Elgin Area
Primary Water Supply System

2014 COMPLIANCE REPORT

CONTACT INFO:

Owner:
Elgin Area Primary Water Supply System Board of Management
c/o City of London, Regional Water Supply Division
235 North Centre Road, Suite 200, London, ON N5X 4E7
519-930-3505

Operating Authority:
Ontario Clean Water Agency
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519-782-3101

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PROFILE

WHO WE ARE

The Elgin Area Primary Water Supply System Board of Management owns and governs the drinking water system. The Board of Management is made up of representatives from each of the seven member municipalities that are currently supplied with water from the Elgin Area Primary Water Supply System (EAPWSS). One of these member municipalities, the City of London, acts as the Administering Municipality. Accordingly, the City of London provides all associated administrative and management services on behalf of the Board. The Board of Management currently utilizes the services of an independent contracted Operating Authority.

The water system is operated and maintained by Ontario Clean Water Agency (OCWA) under contract to the Joint Board of Management.

OPERATING AUTHORITY: ONTARIO CLEAN WATER AGENCY / AGENCE ONTARIENNE DES EAUX

Elgin Area Primary Water Supply System

EAPWSS Board Member Municipalities

City of London *(administering municipality)*
Town of Aylmer
Municipality of Bayham
Municipality of Central Elgin
Township of Malahide
City of St. Thomas
Township of Southwold

WHAT WE DO

Water Treatment & Supply

The Elgin Area Primary Water Supply System is responsible for the treatment and transmission of drinking water to seven (7) municipalities in southwestern Ontario. The population served by this system is approximately 112,000. Water is provided bulk wholesale to the municipalities who then distribute it to their customers.

The Elgin Area Water Treatment Plant (WTP) employs pre-chlorination, screening, powder activated carbon addition (seasonally on an as-required basis), coagulation, flocculation, sedimentation, dual-media filtration, UV disinfection, post-chlorination, fluoridation and pH adjustment using both carbon dioxide and sodium hydroxide to treat raw water obtained from Lake Erie. After the water is treated it is pumped from the WTP to various communities or to the terminal storage reservoirs. The drinking water system is monitored at various locations throughout the system via a Supervisory Control and Data Acquisition (SCADA) system.

Elgin Area Primary Water Supply System: Assets

1 low lift pumping station
1 water treatment plant
2 surge facilities
1 in-ground storage reservoir (consists of 2 reservoir cells)
29.4 km of watermain (twinned 14.7 km pipelines)

Figure 1: Low Lift Pumping Station located on Lake Erie

WHAT'S IMPORTANT

Values of the Water System

The values of the Elgin Area Primary Water Supply System are the inherent beliefs or moral standards that generally reflect what the Elgin Area Primary Water Supply System Board of Management stands for and believes in:

- **Sustainable** - be financially, environmentally, socially, and physically sustainable;
- **Inclusive** - provide access to bulk drinking water for current and prospective members, in accordance with Board policy;
- **Fair and equitable** - balance the interests of individual members with the best interests of all members, as well as the needs of existing members with the needs of new members;
- **Vigilant** - ensure an adequate supply of safe and reasonably priced drinking water is available to members;
- **Innovative** - be receptive to and supportive of new ideas and opportunities for improvement;
- **Cooperative** – be supportive to the needs of the Elgin Area Primary Water Supply System;
- **Open and transparent –** conduct business in a manner that enables member municipalities and the public to review and provide input into major decisions as appropriate;
- **Public Ownership –** retain ownership of the water system in public hands.

