ANNUAL REPORT

ONTARIO REGULATION 170/03
SECTION 11

THORNTON
DRINKING WATER SYSTEM

FOR THE PERIOD:
JANUARY 1, 2016 – DECEMBER 31, 2016

Prepared for the Corporation of the Township of Essa
by the Ontario Clean Water Agency

ONTARIO CLEAN WATER AGENCY
AGENCE ONTARIENNE DES EAUX

Drinking-Water Systems Regulation O. Reg. 170/03

Part III Form 2
Section 11. ANNUAL REPORT.

Drinking-Water System Number:	**220006945**
Drinking-Water System Name:	Thornton Drinking Water System
Drinking-Water System Owner:	The Corporation of the Township of Essa
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	**January 1, 2016 – December 31, 2016**

Complete if your Category is Large Municipal Residential or Small Municipal Residential

Does your Drinking-Water System serve more than 10,000 people? Yes [ ] No [X]

Is your annual report available to the public at no charge on a web site on the Internet? Yes [X] No [ ]

Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.

Township of Essa Municipal Office
5786 Simcoe County Road 21
Utopia, Essa Twp, ON. L0M 1T0 or on the following website:
http://www.essatownship.on.ca

Complete for all other Categories.

Number of Designated Facilities served:

Did you provide a copy of your annual report to all Designated Facilities you serve?
Yes [ ] No [ ]

Number of Interested Authorities you report to:

Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility?
Yes [ ] No [ ]

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
Not applicable	Not applicable

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 [NA]

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

[X] Public access/notice via the web
[X] Public access/notice via Government Office
[ ] Public access/notice via a newspaper
[X] 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 Supply

The Thornton Drinking Water System pumphouse is located on Glen Avenue in the Village of Thornton, Township of Essa. Raw water is supplied to the pumphouse by means of Four (4) drilled wells each equipped with submersible well pumps. Wells 1 & 2 are comprised of a 150mm diameter casings, extending to depths of 50 and 52 meters respectively. Wells 1 & 2 are located adjacent to the pump house each with a maximum pumping rate of 6.06 L/sec at a TDH of 73 m. Wells 3 & 4 are located in the Thornton Creek Estate subdivision, North of the Glen Avenue pumphouse. Well #3 is comprised of a 300mm diameter casing extending to a depth of 32 meters, capable of pumping 5.7 L/sec at a TDH of 60m. Well #4 is comprised of a 160mm diameter casing extending to a depth of 31.4 meters, capable of pumping 3.8 L/sec at a TDH of 73m. Controls for wells #3 & 4 are located in an adjacent pre-fabricated steel building.

Disinfection

Water is pumped from the wells to the Glen Avenue pumphouse where it is disinfected with NSF certified 12% Sodium Hypochlorite Solution. The Sodium Hypochlorite Solution is stored in a 1000L bulk storage tank and a 300L day tank. The solution is injected into the main header by one of two (2) chemical feed pumps, each capable of pumping 2.5 L/hr.

Storage and Distribution

Treated water is pumped to two (2) fused glass lined bolted steel above ground storage tanks, each with a capacity of 556 cubic meters. Water is pumped from the storage tanks to the distribution system by three (3) variable frequency drive high lift pumps, each with a rated pumping capacity of 26.52 L/sec.

Monitoring and Recording

On-line analyzers monitor treated water for free chlorine residual and turbidity. Operational data, including pump run hrs, flow rates; free chlorine residual and turbidity are recorded on a data logger located on the MCC panel. The logged data is down loaded periodically and stored on the main server at the Ontario Clean Water Agency office in Wasaga Beach. The system is alarmed for a number of parameters and monitored continuously by Huronia Alarms, Midland Ontario.

Auxiliary Power

The Glen Avenue pumphouse is equipped with a 175 kw diesel generator with automatic switch over. This supplies power to the plant in the event of a power failure.

List all water treatment chemicals used over this reporting period

Sodium Hypochlorite 12% Solution NSF, Disinfection

Were any significant expenses incurred to?

[X] Install required equipment
[X] Repair required equipment
[X] Replace required equipment

Please provide a brief description of any significant expenses incurred

Expenses incurred which were in addition to normal operating costs in 2016:

1. Purchased spare chlorine pump parts
2. Replaced main isolation valve between standpipes
3. Replaced water pump on diesel generator
4. Inspected and cleaned standpipes and replaced anodes
5. Maintenance and Inspection Reports on Wells #1 and #2
6. Replaced radiator, engine coolant heater, hose and stop switch on diesel generator
7. Replaced transducer cables and pressure sensors
8. Repaired radar unit to eliminate false readings/alarms due to temperature changes causing ice formation in winter months in the reservoir
9. Drinking Water Quality Management Standard (DWQMS) audits of OCWA Quality & Environmental Management System (QEMS)

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
No Incidents to Report for 2016					

Table 1
Microbiological testing done under the Schedule 10 of Regulation 170/03, during this reporting period.

