Cedar Lane Water Service

2020 Annual Report

CRD | Drinking Water

INTRODUCTION

This report provides a summary of the Cedar Lane Water Service for 2020. It includes a description of the service, summary of the water supply, demand and production, drinking water quality, operations highlights, capital project updates and financial report.

SERVICE DESCRIPTION

The Cedar Lane Water Utility is a rural residential community located on Salt Spring Island. The service was created in 1970 and became a CRD service in 2007. The Cedar Lane Water Utility (Figure 1) is comprised of 37 parcels of land of which all are connected to the system.

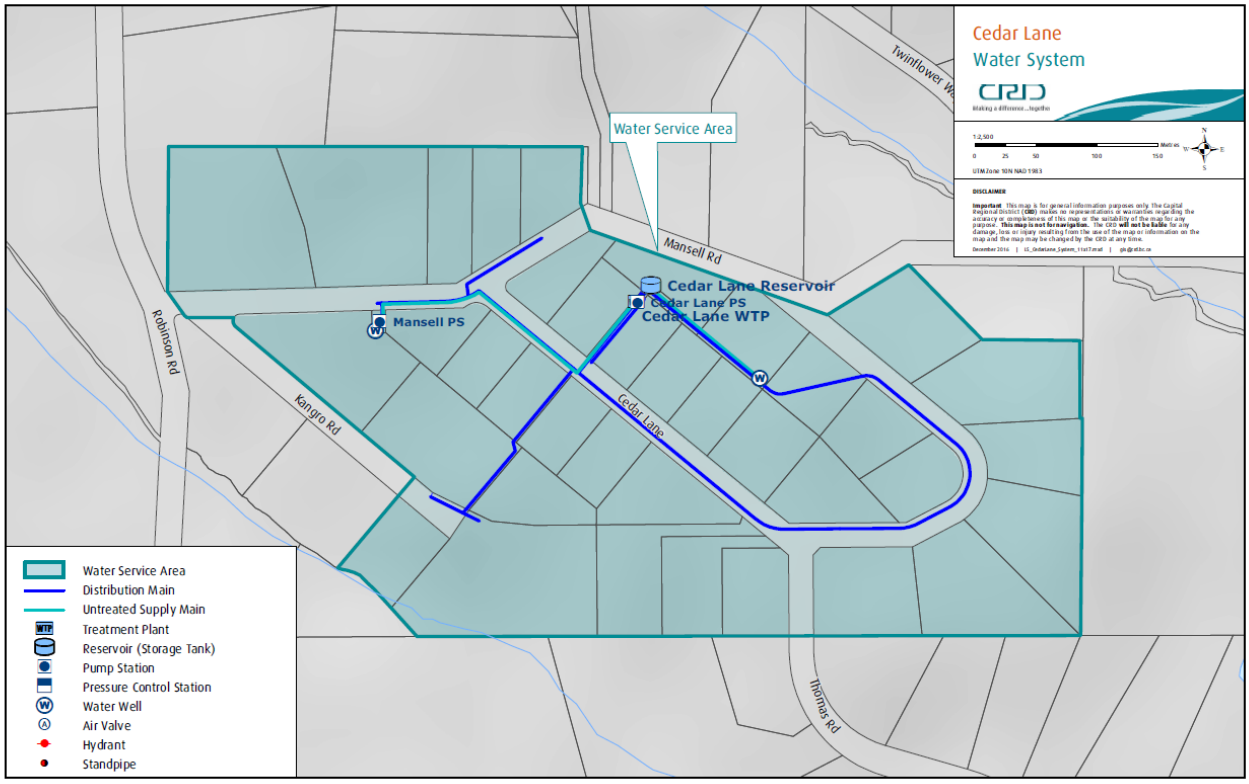

Figure 1: Cedar Lane Water Service

The Cedar Lane water system is primarily comprised of:

