



Report No.
SWB01-20

File No.

Directed to: **Members of Board of Management for the St. Thomas Area Secondary Water Supply System**

Date Authored: Feb 7 2020

Meeting Date: Feb 27 2020

Department: Environmental Services

Attachment

Prepared By: Chris Andrew
Manager of Water and Sewer

#1 – 2019 Summary Report for St. Thomas Area Secondary Water System

Subject: **St. Thomas Area Secondary Water Supply System 2019 Annual and Summary Reports**

Recommendation:

THAT: Report SWB01-20, being a report on the Annual and Summary Reports for the 2019 operation of the St. Thomas Area Secondary Water Supply System, be received for information.

Background:

Under the Safe Drinking Water Act, 2002, Regulation 170/03, Section 11, requires that owners and administrators of drinking water systems prepare Annual Reports by February 28th of each year. Under Schedule 22, the Regulation also requires the owner of a drinking water system to prepare a Summary Report no later than March 31st of each year.

Analysis:

The City of St. Thomas, Township of Southwold and Municipality of Central Elgin jointly own the St. Thomas Area Secondary Water Supply System (STASWSS) and the STASWSS portion of the Elgin Middlesex Pumping Station (EMPS).

The STASWSS is comprised of a transmission main (operated by City of St. Thomas Environmental Services Dept.), and a pumping station, located within the Elgin Middlesex Pumping Station (operated by the Ontario Clean Water Agency (OCWA)).

City of St. Thomas Environmental Services Dept. has prepared Annual and Summary Reports for the operations of the transmission main of the STASWSS, appended as attachment # 1. OCWA has prepared Annual and Summary Reports for the operations of the pumping station within the EMPS. The Annual Reports are provided as an appendices to each of the Summary Reports. The OCWA prepared Summary Report is included as an attachment to the Summary Report prepared by the City of St. Thomas and is appended as attachment # 1.

The Annual Reports have been completed by the required date of February 28, 2020, on standard forms provided by the Ministry and will be filed as required.

The Summary Reports have been completed prior to the required date of March 31, 2020. As required by the regulations, arrangements have been made to post the reports on the City's web site and copies will be sent to the drinking water systems that receive water from the St. Thomas Area Secondary Water Supply System. Copies of the reports will be made available to the Public upon request at the Environmental Services Department.

The water system remains safe, efficient, extensively tested, and well maintained. It meets all of the stringent regulatory requirements. The rates established by the Board contribute to a sustainable asset for this and future generations.

Respectfully,

Chris Andrew
Manager of Water and Sewer

Reviewed By: _____

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St. Thomas Secondary System

License Number: 190-101

Permit Number: 190-201

Provincial Regulation 170/03
Summary Report

For the Period
January 1, 2019 – December 31, 2019



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1 Summary Report Requirements

1.1 Introduction

The 2019 Summary Report for the St. Thomas Area Secondary Water Supply System (STASWSS) is being submitted to satisfy Schedule 22 of Ontario Regulation 170/03, the requirement to prepare and distribute a summary report of water system operations, outlining regulatory non-compliance with respect to water quality and water system management and administration and evaluating the water system infrastructure adequacy (with respect to its ability to continuing meeting the water demands of the serviced community).

As per Ontario Regulation 170/03, the summary report must:

- a. List the requirements of the Act, the regulations, the system's approval, drinking water works permit, municipal drinking water licence, and any orders applicable to the system that were not met at any time during the period covered by the report; and
- b. For each requirement referred to in clause (a) that was not met, specify the duration of the failure and the measures that were taken to correct the failure.

The report must also include the following information for the purpose of enabling the owner of the system to assess the capability of the system to meet existing and planned uses of the system:

- A summary of the quantities and flow rates of the water supplied during the period covered by the report, including monthly average and maximum daily flows.
- A comparison of the summary to the rated capacity and flow rates approved in the system's approval, drinking water works permit or municipal drinking water licence, or if the system is receiving all of its water from another system under an agreement, to the flow rates specified in the written agreement.

The information provided is for the purpose of enabling the owner of the system to assess the capacity of the system. This report covers the reporting period from January 1, 2019 to December 31, 2019.

1.2 System Description

The STASWSS is supplied water from the Elgin Middlesex Pumping Station (EMPS) and Reservoir. The EMPS reservoir is filled by the Elgin Area Primary Water Supply System (EAPWSS) which obtains its water from Lake Erie and provides water treatment at the Elgin Area Primary Water Treatment Plant, located on Dexter Line, East of Port Stanley Ontario.

