

# 2021 Public Water System Operation Report

## Spruce Dr. Water Treatment Plant

The Town of Niverville strives to provide the highest quality drinking water in sufficient quantity to meet the needs of the residents. It is our goal to provide this water in a safe, cost-effective manner

while remaining in compliance with all regulatory requirements governing the provision of potable water.

It is our belief that the public has a right to access information related to the potable water they consume. To that end the following report has been prepared for the Town of Niverville public water system.

### **Where do we get our water from?**

The raw water is currently obtained from two supply wells located one mile west of New Bothwell. The wells draw ground water from secured aquifers in the fractured limestone. Both wells were installed in 2017 and are both 200 mm in diameter. The first well has a total depth of 91.4m with a 300 mm welded black steel casing installed to a depth of 27.1 m. The second well has a total depth of 96.6 m with a 300 mm welded black steel casing installed to a depth of 27.4 m. The wells were tested by Friesen Drillers Ltd. to each have an estimated discharge rate of 500 Imperial Gallons Per Minute (IGPM). The raw water from these two wells travel 10.5 km back to the water treatment plant via a 350 mm High-density polyethylene (HDPE) pipeline.

### **Why do we treat our water?**

We treat our water to ensure that safe and aesthetically pleasing potable water is supplied to our community. The Town of Niverville is committed to meeting and/or exceeding the water quality standards set by the province.

### **What is our treatment process?**

Raw water is pumped from the fractured limestone aquifer to the water treatment plant. The raw water is then dosed with an anti-scalant upstream of the dual train reverse-osmosis (RO) skid. On-skid piping and controls allow up to 30% of the raw water to bypass the RO and be blended back into the permeate stream. This gives the finished water a desired hardness level and minimizes the need for stabilization chemicals. Following filtration, permeate water is dosed with sodium hydroxide (caustic soda) to adjust the pH level of the finished water to around 7.5.

It is also dosed with aqua mag blended phosphate which is a corrosion inhibitor to limit corrosion of various metal piping. Finally, it is dosed with sodium hypochlorite (chlorine) for disinfection. The treated water is then stored in two, below grade reservoirs with a combined capacity of 1,700 m<sup>3</sup>. This size of storage allows the chlorine proper contact time with the water (minimum 20 minutes) to confirm proper disinfection has taken place.

In the unlikely event of a failure of both RO trains, an emergency bypass allows operators to sidestep the filtering process entirely. In this case, a spare chlorine feed station would be set up and the starting and stopping of the raw water pumps would be completed manually. It is expected that operators would notify the local Drinking Water Officer of their intentions to bypass treatment prior to exercising this option.

### **Why and how do we disinfect our water?**

The final step in the treatment of safe water is disinfection. Disinfection is the selective destruction or inactivation of disease-causing organisms in water. The *Drinking Water Safety Act* and supporting regulations require that potable water be in contact with chlorine for a minimum of 20 minutes before it enters the distribution system. The Town uses sodium hypochlorite (chlorine) to disinfect our water. The provincial standards mandate that the Town maintains a minimum residual chlorine level of 0.5 mg/L leaving the water plant.

### **What is our water plant classification and who is certified?**

The facility classification and operator certification fall under The Environmental Acts Water and Wastewater Facility Operators Regulations. Currently, the water treatment plant, and the water distribution system are classified as a Class 2 facility. The Town of Niverville has the following operators available.

#### Water Treatment

Class II – 2 Certified Operators

#### Water Distribution

Class II – 2 Certified Operators

### **What is the ‘distribution system’?**

The water distribution system is the network of underground pipes used to carry the treated water from the water treatment facility to the homes & businesses within our community. We have both PVC (C-900) and High-density polyethylene (HDPE) piping through parts of the Town. The piping is interconnected (looped) to ensure that fresh safe water is continuously supplied. We carry out regular maintenance in the distribution system such as our seasonal flushing program and fire hydrant testing in cooperation with the Town of Niverville Volunteer Fire Department.

### Who do we serve water to?

The water distribution system is comprised of 1,328 service connections. All (100%) of the homes and businesses connected to the distribution system are metered.

Classification	Size	Number
Residential (Single / Multi)	5/8", 3/4"	1294
Commercial / Institutional	1", 1.5", 2", 3"	34
Total		1328

### What are the water rates?

The water rates for the Town of Niverville have not changed since July 2018. The current rate for 1,000 gallons of water is \$11.18. Customers will pay the applicable minimum charge set below which includes the water allowance as listed.

