Ontario Clean Water Agency
Agence Ontarienne Des Eaux

March 31, 2020

Rob Wrigley
Ministry of the Environment, Conservation and Parks
733 Exeter Road
London, ON N6E 1L3

Attention: Mr. Wrigley

RE: West Lorne Wastewater Treatment Plant Annual Report 2019

The Ontario Clean Water Agency is the Operating Authority for the West Lorne Wastewater Treatment Plant on behalf of the Municipality of West Elgin. The system is operated under Environmental Compliance Approval 5873-B4RLEJ. Please find attached the 2019 Annual Report for the West Lorne Wastewater Treatment Plant.

Feel free to contact me should you require any additional information regarding the report. I can be reached at 519-312-0847.

Sincerely,

Terri-Lynn Thomson
Process and Compliance Technician,
Ontario Clean Water Agency

c.c. Madga Badura, Municipality of West Elgin
Dale LeBritton, OCWA Regional Hub Manager
Sam Smith, OCWA Senior Operations Manager
Cindy Sigurdson, OCWA Safety, Process and Compliance Manager
Angela Stroyberg, Ministry of the Environment, Conservation and Parks

MUNICIPALITY OF WEST ELGIN
WEST LORNE WASTEWATER TREATMENT PLANT

2019 ANNUAL REPORT
January 1 to December 31, 2019

Environmental Compliance Approval # 5873-B4RLEJ

Prepared by:

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

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Section 1: Overview

Overall the West Lorne Wastewater Treatment Plant provided effective wastewater treatment in 2019. The wastewater treatment plant was operated under Environmental Compliance Approval 5873-B4RLEJ dated November 30, 2018. Upgrades began in July with flow being diverted to the lagoons during the upgrades. In December 2019 commissioning on the upgraded equipment began.

Collection System

The collection system contains gravity sewers that lead to the Main Pumping Station located on Marsh Line. It contains a wet well with three submersible pumps that pump to the treatment plant. There is a receptacle for a portable generator should the need arise for backup power. In emergencies, the wet well contains an overflow pipe that discharges to the West Lorne Lagoon.

Plant Description

The West Lorne Wastewater Treatment Plant is an extended aeration facility which consists of: grit removal and screening, extended aeration, settling, phosphorus removal, filtration and UV disinfection (seasonal). The extended aeration process is designed to remove carbonaceous and nitrogenous organic compounds (BOD). Aluminum Sulphate is used for phosphorus removal. After the clarifier the effluent is seasonally disinfected using ultraviolet light, then discharged to Zoller Drain. Zoller Drain is connected to Brock's Creek and then from there it goes to Lake Erie. Sludge is directed to the lagoon for storage and settling. Decant liquid off the lagoon is returned to the influent of the plant for treatment.

Process Details

- Wastewater is directed into the sewage lift station from the Village of West Lorne by gravity. Wastewater is then pumped from the sewage lift station located on Mash Line into a reinforced concrete inlet channel, provided with a mechanical rake bar screen.
- The secondary treatment system consists of two trains each consisting of: aeration tank, clarifier tank, and two return activated sludge pumps.
- The phosphorous removal system consists of one 15,000L plastic tank with 2 diaphragm type metering pumps 1 duty and 1 standby.
- Lime system for pH and alkalinity control (currently not in use)
- The objective of the system is to remove organics, total Kjeldahl nitrogen (TKN), phosphorous and ammonia-nitrogen.
- Two rotary lobe blowers one duty and one standby supply low pressure air to the aeration tanks.
- The tertiary treatment system consists of three continuous back wash, up flow, deep bed, granular single media sand filtration units housed in the filter building. The disinfection system consists of a ultra-violet (UV) unit through which the effluent is discharged.
- Operations are controlled by a programmable logic controller (PLC). A data logging computer system with local monitoring capability
- Laboratory space is also located at the WWTP to allow for basic laboratory analyses to be conducted by the plant operator

Section 2: Influent Monitoring Data

Sample Collection and Testing

All samples are collected and tested as per the requirements of the Environmental Compliance Approval.

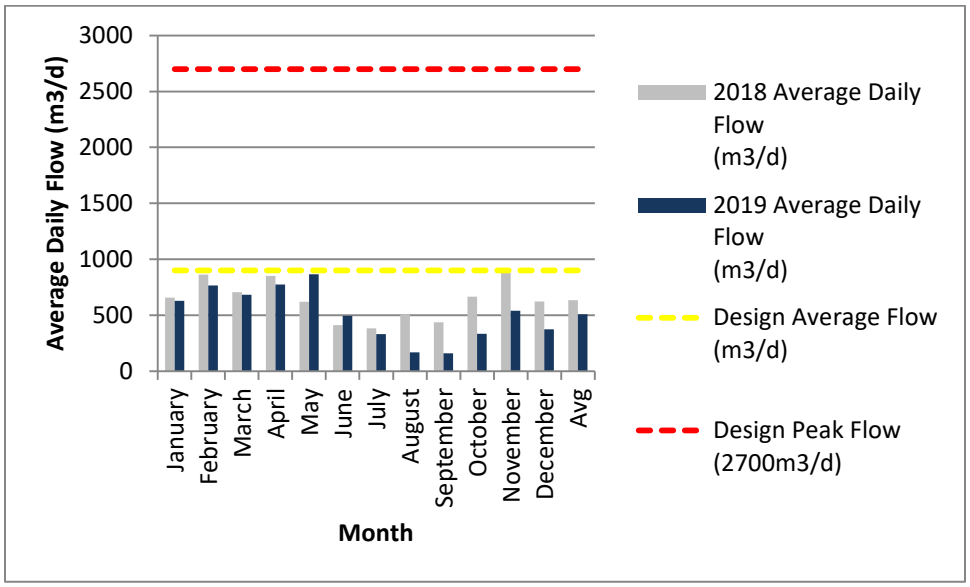
Raw sewage (influent) is sampled bi-weekly and tested for BOD_5, total suspended solids, total phosphorus, total Kjeldahl nitrogen, and alkalinity. The raw samples are collected as 24 hour composite samples.

Flows

Detailed monthly flow information is summarized in Appendix A.

The total flow treated in 2019 was 185,914m^3, which corresponds to a 20% decrease from 2018 raw flows, refer to Chart 1. The annual average daily flow in 2019 was 511m^3/day, or 57% of the plant's rated design capacity of 900m^3/day.

Chart 1. Average daily raw flow for 2019 compared to 2018.

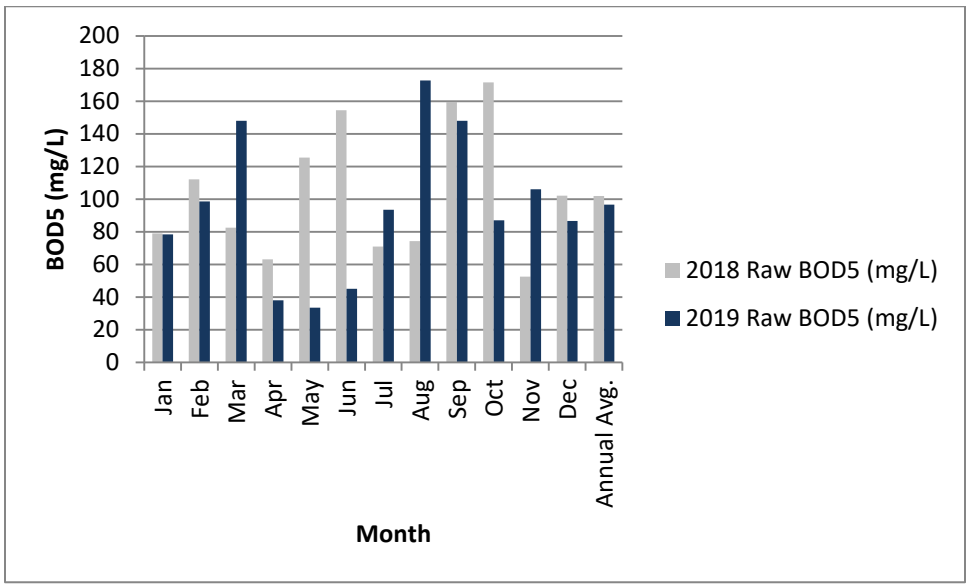


The design average daily flow for the plant was exceeded 22 times during the year, compared to 41 times in 2018. The hydraulic peak flow of 2,700m^3/day for the plant was not exceeded in 2019.

Raw Sewage Quality

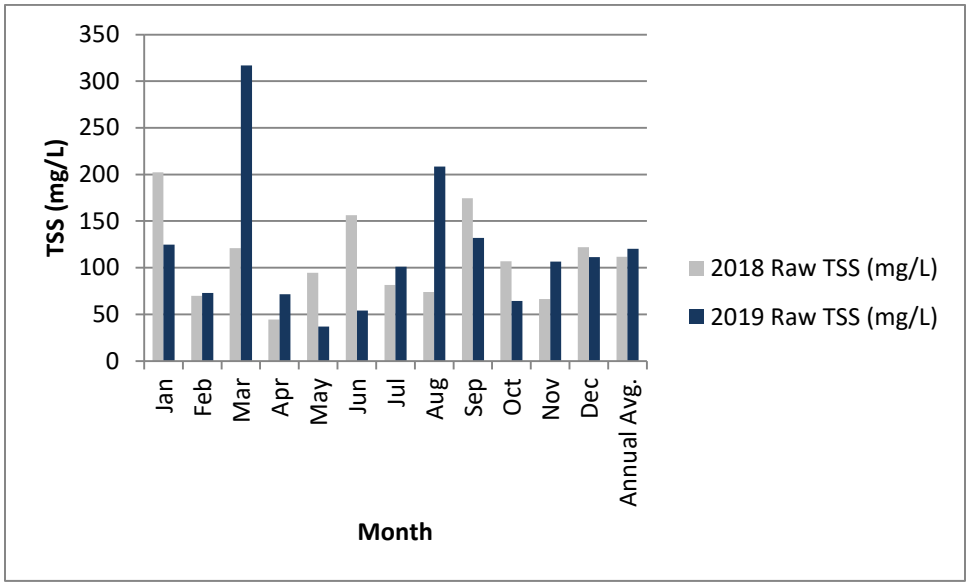
The annual average raw sewage BOD_5 concentration to the plant was 102mg/L with a maximum concentration of 277mg/L. The average concentration of BOD_5 has increased 13.5% from 2018, refer to Chart 3. The average BOD_5 loading to the plant was 49kg/d for 2019. Refer to Appendix A for detailed analytical data.

Chart 3. Raw sewage average monthly concentration of BOD_5 for 2019 compared to 2018 concentrations.



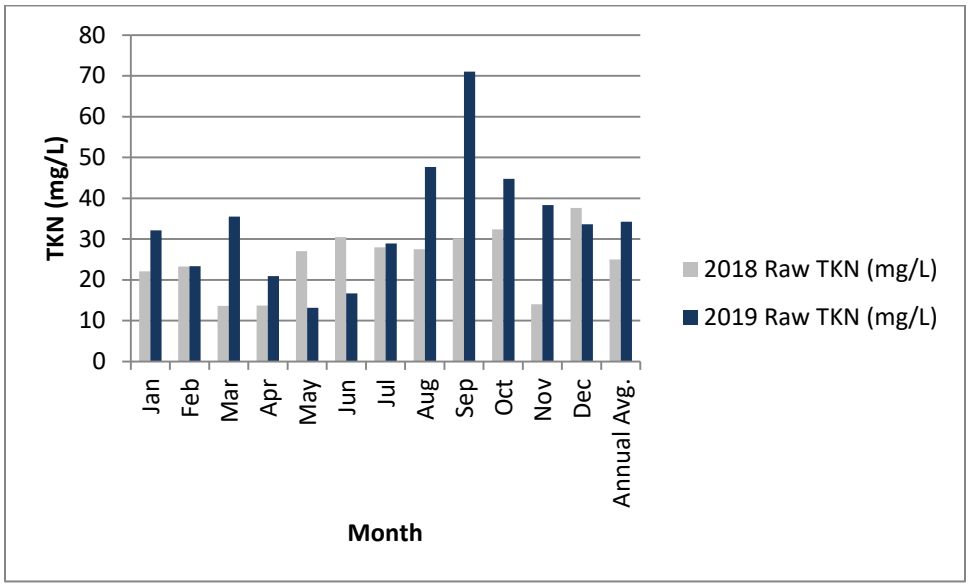
The annual average raw sewage suspended solids (TSS) concentration to the plant was 120.2mg/L, which is a 7.6% increase from 2018 (refer to Chart 4). This corresponds to an average TSS loading to the plant of 61.2kg/day. Refer to Appendix A for detailed analytical data.