ELGIN AREA PRIMARY WATER SUPPLY SYSTEM: AT A GLANCE

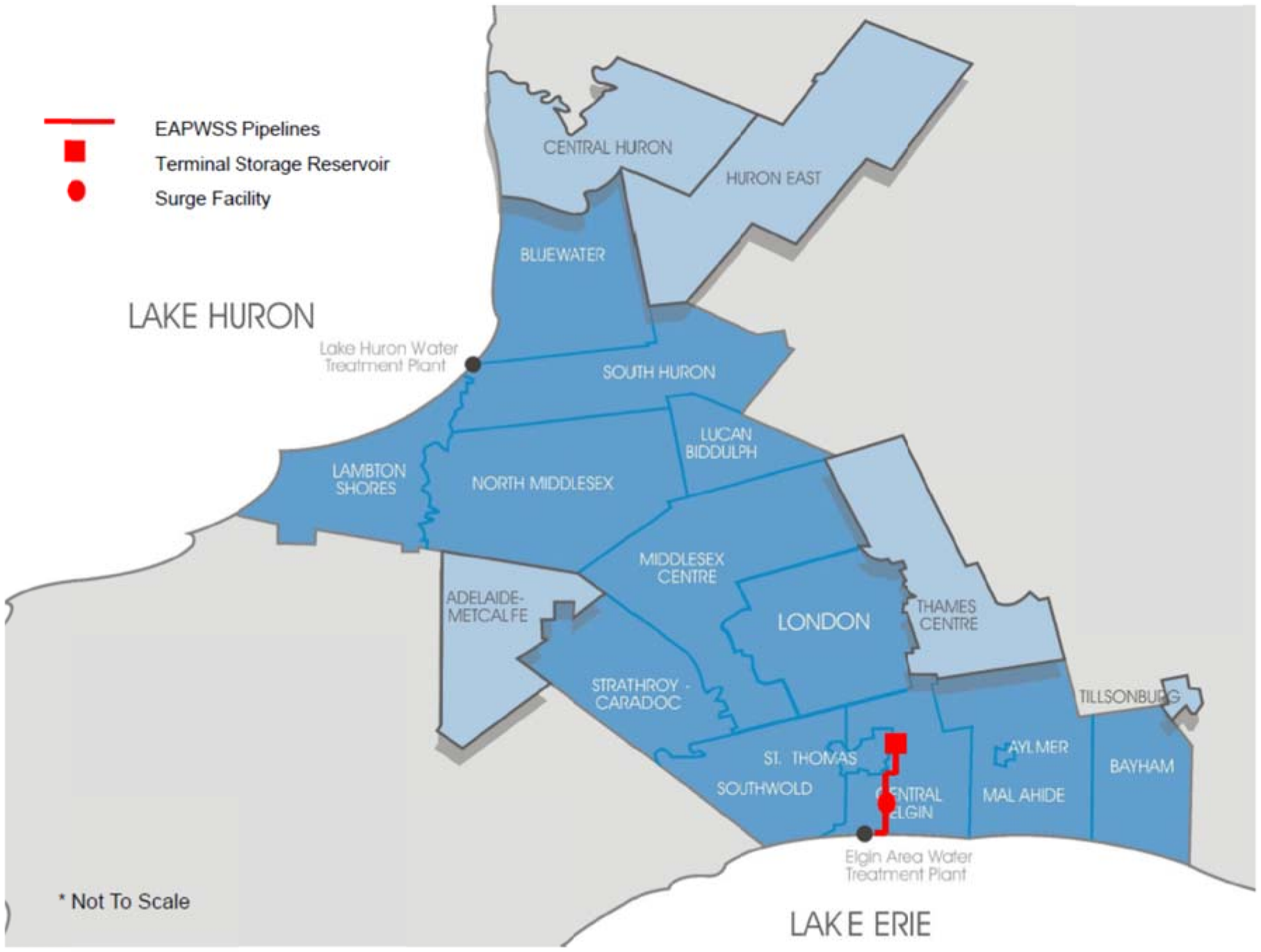

Figure 2: Elgin Area Primary Water Supply System Major Infrastructure Locations

THE WATER TREATMENT PROCESS

The following figure provides a general overview of the conventional water treatment process. The processes outlined below are very similar to the treatment at the Elgin Area Water Treatment Plant, although they are not an exact representation. Some details may vary.

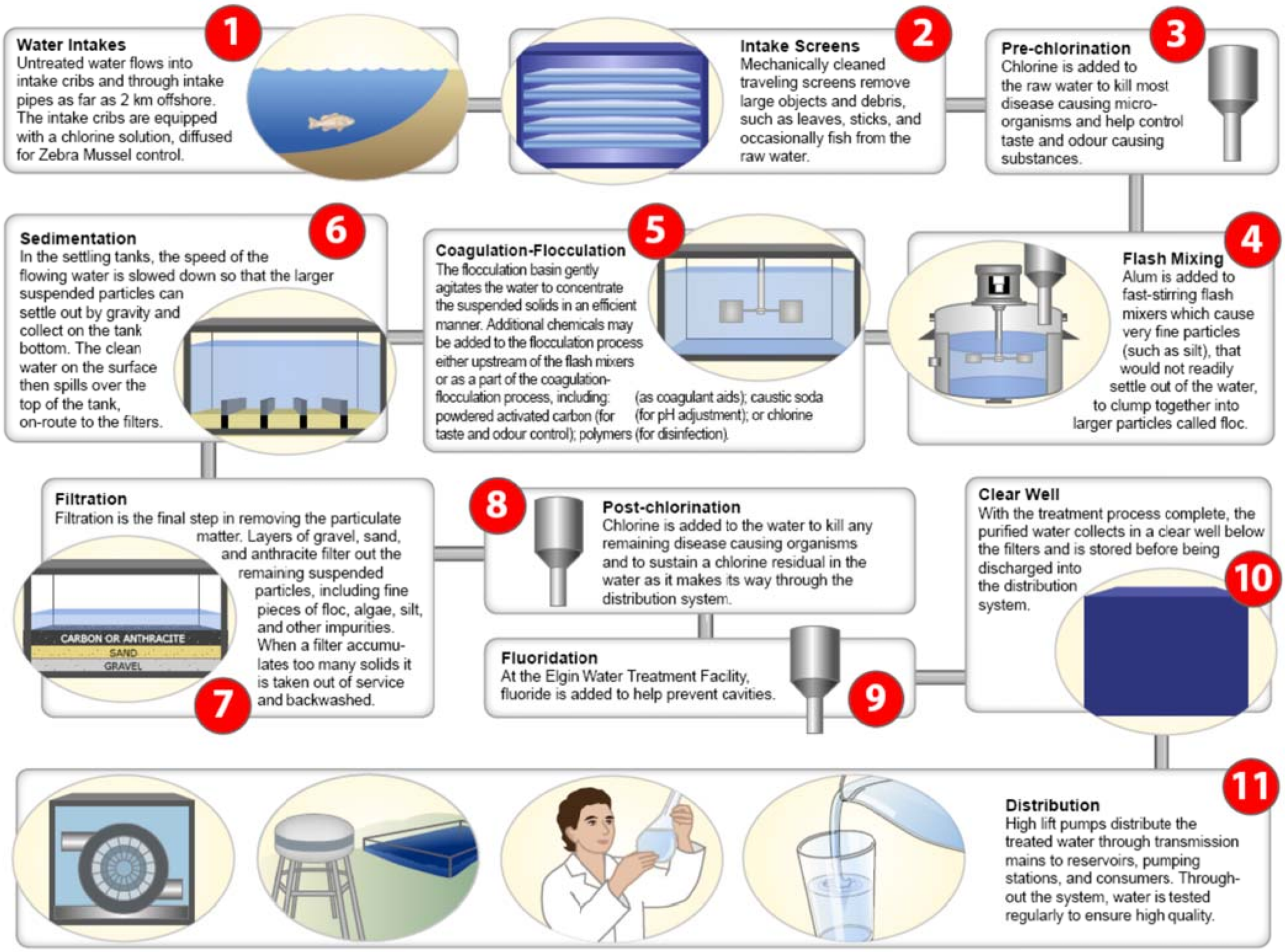

Figure 3: General Overview of the Water Treatment Process

At the Elgin Area Water Treatment Plant, several additional treatment steps take place:

- Carbon dioxide is injected prior to the flash mixing (Step 4) to lower the raw water pH in order to improve the treatment process effectiveness and efficiency.
- A UV reactor is located after each filter (Step 7) for additional disinfection when required.
- Sodium Hydroxide is added as the treated water leaves the water treatment plant and enters the transmission system (Step 11) to raise the treated water pH, resulting in reduced corrosion potential.

2014 CAPITAL PROJECTS – HIGHLIGHTS

RESIDUALS MANAGEMENT FACILITY (RMF)

When the Elgin Area Water Treatment Plant was originally constructed in the mid 1960's by the Province of Ontario (via the Ontario Water Resources Commission), provision of a residuals management facility to treat the waste by-products from the treatment process was not required. At that time, it was typical practice to discharge the waste from sedimentation basins and the filter backwash processes of conventional water treatment plants back to the source water. With increased concern over environmental impacts, pollution, and general due diligence, the introduction of new environmental standards and regulations are now in place to prevent such practices from occurring with newly constructed water treatment facilities.

The need to install a residuals management facility to address the treatment of residuals materials created during the water treatment (sedimentation) and filtration (filter backwash) processes is essential in order to meet the current legislated requirements for discharges to receiving water bodies. The lack of residuals management in concert with the current practice of allowing residual materials to be discharged directly back to Lake Erie makes the Elgin Area Water Treatment Plant non-compliant with existing environmental regulations. It is noted that the plant is presently operating under a Municipal Drinking Water Licence, and previously a Certificate of Approval, which allow for this operating practice. The construction of an RMF for the Elgin Area Water Treatment Plant is required to improve the quality of process waste water returned to Lake Erie.