Operation and Maintenance of the EMPS- St. Thomas section is currently under contract with the Ontario Clean Water Agency (OCWA). The operation and maintenance of the associated transmission main and distribution system of the STASWSS is currently conducted by the City of St. Thomas – Environmental Services Dept.

The STASWSS is considered a distribution-only system, providing water directly to the City of St. Thomas and sections of the Southwold and Central Elgin Water Distribution Systems.

1.3 System Approvals and Regulatory Requirements

Operation and Maintenance of the STASWSS is governed by the Safe Drinking Water Act, 2002, and the regulations established under this Act. In accordance with the Safe Drinking Water Act, The Joint Board of Management of the St. Thomas Area Secondary Water Supply System holds a Municipal Drinking Water Licence and Drinking Water Works Permit, which provide approval for the establishment of drinking water infrastructure and provide the authority to operate and maintain said water system.

During the reporting period, The St. Thomas Area Secondary Water Supply System was operated pursuant to the approvals, licences and permits listed below:

- MDWL No. 190-101, issued on June 28 2016
- DWWP No. 190-201, issued on June 28 2016

Ontario Regulation 170/03 – Drinking Water Systems, governs the operation, maintenance and water quality monitoring requirements for municipal drinking water systems in Ontario. Ontario Regulation 128/04 – Certification of Drinking Water System Operations and Water Quality Analysts sets out the requirements for persons performing operational or maintenance activities on the water system. The Safe Drinking Water Act, 2002 and the associated regulations are enforced by the Ministry of Environment, Conservation and Parks (MECP) and monitored through annual inspections by Ministry personnel. Any non-compliant conditions identified during the course of the annual inspection are listed in the Inspection Report issued at the conclusion of the inspection period and are summarized in section 4.1 of this report.

Ontario Regulation 169/03 – Ontario Drinking Water Quality Standards sets the limits for parameters of concern in drinking water. Drinking water quality is monitored by the Operating Authority and any exceedance of the Drinking Water Quality Standards must be reported to the MECP and Public Health Unit, verbally and in written form through the use of a Notice of Adverse Test Results and Issue Resolution Form. Any non-compliant conditions identified through water quality monitoring exercises over the reporting period have been documented on a Notice of Adverse Test Results and Issue Resolution Form and are summarized in section 4.2 of this report.

2 Evaluation of Water Quantities and Flow Rates

The EMPS is situated on a site owned by the Elgin Area Primary Water Supply System and includes the original St. Thomas pump station, constructed in 1966 that services St. Thomas, and sections of the Municipalities of Central Elgin and Southwold. Two additional pump stations were completed in 1994 and service the City of London, as well as the Municipality of Malahide, Town of Aylmer, and the Municipality of Central Elgin.

The St. Thomas pump station is comprised of three high-lift pumps that deliver water through a transmission main that services the St. Thomas Area Secondary Water Supply System. A gas re-chlorination system provides re-chlorination for water being directed to the St. Thomas Area Secondary Water Supply System.

The Ontario Clean Water Agency (OCWA) is currently the Operating Authority for all 3 pump stations located within the EMPS, and ultimately control the pumps directing water into the STASWSS.

OCWA has prepared a Summary Report for their operations at the EMPS for the reporting period, which evaluates the volumes of water delivered to the STASWSS. The report is attached as Appendix A.

3 Water Quality Summary

A summary of water quality testing completed by the City of St. Thomas – Environmental Services Dept. over the course of the reporting period is available in the Annual Report, attached as Appendix B.

A summary of water quality testing completed by OCWA over the course of the reporting period is available in the Annual Report included as an appendix to the Summary Report (Appendix A to this report).

4 Summary of Non-Compliant Conditions

4.1 Ministry of the Environment, Conservation and Parks Inspection

The Ontario Ministry of the Environment, Conservation and Parks (MECP) conducts an inspection of the St. Thomas portion of the Elgin-Middlesex Pumping Station, operated by OCWA, annually along with the St Thomas Area Secondary Water System, operated by the City of St Thomas.

An MECP inspection took place on October 1, 2019. The final inspection report was issued on November 5, 2019. Non-compliances were identified within the inspection report.

The MECP Inspection Report identified an inspection risk rating of 0% and achieving an overall final inspection rating of 100%, indicating that the risk was minimal.

