

ELGIN-MIDDLESEX PUMPING STATION
AYLMER AREA SECONDARY WATER SUPPLY SYSTEM
2014 COMPLIANCE REPORT
(Schedule 22 Summary Report)

Facility Name: Elgin-Middlesex Pumping Station -
Aylmer 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 3,472 m³/day
Max. Daily Flow 5,156 m³/day
Source Water Elgin Area Primary Water Supply System

CONTACT INFO:

Contract Administration:
Township of Malahide Office
87 John Street South, Aylmer, ON, N5H 3C2
Contact: Mr. Rob Johnson
(519) 773-5344

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

Table of Contents

System Approvals	1
Treated Water Requirements	2
Staff Complement and Training	2
History of Facility	2
Process Description	3
Post-Treatment	3
High Lift Pumping Station	3
Maintenance	4
Sampling Procedures	4
Flow Measurement and Water Quality Monitoring	4
Statement of Comparison	5
Ministry of the Environment Inspections	5
Benefiting Municipalities	5
Appendix A: Water Quality Summary for 2014	
Appendix B: Total Daily Flow for 2014	
Appendix C: Daily Instantaneous Peak Flow for 2014	
Appendix D: 2014 Annual Report	
Appendix E: Chemical Consumption for 2014	

System Approvals:

The Aylmer Area Secondary Water Supply System is supplied water through the Elgin-Middlesex Pump Station, which receives water from the Elgin Area Water Treatment Plant located on Dexter Line, east of Port Stanley, Ontario. During the reporting period, the Aylmer 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):

Aylmer Area Secondary Water Supply System

- o MDWL No. 302-101, issued on July 23, 2012
- o DWWP No. 302-201, issued on July 29, 2011

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 2014, the Aylmer facilities 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, five (5) 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 2014, all employees received Director Approved and practical on-the-job training which contributed to annual MOE 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 1970, 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, Municipality of Malahide, as well as the City of London.

The Aylmer Area Secondary Water Supply System portion of the EMPS is comprised of two high-lift pumps that deliver water through a transmission main that services the Aylmer Area Secondary Water Supply System. A gas re-chlorination system provides re-chlorination for water being directed to the Aylmer 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 Aylmer 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 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 pumps water from a 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 Aylmer pumps are variable speed pumps, each having a rated capacity of 8.64 ML/d.

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 150 lb 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 of 1kg/h.

High Lift Pumping Station:

The two high lift pumps provide redundant pumping capacity into the Aylmer Area Secondary Water Supply System. See Appendix B for the 2014 Total Daily Flows and Appendix C for the 2014 Instantaneous Peak Flow Rates for the Aylmer Area Secondary Water Supply System at the EMPS.

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 in 2014. A summary of non-routine maintenance is available in Appendix D, the 2014 Annual Report.

Sampling Procedures:

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

A distribution water sample is taken twice per week at the inlet to the reservoir and submitted for bacteriological analysis. The treated water entering the Aylmer Area Secondary Water Supply System 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 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 Aylmer Area Secondary Water Supply System 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 in the process utilizing a calibrated flow metering device. Chlorine residual levels are monitored by an on-line analyzer located at the point of entry into the Aylmer Area Secondary Water Supply System. These devices are calibrated and verified in 2014 by licensed OCWA staff and contractors. See Appendix A for a summary of 2014 water quality data.

Statement of Comparison:

The previous Certificate of Approval and new Municipal Drinking Water License for the Aylmer Area Secondary Water Supply System do not identify a rated capacity for the system. The pumping station has an available capacity of 17,280 m³/day, whereby instantaneous peak flow capacity is rated at 200 L/s.

The maximum total daily flow witnessed by the system in 2014 was 5156m³/day, approximately 30% of the system's capacity. The average total daily flow witnessed by the system in 2014 was 3472m³/day, approximately 20% of the capacity.

The maximum instantaneous peak flow witnessed by the system in 2014 was 159 L/s, approximately 80% of the capacity. See Appendix B for 2014 total daily flow values and Appendix C for 2014 daily instantaneous peak flow rates.

Ministry of the Environment Inspections:

The Ontario Ministry of the Environment (MOE) conducts an annual inspection of the Aylmer portion of the Elgin-Middlesex Pumping Station annually along with the Aylmer Area Secondary Water Supply System operated by the Ontario Clean Water Agency. A MOE inspection took place in August 2014. The final inspection report was issued on September 29, 2014. A total of one (0) non-compliance was identified in the inspection report. The final inspection rating received for the 2014-2015 reporting year was 100%.

Benefiting Municipalities:

Following the adoption of the Municipal Water and Sewer Transfer Act in 1997, the Ontario Ministry of the Environment 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 Aylmer Area Secondary Water Supply System at the EMPS is provided in Appendix D. The Ontario Clean Water Agency currently 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 Aylmer portion of the EMPS, on behalf of the Aylmer Area Secondary Water Supply System Joint Board of Management.

