Town of Smithers

2019 Annual Water Public Report

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2019 Annual Water Public Report

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Water Distribution System History

Since 1992, water purveyors in B.C. have been required to possess an Operating Permit issued by their Regional Health Authority, which includes following the *Guidelines for Canadian Drinking Water Quality*), and the *British Columbia Drinking Water Protection Act* and *Drinking Water Protection Regulation*

Water Distribution System Description

The Town of Smithers water system currently draws water from three wells. Well #1 (19th Avenue) is located about 30 feet away from the original well and is connected to the same pumphouse. It is 268 feet deep and in a sand and gravel aquifer with a 12 inch telescoping screen between 234 and 265 feet. This pumphouse is used for annual chlorine application for Spring Water Main Flushing.

Well #2 (Victoria Street well) is 244 feet deep, in the same aquifer, well confined from potential contamination from an old landfill site, and with a similar screen from 193 to 235 feet. Its capacity is unknown, but lower than Well #1.

Well #3 (Riverside Park) is located adjacent to the Bulkley River, is 92 feet deep gravel aquifer with a similar screen from 64 to 85 feet.

The Town reported that the Well #1 (19th Avenue) currently produces about 70 L/s (1,100 USGPM), the Well #2 (Victoria Street) produces about 17 L/s (270 USGPM) and the Well #3 (Riverside Park) produces about 60 L/s (950 USGPM). The system serves approximately 5,400 people.

Standards

The Town of Smithers has a Northern Health Authority permit to operate a drinking water system with 301 -10000 connections (copy of permit attached – Appendix "A"). The Emergency Response Plan is reviewed and updated annually or as required.

Three samples are collected weekly and tested for Bacteria. This schedule was setup with the Environmental Health Officer in 2018 to accommodate the limited days that is available to send out the samples weekly. Overall the Town of Smithers tests at least 9 different locations each month. These samples are taken to the local Northern Health Authority Office and sent to an accredited lab for testing and analyzed for presence of Total Coliform and *E. coli*.

In 2019 there were a total of 142 samples collected, and of the samples collected, 0 were positive for Total Coliforms but 10 tested positive for background growth which could be attributed to many things including handling and testing practices. The samples were resent and came back negative for background growth. Of the samples collected, 0 contained *E. coli*. A complete breakdown of Total Coliforms and *E. coli* results can be found in Appendix 'B'.

Chemical testing is done annually from each source, or at the request of the Environmental Health Officer, and are sent to an accredited lab from Northern Health Authority for testing and are analyzed for chemical and physical parameters including potability, metals and mercury. A history of results can be found in Appendix C.

The results can also be found at Healthspace.ca/nha - Smithers Community Water Systems - Samples

Health Canada has established a new **Health-Based Guideline** in 2019 for manganese with a **M**aximum **A**cceptable **C**oncentration (**MAC**) of 0.12 mg/L and an **A**esthetic **O**bjective (**AO**) of 0.02 mg/L. Lab analysis indicated that the water was slightly soft with relatively low mineral content. It met objectives except that the manganese level in two of the wells were 0.163 mg/L and 0.152 mg/L, both of which are slightly above the maximum acceptable concentration level of 0.12 mg/L.

Other than a high Manganese (Mn) count, which is an aesthetic objective, there were no other exceedances identified during testing. The Town of Smithers water quality meets or exceeds Guidelines for Canadian Drinking Water Quality.

Manganese (Mn)

Manganese is an essential element for humans and occurs naturally in the environment and is widely distributed in air, water and soil. The main problem with manganese in drinking water has to do with undesirable taste and discoloration (black) of the water. Aesthetic Quality Guidelines address parameters, which may affect consumer acceptance of drinking water, such as taste, odour and color. Operational guidelines are set for parameters that may affect processes at a treatment plant or in the drinking water distribution system. The Maximum Aesthetic Objective (MAC) for manganese in drinking water is 0.12 mg/L. As with iron, the presence of manganese in water may lead to the accumulation of microbial growths in the distribution system. Even at concentrations below 0.12 mg/L, manganese may form coatings on water distribution pipes that may slough off as black precipitates. We are actively looking for grant money in order to upgrade our system and treatment plant.

