



January 29, 2018

Blyth Drinking Water System – 2017 Compliance Summary

This document is a compliance summary for the Blyth water supply for the year 2017 as per Reg. 170/03 Schedule 22. A full summary of the water system's test results, flows and significant activities was submitted on February 26, 2018

System Description

The Blyth Drinking Water System (DWS # **220001496**), is characterized as a “secure ground water” system and is classified as a large municipal residential system. The system consists of three wells (1, 2 and 5) with a rated capacity of 2877 m³/day with the inclusion of Well 5 (1728 m³/d), put in operation December 21, 2016. Treatment consists of chlorination (sodium hypochlorite) and iron sequestration (sodium silicate) treatment. The Well 1 and 2 system is located at 201 Thuell St. Well #5 is located in the north east corner of 377 Gypsy Lane. The distribution system serves the community of Blyth with a population of approximately 1000 residents, 450 customer services, with 12.7 km of various size and material water main.

The system is owned by the Corporation of the Township of North Huron and operated by Veolia Water Canada, the Operating Authority.

The Wells 1 and 2 water supply system consists of two drilled wells fitted with pumps capable of pumping the volume specified in the MOE Permit to Take Water. The raw water consistently has substantial naturally occurring hardness and relatively high iron content that requires sequestering to prevent discoloration in the distribution system which is typical of all drilled wells in the area. The raw water also has fluoride concentrations that hover at or just above the maximum allowable concentration in O.Reg 169/03 which is typical of the drilled wells in the area. Chlorine, (a critical process) and an iron sequestering agent are added to the raw water prior to entry into a baffled contact tank that satisfies the chlorine contact time required with adequate chlorine residual to disinfect.

From the contact tank/reservoir the water flows to the high lift building that houses two electrically driven high lift pumps, as well as a diesel engine driven fire pump, that are capable of maintaining adequate system pressure. The water level in the reservoir is maintained by a level controller that starts and stops the well pumps. Also housed in the building is a manually operated standby emergency generator that allows operation of the equipment during extended power interruptions. The building contains cushion tanks that absorb hydraulic shocks and maintain pressure during brief power interruptions. The treated drinking water is monitored for chlorine residual and turbidity by on-line equipment connected to an auto dialer. The monitoring system will alert the on-call



operator to respond if the set points are breached. The chlorine and turbidity analysis data levels are stored on a data logger.

The distribution system has no elevated storage and relies on the pumps and cushion tanks to maintain pressure. Critical processes to ensure safe water are adequate chlorination and maintenance of system pressure. The monitors activate an alarm through the auto dialer if the set points are breached.

The raw water has abnormally high chlorine demand, coupled with sequestering agent and high background sodium levels that result in elevated sodium in the treated water just above the maximum allowable concentrations in O.Reg 169/03.

Well # 5 was put into service in December 21, 2016, as a second isolated source. It is a 175 mm drilled well, 83.5 m deep. Well # 5 is equipped with a submersible vertical turbine pump, well level sensor to measure static level and provide well level monitoring. At this stage of development of the system (phase 1 of 3), Well 5 has been designed to operate on a time of day basis to run twice per day during peak demand times and controlled with a variable speed drive to maintain the desired pressure set point in the distribution system as well as to provide additional volume of water during periods of high water demand such as fire protection.

Although the well has not been in service long enough to have stabilized within the aquifer to determine average quality, it appears to be lower in fluoride, sodium and iron, chlorine demand with similar hardness and alkalinities.

The well house is equipped with back-up diesel generator, complete with auto transfer, sodium hypochlorite (2) and sodium silicate (2) pumps, a chlorine contact loop, on-line monitoring, alarm generation and auto-dialer.

The well house and its equipment have a daily maximum capacity to deliver 1728 m³ per day to the Blyth community.

The water from Well 5 is pumped through a main header where sodium hypochlorite and sodium silicate are added and directed to a chlorine contact loop to provide adequate chlorine concentration/contact time at maximum flow and before the first consumer.

The water quality is monitored and data-logged by a programmable logic controller with breaches of set-points going to an alarm dialer.

Disinfection is achieved on the Blyth well supply through the use of 12% sodium hypochlorite. In the well houses this chemical is added prior to the water entering the chlorine contact reservoir at a suitable dose rate to achieve both primary and secondary disinfection objectives.

The attached distribution system is constructed with a combination of ductile iron, cast iron, PVC and high density polyethylene piping with polyethylene, copper and galvanized steel services. There are no known lead services.

There is no elevated storage to maintain pressure and the system pressure is maintained using pressure tanks, 3 high lift pumps (2 electric and a diesel) and 1 variable speed submersible (Well 5).





The system has approximately 45 fire hydrants that with the additional 20L/s flow from the new Well 5 will provide much improved sustained fire flows. Coupled with the new well, flow testing of the hydrants will take place in 2017 to verify the degree of improvement to report to the Fire Chief.

