



Ontario Clean Water Agency
Agence Ontarienne Des Eaux

2019 Client Monthly Operations Report

Lambton Area Water Supply System

December 31, 2019

Facility Description

Facility Name:	Lambton Area Water Supply System
Facility Type:	Municipal
Classification:	Class 4 Water Treatment Class 4 Water Distribution
Title Holder:	Municipality
Operation Status:	OCWA
Sr. Operations Manager:	Dave Hunt (519) 344-7429 Ext. 251
Business Development Manager:	Susan Budden
Capacity (m3/d):	181844
Service Area:	City of Sarnia, Village of Point Edward, Township of St. Clair, Township of Warwick-Watford, Municipality of Lambton Shores, Town of Plympton-Wyoming
Service Population:	104,162
In service Date:	1975

Operational Description

The Lambton WTP is a direct filtration surface water facility consisting of chemically assisted filtration with disinfection. The facility consists of an intake system (and alternate intake), a low lift pump station, a treatment system and distribution pumping system situated in the City of Sarnia. Water is drawn into the plant (a zebra mussel system is available as needed) and screened at the surge wells (pre-disinfection is utilized). Water flows to the pump wells where a total of 4 vertical turbine pumps are located and used as needed which pump to a discharge header. Coagulant is added, flashed mixed (PAC is also applied at this location when needed) the raw water is then flocculated (Polymer is added at the flocculation trains as needed) and diverted to filtration (10 dual media filters). The gravity fed filter effluents combine into two clear wells where sodium hypochlorite is injected. To maximize the contact time the water is diverted to the two baffled reservoirs (in series). Six vertical turbine pumps are available for supplying the distribution demand as needed. The entire water treatment system is continuously monitored (via SCADA) with continuous on-line analyzers equipped throughout the processes. The utility serves a large part of Lambton County and has over 250 kilometers of pipeline of various sizes and materials. There is also the East Lambton Booster Station with 9,000 cubic meters of storage capacity which is remotely monitored and controlled from the Lambton WTP via SCADA. During the 1997 calendar year the West Lambton Pumping Station, with the largest above ground water storage in the province with a capacity of 90,000m³, was brought on-line. This pumping station is also remotely monitored and controlled from Lambton WTP via SCADA. The LAWSS distribution system has 5 towers/elevated tanks that the utility monitors via SCADA. In 2007 the Residual Management System (RMS) which treats backwash effluent was brought on-line.

Treatment Process

Pre-treatment Chemicals:	Prechlorination (sodium hypochlorite); Zebra mussel control
Coagulation/Flocculation:	Aluminum Sulphate (Clar+Ion A7)
Filtration:	Dual Media; Filter Aid polymer
Disinfection Method:	Sodium hypochlorite
Post Treatment Chemical Addition:	Fluoride
Waste Residue Management:	Filter backwash effluent is treated by an Actiflo system.
Waste effluent/residue Disposal:	Sludge is hauled to Sarnia WPCP on a needed basis.

Inspections: None

Maintenance, Operations & Distribution Works Summary 2019

Maintenance

December:

Date	(P)reventative Capital Major Mtc (C)orrective	Description
Dec 2	Capital	Onsite at Toromont Mississauga to inspect startup of generators.
Dec 3	P	Conducted six month inspection of safety spill kits at the water treatment plant.
Dec 3	P	Pumped water from out of diesel and HFS containment areas.
Dec 3	P	Completed annual inspection of Residual Management System mixers.
Dec 3	P	Completed annual maintenance on portable generators and pumps at the water treatment plant.
Dec 4	P	Annual inspection of VFD at West Lambton Pumping Station completed by Eaton.
Dec 4	P	Completed monthly inspection of eyewash and emergency showers at the water treatment plant.
Dec 4	P	Completed monthly maintenance on West Lambton Pumping Station chlorine analyzers.
Dec 4	C	Investigated/corrected issue with failed sump pump at the Sombra PRV chamber.
Dec 5	C	Replaced UPS on East surge anticipator valve at the water treatment plant.
Dec 5	P	Completed six month inspection of spill kits at West Lambton