Manganese levels for Well # 1 (19th Avenue) 0.152 mg/L, and Well #2 (Victoria Street) 0.104 mg/L and Well #3 (Riverside) 0.163 mg/L.

For more information regarding drinking water, please refer to Health Canada and the Canadian Drinking Water Guidelines (CDWG) Canadian Drinking Water Guidelines - Manganese.

Water Storage Facilities

The distribution system includes two reservoirs, both of which float on the system. The Float on the System is a method of operating a water storage facility. Daily flow

into the facility is approximately equal to the average daily demand for water. When consumer demands for water are low, the storage facility will be filling. During periods of high demand, the facility will be emptying. The reservoir levels are lowered and raised significantly each day. One reservoir is 265,000 gallons and is approximately 10 feet deep. The other is 1,000,000 gallons and 25 feet deep. Both have a single inlet/outlet and the distribution system is flushed annually.

The main Moncton Road reservoir was built in 1975. The reservoir has been tested and the Condition Survey is on file in the Chief Operator's Office as well as in the Engineering Department at the Town Office. This reservoir was cleaned in 2005 and is scheduled for cleaning in 2020.

The small reservoir on Zobnick Road was built in 1950; it contains two compartments and is underground. Access is by manhole. The Zobnick reservoir was cleaned in September 2015.

Well Maintenance

Well maintenance is a critical component of our water infrastructure maintenance program. As the water from the three wells is introduced into our distribution grid untreated, we conduct maintenance and monitoring. The water levels are measured and recorded to ensure the aquifer is not over utilized and the system is checked for malfunctions. The system is flushed regularly and all activities around the wells are closely monitored and regulated. The Environmental Operators Certification Program of British Columbia certifies the employees who maintain this facility. Smithers has a Class 1 system and the Town has three employees who are all level 2 certified that maintain the facilities.

Valve Exercising

Valves are interspersed along water mains and can be shut or opened to alter the flow of water. The Town of Smithers staff began a valve-exercising program in 2003. The Town of Smithers crew inspects each valve annually, exposing buried valves, making repairs and exercising every valve by turning it first to a closed position then back to open. This process begins in June and lasts approximately two weeks. When the water main flushing program is completed in May, the valves are checked to ensure all valves are open to give us adequate water supply and fire protection.

The Town of Smithers has 635 flow control valves attached to the underground network. The valves are primarily used to control the direction of water flow and to isolate areas of the network for inspection or repair. The expected service life of a flow control valve is 40 to 50 years without cathodic protection and 100 years with cathodic protection. Cathodic Protection (CP) is a technique used to control the corrosion of metal surface by making it the cathode of an electrochemical cell.

Water Main Flushing

The Town of Smithers initiated a water main flushing program in 1978. In 2002, the Town of Smithers replaced the old chlorine gas system with a new hypochlorite (liquid chlorine) system. Each main is flushed annually in the month of May during daytime hours and flushes its 49.2 km of water mains. Chlorine is added the week before and during flushing.

The Town of Smithers follows the Guidelines for Canadian Drinking Water Quality (GCDWQ) protocols regarding the levels of Chlorine that is used. More information regarding Chlorine can be found at Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Chlorine.

In addition to accumulated debris, some areas of the water system are susceptible to water stagnation, where water usage is low or water mains terminate at a cul-de-sac or dead-end water main. Accumulated debris and stagnant water inhibit flow through mains, cause dirty water and create a favourable environment for bacteria growth. In response to these concerns, chlorine is added during flushing to offset any bacteria that might be disturbed during the flushing program.

The Town of Smithers takes the responsibility of a water supplier very seriously and takes pride in the fact that we maintain a system that provides the Town of Smithers with the highest quality of potable water.

