



# 2020 Annual Performance & Summary Report Middlesex Centre Distribution System

**Date: January 8, 2021**

*Alternative Formats: If you require this document in an alternative format please contact the Municipality of Middlesex Centre at 519-666-0190 or [customerservice@middlesexcentre.on.ca](mailto:customerservice@middlesexcentre.on.ca)*

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## Introduction

The Municipality of Middlesex Centre prepares a report summarizing system operation and water quality for every municipal drinking water system annually. The reports detail the latest water quality testing results, water quantity statistics and any adverse conditions that may have occurred for the previous year. They are available for review by the end of February on the Municipality of Middlesex Centre website at [www.middlesexcentre.on.ca/services/residents/water](http://www.middlesexcentre.on.ca/services/residents/water) or by contacting the Public Works Department.

All efforts have been made to ensure the information presented in this report is accurate. If you have any questions or comments concerning the report, please contact the Municipality of Middlesex Centre.

**Table 1 – Plant Information**

Drinking Water System	Middlesex Centre Distribution System
Drinking Water System Number	260004202
Drinking Water System Owner & Contact Information	Municipality of Middlesex Centre Large Municipal Distribution System 10227 Ilderton Road, RR #2 Ilderton, Ontario N0M 2A0
Reporting Period	January 1, 2020 to December 31, 2020

## Section A – System Description

The Middlesex Centre Distribution System is owned and operated by the Municipality of Middlesex Centre. The system operates under Municipal Drinking Water License Number 052-101 and Drinking Water Works Permit Number 052-201. This system is made up of the following water systems:

- Arva Distribution System
- Ballymote Distribution System
- Delaware Distribution System
- Denfield Distribution System
- Ilderton Distribution System
- Komoka-Kilworth Distribution System

The water supply for the Arva Distribution System is obtained from a 1050 mm pipeline maintained by the City of London Water Supply System. A 200mm ductile-iron pipeline with flow meter and in-line vertical turbine fire pump distributes treated water. There is

an on-line chlorine analyzer and paperless recorder. Two chemical metering pumps are available for secondary disinfection to boost sodium hypochlorite levels.

The Ballymote Distribution System is supplied by a 200mm water main from the City of London. A re-chlorination injection point exists with a portable chlorine feed system, a sampling tap immediately downstream from the injection point and a chlorine analyzer measure free chlorine residual in the water entering the distribution system.

The Delaware Drinking Water System receives water through a 150 mm water main from the City of London Distribution System connection at the Delaware Re-chlorination facility. The re-chlorination facility consists of two chemical metering pumps, a chemical storage tank, flow meter, piping, SCADA and a chlorine residual analyzer. The water is supplied to the distribution and elevated storage tank by an automatic valve and controls.

The water supply for the Denfield Distribution System is obtained from the 1200 mm pipeline of the LHPWSS. High lift pumps at the Denfield reservoir draw from the above ground storage tank and provide water to the distribution system. The Denfield system is equipped with two fixed speed pumps and one variable speed pump. Two sodium hypochlorite disinfection systems are used to boost chlorine entering and leaving the storage tank.

The water supply for the Ilderton distribution system is obtained from the LHPWSS. High lift pumps at the Ilderton reservoir provide water to the distribution system and the tower, which provides pressure for the distribution system. The reservoir is equipped with three high lift pumps. A sodium hypochlorite disinfection system is used to boost chlorine entering the distribution system.

The water supply for the Komoka-Kilworth distribution system is obtained from the LHPWSS. High lift pumps at the Komoka reservoir draw from the above ground storage tank and provide water to the distribution system and the tower. The reservoir is equipped with two high lift pumps. Two sodium hypochlorite disinfection systems are used to boost chlorine entering and leaving the storage tank.

## **Section B – Water Treatment Chemicals Used**

- 12% sodium hypochlorite
- 6% sodium hypochlorite

## Section C – Modifications & Replacements

Modifications & Replacements	
<b>Delaware Drinking Water System</b>	
Replacement of sodium hypochlorite chemical metering pump at the Rechlorination Station	\$4,028.10
<b>Denfield Distribution System</b>	
Repair of vertical fill pipe, floor cleaning, replacement of 2 depleted magnesium anodes on tank floor and installation of new sealer fillets on all interior sheet edges	\$10,190.00
<b>Ballymote Distribution System</b>	
Replacement of unlimited power supply (UPS) unit	\$372.99
<b>Komoka Distribution System</b>	
Replacement of sodium hypochlorite chemical metering pump at the Rechlorination Station	\$4,028.10

## Section D – Microbiological Testing

### *(I) E. coli & Total Coliform*

Bacteriological tests for E. coli and total coliforms in the distribution water are collected on a weekly schedule in various location throughout the distribution system. Extra samples are taken after major repairs or maintenance work. Any E. coli or total coliform results above 0 in treated distribution water must be reported to the Ministry of Environment, Conservation and Parks (MECP) and Medical Officer of Health (MOH). Resamples and any other required actions are taken as quickly as possible. The results from the 2020 sampling program are shown on the table below.