The detailed design for the RMF was completed by AECOM in 2012 - 2013. In October 2013, the project tender was awarded to Hayman Construction Inc. Construction began in January 2014, and the construction and commissioning is expected to continue through to December 2016.

Work completed to date in 2014 included:

- Retrofit and preparation of sedimentation tanks for the installation of scrapers;
- Construction and installation of sedimentation sludge pumping system, including pumps, piping and controls;
- Construction of below grade tanks and pipe gallery;
- Leakage testing of four south tanks, all of which passed;
- Partial backfill of the RMF structure;
- Installation of interconnecting infrastructure (watermain, glass-lined pipe, electrical).

This project was included as one component of the HELP Clean Water initiative and has received grant funding from senior levels of government.

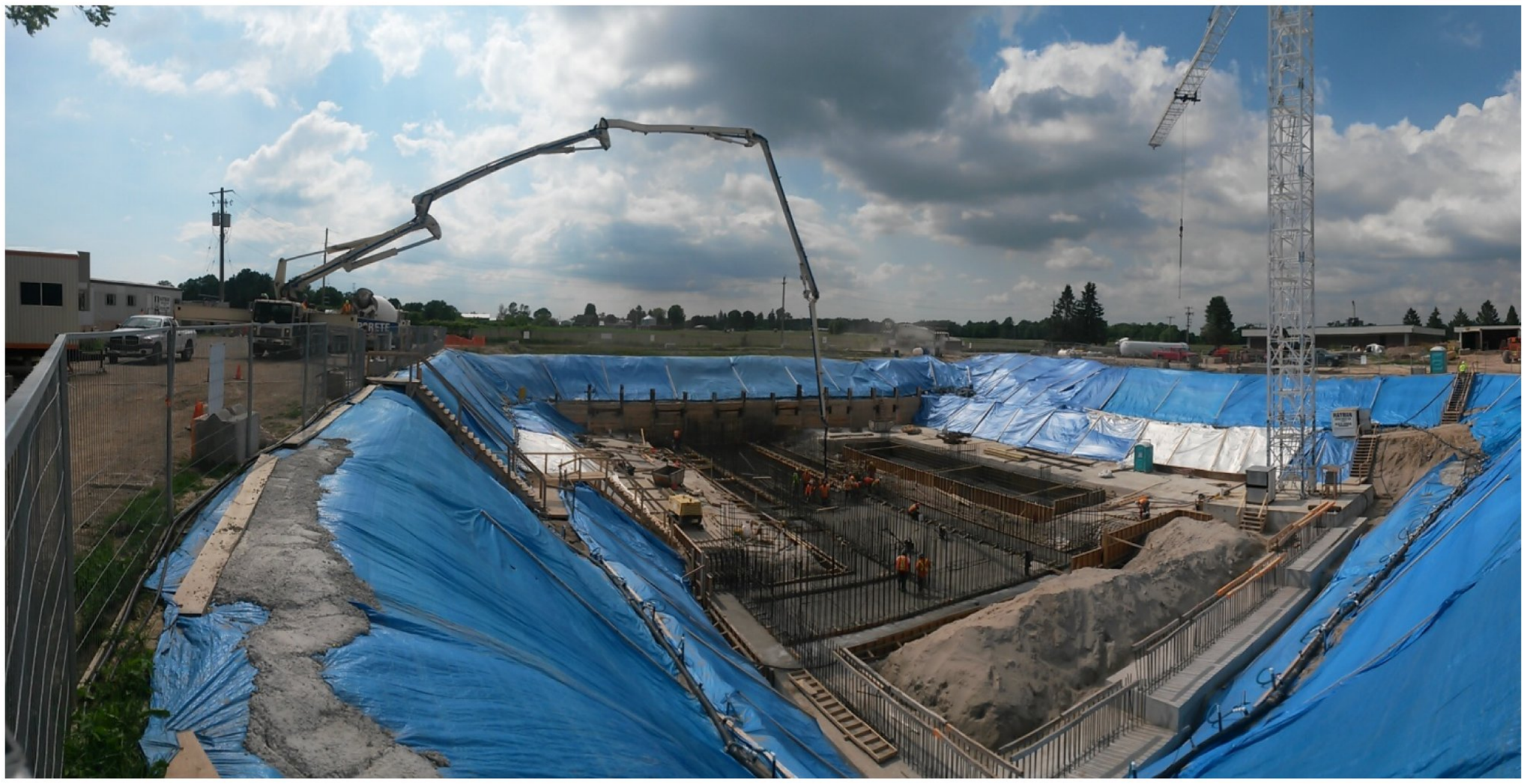

Figure 4: Pouring concrete for slabs.

Figure 5: Setting up concrete forms for the walls.

ZEBRA MUSSEL CONTROL SYSTEM REPLACEMENT

A liquid sodium hypochlorite zebra mussel control system is currently in place which delivers a chlorinated solution to the intake crib. The existing building, pumps, piping and control system have all significantly deteriorated. A new gas chlorination system to deliver the solution to the intake crib is currently being installed to replace the previous system. In October 2014 the tender was awarded to Stonetown Construction Inc. Construction began in November 2014 and is anticipated to be completed in April 2015.

ASBESTOS CEMENT WATERMAIN REPLACEMENT PROJECT

At the time of construction for the Elgin primary transmission main twinning project, it was discovered that an existing 300mm diameter asbestos cement pipe constructed in 1969, connected from the existing primary transmission main to the Port Burwell Connection chamber for a length of approximately 150m, was in very poor condition and required replacement. In October 2014 the tender was awarded to L82 Construction. The previously existing asbestos cement pipe was replaced with PVC pipe. The construction and commissioning for this project took place in October - November 2014.

Figure 6: Installation of the new watermain.

Figure 7: Completing the final tie-in connections.

2014 FLOW SUMMARY

As per the water system's current Permit To Take Water (PTTW), the amount of raw water taken into the Elgin Area Water Treatment Plant cannot exceed 91.0 million litres/day or 63,194 litres/minute. This converts to 1053L/s.

The water taking in 2014 was approved under PTTW #6283-8QZM3N.

As per the water system's Municipal Drinking Water Licence (MDWL), the rated capacity of the Water Treatment Plant is 91.0 million litres/day. The maximum daily volume of treated water that flows from the treatment plant into the distribution system shall not exceed this value.

The following table contains a flow summary, with comparison to the system's rated capacity and permit limits in order to assess the capability of the system to meet existing and planned uses.