MECP Inspection Finding	O.A. Responsible	Action Taken
N/A	N/A	N/A

4.2 Adverse Test Results and Issue Resolution

Any non-compliant conditions identified through water quality monitoring exercises undertaken by St. Thomas Environmental Services over the reporting period, and actions taken are summarized in the table below.

Adverse Test Result (Date / Location)	O.A. Responsible	Action Taken
N/A	N/A	N/A

5 List of Appendices

Appendix A – OCWA EMPS – St. Thomas Secondary Water Supply System – 2019 Summary Report

Appendix B - St. Thomas Secondary Water Supply System – 2019 Annual Report

APPENDIX A

ELGIN-MIDDLESEX PUMPING STATION
ST.THOMAS AREA SECONDARY WATER SUPPLY SYSTEM
2019 COMPLIANCE REPORT
(Schedule 22 Summary Report)

Facility Name: Elgin-Middlesex Pumping Station -
St.Thomas Area Secondary Water Supply System

Mailing Address: Elgin Area Primary Water Supply System
P.O. Box 220
Port Stanley, ON N5L 1J4



Average Daily Flow 7,679 m³/day
Max. Daily Flow 14,263 m³/day
Source Water Elgin Area Primary Water Supply System

CONTACT INFO:

Contract Administration:
City of St.Thomas, City Hall
Environmental Services
545 Talbot Street, St.Thomas, ON N5P3V7
Contact: Mr. Justin Lawrence
Director of Environmental
Services and City Engineer

Operator:
Ontario Clean Water Agency.
P.O. Box 220, Port Stanley, Ontario N5L 1J4
Contact: Mr. Simon Flanagan - Senior Operations Manager
(519) 782-3101

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System Approval:

The St.Thomas Area Water Supply System is supplied water through the Elgin-Middlesex Pump Station, which receives water from the Elgin Area Primary Water Supply System on Dexter Line, east of Port Stanley, Ontario. During the reporting period, The St.Thomas Area Secondary Water Supply System was operated pursuant to the approvals, licenses and permits listed below.

The supply and distribution of water to the system was governed by the following Municipal Drinking Water Licenses (MDWL) and Drinking Water Works Permits (DWWP):

St.Thomas Area Secondary Water Supply System

- o MDWL No. 190-101, issued on June 28, 2016
- o DWWP No. 190-201, issued on June 28, 2016

The DWWP and MDWL were issued in accordance with the *Safe Drinking Water Act (SDWA)*, 2002.



Treated Water Requirements:

Effective as of June 1, 2003 the Ontario government enacted new drinking water regulations under the *Safe Drinking Water Act*, 2002. The Drinking Water Systems Regulation (O.Reg. 170/03) replaced the Drinking Water Protection Regulation for Larger Waterworks (O. Reg. 459/00) and the Drinking Water Protection Regulation for Smaller Waterworks Serving Designated Facilities (O. Reg. 505/01).

Staff Complement and Training:

In 2019, the St.Thomas facility at the Elgin-Middlesex Pump Station (EMPS) was operated and maintained under the operating authority, Ontario Clean Water Agency. The operational and maintenance staff are based at the Elgin Area Primary Water Supply System (EAPWSS) located east of Port Stanley, Ontario, and share their time between the two facilities. Employees responsible for the operations and maintenance of the facility included one (1) Senior Operations Manager, (1) Compliance Manager, two (2) Team Leads, six (6) full time equivalent operations staff, four (4) full time equivalent maintenance staff and one (1) administrative assistant.

The Compliance Manager shares their work hours between the Lake Huron Primary Water Supply System (LHPWSS) and the Elgin Area Primary Water Supply System (EAPWSS).

In 2019, all employees received Director Approved and practical on-the-job training which contributed to annual MECP training requirements.

History of Facility:

The EMPS is occupied by three booster stations that comprise an integrated booster station consisting of two in-ground storage reservoirs, each having a capacity of 27.3 million liters. The site upon which the three booster stations is situated is owned by the Elgin Area Primary Water Supply System and includes the original St.Thomas pump station, constructed in 1966 that services St.Thomas, and sections of the Municipalities of Central Elgin and Southwold. Two additional pump stations were completed in 1994 and service the City of London, as well as the Municipality of Malahide, Town of Aylmer, and the Municipality of Central Elgin.

