



2017 ANNUAL DRINKING WATER SYSTEM SUMMARY REPORT

Mount Elgin Water System

1. GENERAL INFORMATION

Oxford County 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 Oxford County website at www.oxfordcounty.ca/drinkingwater 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 County of Oxford at the address and phone number listed below or by email at publicworks@oxfordcounty.ca.

Drinking Water System:	Mount Elgin Water System
Drinking Water System Number:	220000629
Drinking Water System Owner & Contact Information:	Oxford County Public Works Department Water Services P.O. Box 1614 21 Reeve Street Woodstock, ON, N4S 7Y3 Telephone: 519-539-9800 Toll Free: 866-537-7778 Email: publicworks@oxfordcounty.ca
Reporting Period:	January 1, 2017 - December 31, 2017

1.1. System Description

The Mount Elgin Water System is a Large Municipal Water system as defined by Regulation 170/03 and serves a population of approximately 524. The system consists of one groundwater well and a treatment facility. The water is treated with sodium hypochlorite (liquid chlorine) for disinfection and in 2017 approximately 1.9 m³ of the chemical was used in the water treatment process. The chemical is certified to meet standards set by the Standards Council of Canada or American National Standards Institute.

The treatment facility houses pumps, monitoring equipment, and a 380 m³ underground reservoir. A standby generator is available to run the facility in the event of a power failure. The system is maintained by licensed water system operators, who operate treatment and monitoring equipment and collect samples as specified by the Regulation. Alarms automatically notify operators in the event of failure of critical operational requirements.

1.2. Major Expenses

The Mount Elgin Water System is one of 14 water systems that have revenues and expenses pooled for economy of scale purposes. The systems are combined into the Township Water financial system and in 2017 had operating and maintenance expenditures of approximately \$2,480,000. In addition to regular operational and maintenance expenditures approximately \$1,300,000 was spent to install or upgrade water meters in the Township systems and approximately \$120,000 was spent on design and engineering treatment options for a new supply well.

2. MICROBIOLOGICAL TESTING

2.1. *E. coli* and Total Coliforms

Bacteriological tests for *E. coli* and total coliforms are required weekly on the raw and treated water at the facility and in the distribution system. Extra samples are taken after major repairs or maintenance work. Any *E. coli* or total coliform results above 0 in treated water must be reported to the Ministry of Environment and Climate Change (MOECC) and Medical Officer of Health (MOH). Resamples and any other required actions are taken as quickly as possible. The results from the 2017 sampling program are shown on the table below. There was one adverse test result from the 156 treated water samples in this reporting period.

	<i>Number of Samples</i>	<i>Range of E. coli Results Min - Max MAC = 0</i>	<i>Range of Total Coliform Results Min - Max MAC = 0</i>
Raw	52	0 - 0	0 - 5
Treated	52	0 - 0	0 - 0
Distribution	104	0 - 0	0 - 22

2.2. Heterotrophic Plate Count (HPC)

HPC analyses are required from the treated and distribution water. The tests are required weekly for treated water and for 25% of the required distribution system bacteriological samples. The 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. 2017 results are shown in the table below.

	<i>Number of Samples</i>	<i>Range of HPC Min - Max</i>
Treated	52	0 - 29
Distribution	26	0 - 41

3. CHEMICAL TESTING

The Safe Drinking Water Act requires periodic testing of the water for approximately 70 different chemical parameters. The latest results for all parameters are provided in Appendix A. The sampling frequency varies for different types and sizes of water systems and chemical parameters. 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 MOECC can also require additional sampling be undertaken.

Information on the health effects and allowable limits of components in drinking water may be found on the MOECC web page through the link provided in Appendix A. Additional information on common chemical parameters specific for the Mount Elgin system is provided below.

3.1. Hardness

This is an aesthetic parameter that may affect the appearance of the water but is not related to health. Well water commonly has high levels of hardness and other minerals from being in contact with underground rock formations. Many households have water softeners to help reduce white calcium deposits and improve the efficiency of soaps. This information is included here to help set a water softener at the level recommended by the manufacturer. The Hardness in the Mount Elgin System is 233 mg/L (equivalent to 17 grains/gallon).

