ELGIN-MIDDLESEX PUMPING STATION CITY OF LONDON DISTRIBUTION SYSTEM 2016 COMPLIANCE REPORT

(Schedule 22 Summary Report)

Facility Name: Elgin-Middlesex Pumping Station

City of London Distribution System

Mailing Address: Elgin Area Primary Water Supply System

P.O. Box 220

Port Stanley, ON N5L 1J4



Average Daily Flow 22,123 m³/day Max. Daily Flow 32,642 m³/day

Source Water Elgin Area Primary Water Supply System

CONTACT INFO:

Contract Administration:
City of London
300 Dufferin Ave, London, ON N6B 1Z2
Contact: Mr. John Simon
Divison Manager, Water Operations

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 Approvals:

The City of London Distribution System is supplied water through the Elgin-Middlesex Pump Station, which receives water from the Elgin Area Primary Water Supply System located on Dexter Line, east of Port Stanley, Ontario. During the reporting period, the City of London Distribution 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 License (MDWL) and Drinking Water Works Permit (DWWP):

- o MDWL No. 006-101, issued on November 20, 2015
- o DWWP No. 006-201, issued on November 20, 2015

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 2016, the London 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, three (3) 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 2016, all employees received Director Approved and practical on-the-job training which contributed to annual MOECC 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 that service the Town of Aylmer, Township of Malahide, City of London, and Municipality of Central Elgin.

The London portion of the EMPS has three high-lift pumps, as well as a dedicated surge facility and delivers water into a transmission main that services the City of London Distribution System and the Municipality of Central Elgin.

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. Remote monitoring and control



capabilities are made possible via the EAPWSS and the Elgin-Middlesex Pumping Station (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 site reservoirs where it is subsequently fed via a series of headers to each of the pumping stations serving the City of London Distribution System, Aylmer Area Secondary Water Supply System, and the St.Thomas Area Secondary Water Supply System.

The London pump station has two pumps each having a rated capacity of 28.9 ML/d, and one pump with a rated capacity of 73.0 ML/d.

High Lift Pumping Station:

The three high lift pumps provide redundant pumping capacity into the City of London Distribution System. See Appendix B for 2016 Total Daily Flows and Appendix C for 2016 Daily Instantaneous Peak Flow Rates.

Maintenance:

Site maintenance was carried out by Ontario Clean Water Agency field services staff based at the Elgin Area Primary Water Supply System located near 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. A summary of non-routine maintenance is available in Appendix D, the 2016 Annual Report.

Sampling Procedures:

All samples collected by licensed OCWA personnel are submitted to CALA accredited laboratories for both bacterial 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 City of London's distribution system is sampled weekly and submitted to an external laboratory for bacteriological analysis. Chlorine residual, for the water entering all three distribution systems, is monitored continuously at 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 City of London distribution system is sampled and submitted to an accredited laboratory for the testing of total trihalomethanes (THM), a disinfection by-product. 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 was performed in accordance with Ontario Regulation 170/03.

Flow Measurement and Water Quality Monitoring:

Flow is measured at several points in the process utilizing calibrated flow metering devices. Chlorine residual levels are monitored by an on-line analyzer located at the point of entry into the City of London distribution system. These devices are calibrated and verified in 2016 by licensed OCWA staff and contractors. See Appendix A for a summary of 2016 water quality data.

Statement of Comparison:

The previous Certificate of Approval and new Municipal Drinking Water License for the City of London does not identify a rated capacity for the Elgin-Middlesex Pump Station. The pumping station has an available capacity of 95,800 m³/day, whereby instantaneous peak flow is 1109 L/s.

The maximum daily flow witnessed by the London system in 2016 was 32,642 m³/day, approximately 34% of the system's capacity. The average total daily flow witnessed by the system in 2016 was 22,123 m³/day, approximately 23% of the capacity.

The maximum instantaneous peak flow witnessed by the system in 2016 was 921 L/s, approximately 83% of the capacity. See Appendix B for 2016 total daily flow values and Appendix C for 2016 daily instantaneous peak flow rates.

Ministry of the Environment and Climate Change Inspections:

The Ontario Ministry of the Environment and Climate Change (MOECC) conducts an annual inspection of the City of London Distribution System, including the London portion of the Elgin–Middlesex Pump Station. A MOECC inspection took place in December 2016. The final inspection report was issued on January 10, 2017. There were no non- compliances identified in the inspection report. The final inspection rating received for the 2016-2017 reporting year was 96,05%.