	Total Daily Flow (ML/day)	**Total Daily Flow (% of Capacity)**	**Daily Instantaneous Peak Flow (L/s)**
Permit To Take Water (PTTW) – permitted amount of raw water taking	91.0	100%	1053
Raw Water Flow – Average Day	45.272	49.7%	657
Raw Water Flow – Max. Day	83.411	91.7%	1020
Water Treatment Plant Rated Capacity	91.0	100%	1053
Treated Water Flow – Average Day	42.609	46.8%	689
Treated Water Flow – Max. Day	82.149	90.3%	1143

A complete flow summary for the Elgin Area Primary Water Supply System can be found in Appendix A.

Treated water instantaneous peak flow rates exceeded the requirements of the MDWL on four (4) occasions in 2014, as listed in the table below. In all cases, the total daily flow did not exceed the 91.0 ML/day plant rated capacity.

Date	**Treated Water Instantaneous Flow Rate**	**Reason**
April 28, 2014	1088 L/s	Exceedance occurred when testing flows on B pipeline only.
May 28, 2014	1102 L/s	Exceedance occurred when testing flows on B pipeline only.
October 15, 2014	1142 L/s	Exceedance occurred when running two high lift pumps together to maintain the EMPS & London levels during Lake Huron Primary Water Supply System maintenance.

Date	Treated Water Instantaneous Flow Rate	Reason
October 16, 2014	1143 L/s	Exceedance occurred when running two high lift pumps together to maintain the EMPS & London levels during Lake Huron Primary Water Supply System maintenance.

The majority of the volume of treated drinking water from the EAPWSS is used by the City of London. As shown in Figure 8, London takes approximately 55.7% of the volume, with the other six municipalities using the remaining 44.3%.

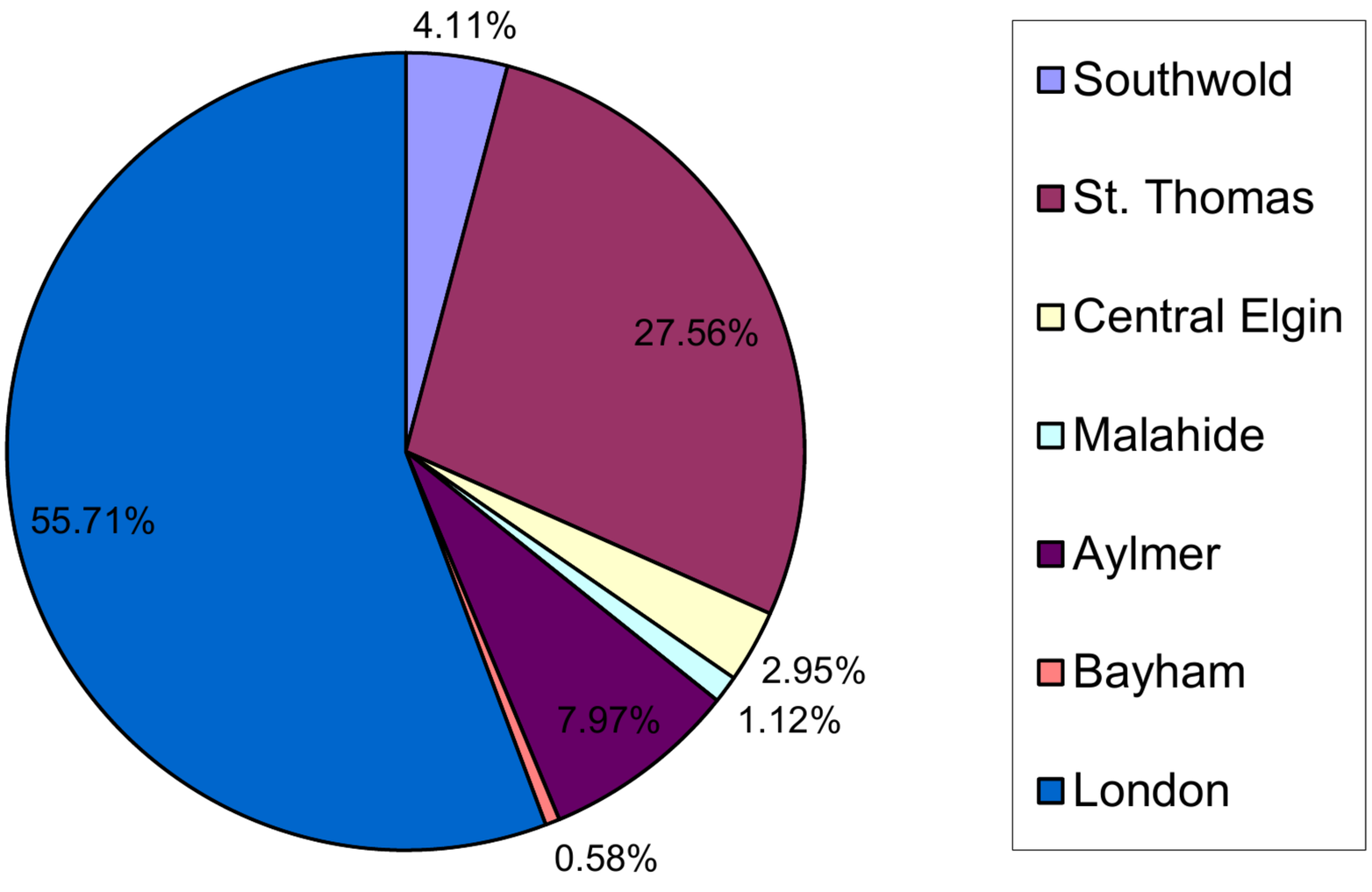

Figure 8 – 2014 Treated Water Volume per Municipality

2014 CHEMICAL CONSUMPTION

A variety of water treatment chemicals are used at the Elgin Area Water Treatment Plant to ensure safe, clean drinking water. The following table outlines the chemicals most frequently used for the Elgin Area Primary Water Supply System. As part of the system's registered ISO14001 Environmental Management System, objectives and targets are currently in place to optimize chemical usage.

Chemical	Purpose	Total amount used in 2014
Aluminum sulphate	Coagulant	550,673 kg
Polymer	Coagulant	336 kg
Powdered activated carbon	Taste and odour control (seasonally)	16,580 kg
Chlorine gas	Primary disinfection	32,837 kg
Sodium hypochlorite	Zebra mussel control at the intake crib	4,067 kg
Fluoride	Prevention of dental cavities	9,050 kg
Carbon Dioxide	pH adjustment - injected at the start of the treatment process to lower the raw water pH for improved treatment effectiveness and efficiency	264,148 kg
Sodium Hydroxide	pH adjustment – injected at the end of the treatment process to raise the treated water pH for reduced corrosion potential	354,040 L

2014 WATER QUALITY SUMMARY

Water Quality Sampling and Monitoring

The Elgin Area Primary Water Supply System (EAPWSS) consistently provides treated drinking water with water quality above the standards required by provincial regulation. Where desirable, the EAPWSS standards are more stringent than what is required by regulation. For example, the target at the Elgin Area Water Treatment Plant for treated water turbidity (a measure of the cloudiness of water) is 10 times more stringent than the provincial standard. The EAPWSS is practicing continual improvement to ensure that high drinking water standards are maintained and enhanced where possible.

