

Township of West Lincoln Water Distribution System Annual Summary Report

Period: January 1, 2020 to December 31, 2020

Drinking Water Works Permit Number: 077-201

Municipal Drinking Water License Number: 077-101

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Introduction

In accordance with the *Safe Drinking Water Act* this report provides members of council of West Lincoln, the legal Owners of the water distribution system with an annual summary report of actions that took place from January 1, 2020 to December 31, 2020. In accordance with the *Act*, this report must list any time the Township failed to meet the conditions and requirements of the Acts, Regulations, Approvals, Drinking Water Works Permits, Municipal Drinking Water Licenses and Orders issued by the Ministry of the Environment. For each requirement not met, the report must specify the duration of the failure and the measures taken to correct the failure. Additionally, the report must list the summary of the quantities and flows of the water supplied.

Waterworks Description

The Township of West Lincoln is a class 1 water distribution system, which receives all treated water from the Regional Municipality of Niagara via the Grimsby Water Treatment Plant. The raw water source is surface water supplied from Lake Ontario. The distribution system consists of approximately 34 km of water main servicing approximately 5945 residents of Smithville in the Township of West Lincoln, 251 fire hydrants and 298 valves. There are approximately 2400 service connections. The size of water mains owned by the Township of West Lincoln range from 150 mm to 300 mm in size.

Compliance

Municipal Drinking Water Licensing Program

As part of a recommendation made by Justice O' Connor during the Walkerton Inquiry, the Ministry of the Environment has introduced a new program, the Municipal Drinking Water Licensing Program. This program requires the Drinking Water System Owner (Township of West Lincoln) to obtain a license to operate their drinking water system.

There are four components to each license;

- Drinking Water Works Permit,
 - Drinking Water Quality Management System (DWQMS)
 - Accreditation of the Quality Management System
 - Financial Plan.
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- Drinking Water Work Permit allows the Municipality to alter, add, replace, modify and extend the drinking water based on a series of predefined conditions.

- Drinking Water Quality Management System (DWQMS) is a series of 21 elements that address all aspects of a water system. The overall goal of the DWQMS is continuous improvement with respect to planning, operating and reviewing the drinking water system. Through the creation of an operational plan the drinking water system Owner demonstrates the ability to operate a safe and effective drinking water system, while continuously monitoring performance and compliance via internal and external audits.
- Accreditation of the Quality Management System is achieved through internal and external audits, the goal of these audits are to ensure that the Owner is following the processes and procedures laid out in the operational plan. The Ministry of the Environment has engaged in an agreement with NSF International Strategic Registrations and QMI-SAI Global to act as the Quality Management System accreditation body. The Township of West Lincoln has registered with QMI-SAI Global as the Quality Management System accreditation body.
- *Ontario Regulation 453/07, Safe Drinking Water Act* requires that each Owner prepare a Financial Plan for the drinking water system. The Township has prepared a Financial Plan and it was submitted to the Ministry of Environment, Conservation and Parks in December 2020.

The Township received its Municipal Drinking Water License and Drinking Water Works Permit on June 10, 2016. This License expires June 9, 2021 and the application for our new License had to be submitted before December 9, 2020. An accreditation Audit was done by SAI global to ensure that the Township is on compliance with all regulations, in order to renew our License. This audit reviewed the Township's Operational Plan and associated documentation to ensure all requirements of the DWQMS were met.

Safe Drinking Water Act

To remain compliant with the *Safe Drinking Water Act*, the Township performs a minimum of 16 microbiological samples a month. Each of these samples is taken from a variety of locations, providing a diverse profile of the water distribution system. Disinfection levels showing free chlorine residual are also taken at the time of each sample; ensuring proper disinfection levels are maintained. The Township takes additional free chlorine residuals throughout the week, again to ensure proper disinfection levels are maintained.

The Township also takes water samples for testing elevated levels of Trihalomethanes (THM) and Haloacetic Acids (HAA's), both are chlorine disinfection by-products. The Township takes these water samples for both parameters from areas where the formation of THM and HAA's would most likely occur.