Chart 4. Raw sewage average monthly concentration of TSS for 2019 compared to 2018 concentrations.



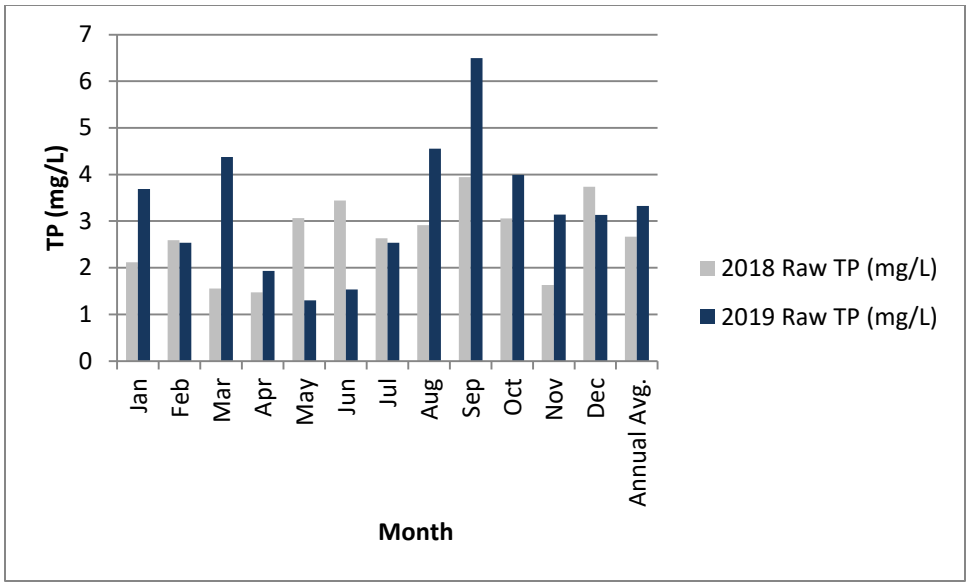
The annual average raw sewage nitrogen concentration (as represented by TKN) to the plant was 34.3mg/L with a loading of 17.5kg/d. This is an increase of 37% from the 2018 annual average concentration, refer to Chart 5. Refer to Appendix A for detailed analytical data.

Chart 5. Raw sewage average monthly concentration of TKN for 2019 compared to 2018 concentrations.



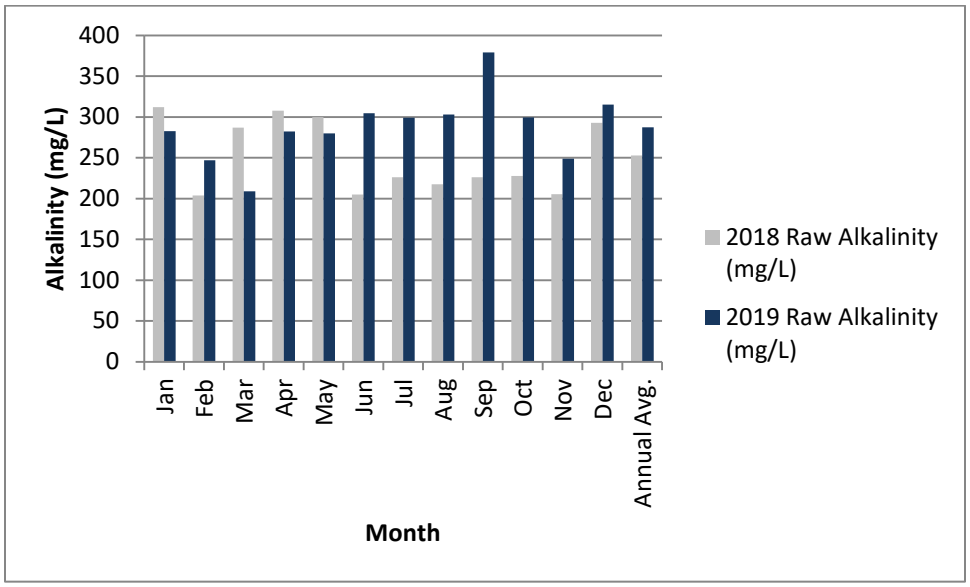
The annual average raw sewage total phosphorus (TP) to the plant was 3.33mg/L, with a loading of 1.69kg/d. This is an increase of 37% from 2018 annual average of TP, refer to Chart 6. Refer to Appendix A for detailed analytical data.

Chart 6. Raw sewage monthly average concentrations of TP for 2019 compared to 2018 concentrations.



The annual average raw sewage alkalinity to the plant was 287.5mg/L. This is an increase of 13.8% from 2018 annual average alkalinity, refer to Chart 7. Refer to Appendix A for detailed analytical data.

Chart 7. Raw sewage average monthly concentrations of alkalinity for 2019 compared to 2018 concentrations.



Section 3: Effluent Monitoring Data

Sample Collection and Testing

Final effluent is sampled bi-weekly and tested for $CBOD_5$, total suspended solids, total phosphorus, free ammonia nitrogen, total Kjeldahl nitrogen, nitrite, nitrate and alkalinity. Samples are collected using an automatic composite sampler and collected over a 24 hour

period. A grab sample of pH, temperature and dissolved oxygen is collected bi-weekly. A grab sample for E. coli is sampled bi-weekly during the disinfection period from April 15 to October 15.

In-house tests are conducted on a weekly basis on the final effluent, raw influent and the mixed liquor suspended solids at the plant to check plant performance and to make any operational changes as required.

In 2019, all chemical and microbiological sample analyses were conducted by SGS Lakefield Research. Temperature, pH and dissolved oxygen were conducted by operators at the treatment plant.

The receiving stream temperature is monitored.

Effluent Limits

Detailed analytical data is attached to this report as Appendix A. The following table provides a summary of monthly average effluent result ranges and loading ranges compared to the compliance limits in the Environmental Compliance Approval.

Summary and Comparison of Compliance Data

Table 1. Monthly average Effluent limits and monthly average loading limits compared to sample results received at the West Lorne WWTP.

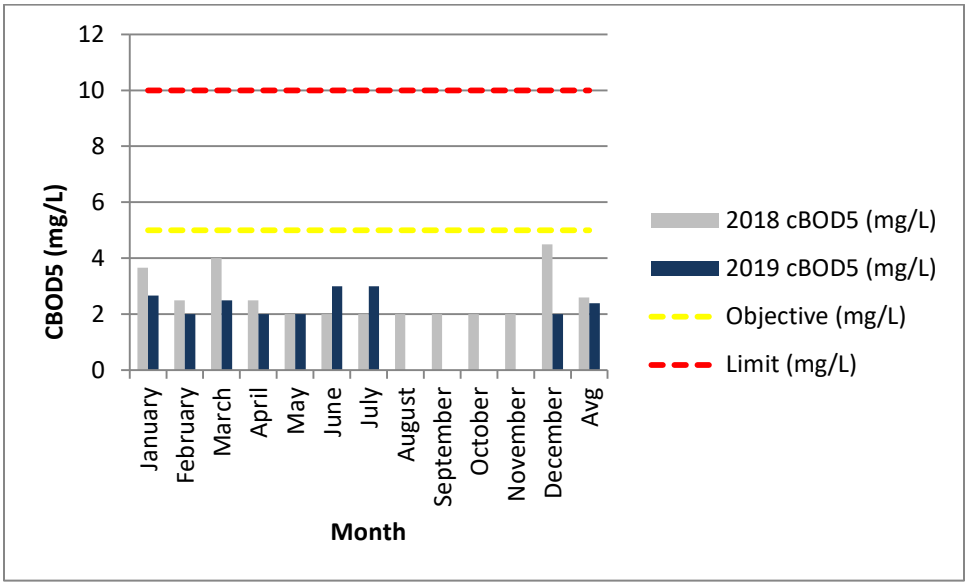
Parameter	Monthly Average Effluent Limit (mg/L)	Monthly Average Effluent Result Ranges (mg/L)	Average Monthly Loading Limit (kg/d)	Monthly Average Loading Ranges (kg/d)
$CBOD_5$	10	<2 – 4	9	0.7 – 1.7
Total Suspended Solids	10	3.5 – 9.7	9	1.6 – 6.1
Total Phosphorus	0.5	0.04 – 0.20	0.45	0.03 – 0.13
Total (Ammonia + Ammonium) Nitrogen	3.0(a)	<0.1 – 0.65	2.7(a)	0.05 – 0.32
	5.0(b)	<0.1 – 0.2	4.5(b)	0.06 – 0.08
E. coli (geomean)	200	<2 - 14		

NOTE: (a) limit applies during the non-freezing period May 1 to November 30
(b) limit applies during the freezing period December 1 to April 30

Discussion on Monitoring Data as Compared to the Effluent Limits

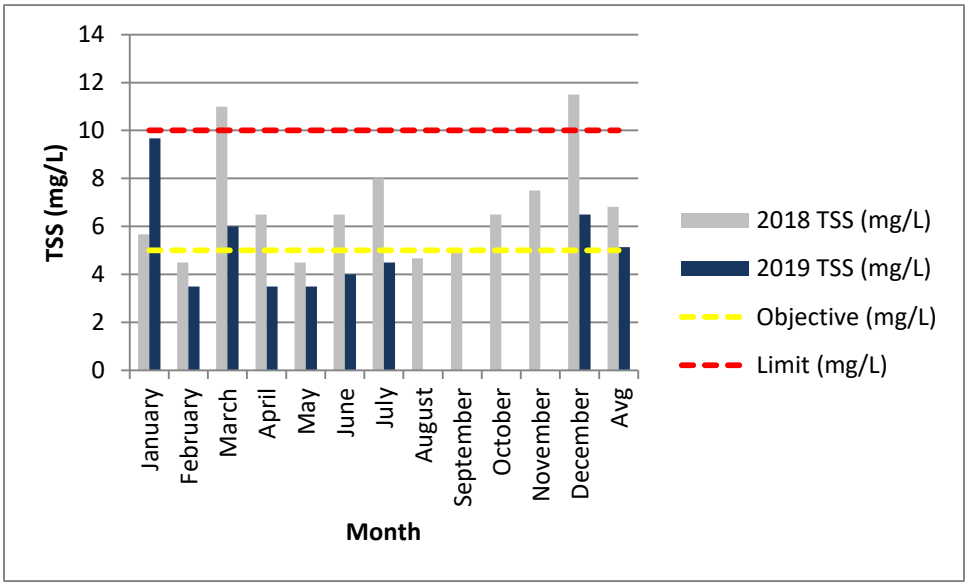
The annual average effluent $CBOD_5$ in 2019 was 2.4mg/L, which is a decrease by 8% from 2018 (refer to Chart 8). The annual loading of $CBOD_5$ was 1.59kg/d. Refer to Table 1 for a list of monthly average effluent limits and loading limits. *Upgrades began July till December; therefore there was no effluent flow.*

Chart 8. The effluent monthly average concentration of BOD_5 in 2019 compared to 2018 concentrations.



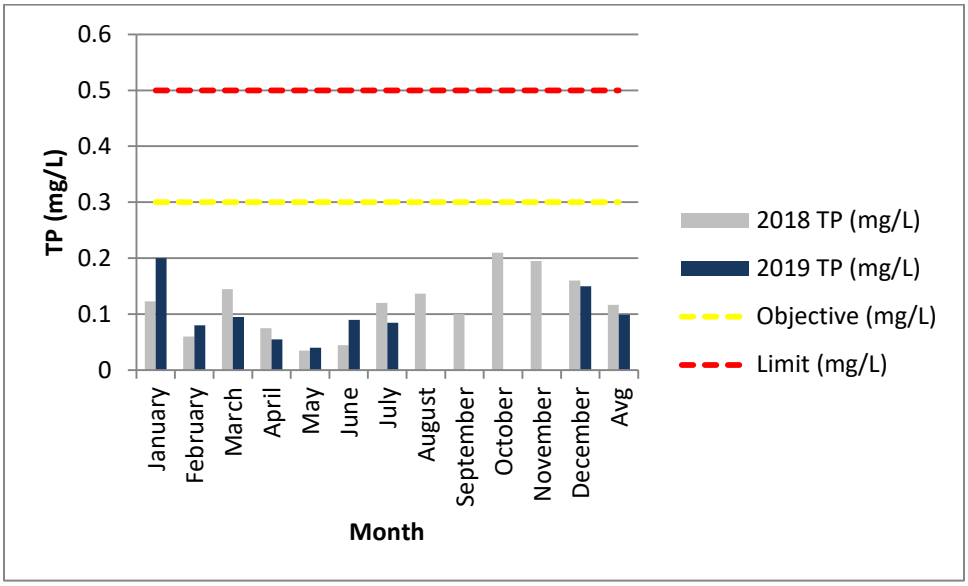
The annual average effluent Total Suspended Solids (TSS) for 2019 was 5.1mg/L, which is a 25% decrease from 2018 (refer to Chart 9). The annual loading of TSS at the plant in 2019 was 3.4kg/d. Refer to Table 1 for a list of monthly average effluent limits and loading limits. *Upgrades began July till December; therefore there was no effluent flow.*

Chart 9. The effluent monthly average concentration of TSS in 2019 compared to 2018 concentrations.