All water quality sampling at the Elgin Area Primary Water Supply System (EAPWSS) is performed in accordance with the *Safe Drinking Water Act* and its associated regulations. All samples are collected by licensed operating authority personnel and are submitted to CALA/SCC accredited laboratories for both bacterial and chemical analysis.

In 2014, a total of 523 microbiological samples were collected from raw, treated and distribution system water, and were tested for E Coli, total coliforms and heterotrophic plate count (HPC). There were no incidents of adverse microbiological test results in 2014. For more information please see the Annual Report attached. The Annual Report can be found in Appendix B.

Annual samples are collected and tested for inorganics (metals) and organics which include herbicides, pesticides and volatile organic parameters. Quarterly sampling is also conducted for trihalomethanes (a disinfection by-product), nitrates and nitrite.

In addition, the water treatment plant operator samples the raw, in-process and treated water six times per day and carries out a battery of physical and chemical tests for operational control.

As required by regulation, the EAPWSS also prepares an Annual Report which includes a summary of water quality test results and a maintenance report. The Annual Report can be found in Appendix B.

Research & Partnerships

The Elgin Area Primary Water Supply System acknowledges the importance of scientific research on water quality and the effects on human health. The EAPWSS has partnered with the Natural Sciences and Engineering Research Council (NSERC) Chair in Drinking Water Research at the University of Waterloo and University of Toronto to pursue research opportunities, as well as University of Western Ontario and is a member of the Water Research Foundation (WRF). In addition, the EAPWSS continues to evaluate and conduct specific research on the efficacy of the existing treatment processes, optimizing and improving treatment systems, and evaluating the potential and need of more advanced treatment alternatives. The EAPWSS also participates in the Ministry of the Environment's Drinking Water Surveillance Program (DWSP) and intake monitoring studies.

MINISTRY OF THE ENVIRONMENT INSPECTIONS

Annual Inspection

The Ontario Ministry of the Environment (MOE) conducts an inspection of the Elgin Area Primary Water Supply System annually. A MOE inspection took place in June 2014. The final inspection report was issued on August 22, 2014. A total of zero (0) non-compliances were identified in the inspection report. The final inspection rating received for the 2014-2015 reporting year was 100%.

Elgin Area
Primary Water Supply System

Regional Water Supply Division
235 North Centre Road
Suite 200
London, ON N5X 4E7
519-930-3505 (ext. 2714)

www.watersupply.london.ca

APPENDIX A – 2014 FLOW SUMMARY

1. RAW WATER INTAKE – FLOW (m^3/DAY)

MONTH DAY	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	40,823	39,232	42,698	45,630	48,062	50,014	54,460	61,473	53,536	39,414	40,446	44,617	
2	37,408	51,847	58,288	47,116	44,650	44,565	42,462	63,831	46,524	42,280	37,504	36,183	
3	38,610	43,567	44,648	45,900	49,887	44,188	49,955	67,716	34,322	37,533	38,754	33,038	
4	41,578	61,222	49,666	43,191	43,506	44,296	48,161	68,190	47,316	40,319	37,590	36,629	
5	52,228	53,197	48,778	45,279	38,180	49,918	49,896	68,094	43,914	39,000	39,646	40,613	
6	47,868	41,609	38,069	49,409	39,565	51,792	49,355	60,413	52,832	37,669	41,246	40,557	
7	48,084	46,676	53,091	54,335	45,912	50,325	44,790	67,474	33,979	46,282	40,060	40,682	
8	49,619	37,104	49,901	36,195	42,119	46,175	44,141	66,575	51,010	38,968	38,382	39,206	
9	38,684	49,288	46,689	51,207	49,004	43,289	44,684	49,695	37,342	39,042	42,405	38,431	
10	41,661	42,029	35,796	41,664	46,705	49,630	43,608	55,989	42,382	51,097	16,773	41,655	
11	44,314	47,833	42,251	50,345	53,963	45,030	49,533	51,980	35,295	34,086	34,080	31,049	
12	42,733	44,629	37,004	49,874	40,863	41,884	54,579	56,588	42,929	38,980	54,214	37,022	
13	39,858	40,931	38,432	39,596	50,519	54,177	43,476	55,845	50,849	36,965	43,076	37,925	
14	49,785	44,343	44,825	49,922	42,779	50,042	41,436	52,174	44,864	53,382	30,955	38,963	
15	40,429	47,693	48,039	50,056	50,333	44,397	53,484	59,483	37,743	83,411	33,341	37,264	
16	36,059	45,660	44,163	46,376	47,364	50,445	40,478	56,466	43,001	60,281	36,923	31,732	
17	50,555	47,749	40,206	41,162	47,165	47,729	49,983	55,852	37,568	35,206	37,627	34,986	
18	41,728	41,362	26,653	47,246	42,234	51,471	50,786	54,899	44,453	52,695	44,751	33,186	
19	47,295	42,642	20,815	43,905	50,619	43,781	59,577	60,419	51,527	28,572	30,478	44,223	
20	41,749	47,646	39,856	46,104	52,811	48,424	58,889	33,874	58,182	42,254	36,681	32,435	
21	40,838	42,366	41,175	49,406	50,906	38,272	51,322	67,277	36,573	32,729	40,400	41,751	
22	49,682	46,691	45,416	49,911	24,907	49,861	58,938	55,513	40,447	45,592	40,875	34,803	
23	40,862	43,686	49,413	48,603	32,094	53,144	50,967	55,993	46,810	33,022	36,339	37,969	
24	42,700	52,587	38,069	46,637	48,550	49,908	53,505	55,206	47,479	45,140	31,329	28,085	
25	41,513	43,040	44,046	40,775	50,628	55,822	68,364	44,546	40,540	43,018	36,645	37,366	
26	47,787	37,292	49,429	47,484	41,746	45,926	64,771	53,529	44,191	41,525	43,427	35,649	
27	39,105	47,877	43,187	49,320	50,644	43,063	74,514	56,476	42,239	30,909	30,529	34,172	
28	52,118	38,709	46,327	39,788	46,773	49,834	64,175	53,216	45,722	41,974	42,558	42,141	
29	43,907		50,160	43,950	41,193	52,331	64,210	55,531	39,418	33,751	42,115	24,543	
30	38,840		49,353	45,394	52,360	50,288	63,735	50,093	47,253	48,285	36,242	41,250	
31	48,144		43,899		44,148		51,282	58,627		34,618		28,466	
Total	1,356,564	1,268,507	1,350,342	1,385,780	1,410,189	1,440,021	1,639,516	1,773,037	1,320,240	1,307,999	1,135,391	1,136,591	16,524,177
Minimum	36,059	37,104	20,815	36,195	24,907	38,272	40,478	33,874	33,979	28,572	16,773	24,543	16,773
Maximum	52,228	61,222	58,288	54,335	53,963	55,822	74,514	68,190	58,182	83,411	54,214	44,617	83,411
Average	43,760	45,304	43,559	46,193	45,490	48,001	52,888	57,195	44,008	42,194	37,846	36,664	45,272

Note: (i) Elgin Area Primary Water Supply System Permit To Take Water #6283-8QZM3N permits the taking of 91MLD.