		Pumping Station.
Dec 5	P	Diesel fuel delivered for all generators.
Dec 6	Capital	Conducting factory acceptance test on radio project at Experteers.
Dec 6	P	Completed six month inspection of backwash pump.
Dec 6	P	Conducted annual maintenance on Filters 3 and 1.
Dec 9	P	Conducted monthly inspection of water treatment plant compressor.
Dec 9	C	Replaced float of sewage pump at West Lambton Pumping Station.
Dec 9-11	Capital	Testing existing PLC equipment to ensure it work with new radio equipment.
Dec 10	P	Conducted annual maintenance on Filters 5, 7 and 9.
Dec 11	P	Completed monthly maintenance on all online chlorine analyzers at the water treatment plant.
Dec 11	Capital	Onsite at Toromont Mississauga to inspect startup of generators.
Dec 12	C	Replacing backflow preventer for HFS and PAC room service water. During install of backflow preventer the flange was broken delaying the repair.
Dec 12	P	Conducted annual inspection of filter effluent actuators.
Dec 12-13	P	Completed monthly maintenance on all online turbidity meters at the water treatment plant.
Dec 13	P	Completed monthly maintenance on lab turbidity meter at the water treatment plant.
Dec 13	C	Replaced broken flange on HFS and PAC room backflow preventer.
Dec 13	P	Conducted monthly inspection of traveling screens at the water treatment plant.
Dec 16	P	Conducted annual maintenance on Filters 4, 6 and 8.
Dec 16	P	Calibrated new online pH probes.
Dec 16	P	Completed monthly maintenance on East Lambton Pumping Station chlorine analyzers.
Dec 17	P	Conducted annual maintenance on Filters 2 and 10.
Dec 17	P	Installed new pH probes for online meters at the water treatment plant.
Dec 17	P	Completed annual inspection of Residual Management System recirculation pumps.
Dec 18	P	Flush clearwell sodium hypochlorite feed lines.
Dec 18	C	Installed South Clearwell level indicator.
Dec 18	P	Conducted monthly test of diesel generators at the water treatment plant.
Dec 19	P	Tested generators at East and West Lambton Pumping Stations.
Dec 19	P	Completed monthly inspection of vacuum priming system at East Lambton Pumping Station.

Dec 19	P	Eaton on site to conduct two year inspection on VFD starter.
Dec 20	P	Completed three year inspection on transformer oil at the water treatment plant.
Dec 20	P	Completed three year inspection on transformer oil at West Lambton Pumping Station.
Dec 23	P	Conducted monthly maintenance on Residual Management System turbidity units.
Dec 23	P	Conducted monthly maintenance on streaming current meters at the water treatment plant.
Dec 23	P	Conducted monthly maintenance on Hach portable chorine units.
Dec 23	P	Conducted monthly maintenance on online fluoride meter.
Dec 24 & 27	P	Completed monthly inspection of all flocculator gear drives at the water treatment plant.
Dec 27	P	Ainsworth in to test Pac and HFS Building backflow preventer.
Dec 31	C	Repaired issue with Wyoming radio system.

Operations and Compliance

December:

Dec 2	TSS sample for Residual Management System taken.
Dec 2	95% rule for filters completed.
Dec 2	Primed and reset East Lambton Pumping Station chlorine pump and panel.
Dec 2	Running polymer system due to high raw water turbidity.
Dec 3	Reviewed contractors and suppliers WSIB certificates.
Dec 3	Primed and reset East Lambton Pumping Station chlorine pump and panel.
Dec 7	Operated Pump #1 at West Lambton Pumping Station.
Dec 8	Operated Pump #5 at West Lambton Pumping Station.
Dec 9	DWSP samples taken.
Dec 11	Tested polymer system at water treatment plant.
Dec 12	Meeting with MECP in regards to reservoir repair.
Dec 12	DWSP samples taken for raw and treated water.
Dec 12	Due to replacement of HFS and PAC room service water backflow preventer water has been shut down and HFS and PAC were turned off. MECP and Public Health Unit were informed verbally and by fax for loss of HFS.
Dec 13	HFS system restored. Fax confirmations sent to MECP and Public Health unit.
Dec 14	Operated Pump #1 at West Lambton Pumping Station.
Dec 15	Operated Pump #5 at West Lambton Pumping Station.
Dec 16	Short power outage. Pumps were reset with no issues.
Dec 19	PAC system shut down for winter season.
Dec 19	Tested for chlorine residuals from effluent of Actiflo units in the Residual Management System. No issues found.