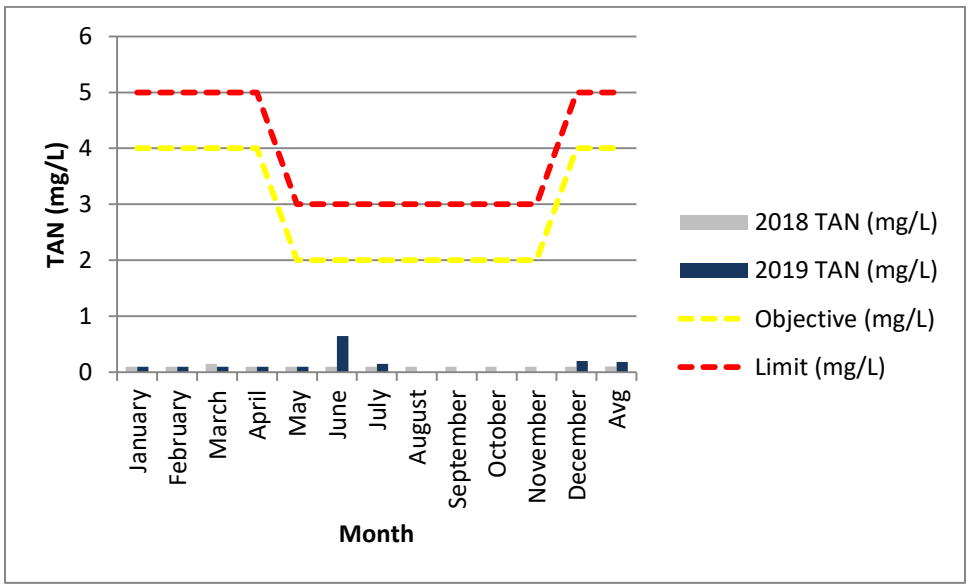
The annual average effluent Total Phosphorus (TP) for 2019 was 0.10mg/L, which is a 15% decrease from 2018 (refer to Chart 10). The annual loading of TP at the plant in 2019 was 0.07kg/d. Refer to Table 1 for a list of monthly average effluent limits and loading limits. *Upgrades began July till December; therefore there was no effluent flow.*

Chart 10. The effluent monthly average concentration of TP in 2019 compared to 2018 concentrations.



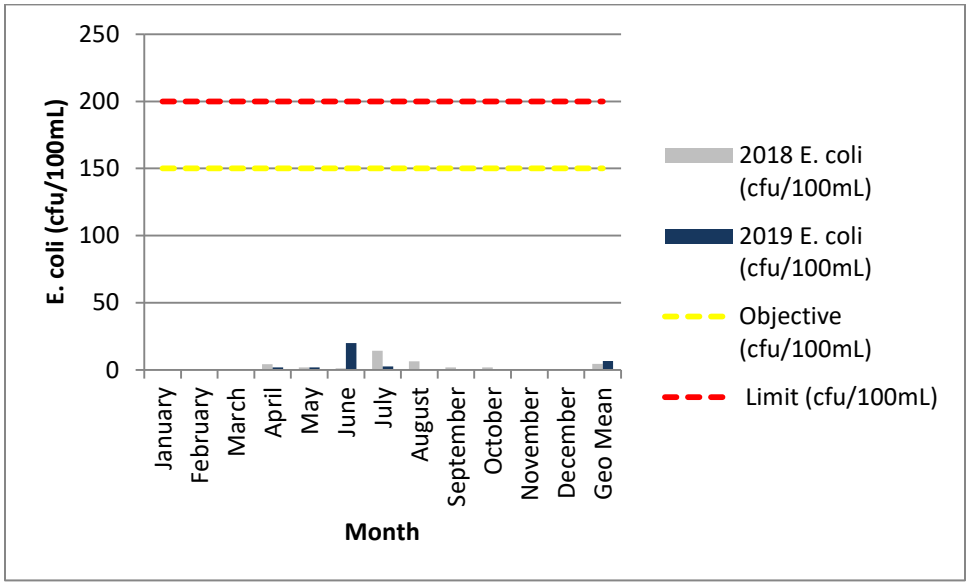
The annual average effluent Total Ammonia + Ammonium Nitrogen (TAN) for 2019 was 0.19mg/L, which is a 80% increase from 2018 (refer to Chart 11). The annual loading of TAN at the plant in 2019 was 0.12kg/d. Refer to Table 1 for a list of monthly average effluent limits and loading limits. *Upgrades began July till December; therefore there was no effluent flow.*

Chart 11. The effluent monthly average concentration of TAN in 2019 compared to 2018 concentrations.



The annual geometric mean effluent E. coli for 2019 was 6.7cfu/100mL, which is a 43% increase from 2018 (refer to Chart 12). E. coli is monitored only during the disinfection season which is from April 15th to October 15th. Refer to Table 1 for a list of monthly geometric mean effluent concentrations. *Upgrades began July till December; therefore there was no effluent flow.*

Chart 12. The effluent monthly geometric mean concentration of E. coli in 2019 compared to 2018 concentrations.



The West Lorne WWTP provides an effective treatment process complying with all the monthly average limit requirements set out in the Environmental Compliance Approval.

Effluent Objectives

The following table represents the monthly average effluent result ranges and the monthly average loading ranges compared to the objectives outlined in the Environmental Compliance Approval.

Table 2. Effluent objectives compared to monthly average concentrations and loadings.

Parameter	Effluent Objective (mg/L)	Monthly Average Effluent Ranges (mg/L)	Monthly Loading Objective (kg/day)	Monthly Average Loading Ranges (kg/d)
$CBOD_5$	5	<2 – 4	4.5	0.7 – 1.7
Total Suspended Solids	5	3.5 – 9.7	4.5	1.6 – 6.1
Total Phosphorus	0.3	0.04 – 0.20	0.27	0.03 – 0.13
Total (Ammonia + Ammonium) Nitrogen	2.0(a)	<0.1 – 0.65	1.8(a)	0.05 – 0.32
	4.0(b)	<0.1 – 0.2	3.6(b)	0.06 – 0.08
E. coli	150	<2 - 14		
Dissolved Oxygen*	5	6.20 – 9.05		
Design Flow (m^3/d)**	900	0 – 1,998		

Note: (a) objective applies during the non-freezing period May 1 to November 30
(b) objective applies during the freezing period December 1 to April 30
*Dissolved Oxygen objective is expressed as a minimum, where all other parameters are expressed as maximums.
**design flow is average daily flows, not monthly average flows.

Discussion of Effluent Objectives

The West Lorne WWTP meet all the effluent objectives identified in the ECA with the exception of total suspended solids. The monthly average concentration objective was not met in January, March and December (refer to Chart 9). The monthly average loading objective wasn't met in January. Many of these objective exceedances correlate with higher flows being received at the plant with the exception of December. Proper functioning filters would alleviate these objective exceedances. Adjustments were made to ensure compliance with the effluent limits by adjusting wasting, adjusting alum dosages and general cleaning to remove algae build up. December is when commissioning the filters began which had an increase of TSS.

The annual average flow for 2019 was 653m^3/d, which is below the design flow of 900m^3/d. However, there were 22 instances where the daily design flow was exceeded compared to 41 instances in 2018 (refer to Section 2). These were all due to infiltration into the collection system when there was snow melt and/or rain.

Section 4: Monitoring Schedule

Refer to Appendix B for the monitoring schedule for 2020. Deviations in the sampling schedule for 2019 occurred due to scheduling conflicts. All changes are documented on the sampling calendars that are signed off by the operator.

Section 5: Operating Problems and Corrective Actions

Plant upgrades began in July with all flow being diverted to the lagoon until completion in December. In 2019 there were no effluent limits reached.

Section 6: Maintenance

Regular scheduled monthly preventative maintenance is assigned and monitored using the Workplace Management System (WMS) program. Refer to Appendix C for a schedule of work orders. The following is a summary of maintenance performed other than WMS work orders:

-repairs to clarifier flight system
-repairs to bar screen
-repairs to compressor
-repairs RAS/WAS pump 106 and 107
-Plant upgrades as per ECA

Section 7: Effluent Quality Assurance

Effluent quality assurance is evaluated by monitoring parameters and changes throughout the plant processes. The operators monitor the aeration tank by performing weekly tests on the mixed liquor. These tests include dissolved oxygen, pH, temperature, settling tests, Mixed

Liquor Suspended Solids (MLSS), and Mixed Liquor Volatile Suspended Solids (MLVSS). As well, monitoring of the alum dosages, wasting volumes and Return Activated Sludge suspended solids is completed. Data collected from these tests provide information to the operator to make the appropriate adjustments in the treatment process and take corrective actions before the plant reaches its effluent limits.

Section 8: Calibration and Maintenance

Regular scheduled monthly preventative maintenance is assigned and monitored using the Workplace Management System program.

Annual maintenance on the generator was completed in May by Albert's Generator Service. Flow Metrix Technical Services Inc. performed the annual calibration on the flow meter in April, refer to Appendix C.

In house meters for pH and dissolved oxygen are calibrated by OCWA operators as per manufacturer's instructions.

Section 9: Effluent Quality

Design objectives were not met more a few months for total suspended solids. This will be alleviated by the upgrades in 2019 under the amended ECA for filters.

The influent flow is currently at 57% of the rated capacity therefore no assessment is to be made at this time.

Section 10: Sludge Generation

The lagoon is used for sludge digestion and storage as per the Environmental Compliance Approval. The waste activated sludge (WAS) is transferred to the lagoon. The sludge settles on the bottom of the lagoon and the liquid is pumped to the head of the plant for treatment. In 2019, the total amount of WAS transferred to the lagoon was approximately 2,050m^3. For 2020 this amount will be approximately 5,000m^3. Due to the upgrades flow was diverted to the lagoons. Approximately 48,000 m^3 of raw flow was also transferred to the lagoon. The lagoon has ample storage for the sludge and will not require cleanout in the coming year.

Section 11: Community Complaints

There were no community complaints received in 2019.

Section 12: Bypasses, Overflow, Spills, and Other Situations Outside Normal Operating Conditions

There were no bypasses, overflows or other situations outside normal operating conditions for the West Lorne WWTP or for the Pumping Station during 2019.

On December 16, 2019 upon arrival of the facility, plant operations observed influent wastewater flowing over the bypass channel of the bar screen and onto the parking lot area. During the installation of the new unit the flow was diverted through the bypass channel where a temporary bar screen was installed. Over the weekend the rags began to build up on the temporary bar screen not allowing flow to pass through. The blockage was removed and the spill cleaned up. This was reported to the Spills Action Centre (SAC). The new bar screen was commissioned preventing this from happening again.

Section 13: Modifications to Sewage Works

There have been no modifications to sewage works under condition 10 of the ECA.

Section 14: Bypass/Overflow Elimination

There were no bypasses or overflow events for the West Lorne Wastewater Treatment Plant in 2019. There are no projects at this time planned in the sanitary sewer system.

Section 15: Proposed Works Completion and Commissioning

There have been some significant replacements that took place in 2019, these amendments are identified as proposed works in the current ECA. The work included:
-grit and screening replacement
-rebuild 2 blowers and add third blower
-replacement of RAS/WAS pumps
-replacement of scum trough
-replacement of sand filters, addition of air compressor for filters
-replacement of backwash pumps and addition of backwash tank
-installation of effluent flow meter (2020)

Refer to Appendix E for the Substantial Completion Letter
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Section 16: Summary

Overall the West Lorne Wastewater Treatment Plant provided effective treatment in 2019.