3.2. Additional Testing Required by MOECC

None.

4. OPERATIONAL MONITORING

4.1. 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 twice weekly at various locations. As a target, the 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. A summary of the chlorine residual readings is provided in the table below. There were no reportable incidents in 2017.

4.2. Turbidity

Turbidity of treated water is continuously monitored at the treatment facility. A change in turbidity can indicate an operational problem. The turbidity of untreated water from each well is checked weekly. Turbidity is measured in nephelometric turbidity units (NTU). Under Regulation 170/03 turbidity in groundwater is not reportable however turbidity should be < 1 NTU at the treatment plant and < 5 NTU in the distribution system. A summary of the monitoring results for 2017 is provided in the table below.

<i>Parameter</i>	<i>Number of Tests or Monitoring Frequency</i>	<i>Range of Results (Min - Max) and Average</i>
Chlorine residual in distribution (mg/L)	365	(0.54 - 1.92) 1.23
Chlorine residual after treatment (mg/L)	Continuous	(0.49 - 2.03) 1.27
Turbidity after treatment (NTU)	Continuous	(0.06 - 3.95) 0.10

5. WATER QUANTITY

Continuous monitoring of flow rates from supply wells into the treatment system and from the facility into the distribution system is required by Regulation 170/03. The Municipal Drinking Water License and Permit to Take Water issued by the MOECC regulate the amount of water that can be utilized over a given time period. A summary of the 2017 flows are provided in the table below and presented graphically in Appendix B.

Summary	Quantity
Permit to Take Water Limit	328 m ³ /d
Municipal Drinking Water License Limit	328 m ³ /d
2017 Average Daily Flow	117 m ³ /d
2017 Maximum Daily Flow	295 m ³ /d
2017 Average Monthly Flow	3,569 m ³
2017 Total Amount of Water Supplied	42,826 m ³

To accommodate future growth, a new treatment facility is anticipated to be constructed in 2018/2019. Once this facility is operational there will be sufficient supply capacity to meet the community's long term growth needs.

6. NON-COMPLIANCE FINDINGS AND ADVERSE RESULTS

This section documents any known incidents of non-compliance or adverse results and the associated corrective actions taken to resolve the issue. Non-compliance issues are typically identified by either the Operating Authority or the MOECC Drinking Water Inspectors. The issues and associated required actions are documented by the Inspectors in the system's Annual Inspection Report. All non-compliance issues are investigated, corrective actions taken and documented using the County's Drinking Water Quality Management System (DWQMS) procedures.

6.1. Non-Compliance Findings

The annual MOECC Inspection for the Mount Elgin Water System took place in July 2017. There was one non-compliance finding. Bacteriological samples were not taken and records of disinfection were not completed after repairs in the treatment facility. The 2017 Inspection Report rating received was 100%.

6.2. Adverse Results

There was one reportable adverse condition in 2017.

A distribution sample taken on July 17 for bacteriological testing had a positive finding of 22 cfu/100mL for Total Coliforms. The result was reported to both the MOECC and MOH. The resamples taken on July 19 were negative for total coliforms.

APPENDIX A: SUMMARY OF CHEMICAL RESULTS

UNDERSTANDING CHEMICAL TEST RESULTS

The following tables summarize the laboratory results of the chemical testing Oxford County is required to complete. Different types of parameters are required to be tested for at different frequencies as noted below. Explanations on the health impacts of these parameters can be found at the MOECC web site link <http://www.ontla.on.ca/library/repository/mon/14000/263450.pdf> document # 4449e01 titled "Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines".

Results are shown as concentrations with units of either milligrams per litre (mg/L) or micrograms per litre (ug/L), 1 mg/L is equal to 1000 ug/L. The Maximum Acceptable Concentration (MAC) is the highest amount of a parameter that the MOECC finds acceptable in Municipal drinking water and can be found in the MOECC Drinking Water Standards. The Method Detection Limit (MDL) is the lowest amount to which the laboratory can confidently measure. A result of ND stands for "Not Detected" and means that the concentration of the chemical is lower than the laboratory's equipment is capable of measuring.