Dec 20	Quarterly staff meeting.
Dec 20	Notified MECP and affected Municipalities that bacteriological samples taken December 9 th were lost by Purolator and did not make it to SGS labs for sampling.
Dec 22	LAWSS pre chlorine pump failed due to air lock. Pump and panel were reset with no issues.
Dec 22	Operated Pumps 1 and 5 at West Lambton Pumping Station.
Dec 23	ORO responsibilities changed to Mark Harris from Dave Hunt
Dec 23	South clearwell Pump #2 failed due to P+. Pump and panel was reset with no issues.
Dec 28	Pump #5 at West Lambton Pumping Station failed after startup.
Dec 29	Operated Pump #1 at West Lambton Pumping Station.
Dec 30	Short power bump at water treatment plant. No major issues noted.
Dec 30	Wyoming radio signal failed.

Distribution

December:

Dec 2	Onsite with Union Gas for third party work at 4739 Confederation Line.
Dec 9	Onsite for third party work at Murphy and Isabella.
Dec 10	Onsite for third party work on London Line at Lottie Neely Park.
Dec 11	Site visit at Union Gas work on London Line in Plympton-Wyoming.
Dec 12	Onsite for third party locate on LaSalle Line near fire school. Cancelled due to lack of permits.
Dec 17	Operating valves in City of Sarnia on Brock St and Confederation Line.
Dec 18	Onsite for abandonment of service line at 3569 Confederation Line.
Dec 18	Site visit with VanBree project on Fleming Rd.
Dec 19	Valve operations on Murphy Rd complete.
Dec 19	Locating connection valve at Nova Moore location.

Call Outs 2019

December: Call out on December 8th for an intruder alarm at East Lambton Pumping Station. Call out on December 21st for service line water repair at 4102 St Clair Parkway.

One Call Utility Locates

These numbers represent the number of locate notifications that were cleared from LAWSS assets

Number of Locates/Month

YEAR	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
2018	50	64	107	149	189	166	163	146	141	163	111	58
2019	69	62	104	164	189	149	182	153	121	148	81	50

RMS Sludge Haulage

These numbers represent total monthly amounts of sludge produced by the Residual Management System and hauled to Sarnia WPCP

Amount of sludge produced per month in m³

YEAR	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
2018	493	300	239	320	230	318	240	240	79	227	238	234
2019	236	158	237	236	216	158	313	237	160	160	159	163