Meter Size	Water Included 1000 of Ratio	Gallons	Customer Service Charge	Water Commodity Charge	Water Total Quarterly Minimum
5/8 inch	1	3,000	\$7.37	\$33.54	\$40.91
3/4 inch	2	6,000	\$7.37	\$67.08	\$74.45
1 inch	4	12,000	\$7.37	\$134.16	\$141.53
1 1/2 inch	10	30,000	\$7.37	\$335.40	\$342.77
2 inch	25	75,000	\$7.37	\$838.50	\$845.87
3 inch	45	135,000	\$7.37	\$1,509.30	\$1,516.67

### Water Quality Standards

The Town's Operating license identifies that our public water system shall operate in a manner that achieves or exceed the quality/treatment standards specified in the table below.

Parameter	Quality Standard
Total Coliform	Less than one total coliform bacteria detectable per 100 mL in all treated and distribution water
E. Coli	Less than one E. Coli bacteria detectable per 100 mL in all treated and distribution water
Chlorine Residual	A free chlorine residual of at least 0.5 mg/L in water entering the distribution system following a minimum contact time of 20 minutes.

	A free chlorine residual of at least 0.1 mg/L always at any point in the water distribution system
Arsenic	Less than or equal to 0.01 mg/L
Benzene	Less than or equal to 0.005 mg/L
Ethylbenzene	Less than or equal to 0.14 mg/L
Fluoride	Less than or equal to 1.5 mg/L
Lead	Less than or equal to 0.005 mg/L
Manganese	Less than or equal to 0.12 mg/L
Nitrate	Less than or equal to 45 mg/L measured as nitrate (10 mg/L measured as nitrogen)
Nitrite	Less than or equal to 3 mg/L measured as nitrite (1 mg/L measured as nitrogen)
Trichloroethylene	Less than or equal to 0.005 mg/L
Tetrachloroethylene	Less than or equal to 0.01 mg/L
Toluene	Less than or equal to 0.06 mg/L
Total Xylenes	Less than or equal to 0.09 mg/L
Uranium	Less than or equal to 0.02 mg/L

The parameters for total coliform and E. Coli are tested every two weeks. These bi-weekly results can be found on our website at <https://www.wheretheyoubelong.ca/wp-content/uploads/2022/03/2021-Bi-Weekly-Samples.pdf>. The other parameters from our licence that require testing were completed on February 23, 2021. These parameters only need to be tested for every three years. The full water analysis can be found on our website at <https://www.wheretheyoubelong.ca/wp-content/uploads/2021/03/2021-Water-Analysis.pdf>. Below is a summary of the testing results for each parameter listed on our licence.

Parameter	Unit	Guide Limit #1	Guide Limit #2	Spruce Drive - Raw Water	Spruce Drive - Treated Water
Arsenic (As)	mg/L		0.01	0.00378	0.00162
Benzene	mg/L		0.005	<0.00050	
Ethylbenzene	mg/L	0.0016	0.14	<0.00050	
Fluoride (F)	mg/L		1.5	0.883	0.196
Lead (Pb)	mg/L		0.005	0.000371	<0.000050
Manganese (Mn)	mg/L	0.02	0.12	0.00626	0.00112
Nitrate (as N)	mg/L		10	<0.0050	0.0066
Nitrite (as N)	mg/L		1	<0.0010	<0.0010
Trichloroethylene	mg/L		0.005	<0.00050	
Tetrachloroethylene	mg/L		0.01	<0.00050	
Toluene	mg/L	0.024	0.06	<0.00050	
Total Xylenes	mg/L	0.02	0.09	<0.00064	
Uranium	mg/L		0.02	0.000249	0.000039

**Is our water tested? What for? When?**

The Town’s operating license identifies that our public water system shall ensure monitoring is completed as set out from the specified table below.

