

Spruce Dr. Water Treatment Plant

2019 Public Water System Operation Report

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 m³. 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 is 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 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.

Is our water tested? What for? When?

Three different water samples are taken every two weeks. One sample is taken from the raw water (well water), another from the reservoir in the plant, and the last one from a resident’s home within the distribution system. These samples are sent to a Provincially approved lab for analysis to ensure that there are no coliforms or e-coli. Town staff also checks to ensure that the free chlorine level from the reservoir is above the 0.5mg/L as well as a minimum free chlorine level of 0.1mg/L from the sample taken out in our distribution system.

Disinfectant testing: The Town tests the level of chlorine (both free and total) in the reservoir daily to ensure that we are meeting the provincial standard of 0.5mg/L of free chlorine. This will ensure proper disinfection.

The Town also tests for free ammonia once a week from the water plant. Free ammonia testing is done to ensure that the water has reached breakpoint chlorination and the Town is disinfecting with free chlorine instead of mono-chloramines.

Water Quality Standards

The Town’s Operating license identifies that our public water system needs to meet or exceed the quality 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 at all times 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
Fluoride	Less than or equal to 1.5 mg/L
Lead	Less than or equal to 0.01 mg/L in the water distribution system
Nitrate	Less than or equal to 45 mg/L measured as nitrate (10 mg/L measured as nitrogen)
Trichloroethylene	Less than or equal to 0.005 mg/L
Tetrachloroethylene	Less than or equal to 0.03 mg/L
Uranium	Less than or equal to 0.02 mg/L

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, our Auto Dialer will automatically 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 2019?

On May 3rd our free chlorine dropped below 0.5 mg/L. The Town ended up finding a faulty valve. Changes were made and the chlorine level was brought back above the minimum requirement of 0.5mg/L

Were there any major expenses incurred in 2019?

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

Price of Project - \$85,000

2. The water plant was struck by lightning in September. As a result, there were sensitive electronics that failed and needed to be replaced. The repairs are on going. The Town's insurance policy has covered to costs minus the Town's deductible.

Future system expansion or expenses expected?

1. Installation of another 4 fire hydrants in 2020 again to bring the hydrant spacing in certain areas on Town to Town standards.

Approximate cost - \$60,000

2. There are water valves that are currently not working as designed. Over the next few years these valves will systematically be inspected, repaired, and put back into service.

Estimated cost - \$20,000

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

Any and all calls regarding water (emergency or not), please call the Town of Niverville directory (204)-388-4600 ext.111 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, as well as our water analysis and the bi-weekly testing results are available on the Town website www.wheretheyoubelong.ca. Paper copies are available upon request at the Town Office.

The Town will also post on our Facebook page that this report is available.

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