Nitrite and nitrate samples are required every 3 months in normal operation.

<i>Parameter</i>	<i>Result Range Min – Max (mg/L)</i>	<i>Average Result (mg/L)</i>	<i>MAC (mg/L)</i>	<i>MDL (mg/L)</i>
Nitrite	ND	ND	1.0	0.003
Nitrate	0.010 – 0.015	0.013	10.0	0.006

Trihalomethanes (THM) and total Haloacetic Acids (HAA) samples are by-products of the disinfection process. The samples are required every 3 months from the distribution system.

<i>Parameter</i>	<i>Annual Average</i>	<i>Result Value (ug/L)</i>	<i>MAC (ug/L)</i>	<i>MDL (ug/L)</i>
Trihalomethanes (THM)	2017	10	100	0.37
Haloacetic Acids (HAA)	2017	ND	80	5.3

The following Table summarizes the most recent test results for Sodium and Fluoride. Testing and reporting of any adverse results is required every 5 years.

<i>Parameter</i>	<i>Sample Date</i>	<i>Result Value (mg/L)</i>	<i>MAC (mg/L)</i>	<i>MDL (mg/L)</i>
Sodium	March 17, 2014	19.7	20.0*	0.01
Fluoride	March 17, 2014	1.34	1.5**	0.06

*Sodium levels between 20 – 200 mg/L must be reported every 5 years.

**Natural levels of fluoride between 1.5 – 2.4 mg/L must be reported every 5 years.

The following Table summarizes the most recent results for the Lead Testing Program. Lead samples are taken every 3 years. Levels of 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.