APPENDIX A

Analytical Data

							Jan-19			Feb-19			Mar-19			Apr-19			May-19			Jun-19			Jul-19			Aug-19			Sep-19			Oct-19			Nov-19			Dec-19			Summary	Annual Loading
		Objective Concentration	Objective Loading	Limits	Loading Limits		Results	Loading		Results	Loading		Results	Loading		Results	Loading		Results	Loading		Results	Loading		Results	Loading		Results	Loading		Results	Loading		Results	Loading		Results	Loading		Results	Loading			
Raw Flow (m3/d)	Avg	900		900 (ann)			629.86			766.89			683.61			774.76			866.53			494.25			333.56			171.17			162.45			334.8			542.4			374.88			509.35	
	Max			2700			1179			1238			946			1022			1998			663			472			240.55			290.16			691.7			837.6			458.15			1998	
	Min						411			547			345			546			494			320			84.24			140.4			98			229.3			333.2			285.48			84.24	
	Sum						19525.5			21473			21191.8			23242.89			26862.3			14827			10340			5306.2			4873.4			10378			16271			11621			185913.93	
Effluent Flow (m3/d)	Avg						629.86			766.89			683.61			774.76			866.53			494.25			363.12			0			0			0			0			363.73			652.75	
	Max						1179			1238			946			1022			1998			663			472			0			0			0			0			391.25			1998	
	Min						411			547			345			546			494			320			283			0			0			0			0			336.96			0	
	Sum						19525.5			21473			21191.8			23242.89			26862.3			14827			9441			0			0			0			0			1818.7			138382.58	
Raw BOD5 (mg/L)	Avg						78.333	49.3		98.5	75.54		148	101.17		38	29.44		33.5	29.03		45	22.24		93.5	31.19		172.67	29.56		148	24.04		87	29.13		106	57.49		86.667	32.49		96.593	49.20
	Max						175			128			244			44			34			50			134			233			172			101			143			132			244	
	Min						25			69			52			32			33			40			53			64			124			73			69			28			25	
Raw SS (mg/L)	Avg						124.667	78.5		73	55.98		317	216.70		71.5	55.40		37	32.06		54	26.69		101	33.69		208.33	35.66		132	21.44		64.5	21.59		106.5	57.8		111.33	41.74		120.222	61.24
	Max						145			102			584			75			40			73			155			395			145			77			136			169			584	
	Min						86			44			50			68			34			35			47			65			119			52			77			43			34	
Raw TKN (mg/L)	Avg						32.133	20.2		23.35	17.9		35.5	24.3		20.95	16.2		13.15	11.4		16.7	8.3		28.9	9.6		47.633	8.2		71	11.5		44.75	15.0		38.35	20.8		33.6	12.6		34.274	17.5
	Max						38.2			33.3			52.4			21.9			13.3			17.3			39.1			58.7			71.5			51.3			40			47.9			71.5	
	Min						23.8			13.4			18.6			20			13			16.1			18.7			39.5			70.5			38.2			36.7			13.6			13	
Raw TP (mg/L)	Avg						3.687	2.32		2.54	1.95		4.375	2.99		1.93	1.50		1.305	1.13		1.535	0.76		2.54	0.85		4.553	0.78		6.495	1.06		3.99	1.34		3.14	1.70		3.133	1.17		3.327	1.69
	Max						5.63			3.46			7			1.94			1.31			1.56			3.45			5.6			6.7			4.39			3.27			4.3			7	
	Min						2.34			1.62			1.75			1.92			1.3			1.51			1.63			3.84			6.29			3.59			3.01			1.38			1.3	
Raw Alkalinity(mg/L)	Avg						282.4			247			209			282			280			304.5			299			303			379			299.5			249			315			287.45	
	Max						308			266			240			283			281			307			341			348			401			311			304			342			401	
	Min						254			220			178			281			279			302			257			243			357			288			194			299			194	
Effluent CBOD5 (mg/L)	Avg	5	4.5	10	9		2.667	1.7	<	2	1.5		2.5	1.7		2	1.5	<	2	1.7	<	3	1.5	<	3	1.1			0.0			0.0			0.0			0.0	<	2	0.7	<	2.438	1.59
	Max						3		<	2			3			2		<	2			4			4							0.0			0.0			0.0	<	2			4	
	Min						2		<	2			2			2		<	2		<	2		<	2							0.0			0.0			0.0	<	2		<	2	
Effluent TSS (mg/L)	Avg	5	4.5	10	9		9.667	6.1	<	3.5	2.7		6	4.1		3.5	2.7		3.5	3.0		4	2.0	<	4.5	1.6			0.0			0.0			0.0			0.0			6.5	2.4	<	5.146	3.36
	Max						11			5			6			4			4			4			7							0.0			0.0			0.0			14			14	
	Min						9		<	2			6			3			3			4		<	2							0.0			0.0			0.0	<	2		<	2	
Effluent TAN (mg/L)	Avg	2 (4)	1.8 (3.6)	3 (5)	2.7 (4.5)	<	0.1	0.06	<	0.1	0.08	<	0.1	0.07	<	0.1	0.08	<	0.1	0.09	<	0.65	0.32	<	0.15	0.05			0.00			0.00			0.00			0.00			0.2	0.07	<	0.181	0.12
	Max					<	0.1		<	0.1		<	0.1		<	0.1		<	0.1			1.2			0.15							0.00			0.00			0.00			0.2			0.2	
	Min					<	0.1		<	0.1		<	0.1		<	0.1		<	0.1		<	0.1		<	0.1							0.00			0.00			0.00			0.2		<	0.1	
Effluent TKN (mg/L)	Avg					<	0.8		<	1.25		<	0.95		<	0.5		<	0.7			1.4			2.25																1.5		<	1.125	
	Max						1			2			1.4		<	0.5			0.9			1.7			2.7																1.5			2.7	
	Min					<	0.5		<	0.5		<	0.5		<	0.5		<	0.5			1.1			1.8																1.5		<	0.5	
Effluent NO2 (mg/L)	Avg					<	0.03		<	0.03		<	1.215			2.965		<	0.03		<	0.955		<	0.235																0.04		<	0.687	
	Max					<	0.03		<	0.03			2.4			4.59		<	0.03			1.88			0.44																0.04			4.59	
	Min					<	0.03		<	0.03		<	0.03			1.34		<	0.03		<	0.03		<	0.03																0.04		<	0.03	
Effluent NO3 (mg/L)	Avg						20			12.98			14			10.625			13.45			14.35			20.3																25.6			16.063	
	Max						22.3			17.6			15.1			13.2			16.2			16.2			20.5																25.6			25.6	
	Min						17.6			8.36			12.9			8.05			10.7			12.5			20.1																25.6			8.05	
Effluent TP (mg/L)	Avg	0.3	0.27	0.5	0.45		0.2	0.13		0.08	0.06		0.095	0.06		0.055	0.04		0.04	0.03		0.09	0.04	<	0.085	0.03			0.00			0.00			0.00			0.00			0.15	0.05	<	0.103	0.07
	Max						0.23			0.12			0.1			0.06			0.04			0.12			0.14																0.15			0.23	
	Min						0.15			0.04			0.09			0.05			0.04			0.06		<	0.03																0.15		<	0.03	
Effluent pH	Avg						7.596			7.566			7.223			7.088			7.251			7.52			7.393																7.02			7.356	
	Max						7.73			7.75			7.52			7.43			7.43			7.81			7.78																7.1			7.81	
	Min						7.5			7.26			6.73			6.75			7.06			7.41			7.2																6.94			6.73	
Effluent Alkalinity (mg/L)	Avg						114.8			116			75			137			118			114			64																83			137	
	Max						144			98			100			113			100.5			102			55																83			91.556	
	Min						70			84			60			89			83			90			46																83			46	
Effluent E. coli (cfu/100	Geomean	150		200												2			2			20			2.828																			6.7	
	Max														<	2		<	2			50			4																			50	
	Min														<	2		<	2			8		<	2																		<	2	
Effluent Temp. (oC)	Avg						8.663			7.525			7.211			10.378			15.611			17.05			21.705																9.05			12.401	
	Max						10.3			10.6			9.4			12.6			31.1			19.1			23.1																9.8			31.1	
	Min						6.8			5.5			5.6			8.6			11.5			14.4			19																8.3			5.5	
Effluent DO (mg/L)	Avg						9.551			9.978			9.809			9.581			9.273			8.268			7.141																8.915			9.103	
	Max						10.08			11.11			10.4			10.12			10.56			9.17			8.21																9.28			11.11	
	Min	5					8.81			8.93			9.05			8.77			8.39			7.28			6.2																8.55			6.2	

APPENDIX B

Monitoring Schedule

QEMS Ontario Clean Water Agency	Sample Schedule 2020 5526 West Lorne WWTP	Issued: 2019-12-18 Rev.#: 0 Pages: 1 of 12
Reviewed by: QEMS Representative	Approved by: Operations Management	

January 2020

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
			1 STAT	2	3 IH Reduced	4
5	6 IH Reduced	7	8 IH Full	9	10 IH Reduced	11
12	13 IH Reduced	14	15 IH Full Raw & Effluent Samples	16	17 IH Reduced	18
19	20 IH Reduced	21	22 IH Full	23	24 IH Reduced	25
26	27 IH Reduced	28	29 IH Full Raw & Effluent Samples	30	31 IH Reduced	

IH (In House) Full: Raw 24hr Composite (pH, Alk)
Aeration (Set Test, MLSS, MLVSS, DO, pH, Temp.)
RAS (SS)
Lagoon Decant (TP, NH3+NH4, pH, DO)
Effluent 24hr Composite (pH, TP, NH3+NH4, Alk, SS); Grab (DO, Temp.)
Receiving Stream (pH, Temp.)

IH (In House) Reduced: Aeration (Set Test, DO, pH, Temp.)
Effluent (DO, pH, Temp., TP, NH3+NH4)

Raw Samples: 24hr Composite (BOD5, SS, TP, TKN)

Effluent Samples: 24hr Composite (cBOD5, SS, NH3+NH4, TKN, NO3, NO2, TP, Alkalinity, pH)
Grab (E. coli—Apr 15 to Oct 15, DO, Temp.)

Notes: Initial on date when sample was taken. Add any additional sampling completed for the facility. At the end of the month hand in to the PCT with folder.

Revision History

Date	Revision #	Reason for Revision	Revision By
2019-12-18	*0*	*Create Schedule*	*Terri-Lynn Thomson*

QEMS Ontario Clean Water Agency	Sample Schedule 2020 5526 West Lorne WWTP	Issued: 2019-12-18 Rev.#: 0 Pages: 2 of 12
Reviewed by: QEMS Representative	Approved by: Operations Management	

February 2020

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
						1
2	3 IH Reduced	4	5 IH Full	6	7 IH Reduced	8
9	10 IH Reduced	11	12 IH Full Raw & Effluent Samples	13	14 IH Reduced	15
16	17 STAT	18	19 IH Full	20	21 IH Reduced	22
23	24 IH Reduced	25	26 IH Full Raw & Effluent Samples	27	28 IH Reduced	29

IH (In House) Full: Raw 24hr Composite (pH, Alk)
Aeration (Set Test, MLSS, MLVSS, DO, pH, Temp.)
RAS (SS)
Lagoon Decant (TP, NH3+NH4, pH, DO)
Effluent 24hr Composite (pH, TP, NH3+NH4, Alk, SS); Grab (DO, Temp.)
Receiving Stream (pH, Temp.)

IH (In House) Reduced: Aeration (Set Test, DO, pH, Temp.)
Effluent (DO, pH, Temp., TP, NH3+NH4)

Raw Samples: 24hr Composite (BOD5, SS, TP, TKN)

Effluent Samples: 24hr Composite (cBOD5, SS, NH3+NH4, TKN, NO3, NO2, TP, Alkalinity, pH)
Grab (E. coli—Apr 15 to Oct 15, DO, Temp.)

Notes: Initial on date when sample was taken. Add any additional sampling completed for the facility. At the end of the month hand in to the PCT with folder.