APPENDIX A – 2014 FLOW SUMMARY

2. RAW WATER INSTANTANEOUS PEAK FLOW (L/s)

MONTH DAY	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	713	680	706	709	580	716	916	915	780	679	337	197	
2	709	706	818	709	642	715	824	918	1,018	671	358	392	
3	804	706	780	575	581	805	580	997	546	555	362	197	
4	541	902	779	710	654	654	829	922	746	600	361	342	
5	820	776	706	686	841	579	719	953	673	659	292	356	
6	807	575	571	573	779	579	744	816	683	552	354	310	
7	1,007	780	705	780	714	579	826	783	680	548	416	355	
8	1,007	810	704	736	715	716	617	914	682	660	361	548	
9	576	571	777	710	827	577	581	717	568	1,008	394	404	
10	800	721	670	712	577	576	784	1,016	754	1,007	290	314	
11	708	657	571	780	715	781	719	914	655	815	358	211	
12	709	573	783	577	714	782	720	851	553	749	610	291	
13	576	606	1,011	761	720	718	719	782	672	571	534	413	
14	576	807	601	574	1,018	579	744	784	563	711	291	401	
15	578	706	573	712	1,020	694	722	915	973	1,008	198	348	
16	744	571	706	575	581	576	679	915	565	1,007	362	295	
17	710	571	784	573	580	718	719	785	632	573	355	290	
18	709	572	998	575	1,016	717	718	782	565	709	407	403	
19	708	732	998	708	581	714	782	917	1,011	572	199	408	
20	707	676	573	574	580	716	782	916	779	743	367	198	
21	708	572	780	578	914	579	832	915	574	389	355	306	
22	708	705	572	714	915	579	782	915	575	824	292	392	
23	708	572	552	577	822	781	723	715	670	389	356	414	
24	573	778	572	795	822	722	914	715	683	758	368	330	
25	574	572	573	549	580	782	915	880	706	644	402	315	
26	694	707	572	713	781	782	783	782	686	569	393	291	
27	708	707	842	574	781	581	914	717	573	700	197	356	
28	710	724	779	792	1,012	580	782	715	574	678	409	359	
29	708		707	717	911	721	915	715	686	572	377	290	
30	730		708	716	718	782	1,013	783	684	709	337	316	
31	731		708		579		1,020	782		389		200	
Minimum	541	571	552	549	577	576	580	715	546	389	197	197	197
Maximum	1,007	902	1,011	795	1,020	805	1,020	1,016	1,018	1,008	610	548	1,020
Average	712	680	715	668	751	679	784	843	684	678	356	330	657

Note: (i) Elgin Area Primary Water Supply System Permit To Take Water #6283-8QZM3N permits the taking of 63,194 L/min. This converts to 1053 L/s.

APPENDIX A – 2014 FLOW SUMMARY

3. TREATED WATER FLOW (m^3/DAY)

MONTH / DAY	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	38,050	36,588	39,549	41,652	45,109	47,622	54,960	58,224	51,737	37,055	37,215	45,494	
2	36,751	49,489	54,977	42,932	41,807	44,733	38,365	60,971	40,327	41,203	36,523	29,896	
3	36,757	40,786	36,551	45,870	47,038	40,758	46,613	63,773	32,779	35,111	35,841	33,819	
4	39,150	56,468	47,048	38,883	42,587	42,623	46,604	65,009	44,878	37,888	36,698	34,010	
5	51,908	51,416	46,569	43,058	33,870	50,447	46,666	65,144	40,398	36,770	38,358	36,754	
6	41,063	39,775	33,930	48,210	37,434	45,579	47,196	60,735	50,421	33,312	36,571	39,026	
7	44,323	44,832	46,563	51,068	44,800	47,282	43,096	63,398	34,333	42,593	38,305	36,815	
8	40,964	34,094	43,566	33,536	38,281	44,624	41,831	63,299	46,259	34,690	37,041	33,142	
9	37,053	46,628	38,008	47,664	46,604	40,280	39,277	49,628	36,167	33,459	38,350	30,892	
10	39,824	36,522	30,842	40,971	43,937	46,798	44,784	53,158	39,557	43,842	16,673	41,614	
11	40,814	46,930	40,108	44,765	51,714	40,621	44,891	48,407	34,127	32,178	30,358	28,574	
12	41,599	40,509	25,733	47,066	38,499	41,065	53,095	54,321	39,542	37,174	47,788	34,451	
13	40,061	38,262	35,240	39,035	48,300	50,406	41,391	55,032	47,383	34,877	32,306	36,189	
14	45,887	42,395	43,424	48,399	35,047	49,795	40,819	51,182	43,118	48,710	31,283	36,182	
15	38,267	45,195	42,657	47,236	44,013	41,472	48,195	58,955	34,758	82,149	33,076	35,416	
16	35,695	44,748	44,149	43,144	44,088	47,869	39,544	52,430	43,106	57,309	34,724	31,112	
17	48,394	44,456	37,389	40,328	47,188	46,709	49,300	53,421	34,861	33,291	34,653	33,567	
18	40,882	36,133	25,984	43,706	39,934	48,770	46,282	51,073	42,565	50,837	41,763	29,904	
19	44,302	40,842	20,222	43,991	48,986	41,952	58,828	55,912	34,079	26,341	29,362	41,506	
20	39,621	42,891	37,944	42,993	52,340	47,525	54,191	33,986	53,343	41,512	35,183	33,056	
21	37,237	40,988	38,405	48,000	45,293	35,880	51,986	62,562	33,893	31,144	36,113	38,206	
22	44,355	41,895	44,532	47,038	23,034	48,560	53,382	53,679	36,444	43,087	39,988	33,262	
23	39,527	42,185	48,409	46,182	32,146	51,233	49,594	53,582	44,187	30,885	33,363	37,605	
24	40,744	51,331	28,368	41,902	47,696	46,249	51,521	52,525	45,566	43,660	28,202	26,945	
25	39,736	40,073	46,299	41,721	47,344	54,017	64,291	42,580	37,257	38,031	36,229	34,749	
26	45,774	34,944	47,913	44,027	37,324	44,298	60,201	51,741	43,692	40,250	41,266	35,728	
27	37,707	44,017	37,891	47,428	49,965	42,135	73,118	52,855	37,078	30,684	26,053	30,658	
28	47,960	34,823	46,462	38,458	46,179	50,239	58,348	51,981	46,448	37,487	41,252	39,232	
29	39,020		48,442	41,181	38,676	52,135	62,026	51,468	36,504	34,339	40,059	23,691	
30	34,699		45,982	42,078	50,664	46,499	53,159	48,666	43,380	47,711	32,431	39,824	
31	46,479		41,376		39,829		44,638	57,257		32,485		26,637	
Total	1,274,603	1,189,215	1,244,532	1,312,522	1,329,726	1,378,175	1,548,192	1,696,954	1,228,187	1,230,064	1,057,027	1,067,956	15,557,153
Minimum	34,699	34,094	20,222	33,536	23,034	35,880	38,365	33,986	32,779	26,341	16,673	23,691	16,673
Maximum	51,908	56,468	54,977	51,068	52,340	54,017	73,118	65,144	53,343	82,149	47,788	45,494	82,149
Average	41,116	42,472	40,146	43,751	42,894	45,939	49,942	54,740	40,940	39,679	35,234	34,450	42,609