- two ground water source wells (#1 and #5);
- a water treatment plant (WTP) that provides primary disinfection with ultraviolet (UV) radiation and residual disinfection using sodium hypochlorite;
- 1 water reservoir – 136 m^3 (30,000 Ig);
- 1,260 metres of water distribution pipe;
- fire hydrant, standpipes, and gate valves;
- water service connections complete with water meters**.**

WATER PRODUCTION AND DEMAND

Referring to Figure 2, 3,410 cubic meters (m^3) of water was extracted (water production) from two ground water wells in 2020; a 2% decrease from the previous year and is a 9% decrease from the five year rolling average. Water demand (customer water billing) for the service totaled 3,370 m^3 of water; a 4% increase from the previous year and a 3% decrease from the five year rolling average.

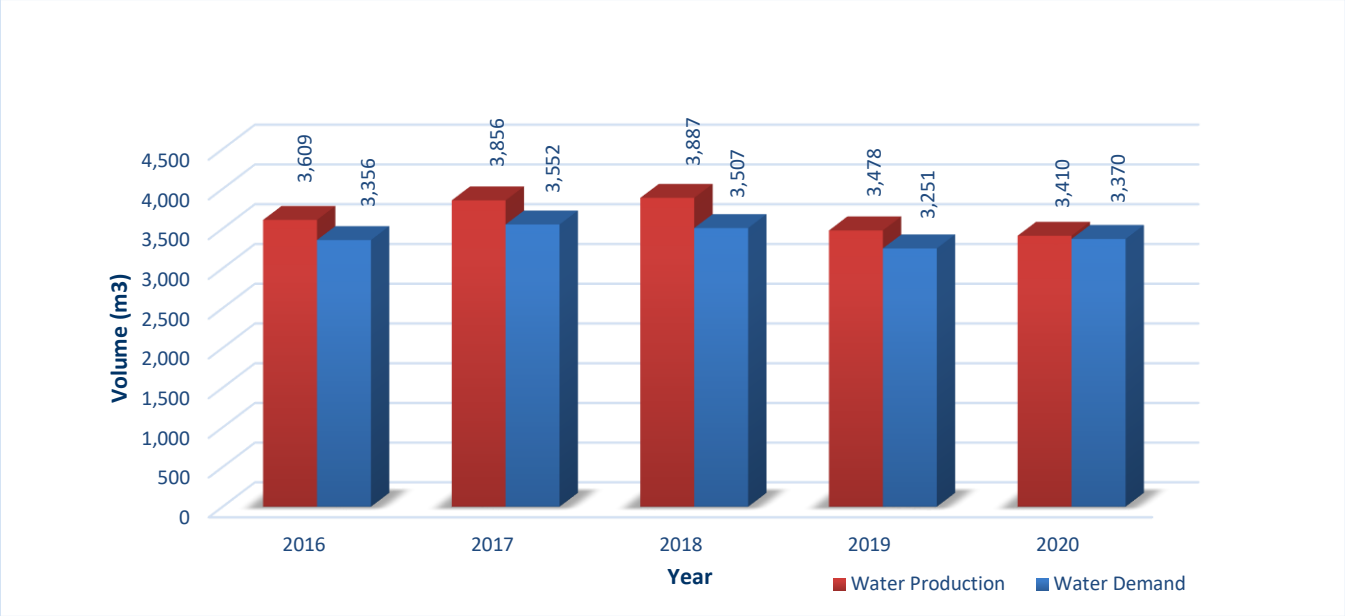

Figure 2: Cedar Lane Water Service Annual Water Production and Demand

Water production by month for the past five years is shown in Figure 3. Water consumption, for most water systems, is greatest during the summer months. Water usage for Cedar Lane is fairly consistent throughout the year likely the result of conservative indoor and outdoor water use.

