



**Ontario Clean Water Agency**  
**Agence Ontarienne Des Eaux**

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February 24 2017

Mayor Andy Major and Council  
The Corporation of the Township of Manitouwadge  
1 Mississauga Drive  
Manitouwadge, Ontario  
P0T 2C0

**Re: O. Regulation 170 - 2016 Section 11 Annual Report for the Manitouwadge Drinking-Water System**

Ontario's Drinking-Water Systems Regulation (O.Reg. 170/03), made under the *Safe Drinking Water Act, 2002*, requires that the owner of a drinking water system prepare an annual report on the operation of the system and the quality of its water.

The annual report must cover the period of January 1st to December 31st in a year and must be prepared not later than February 28th of the following year. Pursuant to the legislative requirements, enclosed for your records is the 2016 Annual Report for the Manitouwadge Drinking-Water System. Pursuant to the legislative requirements, Section 11 (6): the annual report must:

- (a) contain a brief description of the drinking-water system, including a list of water treatment chemicals used by the system during the period covered by the report;
- (b) summarize any reports made to the Ministry under subsection 18 (1) of the Act or section 16-4 of Schedule 16 during the period covered by the report;
- (c) summarize the results of tests required under this Regulation, or an approval or order, including an OWRA order, during the period covered by the report and, if tests required under this Regulation in respect of a parameter were not required during that period, summarize the most recent results of tests of that parameter;
- (d) describe any corrective actions taken under Schedule 17 or 18 during the period covered by the report;
- (e) describe any major expenses incurred during the period covered by the report to install, repair or replace required equipment; and
- (f) in the case of a large municipal residential system or a small municipal residential system, include a statement of where a report prepared under Schedule 22 will be available for inspection under subsection 12 (4). O. Reg. 170/03, s. 11 (6)

In addition, Section 11 (7) gives the direction that a copy of an annual report for the system is given, without charge, to every person who requests a copy and be made available for inspection by any member of the public during normal business hours. The report should be made available at the office of the municipality, or at a location that is accessible to the users of the water system.

Yours truly,

A handwritten signature in black ink, appearing to read 'B. McMahon', written over a horizontal line.

**Bradley McMahon**  
**Senior Operations Manager**  
**Northwestern Ontario Hub**

**Copy to: Steve Butlin – Public Works Superintendent**  
**Operations Staff – Manitouwadge Drinking Water System**

# 2016 Section 11 Annual Report

## Manitouwadge Drinking-Water System

February 2017

Prepared by the



**Ontario Clean Water Agency**  
**Agence Ontarienne Des Eaux**



Section 11 ANNUAL REPORT

Drinking-Water System Number:	220000219
Drinking-Water System Name:	Manitouwadge Water Treatment Plant
Drinking-Water System Owner:	The Corporation of the Township of Manitouwadge
Drinking-Water System Category:	Large Municipal Residential Drinking Water-System
Period being reported:	January 1 – December 31, 2016

<p><b><u>Complete if your Category is Large Municipal Residential or Small Municipal Residential</u></b></p> <p>Does your Drinking-Water System serve more than 10,000 people? Yes [ ] No [ X ]</p> <p>Is your annual report available to the public at no charge on a web site on the Internet? Yes [ ] No [ ]</p> <p>Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.</p> <div style="border: 1px solid black; padding: 5px;"> <p><i>The Corporation of the Township of Manitouwadge 1 Mississauga Drive Manitouwadge, ON POT 2C0</i></p> </div>	<p><b><u>Complete for all other Categories.</u></b></p> <p>Number of Designated Facilities served:</p> <div style="border: 1px solid black; padding: 2px; width: 100px; margin: 5px auto;">N/A</div> <p>Did you provide a copy of your annual report to all Designated Facilities you serve? Yes [ ] No [ ]</p> <p>Number of Interested Authorities you report to:</p> <div style="border: 1px solid black; padding: 2px; width: 100px; margin: 5px auto;">N/A</div> <p>Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? Yes [ ] No [ ]</p>
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Note: For the following tables below, additional rows or columns may be added or an appendix may be attached to the report

List all Drinking-Water Systems (if any), which receive all of their drinking water from your system:

Drinking Water System Name	Drinking Water System Number
N/A	

Did you provide a copy of your annual report to all Drinking-Water System owners that are connected to you and to whom you provide all of its drinking water?

Yes [ ] No [ ]



Indicate how you notified system users that your annual report is available, and is free of charge.