**Table 2 – E. Coli & Total Coliform Samples**

	Number of Samples	Range of E. coli Results Min – Max	Range of Total Coliform Results Min – Max
Distribution	239	0 - 0	0 - 0

### *(II) Heterotrophic Plate Count (HPC)*

HPC analyses are required from the distribution water on a bi-weekly basis. HPC should be less than 500 colonies per 1 mL. Results over 500 colonies per 1 mL may indicate a

change in water quality but it is not considered an indicator of unsafe water. The 2020 results are shown in the table below.

**Table 3 – Heterotrophic Plate Count (HPC) Samples**

Parameters	Number of Samples	Range of HPC Results Min-Max
Distribution	104	0 – 110

## Section E – Chemical Testing

The Safe Drinking Water Act requires periodic testing of the water for chemical parameters. The sampling frequency varies for different types and sizes of water systems. If the concentration of a parameter is above half of the Maximum Allowable Concentration (MAC) under the Ontario Drinking Water Quality Standards, an increased testing frequency of once every three months is required by the Regulation. Where concerns regarding a parameter exist, the MECP can also require additional sampling be undertaken.

### *(I) Trihalomethane (THM) & Haloacetic Acids (HAA)*

The Middlesex Distribution System collected samples for Trihalomethane (THM) and total Haloacetic Acids (HAA) which are by-products of the disinfection process. Samples were collected every 3 months from the distribution system.

**Table 4 – Quarterly Trihalomethane & Haloacetic Acid**

Parameter & Sample Date	Result (mg/l)	Annual Rolling Average (mg/l)	MAC (mg/l)	Exceedance
Trihalomethane				
1st Quarter	0.021	0.039	100	No
2nd Quarter	0.029	0.038	100	No
3rd Quarter	0.029	0.032	100	No
4th Quarter	0.036	0.029	100	No
Haloacetic Acid (HAA)				
1st Quarter	0.006	0.018	80	No
2nd Quarter	0.018	0.018	80	No
3rd Quarter	0.016	0.015	80	No
4th Quarter	0.020	0.015	80	No

### *(II) Lead Testing Program*

The following Table summarizes the most recent results for the Lead Testing Program. Lead samples are twice per year in the winter sample period and the summer sample

period as outlined below. Alkalinity and pH are monitored twice per year in the distribution system to ensure water quality is consistent and does not facilitate leaching of lead into the water.

As identified in Schedule D of the Municipal Drinking Water License #052-101, Middlesex Centre was granted Regulatory Relief for Lead sampling. The number of sampling points has been reduced to the following:

**Table 5 – Regulatory Relief**

Number of Sampling Points Required for Relief from Regulatory Requirements				
Column 1 Drinking Water System or Drinking Water Subsystem Name	Column 2 DWS Numbers	Column 3 Number of Sampling Points in Plumbing that Serves Private Residences	Column 4 Number of Sampling Points in Plumbing that Does Not Serve Private Residences	Column 5 Number of Sampling Points in Distribution System
Middlesex Centre Distribution System	260004202	20	2	4

Ontario Regulation 75/20 made under the Emergency Management and Civil Protection Act issued an emergency order for regulatory relief for drinking water system. With the unprecedented situation facing the province and municipality in responding to the COVID-19 outbreak, Middlesex Centre utilized the pandemic related temporary regulatory relief (alternate arrangement) for the Middlesex Centre Municipal Residential Distribution System. Temporary relief was granted for sampling within residential homes within the Middlesex Centre Distribution System during the winter sample period between December 15, 2019 to April 15, 2020 and the summer sample period of June 15, 2020 to October 15, 2020. The samples results below are for the Middlesex Centre Distribution System and services that do not serve private residents.

**Table 6 – Lead Sampling**

Parameter	Max Result Values	MAC	Exceedance
Winter Sample (Dec. 15 – April 15)			
Lead (ug/l)	1.01	10	No
Distribution Alkalinity (mg/l)	82	*30 - 500	No
Distribution pH	7.74	-	No
Summer Sample (June 15 – Oct. 15)			
Lead (ug/l)	3.47	10	No
Distribution Alkalinity	79	*30 – 500	No



Parameter	Max Result Values	MAC	Exceedance
Distribution pH	7.84	-	No

*\*Distribution alkalinity is an aesthetic objective / Operational Guideline with a range between 30 mg/l to 500 mg/l.*

Middlesex Centre Distribution System has been granted Regulatory Relief for lead sampling as outlined in Table 2, Schedule D Conditions for Relief from Regulatory Requirements in the Regulatory Drinking Water Licence # 052-101, Issue #4 dated October 26, 2017. Middlesex Centre is required to take twenty (20) lead samples from plumbing that serve Private Residence, two (2) samples that do not serve private residents and four (4) samples from the distribution system. Samples results from the summer and winter lead sampling period are listed in Appendix A.