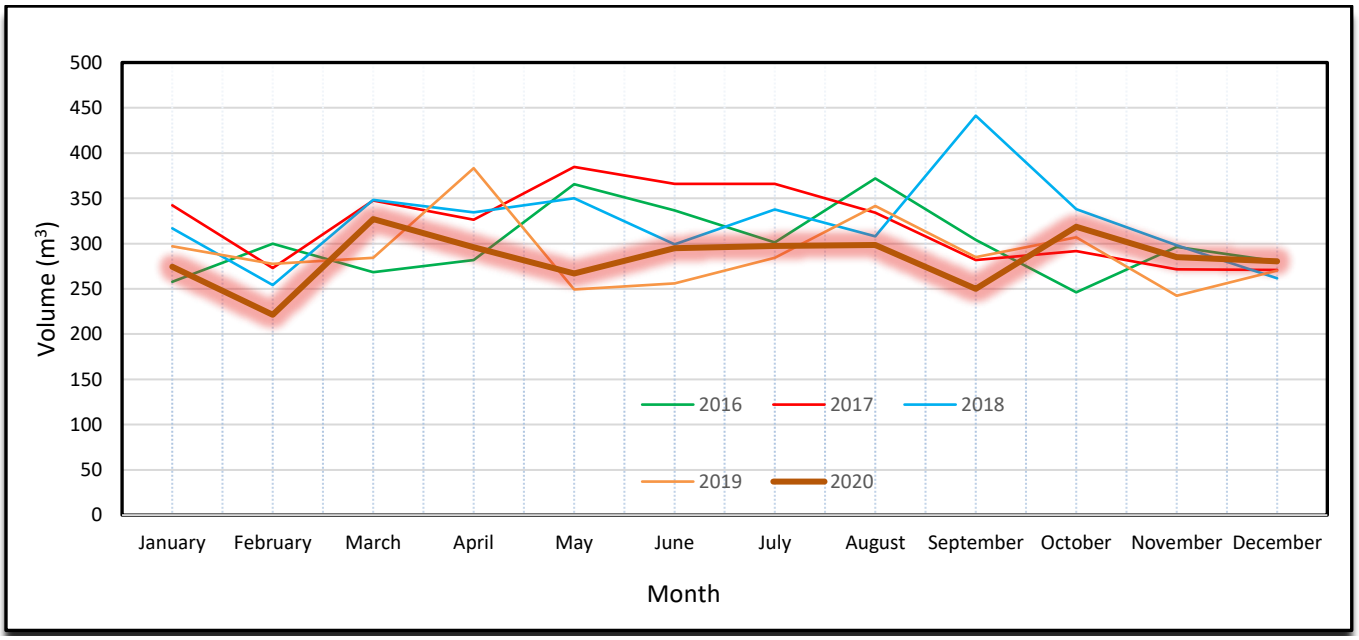

Figure 3: Cedar Lane Water Service Monthly Water Production

The Cedar Lane Water System is fully metered, and water meters are read quarterly. Water meter information enables water production and consumption to be compared in order to estimate leakage losses in the distribution system. The difference between water produced and water demand (total metered consumption) is called non-revenue water and includes distribution leaks, meter error, and unmetered uses such as fire hydrant usage, distribution system maintenance and process water for the treatment plant. Non-revenue water is approximately 1.2%. Water loss is estimated to be slightly lower than this but is considered to be negligible for Cedar Lane.

WATER QUALITY

The analytical results (biological, chemical and physical parameters) of water samples collected in 2020from the Cedar Lane Water System indicated that the water was safe to drink, with the exception of naturally high manganeseconcentrations in the well water which remain insufficiently treated and regularly exceeded the aesthetic limits andoccasionally the health limits established in the Guidelines for Canadian Drinking Water Quality (GCDWQ). Particularly, areas immediately downstream from the treatment plant are vulnerable to manganese concentrations in exceedance of the health limit. Iron and manganese precipitates have been a significant nuisance problem in parts of the Cedar Lane water system and caused discolouration of the drinking water. In order to meet the newly introduced health limit for manganese concentrations in drinking water, the existing treatment system must be upgraded or a new water source must be found.