Note: (i) As per the water system's current Municipal Drinking Water Licence, the rated capacity of the Water Treatment Plant is 91.0 million litres/day

APPENDIX A – 2014 FLOW SUMMARY

4. TREATED WATER INSTANTANEOUS PEAK FLOW (L/s)

MONTH DAY	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	681	657	700	654	653	686	896	919	595	720	559	588	
2	963	633	909	722	692	728	854	971	589	627	597	384	
3	924	673	635	594	633	915	671	902	559	626	582	567	
4	722	914	744	753	663	595	542	917	608	584	600	560	
5	931	961	701	757	738	730	678	904	619	565	583	595	
6	956	656	571	566	734	872	674	895	705	682	601	653	
7	956	738	700	640	637	550	695	922	669	632	583	578	
8	603	648	735	654	659	680	652	907	546	566	596	380	
9	557	663	639	723	889	566	694	592	708	625	583	598	
10	574	755	395	740	779	552	645	887	536	600	582	690	
11	548	659	575	699	629	974	667	898	554	570	597	383	
12	588	731	584	685	743	878	710	912	555	569	611	627	
13	636	616	593	656	559	598	675	910	900	542	565	578	
14	611	637	596	563	640	579	621	889	558	880	679	568	
15	561	730	653	589	959	604	675	885	955	1,142	569	545	
16	687	680	694	701	598	549	631	834	639	1,143	567	574	
17	601	719	910	792	653	637	594	853	559	597	552	555	
18	711	559	886	679	836	642	585	903	540	594	545	576	
19	744	856	645	601	656	589	927	904	598	640	389	594	
20	773	561	566	775	649	696	885	1,045	711	566	570	381	
21	633	945	970	677	924	660	878	898	596	378	541	473	
22	703	724	649	593	928	595	883	840	587	560	576	835	
23	680	719	566	710	954	892	966	693	730	381	577	666	
24	585	652	643	676	564	722	899	700	878	565	727	577	
25	642	766	756	586	600	631	860	686	596	610	549	554	
26	915	970	565	728	875	683	877	683	597	594	594	578	
27	713	686	735	684	859	685	870	806	618	735	641	552	
28	686	601	650	1,088	1,102	590	865	678	715	603	719	605	
29	699		588	635	833	704	903	669	693	733	722	586	
30	740		794	618	838	907	880	629	682	608	710	575	
31	933		612		575		851	894		383		390	
Minimum	548	559	395	563	559	549	542	592	536	378	389	380	378
Maximum	963	970	970	1,088	1,102	974	966	1,045	955	1,143	727	835	1,143
Average	718	718	676	685	744	690	765	840	647	633	596	560	689

(i) As per the water system's current Municipal Drinking Water Licence, the rated capacity of the Water Treatment Plant is 1053 litres/second.

APPENDIX B – 2014 ANNUAL REPORT

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

Drinking-Water System Number:	210000871
Drinking-Water System Name:	**Elgin Area Primary Water Supply System**
Drinking-Water System Owner:	Elgin Area Primary Water Supply System Joint Board of Management
Drinking-Water System Operating Authority:	Ontario Clean Water Agency (OCWA)
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	January 1, 2014 through December 31, 2014

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.

Lake Huron and Elgin Area Water Supply Systems
c/o Regional Water Supply Division
235 North Centre Road, Suite 200
London, ON N5X 4E7
http://www.watersupply.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 EAPWSS:

Drinking Water System Name	Drinking Water System Number
City of London Distribution System	260004917
St. Thomas Area Secondary Water Supply System	260078897
Aylmer Area Secondary Water Supply System	260004722
Port Burwell Secondary Water Supply System	260004735
Municipality of Central Elgin	260004761
St. Thomas Distribution System	260002187

Systems that receive their drinking water indirectly from the EAPWSS:

Drinking Water System Name	Drinking Water System Number
Aylmer Distribution System	260002136
Malahide Distribution System	260004774
Dutton/Dunwich Distribution System	220002967
Municipality of Bayham	260004748
Southwold Distribution System	210001362
Ontario Police College Distribution System	260002161
St. Thomas Psychiatric Hospital Distribution Supply	260005255

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.

[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
[X] Public access/notice via other method News Release

Describe your Drinking-Water System

The Elgin Area Primary Water Supply System employs pre-chlorination, screening, process pH adjustment (utilizing carbon dioxide), powder activated carbon addition (seasonally on an as-required basis), coagulation, flocculation, sedimentation, dual-media filtration, UV disinfection, post-chlorination, final pH adjustment (utilizing sodium hydroxide) and fluoridation to treat raw water obtained from Lake Erie. The WTP has a rated capacity of 91 ML/day (MLD). Water is pumped from the plant through two 750 mm and 900mm diameter water mains to various communities en route to the Elgin-Middlesex terminal reservoir located northeast of St. Thomas in the Municipality of Central Elgin. The drinking water system is monitored at various locations throughout the system via a Supervisory Control and Data Acquisition (SCADA) system.

List all water treatment chemicals used over this reporting period

Sodium Hypochlorite
Carbon Dioxide
Aluminum Sulphate
Cationic Polymer
Powder Activated Carbon
Chlorine Gas
Hydrofluosilicic Acid
Sodium Hydroxide

Were any significant expenses incurred to?