Benefiting Municipalities:

Following the adoption of the Municipal Water and Sewer Transfer Act in 1997, the Ontario Ministry of the Environment and Climate Change 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 Supply 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 City of London Distribution System at the EMPS is provided in Appendix D. The Ontario Clean Water Agency operates and maintains the Elgin-Middlesex Pump Station, under contract to the Aylmer Area Secondary Water Supply System, The Corporation of the City of London and the St.Thomas Area Secondary Water Supply System, with 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 London portion of the EMPS, on behalf of the City of London.

APPENDIX A – 2016 WATER QUALITY SUMMARY

MONTH	POST TREATMENT
	Free Cl ₂
	mg/L
January	
Minimum	0.70
Maximum	0.92
Average	0.83
February	
Minimum	0.71
Maximum	0.85
Average	0.79
March	
Minimum	0.66
Maximum	1.12
Average	0.76
April	
Minimum	0.61
Maximum	0.87
Average	0.74
May	1 2077
Minimum	0.57
Maximum	0.84
Average	0.71
June	0.71
Minimum	0.60
Maximum	0.80
	0.76
Average	0.76
July Minimum	0.56
	0.56
Maximum	0.95
Average	0.79
August	
Minimum	0.51
Maximum	0.91
Average	0.74
September	
Minimum	0.58
Maximum	1.10
Average	0.80
October	
Minimum	0.67
Maximum	1.41
Average	0.90
November	
Minimum	0.57
Maximum	1.33
Average	0.91
December	
Minimum	0.72
Maximum	1.64
Average	0.88
Yearly Minimum	0.51
Yearly Maximum	1.64
Yearly Average	0.74

Note: Chlorine residuals obtained from SCADA.

APPENDIX B LONDON TOTAL DAILY FLOW - 2016

	100						'ey			e7	2	7	
1	E	E	E	E	E	ш	E	E	E	E		H	
-	28126	25221	25106	25171	23175	18082	23077	23172	21220	23129	23187	25726	
N	25155	25247	25104	22332	23159	23139	_ 23100	23085	21105	23118	23194	25764	
n	25189	17019	25131	22367	23169	22738	23147	23098	21217	23191	23214	25714	
ব	25176	16085	25130	22369	23173	23102	23146	23097	21203	23107	23219	25735	
Ŋ	25119	25141	25151	23153	0	23329	23172	23094	21259	23121	25676	13666	
9		25138	25129	23166	23200	23069	10168	23098	21105	23024	25714	10179	
<u></u>		25146	25138	23169	23198	7073	23177	23108	23134	23121	25713	10217	
60		25137	25127	23166	23176	23172	23129	23115	23221	23109	25684	25732	
0	25167	25139	18122	23147	23077	23075	23075	21273	23123	23111	25710	22252	
9	25179	25139	25131	23157	18150	23039	23094	23170	23293	23104	21149	22214	
F		25139	24740	23151	20430	23111	23127	6031	23105	23176	25685	22168	
12	25106	25085	25123	23158	18994	23104	23140	23630	22063	23137	25735	22184	
5	25136	25123	25126	16148	23176	23098	4	21221	23186	23287	25737	12169	
14	12153	25119	25122	23181	23145	0	23097	21206	23075	23233	25696	22103	
15	25171	25132	18118	23151	21112	5209	23088	21075	5080	23261	25724	12193	
16	25174	25133	25132	23149	23186	23138	23084	0	22219	23229	25717	22229	
17		25124	25135	23180	23200	23118	23094	21100	23226	23230	25690	22207	
8		25141	25140	23169	23209	23120	23119	21105	23199	23226	25692	22208	
19	25143	25135	25121	23192	23094	23138	9	21109	23076	23193	25690	9910	
20	25252	25136	25122	16545	23086	14301	23162	21225	18214	23199	25742	15088	
2	25307	25098	25099	23106	23199	23106	23107	21076	23208	0	22126	22190	
22		25129	25120	23100	23192		23112	21178	18061	23179	25603	22186	
23	25151	25143	25177	23108	22271	22614	23122	21086	23228	22007	25692	22192	
24	25089	25173	25136	23119	19156	23164	23093	21099	23221	23191	12149	19331	
25	25111	25121	25128	23196	23109	23149	17844	21205	23216	23188	25576	19203	
26	25163	25130	25126	23181	15083	23090	23088	21096	23114	0	25692	19151	
27	25197	25117	25133	23184	20122	23105	12047	21194	23236	23192	25722	19154	
28	25136	25123	25156	23195	23111	11246	23113	21183	23330	23198	25683	19198	
29	25154	25106	25156	23175	18765	23149	23078	21090	20140	23214	25684	18020	
30	25140		25198	23170	16832	32642	23177	21096	22756	23215	25740	20194	
3	25092		13831		23114		23143	15110		23206		19233	
										,			
	751,530	711,819	753,408	680,755	654,063	596,427	641,130	633,425	649,833	968'029	739,235	609,710	8,092,231
Minimum	25,092	16,085	13,831	16,148	0	0	4 4	0	5,080	0 00 00	12,149	9,910	0 640
	28,126	25,247	25,198	L/1,62	23,209	32,042	7/1/82	23,630	23,330	73,257	75,747	40/102	340,05