Required Monthly Reports

Monthly System Flows- see separate attached summary report

Workplace Management System Reports – see separate attached reports

Performance Data and Compliance – See separate attached report

Required Financial Reports

Quarterly Financial Summary –Q4 due January 30, 2020

Semi-Annual “Schedule G” Reconcilable Commodities Report –Due January 30, 2020

Health & Safety Work Order Summary by Facility

Start Date: 2019-12-01

End Date: 2019-12-31

Hub: Lambton

Cluster	ORG ID	Facility ID	Health and Safety					Closure Rate		
			Initiated	Approved	Completed	Total Labor Hrs	Total Cost \$	Target	Actual	Variance
LAWSS (133000)	Lambton Area Water Treatment	5544, East Lambton Distribution (5544-WDEL)	0	0	0	0.00	0.00	85.00%	100.00%	-15.00%
		5544, East Lambton PS (5544-WPEL)	0	0	0	0.00	0.00	85.00%	100.00%	-15.00%
		5544, Forrest Standpipe (5544-WDFS)	0	0	0	0.00	0.00	85.00%	100.00%	-15.00%
		5544, Indian Road Tower (5544-WDIR)	0	0	0	0.00	0.00	85.00%	100.00%	-15.00%
		5544, Lambton Area RMS (5544-WWLA)	0	0	0	0.00	0.00	85.00%	100.00%	-15.00%
		5544, Lambton Area WTP (5544-WTLA)	3	3	3	6.50	248.83	85.00%	100.00%	-15.00%
		5544, Port Lambton Standpipe (5544-WDPL)	0	0	0	0.00	0.00	85.00%	100.00%	-15.00%
		5544, Watford Standpipe (5544-WDWF)	0	0	0	0.00	0.00	85.00%	100.00%	-15.00%
		5544, West Lambton Booster Stn (5544-WPWL)	0	0	0	0.00	0.00	85.00%	100.00%	-15.00%
		5544, West ST.Clair Distribution (5544-WDWS)	0	0	0	0.00	0.00	85.00%	100.00%	-15.00%
		Lambton Area Water Treatment Plant (5544)	0	0	0	0.00	0.00	85.00%	100.00%	-15.00%
		Total	3	3	3	6.50	248.83	85.00%	100.00%	-15.00%

Key Column	Colour	Meaning
Init		No Work Orders initialized
Closed		Closure Rate between 20-50%
Closed		Closure Rate less than 20%

Work Order Summary by Facility

Start Date: 2019-12-01
End Date: 2019-12-31
Hub: Lambton

Key Col	Colour	Meaning
Init		No Work Orders initialized
Closed		Closure Rate between 20-50%
Closed		Closure Rate less than 20%

			Corrective Maintenance					Emergency Maintenance					Call Back				
			Init	Approved	Completed	Total Labor Hrs	Total Cost \$	Init	Approved	Completed	Total Labor Hrs	Total Cost \$	Init	Approved	Completed	Total Labor Hrs	Total Cost \$
LAWSS (133000)	Lambton Area Water Treatment Plant (5544)	5544, East Lambton Distribution (5544-WDEL)	1	1	1	8	301.16	0	0	0	0	0	1	1	1	6	309.67
		5544, East Lambton PS (5544-WPEL)	2	2	2	2.75	101.06	0	0	0	0	0	0	0	0	0	0
		5544, Lambton Area RMS (5544-WWLA)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		5544, Lambton Area WTP (5544-WTLA)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		5544, West Lambton Booster Stn (5544-WPWL)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		5544, West ST.Clair Distribution (5544-WDWS)	4	3	3	16	916.53	0	0	0	0	0	0	0	0	0	0
		Lambton Area Water Treatment Plant (5544)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total			7	6	6	26.75	1318.75	0	0	0	0.00	0.00	1	1	1	6.00	309.67

0
0

Work Order Summary by Facility

Start Date: 2019-12-01
End Date: 2019-12-31
Hub: Lambton

Key Col	Colour	Meaning
Init		No Work Orders initialized
Closed		Closure Rate between 20-50%
Closed		Closure Rate less than 20%

			Preventive Maintenance					Operational					Capital/Project Work					Closure Rate		
			Init	Approved	Completed	Total Labor Hrs	Total Cost \$	Init	Approved	Completed	Total Labor Hrs	Total Cost \$	Init	Approved	Completed	Total Labor Hrs	Total Cost \$	Target	Actual	Variance
LAWSS (133000)	Lambton Area Water Treatment Plant (5544)	5544, East Lambton Distribution (5544-WDEL)	0	0	0	0	0	4	4	4	12	529.43	0	0	0	0	0	85%	100%	-15.0%
		5544, East Lambton PS (5544-WPEL)	4	4	4	5.25	230.81	3	3	3	10.5	448.79	0	0	0	0	0	85%	100%	-15.0%
		5544, Lambton Area RMS (5544-WWLA)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85%	100%	-15.0%
		5544, Lambton Area WTP (5544-WTLA)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85%	100%	-15.0%
		5544, West Lambton Booster Stn (5544-WPWL)	5	5	5	10	485.69	2	2	2	7	263.26	0	0	0	0	0	85%	100%	-15.0%
		5544, West ST.Clair Distribution (5544-WDWS)	27	27	27	71	3122.1	11	11	11	1466.5	42284.43	0	0	0	0	0	85%	100%	-15.0%
		Lambton Area Water Treatment Plant (5544)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85%	100%	-15.0%
Grand Total			36	36	36	86.25	3838.6	20	20	20	1496	43525.91	0	0	0	0	0	85%	100%	-15.0%