The St.Thomas pump station is comprised of three high-lift pumps that deliver water through a transmission main that services the St.Thomas Area Secondary Water Supply System. A gas re-chlorination system provides re-chlorination for water being directed to the St.Thomas Area Secondary Water Supply System.



In the event of a power failure, an on-site generator can provide sufficient standby power to operate the facility and run the St.Thomas pumps.

Remote monitoring and control of all three pump stations is performed by staff at the Elgin Area Primary Water Supply System (EAPWSS) near Port Stanley, Ontario. Remote monitoring and control capabilities are made possible via the EAPWSS and the EMPS SCADA systems.

Process Description:



The Elgin-Middlesex Pump Station (EMPS) receives treated water from the Elgin Area Primary Water Supply System, which treats water at the water treatment plant located on the shores of Lake Erie to the east of Port Stanley. Water from the plant is pumped into the EMPS site reservoirs where it is subsequently fed via a series of headers to each of the pumping stations serving the Aylmer Area Secondary Water Supply System, the City of London Distribution System, and the St. Thomas Area Secondary Water Supply System.

The St. Thomas pump station has two duty pumps and one standby pump. All three pumps being variable speed pumps. However, the VFD's are presently programmed to act as soft starts. Each pump has a rated capacity of 263 L/s.

Post-Treatment:

The St. Thomas Area and Aylmer Area Secondary Water Supply System pump stations both utilize a gas re-chlorination facility. The facility consists of two scaled 68kg gas chlorine cylinders and three chlorinators equipped with booster pumps. The three chlorinators redundantly serve the Aylmer Area Secondary Water Supply System (AASWSS) and St. Thomas Area Secondary Water Supply System (STASWSS) and have a dosage capacity range of 1-60kg/h of chlorine gas.

High Lift Pump Station:

The three high lift pumps provide redundant pumping capacity into the St. Thomas Area Secondary Water Supply System. See Appendix B for 2019 Total Daily Flows and Appendix C for 2019 Daily Instantaneous Peak Flows.

Maintenance:

Site maintenance was carried out by Ontario Clean Water Agency field services staff based at the Elgin Area Primary Water Supply System located east of Port Stanley. Specialty maintenance services are provided, on an as needed basis by external service providers. All maintenance scheduling is monitored through a computerized maintenance management system.

In addition to the routine preventative maintenance program, a number of maintenance projects were completed at the EMPS in 2019. A summary of non-routine maintenance is available in Appendix D, the 2019 Annual Report.

Sampling Procedures:

All samples collected by licensed OCWA personnel are submitted to CALA accredited laboratories for bacteriological and chemical analysis.

Distribution water samples are taken twice per week at the inlet to the reservoir and submitted for bacteriological analysis. The distribution water entering the St.Thomas Area Secondary Water Supply System is sampled weekly and submitted to an external laboratory for bacteriological analysis. Chlorine residual, for the water entering the St.Thomas Area Secondary Water Supply System, is monitored continuously from the Elgin Area Primary Water Supply System by means of the SCADA system.

On a quarterly basis the distribution water entering the reservoir, as well as the water entering the St.Thomas Area Secondary Water Supply System is sampled and submitted to an accredited laboratory for testing of Total Trihalomethanes (THMs) and Haloacetic Acids (HAA's), disinfection by-products. Twice annually, the distribution water entering the reservoir is sampled and submitted to an accredited laboratory for testing of lead concentrations. All water quality sampling at the Elgin- Middlesex Pump Station is performed in accordance with Ontario Regulation 170/03.

Flow Measurement and Water Quality Monitoring:

Flow is measured in the process utilizing a flow measurement device. Chlorine residual levels are monitored by an on-line analyzer located at the point of entry into the St.Thomas Secondary Water Supply System. These devices were calibrated in 2019 by licensed OCWA staff and contractors. See Appendix A for a summary of 2019 water quality data.

Statement of Comparison:

The previous Certificate of Approval and new Municipal Drinking Water License for the St.Thomas Area Secondary Water Supply System does not identify a rated capacity for the system. The pumping station has an available capacity of 45,446 m³/day, whereby instantaneous peak flow is 526 L/s.

The maximum total daily flow witnessed by the system in 2019 was 14,263 m³/day, approximately 31% of the capacity. The average total daily flow witnessed by the system in 2019 was 7,679 m³/day, approximately 17% of the capacity.