- Public access/notice via the web
- Public access/notice via Government Office
- Public access/notice via a newspaper
- Public access/notice via Public Request
- Public access/notice via a Public Library
- Public access/notice via other method

## Describe your Drinking-Water System

Raw water is extracted from five (5) wells, considered to be GUDI with adequate in-situ filtration. The first well-head site consists of wells #1 and #2, which are located at the pump house within the WTP boundaries. A 400 kW diesel engine generator is located at the WTP to provide emergency power. Wells #3 and #4 are located at the second well-head site adjacent to the west end of Manitouwadge Lake southeast of Oshweken Road. The second well-head site is equipped with a 300 kW diesel engine generator for the emergency power. Well #5 is located in a separate building approximately 30 m southwest of well #3, for a total of three well-head sites. Each well is equipped with a submersible pump rated at 30.3 L/s.

The raw water pumped from the wells is controlled by the treated water reservoir level. When the reservoir level falls to the 'low operating level,' the duty well pump will start drawing water until the reservoir reaches its 'high operating level.' Other well pumps will activate if required in order to meet water demands. The speed of the pumps are controlled by VFDs providing a more flexible and efficient operation.

The Manitouwadge WTP consists of a two-stage disinfection process, involving UV and chlorine disinfection. There are three UV reactors, one at each well-head site. UV treatment (primary disinfection) is provided at the well-head site as soon as the duty raw water well starts. Two UV reactors of rated flow rate of 63 L/s are provided for well-head sites #1 & #2 and another UV reactor with a rated flow rate of 31.5 L/s is provided for well-head site #3. The UV reactors operate using a 254 nm spectrum, and were specifically designed to achieve maximum inactivation of pathogens at a minimum dosage rate of 42 mJ/cm<sup>2</sup>.

After the primary disinfection, water is passed through an aerator unit. There are two aerator units located at the main water treatment plant. The first aerator unit treats water coming from well-head site #1, whereas the second aerator treats water coming from both well-head sites #2 & #3. The aerator units are provided to scrub off the naturally occurring hydrogen sulfides and CO<sub>2</sub> in addition to controlling the pH of the raw water.

Water from the aerators is combined and transmitted through a common header; 400 mm diameter pipeline located at the main water treatment plant. Sodium hypochlorite (12% NaOH) is injected at the common header to provide secondary disinfection. There are two (2) microprocessor-controlled metering pumps capable of delivering 3.78 L/hr of sodium hypochlorite (12% NaOH). Following chlorination, 22.56 m downstream in the common header, water flow is split through a joint reducer and transmitted through two 44.3 m long pipes of 300 mm in diameter that feeds into the reservoir.

Water is stored in a concrete underground reservoir consisting of two cells separated by a sluice gate. There are two clear-wells joint to each separate cell, located underneath the high-lift pumps. The water is pumped from the clear-wells to the distribution system. The two clear-wells are also separated by sluice gates, which provide the operational flexibility for the maintenance purposes. The dimensions of both reservoir and clear-well combined is approximately 43 m long, 20 m wide and 5 m in height. The



total volume for storage by the unit is approximately 4,060 m<sup>3</sup>. Water is distributed and supplied by four high lift pumps with VFD's. Two turbine fire pumps are used as a back up to the high lift pumps. Each high lift pump has a total rated capacity of 40.5 L/s. Fire pumps are also rated at 40.5 L/s. Average daily and peak flows are 854.17 m<sup>3</sup>/day (10 L/s) and 1,218.9 m<sup>3</sup>/day (14 L/s), respectively. The WTP's average day flow demand is well below its rated capacity of 10,472 m<sup>3</sup>/day (121 L/S) (approximately 20% of the rated capacity). Consequently, the operator only requires one well pump and one high lift pump to meet water demands under normal circumstances. A secondary standby well pump is selected to meet the additional demand. Similarly, a fire pump would be used in case of an increase in water demands.

Monitoring equipment includes five flow meters to measure the water coming from each well. There are two additional flow meters; one (1) flowmeter that measures the combined flow of all five wells before it enters the reservoir and one (1) treated water flow meter prior to the distribution network. A free chlorine analyzer is used to measure the free chlorine residual at the point of entrance to the distribution system. A turbidimeter is also set up at the same location as the free chlorine analyzer in order to measure the turbidity of the treated water just before the distribution

**List all water treatment chemicals used over this reporting period**

- Sodium Hypochlorite
- Citric Acid

**Were any significant expenses incurred to?**

- Install required equipment
- Repair required equipment
- Replace required equipment