Revision History

Date	Revision #	Reason for Revision	Revision By
2019-12-18	*0*	*Create Schedule*	*Terri-Lynn Thomson*

QEMS Ontario Clean Water Agency	Sample Schedule 2020 5526 West Lorne WWTP	Issued: 2019-12-18 Rev.#: 0 Pages: 3 of 12
Reviewed by: QEMS Representative	Approved by: Operations Management	

March 2020

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1	2 IH Reduced	3	4 IH Full	5	6 IH Reduced	7
8	9 IH Reduced	10	11 IH Full Raw & Effluent Samples	12	13 IH Reduced	14
15	16 IH Reduced	17	18 IH Full Annual H&S Walkthrough	19	20 IH Reduced	21
22	23 IH Reduced	24	25 IH Full Raw & Effluent Samples	26	27 IH Reduced	28
29	30 IH Reduced	31				

IH (In House) Full: Raw 24hr Composite (pH, Alk)
Aeration (Set Test, MLSS, MLVSS, DO, pH, Temp.)
RAS (SS)
Lagoon Decant (TP, NH3+NH4, pH, DO)
Effluent 24hr Composite (pH, TP, NH3+NH4, Alk, SS); Grab (DO, Temp.)
Receiving Stream (pH, Temp.)

IH (In House) Reduced: Aeration (Set Test, DO, pH, Temp.)
Effluent (DO, pH, Temp., TP, NH3+NH4)

Raw Samples: 24hr Composite (BOD5, SS, TP, TKN)

Effluent Samples: 24hr Composite (cBOD5, SS, NH3+NH4, TKN, NO3, NO2, TP, Alkalinity, pH)
Grab (E. coli—Apr 15 to Oct 15, DO, Temp.)

Notes: Initial on date when sample was taken. Add any additional sampling completed for the facility. At the end of the month hand in to the PCT with folder.

Revision History

Date	Revision #	Reason for Revision	Revision By
2019-12-18	*0*	*Create Schedule*	*Terri-Lynn Thomson*

QEMS Ontario Clean Water Agency	Sample Schedule 2020 5526 West Lorne WWTP	Issued: 2019-12-18 Rev.#: 0 Pages: 4 of 12
Reviewed by: QEMS Representative	Approved by: Operations Management	

April 2020

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
			1 IH Full	2	3 IH Reduced	4
5	6	7 IH Full Raw & Effluent Samples	8	9 IH Reduced	10 STAT	11
12	13 STAT	14	15 IH Full	16	17 IH Reduced	18
19	20 IH Reduced	21	22 IH Full Raw & Effluent Samples	23	24 IH Reduced	25
26	27 IH Reduced	28	29 IH Full	30		

IH (In House) Full: Raw 24hr Composite (pH, Alk)
Aeration (Set Test, MLSS, MLVSS, DO, pH, Temp.)
RAS (SS)
Lagoon Decant (TP, NH3+NH4, pH, DO)
Effluent 24hr Composite (pH, TP, NH3+NH4, Alk, SS); Grab (DO, Temp.)
Receiving Stream (pH, Temp.)

IH (In House) Reduced: Aeration (Set Test, DO, pH, Temp.)
Effluent (DO, pH, Temp., TP, NH3+NH4)

Raw Samples: 24hr Composite (BOD5, SS, TP, TKN)

Effluent Samples: 24hr Composite (cBOD5, SS, NH3+NH4, TKN, NO3, NO2, TP, Alkalinity, pH)
Grab (E. coli—Apr 15 to Oct 15, DO, Temp.)

Notes: Initial on date when sample was taken. Add any additional sampling completed for the facility. At the end of the month hand in to the PCT with folder.

Revision History

Date	Revision #	Reason for Revision	Revision By
2019-12-18	*0*	*Create Schedule*	*Terri-Lynn Thomson*

QEMS Ontario Clean Water Agency	Sample Schedule 2020 5526 West Lorne WWTP	Issued: 2019-12-18 Rev.#: 0 Pages: 5 of 12
Reviewed by: QEMS Representative	Approved by: Operations Management	

May 2020

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
					1 IH Reduced	2
3	4 IH Reduced	5	6 IH Full Raw & Effluent Samples	7	8 IH Reduced	9
10	11 IH Reduced	12	13 IH Full	14	15 IH Reduced	16
17	18 STAT	19	20 IH Full Raw & Effluent Samples	21	22 IH Reduced	23
24	25 IH Reduced	26	27 IH Full	28	29 IH Reduced	30
31						

IH (In House) Full: Raw 24hr Composite (pH, Alk)
Aeration (Set Test, MLSS, MLVSS, DO, pH, Temp.)
RAS (SS)
Lagoon Decant (TP, NH3+NH4, pH, DO)
Effluent 24hr Composite (pH, TP, NH3+NH4, Alk, SS); Grab (DO, Temp.)
Receiving Stream (pH, Temp.)

IH (In House) Reduced: Aeration (Set Test, DO, pH, Temp.)
Effluent (DO, pH, Temp., TP, NH3+NH4)

Raw Samples: 24hr Composite (BOD5, SS, TP, TKN)

Effluent Samples: 24hr Composite (cBOD5, SS, NH3+NH4, TKN, NO3, NO2, TP, Alkalinity, pH)
Grab (E. coli—Apr 15 to Oct 15, DO, Temp.)

Notes: Initial on date when sample was taken. Add any additional sampling completed for the facility. At the end of the month hand in to the PCT with folder.

Revision History

Date	Revision #	Reason for Revision	Revision By
2019-12-18	*0*	*Create Schedule*	*Terri-Lynn Thomson*

QEMS Ontario Clean Water Agency	Sample Schedule 2020 5526 West Lorne WWTP	Issued: 2019-12-18 Rev.#: 0 Pages: 6 of 12
Reviewed by: QEMS Representative	Approved by: Operations Management	

June 2020

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	1 IH Reduced	2	3 IH Full Raw & Effluent Samples	4	5 IH Reduced	6
7	8 IH Reduced	9	10 IH Full	11	12 IH Reduced	13
14	15 IH Reduced	16	17 IH Full Raw & Effluent Samples	18	19 IH Reduced	20
21	22 IH Reduced	23	24 IH Full	25	26 IH Reduced	27
28	29 IH Full Raw & Effluent Samples	30				

IH (In House) Full: Raw 24hr Composite (pH, Alk)
Aeration (Set Test, MLSS, MLVSS, DO, pH, Temp.)
RAS (SS)
Lagoon Decant (TP, NH3+NH4, pH, DO)
Effluent 24hr Composite (pH, TP, NH3+NH4, Alk, SS); Grab (DO, Temp.)
Receiving Stream (pH, Temp.)

IH (In House) Reduced: Aeration (Set Test, DO, pH, Temp.)
Effluent (DO, pH, Temp., TP, NH3+NH4)

Raw Samples: 24hr Composite (BOD5, SS, TP, TKN)

Effluent Samples: 24hr Composite (cBOD5, SS, NH3+NH4, TKN, NO3, NO2, TP, Alkalinity, pH)
Grab (E. coli—Apr 15 to Oct 15, DO, Temp.)

Notes: Initial on date when sample was taken. Add any additional sampling completed for the facility. At the end of the month hand in to the PCT with folder.

Revision History

Date	Revision #	Reason for Revision	Revision By
2019-12-18	*0*	*Create Schedule*	*Terri-Lynn Thomson*

QEMS Ontario Clean Water Agency	Sample Schedule 2020 5526 West Lorne WWTP	Issued: 2019-12-18 Rev.#: 0 Pages: 7 of 12
Reviewed by: QEMS Representative	Approved by: Operations Management	

July 2020

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
			1 STAT	2	3 IH Reduced	4
5	6 IH Reduced	7	8 IH Full	9	10 IH Reduced	11
12	13 IH Reduced	14	15 IH Full Raw & Effluent Samples	16	17 IH Reduced	18
19	20 IH Reduced	21	22 IH Full	23	24 IH Reduced	25
26	27 IH Reduced	28	29 IH Full Raw & Effluent Samples	30	31 IH Reduced	

IH (In House) Full: Raw 24hr Composite (pH, Alk)
Aeration (Set Test, MLSS, MLVSS, DO, pH, Temp.)
RAS (SS)
Lagoon Decant (TP, NH3+NH4, pH, DO)
Effluent 24hr Composite (pH, TP, NH3+NH4, Alk, SS); Grab (DO, Temp.)
Receiving Stream (pH, Temp.)

IH (In House) Reduced: Aeration (Set Test, DO, pH, Temp.)
Effluent (DO, pH, Temp., TP, NH3+NH4)

Raw Samples: 24hr Composite (BOD5, SS, TP, TKN)

Effluent Samples: 24hr Composite (cBOD5, SS, NH3+NH4, TKN, NO3, NO2, TP, Alkalinity, pH)
Grab (E. coli—Apr 15 to Oct 15, DO, Temp.)

Notes: Initial on date when sample was taken. Add any additional sampling completed for the facility. At the end of the month hand in to the PCT with folder.

Revision History

Date	Revision #	Reason for Revision	Revision By
2019-12-18	*0*	*Create Schedule*	*Terri-Lynn Thomson*

QEMS Ontario Clean Water Agency	Sample Schedule 2020 5526 West Lorne WWTP	Issued: 2019-12-18 Rev.#: 0 Pages: 8 of 12
Reviewed by: QEMS Representative	Approved by: Operations Management	

August 2020

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
						1
2	3 STAT	4	5 IH Full	6	7 IH Reduced	8
9	10 IH Reduced	11	12 IH Full Raw & Effluent Samples	13	14 IH Reduced	15
16	17 IH Reduced	18	19 IH Full	20	21 IH Reduced	22
23	24 IH Reduced	25	26 IH Full Raw & Effluent Samples	27	28 IH Reduced	29
30	31 IH Reduced					

IH (In House) Full: Raw 24hr Composite (pH, Alk)
Aeration (Set Test, MLSS, MLVSS, DO, pH, Temp.)
RAS (SS)
Lagoon Decant (TP, NH3+NH4, pH, DO)
Effluent 24hr Composite (pH, TP, NH3+NH4, Alk, SS); Grab (DO, Temp.)
Receiving Stream (pH, Temp.)

IH (In House) Reduced: Aeration (Set Test, DO, pH, Temp.)
Effluent (DO, pH, Temp., TP, NH3+NH4)

Raw Samples: 24hr Composite (BOD5, SS, TP, TKN)

Effluent Samples: 24hr Composite (cBOD5, SS, NH3+NH4, TKN, NO3, NO2, TP, Alkalinity, pH)
Grab (E. coli—Apr 15 to Oct 15, DO, Temp.)

Notes: Initial on date when sample was taken. Add any additional sampling completed for the facility. At the end of the month hand in to the PCT with folder.

Revision History

Date	Revision #	Reason for Revision	Revision By
2019-12-18	*0*	*Create Schedule*	*Terri-Lynn Thomson*

QEMS Ontario Clean Water Agency	Sample Schedule 2020 5526 West Lorne WWTP	Issued: 2019-12-18 Rev.#: 0 Pages: 9 of 12
Reviewed by: QEMS Representative	Approved by: Operations Management	

September 2020

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		1	2 IH Full	3	4 IH Reduced	5
6	7 STAT	8	9 IH Full Raw & Effluent Samples	10	11 IH Reduced	12
13	14 IH Reduced	15	16 IH Full	17	18 IH Reduced	19
20	21 IH Reduced	22	23 IH Full Raw & Effluent Samples	24	25 IH Reduced	26
27	28 IH Reduced	29	30 IH Full			

IH (In House) Full: Raw 24hr Composite (pH, Alk)
Aeration (Set Test, MLSS, MLVSS, DO, pH, Temp.)
RAS (SS)
Lagoon Decant (TP, NH3+NH4, pH, DO)
Effluent 24hr Composite (pH, TP, NH3+NH4, Alk, SS); Grab (DO, Temp.)
Receiving Stream (pH, Temp.)

IH (In House) Reduced: Aeration (Set Test, DO, pH, Temp.)
Effluent (DO, pH, Temp., TP, NH3+NH4)

Raw Samples: 24hr Composite (BOD5, SS, TP, TKN)

Effluent Samples: 24hr Composite (cBOD5, SS, NH3+NH4, TKN, NO3, NO2, TP, Alkalinity, pH)
Grab (E. coli—Apr 15 to Oct 15, DO, Temp.)

Notes: Initial on date when sample was taken. Add any additional sampling completed for the facility. At the end of the month hand in to the PCT with folder.