The maximum instantaneous peak flow witnessed by the system in 2019 was 441 L/s, approximately 84% of the capacity. See Appendix B for 2019 total daily flow values and Appendix C for 2019 daily instantaneous peak flow rates.

Ministry of the Environment Conservation and Parks Inspections:

The Ontario Ministry of the Environment Conservation and Parks (MECP) conducts an inspection of the St.Thomas portion of the Elgin-Middlesex Pumping Station annually along with the St Thomas Area Secondary Water System operated by the City of St Thomas. A MECP inspection took place in October 2019. The final inspection report was issued on November 5, 2019. There were no non-compliances identified in the inspection report. The final inspection rating received for the 2019-2020 reporting year was 100.00%

Benefiting Municipalities:

Following the adoption of the Municipal Water and Sewer Transfer Act in 1997, the Ontario Ministry of the Environment Conservation and Parks transferred the ownership of the three booster stations from the Province of Ontario to the water systems' benefiting municipalities. As a result the Aylmer Area Secondary Water Supply System portion of the EMPS and associated equipment is owned by the Aylmer Area Secondary Water Supply System Joint Board of Management, the London portion of the EMPS is owned by the Corporation of the City of London, and the St.Thomas Area Secondary Water System portion of the EMPS and associated appurtenances are owned by the St.Thomas Area Secondary Water System Joint Board of Management. Jointly these water systems benefit, and are managed on behalf of, the communities of Aylmer, Central Elgin, London, Malahide, Southwold and St.Thomas. A list of municipalities that receive water directly and indirectly from the St.Thomas Area Secondary Water Supply System at the EMPS is provided in Appendix D. The Ontario Clean Water Agency operates and maintains the Elgin- Middlesex Pump Station, under contracts to the Aylmer Area Secondary Water Supply System, The Corporation of the City of London and the St.Thomas Area Secondary Water Supply System. These contracts being administered by the City of St.Thomas on behalf of the various water systems.

This report was prepared by Ontario Clean Water Agency, the Operating Authority for the St.Thomas portion of the EMPS, on behalf of the St.Thomas Area Secondary Water Supply System Joint Board of Management.

APPENDIX A – 2019 WATER QUALITY SUMMARY

MONTH	POST TREATMENT
	Free Cl₂ mg/L
January	
Minimum	1.00
Maximum	1.92
Average	1.32
February	
Minimum	0.94
Maximum	1.63
Average	1.25
March	
Minimum	0.94
Maximum	1.54
Average	1.24
April	
Minimum	0.96
Maximum	1.54
Average	1.26
May	
Minimum	0.92
Maximum	1.54
Average	1.26
June	
Minimum	0.92
Maximum	1.88
Average	1.30
July	
Minimum	0.83
Maximum	1.78
Average	1.32
August	
Minimum	0.72
Maximum	1.92
Average	1.29
September	
Minimum	0.82
Maximum	1.90
Average	1.34
October	
Minimum	0.79
Maximum	2.17
Average	1.33
November	
Minimum	0.79
Maximum	1.98
Average	1.24
December	
Minimum	0.77
Maximum	1.87
Average	1.34
Yearly Minimum	0.72
Yearly Maximum	2.17
Yearly Average	1.29

Note: Chlorine residuals obtained from SCADA.

