May 15, 2025

Weca DWS Trihalomethanes and Corrective Actions Report

1.0 System Background

The Weca Drinking Water System (DWS) is classified as a Class I Water Distribution and Supply Subsystem and categorized as a Large Municipal Residential Drinking Water System under O.Reg 170/3, servicing an approximate population of 417 persons through 143 service connections, in the Village of Loretto, Township of Adjala-Tosorontio. Source water is ground water drawn from three (3) municipal wells at three (3) separate pumphouses drilled into a confined aquifer. Combined they were hereafter referred to as the Weca Drinking Water System.

Weca Well No. 1 Pumphouse
Services well water drawn from one well (PW1). Treatment consists of chlorination with contact time, provided by a dedicated chlorine contact main at the pumphouse, for both primary and secondary disinfection.

Weca Well No. 2 Pumphouse
Services well water drawn from one well (PW2). Treatment consists of chlorination with contact time, provided by a dedicated chlorine contact main at the pumphouse, for both primary and secondary disinfection. During power failures, a stand-by diesel generator outside the pumping station supplies the works with power.

Weca Well No. 3 Pumphouse-Loretto Heights
Services well water drawn from one well (PW1-Loretto Heights) and treatment consists of chlorination with contact time, provided by a dedicated chlorine contact main at the pumphouse, for both primary and secondary disinfection. During power failures, a stand-by diesel generator outside the pumping station supplies the works with power. As of September 2022, Weca Well No. 3 (and pumphouse) has been offline. Therefore Well 3 has not supplied the system with raw or treated water. The old well (PW1-Loretto Heights) that was supplying the system is in process of being decommissioned. In 2023, a new well was drilled and is undergoing approvals in order to be placed into service. Anticipated start-up is in Q4 2025.

2.0 Trihalomethanes (THMs) in Drinking Water

The below information is taken from the Simcoe Muskoka District Health Unit (SMDHU) and Health Canada regarding Trihalomethanes (THMs) in Drinking Water. THMs are a group of

compounds that can sometimes be found in chlorinated water which is drawn from a source typically with high levels of organic materials. THM formation is the result of by-products from the process of disinfecting water (i.e., the addition of chlorine to water systems). THMs are produced when chlorine reacts with naturally occurring organics found in the source water. THMs are colourless, tasteless and odourless. It is very important (and legally required) that municipal water be chlorinated as chlorine helps to prevent serious illness from organisms in water that can produce disease. The methods for treating drinking water in a system must be designed and operated to remove or inactivate pathogens as a first priority and minimizing the formation of disinfection by-products is secondary as the health risks from drinking water that has not been disinfected are much higher than the perceived risks from disinfection by-products, including THMs.

The formation of THMs in drinking water systems is dependent on several factors including: temperature, pH, water source, natural organic matter present in source water, chlorine contact time, and water system distribution factors. As such, concentrations of THMs within a drinking water system may vary significantly over time.

Drinking water is carefully treated and monitored by the system operator, and the Ministry of the Environment, Conservation and Parks, as well as the local health unit, to ensure it meets water quality standards. According to the Canadian Drinking Water Guidelines and the Ontario Drinking Water Quality Standards (ODWQS), the maximum acceptable concentration (MAC) for THMs is 0.100 mg/L (100 µg/L). The MAC is based on a locational running annual average (RAA) from a minimum of quarterly samples taken at the point in the distribution system with the highest potential THM level (typically the areas in the distribution system with the longest disinfection retention time, which is typically the furthest point in the distribution system).

Health Canada has stated that “although individual measurements may exceed the guideline value, this would be of concern only if they caused the running average of quarterly samples to exceed the guideline value.” Although Health Canada’s guideline value for THMs is 100 µg/L, they do recommend that THM “concentrations be kept as low as reasonably achievable without compromising the effectiveness of disinfection”. Research indicates that periodic increases in THMs above 100 µg/L have not been found to be associated with negative health impacts. As *there are no established adverse health effects associated with short-term variation in THM concentrations*, using the annual average of THM concentrations as the measure of compliance with standards and guidelines appears to be supported by the best evidence currently available.

3.0 THMs in the Weca Drinking Water System

THM samples have been completed quarterly as required in the Weca Drinking Water System. Historically, THM sampling results have varied. Since 2015, there has been one reportable exceedance of the running annual average (RAA) of 100.0 µg/L, which occurred in quarter 2 of 2024 based on the three quarterly samples taken in Q3 and Q4 of 2023 and Q1 and Q2 of 2024. As a result, the Simcoe Muskoka District Health Unit (SMDHU) and the MECP have indicated that the following corrective actions should be taken:

1) Action should be taken immediately to better understand the causative factors and for the formation of, and for the reduction of these compounds within the distribution system and treatment works.

2) The Owner and Operating Authority should continue to explore methods of reducing the concentrations of THMs found in the distribution system which may include a new source, increased flushing, adjusting operational activities, alternative treatment processes etc.

To aid in determining a course of action to permanently reduce THM concentrations in the Weca distribution system water before they again become adverse, the MECP is requesting that the Owner and the Operating Authority enact the following:

1) Immediately increase the distribution water THM sampling frequency from one sample every quarter to at least four samples every month from the four sample stations farthest from the treatment works (Joseph, Wilony, Simon and Keenan and potentially a fifth location Eliza).
2) Provide a written summary of the activities taken to date in order to limit and control the formation of THMs, and a plan detailing actions and activities that will be taken to limit, control and reduce the formation of THMs going forward.

4.0 Corrective Actions to Limit and Control THMs

In response to the increase in THM concentrations in the Weca DWS, OCWA has taken the following corrective actions to date, on behalf of the Owner, to limit and control the formation of THMs within the distribution system and treatment works:

• Increase the distribution water THM sampling frequency from one sample every quarter to at least four samples every month from the four sample stations farthest from the treatment works (Joseph, Wilony, Simon and Keenan Sample Stations). Monthly sampling began January 2025 and will remain in place until otherwise directed by the MECP and SMDHU. Increased sampling will help to determine if any causative factors, such as organics, temperature, seasonality or location is/are a factor. Further monthly sampling results are required to determine if other causative factors can be associated with THM formation.

• Instituting a diligent monthly distribution system flushing program, inclusive of all the dead-end locations, within the distribution system.

• Treated water free chlorine residuals have been reduced slightly, without compromising disinfection.

The following Capital projects have been planned, pending Ministry approval, which may help to control and limit THM formation:

• As of September 2022, Weca Well No. 3 (and pumphouse) have been offline. The old well (PW1-Loretto Heights) that was supplying the system is in process of being decommissioned. In 2023, a new source well was drilled and is undergoing Ministry approvals in order to be placed into service. The well is anticipated to be placed in service in the Q4 of 2025.

• OCWA, on behalf of the Owner, has submitted an application to add Sodium Silicate (an iron sequestering chemical) to the treatment works at Weca Pumphouse #2 which may help reduce THM formation within the distribution system. The application is currently under review by the Ministry

The above listed corrective actions taken, have thus far provided THM results that are within the regulatory limits for the locational RAA. OCWA will continue with the aforementioned corrective actions and will regularly monitor sample results in order to determine any causative factors and make treatment adjustments, as necessary, in order reduce the formation of THMs within the Weca distribution system.

For more information on THMs in Drinking Water, please visit the Simcoe Muskoka District Health Unit website at: Trihalomethanes in Drinking Water.