

# **St. Clair Township Water Distribution System**

## **2017 Annual Summary Report – O.Reg. 170/03**

Waterworks # 260006464  
Drinking Water Works Permit (DWWP) # 039-201  
Municipal Drinking Water Licence (MDWL) # 039-101

### **Introduction**

The Corporation of the Township of St. Clair owns and operates the St. Clair Township Water Distribution System and supplies potable water to residents and businesses throughout the Township. Potable water is purchased from the Lambton Area Water Supply System (LAWSS), which operates a Water Treatment Plant in Sarnia and a trunk distribution system, serving six Lambton County municipalities.

The Township of St. Clair and the LAWSS operate their facilities in accordance with the Provincial Drinking Water System Regulation 170/03, introduced in June 2003 under the Safe Drinking Water Act, 2002. The new regulation updated Ontario Regulation 459/00 which set standards for all publicly operated water systems in the Province. Among the requirements of the regulation is the production of an Annual Report summarizing the results of water quality testing and an Annual Summary Report outlining the general operation of the water system.

The reports and detailed test results are available at the St. Clair Civic Centre, 1155 Emily Street, Mooretown, Ontario. The Annual Report may also be viewed on the Internet at [stclairtownship.ca](http://stclairtownship.ca). Copies of LAWSS test results and reports, and the regulations and standards are also available for review. If you have any questions concerning this report or the operation of the St. Clair Water System, please call the, Coordinator of Operations Water/Wastewater, Chris Westbrook or the Water/Wastewater Specialist, Nova VanderSlagt at 519-867-2125.

### **History**

The current water supply system serving St. Clair Township has evolved significantly over the years. Initially, several of the urban areas developed their own independent water distribution systems. These systems obtained drinking water from communal wells or the St. Clair River. In the early 1950's, with the development of the Shell Canada Refinery, a piped water supply was obtained from the City of Sarnia to service the Shell Refinery and Corunna.

In the early 1970's, the Ontario Water Resources Commission and local municipalities developed an area water system, LAWSS. It supplied treated water to Point Edward, Sarnia, Moore, Sombra and part of Sarnia Township. This system was expanded in the late 1980's to service municipalities in the northeastern part of Lambton County. The LAWSS provided a safe treated water supply to the urban areas of Brigden, Corunna, Courtright, Mooretown, Port Lambton and Sombra Village in the mid 1970's. In the late 1980's expansion of the Township distribution system began, to service the rural areas of the Township. Today, over 95% of the population is serviced with a piped water supply.

The LAWSS is currently governed by the six-member municipalities and operated under contract by the Ontario Clean Water Agency. The Council of the Township of St. Clair controls the St. Clair Township Water Distribution System.

## **System Description**

Treated Water is supplied by LAWSS 210000906 and distributed to the customers of the St. Clair Water Distribution System 260006464. The system has one re-chlorination point at the Brigden Elevated Water Tower and has emergency interconnections with adjoining Municipalities.

A SCADA system monitors pressure, flow, and chlorine residual at the Brigden Elevated Water Tower. Distribution system continuous monitoring is located at the Port Lambton Storm Station to monitor for free chlorine residual as a daily operational check as per O. Reg. 170/03. Distribution System sampling and testing requirements as per O. Reg. 170/03 are conducted by OCWA. Customers are metered for water usage. Replacement of aging infrastructure is performed under Capital Projects.

The St. Clair Water Distribution System No. 260006464 is currently supplying drinking water to the City of Sarnia Water Distribution System No. 260003136, at St. Clair Parkway and LaSalle Line, owned and operated by the City of Sarnia. The City of Sarnia Water Distribution No. 260003136 is currently supplying St Clair Water Distribution System No. 260006464 at Plank Road North of LaSalle Line.

Processes outside of our control, include the Port Lambton Water Tower, which is owned by LAWSS and operated by OCWA.

## **Annual Highlights**

Frequent watermain flushing and chlorine residual testing is completed to ensure that residuals are remaining at acceptable levels. Monitoring is continuing across the entire Township to ensure that water quality is being maintained.

1. On January 27, 28 and 29, 2017 daily chlorine residuals were not sampled. They are now being continuously monitored at the Port Lambton Storm Station by a CL17 monitored by the SCADA.
2. On April 25, 2017 the Township began using the continuous monitoring equipment at the Port Lambton Storm Station to collect data for daily chlorine residual as per regulatory requirements.
3. On October 18, 2017 OCWA, the Township sampling contractor, reported an adverse test result of 1 TC/100 mL sample from October 16, 2017. The AWQI number is 137400. The MOH and SAC were notified, and a notice of adverse form was submitted. A resample from the adverse location was completed immediately after notification on October 18, 2017. No boil water advisory was issued.
4. On October 30, 2017 Hach was onsite to calibrate the continuous chlorine analyzers (CL17) at the Brigden Water Tower and the Port Lambton Storm Station as well as the 9 hand held pocket colorimeters.
5. On December 6, 2017 the MOECC completed the annual water inspection covering January 1, 2017 – November 31, 2017.