Ontario Clean Water Agency
Time Series Info Report

From: 01/01/2019 to 31/12/2019

Report extracted 01/07/2020 13:47

Facility Org Number: 5544
Facility Works Number: 210000906
Facility Name: LAMBTON AREA WATER SUPPLY SYSTEM (LAWSS)
Facility Owner: Local Services Board: LAMBTON AREA WATER SUPPLY SYSTEM
Facility Classification: Class 4 Water Treatment
Receiver:
Service Population: 100000.0
Total Design Capacity: 181844.0 m3/day

	01/2019	02/2019	03/2019	04/2019	05/2019	06/2019	07/2019	08/2019	09/2019	10/2019	11/2019	12/2019	Total	Avg	Max	Min
Coagulation/Flocculation / Coagulant Dosage-Calculated - mg/L																
Max IH	38.605	29.517	32.268	31.172	26.559	26.095	23.836	25.822	22.272	31.139	26.33	32.538			38.605	
Mean IH	26.763	24.002	23.839	22.375	22.91	21.558	20.805	20.901	19.819	21.006	21.377	20.607		22.158		
Min IH	21.912	18.131	18.009	17.868	19.041	18.665	18.086	19.041	17.621	18.079	17.595	16.691				16.691
Coagulation/Flocculation / Coagulant Used - kg																
Max IH	1792	1408	1651.2	1241.6	1344	2150.4	2060.8	1804.8	1356.8	1472	1203.2	1408			2150.4	
Mean IH	1220.542	1167.086	1160.671	1009.067	1129.29	1339.307	1594.632	1397.677	1108.139	996.335	987.307	955.871		1172.873		
Min IH	972.8	947.2	832	768	934.4	921.6	1088	1100.8	844.8	652.8	729.6	755.2				652.8
Total IH	37836.8	32678.4	35980.8	30272	35008	40179.2	49433.6	43328	33244.16	30886.4	29619.2	29632	428098.6			
Coagulation/Flocculation / Coagulant Volume Used - m³																
Max IH	1.4	1.1	1.29	0.97	1.05	1.68	1.61	1.41	1.06	1.15	0.94	1.1			1.68	
Mean IH	0.954	0.912	0.907	0.788	0.882	1.046	1.246	1.092	0.866	0.778	0.771	0.747		0.916		
Min IH	0.76	0.74	0.65	0.6	0.73	0.72	0.85	0.86	0.66	0.51	0.57	0.59				0.51
Total IH	29560	25530	28110	23650	27350	31390	38620	33850	25972	24130	23140	23150	334452			
Coagulation/Flocculation / Polymer Dosage - mg/L																
Max IH	0.042			0.024								0.019			0.042	
Mean IH	0.02			0.024								0.006		0.016		
Min IH	0.002			0.024								0				0
Coagulation/Flocculation / Polymer Used - kg																
Max IH	2.1			1.1								1			2.1	
Mean IH	1.025			1.1								0.333		0.775		
Min IH	0.1			1.1								0				0
Total IH	4.1			1.1								1	6.2			
DW THM Data / Trihalomethane: Total - µg/l																
Max Lab		30			37			58			55				58	
Mean Lab		27			31.667			52.667			50			40.333		
Min Lab		24			25			46			45					24
East Lambton Booster Station / Cl Residual: Inlet Free - mg/L																
Max OL	1.74	2.49	1.68	1.58	1.43	1.4	1.36	1.29	1.56	1.64	1.48	1.5			2.49	
Mean OL	1.535	1.401	1.428	1.388	1.3	1.277	1.22	1.124	1.344	1.348	1.356	1.363		1.34		
Min OL	0	0	0	0	0	0	0	0	0	0	0	0				0
Filter Backwash / Backwash Volume - m³																
Max IH	4792	2408	2992	3006	3004	3004	2998	3002	2418	2418	2410	4702			4792	
Mean IH	2268.323	1929.786	2028.194	1927.733	1900.774	2043	2095.032	2056.903	1966.067	1893.871	1863.733	2015.29		2000.164		
Min IH	1794	1788	1794	1198	1204	1792	1788	1059	1796	1204	1196	0				0
HFS / Fluoride Dosage - mg/L																
Max IH	0.64	0.644	0.614	0.622	0.592	0.628	0.612	0.589	0.573	0.655	0.649	0.634			0.655	
Mean IH	0.556	0.557	0.559	0.557	0.542	0.548	0.535	0.537	0.531	0.533	0.6	0.549		0.55		
Min IH	0.46	0.417	0.482	0.487	0.486	0.464	0.486	0.49	0.474	0.476	0.531	0.196				0.196
HFS / Fluoride Used - l																
Max IH	108.877	97.419	97.419	94.553	100.284	186.246	171.916	143.263	117.475	114.611	103.149	100.284			186.246	
Mean IH	85.495	87.63	89.655	83.952	90.041	115.949	139.658	123.298	101.43	85.218	91.975	83.739		98.255		
Min IH	65.901	66.384	71.631	71.631	74.497	88.823	111.745	103.149	85.957	68.766	83.09	28.652				28.652
Total IH	2650.36	2453.634	2779.305	2518.562	2791.284	3478.466	4329.406	3822.244	3042.903	2641.76	2759.246	2595.922	35863.09			