Revision History

Date	Revision #	Reason for Revision	Revision By
2019-12-18	*0*	*Create Schedule*	*Terri-Lynn Thomson*

QEMS Ontario Clean Water Agency	Sample Schedule 2020 5526 West Lorne WWTP	Issued: 2019-12-18 Rev.#: 0 Pages: 10 of 12
Reviewed by: QEMS Representative	Approved by: Operations Management	

October 2020

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
				1	2 IH Reduced	3
4	5 IH Reduced	6	7 IH Full Raw & Effluent Samples	8	9 IH Reduced	10
11	12 STAT	13	14 IH Full	15	16 IH Reduced	17
18	19 IH Reduced	20	21 IH Full Raw & Effluent Samples	22	23 IH Reduced	24
25	26 IH Reduced	27	28 IH Full	29	30 IH Reduced	31

IH (In House) Full: Raw 24hr Composite (pH, Alk)
Aeration (Set Test, MLSS, MLVSS, DO, pH, Temp.)
RAS (SS)
Lagoon Decant (TP, NH3+NH4, pH, DO)
Effluent 24hr Composite (pH, TP, NH3+NH4, Alk, SS); Grab (DO, Temp.)
Receiving Stream (pH, Temp.)

IH (In House) Reduced: Aeration (Set Test, DO, pH, Temp.)
Effluent (DO, pH, Temp., TP, NH3+NH4)

Raw Samples: 24hr Composite (BOD5, SS, TP, TKN)

Effluent Samples: 24hr Composite (cBOD5, SS, NH3+NH4, TKN, NO3, NO2, TP, Alkalinity, pH)
Grab (E. coli—Apr 15 to Oct 15, DO, Temp.)

Notes: Initial on date when sample was taken. Add any additional sampling completed for the facility. At the end of the month hand in to the PCT with folder.

Revision History

Date	Revision #	Reason for Revision	Revision By
2019-12-18	*0*	*Create Schedule*	*Terri-Lynn Thomson*

QEMS Ontario Clean Water Agency	Sample Schedule 2020 5526 West Lorne WWTP	Issued: 2019-12-18 Rev.#: 0 Pages: 11 of 12
Reviewed by: QEMS Representative	Approved by: Operations Management	

November 2020

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1	2 IH Reduced	3	4 IH Full Raw & Effluent Samples	5	6 IH Reduced	7
8	9	10 IH Full	11 STAT	12	13 IH Reduced	14
15	16 IH Reduced	17	18 IH Full Raw & Effluent Samples	19	20 IH Reduced	21
22	23 IH Reduced	24	25 IH Full	26	27 IH Reduced	28
29	30 IH Reduced					

IH (In House) Full: Raw 24hr Composite (pH, Alk)
Aeration (Set Test, MLSS, MLVSS, DO, pH, Temp.)
RAS (SS)
Lagoon Decant (TP, NH3+NH4, pH, DO)
Effluent 24hr Composite (pH, TP, NH3+NH4, Alk, SS); Grab (DO, Temp.)
Receiving Stream (pH, Temp.)

IH (In House) Reduced: Aeration (Set Test, DO, pH, Temp.)
Effluent (DO, pH, Temp., TP, NH3+NH4)

Raw Samples: 24hr Composite (BOD5, SS, TP, TKN)

Effluent Samples: 24hr Composite (cBOD5, SS, NH3+NH4, TKN, NO3, NO2, TP, Alkalinity, pH)
Grab (E. coli—Apr 15 to Oct 15, DO, Temp.)

Notes: Initial on date when sample was taken. Add any additional sampling completed for the facility. At the end of the month hand in to the PCT with folder.

Revision History

Date	Revision #	Reason for Revision	Revision By
2019-12-18	*0*	*Create Schedule*	*Terri-Lynn Thomson*

QEMS Ontario Clean Water Agency	Sample Schedule 2020 5526 West Lorne WWTP	Issued: 2019-12-18 Rev.#: 0 Pages: 12 of 12
Reviewed by: QEMS Representative	Approved by: Operations Management	

December 2020

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		1	2 IH Full Raw & Effluent Samples	3	4 IH Reduced	5
6	7 IH Reduced	8	9 IH Full	10	11 IH Reduced	12
13	14 IH Reduced	15	16 IH Full Raw & Effluent Samples	17	18 IH Reduced	19
20	21 IH Reduced	22	23 IH Full	24	25 STAT	26
27	28 STAT	29 IH Full Raw & Effluent Samples	30	31 IH Reduced		

IH (In House) Full: Raw 24hr Composite (pH, Alk)
Aeration (Set Test, MLSS, MLVSS, DO, pH, Temp.)
RAS (SS)
Lagoon Decant (TP, NH3+NH4, pH, DO)
Effluent 24hr Composite (pH, TP, NH3+NH4, Alk, SS); Grab (DO, Temp.)
Receiving Stream (pH, Temp.)

IH (In House) Reduced: Aeration (Set Test, DO, pH, Temp.)
Effluent (DO, pH, Temp., TP, NH3+NH4)

Raw Samples: 24hr Composite (BOD5, SS, TP, TKN)

Effluent Samples: 24hr Composite (cBOD5, SS, NH3+NH4, TKN, NO3, NO2, TP, Alkalinity, pH)
Grab (E. coli—Apr 15 to Oct 15, DO, Temp.)

Notes: Initial on date when sample was taken. Add any additional sampling completed for the facility. At the end of the month hand in to the PCT with folder.

Revision History

Date	Revision #	Reason for Revision	Revision By
2019-12-18	*0*	*Create Schedule*	*Terri-Lynn Thomson*

APPENDIX C

Flow Meter Verification

F+P (ABB) Mag-meter
Verification Report

FLOWMETRIX

AS FOUND CERTIFICATION

FORWARD FLOW DIRECTION

PASS

CLIENT DETAIL

CUSTOMER	OCWA - Tri-County Water Board
CONTACT	Cindy Sigurdson
	Compliance Manager
	9210 Graham Road, West Lorne
	c: 226-377-3563
	e: csigurdson@ocwa.com

VER. BY - FM Brendon Jacksic

Quality Management Standards Information - Reference equipment and instrumentation used to conduct this verification test is found in our AC-QMS document at the time this test was conducted.

EQUIPMENT DETAIL

[MUT] MANUFACTURER		Fisher & Porter
MODEL		50XM1000
CONVERTER SERIAL NUMBER		9409B2039/6/B2
FUSE		Pull Plug on Unit
PLANT ID		West Lorne WWTP
METER ID		Influent Raw Meter
FIT ID		n/a
CLIENT TAG		OCWA# 123540
OTHER		ORG# 5526
GPS COORDINATES	N42 35.162	W081 35.77
VERIFICATION DATE		April 18, 2019
CAL. FREQUENCY		Annual
CAL. DUE DATE		April, 2020

PROGRAMMING PARAMETERS

DIAMETER (DN)	mm	200
F.S. FLOW - MAG	M3/H	1097.0
F.S. RANGE - O/P	M3/H	144.0

FORWARD TOTALIZER INFORMATION

AS FOUND	2159996	M3
AS LEFT	2160021	M3
DIFFERENCE	25	M3

TEST CRITERIA

AS FOUND CERTIFICATION TEST	Yes
FORWARD FLOW DIRECTION	Yes
ALLOWABLE [%] ERROR	5

COMPONENTS TESTED

CONVERTER DISPLAY	Yes
mA OUTPUT	Yes
TOTALIZER	Yes
ACCURACY BASED ON [% o.r.]	Yes

ERROR DOCUMENTED IN THIS REPORT; BASED ON % o.r.

FLOW TUBE SIMULATION

				0.00	0.33	0.66	0.98	1.31	% Dial (m/s)
				0.00	3.28	6.56	9.85	13.13	% F.S. Flow
				0.0	25.0	50.0	75.0	100.0	% F.S. Range
REF. FLOW RATE				0.000	36.000	72.000	108.000	144.000	M3/H
MUT [Reading]				0.000	35.580	71.380	107.100	142.000	M3/H
MUT [Difference]				0.000	-0.420	-0.620	-0.900	-2.000	M3/H
MUT [% Error]				n/a	-1.17	-0.86	-0.83	-1.39	%
mA OUTPUT				**4.000**	**8.000**	**12.000**	**16.000**	**20.000**	mA
MUT [Reading]	min.	4.000	mA	3.998	7.933	11.902	15.897	19.753	mA
MUT [Difference]	max.	20.000	mA	-0.002	-0.067	-0.098	-0.103	-0.247	mA
MUT [% Error]				-0.05	-0.84	-0.82	-0.64	-1.24	%
TOTALIZER - REF. FLOW RATE								**144.000**	M3/H
TOTALIZER [MUT]								5	M3
TEST TIME								126.81	SECONDS
CALC. TOTALIZER								5.072	M3
ERROR								-1.45	%

COMMENTS

QUALITY MANAGEMENT STANDARDS INFO.

[QMS] INFORMATION	IDENT.	ID #
[REFERENCE] FTS	ABBMM	1
PROCESS METER	DMM	11
ANALOG METER	AM	N/A
STOP WATCH	SW	Yes

RESULTS

TEST	AVG % o.r.	PASS FAIL
DISPLAY	-1.06	PASS
mA OUTPUT	-0.72	PASS
TOTALIZER	-1.45	PASS

This report reflects the test results of the overall accuracy for the above flow converter using the specified manufacturers flow tube simulator to within the specified tolerance as identified within this report.

APPENDIX D

Work Order Schedule

Workorder Summary Report

Report Start Date: Jan 1, 2019 12:00 AM

Report End Date: Dec 31, 2019 11:59 PM

Location: 5526-SPP1,5526-WWWL

Work Order Type: CAP,CORR,EMER,OPER,PM

Work Order Class:

				WorkOrder		PM Schedule		Workorder Details				
WO #	Asset ID	Asset Description	Location Description	Type	Class	FEQ	Units	Work Order Description	Status	Schedule Start	Actual Start	Actual Finsh
1400013			5526, West Lorne WW TP	PM	Health and	1	MONTHS	OHSA Inspection West Lorne (1m)	CLOSE	9/1/19 12:00 AM	10/1/19 08:12 AM	10/1/19 08:12 AM
1320569			5526, West Lorne WW TP	PM	Health and	1	MONTHS	OHSA Inspection West Lorne (1m)	CLOSE	7/1/19 12:00 AM	7/17/19 08:21 AM	7/17/19 08:21 AM
1360257			5526, West Lorne WW TP	PM	Health and Safety	1	MONTHS	OHSA Inspection West Lorne (1m) - 5526	CLOSE	8/1/19 12:00 AM	9/11/19 08:34 AM	9/11/19 08:34 AM
1279002			5526, West Lorne WW TP	PM	Health and	1	MONTHS	OHSA Inspection West Lorne (1m)	CLOSE	6/1/19 12:00 AM	6/19/19 07:38 AM	6/19/19 07:38 AM
1239891			5526, West Lorne WW TP	PM	Health and	1	MONTHS	OHSA Inspection West Lorne (1m)	CLOSE	5/1/19 12:00 AM	5/23/19 07:42 AM	5/23/19 07:42 AM
1199133			5526, West Lorne WW TP	PM	Health and Safety	1	MONTHS	OHSA Inspection West Lorne (1m) - 5526	CLOSE	4/1/19 12:00 AM	4/29/19 11:14 AM	4/29/19 11:14 AM
1159055			5526, West Lorne WW TP	PM	Health and Safety	1	MONTHS	OHSA Inspection West Lorne (1m) - 5526	CLOSE	3/1/19 12:00 AM	3/8/19 11:21 AM	3/8/19 11:21 AM
1158902			5526, West Lorne WW TP	PM	Health and Safety	3	MONTHS	OHSA Inspection & Report West Lorne (3m) - 5526	CLOSE	3/1/19 12:00 AM	6/4/19 11:16 AM	6/4/19 11:16 AM
1122609			5526, West Lorne WW TP	PM	Health and Safety	1	MONTHS	OHSA Inspection West Lorne (1m) - 5526	CLOSE	2/1/19 12:00 AM	2/28/19 08:26 AM	2/28/19 08:26 AM
1080107			5526, West Lorne WW TP	PM	Health and Safety	1	MONTHS	OHSA Inspection West Lorne (1m) - 5526	CLOSE	1/1/19 12:00 AM	1/30/19 01:59 PM	1/30/19 01:59 PM
1080716			5526, West Lorne WW TP	PM	Health and Safety	1	YEARS	Lifting Device Insp Route (1y) - 5526	CLOSE	1/1/19 12:00 AM	1/30/19 02:01 PM	1/30/19 02:01 PM
1519570			5526, West Lorne WW TP	PM	Health and Safety	1	MONTHS	OHSA Inspection West Lorne (1m) - 5526	CLOSE	12/1/19 12:00 AM	12/12/19 08:30 AM	12/12/19 08:30 AM
1482830			5526, West Lorne WW TP	PM	Health and	1	MONTHS	OHSA Inspection West Lorne (1m)	CLOSE	11/1/19 12:00 AM	11/28/19 01:39 PM	11/28/19 01:39 PM
1481636	0000123216	PANEL ALARM/DIALER	5526, West Lorne WW TP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 5526	CLOSE	11/1/19 12:00 AM	11/28/19 07:58 AM	11/28/19 07:58 AM
1482130	0000123442	ENGINE DIESEL STAND-BY PLANT	5526, West Lorne WW TP	PM	Inspection	1	MONTHS	Engine Diesel Test/Insp (1m) - 5526	CLOSE	11/1/19 12:00 AM	11/22/19 01:21 PM	11/22/19 01:21 PM
1482149	0000123677	ENGINE DIESEL STAND-BY LIFE STATION	5526, West Lorne WW TP	PM	Inspection	1	MONTHS	Engine Diesel Test/Insp (1m) - 5526	CLOSE	11/1/19 12:00 AM	11/21/19 08:01 AM	11/21/19 08:01 AM
1487798			5526, West Lorne WW TP	PM	Inspection	1	YEARS	Emergency Generator Trailer Insp/Service (1y) - 5526	CLOSE	11/1/19 12:00 AM	11/15/19 07:40 AM	11/15/19 07:40 AM
1487940	0000123502	UPS BATTERY BANK PLANT	5526, West Lorne WW TP	PM	Inspection	1	YEARS	UPS Battery Bank Plant Insp/Service (1y) - 5526	CLOSE	11/1/19 12:00 AM	11/13/19 12:10 PM	11/13/19 12:10 PM
1482650			5526, West Lorne WW TP	PM	Inspection	1	MONTHS	Building & Grounds Maintenance	CLOSE	11/1/19 12:00 AM	11/12/19 07:31 AM	11/12/19 07:31 AM
1443113			5526, West Lorne WW TP	PM	Inspection	1	MONTHS	Building & Grounds Maintenance	CLOSE	10/1/19 12:00 AM	11/1/19 01:35 PM	11/1/19 01:35 PM
1078515	0000123216	PANEL ALARM/DIALER PLANT	5526, West Lorne WW TP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 5526	CLOSE	1/1/19 12:00 AM	1/18/19 08:18 AM	1/18/19 08:18 AM
1079108	0000123442	ENGINE DIESEL STAND-BY PLANT	5526, West Lorne WW TP	PM	Inspection	1	MONTHS	Engine Diesel Test/Insp (1m) - 5526	CLOSE	1/1/19 12:00 AM	1/31/19 03:44 PM	1/31/19 03:44 PM
1079134	0000123677	ENGINE DIESEL STAND-BY LIFE	5526, West Lorne WW TP	PM	Inspection	1	MONTHS	Engine Diesel Test/Insp (1m) - 5526	CLOSE	1/1/19 12:00 AM	1/31/19 03:46 PM	1/31/19 03:46 PM
1079644			5526, West Lorne WW TP	PM	Inspection	1	MONTHS	Building & Grounds Maintenance	CLOSE	1/1/19 12:00 AM	2/13/19 11:31 AM	2/13/19 11:31 AM

			TP					(1m) - 5526				
1518521	0000123442	ENGINE DIESEL STAND-BY PLANT	5526, West Lorne WW TP	PM	Inspection	1	MONTHS	Engine Diesel Test/Insp (1m) - 5526	CLOSE	12/1/19 12:00 AM	12/20/19 08:15 AM	12/20/19 08:15 AM
1518540	0000123677	ENGINE DIESEL STAND-BY LIFE	5526, West Lorne WW TP	PM	Inspection	1	MONTHS	Engine Diesel Test/Insp (1m) - 5526	CLOSE	12/1/19 12:00 AM	12/20/19 08:16 AM	12/20/19 08:16 AM
1519317			5526, West Lorne WW TP	PM	Inspection	1	MONTHS	Building & Grounds Maintenance (1m) - 5526	COMP	12/1/19 12:00 AM	12/31/19 01:51 PM	12/31/19 01:51 PM
1442047	0000123216	PANEL ALARM/DIALER	5526, West Lorne WW TP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 5526	CLOSE	10/1/19 12:00 AM	10/23/19 07:33 AM	10/23/19 07:33 AM
1442593	0000123442	ENGINE DIESEL STAND-BY PLANT	5526, West Lorne WW TP	PM	Inspection	1	MONTHS	Engine Diesel Test/Insp (1m) - 5526	CLOSE	10/1/19 12:00 AM	10/31/19 02:43 PM	10/31/19 02:43 PM
1442612	0000123677	ENGINE DIESEL STAND-BY LIFE	5526, West Lorne WW TP	PM	Inspection	1	MONTHS	Engine Diesel Test/Insp (1m) - 5526	CLOSE	10/1/19 12:00 AM	10/21/19 10:27 AM	10/21/19 10:27 AM
1398628	0000123216	PANEL ALARM/DIALER	5526, West Lorne WW TP	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 5526	CLOSE	9/1/19 12:00 AM	9/12/19 12:21 PM	9/12/19 12:21 PM
1399240	0000123442	ENGINE DIESEL STAND-BY PLANT	5526, West Lorne WW TP	PM	Inspection	1	MONTHS	Engine Diesel Test/Insp (1m) - 5526	CLOSE	9/1/19 12:00 AM	9/19/19 07:43 AM	9/19/19 07:43 AM
1399259	0000123677	ENGINE DIESEL STAND-BY LIFE	5526, West Lorne WW TP	PM	Inspection	1	MONTHS	Engine Diesel Test/Insp (1m) - 5526	CLOSE	9/1/19 12:00 AM	10/1/19 08:09 AM	10/1/19 08:09 AM
1442054	0000123533	PANEL ALARM/DIALER 01 PS	5526, West Lorne Sewage Pumping Stn	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 5526	CLOSE	10/1/19 12:00 AM	10/9/19 10:35 AM	10/9/19 10:35 AM
1481643	0000123533	PANEL ALARM/DIALER 01 PS	5526, West Lorne Sewage Pumping Stn	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 5526	CLOSE	11/1/19 12:00 AM	11/15/19 03:20 PM	11/15/19 03:20 PM
1487951	0000123532	UPS	5526, West Lorne Sewage Pumping Stn	PM	Inspection	1	YEARS	UPS Insp/Service (1y) - 5526	CLOSE	11/1/19 12:00 AM	11/7/19 02:47 PM	11/7/19 02:47 PM
1517811	0000123533	PANEL ALARM/DIALER 01 PS	5526, West Lorne Sewage Pumping Stn	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 5526	COMP	12/1/19 12:00 AM	12/31/19 01:52 PM	12/31/19 01:52 PM
1078522	0000123533	PANEL ALARM/DIALER 01 PS	5526, West Lorne Sewage Pumping Stn	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 5526	CLOSE	1/1/19 12:00 AM	1/30/19 02:16 PM	1/30/19 02:16 PM
1121317	0000123533	PANEL ALARM/DIALER 01 PS	5526, West Lorne Sewage Pumping Stn	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 5526	CLOSE	2/1/19 12:00 AM	2/28/19 08:23 AM	2/28/19 08:23 AM
1398635	0000123533	PANEL ALARM/DIALER 01 PS	5526, West Lorne Sewage Pumping Stn	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 5526	CLOSE	9/1/19 12:00 AM	9/12/19 12:18 PM	9/12/19 12:18 PM
1157597	0000123533	PANEL ALARM/DIALER 01 PS	5526, West Lorne Sewage Pumping Stn	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 5526	CLOSE	3/1/19 12:00 AM	3/28/19 11:27 AM	3/28/19 11:27 AM
1197866	0000123533	PANEL ALARM/DIALER 01 PS	5526, West Lorne Sewage Pumping Stn	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 5526	CLOSE	4/1/19 12:00 AM	4/30/19 11:37 AM	4/30/19 11:37 AM
1238627	0000123533	PANEL ALARM/DIALER 01 PS	5526, West Lorne Sewage Pumping Stn	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 5526	CLOSE	5/1/19 12:00 AM	5/15/19 07:40 AM	5/15/19 07:40 AM
1277504	0000123533	PANEL ALARM/DIALER 01 PS	5526, West Lorne Sewage Pumping Stn	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 5526	CLOSE	6/1/19 12:00 AM	6/7/19 08:07 AM	6/7/19 08:07 AM
1319352	0000123533	PANEL ALARM/DIALER 01 PS	5526, West Lorne Sewage Pumping Stn	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 5526	CLOSE	7/1/19 12:00 AM	7/10/19 07:39 AM	7/10/19 07:39 AM
1359042	0000123533	PANEL ALARM/DIALER 01 PS	5526, West Lorne Sewage Pumping Stn	PM	Inspection	1	MONTHS	Alarm Dialer Test/Insp (1m) - 5526	CLOSE	8/1/19 12:00 AM	8/16/19 10:07 AM	8/16/19 10:07 AM
1421020			5526, West Lorne WW TP	OPER	Inspection	0		Daily O&M Activities West Lorne WWTP (1y) - 5526	COMP		1/2/20 07:32 AM	1/2/20 07:32 AM
1378597			5526, West Lorne WW TP	CORR	Refurbish/Replace/Repair	0		5526 Aeration tanks cleaning	CLOSE		8/12/19 07:40 AM	8/12/19 07:40 AM