Location	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 – Well 1	52	0 - 0	0 - 2		
Raw – Well 2	52	0 - 0	0 - 1		
Raw – Well 3	52	0 - 0	0 - 1		
Raw – Well 4	52	0 - 0	0 - 1		
Treated Water - TW	52	0 - 0	0 - 0	52	0 - 132
Distribution - DW	123	0 - 0	0 - 0	52	0 - 580

Table 2
Operational testing done under Schedule 7 of Regulation 170/03 during the period covered by this Annual Report.

	Number of Grab Samples	Range of Results (min #)-(max #)
Raw Turbidity		
Well #1	12	0.24 – 0.82 NTU
Well #2	12	0.25 – 0.88 NTU
Well #3	12	0.19 – 0.74 NTU
Well #4	12	0.17 – 0.71 NTU
Treated Turbidity	8760	0.00 - 5.00* NTU
Treated Free Chlorine	8760	0.62 – 4.31 mg/L
Free Chlorine Residual Distribution System	390	0.64 – 2.20 mg/L

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

* Treated Turbidity results of 5.00 NTU due to analyzer maintenance and does not indicate an adverse situation.

Table 3
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
Not Applicable				

Table 4
Summary of Inorganic parameters tested during this reporting period or the most recent sample results

Please refer to Appendix A

Table 5
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	Lead Results and Comments
Plumbing	Relief from all Plumbing Requirements
Distribution	No Lead Testing in the Distribution in 2016 Alkalinity tested during the two regulated sample periods had results between 199 mg/L to 221 mg/L

Table 6
Summary of Organic parameters sampled during this reporting period or the most recent sample results

Please refer to Appendix A

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
Only Sodium on the treated water exceeded half the standard prescribed in Schedule 2 for the Thornton Water System Refer to Table 4 in Appendix A			

(Only if DWS category is large municipal residential, small municipal residential, large municipal non residential, non municipal year round residential, large non municipal non residential)

APPENDIX A

ANNUAL SUMMARY for parameters tested during 2016 or the most recent sample results

Table 4 – Inorganic Parameters
Table 6 – Organic Parameters

Location:
TW – Treated Water
DW – Distribution Water

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Annual Summary - Inorganic Parameters

Waterworks: 6066 - [220006945 Thornton DWS]
Period being reported: 01/01/2016 to 12/31/2016

Table 4

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

TREATED WATER	Sample Date (yyyy/mm/dd)	Sample Result	MAC	No. of Exceedances	
				MAC	1/2 MAC
Antimony: Sb (ug/L) - TW	2015/01/05	< 0.02	6.0	No	No
Arsenic: As (ug/L) - TW	2015/01/05	< 0.2	25.0	No	No
Barium: Ba (ug/L) - TW	2015/01/05	84.8	1000.0	No	No
Boron: B (ug/L) - TW	2015/01/05	31.1	5000.0	No	No
Cadmium: Cd (ug/L) - TW	2015/01/05	< 0.003	5.0	No	No
Chromium: Cr (ug/L) - TW	2015/01/05	0.07	50.0	No	No
Mercury: Hg (ug/L) - TW	2015/01/05	< 0.01	1.0	No	No
Selenium: Se (ug/L) - TW	2015/01/05	< 1.0	10.0	No	No
Uranium: U (ug/L) - TW	2015/01/05	0.599	20.0	No	No
Additional Inorganics					
Fluoride (mg/L) - TW	2013/06/11	0.13	1.5	No	No
Nitrite (mg/L) - TW	2016/01/05	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW	2016/04/05	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW	2016/07/04	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW	2016/10/04	<MDL 0.003	1.0	No	No
Nitrate (mg/L) - TW	2016/01/05	1.52	10.0	No	No
Nitrate (mg/L) - TW	2016/04/05	1.27	10.0	No	No
Nitrate (mg/L) - TW	2016/07/04	1.49	10.0	No	No
Nitrate (mg/L) - TW	2016/10/04	1.5	10.0	No	No
Sodium: Na (mg/L) - TW	2013/06/19	34.1	20*	Yes	Yes

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Annual Summary - Organic Parameters

Waterworks: 6066 - [220006945 Thornton DWS]
Period being reported: 01/01/2016 to 12/31/2016

Table 6
Summary of organic parameters tested during this reporting period or the most recent sample results