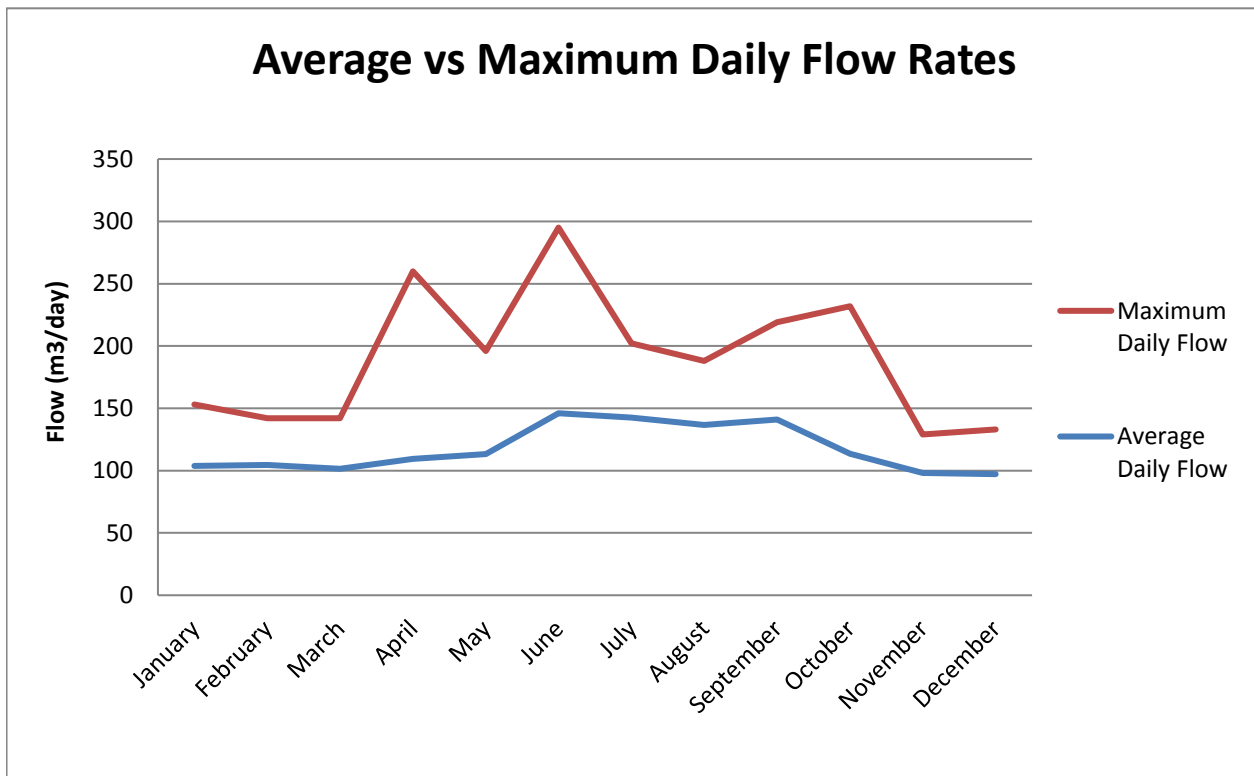
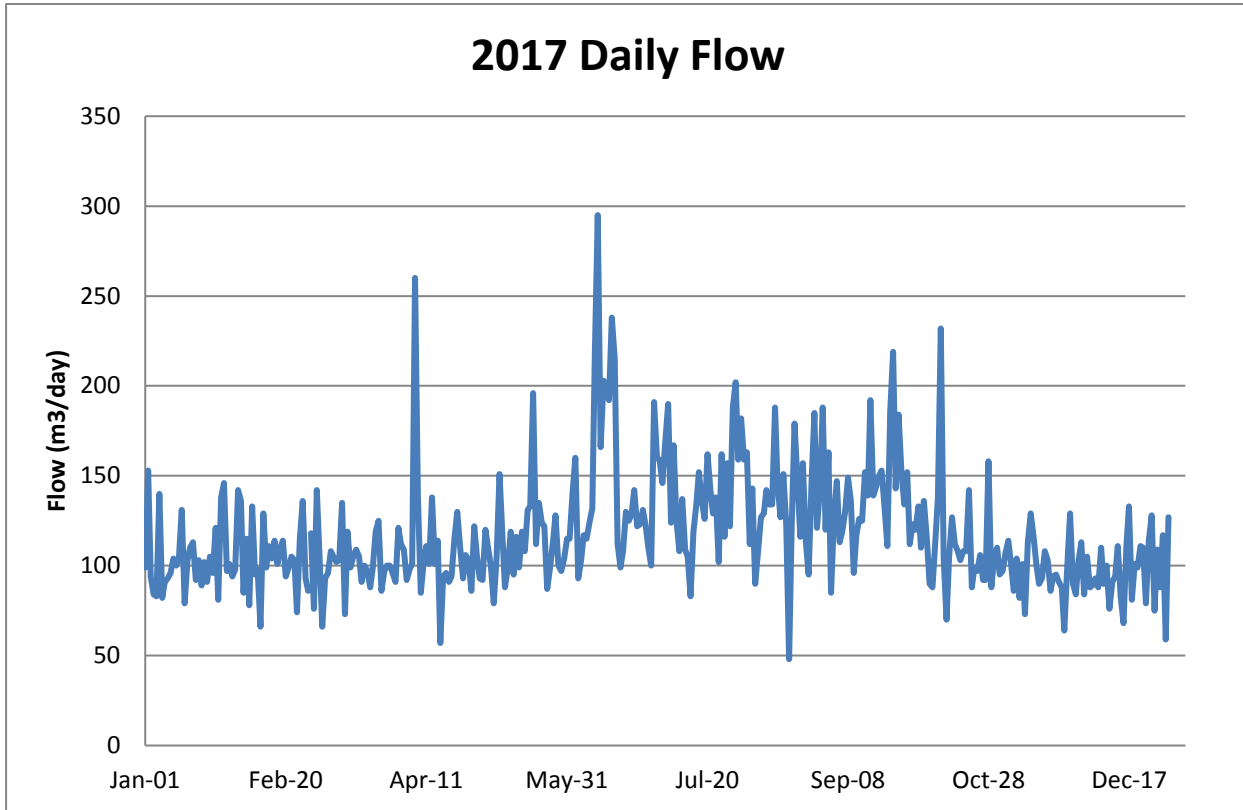
<i>Parameter</i>	<i>Result Range (Min - Max)</i>	<i>Number of Samples</i>	<i>Acceptable Level</i>
Distribution Alkalinity	216 - 242	2	30 - 500 (mg/L)
Distribution pH	7.1 - 7.3	2	6.5 - 8.5
Distribution Lead 2015	0.20 - 1.07	2	10 ug/L MAC