1365757	0000123536	PUMP SUBMERSIBLE P102 RAW PS-1	5526, West Lorne Sewage Pumping Stn	PM	Refurbish/Replace/Repair	1	YEARS	Pump Submersible P102 Raw Ps-1 Insp/Service (1y) - 5526	CLOSE	8/1/19 12:00 AM	10/15/19 01:20 PM	10/15/19 01:20 PM
1365766	0000123537	PUMP SUBMERSIBLE P101 RAW PS-1	5526, West Lorne Sewage Pumping Stn	PM	Refurbish/Replace/Repair	1	YEARS	Pump Submersible P101 Raw Ps-1 Insp/Service (1y) - 5526	CLOSE	8/1/19 12:00 AM	10/15/19 01:23 PM	10/15/19 01:23 PM
1365775	0000123538	PUMP SUBMERSIBLE P100 PS-1	5526, West Lorne Sewage Pumping Stn	PM	Refurbish/Replace/Repair	1	YEARS	Pump Submersible P100 Ps-1 Insp/Service (1y) - 5526	CLOSE	8/1/19 12:00 AM	9/13/19 08:14 AM	9/13/19 08:14 AM
1365802	0000123692	PUMP SUBMERSIBLE PS PUMP 100 SPARE SCUM	5526, West Lorne Sewage Pumping Stn	PM	Refurbish/Replace/Repair	1	YEARS	Pump Submersible Ps Pump 100 Spare Scum Insp/Service (1y) - 5526	CLOSE	8/1/19 12:00 AM	8/8/19 02:24 PM	8/8/19 02:24 PM
1399728	0000123567	UV LIGHT EFFLUENT	5526, West Lorne WW TP	PM	Refurbish/Replace/Repair	1	MONTHS	UV Light Insp (1m) - 5526	CLOSE	9/1/19 12:00 AM	9/10/19 01:05 PM	9/12/19 12:21 PM
1360014	0000123567	UV LIGHT EFFLUENT	5526, West Lorne WW TP	PM	Refurbish/Replace/Repair	1	MONTHS	UV Light Insp (1m) - 5526	CLOSE	8/1/19 12:00 AM	8/12/19 03:48 PM	8/12/19 03:48 PM
1365793	0000123566	PUMP SUBMERSIBLE 01 SANITARY SUMP	5526, West Lorne WW TP	PM	Refurbish/Replace/Repair	1	YEARS	Pump Submersible 01 Sanitary Sump Insp/Service (1y) - 5526	CLOSE	8/1/19 12:00 AM	8/1/19 03:31 PM	8/1/19 03:31 PM
1278689	0000123567	UV LIGHT EFFLUENT	5526, West Lorne WW TP	PM	Refurbish/Replace/Repair	1	MONTHS	UV Light Insp (1m) - 5526	CLOSE	6/1/19 12:00 AM	6/12/19 08:45 AM	6/12/19 08:45 AM
1320326	0000123567	UV LIGHT EFFLUENT	5526, West Lorne WW TP	PM	Refurbish/Replace/Repair	1	MONTHS	UV Light Insp (1m) - 5526	CLOSE	7/1/19 12:00 AM	7/11/19 11:32 AM	7/11/19 11:32 AM
1284981	0000123442	ENGINE DIESEL STAND-BY PLANT	5526, West Lorne WW TP	PM	Refurbish/Replace/Repair	1	YEARS	Engine Diesel Stand-By Plant Insp/Service (1y) - 5526	CLOSE	6/1/19 12:00 AM	6/21/19 01:43 PM	6/21/19 01:43 PM
1285025	0000123677	ENGINE DIESEL STAND-BY LIFE STATION	5526, West Lorne WW TP	PM	Refurbish/Replace/Repair	1	YEARS	Engine Diesel Stand-By Life Station Insp/Service (1y) - 5526	CLOSE	6/1/19 12:00 AM	6/21/19 01:44 PM	6/21/19 01:44 PM
1365784	0000123565	PUMP 02 SANITARY SUMP	5526, West Lorne WW TP	PM	Refurbish/Replace/Repair	1	YEARS	Pump 02 Sanitary Sump Insp/Service (1y) - 5526	CLOSE	8/1/19 12:00 AM	8/1/19 03:32 PM	8/1/19 03:32 PM
1326076	0000123009	TANK PROCESS CLARIFIER EAST	5526, West Lorne WW TP	PM	Refurbish/Replace/Repair	1	YEARS	Tank Process Clarifier East Insp/Service (1y) - 5526	CLOSE	7/1/19 12:00 AM	7/10/19 07:44 AM	7/10/19 07:44 AM
1326079	0000123010	TANK PROCESS CLARIFIER WEST	5526, West Lorne WW TP	PM	Refurbish/Replace/Repair	1	YEARS	Tank Process Clarifier West Insp/Service (1y) - 5526	CLOSE	7/1/19 12:00 AM	7/10/19 07:45 AM	7/10/19 07:45 AM
1326082	0000164709	VALVE BACKFLOW PREVENTER	5526, West Lorne WW TP	PM	Refurbish/Replace/Repair	1	YEARS	Valve Backflow Preventer Insp (1y) - 5526	COMP	7/1/19 12:00 AM	12/31/19 01:53 PM	12/31/19 01:53 PM
1239648	0000123567	UV LIGHT EFFLUENT	5526, West Lorne WW TP	PM	Refurbish/Replace/Repair	1	MONTHS	UV Light Insp (1m) - 5526	CLOSE	5/1/19 12:00 AM	5/13/19 07:43 AM	5/13/19 07:43 AM
1244603	0000123443	SAMPLER FINAL EFFLUENT	5526, West Lorne WW TP	PM	Refurbish/Replace/Repair	1	YEARS	Sampler Final Effluent Insp/Service (1y) - 5526	CLOSE	5/1/19 12:00 AM	10/28/19 07:46 AM	10/28/19 07:46 AM
1244606	0000123415	SAMPLER RAW SEWAGE	5526, West Lorne WW TP	PM	Refurbish/Replace/Repair	1	YEARS	Sampler Raw Sewage Insp/Service (1y) - 5526	CLOSE	5/1/19 12:00 AM	8/8/19 02:23 PM	8/8/19 02:23 PM
1198888	0000123567	UV LIGHT EFFLUENT	5526, West Lorne WW	PM	Refurbish/Repla	1	MONTHS	UV Light Insp (1m) - 5526	CLOSE	4/1/19 12:00 AM	4/16/19 03:20 PM	4/16/19 03:20 PM
1162638	0000123478	PUMP CENT 110 EFFLUENT	5526, West Lorne WW TP	PM	Refurbish/Replace/Repair	1	YEARS	Pump Cent 110 Effluent Insp/Service (1y) - 5526	CLOSE	3/1/19 12:00 AM	3/28/19 11:22 AM	3/28/19 11:22 AM
1162641	0000123480	PUMP CENT P120 FOAM CONTROL	5526, West Lorne WW TP	PM	Refurbish/Replace/Repair	1	YEARS	Pump Cent P120 Foam Control Insp/Service (1y) - 5526	CLOSE	3/1/19 12:00 AM	3/8/19 08:03 AM	3/8/19 08:03 AM
1158760	0000123567	UV LIGHT EFFLUENT	5526, West Lorne WW TP	PM	Refurbish/Replace/Repair	1	MONTHS	UV Light Insp (1m) - 5526	CLOSE	3/1/19 12:00 AM	3/8/19 08:05 AM	3/8/19 08:05 AM
1122344	0000123567	UV LIGHT EFFLUENT	5526, West Lorne WW TP	PM	Refurbish/Replace/Repair	1	MONTHS	UV Light Insp (1m) - 5526	CLOSE	2/1/19 12:00 AM	2/28/19 08:19 AM	2/28/19 08:19 AM
1123539	0000123549	SEPARATOR GRIT CYCLONE	5526, West Lorne WW TP	PM	Refurbish/Replace/Repair	1	YEARS	Separator Grit Cyclone Insp/Service (1y) - 5526	CLOSE	2/1/19 12:00 AM	3/6/19 12:34 PM	3/6/19 12:34 PM
1080859	0000123605	BLOWER POSITIVE DISPLACEMENT	5526, West Lorne WW TP	PM	Refurbish/Replace/Repair	1	YEARS	Blower B100 Aeration Insp/Service (1y) - 5526	CLOSE	1/1/19 12:00 AM	1/30/19 02:13 PM	1/30/19 02:13 PM

1080864	0000123608	BLOWER POSITIVE DISPLACEMENT	5526, West Lorne WW TP	PM	Refurbish/Replace/Repair	1	YEARS	Blower B101 Aeration Insp/Service (1y) - 5526	CLOSE	1/1/19 12:00 AM	1/30/19 02:13 PM	1/30/19 02:13 PM
1482587	0000123567	UV LIGHT EFFLUENT	5526, West Lorne WW TP	PM	Refurbish/Replace/Repair	1	MONTHS	UV Light Insp (1m) - 5526	CLOSE	11/1/19 12:00 AM	11/7/19 08:27 AM	11/7/19 08:27 AM
1487971	0000123571	PUMP SUBMERSIBLE CP7 SCUM PIT	5526, West Lorne WW TP	PM	Refurbish/Replace/Repair	1	YEARS	Pump Submersible Cp7 Scum Pit Insp/Service (1y) - 5526	CLOSE	11/1/19 12:00 AM	11/20/19 07:52 AM	11/20/19 07:52 AM
1487980	0000123693	PUMP SUBMERSIBLE SPARE	5526, West Lorne WW TP	PM	Refurbish/Replace/Repair	1	YEARS	Pump Submersible Spare Insp/Service (1y) - 5526	CLOSE	11/1/19 12:00 AM	11/13/19 12:08 PM	11/13/19 12:08 PM
1487989	0000123776	PUMP SUBMERSIBLE P107 RAS-WAS	5526, West Lorne WW TP	PM	Refurbish/Replace/Repair	1	YEARS	Pump Submersible P107 Ras-WAS Insp/Service (1y) - 5526	CLOSE	11/1/19 12:00 AM	11/13/19 12:07 PM	11/13/19 12:07 PM
1487998	0000123778	PUMP SUBMERSIBLE P105 RAS-WAS	5526, West Lorne WW TP	PM	Refurbish/Replace/Repair	1	YEARS	Pump Submersible P105 Ras-WAS Insp/Service (1y) - 5526	CLOSE	11/1/19 12:00 AM	11/12/19 07:29 AM	11/12/19 07:29 AM
1488007	0000123779	PUMP SUBMERSIBLE P106 RAS-WAS	5526, West Lorne WW TP	PM	Refurbish/Replace/Repair	1	YEARS	Pump Submersible P106 Ras-WAS Insp/Service (1y) - 5526	CLOSE	11/1/19 12:00 AM	11/13/19 12:05 PM	11/13/19 12:05 PM
1519047	0000123586	PUMP 01 ALUM CHEMIC RM	5526, West Lorne WW TP	PM	Refurbish/Replace/Repair	1	YEARS	Pump Diaphragm 01 Insp/Service (1y) - 5526	CLOSE	12/1/19 12:00 AM	12/20/19 08:17 AM	12/20/19 08:17 AM
1519065	0000123585	PUMP DIAPHRAGM 02 ALUM CHEMIC RM	5526, West Lorne WW TP	PM	Refurbish/Replace/Repair	1	YEARS	Pump Diaphragm 02 Insp/Service (1y) - 5526	CLOSE	12/1/19 12:00 AM	12/20/19 08:18 AM	12/20/19 08:18 AM
1519202	0000123567	UV LIGHT EFFLUENT	5526, West Lorne WW TP	PM	Refurbish/Replace/Repair	1	MONTHS	UV Light Insp (1m) - 5526	CLOSE	12/1/19 12:00 AM	12/3/19 07:33 AM	12/3/19 07:33 AM
1079581	0000123567	UV LIGHT EFFLUENT	5526, West Lorne WW TP	PM	Refurbish/Replace/Repair	1	MONTHS	UV Light Insp (1m) - 5526	CLOSE	1/1/19 12:00 AM	1/17/19 08:12 AM	1/17/19 08:12 AM
1487962	0000123557	PUMP SUBMERSIBLE	5526, West Lorne WW TP	PM	Refurbish/Replace/Repair	1	YEARS	Pump Submersible Insp/Service (1y) - 5526	CLOSE	11/1/19 12:00 AM	11/20/19 07:54 AM	11/20/19 07:54 AM
1443050	0000123567	UV LIGHT EFFLUENT	5526, West Lorne WW TP	PM	Refurbish/Replace/Repair	1	MONTHS	UV Light Insp (1m) - 5526	CLOSE	10/1/19 12:00 AM	10/9/19 08:39 AM	10/9/19 08:39 AM
1204052	0000123215	METER FLOW FE170 RAW SEWAGE	5526, West Lorne WW TP	PM	Calibration	1	YEARS	Meter Flow Insp/Service (1y) - 5526	CLOSE	4/1/19 12:00 AM	8/20/19 02:58 PM	8/20/19 02:58 PM
1406643	0000123592	METER FLOW FIT300 AIR	5526, West Lorne WW TP	PM	Calibration	1	YEARS	Meter Flow Insp/Service (1y) - 5526	CLOSE	9/1/19 12:00 AM	9/10/19 01:09 PM	9/10/19 01:09 PM

APPENDIX E

Substantial Completion Letter

R.V. Anderson Associates Limited
557 Southdale Road Suite 200
London Ontario N6E 1A2 Canada
Tel 519 681 9916 Fax 855 833 4022
www.rvanderson.com

March 16, 2020 RVA 173637

Municipality of West Elgin
22413 Hoskins Line
Rodney, ON
N0L 2C0

Attention: Rob Wrigley, London District Manager
Ministry of Environment, Conservation and Parks

Dear Mr. Wrigley:

Re: West Lorne WPCP Upgrades
Environmental Compliance Approval – 5873-B4RLEJ
General Review of Construction

The construction of the project covered under the above Environmental Compliance Approval (ECA) has now reached Substantial Completion. During the construction activities, R.V. Anderson Associates Limited (RVA) reviewed the work, and has found that all proposed works have been constructed in accordance with ECA #5873-B4RLEJ, with the exception of the following:

1. Under the 'Filtration' of the Proposed Works, there was a clerical mistake which is corrected as follows:
    a. Installation of one (1) air compressor rated to 470 litres per minute at 1034 kPa (10.34 bar) to serve above mentioned filters.

2. Under the 'Backwash Pumps' of the Proposed Works, the following change applies:
   Remove
    a. Replacement of two (2) existing 3.7 kilowatts backwash pumps with two (2) 0.25 kilowatts end suction centrifugal pumps.
   Add
    a. Replacement of two (2) existing 3.7 kilowatts backwash pumps with two (2) 1.125 kilowatts open impeller centrifugal pumps.

3. As-built drawings are currently outstanding and will be prepared within one (1) year of Substantial Completion of the Proposed Works.
4. The Operations and Maintenance Manual is currently outstanding and will be prepared within six (6) months of Substantial Completion of the Proposed Works.

…/2

Yours very truly,

R.V. ANDERSON ASSOCIATES LIMITED

Phil Spenser, P.Eng., M.E.Sc.
Project Manager

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