**APPENDIX A – 2014 WATER QUALITY
SUMMARY**

MONTH	POST TREATMENT
	Free Cl ₂ mg/L
January	
Minimum	0.75
Maximum	1.13
Average	1.00
February	
Minimum	0.68
Maximum	*3.53
Average	0.98
March	
Minimum	0.52
Maximum	1.30
Average	0.90
April	
Minimum	0.76
Maximum	1.69
Average	1.07
May	
Minimum	0.75
Maximum	2.14
Average	1.09
June	
Minimum	0.77
Maximum	1.48
Average	1.13
July	
Minimum	0.73
Maximum	1.79
Average	1.15
August	
Minimum	0.72
Maximum	1.54
Average	1.12
September	
Minimum	0.65
Maximum	*4.31
Average	1.19
October	
Minimum	0.69
Maximum	2.03
Average	1.10
November	
Minimum	0.75
Maximum	1.43
Average	1.02
December	
Minimum	0.75
Maximum	1.33
Average	0.96
Yearly Minimum	0.52
Yearly Maximum	4.31
Yearly Average	1.06

Note: Chlorine residuals obtained from SCADA.

* Maintenance activities

APPENDIX B
AYLMER TOTAL DAILY FLOW - 2014

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	2981	3226	3746	2498	3495	4029	4103	3358	3778	3492	3777	3653
2	2725	3070	3213	3256	3075	3697	4200	3655	3824	3706	3651	3681
3	3004	2937	3164	3173	3233	3398	3544	3215	3555	3292	3824	3703
4	3008	2979	3208	3384	3505	3300	3672	3537	3972	3409	3388	3815
5	3028	2989	3608	3347	3354	3678	3659	3576	3626	3607	4101	3453
6	2909	3124	3263	3295	3291	3984	3783	3096	3528	3292	3439	4184
7	2837	2937	3182	3149	3612	3941	2643	3523	3443	3395	3683	3654
8	3329	3248	3254	2836	3304	3355	2453	3717	3461	3374	3935	3683
9	3463	2890	3063	2459	3655	3942	2103	3684	3983	3426	3434	3963
10	2961	3243	3339	3273	3292	3576	2382	3593	3601	3399	3527	3430
11	3322	2886	3233	3023	3800	4053	2434	3524	3397	3607	3945	3361
12	3162	3471	3186	3647	3366	3542	3300	4048	3714	3294	3374	3787
13	3045	3234	3246	3252	3757	3532	3446	4757	3374	3420	3655	3702
14	3604	3235	3421	3264	4635	3482	3756	4294	3334	3424	3460	3654
15	3064	3334	3533	3232	3223	3799	3483	5156	3332	3469	3889	3192
16	3512	2992	2857	3091	3140	3777	3488	4688	3288	3476	3449	3638
17	3163	3231	3700	3622	3666	3757	3535	4473	3414	3458	3474	3421
18	3056	3285	3010	2967	3043	3684	4131	4667	3223	3362	3738	3500
19	3112	3286	3348	3588	3536	4037	3428	4917	3399	3685	3713	3709
20	2933	2895	3016	3431	3282	3790	3413	4977	2892	3361	3643	3471
21	2849	3345	3324	3205	3680	4197	3627	4477	2600	3289	3345	3147
22	4181	3781	3575	3327	3231	4439	3345	3910	3054	3399	4079	3091
23	2985	3054	3077	3446	3330	4542	3476	3610	3274	3658	3747	3156
24	2913	3386	3392	3119	3441	4377	3597	3802	3737	3760	3713	3065
25	3144	3281	3120	3179	3751	3827	3480	3533	3622	3365	3782	3104
26	3121	3253	3466	3673	4183	3807	3530	3986	3889	3677	3448	2940
27	2741	2914	3226	3118	3783	4078	3600	3745	3363	3623	3820	3019
28	3130	3342	3233	3201	3618	4576	3233	3952	3838	3461	3718	3350
29	2884	3459	3290	3459	3633	3890	3546	3812	3640	3861	3753	2840
30	2917	3247	3247	3077	3570	4354	3443	3782	3331	3683	3797	3210
31	3411	3433	3433	3433	4053	3689	3689	3889	3889	3440	3440	2931
Total	96,494	88,848	101,973	96,591	109,537	116,440	105,522	122,953	104,486	108,164	110,301	106,507
Minimum	2,725	2,886	2,857	2,459	3,043	3,300	2,103	3,096	2,600	3,289	3,345	2,840
Maximum	4,181	3,781	3,746	3,673	4,635	4,576	4,200	5,156	3,983	3,861	4,101	4,184
Average	3,113	3,173	3,289	3,220	3,533	3,881	3,404	3,966	3,483	3,489	3,677	3,436