Both wells ran very low during the dry summer months. Well #1 exhibited repeatedly elevated turbidity following heavy rainfall events.

Typical Cedar Lane Water System drinking water quality characteristics for 2020 are summarized as follows:

- Source water from both wells was free of any total coliform or *E. coli* bacteria.
- Well #1 registered periods with elevated turbidity throughout the year. The periods were predominantly during the winter months. These raw water turbidity excursions reached levels of up to 21 NTU on August 10, 2020. This event was likely related to extremely low water levels in the well during the late summer period. The treated water turbidity remained under 1 NTU throughout this particular short-term event and also during other raw water turbidity spike events. Therefore, these events have not been a public health concern yet.
- Source water is characterized as hard (143 mg/L $CaCO_3$).
- Both wells exhibited elevated iron and especially high manganese concentrations.
- Treated water was safe to drink and contained no total coliform or *E. coli* bacteria.
- Free chlorine residual concentrations were acceptable and within the desired range (i.e., 0.33 – 1.23 mg/L)
- Disinfection by-products: trihalomethanes (THM) were well below (35.25 µg/L) the GCDWQ limit of 100 µg/L, haloacetic acids (HAA) were not tested in 2020 due to a history of very low concentrations in this system.
- Metals were typically below limits except for elevated manganese concentrations. The median annual manganese concentration of 60.15 µg /L in the treated water was consistently above the aesthetic objective in the GCDWQ (20 µg/L) and led regularly to discoloration of the drinking water. But it was also occasionally above the maximum health limit of 120 µg/L, especially in parts of the system that are immediately downstream of the treatment plant. CRD staff are working on mitigation strategies for this issue.

Table 1 and 2 below provide a summary of the 2020 raw and treated water test results.

Water Quality data collected from this drinking water system can be reviewed on the CRD website: https://www.crd.bc.ca/about/data/drinking-water-quality-reports

OPERATIONAL HIGHLIGHTS AND CAPITAL IMPROVEMENTS

The following is a summary of the major capital improvements including year ending spending for 2020:

Asset Management Plan (CE.642.4501): A prioritized list of infrastructure replacements, which will serve as the basis for future capital spending plans.

Project	Spending
Budget	$5,000
Project Management	($4)
Contract	($4597)
Project Closed Balance Returned to CWF	**$399**

Safe Work Procedures (CE.699.4505): The work scope includes reviewing and developing safe work procedures for operational and maintenance tasks

Project	Spending
Budget	$5,000
Contract	($930)

Supplies/Materials	($148)
Balance Remaining	**$3,922**

Back-up Power Design (735.4503): Complete electrical designs for new onsite back-up power.

Project	Spending
Budget	$5,000
Project Management	($49)
Balance Remaining	**$4,951**

Electronic Equipment Replacement (CE.750): Pressure transmitter replacement.

Project	Spending
Budget	15,163
Well #1 Pressure Transmitter Replacement	($6,455)
Well #5 Pressure Transmitter Replacement	($3,302)
Water Tank Trans and RTU Replacement	($5,408)
Project Closed Balance Remaining	**$0**

Well #5 Pump Replacement (CE.747): Pump not operating and required replacement.

Project	Spending
Budget	$3,590
Well #5 Pump Replacement	($3,590)
Project Closed Balance Remaining	**$0**

2020 FINANCIAL REPORT

Please refer to the attached 2020 Financial Report. Revenue includes parcel taxes (Transfers from Government), fixed user fees (User Charges), Water Sales (Sale-Water), interest on savings (Interest Earnings), and miscellaneous revenue such as late payment charges (Other Revenue).

Expenses includes all costs of providing the service. General Government Services includes budget preparation, financial management, utility billing and risk management services. CRD Labour and Operating Costs includes CRD staff time as well as the costs of equipment, tools and vehicles. Debt servicing costs are interest and principal payments on long term debt. Other Expenses includes all other costs to administer and operate the water system, including insurance, supplies, water testing and electricity.