COMPLETED PROJECTS

In 2019 the Town of Smithers undertook the following:

- Flushed every water main
- Maintained 3 pump stations
- Repaired 2 main line repairs
- Repaired 4 water main valves
- Repaired 12 water serviced boxes
- Repaired 3 fire hydrants
- Turned on/off 9 water services
- Conducted 142 microbiological tests and continued a dedicated water sampling and testing program
- Detected no fecal coliform in any test
- Installed 5 new water meters with R-900i meters
- Total water pumped in 2019 = 858,921 cubic meters
- Maintained emergency generator by running it once a month for an hour

FUTURE PLANS

The Town of Smithers plans to replace cast iron water mains.

Respectfully submitted,

Dale Chartrand
Chief Utilities Operator

DC/jb

Town of Smithers

APPENDIX "A"

2019 Ministry of Health Permit

PERMIT
TO OPERATE

A Drinking Water System with 301-10000 Connections

System Name:	Smithers Community Water System
Physical Location:	Smithers Community Water System 1027 Aldous Street Smithers BC
Owner Name:	Town of Smithers

Conditions of Permit

> Bacteriological sampling required minimum of twice weekly, from locations that are representative of the distribution system, as approved by the Environmental Health Officer.
> Chemical sampling is required minimum yearly, from each source, or at the request of the Environmental Health Officer.
> An Emergency Response plan shall be maintained and updated annually; or as required.

1-Jul-1992
Effective Permit Date

Environmental Health Officer

30-Jun-2016
Permit Revised Date

This permit must be displayed in a conspicuous place and is non-transferable

northern health
Expires March 2021
1352

northern health
the northern way of caring

Town of Smithers

APPENDIX "B"

2019 Bacteriological Test Results

ANALYTICAL REPORT

Town of Smithers - Drinking water

LAB #				N909122-01	N909122-02
SAMPLED DATE				17-Sep-19	17-Sep-19
SAMPLED TIME				12:40	12:58
SAMPLE ID				19th Ave Well	Victoria St Well
	MRL	*Units*	*CDWG*		
Bacteriological Parameters (Water)					
Total Coliforms	1	CFU/100 mL	MAC = None Detected (<1)	<1	<1
E. coli	1	CFU/100 mL	MAC = None Detected (<1)	<1	<1
General Parameters (Water)					
pH	1.0	pH units	7.0-10.5	**8.3**	**8.2**
Alkalinity (total, as CaCO3)	1	mg/L	-	**210**	**220**
Conductivity	1.0	uS/cm	-	**421**	**405**
Colour	1	PtCo units	AO <= 15	**6**	**2**
Turbidity	0.05	NTU	MAC = 1	**0.05**	**0.07**
Solids, Total Dissolved / TDS	1.0	mg/L	AO <= 500	**250**	**250**
Calculated Parameters (Water)					
Nitrate (as N)	0.10	mg/L	MAC = 10	<0.10	<0.10
Hardness, Total (as CaCO3)	0.500	mg/L	-	**89.3**	**66.9**
Anions (Water)					
Chloride	1.0	mg/L	AO <= 250	**14.2**	**3.5**
Fluoride	0.05	mg/L	MAC = 1.5	**0.13**	**0.14**
Nitrite (as N)	0.01	mg/L	MAC = 1	<0.01	<0.01
Nitrate + Nitrite (as N)	0.10	mg/L	MAC = 10	<0.10	<0.10
Sulfate	1.0	mg/L	AO <= 500	**2.1**	**6.1**
Total Metals (Water)					
Aluminum, total	0.0050	mg/L	OG < 0.1	<0.0050	<0.0050
Antimony, total	0.00020	mg/L	MAC = 0.006	<0.00020	<0.00020
Arsenic, total	0.00050	mg/L	MAC = 0.01	**0.00161**	**0.00247**
Barium, total	0.0050	mg/L	MAC = 1	**0.0891**	**0.0957**
Beryllium, total	0.00010	mg/L	-	<0.00010	<0.00010
Bismuth, total	0.00010	mg/L	-	<0.00010	<0.00010
Boron, total	0.0050	mg/L	MAC = 5	**0.0428**	**0.0466**
Cadmium, total	0.000010	mg/L	MAC = 0.005	<0.000010	<0.000010
Calcium, total	0.20	mg/L	-	**22.7**	**17.1**
Chromium, total	0.00050	mg/L	MAC = 0.05	**0.00072**	**0.00077**
Cobalt, total	0.00010	mg/L	-	<0.00010	<0.00010