The chlorine dosages range varies with the chlorine demand of the raw water. The free chlorine residual is monitored at the point of entry to the distribution system, by an on-line chlorine analyzer, with a target residual of > 1.00 mg/l and < 1.30 mg/l.

The Blyth well supply has 1 PTTW (Permit To Take Water) # 6057-A3SJAU with an expiry date of November 30, 2025, which allows 3504.960 cubic metres per day to be pumped from the combined wells.

The Blyth Drinking Water System (treatment Subsystem) has maximum flows as specified in the Municipal Drinking Water Licence (MDWL) 090-101, Issue 2 and Drinking Water Works Permit (DWWP) 090-201, Issue 3. The maximum total daily flow is 2877 cubic meters per day. Authorization to operate Well 5 is in a Form C addendum to the DWWP. Well 5

The pre-chlorine entering the contact facilities and treated water (point of entry to distribution) is monitored by on-line chlorine analyzers.

Typical system pressure ranges from 40 psi at the higher elevations to 85 psi at Wells 1 and 2 which is the lowest elevation of the system. Well 5 system pressure ranges between 53psi to 65psi under normal operating conditions

Chemicals Fed Disinfectant

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The maximum daily flow in 2017 was 474 cubic meters or 13.5% of capacity.
The 2017 average daily flow was 469.99 cubic meters or 13.4%

Precautionary Boil Water Notices





There was one precautionary boil water notice issued for the Blyth Water system Users on Blyth Rd east of Howsons transport for 2 water system users, The PBWN was issued on March 8, 2017 because a watermain was damaged resulting in a loss of pressure, samples were taken on March 9, 2017 and the results were received on March 14, 2017 with zero total coliforms or Ecoli, the Precautionary boil water lift notices was distributed to the 2 affected users on March 15, 2017

Boil Water Advisory

There were no Boil Water Advisories issued by the Huron County MOH on the Blyth Drinking Water system in 2017.

Annual Ontario Ministry of the Environment Inspection

Matthew Shannon, MOE Drinking Water Inspector, inspected the water system and examined the water quality and operational records on November 4, 2016. He issued a report of his findings on January 9, 2017.

There were 0 non-compliant issues. The rating was 100%.

Adverse Water Quality Indicators

There was one AWQI for the Blyth Drinking Water system in 2017, One distribution sample collected on August 15, 2017 had a 1cfu/100mL Total Coliform result, Resamples were collected upstream and downstream as well as at the location of the adverse on August 17, 2017 and the results were zero.

Exceedances

Fluoride

O. Reg. 169/03 (the Ontario Drinking Water Standard) has a MAC (maximum allowable concentration) of 1.5 mg/l for fluoride.

The treated water from the Blyth Drinking Water System monitored every 5 years for fluoride. It has naturally occurring levels that can exceed 1.5 mg/L.

As required by O. Reg. 170/03 schedule 13 section 13.9, an AWQI (adverse water quality indicator) is filed every 60 months. The report was last filed in August 2013.

Treated Water Fluoride was not sampled in 2017. A Raw water sample is collected annually to further monitor the natural occurring levels of fluoride, On August 8, 2017 the Raw water fluoride was sampled and the results were as follows:

Well 1: 1.67mg/L

Well 2: 1.86mg/L

Well 5: 1.36mg/L

Sodium

O. Reg. 169/03 (the Ontario Drinking Water Standard) has a MAC (maximum allowable concentration) of 20 mg/l for fluoride.

The treated water from the Blyth Drinking Water System monitored every 5 years for sodium. It has naturally occurring levels that can exceed 20 mg/L.

As required by O. Reg. 170/03 schedule 13 section 13.8, an AWQI (adverse water quality indicator) is filed every 60 months. The report was last filed in August 2013.

Treated Water Sodium was not sampled in 2017. A Raw water sample is collected annually to further monitor the natural occurring levels of sodium, On August 8, 2017 the Raw water Sodium was sampled and the results were as follows:





Well 1: 21.1mg/L
Well 2: 16.1mg/L
Well 5: 16.1mg/L

Fluoride and Sodium 60 Month Samples (5 year) on the treated water will be completed in January 2018.

Infrastructure Assessment

Regular contact is maintained with the Township of North Huron Representatives. The JobsPlus program is continually updated with preventative and corrective maintenance issues. A complete summary can be forwarded to the client upon their request. Through regular communication between the operating authority and the client, capital items are discussed. A list of capital items and concerns was forwarded to North Huron' representatives on October 25, 2017 for the Operating year 2018.

The annual Management Review was conducted by the operating authority on July 19, 2017 as per the DWQMS requirement in Element 14. These regular discussions between the client and the operating authority for this water system are continued throughout the year by emails, phone calls, and meetings as per the requirements of Element 15 of the DWQMS.

The Internal Audit was completed on May 31-June 1 2017 and the Risk Assessment was completed December 20, 2017. Veolia Employees reviewed an Emergency Response exercise on December 20, 2017. This was a table-top discussion involving Office Evacuation in the case of a fire. A review of the Flooding Contingency plan was performed in June 2017 as well.

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