**APPENDIX B
ST. THOMAS TOTAL DAILY FLOW - 2019**

Date	January m ³	February m ³	March m ³	April m ³	May m ³	June m ³	July m ³	August m ³	September m ³	October m ³	November m ³	December m ³	
1	6682	5825	7684	8766	8307	8707	10794	6267	4551	5191	7655	7501	
2	6498	6411	8086	9709	8291	9493	9722	6697	5902	4851	7941	7317	
3	6620	6947	8618	9120	7331	8724	10517	6203	5340	3955	8361	7070	
4	6765	6130	8212	7535	7900	9225	11549	5278	5583	6918	7941	7277	
5	7271	8518	7692	7185	8884	8652	11700	5914	4802	9750	7736	7036	
6	7774	7584	7721	8282	8525	8903	9535	5582	4935	9817	7821	6902	
7	6463	7504	8044	8137	7551	9715	10111	6308	5000	9698	7790	7852	
8	6876	7591	8102	7793	7501	10300	10861	5515	5515	10011	7313	8803	
9	5747	7904	9062	7517	7835	10263	11065	6084	4853	8908	8590	7291	
10	5872	8289	7700	8257	7247	8761	10575	5841	4921	8851	8344	6910	
11	6004	7584	7512	7557	8060	12895	11337	6542	4980	8723	7937	7119	
12	6689	7512	7906	7044	7951	14263	11923	6178	4769	8592	7764	7201	
13	7577	7673	7493	7928	7746	12604	11090	6521	5780	8528	7949	7105	
14	6175	7528	7706	9560	8018	10370	10645	7300	5504	8932	7143	7459	
15	5965	7399	7955	7950	8202	8684	11545	7380	5897	8344	6910	8075	
16	5756	7787	7994	7006	8281	8314	10375	8331	5409	4702	7454	7766	
17	5943	7624	10720	7969	8295	8856	9362	6680	4946	8385	7911	7516	
18	5765	7793	7579	7196	8759	9673	7296	7460	5163	8880	7541	7420	
19	6700	8189	7699	8746	8815	10001	5932	7376	5011	9139	7492	7473	
20	7212	7672	8014	7342	9169	8073	5728	6494	5464	9179	7376	7299	
21	6193	7732	7700	7932	8742	9181	5674	6922	5713	8243	7096	8093	
22	5650	8093	7615	8128	8069	9796	7249	5949	9930	8177	7018	8385	
23	5727	9367	8620	7683	8317	10335	6092	5849	6179	8764	7421	8342	
24	5940	10837	9150	7940	8206	9288	6454	5662	4788	8217	7761	8204	
25	5546	9941	7632	8154	8907	11918	8023	5861	4744	8039	6985	7613	
26	6521	7916	7700	7600	9273	11126	7526	5876	4533	8334	6995	7622	
27	6448	8068	7856	7788	8787	11047	7055	4635	4504	8841	6957	8349	
28	6163	7900	7612	8204	8638	11213	5893	5036	4619	7805	7206	8326	
29	5541		7553	7744	8935	10314	5827	5548	4903	7432	7102	8136	
30	6280		7484	8036	8112	9819	5369	5296	4517	7652	8516	7852	
31	6357		8766		8988		5742	5350		7097		8313	
Total	196,720	219,318	249,187	239,808	257,642	300,513	272,566	191,935	158,755	249,955	228,026	237,627	2,802,052
Minimum	5,541	5,825	7,484	7,006	7,247	8,073	5,369	4,635	4,504	3,955	6,910	6,902	3,955
Maximum	7,774	10,837	10,720	9,709	9,273	14,263	11,923	8,331	9,930	10,011	8,590	8,803	14,263
Average	6,346	7,833	8,038	7,994	8,311	10,017	8,792	6,191	5,292	8,063	7,601	7,665	7,679

**APPENDIX C
ST. THOMAS DAILY INSTANTANEOUS PEAK FLOW - 2019**

Date	January L/s	February L/s	March L/s	April L/s	May L/s	June L/s	July L/s	August L/s	September L/s	October L/s	November L/s	December L/s
1	248	268	273	271	275	271	273	268	268	269	290	290
2	249	269	277	273	271	270	271	268	271	268	273	282
3	441	271	273	272	270	269	273	266	269	266	274	286
4	263	271	271	271	270	270	271	268	268	270	295	270
5	261	272	275	275	272	267	270	266	267	268	290	276
6	263	272	273	270	278	268	270	266	266	273	275	287
7	264	274	273	274	273	268	271	267	266	290	282	279
8	269	282	274	275	269	269	272	265	265	274	286	283
9	260	278	277	274	272	270	275	265	266	273	289	285
10	260	270	276	273	275	275	275	266	269	270	283	290
11	265	274	275	271	272	274	275	265	267	271	279	280
12	258	272	276	271	272	275	276	261	266	272	296	292
13	262	271	277	270	269	275	273	269	269	269	282	286
14	263	303	272	272	272	273	271	266	270	272	282	288
15	263	275	270	271	269	271	276	267	269	271	273	279
16	260	288	273	272	269	270	273	267	270	276	272	277
17	262	285	307	274	270	272	269	264	267	272	280	275
18	262	278	273	270	268	271	274	269	272	266	299	275
19	260	275	273	271	271	275	267	267	269	270	277	283
20	259	296	270	271	269	277	268	263	266	271	288	284
21	258	283	271	273	269	272	271	265	267	277	279	287
22	266	289	351	274	270	275	271	268	269	274	286	283
23	269	272	272	270	271	274	269	263	266	269	297	277
24	270	272	276	270	270	274	269	264	266	270	288	281
25	269	274	275	269	272	277	271	267	269	271	287	275
26	271	275	274	268	272	270	267	268	272	269	293	271
27	271	274	276	271	266	272	268	268	269	269	293	273
28	270	270	277	271	267	270	266	269	267	274	284	273
29	272		273	271	263	273	269	270	274	271	269	271
30	268		277	270	268	275	268	263	269	274	292	271
31	267		273		271		268	266		274		273
Minimum	248	268	270	268	263	267	266	261	265	266	269	270
Maximum	441	303	351	275	278	277	276	270	274	290	299	292
Average	269	277	278	272	270	272	271	266	268	272	284	280