Northern Laboratories (2010) Ltd.
Address: 530 3rd Avenue West Prince Rupert, BC V8J 1L8
Phone: 250.627.1906 • Fax: 250.627.8214 • www.norlabsltd.com • info@norl

ANALYTICAL REPORT

Town of Smithers - Drinking water

LAB #				N909122-01	N909122-02
SAMPLED DATE				17-Sep-19	17-Sep-19
SAMPLED TIME				12:40	12:58
SAMPLE ID				19th Ave Well	Victoria St Well
	MRL	Units	CDWG		
Total Metals (continued)					
Copper, total	0.00040	mg/L	AO = 1 MAC = 2	0.00161	0.0101
Iron, total	0.010	mg/L	AO <= 0.3	<0.010	<0.010
Lead, total	0.00020	mg/L	MAC = 0.005	**0.00020**	**0.00089**
Lithium, total	0.00010	mg/L	-	**0.00321**	**0.00400**
Magnesium, total	0.010	mg/L	-	**7.89**	**5.87**
Manganese, total	0.00020	mg/L	AO <= 0.02 MAC = 0.12	0.152	**0.104**
Mercury, total	0.000010	mg/L	MAC = 0.001	<0.000010	<0.000010
Molybdenum, total	0.00010	mg/L	-	**0.00399**	**0.00505**
Nickel, total	0.00040	mg/L	-	<0.00040	**0.00043**
Phosphorus, total	0.050	mg/L	-	<0.050	**0.054**
Potassium, total	0.10	mg/L	-	**1.53**	**1.34**
Selenium, total	0.00050	mg/L	MAC = 0.05	<0.00050	<0.00050
Silicon, total	1.0	mg/L	-	**8.0**	**8.1**
Silver, total	0.000050	mg/L	-	<0.000050	<0.000050
Sodium, total	0.10	mg/L	AO <= 200	**66.9**	**74.5**
Strontium, total	0.0010	mg/L	MAC = 7	**0.311**	**0.271**
Sulfur, total	3.0	mg/L	-	<3.0	<3.0
Tellurium, total	0.00050	mg/L	-	<0.00050	<0.00050
Thallium, total	0.000020	mg/L	-	<0.000020	<0.000020
Thorium, total	0.00010	mg/L	-	<0.00010	<0.00010
Tin, total	0.00020	mg/L	-	<0.00020	<0.00020
Titanium, total	0.0050	mg/L	-	<0.0050	<0.0050
Tungsten, total	0.0010	mg/L	-	<0.0010	<0.0010
Uranium, total	0.000020	mg/L	MAC = 0.02	**0.000687**	**0.000705**
Vanadium, total	0.0010	mg/L	-	**0.0010**	<0.0010
Zinc, total	0.0040	mg/L	AO <= 5	<0.0040	**0.0070**
Zirconium, total	0.00010	mg/L	-	<0.00010	<0.00010

ANALYTICAL REPORT

Town of Smithers - Drinking water

Work Order: NP09122

Glossary of Terms

MRL	Method Reporting Limit
<	Less than the reported detection limit (RDL)
CFU/100 mL	Colony Forming Units per 100 mL
mg/L	Milligrams per Litre
NTU	Nephelometric Turbidity Units
pH units	pH units
PtCo units	Platinum Colbalt colour units
uS/cm	Micro Siemens per centimeter
MAC	Maximum Acceptable Concentration. Values above MAC are formatted with red text and solid outline
AO	Aesthetic Objective (not health related). Values above AO are formatted with a dashed outline
OG	Operational guideline (for treated water)

Standards / Guidelines Referenced

CDWG	Canadian Drinking Water Quality Guidelines (2019) https://www.canada.ca/content/dam/hc-sc/migration/hc-sc/ewh-semt/alt_formats/pdf/pubs/water-eau/sum_guide-res_recom/sum_guide-res_recom-eng.pdf