## Section F – Operational Monitoring

### *(I) Chlorine Residual*

Free chlorine levels of the treated water are monitored continuously at the discharge point of the Water Treatment Facility. In the distribution system, free chlorine is checked daily at various locations. As a target, free chlorine residual within the distribution system should be above 0.20 mg/L. A free chlorine level lower than 0.05 mg/L must be reported and corrective action taken. There were no reportable incidents in 2020. A summary of the chlorine residual readings is provided in the table below.

**Table 7 – Chlorine Residuals**

Parameter	Number of Tests or Monitoring Frequency	Range of Results (Min – Max)
Chlorine residual Point of Entry (POE) (mg/L)	Continuous	0.20 – 3.00

## Section G – Water Quantity

Continuous monitoring of flowrates from the supply systems to the Middlesex Distribution System is required by Regulation 170/03. The Municipality of Middlesex Centre receives water from the Lake Huron Water Supply System and the London Distribution system in Delaware. A summary of the 2020 flows are provided below.

**Table 8 – Arva Water 2020 Flows**

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg.
Treated Flow	m <sup>3</sup>	2,297	2,460	2,340	2,532	3,429	5,824	8,227	5,698	4,515	3,110	2,301	2,498	3,769
Raw Avg.	m <sup>3</sup> /d	74	88	75	84	111	194	265	184	151	100	77	81	124
Raw Max	m <sup>3</sup> /d	92	96	95	112	194	279	384	246	204	121	119	101	170

**Table 9 – Ballymote Water 2020 Flows**

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg.
Treated Flow	m <sup>3</sup>	522	524	509	568	723	776	1052	1155	620	564	439	555	667
Raw Average	m <sup>3</sup> /d	17	19	16	18	23	26	34	41	21	18	15	18	22
Raw Max	m <sup>3</sup> /d	26	23	22	71	72	44	50	48	33	24	20	25	38

**Table 10 – Delaware Water 2020 Flows**

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg.
Treated Flow	m <sup>3</sup>	9,038	8,698	9,466	9,220	11,982	14,861	14,965	13,465	12,375	12,432	11,063	14,459	11,835
Raw Average	m <sup>3</sup> /d	292	311	305	307	387	495	483	434	413	401	369	466	389
Raw Max	m <sup>3</sup> /d	499	487	412	546	628	802	841	605	580	538	525	915	615

**Table 11 – Denfield Water 2020 Flows**

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg.
Treated Flow	m <sup>3</sup>	942	897	936	1,059	1,375	1,491	1,573	1,106	1,002	1,054	947	1,053	1,120
Raw Average	m <sup>3</sup> /d	30	32	30	35	44	50	51	36	33	34	32	34	37
Raw Max	m <sup>3</sup> /d	47	37	37	48	77	72	92	55	50	48	43	50	55

**Table 12 – Ilderton Water 2020 Flows**

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg.
Treated Flow	m <sup>3</sup>	17,896	16,738	19,203	17,218	22,124	26,211	31,381	24,532	21,186	18,945	18,601	19,469	21,125
Raw Avg	m <sup>3</sup> /d	577	598	619	574	714	874	1,012	791	706	611	620	628	694
Raw Max	m <sup>3</sup> /d	763	722	994	734	964	1,469	1,862	981	1,005	949	1,093	1,063	1,050

Table 13 – Komoka Water 2020 Flows

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg.
Treated Flow	m <sup>3</sup>	24,050	22,405	25,760	26,362	31,614	43,172	51,099	39,784	32,041	29,108	28,116	29,951	31,955
Raw Average	m <sup>3</sup> /d	776	800	831	879	1,020	1,439	1,648	1,283	1,068	939	937	966	1,049
Raw Max	m <sup>3</sup> /d	871	925	1,176	982	1,443	1,893	2,512	1,599	1,187	1,047	1,081	1,110	1,319

## Section H – Non-Compliance Findings & Adverse Results

Section 6 documents any known incidents of non-compliance or adverse results and the associated correction actions taken to resolve the issue. Non-compliance issues are typically identified by either the Operating Authority or the MECP Drinking Water Inspectors. All non-compliance issues are investigated, corrective actions taken and documented using the Municipalities Drinking Water Quality Management System (DWQMS) procedures.

### *Non-Compliance Findings*

The MECP conducted an announced routine inspection of the Middlesex Centre Distribution System on July 30, 2020. The MECP inspector identified two (2) non-compliances with the regulatory requirements.