The difference between Revenue and Expenses is reported as Net Revenue (expenses). Any transfers to or from capital or reserve funds for the service (Transfers to Own Funds) are deducted from this amount and it is then added to any surplus or deficit carry forward from the prior year, yielding an Accumulated Surplus (or deficit) that is carried forward to the following year.

WATER SYSTEM PROBLEMS - WHO TO CALL:

To report any event or to leave a message regarding the Cedar Lane water system, call either:

CRD water system emergency call centre: **1-855-822-4426 (toll free)**
CRD water system emergency call centre: **1-250-474-9630 (toll)**
CRD water system general enquiries: **1-800-663-4425 (toll free)**

When phoning with respect to an emergency, please specify to the operator, the service area in which the emergency has occurred.

Submitted by:	Matthew McCrank, MSc., P.Eng, Senior Manager, Wastewater Infrastructure Operations
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Concurrence	Ted Robbins, BSc, C.Tech, General Manager, Integrated Water Services

Attachments:

Table 1: 2020 Summary of Raw Water Test Results, Cedar Lane Water System

Table 2: 2020 Summary of Treated Water Test Results, Cedar Lane Water System

Attachment 1: 2020 Financial Report

For questions related to this Annual Report please email saltspring@crd.bc.ca

Table 1: 2020 Summary of Raw Water Test Results, Cedar Lane Water System									
PARAMETER		**2020 ANALYTICAL RESULTS**				**CANADIAN GUIDELINES**	**2010 - 2019 RESULTS**		
Parameter Name	Units of Measure	Annual Median	Samples Analyzed	Range Minimum	Range Maximum	≤ = Less than or equal to	Median	Samples Analyzed	Range Minimum-Maximum
ND means Not Detected by analytical method used									
Physical Parameters/Biological									
Colour, True	TCU	Last analyzed in 2013				≤ 15 AO	2.8	2	2.5 - 3.1
Conductivity @ 25C	uS/cm	Last analyzed in 2009							
Hardness as $CaCO_3$	mg/L	**143.0**	8	111.0	176.0	No Guideline Required	137.0	50	90.5 - 193.0
pH	pH Units	**7.35**	4	7.30	7.40	7.0-10.5 AO	7.47	34	7.26 - 8.60
Total Organic Carbon	mg/L	**0.94**	8	ND	1.50		1.28	24	ND - 2.35
Turbidity	NTU	**0.35**	24	ND	21.0		0.64	72	ND - 16.0
Water Temperature	Degrees C	**12.5**	24	11.0	14.5	≤ 15 AO	12.0	209	5.0 - 17.0
Microbial Parameters									
Indicator Bacteria									
Coliform, Total	CFU/100 mL	**ND**	25	ND	0		0	226	0 - 800