[illegible]

Total IH		13753.38	12536.08	13437.3	12113.08												51839.83						
Pre-chlorination / Hypochlorite Volume-Total-1 - m³																							
Max IH		0.446	0.474	0.435	0.477																0.477		
Mean IH		0.378	0.381	0.369	0.355														0.371				
Min IH		0.326	0.336	0.29	0.288																	0.288	
Total IH		11705	10669	11436	10309												44119						
Raw Water / Background - cfu/100mL																							
Max Lab		160	82	82	410	260	720	2800	2800	8600	56	2	4							8600			
Mean Lab		69.2	33.25	21.5	105.8	69.25	346.25	751.2	1137.5	2760	12.4	0.5	1.333						479.423				
Min Lab		18	0	1	13	0	0	0	0	160	0	0	0									0	
Raw Water / Conductivity - µS/cm																							
Max IH		228.5	223.2	231.5	232.3	243.7	238.2	238.8	236.2	235.2	228.6	225.3	223.4							243.7			
Mean IH		221.019	219.725	222.174	225.038	233.042	232.617	236.165	235.252	231.17	227.025	222.907	220.674						227.288				
Min IH		217.8	218	217.9	170	222.6	228.5	232.2	234.1	223.8	225.2	221.3	219									170	
Raw Water / E. Coli: EC - cfu/100mL																							
Max Lab		1	0	0	1	0	0	10	< 10	< 10	0	0	0						< 10				
Mean Lab		0.4	0	0	0.2	0	0	3.8	< 3.25	< 2.4	0	0	0						< 0.904				
Min Lab		0	0	0	0	0	0	0	< 0	0	0	0	0								< 0		
Raw Water / Raw Flow Daily - m³/d																							
Max IH		52987	56479	56245	51694	56670	100783	98594	80666	61463	59068	55288	52646							100783			
Mean IH		45508.9	48755.75	48621.65	45139.4	49348.52	62008.87	76680.9	66884.77	55870.33	47562.55	46161.03	46399.06						53292.46				
Min IH		40082	40763	41664	36877	42212	47569	60157	54511	47226	34339	37635	39959									34339	
Raw Water / Raw Flow Rate - l/s																							
Max IH		613.27	653.69	650.98	598.31	654.75	1166.47	1141.13	933.63	926.67	683.66	639.91	609.33							1166.47			
Mean IH		526.72	565.27	562.75	522.45	571.13	717.93	887.51	774.13	653.31	550.49	534.28	537.02						617.45				
Min IH		463.91	471.79	482.22	426.82	488.56	550.57	696.26	630.91	546.6	397.44	435.9	462.49									397.44	
Raw Water / Raw Water Turbidity - NTU																							
Max OL		21.4	7.14	13.7	12.2	6.8	3.1	7	2.17	2.4	26.5	5.63	10.9							26.5			
Mean OL		2.887	1.135	2.448	2.458	1.769	1.08	0.97	0.75	0.785	2.341	1.526	1.049						1.6				