## **Water Quality**

Testing throughout the distribution system is conducted on a weekly basis for chlorine residual and microbiological parameters. The maintenance of chlorine residual in the distribution system is one important step used to prevent microbiological contamination of the water supply. Chlorine is added at the treatment plant and at various locations throughout the distribution system to ensure adequate disinfection capabilities are maintained. The Township is careful to avoid possible contamination during the repair of water mains, the installation of new connections and services, and during routine maintenance.

Appendix 'A' summarizes the results of distribution system testing conducted from January through December 2017. Monitoring is required for parameters such as lead, quarterly for parameters such as trihalomethanes and haloacetic acids, weekly for parameters such as E-Coli, Total Coliform, Heterotrophic Plate Count (HPC) and daily for parameters such as free chlorine residual all monitoring as per O. Reg 170/03. Appendix 'A' also summarizes the results from the non-regulatory continuous online chlorine analyzer at the Brigden Water Tower. Appendix 'B' addresses the various parameters of water quality that are tested for.

## **Compliance**

Ontario Regulation 170/03 requires that the Annual Summary Report list any requirements of the Safe Drinking Water Act (SDWA), the regulations under the SDWA or the drinking-water system's approval that the system failed to meet at any time during the period covered by the report. There was one non-compliance to report for 2017. The non-compliance as per MOECC inspection report is as follows:

**1. All specified corrective actions (as per Schedule 17) were not taken to address adverse conditions.**

*In accordance with Schedule 17-6., if a report is required to be made under Section 18 of the Act in respect to total coliforms, the Owner of the drinking water system and the Operating Authority for the system shall ensure that corrective action is taken to resample and test as soon as reasonably possible. Resample and test, as specified in Section 1 of O.Reg. 170/03, means take a set of water samples, at approximately the same time with, at least one sample from the same location that gave rise to the corrective action, at least one sample from a location that is a significant distance upstream from the location and at least one sample from a location that is a significant distance downstream from the location.*

*Corrective actions taken in response to the adverse test result obtained on October 18th, 2017 did not satisfy the requirements of the regulation as only one sample was collected from the location that gave rise to the corrective action.*

**Action(s) Required:**

*It is recommended that the Owner and the Ontario Clean Water Agency review their standard operating procedures and/or communication protocols, currently in place to deal with adverse conditions, to ensure that all required notifications and corrective actions are undertaken in accordance with O.Reg. 170/03.*

### **System Capacity**

Ontario Regulation 170/03 requires that the Annual Summary Report include a summary of the quantities and flow rates of the water supplied during the year such that the owner of the system will be able to assess the capability of the system to meet existing and planned uses of the system. As per MDWL #039-101 Issue #2, regulatory relief has been given to this requirement and replaced with a calculated monthly and annual water quantity for the purpose of fulfilling Schedule 22, section 22-2(3)1.

**Table 1** lists the volumes of water received from the LAWSS distribution system each month throughout the year.

**Table 1**

<b><i>Month</i></b>	<b><i>Monthly Flow 2017 (m3)</i></b>
<b>January</b>	348,766
<b>February</b>	307,577
<b>March</b>	336,791
<b>April</b>	282,670
<b>May</b>	380,175
<b>June</b>	435,584
<b>July</b>	447,415
<b>August</b>	437,031
<b>September</b>	357,506
<b>October</b>	336,281
<b>November</b>	360,407
<b>December</b>	355,438
<b>Total Flow 2017 (m3)</b>	4,385,641

The Lambton Area Water Treatment Plant has a rated maximum daily flow rate of 181,844 cu.m./day. St. Clair Township's proportion of the normal flow rate is approximately 28%.

Large industrial consumers accounted for approximately 70% of the total volume of water used in St. Clair Township in 2017. The largest users in the water distribution system are the Nova-Moore Site and the St Clair Ethanol Plant.

## APPENDIX 'A'

### 2017 Water Quality Test Results

(Waterworks # 260006464)