APPENDIX C
AYLMER DAILY INSTANTANEOUS PEAK FLOW - 2014

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	131	131	131	132	132	131	135	133	140	140	139	137
2	132	131	131	132	132	132	134	133	140	141	138	138
3	130	133	132	132	132	132	134	133	138	140	139	137
4	130	132	131	132	132	131	134	133	131	139	138	137
5	131	130	132	131	132	132	134	134	135	140	144	138
6	131	130	132	131	132	145	134	133	132	141	159	138
7	131	132	131	131	133	133	134	134	134	140	156	138
8	131	132	131	133	133	133	133	133	133	144	138	137
9	132	130	131	132	131	132	134	133	133	137	137	138
10	131	131	131	132	131	132	133	133	132	135	139	137
11	130	132	133	131	130	132	131	133	133	132	138	138
12	131	132	133	132	131	132	132	135	133	132	138	137
13	130	131	131	150	131	131	133	136	132	130	132	138
14	131	131	131	130	132	132	135	133	133	133	132	138
15	132	132	131	146	131	132	137	134	133	133	131	138
16	130	131	132	132	130	133	148	134	134	131	130	136
17	131	131	131	132	130	136	133	134	139	132	131	137
18	132	130	130	132	131	136	133	135	140	132	131	136
19	132	132	131	141	149	133	132	138	139	132	137	131
20	131	131	131	132	133	148	132	139	140	133	137	131
21	132	132	131	131	132	132	133	133	140	133	138	131
22	131	130	132	132	133	132	132	133	139	139	138	131
23	133	131	131	132	134	131	133	133	139	132	138	132
24	130	131	132	133	133	131	133	133	140	132	138	130
25	131	131	132	133	132	132	133	134	143	133	136	130
26	131	133	131	133	133	134	134	134	140	133	137	137
27	131	132	133	132	134	133	133	139	140	132	151	137
28	132	132	132	132	132	134	133	140	154	132	137	136
29	132	132	131	147	133	134	133	144	144	137	138	137
30	132	130	130	131	133	134	133	141	139	139	138	137
31	131	132	132	132	132	134	133	140	140	139	137	137
Minimum	130	130	130	130	130	131	131	133	131	130	130	130
Maximum	133	133	133	150	149	148	148	144	154	144	159	138
Average	131	131	131	134	133	133	134	135	137	135	138	136



Drinking-Water System Number:	260004722
Drinking-Water System Name:	Elgin Middlesex Pumping Station (EMPS) – Aylmer Area Secondary Water Supply System
Drinking-Water System Owner:	Aylmer Secondary Water Supply System Board of Management c/o Township of Malahide
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	January 1, 2014 through December 31, 2014

<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 [X] No []</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> <div style="border: 1px solid black; padding: 5px;"> <p>Township of Malahide Office 87 John Street South Aylmer, ON N5H 2C3 www.malahide.ca</p> <p>Elgin Area Water Treatment Plant 43665 Dexter Line, Union, ON</p> </div>	<p><u>Complete for all other Categories.</u></p> <p>Number of Designated Facilities served:</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 5px 0;">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: fit-content; margin: 5px 0;">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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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 Aylmer EMPS:

Drinking Water System Name	Drinking Water System Number
Aylmer Area Secondary Water Supply System	260004722

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

Drinking Water System Name	Drinking Water System Number
Municipality of Central Elgin	260004761
Malahide Distribution System	260004774
Aylmer Distribution System	260002136



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 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. A gas chlorine system is utilized to provide re-chlorination for water being directed to the St. Thomas and Aylmer Secondary 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. Area Thomas Secondary System; the second services the City of London distribution system; the third pipeline services the municipalities on the Aylmer Area Secondary System.

List all water treatment chemicals used over this reporting period

Gas Chlorine

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

- Fuel system upgrades - \$105000 in process
- Valve repositioning - \$1100.00
- Pump and Motor 1 rebuild - \$17000.00
- Pump guards - \$1500.00

- Configure tower alarms to Elgin WTP SCADA - \$1500.00
- Corrosion protection coating on suction piping - \$500.00

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	54	(0) – (0)	(0) – (0)	54	(0) – (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	0.52	4.31	1.06

Note: The free chlorine residual spiked on occasion during 2014. 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 latest annual average)	January 7, 2014	12	µg/L	NO
	April 8, 2014	16	µg/L	
	July 8, 2014	20	µg/L	
	October 7, 2014	31	µg/L	

APPENDIX E	
2014 EMPS Treatment	
Month	Total Chlorine Gas Usage - Kg
January	134.2
February	136.4
March	140.9
April	116.7
May	135.3
June	157.2
July	163.6
August	181.4
September	184.9
October	203.3
November	113.1
December	153.7
Yearly Total	1820.7

Please note: Aylmer and St.Thomas combined cl2 usage