The following Table summarizes the most recent test results for Schedules 23 and 24. Testing is required every 3 years for secure groundwater wells.

<i>Parameter</i>	<i>Sample Date</i>	<i>Result Value (ug/L)</i>	<i>MAC (ug/L)</i>	<i>MDL (ug/L)</i>
Antimony	Feb 27, 2017	0.03	6	0.02
Arsenic	"	ND	25	0.2
Barium	"	146	1000	0.01
Boron	"	107	5000	2
Cadmium	"	0.003	5	0.003
Chromium	"	0.83	50	0.03
Mercury	"	ND	1	0.01
Selenium	"	ND	5	0.04
Uranium	"	0.016	20	0.002

<i>Parameter</i>	<i>Sample Date</i>	<i>Result (ug/L)</i>	<i>MAC (ug/L)</i>	<i>MDL (ug/L)</i>
Alachlor	Feb 27, 2017	ND	5	0.02
Atrazine + N-dealkylatedmetabolites	"	ND	5	0.01
Azinphos-methyl	"	ND	20	0.01
Benzene	"	ND	1	0.32
Benzo(a)pyrene	"	ND	0.01	0.004
Bromoxynil	"	ND	5	0.33
Carbaryl	"	ND	90	0.05
Carbofuran	"	ND	90	0.01
Carbon Tetrachloride	"	ND	2	0.16
Chlorpyrifos	"	ND	90	0.02
Chlorpyrifos	"	ND	90	0.02
Diazinon	"	ND	20	0.02
Dicamba	"	ND	120	0.20
1,2-Dichlorobenzene	"	ND	200	0.41
1,4-Dichlorobenzene	"	ND	5	0.36
1,2-Dichloroethane	"	ND	5	0.35
1,1-Dichloroethylene (vinylidene chloride)	"	ND	14	0.33
Dichloromethane	"	ND	50	0.35
2-4 Dichlorophenol	"	ND	900	0.15
2,4-Dichlorophenoxy acetic acid (2,4-D)	"	ND	100	0.19
Diclofop-methyl	"	ND	9	0.40
Dimethoate	"	ND	20	0.03
Diquat	"	ND	70	1
Diuron	"	ND	150	0.03
Glyphosate	"	ND	280	1
Malathion	"	ND	190	0.02
2-methyl-4chlorophenoxyacetic acid (MCPA)	"	ND	100	0.12
Metolachlor	"	ND	50	0.01
Metribuzin	"	ND	80	0.02
Monochlorobenzene	"	ND	80	0.30
Paraquat	"	ND	10	1
Pentachlorophenol	"	ND	60	0.15
Phorate	"	ND	2	0.01
Picloram	"	ND	190	1
Polychlorinated Biphenyls(PCB)	"	ND	3	0.04
Prometryne	"	ND	1	0.03
Simazine	"	ND	10	0.01
Terbufos	"	ND	1	0.01
Tetrachloroethylene	"	ND	10	0.35
2,3,4,6-Tetrachlorophenol	"	ND	100	0.14
Triallate	"	ND	230	0.01
Trichloroethylene	"	ND	5	0.43
2,4,6-Trichlorophenol	"	ND	5	0.25
Trifluralin	"	ND	45	0.02
Vinyl Chloride	"	ND	1	0.17

APPENDIX B: 2017 WATER QUANTITY SUMMARY



Mount Elgin Water System Capacity 328 m³/day