E. coli	CFU/100 mL	**ND**	24	ND	0		0	226	0 - 19
Hetero. Plate Count, 35C (2 day)	CFU/1 mL	Last tested in 2014							
Parasites						No MAC Established			
Cryptosporidium , Total oocysts	oocysts/100 L	Last tested in 2014				Zero detection desirable	0	1	0
Giardia , Total cysts	cysts/100 L	Last tested in 2014				Zero detection desirable	0	1	0
Metals									
Aluminum	ug/L as Al	**ND**	8	ND	3.90	2900 MAC / 100 OG	ND	50	ND - 108.0
Antimony	ug/L as Sb	**ND**	8	ND	0.0	6 MAC	ND	50	ND - 0.0
Arsenic	ug/L as As	**0.39**	8	0.15	1.64	10 MAC	0.30	50	ND - 1.14
Barium	ug/L as Ba	**8.70**	8	4.40	12.1	1000 MAC	5.35	50	ND - 15.0
Beryllium	ug/L as Be	**ND**	8	ND	0.0		ND	50	ND - 0.0
Bismuth	ug/L as Bi	**ND**	8	ND	0.0		ND	40	ND - 0.0
Boron	ug/L as B	**41.5**	8	ND	67.0	5000 MAC	ND	50	ND - 99.0
Cadmium	ug/L as Cd	**ND**	8	ND	0.0	5 MAC	ND	50	ND - 0.10
Calcium	mg/L as Ca	**43.75**	8	33.5	54.8	No Guideline Required	41.2	50	25.7 - 58.7
Chromium	ug/L as Cr	**ND**	8	ND	0.0	50 MAC	ND	50	ND - 1.5
Cobalt	ug/L as Co	**ND**	8	ND	0.0		ND	50	ND - 0.0
Copper	ug/L as Cu	**1.94**	8	1.36	4.27	2000 MAC / ≤ 1000 AO	2.76	50	ND - 21.5
Iron	ug/L as Fe	**114.0**	8	20.6	4170	≤ 300 AO	116.5	52	11.4 - 3540
Lead	ug/L as Pb	**0.66**	8	ND	1.50	5 MAC	0.39	50	ND - 9.29
Lithium	ug/L as Li	**17.95**	4	15.7	20.5		17.7	19	14.7 - 21.4
Magnesium	mg/L as Mg	**8.07**	8	6.69	9.77	No Guideline Required	8.51	50	6.15- 11.2
Manganese	ug/L as Mn	**392.5**	8	292.0	491.0	120 MAC / ≤ 20 AO	391.0	52	92.0 - 1140.0
Molybdenum	ug/L as Mo	**ND**	8	ND	0.0		ND	50	ND - 0.0
Nickel	ug/L as Ni	**ND**	8	ND	0.0		ND	50	ND - 1.30
Potassium	mg/L as K	**0.25**	8	0.22	0.28		0.26	50	ND - 0.58
Selenium	ug/L as Se	**ND**	8	ND	0.0	50 MAC	ND	48	ND - 0.29
Silicon	mg/L as Si	**9.43**	8	8.60	10.70		9.49	50	0.53 - 11.7
Silver	ug/L as Ag	**ND**	8	ND	0.0	No Guideline Required	ND	50	ND - 0.0
Sodium	mg/L as Na	**53.05**	8	41.4	60.0	≤ 200 AO	53.2	50	37.6 - 78.9
Strontium	ug/L as Sr	**455.5**	8	354.0	549.0	7000 MAC	395	50	280 - 559
Sulphur	mg/L as Si	**6.70**	8	4.70	8.30		6.45	40	3.70 - 8.80
Tin	ug/L as Sn	**ND**	8	ND	0.0		ND	48	ND - 0.0
Titanium	ug/L as Ti	**ND**	8	ND	0.0		ND	50	ND - 0.0
Thallium	ug as Tl	**ND**	8	ND	0.0		ND	40	ND - 0.0
Uranium	ug/L as U	ND	**8**	ND	0.11	20 MAC	ND	40	ND - 0.14
Vanadium	ug/L as V	**ND**	8	ND	0.0		ND	50	ND - 0.0
Zinc	ug/L as Zn	**6.85**	8	ND	14.7	≤ 5000 AO	9.65	50	ND - 211.0
Zirconium	ug/L as Zr	ND	8	ND	0.0		ND	40	ND - 0.0

