Belgrave Drinking Water System – 2015 Compliance Summary

This is a summary of the Belgrave well supply’s regulatory compliance. A complete summary of flows, chemical use, laboratory analysis and activities on the system was submitted with the Annual Report on February 26, 2016.

System Description
The Belgrave water system is characterized as a “secure ground water” system and is classified as a large municipally owned water system. The well house and its equipment have a daily maximum capacity to deliver 501 cubic metres of potable water per day to the Belgrave community in Morris-Turnberry and the Humphrey subdivision in North Huron. The current water sources are two secure deep bed rock wells. The Jane St. production well is located at 32 Hamilton St. and the McCrea well is located at 23 McCrea St. Both are connected to the treatment plant at 28 McCrea St. via dedicated raw water mains.

The treatment plant is equipped with high lift pumps, backup diesel generator set, chlorinators, a chlorine contact reservoir, green sand filtration for iron removal and online monitoring. The system is controlled and monitored by an on-site PLC.

The Belgrave well supply was put in service May 1, 2007 and replaces the former Jane St, McCrea St. and Humphrey subdivision water systems. The Jane St. and McCrea St. wells were upgraded and retained as sources. The Humphrey subdivision well was abandoned. The Humphrey well house was retained and acts as a sample station and houses an on-line chlorine analyzer for the distribution system.

The distribution system in the Morris-Turnberry side of Belgrave was constructed in 2008 and is constructed of PVC with polyethylene services.

There is a connection to the Humphrey subdivision on the North Huron side. This distribution system is polyethylene and was constructed in the 1980’s.

There is no elevated storage to maintain pressure and therefore, the system pressure is maintained using pressure tanks and the high lift pumps.

The system has no hydrants and lacks the capacity to provide fire flows.

Chemicals Fed
Disinfectant
Disinfection was achieved on the Belgrave well supply through the use of 6% sodium hypochlorite.

In the well house, this chemical was added prior to the water entering the chlorine contact chambers at dosages high enough to achieve both primary and secondary disinfection objectives. The chlorine dosages ranged from 2.49 mg/l to 3.33 mg/l. varying with the chlorine demand of the raw water.
The free chlorine residual was monitored at the point of entry to the distribution system with a target residual of > 0.65 mg/l and < 1.00 mg/l which is typical of the treated water in other municipal water systems.

Iron Removal
The well water at Belgrave has iron levels higher than what is considered aesthetically acceptable. The well house provides chemically assisted iron filtration through green sand pressurized filters. The chemical used is potassium permanganate. This chemical was fed to the raw water prior to the filters.

Flows
The Belgrave water system PTTW (permit to take water) # 5042-8Y5KVG allows 501 cubic metres per day from the combined wells: Jane Well 138.2 and McCrea 362.8. The permit was issued November 12, 2012 and the PTTW expires on October 31, 2022. This limit was not exceeded in 2015. A full summary of the 2015 flows is attached with the annual report sent February 27, 2015.

The Drinking Water Works Permit (DWWP) #247-201 for the Belgrave Drinking Water System was issued on August 2, 2011. The maximum flow allowed is 6.9 litres per second.

The limiting factor regarding flow is chlorine contact time in the chlorine contact reservoir. Flow monitoring is necessary to meet the regulatory CT requirements. Increased flows beyond 6.9 litres per second must have increased free chlorine residual to counter the decreased retention time in the chlorine contact chamber.

The combination of maximum flows through the chlorine contact reservoir and minimum free chlorine residuals exiting the contact reservoir did not exceed limitations in 2015 as recorded by the flow meters and the on-line chlorine analyzer.

The maximum flow in 2015 was 209 cubic meters per day or 41.72% of capacity.
The average flow in 2015 was 65.32 cubic meters per day or 13.03% of capacity.

Precautionary Boil Water Notices
No precautionary boil water notices were placed on the Belgrave system in 2015.

Boil Water Advisory
There were no Boil Water Advisories issued by the Huron County MOH on the Belgrave water system in 2015.

Adverse Water Quality Indicators AWQI
In 2015 the MOE Spills Action Centre and the Huron County Health Unit were notified of 1 AWQI.

1) Jul 7/15 #124848 Total coliform result of 2 cfu/100 ml in the distribution system.
The area was resampled and all results came back clear.

Annual Ontario Ministry of the Environment Inspection
The most recent Ministry of Environment inspection occurred on November 27, 2015. Two non-compliances were noted.
1. There were two inconsistencies noted in the Drinking Water Works Permit. Amendments to the permit have been submitted along with the Municipal Drinking Water License renewal on January 26, 2016.

2. The maximum flow rate for the McCrae well was exceeded numerous times. The valve controlling the flow from the well was turned down to limit the maximum flow. Lockouts are in progress to ensure that no exceedances occur in the future.

**Exceedences**

**Fluoride**

O. Reg. 169/03 (Ontario Drinking Water Standard) has a MAC (maximum allowable concentration) of 1.5 mg/l for fluoride. The water from the Belgrave wells is monitored every 5 years for fluoride. The wells have 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. This was reported November 2012.

The 2015 result reported were as follows:

May 5/15 — 1.48 mg/L

**Infrastructure Assessment**

Regular contact is maintained with the Belgrave representative. 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 discussed with Belgrave’s representatives on December 9, 2015.

The annual Management Review was conducted by the operating authority on April 29, 2015, 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 October 26, 2015 and the Risk Assessment was completed December 9, 2015. The Onsite Audit was completed by SAI on June 22, 2015. The staff was involved with an Emergency Response exercise on December 7, 2015, which involved a severe thunderstorm causing damage to a well head and generator.

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