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

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

Capital Projects:

- Residuals Management Facility (RMF) - under construction
- Low lift service water line replacement
- Raw water line check valve replacement
- Replacement of 150m of asbestos cement pipe with PVC pipe
- Phone system upgrade
- Chlorine system upgrade for zebra mussel control - under construction
- Server replacement upgrade - in process
- Field Control Devices Study
- Energy Audit and Pump Optimization Study
- Roof replacement – low lift, surge building and valve house building
- Uninterruptible Power Supply (UPS) replacement
- 2014 instrumentation replacement plan

Maintenance Projects:

- Building Automation System (BAS) control system upgrade for remote buildings and plant areas
- Cement sidewalk replacement
- Generator cooling system repair
- Installation of additional heating capacity for generator building
- UV System major preventive maintenance
- Filter annual preventive maintenance
- Low Lift Well cleaning and intake inspections
- Update alarm coding structure within SCADA
- Chamber maintenance
- Connection removal in chamber P035A
- Cathodic protection survey on B Pipeline
- Replace shaft on gate valve P039B

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 Report 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 Results (counts/100 mL) (min #)-(max #)	Range of Total Coliform Results (counts/100 mL) (min #)-(max #)	Range of HPC Results (counts/1 mL) (min #)-(max #)
Raw Water	104	(0)-(300)	(0)-(44,000)	(<10)-(>2000)
Treated Water (WTP)	259	(0)-(0)	(0)-(0)	(0)-(400)
Distribution (EMPS Valve House & Fruitridge Surge Facility)	160	(0)-(0)	(0)-(0)	(1)-(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	Range of Results (min #)-(max #)
Treated Water Free Chlorine (mg/L)	Continuous Monitoring	(0.23)-(2.24)
	2123	(0.80)–(1.64)
Treated Water Turbidity (NTU)	Continuous Monitoring	(0.002)–(2.00)
	2124	(0.006)–(0.123)
Treated Water Fluoride (mg/L)	Continuous Monitoring	(0.13)-(1.19)
	709	(0.09)–(0.84)
Filter #1 - Filtered Water Turbidity (NTU)	Continuous Monitoring	(0.005)-(2.00)
Filter #2 - Filtered Water Turbidity (NTU)	Continuous Monitoring	(0.006)–(2.00)
Filter #3 - Filtered Water Turbidity (NTU)	Continuous Monitoring	(0.021)–(2.00)
Filter #4 - Filtered Water Turbidity (NTU)	Continuous Monitoring	(0.010)–(2.00)
Combined Filtered Water Turbidity (NTU)	2124	(0.034)–(0.163)

NOTE:
Turbidity spikes above 1.00 NTU on filtered and treated water coincide with instrument calibrations, instrument flushing, pump start-ups, or maintenance. Filter effluent turbidity spikes did not exceed fifteen minutes on any of the filters.

Summary of Inorganic parameters tested during this reporting period

*(*All tests were conducted on treated water leaving the WTP unless otherwise noted)*

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	January 7, 2014 August 5, 2014	Not Detected 0.04	µg/L µg/L	NO
Arsenic	January 7, 2014 August 5, 2014	0.5 0.6	µg/L µg/L	NO
Barium	January 7, 2014 August 5, 2014	20.4 19.0	µg/L µg/L	NO
Boron	January 7, 2014 August 5, 2014	21.0 19.4	µg/L µg/L	NO
Cadmium	January 7, 2014 August 5, 2014	Not Detected 0.003	µg/L µg/L	NO
Chromium	January 7, 2014 August 5, 2014	Not Detected 0.30	µg/L µg/L	NO
Lead *(EMPS Valve House)*	January 7, 2014 August 5, 2014	Not Detected 0.04	µg/L µg/L	NO
Mercury	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	NO
Selenium	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	NO
Sodium	January 7, 2014 April 11, 2014 July 11, 2014 October 10, 2014	*24.2 *27.1 16.2 16.4	mg/L mg/L mg/L mg/L	YES
Uranium	January 7, 2014 August 5, 2014	0.017 0.043	µg/L µg/L	NO
Nitrite	January 7, 2014 April 8, 2014 July 8, 2014 October 10, 2014	Not Detected Not Detected Not Detected Not Detected	mg/L mg/L mg/L mg/L	NO
Nitrate	January 7, 2014 April 8, 2014 July 8, 2014 October 10, 2014	1.52 0.359 0.084 0.132	mg/L mg/L mg/L mg/L	NO

NOTE:

*** Sodium was reported to the Spills Action Centre as an AWQI on June 19, 2013. Sodium is required to be sampled a minimum of once every 60 months, and an AWQI report is only required if a report has not been made in the preceding 57 months.**

Summary of Organic parameters sampled during this reporting period

*(*All tests were conducted on treated water leaving the WTP unless otherwise noted)*

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Aldicarb	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Aldrin + Dieldrin	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Atrazine + N-dealkylated metobolites	January 7, 2014 August 5, 2014	0.09 0.05	µg/L µg/L	**NO**
Azinphos-methyl	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Bendiocarb	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Benzene	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Benzo(a)pyrene	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Bromoxynil	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Carbaryl	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Carbofuran	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Carbon Tetrachloride	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Chlordane (Total)	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Chlorpyrifos	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Cyanazine	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Diazinon	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Dicamba	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
1,2-Dichlorobenzene	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
1,4-Dichlorobenzene	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Dichlorodiphenyltrichloroethane (DDT) + metabolites	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
1,2-Dichloroethane	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
1,1-Dichloroethylene (vinylidene chloride)	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Dichloromethane	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
2-4 Dichlorophenol	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**

2,4-Dichlorophenoxy acetic acid (2,4-D)	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Diclofop-methyl	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Dimethoate	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Dinoseb	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Diquat	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Diuron	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Glyphosate	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Heptachlor + Heptachlor Epoxide	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Lindane (Total)	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Malathion	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Methoxychlor	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Metolachlor	January 7, 2014 August 5, 2014	0.01 Not Detected	µg/L µg/L	**NO**
Metribuzin	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Monochlorobenzene	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Paraquat	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Parathion	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Pentachlorophenol	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Phorate	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Picloram	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Polychlorinated Biphenyls(PCB)	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Prometryne	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Simazine	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Total Trihalomethanes *(EMPS Valve House)*	January 7, 2014 April 8, 2014 July 8, 2014 October 7, 2014	9.6 17 25 17	µg/L µg/L µg/L µg/L	**NO**
Temephos	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Terbufos	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**

Tetrachloroethylene	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
2,3,4,6-Tetrachlorophenol	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Triallate	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Trichloroethylene	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
2,4,6-Trichlorophenol	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Trifluralin	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**
Vinyl Chloride	January 7, 2014 August 5, 2014	Not Detected Not Detected	µg/L µg/L	**NO**

NOTE: *During 2014, no Inorganic or Organic parameter(s) exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards.*