The Ministry of the Environment has also provincially mandated a Community Lead Testing Program. This program involves taking 3 samples directly from the distribution

system, twice a year. This must be done once between December 15 and April 15 and again June 15 to October 15th, on an ongoing cycle.

All of the aforementioned samples, in accordance with the *Act* must be taken by an individual with a Water Operators license, Operator in Training license or a Water Quality Analyst license. These licenses are distributed by the Ontario Water Wastewater Certification Office, in accordance with *Ontario Regulation 128/04, Safe Drinking Water Act*.

Samples are then taken to a Ministry of the Environment approved laboratory. Laboratories must meet quality standards determined by the Ministry of the Environment and are audited by the Canadian Association for Laboratories Accreditation. In the event an incident occurs where water samples do not meet Provincial water quality standards, this is deemed an Adverse Water Quality Incident (AWQI). This is detailed further in the chart following entitled *Adverse Water Quality Incidents and Actions*

An Annual Drinking Water Report has been completed and is available free of charge to the public through the Township's website and at the West Lincoln Town Hall located at 318 Canborough St., Smithville as well as Public Works Yard at 6218 London Rd., Smithville.

Township of West Lincoln Water Quality Test Results

Parameter		MAC	Number of Samples	Range	Comments
Microbiological Analysis					
Escherichia Coli (E. Coli) CFU/ 100mL		0	204	0	Indicates presence of fecal matter
Total Coliforms CFU/ 100 mL		0	204	0 - 1	Indicates the possible presence of fecal contamination
Fecal Coliforms CFU/ 100 mL		0	204	0	Indicates the possible presence of fecal contamination
Heterotrophic Plate Count (HPC) CFU/mL		N/A	204	0 - 19	Indication of overall water quality
Chemical Analysis					
Haloacetic Acids		0.08 mg/L	4	0.0068	Average of Samples taken quarterly
Trihalomethanes mg/L		0.10 mg/L	4	0.0184	Average of Samples taken quarterly
Lead mg/L	Residential	0.010 mg/L	N/A	N/A	Township is exempt for residential sampling
	Non-Residential	0.010 mg/L	N/A	N/A	
	Distribution	0.010	N/A	N/A	Township is exempt

		mg/L			until 2021
Disinfection					
Free Chlorine Residual mg/L	0.05 to 4.0 mg/L	466	0.34-1.13	Level of disinfectant	

Adverse Water Quality Incidents and Actions

Date	Location	Parameter	Result	Actions	Date of Resolution
August 6, 2020	Hydrant #133	TC	1	Flush and Resample	August 8, 2020

* Denotes distribution system only

In the event of an adverse water quality incident (AWQI), the Township of West Lincoln receives immediate notification from the laboratory. The Township is then required as per Ontario regulations to verbally notify the Regional Public Health Unit and the Ministry of Environment Spills Action Centre.

These individuals are then faxed the same information that was shared verbally.

To ensure water safety, the Township of West Lincoln immediately sends a member of staff to flush the upstream and downstream fire hydrants closest to the adverse location as possible, and resample at the source of the AWQI, as well as upstream and downstream of the AWQI. 24 – 48 hrs after the first resample, a second set of resamples must be taken. If both sets of resamples come back clear from the laboratory, than the issue is considered resolved and the AWQI number is closed.

In the above table, the column “Date of Resolution” indicates the date in which the Township of West Lincoln has received copies of the laboratory results and submits the “Notice of Resolution” to the Ministry of Environment and Public Health Unit.

It should be noted that an Adverse Water Quality Incident does not indicate that the drinking water is unsafe; rather it indicates that with respect to that specific sample, the Provincial water quality objective was exceeded.

Operational Activities

In 2020, the Township of West Lincoln experienced one water main repair. The Township of West Lincoln follows a standard operating procedure, detailing the steps taken to repair a water main, while ensuring water quality. Following a water main break, microbiological samples are taken upstream and downstream of the break when necessary as per Regulations; ensuring the break was repaired in such a way that water quality levels were not affected.

Water Main Repairs

Date	Location	Cause
Oct 24, 2020	34 Wallis Ave	Ring Break

In 2020, the Township of West Lincoln performed 5 water service repairs. The Township of West Lincoln follows a standard operating procedure, detailing the steps taken to repair the services, while ensuring water quality.