**Please provide a brief description and a breakdown of monetary expenses incurred**

Install	Repair	Replace	Description	Expense
		X	Engineer CT Calculations	\$ 6614
X		X	Analyzer UPS Installation	\$ 1983
X			SCADA Process Narrative	\$ 14755
	X		UV Validation	\$ 8372
		X	UV PLC replacement	\$ 1847
		X	Chlorine Analyzer Replacement	\$ 5368
		X	Turbidity Analyzer Replacement	\$ 4903



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		X	Well Pump #1 and #2 Transducer Replacement	\$ 4025
X			Chlorine Tank Reducer	\$ 1173

Provide details on the notices submitted in accordance with subsection 18(1) of the Safe Drinking-Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to Spills Action Centre

Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date

Microbiological testing done under the Schedule 10, 11 or 12 of Regulation 170/03, during this reporting period.

	Number of Samples	Range of E.Coli Or Fecal Results (min #)-(max #)	Range of Total Coliform Results (min #)-(max #)	Number of HPC Samples	Range of HPC Results (min #)-(max #)
Raw	259	0	0	N/A	N/A
Treated	52	0	0	52	0-2
Distribution	208	0	0	208	0-9

Operational testing done under Schedule 7, 8 or 9 of Regulation 170/03 during the period covered by this Annual Report.

	Number of Grab Samples	Range of Results (min #)-(max #)
<b>Turbidity</b>		
Raw Well 1	12	0.23 – 0.97 NTU
Raw Well 2	12	0.1 – 0.48 NTU
Raw Well 3	12	0.09 – 0.35 NTU
Raw Well 4	12	0.14 – 0.33 NTU
Raw Well 5	12	0.11 – 0.31 NTU
Treated	8760	0 – 0.989 NTU
<b>Chlorine</b>		
Treated	8760	0.0 – 2.00 mg/L
Distribution	453	0.38 – 1.59 mg/L
<b>Fluoride (If the DWS provides fluoridation)</b>	N/A	N/A

**NOTE:** For continuous monitors use 8760 as the number of samples.

\* Turbidity & chlorine Min/Max (lows/highs) are due to planned maintenance and not plant upset.

**Summary of additional testing and sampling carried out in accordance with the requirement of an approval, order or other legal instrument.**

Date of legal instrument issued	Parameter	Date Sampled	Result	Unit of Measure
N/A				

**Summary of Inorganic parameters tested during this reporting period or the most recent sample results**

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	10-Feb-2016	< 0.6	µg/L	No
Arsenic	10-Feb-2016	< 1.0	µg/L	No
Barium	10-Feb-2016	38	µg/L	No
Boron	10-Feb-2016	< 50.0	µg/L	No
Cadmium	10-Feb-2016	< 0.1	µg/L	No
Chromium	10-Feb-2016	< 1.0	µg/L	No
*Lead	Refer to Summary Table Below			
Mercury	10-Feb-2016	< 0.1	µg/L	No
Selenium	10-Feb-2016	< 1.0	µg/L	No
Sodium	28-Jan-2015	45.5	mg/L	Yes
Uranium	10-Feb-2016	<2.0	µg/L	No
Fluoride	19-Jan-2015	0.070	mg/L	No
Nitrite	20-Jan-2016	0.017	mg/L	No
	18-Apr-2016	<0.010	mg/L	No
	20-Jul-2016	<0.010	mg/L	No
	16-Oct-2016	<0.010	mg/L	No
Nitrate	20-Jan-2016	1.47	mg/L	No
	18-Apr-2016	1.47	mg/L	No
	20-Jul-2016	1.25	mg/L	No
	16-Oct-2016	1.50	mg/L	No

\*only for drinking water systems testing under Schedule 15.2; this includes large municipal non-residential systems, small municipal non-residential systems, non-municipal seasonal residential systems, large non-municipal non-residential systems, and small non-municipal non-residential systems

**Summary of lead testing under Schedule 15.1 during this reporting period**

(applicable to the following drinking water systems; large municipal residential systems, small municipal residential systems, and non-municipal year-round residential systems)

Location Type	Number of Samples	Range of Lead Results	Number of Exceedances
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		(min#) – (max #)	
Plumbing	88	<1 - 6.9 ug/l	0
Distribution	8	<1 ug/l	0