Drinking-Water System Number:	260078897
Drinking-Water System Name:	Elgin Middlesex Pumping Station - St. Thomas Area Secondary Water Supply System
Drinking-Water System Owner:	St. Thomas Area Secondary Water Supply System Joint Board of Management
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	January 1, 2019 through December 31, 2019

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

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

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.

City of St. Thomas, City Hall
Environmental Services
545 Talbot Street
St Thomas, ON.
N5P 3V7
www.city.st-thomas.on.ca

Elgin Area Primary Water Supply System
Treatment Plant
43665 Dexter Line, Union, ON
N0L 2L0

Complete for all other Categories.

Number of Designated Facilities served:

N/A

Did you provide a copy of your annual report to all Designated Facilities you serve?

Yes [] No []

Number of Interested Authorities you report to:

N/A

Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility?

Yes [] No []

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

Systems that receive their drinking water directly from the St. Thomas EMPS:

Drinking Water System Name	Drinking Water System Number
St. Thomas Area Secondary Water Supply System	260078897
St. Thomas Distribution System	260002187



Systems that receive their drinking water indirectly from the St. Thomas EMPS:

Drinking Water System Name	Drinking Water System Number
Dutton/Dunwich Distribution System	220002967
Municipality of Central Elgin	260004761
Southwold Distribution Supply	210001362

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

The Elgin Middlesex Pumping Station (EMPS) receives water from the Elgin Area Primary Water Supply System, which is located to the east of Port Stanley. Through various secondary water supply systems, the EMPS serves the Cities of London, St. Thomas, Town of Aylmer, and Municipalities of Central Elgin, Malahide, Dutton-Dunwich and Southwold.

The EMPS is a shared facility encompassing a twin celled reservoir with a total capacity of 54,600m³. Booster pumps are dedicated to directing water to the City of London, St. Thomas Secondary and/or Aylmer Area Secondary Water Supply Systems. A gas chlorine system is utilized to provide re-chlorination for water being directed to the St. Thomas and Aylmer Area Secondary Water Supply Systems. The facility also houses a 600kW standby diesel generator that provides emergency power to pump water into the St. Thomas and Aylmer systems during a power interruption.

Three pipelines exit the EMPS: one exits to the south of the EMPS property and extends west to service the St. Thomas Secondary Water Supply System; the second services the City of London distribution system; the third services the municipalities on the Aylmer Area Secondary Water Supply System.

List all water treatment chemicals used over this reporting period

Chlorine Gas



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

- SCADA Server replacement and software version upgrades
- Chlorinator system replacement
- Primary Transformer – fan replacement
- Installation of IR windows in switchgear
- Chlorine analyzer probe replacement
- Major electrical maintenance
- Exterior envelope repairs and drainage

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
June 13, 2019	Total Coliform	68	CFU/100 mL	Resampled and tested. All resample results were clear.	June 13, 2019 and June 14, 2019

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 Results (CFU/100 mL) (min #)-(max #)	Range of Total Coliform Results (CFU/100 mL) (min #)-(max #)	Number of Heterotrophic Plate Count (HPC) Samples	Range of HPC Results (CFU/1 mL) (min #)-(max #)
Distribution	53	(0) – (0)	(0) – (68)	53	(<10)-(20)

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

Parameter	Number of Grab Samples (Continuous Monitoring)	Min	Max	Avg
Free Chlorine Residual (mg/L)	8760	0.72	2.17	1.60

Note: The free chlorine residual spiked on occasion during 2019. Each spike corresponded with a pump start-up. None of the spikes lasted longer than 5 minutes after pump start-up.