Water Service Repairs

Date	Location	Repair Type
June 16/20	118 Colver St	Service repair
June 17/20	6427 Townline Rd	Service repair
June 23/20	215 Station St	Service repair
June 23/20	221 Station St	Service repair
July 21/20	6421 Townline Rd	Service repair

Water Meters Installed

114 meter installations carried out in 2020. This was a combination of new water meters and replacement water meters.

Backflow Devices

All known backflow devices were inspected and documented for 2020 as per the Township By-Law.

DWQMS Updates

As a requirement of DWQMS (Drinking Water Quality Management System) the DWQMS representative is to update members of council and senior management of any major changes to the Operational Plan as well as any activities that relate to the DWQMS. No major changes were made to our QMS.

Flow Rates

2020 Monthly Water Flow Rates (m³)

Month	Quantity (m ³)
January	87 150.00
February	81 000.00
March	87 160.00
April	90 070.00

May	94 200.00
June	117 220.00
July	131 300.00
August	123 580.00
September	97 440.00
October	80 200.00
November	77 200.00
December	75 370.00
Total	1 141 890.00
Monthly Average	95,157.50
Daily Average	3 876.41

Definitions

MAC - Maximum Acceptable Concentration

This is a health-related standard established for parameters which when present above a certain concentration, have known or suspected adverse health effects. The length of time the MAC can be exceeded without injury to health will depend on the nature and concentration of the parameter. (Ontario Drinking Water Standards - Ministry of Environment, Conservation and Parks)

Mg/L - milligrams per litre (parts per million)

cfu/100 mL - Colony Forming Units per 100 millilitres of sample

ug/l - micrograms per litre

< - Less than

> - Greater than

Microbiological parameters (i.e. bacteria) - the source of bacteria may come from wastewater treatment plants, livestock operations, septic systems and wildlife. Microbiological analysis is the most important aspect of drinking water quality due to its association with dangerous waterborne diseases. (Ontario Drinking Water Standards- Ministry of Environment, Conservation and Parks)

Total Coliform - the group of bacteria most commonly used as an indicator of water quality. The presence of these bacteria in a water sample indicates inadequate filtration and / or disinfection. (Ontario Drinking Water Standards - Ministry of the Environment)

Escherichia coli (E. coli) - a sub-group of coliform bacteria. It is most frequently associated with recent fecal pollution. The presence of E. coli or fecal coliforms in

drinking water is an indication of sewage contamination. (Ontario Drinking Water Standards- Ministry of the Environment)

Heterotrophic Plate Count (HPC) - an estimate of the number of background bacteria present in the distribution system. It is not an indicator of fecal contamination, but more a general indicator of disinfection effectiveness and distribution system status with respect to biofilm presence and the influence of bacterial re-growth in the distribution system.

Haloacetic Acids (HAA'S) – The maximum acceptable concentration (MAC) for HAA's in drinking water is 0.080 mg/L based on a four quarter running annual average of test results. The most commonly detected HAA's in drinking water are Dibromoacetic Acid, Dichloroacetic Acid, Bromoacetic Acid, Chloroacetic Acid and Trichloroacetic Acid. HAA's in drinking water is the action of chlorine with naturally occurring organics (precursors) left in the water after filtration.

Trihalomethanes (THM's) - The maximum acceptable concentration (MAC) for Trihalomethanes (THMs) in drinking water is 0.10 mg/L based on a four quarter moving annual average of test results. Trihalomethanes are the most widely occurring synthetic organics found in chlorinated drinking water.

The four most commonly detected Trihalomethanes in drinking water are chloroform, bromodichloromethane, dibromochloromethane and bromoform. The principal source of Trihalomethanes in drinking water is the action of chlorine with naturally occurring organics (precursors) left in the water after filtration.

Lead - Metals, for the most part, are naturally present in source water, or are the result of industrial activity. Some, such as Lead, may enter the drinking water from plumbing in the distribution system.

Lead can occur in the source water as a result of erosion of natural deposits. The most common source of lead is corrosion of the household plumbing. The MAC for lead levels is 0.010 mg/L.