

**2018 ANNUAL
PERFORMANCE REPORT
MIDDLESEX CENTRE DISTRIBUTION SYSTEM**



DATE: FEBRUARY 20TH, 2018

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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/Public/drinking water](http://www.middlesexcentre.on.ca/Public/drinking_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, 2018 to December 31, 2018

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 systems 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
No major upgraded or Form 2 Record of Minor Modifications or Replacements to the Drinking Water System

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 2018 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	251	0 - 0	0 - 12

(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. 2018 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	106	<10 – 580

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.

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	0.033	0.041	100	No
2nd Quarter	0.032	0.037	100	No
3rd Quarter	0.048	0.039	100	No
4th Quarter	0.057	0.043	100	No
Haloacetic Acid (HAA)				
1st Quarter	0.0186	0.0203	80	No
2nd Quarter	0.0285	0.0219	80	No

3rd Quarter	0.0262	0.0228	80	No
4th Quarter	0.0148	0.0220	80	No

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 Center 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

TABLE 6 – LEAD SAMPLING

Parameter	Max Result Values	MAC	Exceedance
Winter Sample (Dec. 15 – April 15)			
Lead (ug/l)	4.47	10	No
Distribution Alkalinity (mg/l)	86	*30 - 500	No
Distribution pH	8.32	-	No
Summer Sample (June 15 – Oct. 15)			
Lead (ug/l)	2.00	10	No
Distribution Alkalinity	81	*30 - 500	No
Distribution pH	8.23	-	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 2018. 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	0.28 – 3.08

SECTION G - WATER QUANTITY

Continuous monitoring of flowrates from the supply systems to the Middlesex Distribution System is required by Regulation 170/03. The Municipal Drinking Water License and Permit to Take Water issued by the MECP regulate the amount of water that can be utilized over a given time period. A summary of the 2018 flows are provided below.

TABLE 8 – ARVA WATER 2018 FLOWS

		Jan	Feb	March	April	May	June	July	Aug	Sept	Oct.	Nov	Dec
Monthly Total	m ³	2,599	2,325	2,901	2,911	5,095	6,671	5,441	4,609	4,279	2635	2,570	2,619
Monthly Avg	m ³ /day	84	83	94	97	164	222	176	149	143	85	86	84
Monthly Max	m ³ /day	102	93	108	141	255	303	275	196	170	109	124	114

TABLE 9 – BALLYMOTE WATER 2018 FLOWS

		Jan	Feb	March	April	May	June	July	Aug	Sept	Oct.	Nov	Dec
Monthly Total	m ³	457	432	500	466	819	997	877	760	561	492	460	562
Monthly Avg	m ³ /day	15	15	16	15	26	33	28	27	19	16	15	18
Monthly Max	m ³ /day	20	21	19	32	48	56	41	61	32	26	19	24

TABLE 10 – DELAWARE WATER 2018 FLOWS

		Jan	Feb	March	April	May	June	July	Aug	Sept	Oct.	Nov	Dec
Monthly Total	m ³	9,800	8,195	9,137	9,572	12,860	15,569	16,503	11,581	11,933	9741	9,408	10,183
Monthly Avg	m ³ /day	316	293	295	319	415	519	532	374	398	314	314	328
Monthly Max	m3/day	443	425	474	476	754	802	832	508	546	441	419	416

TABLE 11 – DENFIELD WATER 2018 FLOWS

		Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Monthly Total	m ³	910	801	931	976	1,209	1,305	1,158	1,146	975	942	916	961
Monthly Avg	m ³ /day	29	29	30	33	39	44	37	37	32	30	31	31
Monthly Max	m3/day	35	37	37	56	72	70	61	72	46	45	56	37

TABLE 12 – ILBERTON WATER 2018 FLOWS

		Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Monthly Total	m ³	15,320	15,013	16,499	16,732	21,213	23,500	25,456	15,782	21,351	17,773	17,394	19,009
Monthly Avg	m ³ /day	494	536	532	558	684	783	821	509	712	573	580	613
Monthly Max	m3/day	955	863	918	979	1,128	1,397	1,112	1,059	956	838	986	948

TABLE 13 – KOMOKA WATER 2018 FLOWS

		Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Monthly Total	m ³	25,913	23,344	26,290	26,996	34,932	37,823	39,444	32,075	27,518	25,271	22,714	24554
Monthly Avg	m ³ /day	836	834	848	900	1,127	1,261	1,272	1035	917	815	757	792
Monthly Max	m3/day	980	982	974	1,086	1,775	1,984	1,827	1,937	1,175	1138	922	926

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.

(I) SUMMARY OF REPORTING ADVERSE TEST RESULTS AND OTHER PROBLEMS (SCHEDULE 16)

There were 3 Adverse Water Quality Indicators (AWQI) during in 2018 reporting period.

Ballymote

There were two (2) adverse results during the year within the Ballymote Distribution System. The samples on May 30th, 2018 tested positive for three (3) total coliform and twelve (12) total coliforms on August 22nd, 2018. The Ballymote sample station, upstream fire hydrants and downstream fire hydrants were flushed on each occasion. Samples for total coliforms were collected at the sample stations and upstream and downstream fire hydrants, all resamples were negative for bacteria.

Komoka

There was one (1) low pressure during a service line repair, which lasted for less than 2 minutes on June 4th, 2018. The water main system was flushed for an hour and bacteriological samples were collected at the water service line, all samples were negative for bacteria.