TREATED WATER	Sample Date (yyyy/mm/dd)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
Alachlor (ug/L) - TW	2015/01/05	< 0.02	5.00	No	No
Aldicarb (ug/L) - TW	2015/01/05	< 0.01	9.00	No	No
Aldrin+Dieldrin (ug/L) - TW	2015/01/05	< 0.01	0.70	No	No
Atrazine + N-dealkylated metabolites (ug/L) - TW	2015/01/05	< 0.01	5.00	No	No
Azinphos-methyl (ug/L) - TW	2015/01/05	< 0.02	20.00	No	No
Bendiocarb (ug/L) - TW	2015/01/05	< 0.01	40.00	No	No
Benzene (ug/L) - TW	2015/01/05	< 0.32	5.00	No	No
Benzo(a)pyrene (ug/L) - TW	2015/01/05	< 0.004	0.01	No	No
Bromoxynil (ug/L) - TW	2015/01/05	< 0.33	5.00	No	No
Carbaryl (ug/L) - TW	2015/01/05	< 0.01	90.00	No	No
Carbofuran (ug/L) - TW	2015/01/05	< 0.01	90.00	No	No
Carbon Tetrachloride (ug/L) - TW	2015/01/05	< 0.16	5.00	No	No
Chlordane: Total (ug/L) - TW	2015/01/05	< 0.01	7.00	No	No
Chlorpyrifos (ug/L) - TW	2015/01/05	< 0.02	90.00	No	No
Cyanazine (ug/L) - TW	2015/01/05	< 0.03	10.00	No	No
Diazinon (ug/L) - TW	2015/01/05	< 0.02	20.00	No	No
Dicamba (ug/L) - TW	2015/01/05	< 0.2	120.00	No	No
1,2-Dichlorobenzene (ug/L) - TW	2015/01/05	< 0.41	200.00	No	No
1,4-Dichlorobenzene (ug/L) - TW	2015/01/05	< 0.36	5.00	No	No
DDT + metabolites (ug/L) - TW	2015/01/05	< 0.01	30.00	No	No
1,2-Dichloroethane (ug/L) - TW	2015/01/05	< 0.35	5.00	No	No
1,1-Dichloroethylene (ug/L) - TW	2015/01/05	< 0.33	14.00	No	No
Dichloromethane (Methylene Chloride) (ug/L) - TW	2015/01/05	< 0.35	50.00	No	No
2,4-Dichlorophenol (ug/L) - TW	2015/01/05	< 0.15	900.00	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW	2015/01/05	< 0.19	100.00	No	No
Diclofop-methyl (ug/L) - TW	2015/01/05	< 0.4	9.00	No	No
Dimethoate (ug/L) - TW	2015/01/05	< 0.03	20.00	No	No
Dinoseb (ug/L) - TW	2015/01/05	< 0.36	10.00	No	No
Diquat (ug/L) - TW	2015/01/05	< 1.0	70.00	No	No
Diuron (ug/L) - TW	2015/01/05	< 0.03	150.00	No	No
Glyphosate (ug/L) - TW	2015/01/05	< 1.0	280.00	No	No
Heptachlor+hepachlor epoxide (ug/L) - TW	2015/01/05	< 0.01	3.00	No	No
Lindane (ug/L) - TW	2015/01/05	< 0.01	4.00	No	No
Malathion (ug/L) - TW	2015/01/05	< 0.02	190.00	No	No
Methoxychlor (ug/L) - TW	2015/01/05	< 0.01	900.00	No	No
Metolachlor (ug/L) - TW	2015/01/05	< 0.01	50.00	No	No
Metribuzin (ug/L) - TW	2015/01/05	< 0.02	80.00	No	No
Monochlorobenzene (Chlorobenzene) (ug/L) - TW	2015/01/05	< 0.3	80.00	No	No
Paraquat (ug/L) - TW	2015/01/05	< 1.0	10.00	No	No
Parathion (ug/L) - TW	2015/01/05	< 0.02	50.00	No	No
PCB (ug/L) - TW	2015/01/05	< 0.04	3.00	No	No

Pentachlorophenol (ug/L) - TW	2015/01/05	< 0.15	60.00	No	No
Phorate (ug/L) - TW	2015/01/05	< 0.01	2.00	No	No
Picloram (ug/L) - TW	2015/01/05	< 1.0	190.00	No	No
Prometryne (ug/L) - TW	2015/01/05	< 0.03	1.00	No	No
Simazine (ug/L) - TW	2015/01/05	< 0.01	10.00	No	No
Temephos (ug/L) - TW	2015/01/05	< 0.01	280.00	No	No
Terbufos (ug/L) - TW	2015/01/05	< 0.01	1.00	No	No
Tetrachloroethylene (ug/L) - TW	2015/01/05	< 0.35	30.00	No	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW	2015/01/05	< 0.14	100.00	No	No
Triallate (ug/L) - TW	2015/01/05	< 0.01	230.00	No	No
Trichloroethylene (ug/L) - TW	2015/01/05	< 0.44	50.00	No	No
2,4,6-Trichlorophenol (ug/L) - TW	2015/01/05	< 0.25	5.00	No	No
2,4,5-Trichlorophenoxyacetic acid (2,4,5-T) (ug/L) - TW	2015/01/05	< 0.22	280.00	No	No
Trifluralin (ug/L) - TW	2015/01/05	< 0.02	45.00	No	No
Vinyl Chloride (ug/L) - TW	2015/01/05	< 0.17	2.00	No	No
DISTRIBUTION WATER					
Trihalomethane: Total (ug/L) Annual Average - DW	2016/01/01	19.75	100.00	No	No