**Summary of Organic parameters sampled during this reporting period or the most recent sample results**

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	10-Feb-2016	< 0.1	µg/L	No
Aldicarb	19-Jan-2015	< 1.0	µg/L	No
Aldrin + Dieldrin	19-Jan-2015	< 0.04	µg/L	No
Atrazine + N-dealkylated metabolites	10-Feb-2016	< 0.2	µg/L	No
Azinphos-methyl	10-Feb-2016	< 0.1	µg/L	No
Bendiocarb	19-Jan-2015	< 0.2	µg/L	No
Benzene	10-Feb-2016	< 0.5	µg/L	No
Benzo(a)pyrene	10-Feb-2016	< 0.01	µg/L	No
Bromoxynil	10-Feb-2016	< 0.2	µg/L	No
Carbaryl	10-Feb-2016	< 0.2	µg/L	No
Carbofuran	10-Feb-2016	< 0.2	µg/L	No
Carbon Tetrachloride	10-Feb-2016	< 0.5	µg/L	No
Chlordane (Total)	19-Jan-2015	< 0.3	µg/L	No
Chlorpyrifos	10-Feb-2016	< 0.1	µg/L	No
Cyanazine	19-Jan-2015	< 0.1	µg/L	No
Diazinon	10-Feb-2016	< 0.1	µg/L	No
Dicamba	10-Feb-2016	< 0.2	µg/L	No
1,2-Dichlorobenzene	10-Feb-2016	< 0.5	µg/L	No
1,4-Dichlorobenzene	10-Feb-2016	< 0.5	µg/L	No
Dichlorodiphenyltrichloroethane (DDT) + metabolites	19-Jan-2015	< 0.4	µg/L	No
1,2-Dichloroethane	10-Feb-2016	< 0.5	µg/L	No
1,1-Dichloroethylene (vinylidene chloride)	10-Feb-2016	< 0.5	µg/L	No
Dichloromethane	10-Feb-2016	< 5.0	µg/L	No
2-4 Dichlorophenol	10-Feb-2016	< 0.3	µg/L	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	10-Feb-2016	< 0.2	µg/L	No
Diclofop-methyl	10-Feb-2016	< 0.2	µg/L	No
Dimethoate	10-Feb-2016	< 0.1	µg/L	No
Dinoseb	19-Jan-2015	< 0.2	µg/L	No
Diquat	10-Feb-2016	< 1.0	µg/L	No
Diuron	10-Feb-2016	< 1.0	µg/L	No
Glyphosate	10-Feb-2016	< 5.0	µg/L	No
Heptachlor + Heptachlor Epoxide	19-Jan-2015	< 0.2	µg/L	No
Lindane (Total)	19-Jan-2015	< 0.1	µg/L	No
Malathion	19-Jan-2015	< 0.1	µg/L	No



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Methoxychlor	19-Jan-2015	< 0.1	µg/L	No
Metolachlor	10-Feb-2016	< 0.1	µg/L	No
Metribuzin	10-Feb-2016	< 0.1	µg/L	No
Monochlorobenzene	10-Feb-2016	< 0.5	µg/L	No
Paraquat	10-Feb-2016	< 1.0	µg/L	No
Parathion	19-Jan-2015	< 0.1	µg/L	No
Pentachlorophenol	10-Feb-2016	< 0.35	µg/L	No
Phorate	10-Feb-2016	< 0.5	µg/L	No
Picloram	10-Feb-2016	< 0.1	µg/L	No
Polychlorinated Biphenyls(PCB)	10-Feb-2016	< 0.04	µg/L	No
Prometryne	10-Feb-2016	< 0.1	µg/L	No
Simazine	10-Feb-2016	< 0.1	µg/L	No
THM (NOTE: show latest annual average)	18-Oct-2016 2016 Average	24.5 27.73	µg/L µg/L	No No
Temephos	19-Jan-2015	< 0.1	µg/L	No
Terbufos	10-Feb-2016	< 0.2	µg/L	No
Tetrachloroethylene	10-Feb-2016	< 0.5	µg/L	No
2,3,4,6-Tetrachlorophenol	10-Feb-2016	< 0.5	µg/L	No
Triallate	10-Feb-2016	< 0.1	µg/L	No
Trichloroethylene	10-Feb-2016	< 0.5	µg/L	No
2,4,6-Trichlorophenol	10-Feb-2016	< 0.5	µg/L	No
2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)	19-Jan-2015	< 0.2	µg/L	No
Trifluralin	10-Feb-2016	< 0.1	µg/L	No
Vinyl Chloride	10-Feb-2016	< 0.2	µg/L	No
MCPA	10-Feb-2016	< 0.2	µg/L	No

List any Inorganic or Organic parameter(s) that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards.

Parameter	Result Value	Unit of Measure	Date of Sample
Lead (Plumbing)	6.9	µg/L	14-Apr-2016