boron (B)	5000		ug/L	347
Total Cadmium (Cd)	7		ug/L	<0.010
Total Chromium (Cr)	50		ug/L	<1.0
Total Cobalt (Co)			ug/L	<0.20
Total Copper (Cu)	2000	1000	ug/L	2.08
Total Iron (Fe)		300	ug/L	10
Total Lead (Pb)	5		ug/L	0.2
Total Manganese (Mn)	120	20	ug/L	**31.4**
Total Molybdenum (Mo)			ug/L	<1.0

CARLTON WATER

DISTRIBUTION - S1

			Sample ID	S1-1264 CARLTON DR (WTX 2CA94)
			Sampling Date	07/20/23
			Sampling Time	10:45 AM
Parameter Name	***MAC***	***AO***	***Units***	***Result***
Total Nickel (Ni)			ug/L	<1.0
Total Selenium (Se)	50		ug/L	<0.10
Total Silicon (Si)			ug/L	10700
Total Silver (Ag)			ug/L	<0.020
Total Strontium (Sr)	7000		ug/L	203
Total Thallium (Tl)			ug/L	<0.010
Total Tin (Sn)			ug/L	<5.0
Total Titanium (Ti)			ug/L	<5.0
Total Uranium (U)	20		ug/L	<0.10
Total Vanadium (V)			ug/L	<5.0
Total Zinc (Zn)		5000	ug/L	<5.0
Total Zirconium (Zr)			ug/L	<0.10
Total Calcium (Ca)			mg/L	28.9
Total Magnesium (Mg)			mg/L	7.2
Total Potassium (K)			mg/L	0.381
Total Sodium (Na)		200	mg/L	8.31
Total Sulphur (S)			mg/L	4.3
Total Mercury (Hg)	1		ug/L	<0.0019
Total Total Kjeldahl Nitrogen (Calc)			mg/L	<0.020
Total Organic Carbon (C)			mg/L	<0.50
Total Nitrogen (N)			mg/L	<0.020
Total Ammonia (N)			mg/L	<0.015
Sulphide (as H2S)		0.05	mg/L	<0.0020
Total Sulphide		0.05	mg/L	<0.0018
Total Coliforms	0		CFU/100mL	**1**
E. coli	0		CFU/100mL	**1**
Heterotrophic Plate Count			CFU/mL	1
Fecal Coliforms			CFU/100mL	0
Non-Coliform (Background)			CFU/100mL	<1
Iron Bacteria			CFU/mL	<25
Sulphate reducing bacteria			CFU/mL	<75
Total Trihalomethanes	100		ug/L	7.5
Bromodichloromethane			ug/L	2.6
Bromoform			ug/L	<1.0
Dibromochloromethane			ug/L	1.7
Chloroform			ug/L	3.2
Dalapon			ug/L	<5.0

CARLTON WATER

DISTRIBUTION - S1

			Sample ID	S1-1264 CARLTON DR (WTX 2CA94)
			Sampling Date	07/20/23
			Sampling Time	10:45 AM
Parameter Name	***MAC***	***AO***	***Units***	***Result***
Monochloroacetic Acid			ug/L	<5.0
Monobromoacetic Acid			ug/L	<5.0
Dichloroacetic Acid			ug/L	<5.0
Trichloroacetic Acid			ug/L	<5.0
Bromochloroacetic Acid			ug/L	<5.0
Dibromoacetic Acid			ug/L	<5.0
Total Haloacetic Acids	80		ug/L	<5.0