APPENDIX C LONDON DAILY INSTANTANEOUS PEAK FLOW - 2016

October November Dec	%	833		846 746) 782 752 770	870 785	820 770	853 745	799	687	720 693	729	727 829	777	775	198	821 766	196	824 694	801	775	0	813	765	726	998	0 738	746	721	806 720	77.1	714	7.10	024 +832
August September	Us L/s	683 780	756 839	796 782	813 750	849 838		801 861	871 858	875 894	839 851	409 842	915 855	852 843			0 783			832 778				787 842	791 786	767 770			715 875		667 873		0 434	_
June July				896 805	819 862			675 713	969 870	_	787 787	851 857				845 768		921 698		825 34	615 737			843 766		628 670	558 809				917 790	650	0 24	_
April May		099 602	629 629	671 650	999 099	681 0	668 765	651 757	684 681	622 674			632 723			639 627				713 750					775 849	728 854	642 852				737 748		622 0	_
Ž,	Us Us	752 547	771 498	762 565		598 628			610 602		605 603									999 299				598 733						573 659		694	539 498	
Date January	2	1 553	2 556	3 595	4 604	5 636	6 748	7 595		9 581	10 605		12 611				16 587			19 621						25 593				29 659		31 785	Minimum 553	

Appendix D 2016 Annual Report



Drinking-Water System Number: Drinking-Water System Name:

Drinking-Water System Owner:

Drinking-Water System Category:

Period being reported:

260004917

Elgin Middlesex Pumping Station – City of London
Distribution System

City of London

Large Municipal Residential

January 1, 2016 through 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 [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 London 300 Dufferin Ave London, ON N6B 1Z2 www.london.ca

Elgin Area Water Treatment Plant 43665 Dexter Line, Union, ON

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 London EMPS:

Drinking Water System Name	Drinking Water System Number
City of London Distribution System	260004917

Systems that receive their drinking water indirectly from the London EMPS:

Drinking Water System Name	Drinking Water System Number
Municipality of Central Elgin	260004761

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

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 systen	ı users that your	annual report is	s available, and i	s 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
1 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 and St. Thomas, Town of Aylmer, and Municipalities of Central Elgin, Malahide 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 Secondary Water Supply Systems. The EMPS houses a surge facility to service the London transmission main.

Three pipelines exit the EMPS: one pipeline runs North along Highbury Avenue, servicing the London Distribution system; the second exits to the south of the EMPS property and extends West to service the St. Area Thomas Secondary System; the third exits to the South, to Highway 3 and then runs in an Easterly direction to service the municipalities on the Aylmer Area Secondary System.

List all water treatment chemicals used over this reporting period

No re-treatment of water destined for London took place at the EMPS in 2016.

Were any significant expenses incurred to?

[X] Install required equipment

[] Repair required equipment

[X] Replace required equipment

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

- SCADA EMPS Study, \$5,000
- PLC Cabinet UPS Units Replacement, \$1,000
- Painting Pump #6 and Piping, \$4,000
- London Pump #4 and #5 Replacement, \$1,400,000

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
N/A	N/A	N/A	N/A	N/A	N/A

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	52	(0)-(0)	(0) - (0)	52	(<10) - (66)

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	0.51	1.64	0.80

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 5, 2016 April 5, 2016 July 5, 2016 October 14, 2016	12 15 21 19	μg/L μg/L μg/L μg/L	NO
THM Running Annual Average (RAA)	2016	16.8	μg/L	NO