Min OL		0.46	0.23	0.201	0.57	0.445	0.365	0.33	0.34	0.2	0.284	0.28	0.18									0.18	
Raw Water / Raw Water pH - ---																							
Max IH		8.22	8.12	8.2	8.9	8.35	8.35	8.41	8.41	8.39	8.4	8.28	8.26							8.9			
Mean IH		8.045	8.008	8.056	8.197	8.239	8.269	8.331	8.355	8.307	8.241	8.192	8.156						8.201				
Min IH		7.94	7.88	7.86	8.09	8.18	8.2	8.26	8.26	8.22	8.11	8.08	8.04									7.86	
Raw Water / Temperature - °C																							
Max IH		8.01	6	8	11.5	13.1	18.5	23	25	22.5	17.6	12.7	10.1							25			
Mean IH		6.396	5.025	5.653	9.285	11.661	15.612	21.142	23.064	19.033	14.308	10.062	8.437						12.523				
Min IH		3	3.25	4	7	10	13	17.8	22	16	12	7.75	7.25									3	
Raw Water / Total Coliform: TC - cfu/100mL																							
Max Lab		39	15	10	31	4	2	100	71	< 66	0	0	0						< 100				
Mean Lab		10.2	4.5	2.5	8.2	1.25	0.75	23.6	< 20.25	< 29.2	0	0	0						< 9.096				
Min Lab		2	0	0	0	0	0	0	< 0	0	0	0	0								< 0		
Treated Water / Background - cfu/100mL																							
Max Lab		0	0	0	0	0	0	0	0	0	0	0	0							0			
Mean Lab		0	0	0	0	0	0	0	0	0	0	0	0						0				
Min Lab		0	0	0	0	0	0	0	0	0	0	0	0								0		
Treated Water / E. Coli: EC - cfu/100mL																							
Max Lab		0	0	0	0	0	0	0	0	0	0	0	0							0			
Mean Lab		0	0	0	0	0	0	0	0	0	0	0	0						0				
Min Lab		0	0	0	0	0	0	0	0	0	0	0	0								0		
Treated Water / Electrical Consumption - kWh																							
Total IH		963849.2	1042697	1022817	1067361	931726.5	922742.6	979665.2	1081486	978235.3	849895.7	785786.5	982628.6	11608890									
Treated Water / Flow: Total of All Sources - m³/d																							
Max IH		51137	53292	51967	49343	52401	97988	96442	77634	64029	60875	50600	51407							97988			
Mean IH		44841	46364	46748.23	44048.37	48460.74	61126.97	76220.23	67154.84	56044.43	47285.74	45425.17	45201.1						52467.97				
Min IH		41397	41527	41284	39452	41184	41283	60988	56137	50125	41493	42109	40167									39452	
Total IH		1390071	1298192	1449195	1321451	1502283	1833809	2362827	2081800	1681333	1465858	1362755	1401234	19150808									
Treated Water / HPC - cfu/mL																							
Max Lab		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10						< 10				
Mean Lab		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10						< 10				