O.Reg. 170/03	Sampling Period	Number of Samples	Number of Detectable Results	Range	MAC or IMAC	Exceedance	Typical Source of Parameter	
<u>Microbiological Parameters</u>								
Total Coliforms (membrane filter analysis) (counts / 100ml)	Schedule 10-2	Jan/01 - Dec/31 (sampled weekly and resample)	416 <sup>1</sup>	1	0-1 <sup>2</sup>	0*	Yes	Indicates possible presence of fecal matter.
Fecal Coliforms (E. Coli) (membrane filter analysis) (counts / 100ml)	Schedule 10-2	Jan/01 - Dec/31 (sampled weekly and resample)	416 <sup>1</sup>	0	0-0	0*	No	Definite indicator of fecal contamination.
Heterotrophic Plate Count (HPC) (spread plate) (counts/1mL)	Schedule 10-2	Jan/01 - Dec/31 (sampled weekly and resample)	125	125	<10-940	--	N/A	Indicates overall water quality.
Background Count (membrane filter analysis) (counts / 100ml)		Jan/01 - Dec/31 (sampled weekly and resample)	416 <sup>1</sup>	18	0-700	200	Yes	Indicates presence of aerobic bacteria and effectiveness of disinfection.
* indicator of adverse water quality if detected in treated water								
<u>Parameters Related to Microbiological Quality</u>								
Free Chlorine (Distribution System) (mg/l)	Schedule 6-3	Jan/01 - Dec/31 (sampled weekly and resample)	416 <sup>1</sup>	416	0.40 – 1.79	--	N/A	Recommended level of at least 0.2mg/l in system to maintain microbiological quality.
Free Chlorine (Operational - Flushing)	◆	Jan/01 - Dec/31	885	--	0.08 – 1.87	--	N/A	Recommended level of at least 0.2mg/l in system to maintain microbiological quality.
Free Chlorine (Daily)	Schedule 7-2(3)	Jan/01 - Apr/24	111	--	1.04 - 1.86	--	N/A	
Free Chlorine (Daily SCADA) <sup>5</sup>	Schedule 7-2(3)	Apr/25 - Dec/31	72,288 <sup>3</sup>	--	0.00 - 1.56 <sup>4</sup>	--	N/A	
Free Chlorine (SCADA)	◆	Jan/01 - Dec/31	105,120 <sup>3</sup>	--	0.00 – 2.90 <sup>4</sup>	--	N/A	
<u>Volatile Organics</u>								
Trihalomethanes (running annual average) (ug/l)	Schedule 13-6	Jan/01 – Dec/31 (sampled quarterly)	4	4	31-75	100	No	Byproduct of chlorine reacting with naturally occurring organics.
<u>General Organics</u>								
Haloacetic acids (running annual average) (ug/l)	Schedule 13-6.1	Jan/01 – Dec/31 (sampled quarterly)	4	4	17.1 - 36.4	80	No	Byproduct of chlorine reacting with naturally occurring organics.
<u>Inorganic Parameters</u>								
Lead (ug/l)	Schedule 15.1	2017 Distribution (summer and winter)	9	9	0.01 – 6.32	10	No	Results from corrosion of lead pipe or lead solder in plumbing.

<sup>1</sup> The number of samples significantly exceeds the required number (23 per month – 276 annually). There were 521 samples but only 416 samples meet “distribution sample” by definition.

<sup>2</sup> Re-sampling and re-testing yielded acceptable results.

<sup>3</sup> A full year of data consists of 105,120 samples when taken at 5-minute intervals.

<sup>4</sup> High / Low chlorine levels were attributed to maintenance, power outages and/or equipment malfunction.

<sup>5</sup> Daily free chlorine is now read at 5-minute intervals through the SCADA at the Port Lambton Storm Station beginning April 25, 2017.

◆ Indicates additional operational testing not required by O.Reg. 170/03.

## APPENDIX 'B' WATER QUALITY PARAMETERS

### **What parameters do we test for?**

Some parameters may be present in source water before it is treated. Here is a description of the various groups of parameters. The presence of these substances in drinking water does not necessarily mean that the water poses a health risk.

*Microbiological parameters* such as bacteria may come from sewage plants, livestock operations, septic systems and wildlife. Microbiological quality is the most important aspect of drinking water quality because of its association with dangerous water-borne diseases, which can strike quickly.

*Inorganic parameters* such as salts and metals can be naturally occurring or a result of urban storm runoff, industrial or domestic wastewater discharge, mining or agriculture. Some may be a result of treatment and distribution of water (for example, lead from old solder in pipes).

*Organic parameters* can be naturally occurring, but most organics of concern are synthetic. They originate from industrial discharges, urban storm runoff and other sources. Included in this group are pesticides that originate from both rural and urban areas. Some may originate from treatment of drinking water (for example, chlorination byproducts such as trihalomethanes and haloacetic acids).

### **Definitions**

Here are some terms you should know about before reading the information below.

#### *MAC*

*Maximum Acceptable Concentration.* This is a health-related Ontario drinking water standard established for contaminants that have known or suspected adverse health effects when above a certain concentration. The length of time the MAC can be exceeded without injury to health will depend on the nature and concentration of the parameter.

#### *IMAC*

*Interim Maximum Acceptable Concentration.* This is a health-related Ontario drinking water standard established for contaminants when there are insufficient toxicological data to establish a MAC with reasonable certainty, or when it is not practical to establish a MAC at the desired level.

#### *Parameter*

This is a substance that we sample and analyze for in the water.

#### *mg/l*

*milligrams per litre.* This is a measure of the concentration of a parameter in water, sometimes called parts per million (ppm).

#### *ug/l*

*micrograms per litre.* This is a measure of the concentration of a parameter in water, sometimes called parts per billion (ppb).