**Where an activity has occurred that could introduce contamination, all parts of the drinking water system were not disinfected in accordance with Schedule B, Condition 2.3 of the Drinking Water Works Permit.** Drinking Water Works Permit #052-201 - Section 2.3 stipulates minimum requirements related to disinfection of parts associated with the drinking water system. Generally stated, all parts of the drinking water system that come in contact with the drinking water shall be disinfected in accordance with a procedure approved by the Director or in or in accordance with the applicable provisions of the following documents:

- a) The ministry's Watermain Disinfection Procedure, effective December 30, 2016;
- b) AWWA C652 – Standard for Disinfection of Water-Storage Facilities;
- c) AWWA C653 – Standard for Disinfection of Water
- d) AWWA C654 – Standard for Disinfection of Wells.

As part of this inspection the Owner / Operating Authority provided four sets of the documents as related to the installation of new watermains within the system. Generally stated, the work completed was compliant with the requirements prescribed by Section 2.3 of Drinking Water Works Permit #052-201. It should be noted however, that during one of the pipe installation projects, the concentration of free chlorine within the pipe deteriorated greater than 50 mg/L during a continuous feed application, which also resulted in a drop of greater than 40% of the original concentration of free chlorine which is not acceptable as per the requirements of Section 2.3 of the Permit and the

corresponding Watermain Disinfection Procedure. Once notified of this issue, the Operating Authority provided immediate training to operational staff as a means of mitigating this issue from occurring in the future.

**Action(s) Required:**

From herein, the Owner / Operating Authority shall ensure that all procedures prescribed by Section 2.3 of Drinking Water Works Permit #052-201 are met with as related to the disinfection of watermains. Compliance with this requirement will be assessed during the next inspection of the water system.

**All water quality monitoring requirements imposed by the MDWL or DWWP issued under Part V of the SDWA were not being met.**

Municipal Drinking Water License #052-101, Issue #4, Schedule D prescribes relief from regulatory lead sampling as prescribed by Ontario Regulation 170/03 – Schedule 15.1. The relief within the aforementioned license allows for the following sampling:

1. 20 Private Residential Lead samples
2. 2 Non-Private Residential Lead samples
3. 4 Distribution Lead samples

The aforementioned sampling is to occur during the following sampling periods:

1. Dec 15, 2017 to Apr 15, 2018
2. June 15, 2018 to Oct 15, 2018

Over the course of the inspection period, there were three sampling periods including:

1. June 15, 2019 to Oct 15, 2019
2. Dec 15, 2019 to Apr 15, 2020
3. June 15, 2020 to Oct 15, 2020

During the period from June 15, 2019 to October 15, 2019, the Owner / Operating Authority continued to collect lead samples according to the prescribed requirements of Schedule D of the MDWL. During the period from December 15, 2019 to April 15, 2020, the Owner / Operating Authority applied and received Temporary Pandemic Relief under Approval # 76-M-052-101 dated April 24, 2020 which reduced the required lead sampling program to the following:

- a. 4 Private Residential Lead samples
- b. 2 Non-Private Residential Lead samples
- c. 4 Distribution Lead samples

The Owner / Operating Authority met with the requirements prescribed by the Temporary Pandemic Relief under Approval # 76-M-052-101 as related to the number and location of samples required for testing. However, it should be noted that one of the Private Residential samples was analyzed for parameters included Lead, pH and Alkalinity as opposed to the required two samples analyzed for lead and pH as prescribed by Ontario Regulation 170/03 – Schedule 15.1-7(1) and (3). The third sampling period from June 15, 2020 to October 15, 2020 has not yet ended and as

such, compliance cannot be determined at this point in time. It should be noted that the Owner / Operating Authority has re-applied for Pandemic Relief.

**Action(s) Required:**

From herein, the Owner / Operating Authority shall ensure that the appropriate testing is completed on plumbing samples as prescribed by the requirements of Ontario Regulation 170/03 – Schedule 15.1-7(1) and (3). Compliance with this requirement will be assessed during the next inspection of the water system.

***Summary of Reporting Adverse Test Results and Other Problems (Schedule 16)***

There was one (1) Adverse Water Quality Indicators (AWQI) during the 2020 reporting period.

July 29, 2020 – AWQI # 150984 was issued due a total coliform count detected from a water sample collected at the Denfield Sampling Station on July 27, 2020. Middlesex Centre was notified on the issue and immediately flushed the system. Bacteriological samples were collected at the source, upstream and downstream and submitted for analysis. All samples were negative for bacteria and the MECP Notice of Adverse Test Results and Other Problems and Notice of Issue Resolution at Drinking Water System Forms 2(A) & 2(B) are attached.