Table 2: 2020 Summary of Treated Water Test Results, Cedar Lane Water System									
PARAMETER		**2020 ANALYTICAL RESULTS**				**CANADIAN GUIDELINES**	**2010 - 2019 RESULTS**		
Parameter Name	Units of Measure	Annual Median	Samples Analyzed	Range Min.	Range Max.	≤ = Less than or equal to	Median	Samples Analyzed	Range Min.-Max.
ND means Not Detected by analytical method used									
Physical Parameters									
Alkalinity, Total	mg/L	Last analyzed in 2009							
Carbon, Total Organic	mg/L as C	**0.94**	4	0.66	1.40		1.15	20	ND - 2.52
Colour, True	TCU	Last analyzed in 2009				≤ 15 AO			
Conductivity @ 25C	uS/cm	Last analyzed in 2009							
Hardness as $CaCO_3$	mg/L	**146.5**	16	140.0	158.0	No Guideline Required	141.0	38	123.0 - 161.0
pH	pH units	**7.60**	2	7.60	7.60	7.0-10.5 AO	7.74	23	7.50 - 8.10
Turbidity	NTU	**0.40**	12	0.30	0.55	1 MAC and ≤ 5 AO	0.41	60	ND - 1.20
Water Temperature	Degress C	**8.0**	110	6.5	18.5	≤ 15 AO	12.0	1850	0.0 - 22.0
Microbial Parameters									
Indicator Bacteria									
Coliform, Total	CFU/100 mL	**ND**	48	ND	0	0 MAC	0	257	0 - 120
E. coli	CFU/100 mL	**ND**	48	ND	0	0 MAC	0	257	ND - 0
Hetero. Plate Count 7 day	CFU/1 mL	Not tested in 2020				No Guideline Required	10	44	0 - 2600
Disinfectants									
Disinfectants									
Chlorine, Free Residual	mg/L as Cl2	**0.69**	110	0.33	1.23	No Guideline Required	0.57	2061	0.03 - 2.20
Chlorine, Total Residual	mg/L as Cl_2	**0.63**	110	0.30	1.10	No Guideline Required	0.68	2057	0.11 - 2.20
Disinfection By-Products									
Trihalomethanes (THMs)									
Bromodichloromethane	ug/L	**13.0**	4	9.9	14.0		10.0	22	5.29 - 15.0
Bromoform	ug/L	**ND**	4	ND	1.0		ND	22	ND - 1.0
Chloroform	ug/L	**17.0**	4	9.4	24.0		16.0	22	5.89 - 180
Chlorodibromomethane	ug/L	**5.90**	4	5.0	7.5		5.09	22	ND - 8.3
Total Trihalomethanes	ug/L	**35.0**	4	28.0	42.0	100 MAC	30.0	22	20.0 - 185
Haloacetic Acids (HAA)									
HAA5	ug/L	Not tested in 2020				80 MAC	3.25	2	0.96 - 5.55
Metals									
Aluminum	ug/L as Al	**ND**	16	ND	5.0	2900 MAC / 100 OG	ND	38	ND - 73.0
Antimony	ug/L as Sb	**ND**	16	ND	0.0	6 MAC	ND	38	ND - 0.0
Arsenic	ug/L as As	**0.28**	16	0.19	0.37	10 MAC	0.28	38	ND - 0.82
Barium	ug/L as Ba	**6.65**	16	4.8	8.1	1000 MAC	6.50	38	ND - 29.0
Beryllium	ug/L as Be	**ND**	16	ND	0.0		ND	38	ND - 0.0
Bismuth	ug/L as Bi	**ND**	16	ND	0.0		ND	32	ND - 0.0
Boron	ug/L as B	**51.0**	16	ND	59.0	5000 MAC	ND	38	ND - 64.0
Cadmium	ug/L as Cd	**ND**	16	ND	0.0	5 MAC	ND	38	ND - 0.0
Calcium	mg/L as Ca	**46.2**	16	43.4	50.8	No Guideline Required	44.3	38	37.5 - 51.5
Chromium	ug/L as Cr	**ND**	16	ND	0.0	50 MAC	ND	38	ND - 0.0
Cobalt	ug/L as Co	**ND**	16	ND	0.0		ND	38	ND - 0.0
Copper	ug/L as Cu	**15.5**	16	9.66	44.0	2000 MAC / ≤ 1000 AO	18.65	38	10.0 - 48.8
Iron	ug/L as Fe	**18.9**	16	ND	49.8	≤ 300 AO	26.0	39	ND - 138.0
Lead	ug/L as Pb	**0.66**	16	0.21	2.27	5 MAC	0.53	38	ND - 1.66
Lithium	ug/L as Li	**17.1**	8	16.5	18.3		18.3	12	16.9 - 19.6
Potassium	ug/L as K	**0.26**	16	0.24	0.28		0.26	38	0.24 - 0.51
Magnesium	mg/L as Mg	**7.85**	16	7.32	8.29	No Guideline Required	7.38	38	6.47 - 9.39
Manganese	ug/L as Mn	**60.15**	16	6.4	183.0	120 MAC / ≤ 20 AO	82.1	39	22.3 - 357.0
Molybdenum	ug/L as Mo	**ND**	16	ND	0.0		ND	38	ND - 0.0
Nickel	ug/L as Ni	**ND**	16	ND	0.0		ND	38	ND - 0.0
Selenium	ug/L as Se	**ND**	16	ND	0.0	50 MAC	ND	37	ND - 0.21
Silicon	ug/L as Si	**9.75**	16	9.04	10.3		9.44	38	ND - 10400.0
Silver	ug/L as Ag	**ND**	16	ND	0.0	No Guideline Required	ND	38	ND - 0.0
Sodium	mg/L as Na	**52.15**	16	51.0	53.1	≤ 200 AO	53.8	38	38.8 - 68.0
Strontium	ug/L as Sr	**460.0**	16	404.0	497.0	7000 MAC	415.0	38	343.0 - 445.0
Sulphur	mg/L as S	**6.25**	16	5.80	7.50		6.55	32	5.30 - 8.90
Tin	ug/L as Sn	**ND**	16	ND	0.0		ND	37	ND - 0.0
Titanium	ug/L as Ti	**ND**	16	ND	0.0		ND	38	ND - 0.0
Thallium	ug/L as Tl	**ND**	16	ND	0.0		ND	32	ND - 0.0
Uranium	ug/L as U	ND	16	ND	0.0	20 MAC	ND	32	ND - 0.0
Vanadium	ug/L as V	**ND**	16	ND	0.0		ND	38	ND - 0.0
Zinc	ug/L as Zn	**17.7**	16	10.3	37.4	≤ 5000 AO	19.2	38	ND - 207.0
Zirconium	ug/L as Zr	ND	16	ND	0.0		ND	32	ND - 0.0