Min Lab	<	10	<	10	<	10	<	10	<	10	<	10	<	10	<	10	<	10					<	10
Treated Water / Total Coliform: TC - cfu/100mL																								
Max Lab		0		0		0		0		0		0		0		0		0				0		
Mean Lab		0		0		0		0		0		0		0		0		0		0				
Min Lab		0		0		0		0		0		0		0		0		0					0	
Treated Water / Turbidity - NTU																								
Max OL		0.117		0.08		0.1		0.082		0.11		0.095		0.096		0.097		0.096		0.088		0.096	0.117	
Mean OL		0.062		0.063		0.065		0.063		0.064		0.066		0.066		0.067		0.067		0.066		0.067	0.065	
Min OL		0.043		0.047		0.046		0.047		0.046		0.046		0.049		0.052		0.052		0.047		0.051	0.043	
West Lambton Booster Station / Cl Residual: Outlet Free - mg/L																								
Max OL		2.19		1.86		1.83		1.8		1.6		1.62		4.99		1.67		2.17		4.99		2.6	2.18	
Mean OL		1.684		1.685		1.595		1.586		1.429		1.413		1.395		1.395		1.651		1.868		2.001	1.754	
Min OL		0		0		0		0		0		0		0		0		0		0		0	0	
Zebra Mussel Control / Chlorine Dosage - mg/L																								
Max IH						1.125		1.173		1.25		1.327		1.29		1.218		1.285		1.271		1.107		
Mean IH						1.125		1.068		1.127		1.158		1.126		1.112		1.065		1.02		1.11		
Min IH						1.125		0.955		1.01		1.028		1.113		0.948		0.955		0.953		0.917	0.917	
Zebra Mussel Control / Cl Residual: Free - mg/L																								
Max IH						0.36		0.67		0.66		0.63		0.64		0.64		0.63		0.66		0.68		
Mean IH						0.36		0.6		0.588		0.559		0.586		0.59		0.587		0.595		0.617	0.589	
Min IH						0.36		0.44		0.52		0.39		0.52		0.52		0.5		0.43		0.43	0.36	
Zebra Mussel Control / Cl Residual: Total - mg/L																								
Max IH						0.54		0.81		0.8		0.79		0.79		0.81		0.78		0.84		0.85		
Mean IH						0.54		0.746		0.712		0.679		0.72		0.736		0.726		0.745		0.766	0.728	
Min IH						0.54		0.55		0.63		0.51		0.66		0.66		0.62		0.54		0.57	0.51	
Zebra Mussel Control / Hypochlorite Dosage - mg/L																								
Max IH						9.374		9.777		10.417		11.057		10.753		10.149		10.71		10.593		9.224	11.057	
Mean IH						9.374		8.898		9.395		9.649		10.05		9.382		9.266		8.876		8.503	9.253	
Min IH						9.374		7.961		8.418		8.569		9.277		7.9		7.954		7.938		7.645	7.645	
Zebra Mussel Control / Hypochlorite Used - kg																								
Max IH						433.575		514.65		848.35		851.875		774.325		598.075		548.725		517		458.25	851.875	
Mean IH						433.575		439.147		582.408		735.512		670.735		524.246		439.715		409.488		394.269	524.303	
Min IH						433.575		336.05		444.15		619.225		538.15		413.6		367.775		321.95		351.325	321.95	
Total IH						433.575		13613.55		17472.25		22800.88		20792.8		15727.38		13631.18		12284.63		12222.35	128978.6	
Zebra Mussel Control / Hypochlorite Volume-Total-1 - m³																								
Max IH						0.369		0.438		0.722		0.725		0.659		0.509		0.467		0.44		0.39	0.725	
Mean IH						0.369		0.374		0.496		0.626		0.571		0.446		0.374		0.349		0.336	0.446	
Min IH						0.369		0.286		0.378		0.527		0.458		0.352		0.313		0.274		0.299	0.274	
Total IH						369		11586		14870		19405		17696		13385		11601		10455		10402	109769	