<b>Water Quality Monitoring</b>	
<b>Parameter</b>	<b>Monitoring Requirement</b>
Bacteriological (total coliform and E. coli)	Biweekly sampling program with each set of samples consisting of one raw, one treated, and a minimum of one distribution sample. Consecutive sample sets to be separated by at least 12 days
Free Chlorine (treated water)	One sample per day of water entering the distribution system following at least 20 minutes of contact time
Free Chlorine (distribution system)	At the same times and location(s) as bacteriological distribution system sampling
Total Chlorine (treated water)	One sample per day of water entering the distribution system following at least 20 minutes of contact time
Total Chlorine (distribution system)	At the same times and location(s) as bacteriological distribution system sampling
Free Ammonia (treated water)	One sample per week of water entering the distribution system
General Chemistry (parameter list provided by Office of Drinking Water)	One raw and one treated water sample once every three years
Total Metals (distribution system)	One sample taken at the same time(s) as General Chemistry sampling at a mid-point in the distribution system
Lead	As per the instructions of the drinking water officer
Manganese	Monitoring included in the General Chemical and Total Metals analysis
Other Parameters	As per the instructions of the drinking water officer

**What do we have in place to alert Operations Staff to water emergencies?**

All certified operators are given a smart phone. In the water plant, our filtration system is run on a Supervisory Control and Data Acquisition (SCADA) system which can be accessed via smart phones. The SCADA system allows operators to log in remotely to the water plant to see a real-time display of everything going on in the water plant. Operators can check on the status of pumps, valves, sensors, flows, and chemical dosing. The SCADA system has set numbers for different aspects of the treatment process that need to be met. If one of these numbers is off, or something is not working properly an alarm will go off. Once this happens, Bell MTS Security is notified and will start to call through a list of pre-set Operators until the alarm is acknowledged and accepted. The Operator can then log on to the SCADA system through either their phone or the PC at the water plant to determine the cause of the alarm. By having control of the SCADA system remotely we can minimize down time.

**Were there any emergencies, regulatory compliance issues or other operational issues to report for 2021?**

There were four days between February 5 – 8 where the chlorine level entering the distribution system was below 0.5mg/L free chlorine. The office of drinking water was contacted about this issue on February 5. The contributing factor to the low chlorine level was due to an extremely weak batch of chlorine. Even when dosing at triple speed, the weak chlorine was still not strong enough to bring the free chlorine level above 0.5mg/L. New chlorine barrels were ordered and used to correct this problem.

On the days of March 21, September 26, October 17, and October 31, daily chlorine testing was not completed due to staff scheduling.

Free ammonia testing was not completed during the weeks of August 23 – 27, and November 21 – 27. This was due to staff scheduling.

**Were there any drinking water safety orders issued?**

In the reporting period, no Drinking Water Safety Orders were issued to the Town of Niverville's Spruce Drive water treatment plant.

**Were there any boil water advisories?**

In the reporting period, no Boil Water Advisories were issued to the Town of Niverville's Spruce Drive water treatment plant.

**Were there any warnings issued, or charges laid?**

A letter or direction was sent out from our Drinking Water Officer in February 2021 due to the recurring non-compliance issue of monitoring disinfection residuals. As per our licence, one sample per day of water entering the distribution system needs to be tested for free and total chlorine.

**Were there any major expenses incurred in 2021?**

1. The Town installed two new fire hydrants to bring the hydrant spacing in certain areas to within Town standards.

Approximate cost of the Project - \$30,000

2. New RO membranes were purchased and installed. These membranes have a 5-7-year life span.

Approximate cost of the Project - \$77,000

3. Repairs to the current water treatment plant HVAC system and installation of two new natural gas heaters.

Approximate cost of the Project - \$25,000

### **Future system expansion or expenses expected?**

1. The Town of Niverville has partnered with the Manitoba Water Service Board on the construction of a new water treatment plant building and reservoir. The project was designed and engineered by Associated Engineering. Penn-Co Construction is the general contractor. Construction is expected to be completed in the fall of 2022.

### **Who can we call with questions or concerns regarding our drinking water?**

All calls regarding water (emergency or not), please call the Town of Niverville directory (204)-388-4600 ext.1111 and leave a message. Staff will listen to the message within a reasonable amount of time and respond accordingly.

### **How can you find out about this report?**

This report will be available on or before March 31 of each year. The Town will also post the link to this report on our Facebook page once it is available. The link for this report is <https://www.wheretheyoubelong.ca/wp-content/uploads/2022/03/Annual-Potable-Water-Report-2021.pdf>. Paper copies are available upon request at the Town Office.

If you wish to leave an email (non-emergency) please send it to [ryan@wheretheyoubelong.ca](mailto:ryan@wheretheyoubelong.ca)