CAPITAL REGIONAL DISTRICT

CEDAR LANE WATER
Statement of Operations (Unaudited)
For the Year Ended December 31, 2020

	2020	2019
Revenue		
Transfers from government	11,951	13,090
User Charges	36,700	37,350
Sale - Water	12,391	9,475
Other revenue from own sources:		
Interest earnings	41	189
Other revenue	272	227
Total Revenue	61,354	60,331
Expenses		
General government services	3,211	2,992
Contract for Services	31,160	23,328
CRD Labour and Operating costs	550	540
Debt Servicing Costs	7,853	9,448
Other expenses	12,348	11,132
Total Expenses	55,123	47,439
Net revenue (expenses)	6,232	12,892
Transfers to own funds:		
Capital Reserve Fund	4,096	10,392
Operating Reserve Fund	2,136	2,500
Annual surplus/(deficit)	-	-
Accumulated surplus/(deficit), beginning of year	-	-
Accumulated surplus/(deficit), end of year $	-	-

CAPITAL REGIONAL DISTRICT

CEDAR LANE WATER
Statement of Reserve Balances (Unaudited)
For the Year Ended December 31, 2020

	Capital Reserve	
	2020	**2019**
Beginning Balance	92,334	84,599
Transfer from Operating Budget	4,096	10,392
Transfer to Capital Project	(23,753)	(5,000)
Interest Income	1,757	2,344
Ending Balance	74,434	92,334

	Operating Reserve	
	2020	**2019**
Beginning Balance	23,935	20,832
Transfer from Operating Budget	2,136	2,500
Interest Income	257	603
Ending Balance	26,328	23,935