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

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
THM (NOTE: result value is based on one sample)	January 22, 2019 April 11, 2019 July 23, 2019 October 22, 2019	9.6 13 22 21	µg/L µg/L µg/L µg/L	NO
THM Running Annual Average (RAA)	2019	16.4	µg/L	NO
HAA (NOTE: result value is based on one sample)	January 22, 2019 April 11, 2019 July 23, 2019 October 22, 2019	ND ND 6.6 6.1	µg/L µg/L µg/L µg/L	NO
HAA Running Annual Average (RAA)	2019	3.2	µg/L	NO

ND= Non-detect

APPENDIX E 2019 EMPS Treatment	
Month	Total Chlorine Gas Usage - Kg
January	123.7
February	128.7
March	132.6
April	128.4
May	143.3
June	184.5
July	209.1
August	177.8
September	151.0
October	230.9
November	184.8
December	175.3
Yearly Total	1970.1

Please note: Aylmer and St.Thomas combined cl2 usage

APPENDIX B



Drinking-Water System Number:	260078897
Drinking-Water System Name:	St. Thomas Area Secondary Water Supply System
Drinking-Water System Owner:	Joint Board of Management of the St. Thomas Area Secondary Water Supply System
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	January 1, 2019 through December 31, 2019

<p><u>Complete if your Category is Large Municipal Residential or Small Municipal Residential</u></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 [X] No []</p> <p>Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.</p> <table border="1" style="width: 100%;"> <tr> <td> City of St. Thomas, City Hall Environmental Services 545 Talbot Street St Thomas, Ontario </td> </tr> </table>	City of St. Thomas, City Hall Environmental Services 545 Talbot Street St Thomas, Ontario	<p><u>Complete for all other Categories.</u></p> <p>Number of Designated Facilities served:</p> <table border="1" style="width: 100%;"> <tr> <td>NA</td> </tr> </table> <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> <table border="1" style="width: 100%;"> <tr> <td>NA</td> </tr> </table> <p>Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? Yes [] No []</p>	NA	NA
City of St. Thomas, City Hall Environmental Services 545 Talbot Street St Thomas, Ontario				
NA				
NA				

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
City of St. Thomas Water Distribution System	260002187
Municipality of Central Elgin	260004761
Township of Southwold	210001362
Dutton/Dunwich Distribution System	220002967

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 [X] No []



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

- Public access/notice via the web
 City of St. Thomas Website – www.city.st-thomas.on.ca
- 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

The system consists of an Elevated Water Tower storage tank and trunk water mains. A 750 mm diameter watermain is connected to the Primary System at the West Chamber on South Edgeware Road. The pipeline then connects to the Elevated Storage Tank, a 0.76 ML (200,000 gallon) steel teardrop elevated tank that is located just off Water Tower Line Road near Waterworks Park in the City of St. Thomas. The pipeline then extends west for approximately 2.6 km along Edgeware Road to County Road 26 and then along Ford Road/Wonderland Road before turning northwesterly for approximately 3.6 km. to the Ford Chamber located at the northwest corner of Clinton Line (Concession Road 11) and Wonderland Road. At the intersection of Ford Road and Talbotville Road, the diameter of the pipeline is reduced to 500 mm.

List all water treatment chemicals used over this reporting period

12% Sodium Hypochlorite Chlorine Gas (EMPS)
 Sodium Metabisulphite

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

EMPS Pump Replacement \$670,000

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
NA	NA	NA	NA	NA	NA



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	NA	NA	NA	NA	NA
Treated	NA	NA	NA	NA	NA
Distribution	109	(0)-(0)	(0)-(0)	109	(<10)-(270)

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 #)
Chlorine (Grab Samples)	109	(0.87)-(1.72)
Chlorine (Continuous Monitoring)	8760	(0.00)-(2.80)

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

NOTE: The value of 0.00 mg/L was recorded on the continuous chlorine sampler as a result of equipment abnormality/SCADA issue/maintenance work or calibration.

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
NA	NA	NA	NA	NA

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

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
NA	NA	NA	NA	NA

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 (min#) – (max #)	Number of Exceedances
Plumbing	NA	NA	NA
Distribution	NA	NA	NA



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

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
HAA5	Feb 21 2019 May 14 2019 Aug 27 2019 Nov 21 2019	20.25	ug/L	no
THM (NOTE: show latest annual average)	Feb 21 2019 May 14 2019 Aug 27 2019 Nov 21 2019	9.6	ug/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
NA	NA	NA	NA
NA	NA	NA	NA